Sten Vermund
My name is Sten Vermund.
I'm the dean of the School of Public Health here at Yale University.
I wanna welcome all of you in the Winslow Auditorium this evening, as well as those of you joining via live streaming.
Thanking in advance our speakers who have joined us this evening on short notice.
My only duty this evening other than to quiet the crowd is to welcome this evening's moderator and introduce him.
Dr. Saad Omer is director of the Yale Institute for Global Health.
He is an infectious disease epidemiologist, a vaccinologist, and a physician.
He's also a professor of medicine.
He holds a Susan Dwight Bliss Professor of Epidemiology of Microbial Diseases at the Yale School of Medicine.
He also has a secondary appointment in the Yale School of Nursing.
We are lucky to have Dr. Omer here.
He is the inaugural director of our Yale Institute for Global Health.
And without further ado...
Thanks Sten, and besides being the dean of the School of Public Health,
we at the Institute for Global Health are privileged to have a true pioneer, Sten, as one of the deans here. He's one of the founding fathers of the Institute for Global Health. So it's a privilege to be here and talk about this important emerging public health issue.

And, just to outline what we'll be discussing, we'll be discussing the academic response of the various parts of the university, not university, the University and the hospital as an institution which is located in New Haven, and interacts with its communities. It is a part of it, but our focus here is on a few issues ranging from epidemiology, to virology, to some aspects of preventive measures and the public health response, and in the last week or so in the university, this one has a focus. We want to do a comprehensive focus on questions and answers.

And then, I'll welcome our distinguished panelists. And most of the session will be based on questions and answers.
I’ll go through a couple of rounds of questions from the panelists then we’ll open this forum for discussion. We have a really good and solid, rich base of faculty and students who have a lot to contribute. So please, feel free to contribute.

I wanna thank, in terms of organizing this, specifically, YSPH’s Department of Epidemiology of Microbial Diseases, especially, Albert Ko, who was very instrumental, and he was instrumental in choosing the panelists, et cetera, and was very helpful in organizing this. I also want to thank Global Health Justice Partnership. Gregg Gonsalves, who’s one of the panelists, and Amy Kapczynski, and a few others who have been really helpful. Yale is very privileged to have long-standing collaborations with our colleagues in China. And there are a lot of efforts going on, especially, for example, there’s a coronavirus working group focusing on a few research questions, which is very driven by our Starlight Fellows. And I would encourage colleagues with connections to China and of Chinese heritage, to contribute in today’s discussion.

So without further ado, I will start with my introductory slides. So we know that the initial cases were identified
and reported from Wuhan City in China. And it is an unfortunate aspect that some people call it a Wuhan coronavirus. I’m very uncomfortable, and a lot of us are very uncomfortable, labeling this virus with a place and adding to a little bit of culture of stigma that sometimes evolves. But it was identified, it’s appropriate to say, initially, in that place. It has now, as of this morning, it’s spread to 28 countries.

And this is a map, but there’s also, there’s some sobering reflection on the status of the outbreak in the sense that the major chunk remains in China, and the major chunk remains in mainland China. There have been over 28,000 cases reported. There are model-based estimates that go much higher than that. But, in terms of reported cases are 28,353, including, unfortunately, 565 deaths. And that’s a very sobering reflection on the status of the outbreak. But when it comes to emerging diseases, it’s not just that we are concerned about what has happened so far. And can you imagine that, during the holidays, most of us had, in fact, yes, I was looking at the reports, there were emails circulating in early January,
starting in late December there was something percolating.

But we didn’t know about this major outbreak.

Certainly, it wasn’t common knowledge.

It wasn’t a major concern and how quickly this disease has become a major concern.

We think the family of viruses it comes from, it sort of tells us that it is likely to have the more prominent host as a bat virus.

You know, when you use icons sometimes, they look closer to Batman symbol.

(assembly laughing)

But, you know, take my word, it’s a bat.

But there is a possibility of an intermediate host.

Having said that, there was a lot of rumors–

and sort of preprints that were shared.

Someone looked at the receptors and had some speculation

that we have a snake intermediate host.

And, no matter what you guys do, don’t call it a snake virus.

There was a headline, not in the Baltimore Sun, in the Scottish Sun– Baltimore Sun is a much better paper

that had this snake flu headline.

But, obviously, it got transmitted to humans.

And what really concerned us,

was the well-established human to human transmission.

Because when things come from zoonosis,

when there’s a jumping of a virus or a pathogen
from an animal host to a human, that happens with some frequency. But what really concerns us is when there’s human to human transmission established. Just to give you a little bit of a big picture estimate, so one measure of transmissibility is the so-called basic reproduction number. Some people call it basic reproductive number. That’s not a preferable term. Basic reproduction number, meaning, one way of conceptualizing it is that in a naive population, where everyone is susceptible to this infection, if there is one case introduced of this disease, on average, how many cases they would infect? So that’s one simple way of understanding this. And this is a measure of transmissibility. This is not the sole predictor of how big, how dangerous the outbreak will be. But it is an important measure. There’s some uncertainty about the magnitude of it. But we do know that it is not as transmittable as, let’s say, measles, which is one of the most transmittable common diseases which has this R0 Number of 12 to 15. In certain outbreaks, it has gone up to 17. Ebola had this number of two. And this is, the novel coronavirus is comparable to SARS. It’s more than the flu. And so, this is some perspective to keep in mind,
with a caveat that our information is evolving.

We certainly know a lot more about this virus than we knew a couple of weeks ago.

But our understanding is evolving and so keep that in mind.

Now, this is a natural phenomenon in all outbreaks that are emerging.

So what can we do?

So I have thought about it a little bit in terms of the big picture policy response, and we will be, so the implicit focus will be, the response, from an academic and research perspective for the rest of the panel.

But one of the things, those of you who don’t know, that the writers have very little control over the headlines.

So there’s separate editors who do the headlines.

So my op-ed was a little bit more nuanced than the headline would suggest.

But we certainly have, I certainly didn’t go, for a call and response kind of a framework. “Are we ready?”

“Are we ready?”

But we did talk about certain gaps.

First of all, what I postulated was, and this was, I wrote this a few hours after the first case were identified.

The government hadn’t formulated its response.

So some of us were concerned about the response
being handled by the political leadership. Look, it’s not an unreasonable thing. 

to say that our elected leaders who we elect in a democracy could be at the helm of a major emergency. But this is slightly different and it should vary from pathogen to pathogen and emergency to emergency, and here’s the reason why. When you have an outbreak with substantial uncertainty, we should acknowledge that uncertainty, but the decision-making process should be structured in a way that the assimilation of ever-changing and ever-evolving information, and the decision-making should be very proximal and ideally led by the same set of people, who have the detailed, nuanced knowledge, intuitively of these things. They should be calling the shots. And who are those people? Fortunately, those in this country who are leading our major public health agencies, the NIH, the CDC, FDA, even the HHS, various entities within the HHS, are mainstream, well-respected scientists or public health professionals. And so, rather than sort of having this outbreak, irrespective of the political perspective, in this kind of a situation, being handled at the White House level, for example, it would be best for the agency heads to tackle this.
So similarly, let the scientists and public health professionals lead. But, look, it is hard, it’s highly unsatisfying. I was on an AMA Reddit half an hour before I came here, where a lot of questions, it’s easy to speculate. It’s very tempting to say, provide certainty. We certainly know a lot about this outbreak than before. But we owe it to the general public to convey what we don’t know. But also, what is knowable and what will never be known. And so, therefore, yes, saying that what is happening right now, you shouldn’t be walking around in a spacesuit on College Street, it is reasonable to say that. But on the other hand, we don’t know the future risk of this outbreak. We have some things to go by, and we’ll flesh that out a little bit in more nuance. So don’t provide false assurances, don’t alarm, certainly. And the other thing that has happened, as look universities have a unique space in our society. Which is we are the guardians of evidence. Lux et Veritas is not an accident. And when we are guardians of evidence, we should think about not just what knowledge is being generated and how it’s being implemented, but the quality of that evidence.
And so, the preprint server movement, where open science requires and nudges us to share our data and our academic output very quickly on these preprint servers without peer review. Overall, is a really positive development when it comes to speed of sharing knowledge and can serve us really well. The genomes were posted very quickly and very robustly, in the sense that, in terms of the number, obviously there was a proportion there was a lag. But we should also be careful about how valid that information is. So one way to thread that needle, and there have been incidents that things have been retracted, even in the New England Journal. So it’s not just the new preprint servers that have been vulnerable. There have been other things on preprint servers that have been revised, et cetera, and people have changed their perceptions around the outbreak based on that. So one of the proposals I discussed there is to have a preplanned rapid peer review system that is already set up to evaluate information on a quick turnaround basis. I’m not going to go into the details right now. But just to remind you of the response, this is a public health emergency of international concern declared by the WHO.
There have been travel restrictions, and there have been quarantine, various measures akin to quarantine that have been implemented. We will discuss the matter to the value and sort of nuances of these responses in a little while.

