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00:00:00.175 --> 00:00:03.008 (ambient chatter)  
00:00:08.225 --> 00:00:09.058 - [Sten] Good evening.  
00:00:09.058 --> 00:00:10.207 My name is Sten Vermund.  
00:00:10.207 --> 00:00:11.743 I'm the dean of the School of Public Health  
00:00:11.743 --> 00:00:13.380 here at Yale university.  
00:00:13.380 --> 00:00:14.570 I wanna welcome all of you  
00:00:14.570 --> 00:00:16.820 in the Winslow Auditorium this evening,  
00:00:16.820 --> 00:00:21.130 as well as those of you joining via live streaming.  
00:00:21.130 --> 00:00:24.010 Thanking in advance our speakers who  
00:00:24.010 --> 00:00:27.030 have joined us this evening on short notice.  
00:00:27.030 --> 00:00:28.970 My only duty this evening other than  
00:00:28.970 --> 00:00:32.535 to quiet the crowd is to welcome  
00:00:32.535 --> 00:00:35.520 this evening's moderator and introduce him.  
00:00:35.520 --> 00:00:37.122 Dr. Saad Omer is director of  
00:00:37.122 --> 00:00:40.480 the Yale Institute for Global Health.  
00:00:40.480 --> 00:00:43.920 He is an infectious disease epidemiologist,  
00:00:43.920 --> 00:00:46.830 a vaccinologist, and a physician.  
00:00:46.830 --> 00:00:49.599 He's also a professor of medicine  
00:00:49.599 --> 00:00:52.830 in infectious diseases at the Yale School of  
Medicine.  
00:00:52.830 --> 00:00:54.180 He holds a Susan Dwight Bliss  
00:00:54.180 --> 00:00:57.090 Professor of Epidemiology of Microbial Diseases  
00:00:57.090 --> 00:00:58.077 at the Yale School of Public Health  
00:00:58.077 --> 00:01:00.500 and also has a secondary appointment  
00:01:00.500 --> 00:01:02.000 in the Yale School of Nursing.  
00:01:03.180 --> 00:01:05.770 We are lucky to have Dr. Omer here.  
00:01:05.770 --> 00:01:07.430 He is the inaugural director of our  
00:01:07.430 --> 00:01:08.720 Yale Institute for Global Health.  
00:01:08.720 --> 00:01:10.103 And without further ado...  
00:01:10.951 --> 00:01:14.118 (audience applauding)

00:01:19.278 --> 00:01:22.890 - [Saad] Thanks Sten, and besides being  
00:01:22.890 --> 00:01:25.040 the dean of the School of Public Health,  
00:01:25.040 --> 00:01:27.610 we at the Institute for Global Health  
00:01:27.610 --> 00:01:30.068 are privileged to have a true pioneer  
00:01:30.068 --> 00:01:34.690 in global health, Sten, as one of the deans here  
00:01:34.690 --> 00:01:36.993 as the dean of the School of Public Health.  
00:01:38.707 --> 00:01:40.060 And he's one of the founding fathers  
00:01:40.060 --> 00:01:41.240 of the Institute for Global Health.  
00:01:41.240 --> 00:01:44.330 So it's a privilege to be here  
00:01:44.330 --> 00:01:49.300 and talk about this important emerging public  
health issue.  
00:01:49.300 --> 00:01:51.830 And, just to outline what we'll be discussing,  
00:01:51.830 --> 00:01:55.830 we'll be discussing the academic response  
00:01:55.830 --> 00:01:59.210 of the various parts of the university, not univer-  
sity,  
00:01:59.210 --> 00:02:01.730 the University and the hospital as an institution  
00:02:01.730 --> 00:02:05.720 which is located in New Haven, et cetera,  
00:02:05.720 --> 00:02:08.226 and interacts with its communities.  
00:02:08