These are a couple of things WHO recommends in terms of preventive measures: covering mouth and nose when you’re coughing and sneezing, if you’re using tissues into closed bin immediately after use, cleans hands, hand-washing is a very important preventive measure, it’s not a panacea, that’s gonna take care of all our wolves when it comes to respiratory disease, but it is something that you can do now. It is evidence-based and this is something we can do now without any further technological development.

And then, there are certain recommendations, without going into details, on the WHO side in terms of staying healthy while traveling. So I’ll pause here and I will then introduce our panelists one by one. But before I do that, I wanna thank one of my postdocs who helped with some of those slides, Amyn Malik, and I already thanked Albert and others for helping organize this session. I’m gonna call the panelists in alphabetical order. The first one is Ellen Foxman.
She’s an assistant professor of lab medicine and immunology at the Yale School of Medicine.

Her research focuses on understanding the natural mechanisms that protect the airway from respiratory viruses. And you can see how that is relevant to what we are talking about right now.

One of the interesting things that she’s working on is rapid diagnostics for these kinds of emerging diseases straddles individual and public health response. And that’s one of my favorite kinds of responses.

The second panelist is Gregg Gonzalez. He’s an assistant professor of epidemiology and associate adjunct professor of law of Yale Law School, and he’s the co-director of the Yale Global Health Justice Partnership. So he has two homes, Yale School of Public Health and the Law School.

And he’s a perfect example of an activist scientist. He’s a solid activist, a very passionate activist, he has the fire in the belly that we all felt on our first day of grad school. Some of us get jaded, others stay enthusiastic and passionate.

And he’s also a top-notch scientist and models impact of decisions and operation instead of using quantitative techniques, which are really fascinating.
The third panelist is Nathan Grubaugh. He’s also an assistant professor of epidemiology of microbial diseases at the Yale School of Public Health, and he has done some very interesting work on genetic epidemiology and has been co-curating with his colleagues these viral genomes that have been posted or have been shared, and sort of creating this, if you will, the map of this genome as it evolves. And this is real-time public health that takes advantage of important immediate information sharing and brings it together for, hopefully, decision-making and response to an emerging threat.

Then, we have Lisa Sanders. Dr. Sanders is a clinical educator in Internal Medicine and she’s a primary care provider and an Emmy Award-winning producer of CBS News, as well as an author. And the other thing that I like, as a House fan, she was one of the inspirations for House. Is that correct?

My column, nothing personal, I’m way nicer. Sometimes, I win. Because I was trying to look for the resemblance with Hugh Laurie. Sometimes, I win. And then, our last panelist is David Vlahov. He’s the PhD program director and professor.
at the Yale School of Nursing, and then he also has a joint appointment with Epi here in the School of Public Health. He was involved and he did some very fascinating work in early 2000 when SARS broke and anthrax happened on the response of healthcare providers or the public health workforce, including school nurses, et cetera, who can be the tip of the spear of a mass response, and was involved from that perspective. But also, as a professor of nursing, has thought about and would provide his expertise on some of the healthcare and workforce decisions, et cetera. There are a couple of people who are in the audience who are not official panelists, but I may sort of put them on the spot. One is Dr. Paul Genecin. He’s the director of Yale Health. So if there are any questions that come from that perspective, I will point to you. And Albert Ko, who’s an overall smart person, has long-standing links with Chinese colleagues. But, equally importantly, he’s involved with a WHO working group developing interventions and evaluating interventions, more importantly, developing a common protocol so that we are not have a different playbook for developing countermeasures.
0:20:16.91 -> 0:20:18.163 against this outbreak.

0:20:19.435 -> 0:20:23.2 So with that, I’ll switch to the question and answer phase

0:20:23.2 -> 0:20:24.033 of this forum.

0:20:29.89 -> 0:20:34.72 So my first question will be from Nate,

0:20:36.617 -> 0:20:38.53 “So where did this virus come from?”

0:20:38.53 -> 0:20:41.79 And I think our best bet to figure this out

0:20:41.79 -> 0:20:44.423 is not to send Hugh Laurie and investigate,

0:20:46.29 -> 0:20:49.8 but to look at the genetic data and look at other viruses,

0:20:49.8 -> 0:20:52.93 et cetera, that could tell something about that.

0:20:52.93 -> 0:20:54.46 Could you elaborate a little bit on that.

0:20:55.839 -> 0:20:57.48 - [Nate] Yeah, sure, thank you.

0:20:57.48 -> 0:21:00.9 so many students in the audience,

0:21:00.9 -> 0:21:03.44 from a lot of different backgrounds.

0:21:03.44 -> 0:21:06.46 So the question really gets at something

0:21:06.46 -> 0:21:08.21 that I’m very interested in with outbreaks

0:21:08.21 -> 0:21:10.64 and that is misinformation.

0:21:10.64 -> 0:21:13.66 So, if any of you are on Twitter

0:21:13.66 -> 0:21:15.3 or are reading some columns,

0:21:15.3 -> 0:21:17.97 maybe you see a lot of misinformation about the origins

0:21:17.97 -> 0:21:19.43 of this outbreak.

0:21:19.43 -> 0:21:22.56 For a second telling you this is not a deliberate release

0:21:22.56 -> 0:21:24.09 from a laboratory.

0:21:24.09 -> 0:21:27.832 Some of the evidence that people present for that

0:21:27.832 -> 0:21:31.61 is a paper that did some, I’m gonna say, “shoddy”

0:21:31.61 -> 0:21:35.58 to say that there is elements within the coronavirus genome

0:21:35.58 -> 0:21:38.68 that had an, “uncanny resemblance to HIV.”
And therefore it was man-made and released from a lab that they say there’s a high-containment virology lab in Wuhan which is actually perfect for being able to respond to these events but then people are suggesting that the virus was manmade and came from this lab.
That is absolutely not true, there is no evidence to actually say that, and the analysis was faulty.

Where this actually came from is like with Saad’s slide, the group of viruses that this virus belongs to are beta-corona viruses. And they’re ancient origins are in bats, there’s some 200 different known species of beta-corona viruses in bats, there are seven of these viruses that have spilled over into human populations that caused outbreaks.
Four of ’em cause common cold, they’re right here in New Haven. One of ’em is SARS, one of ’em is MERS, and one of ’em is now this novel coronavirus.

So the question really is then, looking at these genomes and looking at this data of when and where did this happen? So the when part of it, if we look at all the genetic data that we have, we can estimate that the origins of the outbreak was about early December, maybe late November.
And there are some questions about whether this came directly from a live market that was in Wuhan, it’s sort of uncertain if that is actually the case, the most epidemiological evidence would suggest that. But it certainly came from a mammal of sort, so beta-corona viruses infect mammals and this gets into another point of misinformation out there that maybe this was a snake virus, or maybe this actually spilled over from fish. We don’t know of any of these viruses that have ever infected anything other than mammals. So what exactly that intermediate host was, if there was an intermediate host, before we had a human outbreak is sort of unknown.

So that brings me to the question about the viral pathogenesis, so Ellen, do you mind elaborating a little bit on that part of how the virus effects our cells and us as humans? Yeah, sure. Hello everyone, it’s great to be here. So my life study’s respiratory viruses and there’s a lot of those as we were all familiar with the common cold, the flu, and these viruses that we get, year after year. And so I thought I’d talk about this virus in the context of that, what are similarities and what are some differences?
So as many of you probably know, the way a virus causes illness is it is able to enter a cell or several cells of your body and hijack those cells and basically turn those cells into factories for making more virus, which can be damaging to the cells. But then your immune system realizes that’s happening and comes to that area of the body to fight it, fight the virus and get rid of it. And wherever that battle is going on is where you get the symptoms. So if you get the common cold virus in your nose, the immune system’s fighting it in your nose, you get the symptoms of the runny nose and so forth. If that battle’s going on in the lungs, then you’re going to get lung symptoms, breathing problems and whatnot, the things we associate with pneumonia. So this virus can do both of those things. It can effect the nose or it can effect the lungs or both. So you might ask, "Well, why are we more concerned about this, we get these viruses every year, "about this, we get these viruses every year, "they’re going on in New Haven right now. “We’ve got lots of other respiratory viruses.” And the main thing is, is the fact that it’s new to the human population. So as I’m sure many of you are also familiar with, the idea that when our body fights a virus there’s a memory immune response that’s formed, that makes it so if we see a virus,
that virus or a similar virus again,
our body is much better at blocking it before it even gets into cells.
So that’s always the concern about a new virus
is that none of us have that pre-existing immune defense up and going.
And that makes it potentially easier for the virus to spread from person-to-person and also if it gets into your body,
you don’t have that first line of defense that could maybe prevent disease as well as if you had seen the virus before.
And that’s why, like a new virus,
is always a cause to be alert, it’s a cause to be vigilant.
Just because it’s new,
doesn’t mean it’s worse than other viruses that we know,
that we’re familiar with but it means there’s a potential reason for the heightened vigilance about it.
That’s a very important point to remember, just because it’s new, doesn’t necessarily mean it’s worse, unless it’s a disaster movie.
You get that, it’s not-
Yeah, we just don’t know a lot of those things yet.
Yeah, exactly.
And so Lisa, you’re practically a doc and tell us a little bit about what preventive measures we can take now and perhaps if the outbreak expands
0:26:40.92 → 0:26:41.77 in the community.
0:26:43.77 → 0:26:47.268 [Lisa] Well, it seems now, we all know what to do,
0:26:47.268 → 0:26:52.02 hand-washing and coughing into your elbow
0:26:52.02 → 0:26:53.93 and things like that.
0:26:53.93 → 0:26:58.93 Not probably getting too close to people
0:26:59.05 → 0:27:03.13 who have obvious infections, giving them their space,
0:27:03.13 → 0:27:06.35 there’s probably pass-through fomites
0:27:06.35 → 0:27:10.597 or other kinds of respiratory-borne particles.
0:27:11.82 → 0:27:14.93 So I don’t think there’s anything particularly wild
0:27:14.93 → 0:27:16.697 that we can do, I’m not sure that,
0:27:16.697 → 0:27:19.02 certainly if you had a cold
0:27:19.02 → 0:27:21.1 perhaps it might help if you wore a mask.
0:27:21.1 → 0:27:23.67 But certainly there’s no evidence that wearing a mask
0:27:23.67 → 0:27:26.18 is going to keep you from getting it.
0:27:26.18 → 0:27:28.97 Nor does there seem like there’re very many people who
0:27:28.97 → 0:27:31.37 have it now to get it from.
0:27:31.37 → 0:27:36.19 So I think having ordinary levels of precaution makes sense.
0:27:36.19 → 0:27:38.08 I mean, I assure you,
0:27:38.08 → 0:27:41.09 most people don’t wash their hands nearly enough.
0:27:41.09 → 0:27:43.94 So if people just washed their hands just a little bit more,
0:27:43.94 → 0:27:45.883 it would probably go a long way.
0:27:46.76 → 0:27:48.42 [Saad] Yeah, that’s certainly aligned with
0:27:48.42 → 0:27:51.536 CDC recommendations and specifically,
0:27:51.536 → 0:27:52.369 at least at this point,
0:27:52.369 → 0:27:55.68 CDC doesn’t recommend wearing face masks.
0:27:55.68 → 0:27:59.66 It’s probably perhaps one of the reasons people wear them
0:27:59.66 → 0:28:04.13 is for self-efficacy, they want to feel in charge.
0:28:04.13 → 0:28:06.5 It’s a situation of helplessness,
when there is a lot of uncertainty.
So perhaps those of us who, there's a few who work
perhaps we should have a message of self-efficacy
in the form of saying, “You can wash hands.”
Which is not going to take care of everything,
you can practice some level of social distancing
without being paranoid about this,
especially when you have someone infected,
social distancing doesn’t mean that start discriminating
against people willy-nilly, it means if you have someone,
if you are specifically in that kind of a situation,
you take some of these precautions.
And also, the original prevention to public health re-
response
David, do you have any thoughts in terms of the
response
at the mass level and some of the things
that you were involved with earlier on,
in previous similar outbreaks?
And the second part of that question
of some of the things that have been employed
by various countries, including China, including the
US,
and some of the others.
- Here you go, sir.
- Oh, okay (laughs).
Thank you for the question.
In terms of what’s going on in China,
there’s quite a bit of discussion about whether quarant-
make things better or makes things worse.
And the idea of having people that are separated and protected, seems like it would be a good idea, but it also has a stigmatizing effect where people can under report, go underground, if you will.

And if we take the example of Ebola, which again’s a very different analogy that doesn’t work at a lot of levels, but again just that stigma of being confined and not trusting in a particular environment, there’s a lot of discomfort and anger and acting out that can happen with that.

So what’s the process that can be a middle ground. And the approach that I think seems better, although you have to look at what is the local situation, what are cultural considerations that go with that, are to be able to have a conversation with people, in terms of what is your likelihood of having been exposed given what we know and taking that person to have the individual responsibility for staying at home, for example, right?

Secluding oneself for a period of time, that’s a social contract that happens, and for many people that seems very reasonable and there’re going to be others that may need a little bit more assistance in that area. So I think that’s one of the larger issues that comes up and has certainly been in the news, is quarantine or cordon sanitaire, right?
0:31:33.46 –> 0:31:37.66 What are the different levels of protection one can have?

0:31:37.66 –> 0:31:41.62 Now another part of the question is

0:31:41.62 –> 0:31:44.073 what is a public health response?

0:31:45.544 –> 0:31:50.544 And Robin Gershon and Chris Korechi were doing a study

0:31:50.87 –> 0:31:54.71 of nurse preparedness in New York City

0:31:56.349 –> 0:32:00.17 and found that if there was some sort of disaster

0:32:00.17 –> 0:32:03.49 that was about to happen, what barrier,

0:32:03.49 –> 0:32:06.27 how many of you would have at least one barrier,

0:32:06.27 –> 0:32:09.45 that would stop you from showing up to work, whatever?

0:32:09.45 –> 0:32:14.36 So turns out it was 90%, like a childcare,

0:32:14.36 –> 0:32:18.763 all those different issues and then, it was not by design,

0:32:19.807 –> 0:32:23.35 but the Anthrax, hit New York City and they followed up

0:32:23.35 –> 0:32:25.74 and they found out that every single person,

0:32:25.74 –> 0:32:28.18 every single one of the nurses, showed up to work,

0:32:28.18 –> 0:32:32.21 and did what their job was, right?

0:32:32.21 –> 0:32:37.21 So part of it is recognizing that people will rise up

0:32:37.95 –> 0:32:39.81 to what that challenge is,

0:32:39.81 –> 0:32:43.36 what their professional responsibilities are,

0:32:43.36 –> 0:32:48.36 and part of that also is having the education and support

0:32:49.88 –> 0:32:51.13 to be able to do that.

0:32:51.13 –> 0:32:55.119 So I'll pause, 'cause I could keep going, I'll pause.

0:32:55.119 –> 0:32:55.952 (audience laughs)


0:32:58.24 –> 0:33:00.31 So you mentioned quarantine

0:33:00.31 –> 0:33:02.207 and Gregg I want to sort of switch to you,

0:33:02.207 –> 0:33:04.25 there was some really interesting work,

0:33:04.25 –> 0:33:08.02 I wasn't here in New Haven in the area at that time,
but there was Ebola-related quarantine, as I understand,
in the area and even as an outsider,
as someone who looks at these issues,
I found Yale Law School’s and some of the people who were involved in the Global Health Justice Partnership,
collaborated with the ACLU,
on a report that came out of that experience.
Which is a very, very helpful, very pragmatic tool,
that a lot of public health practitioners should pay attention to.
Could you elaborate, in terms of, if we quarantine
or whatever the parameters of quarantine should be?
And if we do that, how should that look like?
So if you were here in 2014, 2015,
in wake of the Ebola epidemic in West Africa,
several governors across the country,
decided to quarantine individuals returning from,
West Africa healthcare workers, in absence of symptoms,
confine them under quarantine.
Including two Yale students,
who were not infected with Ebola,
and including a West African family from Westhaven,
who were not infected with Ebola,
this was done by former Governor Dan Malloy.
We’re still in a lawsuit,
the law school’s immigration clinic is partnering with us
in a suit against the State of Connecticut
against these quarantines,
but we wrote a paper with the ACLU and Doctors Without Borders that talked about what would happen, the epidemiological and the legal implications of the Ebola quarantine on healthcare workers.

And Dan Bausch who was one of our evening speakers two weeks ago was one of the scientific advisors on that (murmurs) illness and helped out.

You can see the report on the GHJP website at the Yale Law School, but the back of the report has recommendations about what happens next time? Guess what, it’s next time.

A couple of things to remember, one is to use the least restrictive measures possible, so not to overreact.

In the case of the Ebola epidemic the quarantines were absolutely unnecessary, unjustified. As David is saying, there may be self-isolation and staying at home if you feel sick or quarantined if necessary, but really to use the least restrictive measures for a start, rather than sort of going full-steam ahead for quarantines. The other thing is to ensure robust procedural protections.

You have rights, under the US constitution, to bodily autonomy and due process. So when our students were put into quarantine, we could appeal their cases immediately to the courts, but it was a 14 day quarantine and we ended up saying,
0:35:51.802 → 0:35:55.72 afterwards because the time-period was too short.
0:35:55.72 → 0:35:57.98 But you do have robust - you do have rights
0:35:57.98 → 0:36:00.54 under the constitution to due process.
0:36:00.54 → 0:36:04.757 Kaci Hickox was a nurse, with MSF, who came back to the US
0:36:04.757 → 0:36:06.64 and was quarantined by Governor Christie,
0:36:06.64 → 0:36:09.61 a republican in New Jersey,
0:36:09.61 → 0:36:12.01 her quarantine was overturned by a judge in Maine,
0:36:12.01 → 0:36:14.1 who said it was epidemiologically unjustified.
0:36:14.1 → 0:36:16.78 So in one case the law worked out.
0:36:16.78 → 0:36:21.55 The other thing is ensure humane conditions of confinement.
0:36:21.55 → 0:36:25.12 Now I saw on the news today that China is thinking about
0:36:25.12 → 0:36:28.92 quarantining or taking all the infected people,
0:36:28.92 → 0:36:30.06 in Wuhan and other places,
0:36:30.06 → 0:36:32.813 and putting them into quarantine camps.
0:36:34.85 → 0:36:36.61 What are the conditions going to be like for them?
0:36:36.61 → 0:36:38.4 Are they gonna get adequate health care?
0:36:38.4 → 0:36:40.703 Is there gonna be adequate infection control?
0:36:41.67 → 0:36:43.21 We’re thinking about the risks
0:36:43.21 → 0:36:44.33 to us here in the United States,
0:36:44.33 → 0:36:47.15 but think of the thousands of Chinese patients
0:36:47.15 → 0:36:51.553 with coronavirus now whose health status
0:36:51.553 → 0:36:54.69 is going to be put into precarious position
0:36:54.69 → 0:36:56.48 if they are isolated in these facilities
0:36:56.48 → 0:37:00.49 that we have no idea of who’s overseeing their quality
0:37:00.49 → 0:37:04.6 and their ability to prevent onward transmission
0:37:04.6 → 0:37:05.593 from these sites.
0:37:06.443 → 0:37:07.276 So there’s lots of things we can do,
0:37:07.276 → 0:37:08.3 I’m not gonna go through all the recommendations,
0:37:08.3 → 0:37:12.22 but follow the science, as Saad said.
Follow the evidence.

If you hear the words, “abundance of caution,” beware, because it means, "Damn the evidence and we’re gonna do what we want to do."

And that’s what Governor Daniel Malloy, Governor Chris Christie, and Governor Andrew Cuomo did in 2014, 2015, which was bi-partisan stupidity.

(audience laughs)

On that note of bi-partisan Kumbaya, I guess (audience laughs)

So I want to switch to a lot of those decisions were made in a communications environment, in a public, in the view of an interesting, to say the least, public discourse.

So, Lisa, as someone who has been involved, as an author, as a producer, obviously as a physician, on top of all of this, what do you think, what is your initial impression of what is happening now?

What are some of the nuances, what are some of the adequacies, what are the things that we should have learned from previously that we could do better?

Well, if you, I don’t know how accurate a representation of the country Twitter is, but you don’t have to look very deep in Twitter to start seeing real crazy about this proliferate.

And to some degree I think that’s completely natural
because of the disconnect between the messaging that we have

"You’re much more at risk of the flu, just wash your hands,

don’t worry about it, it’s going to be okay.”

Versus closing the country off
to people from different countries, who’ve been to China,

imposing quarantine, sending people to concentration camps

when they’re diseased.

I mean, that suggests a level of concern,

that doesn’t really match what we’re told to do, right?

So we’re told to calm down and yet everybody

in the government seems to be extremely excited.

And nobody’s really trying to make that connection

and when you have big gaps like that,

it’s inevitable that crazy creeps in

because people are worried and that’s how people express it.

I think that we need to acknowledge that we have to

try to make sure that nothing bad happens,

while saying the risk right now seems limited,

and acknowledge that we don’t know what the future holds.

I mean, I think that those are the reasonable steps.

But this kind of “pooh-poohing” concern, of course,

makes everybody crazy and really worried

and I think it’s completely natural.

As journalists, of course, we need the snappy headline,

it’s essential, I mean, maybe the New York Times

doesn’t need a snappy headline,
although I think they have been tempted by that once or twice, but certainly other publications need that, television needs that. I mean, people are, this is a competitive environment. So some of that is understandable, I don’t know that it’s forgivable. But as public health people, we have to step in and try to make it make sense to the people around us. We can’t depend on the media necessarily to do it.

So the frontline of this response, in this country, because of the way certain powers are given to the state and local health departments, a lot of people don’t realize that yes, CDC provides technical guidance, but actual action, in terms of outbreak prevention and control, on the ground happens at the state and local health departments. Over the past 20 years, there has been a lot of investment. The investment in terms of resources have stalled. Should we be reassured, in one way, by the headstart we have had, since SARS and Anthrax and the 2009 epidemic and/or should we be concerned because of the cuts that the public health system has seen over the last, at least, six, seven years?

I’m not sure except, how best to start on that. You know it’s a crisis like this that can be a stimulus to get the public health funding.
I mean, we certainly saw that in earlier crises, it may be delayed, but I think there’s a opportunity here. To say we’ve gotta take the public health preparedness very seriously and to generate the resources to be able to respond to this. I think that’s [Saad].

But isn’t that, usually vanished after, sort of we get this bolus, this sugar rush of investment in global health and then we have this seven years of crankiness. After building up, having this surge, then suffers from these consequences.

Any thoughts on a sustainable way of investing in public health this way? I know Sten, Development had a very good op-ed, in terms of the global health investment and not having these boom, bust cycles and sustaining the infrastructure.

But domestically speaking, sort of any thoughts on how to maintain that infrastructure that doesn’t go through these cycles? Sten, do you want to contribute?

The reality is that public health is faced with an inherent challenge. It’s hard to convince policy-makers to pay you to do something to prevent something from happening. It’s much more intuitive to invest in hospitals, to care for the ill,
than it is in public health infrastructure to prevent the illness to begin with.
So that is part of the theme I think this evening of all the panelists, that we’re up against tremendous communications challenges.
How do we advocate for infrastructures for disease prevention, for rapid response?
To be prepared for something that might or might not happen?
And there’s so many compelling demands, in a developing country you advocate for public health and you’re up against the minister of defense, you’re up against the minister of tourism, you’re up against the minister of education.
Where we have more resources and high-income settings, it’s almost equally challenging.
The NIH budget is in the neighborhood of $33 billion dollars a year and the CDC budget is a fifth of that.
So people understand disease, research to treat disease, tremendous investments in clinical trials, the prevention budget is far more modest.
So I think it’s part of our duty, here in the school of public health, to work more diligently on how to communicate with lay audiences about public health and prevention. How to communicate with policy makers so that they appreciate that an ounce of prevention is worth a pound of cure,
which I suspect our grandmothers told us.
And at the end of the day, integrating acute care settings,
with chronic care maintenance,
as with the HIV investments in Africa,
where a tunnel vision approach,
that these are for HIV, HIV and nothing but HIV,
when people may be dying of untreated hypertension,
where there may be an Ebola virus epidemic around the corner
in which those infrastructures could be helpful,
a coronavirus epidemic.
I think we need to be broader in our thinking,
less siloed and more attentive to how infrastructures can be very potent, they can serve a function today,
for an investment today,
but keeping in mind that there may be
an investment in near future,
for which these infrastructures can be highly valued.
Ultimately, that’s a challenge we’re facing.
I know that the Bloomberg philanthropies are investing
in precisely that with Tom Friedman’s initiative
in New York City and the whole philosophy of that initiative
is chronic disease care, upgrading that care globally,
but having each chronic disease investment, be prepared
for acute responses to outbreaks
and I think that’s a very wise philosophy.
That’s a really good point.
In terms of, coming back to a little bit more science,
one of the misconceptions
and one of the more frequent questions some of us get asked by the press is, “Is this virus mutating?” And that’s such a general question, I’m not gonna go into the details of why is that a non-specific question because we have someone who knows a lot more about it than I do, so Nate, would you like to elaborate on the various layers of that question? So this is one of my favorite topics of misinformation during outbreaks and the answer is, “Of course, it’s mutating.” But go back a second. So mutations sort of conjure up these inherent fears of something unexpected and some major change, think of American pop culture - X-Men, right? These mutant humans have these extraordinary abilities. You think about, have you ever read “Andromeda Strain” or watched the movie “Outbreak”? As soon as a mutation is introduced into the picture, something new is happening. So of course, the people that grew up on this, when you hear the word mutation, right, this is what you’re thinking about. You’re thinking about these crazy changes that can happen, not about the fundamental evolutionary processes. So every time a virus replicates, when it copies its genome on average about one mutation is introduced.
And most of these mutations don’t do anything to the virus, some of ’em make the virus worse than their loss, and some of them provide a benefit. But what we’re actually thinking about, I think, when people ask about mutations are actually natural selection. So are these viruses becoming better adapted at something. So I think it’s a perfectly reasonable question to ask, “Is this novel coronavirus, adapting to humans?” So during the Ebola epidemic, in West Africa, we found that early on in the outbreak, there was a mutation that appeared and through a lot of experiments and everything, we found that it eventually dominated the outbreak. And it looked to be a human adaptation. But when we look at the epidemiological evidence, so that people who are infected with this mutation, or with not, there wasn’t a difference in the death rates, there wasn’t a difference in how much virus you had. It was a human adaptation that didn’t really have a major epidemiological impact, the same with SARS. SARS, after it was introduced, we found these changes that happened that looked like they were human adaptations, but when you look back at the data you can’t actually determine if this had any major impact on the overall epidemic.
0:49:08.758 –> 0:49:10.37 So could this novel coronavirus adapt better to infect humans?
0:49:14.5 –> 0:49:16.78 Will it have a major impact on the epidemic?
0:49:16.78 –> 0:49:19.11 Will it cause more deaths?
0:49:19.11 –> 0:49:22.09 There’s not really any evidence to suggest that.
0:49:22.09 –> 0:49:24.48 - [Saad] So my last question of this phase, before I open up, is from Ellen,
0:49:24.48 –> 0:49:27.14 and I want you to talk about a little bit about diagnostics.
0:49:27.14 –> 0:49:31.54 So our ability to detect this,
0:49:31.54 –> 0:49:33.3 So our ability to detect this, especially from the perspective of being Global Health,
0:49:33.3 –> 0:49:36.25 or the absence of detection, et cetera?
0:49:36.25 –> 0:49:38.593 For example, in Africa, one of the questions is,
0:49:39.998 –> 0:49:42.61 the fact that we haven’t detected a lot of cases,
0:49:42.61 –> 0:49:46.6 is because is it the absence of the virus
0:49:46.6 –> 0:49:51.4 or the absence of detection, et cetera?
0:49:51.4 –> 0:49:54.063 So could you talk a little bit about our ability to have these diagnostics and it’s implications
0:49:54.063 –> 0:49:55.8 for an equitable response through knowing the burden
0:49:55.8 –> 0:49:58.239 and the ability from a scientific perspective,
0:49:58.239 –> 0:50:02.73 to detect these viruses in populations.
0:50:02.73 –> 0:50:06.46 - [Ellen] Okay, sure.
0:50:06.46 –> 0:50:10.964 (alarm rings)
0:50:10.964 –> 0:50:11.898 So one thing that was really quite amazing
0:50:11.898 –> 0:50:13.88 about this outbreak compared to other ones
0:50:13.88 –> 0:50:16.68 how quickly the actual genome sequence
0:50:16.68 –> 0:50:22.36 of the virus was online.
0:50:22.36 –> 0:50:25.22 It took about a week, I mean, it was amazing
0:50:25.22 –> 0:50:28.726 and so advance in technology,
0:50:28.726 –> 0:50:33.726 we all know that it’s much easier to sequence genes
than it used to be, but this is really a great example of that,
where as soon as that outbreak was recognized, that scientists were able to actually,
right from the patient sample, get the whole sequence of the virus.
In the past you had to try to grow it and there was a many steps.
And that was really an example of the application of a pretty expensive technology actually,
but in a way that’s gonna benefit a lot of people very quickly.
As far as diagnostic tests, that’s discovery, that’s virus discovery and this has really been quite like a poster-child for amazing infrastructure
for virus discovery.
As far as diagnostics, having that genome sequence online immediately, the way that we detect viruses,
here in our hospital right here in Yale, is often by doing a detection of the snippet of the genome.
And having that genome sequenced that quickly means you can quickly make a diagnostic test.
Which the CDC has done.
But then the other issue comes of if you do a diagnostic test enough times,
on a population that doesn’t have the disease, you’re gonna get some false positives.
Any positive would be a false positive.
So right now what’s happening is, there’s a lot of criteria,
before people will be tested by the CDC, that they actually have a chance of having the virus, before they will be tested in the US. As far as around the world, I mean, these kinds of tests are not super cheap. These PCR based tests, it’s a little bit complicated, you need a special machine, you need people who are trained to perform the test. So for all those reasons, it’s not something that you can quickly and cheaply get out to tons of people. So there are a lot of efforts now to say, how can we use our new technologies that we have now, that we’re developing on a research scale, to make cheap, quick tests that could be distributed and could allow people to be diagnosed more widely. Before I open up for questions, I just want to remind everyone that outbreaks, as the plague in Europe or the 1918 flu pandemic or more recent Ebola outbreak, et cetera, can bring the best and the worst out of people. It’s extremely important for us to treat each other with dignity and respect and compassion. Dignity and respect and tolerance is somewhat passive ways of looking at the world and in my short time at Yale, I think I can fairly say with some confidence, this is not a passive community. So it also demands that we are active in our compassion, for our peers, for our students, not just when the outbreak is in China, but when we have a scenario,
that your mom or uncle or cousin from Colorado calls
and says, “I’ve heard this thing on Twitter”
and there is that tone of concern and fear,
that is part of that conversation.
So as part of the Yale community,
It's our responsibility to in these kinds of situations,
I'm not saying this is gonna happen,
with this and uncertainty doesn’t mean
So as part of the Yale community, most of us who are here,
we’ll be proud of our response as a group of people.
before I open this and have no doubt that it’s not gonna happen,
we bring the same passion and compassion
we bring to the other parts of our endeavors at this campus.
So the way, there is a microphone somewhere,
you’re a couple of microphones on either side.
So please ask your questions, state your name, et cetera
and if you have an affiliation one way or another,
if you’re comfortable please state that as well.
Please raise your hands.
Yes, this one here.
– [Mark] Hi, Mark Russi, Yale School of Medicine and also
Yale health system.

In 2003, there was a lot of discussion about the phenomenon of a super-spreader (mumbles) of Hong Kong, the index patient at the Metropole Hotel.

Are you seeing, perhaps this is question for Nathan and Ellen, are you seeing anything, either potentially ascribable to host factors or to some combination of low levels of humidity, directional airflow,

et cetera, that leads you to believe that there are cases where there is a substantial excursion from the R0 that we’re seeing of about two and a half for this disease?

I will start by saying I don’t really know the answer to your question.

The only thing that comes to mind is this. There was a report in several Chinese media outlets, that they tested environmental samples, at that Wuhan market, and there was a good number of them tested positive for the virus.

So that suggests that at least at that market, there was a spot where there was a lot of this virus. Why that was is not clear, but there was a spot where there was a lot of this virus.

Was it from an individual who was shedding it? Was it from an animal?

I don’t know the answer to that, but that’s the only thing I can think of that I’ve read about that would suggest what you’re talking about.
0:57:00.42 –> 0:57:03.63 I don’t really know the answer to that with regards to any,
0:57:03.63 –> 0:57:05.95 I have not heard of any reports of super-spreaders
0:57:05.95 –> 0:57:07.48 or anything like that at this point.
0:57:07.48 –> 0:57:09.85 I don’t know if anyone else might know.
0:57:12.85 –> 0:57:14.75 - [Saad] Do you want to say something?
0:57:16.622 –> 0:57:20.25 So there’s a question at the back, right hand side.
0:57:22.183 –> 0:57:23.81 Okay so I have some questions, first one is,
0:57:23.81 –> 0:57:27.02 is there any scientific way to learn the quality
0:57:27.02 –> 0:57:29.76 of the data published by Chinese officials?
0:57:29.76 –> 0:57:32.499 And the second question is emphatically, if the initial
0:57:32.499 –> 0:57:34.67 outbreak is happening in New York,
0:57:34.67 –> 0:57:38.304 which has the closest resemblance to high-insurance filled
0:57:38.304 –> 0:57:41.46 population and mobility and if the public health official
0:57:41.46 –> 0:57:44.28 was notified two weeks after the initial outbreak
0:57:44.28 –> 0:57:46.197 how can things handle different?
0:57:47.39 –> 0:57:50.489 - [Saad] So I will, so Nate, you have thought
0:57:50.489 –> 0:57:53.19 a little bit about sort of information quality
0:57:53.19 –> 0:57:56.84 around this Rpeg, do you have any thoughts to contribute
0:57:56.84 –> 0:57:58.173 to on this?
0:57:59.684 –> 0:58:00.536 - [Nate] You can start it, I’ll join in.
0:58:00.536 –> 0:58:01.611 - [Saad] I’m sorry?
0:58:01.611 –> 0:58:02.444 - [Nate] I said you can go ahead and start me.
0:58:02.444 –> 0:58:03.43 - [Saad] So I can start.
0:58:03.43 –> 0:58:07.708 So that’s a really good question, so we don’t have a direct
0:58:07.708 –> 0:58:11.75 sophisticated way of saying that what a given paper
0:58:13.85 –> 0:58:16.88 is saying is valid, other than we do have tools,
they are tools that have been with us and have served us overall well, but not perfectly, for decades, if not centuries and that, the most effective tool, is called peer review. And that’s where someone else, who’s not involved with this whole process, says, “But there’s something odd about this.” And then they sort of, they question, they push back, and if the responses are not satisfactory, then sometimes the paper doesn’t get published, etc. So that has changed, we are in a very different communications environment now. Scientific communications environment, in this kind of situation, the results of these products, intellectual products, are being shared on Twitter before they are even submitted they are on preprint servers, etc. Which is okay, which is overall sharing the viral genome quickly and publishing that has a lot of value. I think we’ll have to compliment that with a rapid, standing peer review system. That looks at that and says, “We are gonna perform peer review.” “You have posted it on a preprint server.” The preprint server flags it, sends it out to this group that has signed contracts, maybe pay them to have this commitment. Say, I’m gonna turn around because there’s a finite
types of people that you would need in an emerging pathogen kind of a situation. You would need epidemiologist, you would need virologists, you would need a few clinicians who would pay attention to these kinds of things. So you can have them on a retainer in future situations where you say that this paper is submitted to this preprint server. We evaluate quickly and we say does that make sense or not before you know while the information is still out there we give it a stamp of approval or otherwise. So that would be a way to do that? Any other thoughts, Nate? Yeah, I'll just say something on the quality of the data that's coming out. So one thing that's really important to keep in mind here, is the sheer number of cases that are being reported a day now into like the 3 thousands. Those are at least then, 3000 tests that are being performed a day and probably not all of them are positive. So you gotta think about some of it may, the quality it may not really reflect what is happening, I don’t think it has anything to do with the quality of the reporting per se. It's just like, how many tests can you actually do in some of these places everyday,
So there’s going to be under-reporting that’s happening, which isn’t necessarily deliberate by any means, but it’s just sort of a function of overloading systems.

I mean, the only thing we can say is that data-sharing is important at this moment. It’s like, whoever has data needs to share it at a global scale among the scientific communities. 'Cause it’s not just what you see in the publication that’s important, it’s the raw data that people can run re-analysis on and there’s some question about whether all the data’s being shared in sort of a transparent way at the current moment.

That’s a very important point. One more comment about the preprint servers though, it is quite amazing the preprint servers though, it is quite amazing that Nate talked about that sort of wrong analysis misconcluding about the HIV present in the coronavirus genome, but I have to say that went up on a preprint server, many scientists read it, many scientists commented about it, and said, “This is a problem.” And the authors took it down and apologized. And that all happened like within a few days.

So actually in a way, the system is, there is sort of this informal peer review going on. Likewise, with the New England Journal article that was retracted. So there is sort of an informal process that’s kind of
coming out of our global connectivity, which is sort of encouraging.

So I’m generally a glass 10% full kind of person, it’s always something to be hopeful about.

With this exception, after having worked in vaccines, I’ve interacted with a few swamps of 4chan, where these conspiracies live and thrive and multiply and my concern is, even after all the retractions, some of that stuff will find a life of its own.

But it is, there is always these kinds of things have trade-offs.

I think having access to especially raw data, but also some of the analysis quickly, my tendered objective is, it’s a net positive. A net positive not by sort of close margin, but substantially, but it has had, to quote Batman, or actually, Spider-man, “With great power, comes great responsibility.” Voltaire said it, but he probably didn’t say it wearing tights.

But so with the power of sharing that information, it is our responsibility to guard the veracity and the quality of that information, through the full scientific process.

I can talk without the mic, I’m Ley Chen-

So we have broadcasting, so

So I will wait.

Who was the person in the back that was there first.

Should I wait, Lay Chen, School of Medicine,
Department of Pediatrics.

I have a question about the seemingly the difference in mortality between Wuhan patients and those outside. Do you think that's simply a question of not knowing the denominator of how many people are really sick outside of Wuhan or it's something specific about the environment?

So, Albert, do you have any thoughts on that?

No, go ahead, I don’t know.

The mic right there. So I think that of course the numbers coming out of Wuhan are very concerning, especially because of the number of deaths. But this is kind of very much like many epidemics that occur at the epicenter, the cases that were identified were primarily severe cases. You can tell by the age, the average age is around 60, in cases that were reported. If you compare that to what we’re seeing among travelers or evacuees that are being identified, we’re seeing that all ages and many of them are having mild symptoms. So this is probably as you’re suspecting, we call it case ascertainment bias, in that many of the cases in the initial part of the epidemic were more severe. So I’m gonna come back to the question that was asked, it was a two part question.
And one of them was what would happen if something like this was reported in New York City? And I think that’s an important question, and we should keep it in mind before we criticize other entities, countries, in Africa or in Asia or in wherever, in terms of what would happen. Both in terms of, it’s a good counter-factual, both positive and negative as well.

So any thoughts on that?

- [David] Well, in New York City, you have quite a bit of history, and it’s also a major, in New York City I think there’s greater preparedness based on a history and certainly a recent history of events that have happened. So there’s memory, if you will, and preparedness that goes along.

The second part is that the information and decision-making, is much more de-centralized and so that decisions can be made much faster than what’s being reported overseas. So again, how much preparedness is there? The experience with it, what’s the level of decision-making?

I think those would be three of the bigger buckets and we could probably flesh that out more.

- [Saad] So we were fortunate to have folks from the health department or experience with health department so as the mic goes there,
I want to talk to Paul a little bit.

Dr. Jensen, any thoughts about hospital preparedness in this kind of a situation?

For Yale?

For Yale.

Yeah. Well, first just to say that the Wuhan hospital is full, the capacity for surge is a real question.

We have a fairly elaborate preparedness plan, including the capacity to setup a field hospital at the Lanman Center at the gym in a case of need, but the concern about how we would be able to respond to a large number of pupils with serious illnesses is a real one.

I just can’t say, but there’s a balance on one hand between trying to balance anxiety and concern, which is predominately what we’re dealing with now over against the issues of what would really happen in the event of an outbreak.

And then just speaking to one point that she made, a little bit tangential about self-efficacy and the need that people have to feel like they’re doing something, anyone hasn’t had their flu shots, please get one.

Sir, I’m Drew Hadler, I was a former Connecticut state epidemiologist.

For the last 11 years I’ve been working in emerging
Infections program here, but also as a consultant to New York City Health Department.

So I think I came from a control perspective, I can’t say what the reaction would have been, but I think from the information-gathering perspective, it would have been much, much more focused and the information will be out there a lot of the information that we need.

So for example, I was there when pandemic flu hit in 2009 and New York City had a huge high school outbreak it was one you could see through the city, where four or five kids came back from vacation from Cancun, turned out they had H1N1 they went to the same high school and within two weeks, there were 900 cases in that high school and at least that many family members.

That was a fair amount of resources went into that, it was fully described, transmission issues were described, speculant disease within that context was described, the city also setup surveillance for hospitalized cases of H1N1 right away, ’cause they didn’t have it going on quaran, and quickly had counts of am I in trouble, is this going on.

They also had mortality surveillance and so within a month we had a full spectrum of really good information to say that H1N1 was no more (mumbles) can sense,
then any seasonal influenza.
We do know it was effecting children more than older adults,
which the (mumbles) seem to believe
there’s good explanations for that,
because older adults, people in their 50s,
40s, 50s, and older, actually it turned out
did have some immunity to H1N1.
And weren’t quite as severely as effected as younger people.
So basically we could put it in perspective
and then base control measures on that.
Again, I don’t know what the immediate control measures
were dealing with this but there would have been
surveillance setup that would have attempted to find,
full measure of the disease, how severe it was, and CDC
would be invited in as it was then.
Which actually helped the CDC (mumbles) station
because we can see the life department anyway
and so there would be a lot of communication with CDC,
daily conference calls with jurisdictions around the country
to explain what would be happening if New York City
is the one that was affected and we’d have the information
we need to try and have a rational response to it.
Not one that’s sort of all desperate.
There’s someone in the back, there.
Thank you, Thatcher, School of Public Health,
New (mumbles) Health.

So my question is about the large number of patients so since the outbreak a large number of patients, with mild or severe, no matter mild or severe, they rush to the hospitals so I believe the number is quite more than 10 times, 10 times more than the hospital can feed.

So my question is, so would you recommend people with mild symptoms not to go to hospital and just to stay at home?

[Saad] So I can start the response, and if anyone has anything to add or you have any thoughts on that.

So this is very important. So at the big public health response level, in an emerging situation, having clear evidence-based communication, is extremely important.

Talking to people that at certain stage of the outbreak and response, certain kinds of symptoms, need to stay home for the “abundance of caution” in terms of the individual response may require, if there is a judicious use, to self-isolate without disrupting the more old-fashioned society in that sense.

But also, so Dr. Jensen mentioned, Paul mentioned, something very important, getting your flu shot. And the reason why you say it’s not biological, is that flu shot doesn’t protect against the coronavirus.
But it does protect against a major respiratory illness. So it helps in two ways. First of all, it has its own benefits in terms of reducing morbidity and mortality in several age groups. But also it reduces, if you are reducing symptoms, of respiratory illness in a population, then unnecessary visits that were not caused by Coronavirus go down. So again, we're not helpless, passive, spectators to something that is unfolding. We have inherent self-efficacy in the form of hand-washing, which is evidence-based measure for all respiratory illness, flu shot, and some of the other measures. Do you want to say something more, Paul or Albert?

Paul: Yeah, I think that's very important. Also just to, a less likely influenza is in the community, the more likely it is to be able to assess people with respiratory infection quickly and efficiently in the event that we do have an outbreak of coronavirus. That's an interesting point, I did it in a study awhile back, looking at if you have syndromic surveillance in New York City, looking for outbreaks, can you immunize people enough so that you have greater specificity. And the challenge of getting enough people immunized is there, so from a population perspective as a concept,
1:13:49.48 → 1:13:54.48 I think it’s great, but that could also add to the case
1:13:54.88 → 1:13:57.85 that we want to make, is that’s another reason
1:13:57.85 → 1:14:00.693 why we should be encouraging immunization.
1:14:01.73 → 1:14:02.712 - [Saad] Yes, there’s a question there.
1:14:02.712 → 1:14:07.712 - [Hadjur] Hadjur from the (mumbles) So as a Chi-
nese,
1:14:08.33 → 1:14:09.767 all my family is still in China
1:14:09.767 → 1:14:13.565 and my friends share me all these information all
day.
1:14:13.565 → 1:14:18.565 So my question or wondering is when will this end?
1:14:18.616 → 1:14:22.72 I think the correct question is when do you expect
1:14:22.72 → 1:14:24.84 the turning point will be?
1:14:24.84 → 1:14:29.84 Some experts say we have incubation period of two
weeks,
1:14:30.66 → 1:14:34.77 and since the quarantine of the whole, has seen
1:14:34.77 → 1:14:38.052 a lot of quarantined have been taken,
1:14:38.052 → 1:14:41.233 there is roughly 10 days or two weeks already passed,
1:14:44.247 → 1:14:47.197 So if you’re doing some modeling or forecasting when
do you
1:14:48.105 → 1:14:50.503 expect this (mumbles) will show?
1:14:53.91 → 1:14:55.74 - [Nate] I’ll just start with something basic on this.
1:14:55.74 → 1:14:58.19 So just based on one model that I’ve seen,
1:14:58.19 → 1:15:00.47 and I don’t know necessarily if this is going to be
1:15:00.47 → 1:15:03.03 the most accurate prediction, but it was looking like
1:15:03.03 → 1:15:05.87 mid to late February would be the peak.
1:15:05.87 → 1:15:07.98 But there’s a lot of things that can happen,
1:15:07.98 → 1:15:11.03 between now and then, that would even change those
estimates
1:15:11.03 → 1:15:12.573 and then you have to wonder, the data
1:15:12.573 → 1:15:14.49 that this is all based on.
1:15:14.49 → 1:15:18.36 So I don’t know if we have a really great handle
1:15:18.36 → 1:15:21.28 on when this is going to be peaking
and when it’s going to start coming down.

An enough providing false assurances,

I think it’s reasonable to share experience

with other corona viruses, especially SARS,

but there does seem to be a seasonality associated

with those viruses.

And they seem to be more transmissible using the term

loosely in this kind of a situation,

the peaks are higher in winter.

So there is, again, tentative hope that some of those months

will have a positive impact.

But again, it’s tentative, we are dealing with,

I would be providing false assurances by providing

some certainty around that.

I think the fairest thing

during the Ebola outbreak

there were multiple mathematical models that predicted

wide sort of trajectories of the epidemic.

So I think that information is trickling out,

to parametrize these models, so until we have more data,

until we have more sort of examination

of how these parameters were put together,

I think the safest thing is to say, we don’t know.

I taught with Alex Langmuir, who was the founder

of the immunologic intelligence service.

And the one thing that we used in class was Farr,

right?

Farr’s law, and it’s the first law of epidemics which is,

“Whatever goes up, must come down.”
1:16:54.01 –> 1:16:58.518 So we don’t know where that point is-
1:16:58.518 –> 1:17:00.59 - [Saad] Sorry, did you say that you sort of
1:17:00.59 –> 1:17:02.894 talked to Langmuir himself?
1:17:02.894 –> 1:17:05.05 - [David] We taught together.
1:17:05.05 –> 1:17:06.36 - [Saad] Oh, you taught together, okay.
1:17:06.36 –> 1:17:08.309 So you were professor at the age of 12, I guess.
1:17:08.309 –> 1:17:09.844 (audience laughs)
1:17:09.844 –> 1:17:12.235 (mumbling)
1:17:12.235 –> 1:17:15.4 - [Jerry] Hi I’m Jerry Friedlander, School of Medicine,
1:17:15.4 –> 1:17:19.602 School of Public Health.
1:17:19.602 –> 1:17:23.287 So one of the real unusual characteristics of this
1:17:23.287 –> 1:17:26.777 is how rapidly it’s spread globally
1:17:26.777 –> 1:17:30.129 and in a month’s period of time this is (mumbles)
1:17:30.129 –> 1:17:34.569 so many countries. It’s very different (mumbles)
precipice.
1:17:34.569 –> 1:17:38.179 Unfortunate time in which this occurred
1:17:41.464 –> 1:17:44.79 So I wonder what we know about the response in other
places?
1:17:44.79 –> 1:17:48.299 We’re most concerned about what happens here
1:17:48.299 –> 1:17:50.54 in the US, but this is a global epidemic now,
1:17:50.54 –> 1:17:53.297 of some magnitude that we don’t really know.
1:17:53.297 –> 1:17:56.876 The response will be different in different places
1:17:56.876 –> 1:17:58.443 and that’s gonna have consequences actually
1:17:58.443 –> 1:18:02.857 for the global nature of this and (mumbles)
1:18:02.857 –> 1:18:03.69 and the future.
1:18:03.69 –> 1:18:08.36 So is there any coordination, on an international level
1:18:08.36 –> 1:18:09.797 at this point?
1:18:09.797 –> 1:18:14.4 Can we, somehow or other, advocate for this
1:18:14.4 –> 1:18:20.6 if it’s not going on in a way that’s actually functional
1:18:20.6 –> 1:18:22.03 and important and the information coming from other
places will be very, very important in terms of what we understand and how we can respond.

Albert might-

[Saad] Albert, you wanna?

(mumbling)

[Albert] I think this is being videotaped.

(audience laughs)

So the politically correct answer is that, of course,

there is coordination,

and that coordination is being done by WHO,

on many different levels in terms of operating response,

in terms of training, capacity and so forth.

But we all know the situation with WHO

has been essentially neutered

because of the lack of multi-level funding,

Much of the funding is bilateral and which is really incapacitated some effective responses and coordination.

So I’m being a little harsh on that, but I think that is a gap and that’s why we have this myriad of bi-lateral responses which are potentially not well-coordinated.

And I think the concern and I’m just gonna jump on to,

I mean, this is I think we’re still in the exponential phase

of the epidemic in many of the cities

of the 5 million people who left Wuhan before.

We don’t know the exact proportion of who’s effected but

I think it’s fair to say, with regard to provinces,

Shanghai and Guangdong are in the exponential phase.
And that delay of models, which has been modeled three days, and maybe much longer, so I think we’re in for the long-term.

I think the big question is, is that in places that have weaker surveillance systems, I’m thinking about Southeast Asia, South Asia, maybe there’s only three cases, but how many kits are available?

And so the concern is we can go all the way back to the beginning of what Nate said, this is probably one of seven pandemics or so, of the coronavirus, it would be good to be optimistic it would be good to think that we can push this into a season that has low-transmission.

But I think we have to tie it on this being, spreading and not necessarily peaking early.

And I think we also have to plan on what’s gonna happen in the most vulnerable populations around the world.

And what happens when it gets there, and this is a case fatality rate, that may not be as high as MERS or SARS, but it’s not going to be negligible either.

It’s going to be heterogenous in different parts of the world, seasonally.

So, I want to go back to a question that was asked earlier about the people going to, with mild infection, going to the hospital.

And I think that a lot of that could be prevented
if we had a very good sense of what the natural history of this disease was and what it looked like when it was bad. Like, does it start off mild and become bad? That’s one disease pattern. Or does it start off bad and stay bad? If it starts off bad and stays bad, then if you got a mild case, then you shouldn’t go to the hospital. But until we know what that is, until we can describe it and make that public, people, of course, are going to go to the hospital with even the mildest symptoms ’cause of course they’re worried. And rightfully so perhaps, but I think that’s one of the pieces of information, that we really need to get out to people. Is what does it look like when it happens. Like, is it bad all the time? Or does it start off mild and get bad? That’s an important distinction. So, in the interest of time, I want to finish on time, I’ll take only a couple of more questions and there were a few questions on this side, so you had a question for awhile. We spent some time on this side for awhile, so unfortunately we will have to stop here and I’ll be happy to stay back and maybe others will also stick around.
Hi I’m (murmurs) from the department of internal medicine and herbology.

I was wondering, you mentioned seven of these coronaviruses some causing cold and yet some like SARS with a lot of fatality do we know, biologically, what is different about the SARS versus the ones that cause colds and causes this without fatality and can use that information when we’re studying mutations in this current coronavirus to predict potentially what might be more of a problem?

Well, one interesting thing is there’s a coronavirus, the corona viruses that circulate every year in New Haven and throughout the US, sometimes cause colds and they can cause serious illness, particularly in people who have other health conditions kind of like what we’ve seen a little bit with this virus too.

As far as the receptor the virus uses to enter cells, this virus uses the same receptor as SARS and the same receptor as a different Coronavirus that causes colds, so that’s not the key thing. With SARS there was some information about it suppressing the anti-viral response pretty well...

which you can imagine would allow the virus...
1:23:42.08 –> 1:23:46.06 to get to a higher level in the body.
1:23:46.06 –> 1:23:49.26 But as far as this virus, I really don’t know.
1:23:49.26 –> 1:23:52.14 So it’s interesting that people have studied already
1:23:53.02 –> 1:23:57.04 where those receptors are found, the receptor the virus
1:23:57.04 –> 1:24:00.524 uses to get into cells, they’re in the upper airway,
1:24:00.524 –> 1:24:03.03 they’re in the lower airway where the gas exchange
occurs
1:24:03.03 –> 1:24:05.91 in the lung and also in other tissues of the body,
1:24:05.91 –> 1:24:07.92 like in the liver and the blood vessels
1:24:07.92 –> 1:24:09.708 and things like that.
1:24:09.708 –> 1:24:12.05 But I think there still needs to be more work
1:24:12.05 –> 1:24:16.703 on the pathogenesis of this one to figure out exactly.
1:24:17.7 –> 1:24:21.431 It’s not totally clear, kind of getting back to something
1:24:21.431 –> 1:24:24.23 that was said earlier is
1:24:24.23 –> 1:24:26.586 at the beginning when a lot of people
1:24:26.586 –> 1:24:30.51 who are presenting to a hospital are very, very sick,
1:24:30.51 –> 1:24:33.9 a lot of those initial people were also people
1:24:33.9 –> 1:24:35.38 with other medical conditions,
1:24:35.38 –> 1:24:38.41 who you might expect to get ill.
1:24:38.41 –> 1:24:41.87 More ill than somebody who’s perfectly healthy and
young.
1:24:41.87 –> 1:24:45.02 So it’s still not totally clear,
1:24:45.02 –> 1:24:47.3 how that factors into the pathogenesis we’re seeing
1:24:51.59 –> 1:24:54.29 - [Nate] Really quick, so we can go to the next question.
1:24:54.29 –> 1:24:56.303 So it does seem to be,
1:24:56.303 –> 1:24:57.61 if the virus can use the ACE2 receptor,
1:24:57.61 –> 1:24:59.213 it can infect humans, if it cannot use it,
1:24:59.213 –> 1:25:01.55 then it can’t infect humans.
1:25:01.55 –> 1:25:02.74 That’s one of the parts of it,
1:25:02.74 –> 1:25:06.93 but whether this is gonna be SARS or a common cold?
We can't just look at the genome and sort of gaze at it yet.

We don't have the tools or enough data to say how bad this is gonna be, that's not quite possible.

So there was another question from there or that has been answered by?

So I'll come to Evelyn and then I think we have, I said two or one more, sort of
time for one more question, et cetera.

So Evelyn, do you want to?

Michael can we do this question and then I-

Okay.

So I know China just finished building a thousand person hospital isolation ward.

What do y'all think?

Is this an efficient way to contain the outbreak or are we gonna end up with more issues than we started with?

I’m curious about the construction and the quality and the resources that go into that,

supplies that are available, what’s the access?

Really don’t have enough information about the specifics.

But I am gonna turn it over to Gregg, who does.

(audience laughs)

No, but that’s not the point, the point is that we can’t abandon our Chinese brothers and sisters

and say like, “Let ’em do what...”

The point is that the conditions of confinement have to be clinically suitable
and meet human rights norms.

And if they’re being dumped in a hospital with poor infection control and without sufficient clinical capacity to take care of people, it’s not the right thing to do.

We all have friends in China and we need information to get out so that people are taken care of both in their communities and in any facilities they might be sent to.

Hi, Evelyn Shay from the School of Medicine and Public Health. I actually wanted to follow up on Jerry’s question and hear from Albert, when you said there are myriad bi-lateral initiatives, is that countries with China? I’m curious to know sort of the degree to which there’s a partnership with China, whether it’s CDC or government and how effective that has been?

How much are they doing this on their own domestically?

How much is their engagement, it’s a little bit hard to tell from the outside.

And I think this goes along with what Gregg was saying, to what degree is there-

So I’d very much like Sten or David to answer this question.

(presenter laughs) (audience laughs)
My authority is my friends in China on WeChat. Who’ve been lighting up my phone all week. And it does seem like the Chinese are pretty much on their own on this one. There isn’t any substantial international help infrastructure in Hubei province in Wuhan city. The US CDC has a presence in Beijing but I’m going to guess that there isn’t a coronavirus control expert in the group. But they do have good, solid (murmurs), just that it’s not improbable that there’s communication with the China CDC. China’s CDC’s a pretty sophisticated operation. They have a sort of a command center for outbreak investigations some I visited that reminded me of the CDC command center and was modeled after it. And I am thinking that the Chinese are largely tackling this on their own. I have no evidence to the contrary and my friends at WHO are not deeply engaged. I know people high up in the state department that I talk to and they’re helping the Chinese, but they’re helping them from Geneva and from Atlanta. So I think there’s a lot of communication, a lot of consultation, but on the ground, the Chinese are handling this on their own. I think that’s fair to say.
[Sten] Yeah.

[F] Sorry just to follow-up,

[Sten] I was in Beijing recently and I was speaking to a documentary filmmaker about a film she made about emerging epidemics and she was focusing on the Ebola virus but when she was in Africa she said that the best makeshift hospital that she had encountered were the ones built from China so I think that if that’s reassuring I think there’s a lot of issues coming around freedom of information and dissemination of information. As I said, the Chinese CDC is a very sophisticated organization and once, and I think this is up to debate and this is all speculation, but once the outbreak was shown, I mean it was identified. And there are probably policy reasons why it wasn’t the early warning system didn’t work as it had worked with H7N9. And they detected other emerging pathogens, in the interim time between SARS and are very efficient, why it didn’t work now is unclear. And that’s something that I think we really don’t have a good answer,
but once they had detected it, and once it went into the early warning, through IHR. They followed all IHR regulations very sophisticated responses, they sequenced the genome, they are now doing, many randomized controlled trials for treatments, many of those are probably gonna come out with information in the next one or two weeks about how to cure. So very sophisticated responses on many fronts. I think we have to just put this all kind of into perspective. I know there are other questions and that’s an indication of the importance of the issue and the engagement so I’d be happy to stay back. I can’t speak for other people, but I’d stay back if you have other questions, et cetera. But I don’t want to wrap up as we wrap for seven on time, colleagues who put it together and helped to organize on a quick notice. I’m not going to be able to go through the full list, specifically Ros and Alyssa and Mike Skonieczny and Jen and many others from different parts, and Colin and others from YSPH and YGH et cetera. Who made this possible at a very short notice. But I will wrap up, as I wrap up, I want you to remember
the intensity of response, mounted by health workers, both clinical workers, but also public health workers in China as we speak. They keep all of us safe, they have risen up to the challenge. Set aside all the politics, individual health workers and the health system, folks on the ground, have responded, not just on behalf of their own community but on behalf of us. And if there was any doubt of the sacrifice, we should remember one of the physicians who was initial canary in the coal mine, passed away. There are reports that he passed away. There were mixed reports, but I think it’s now confirmed, that he passed away today. On that somber note, we should also remember that we are not helpless observers, we have self-efficacy, both as humans and as compassionate beings and as scientists, public health professionals-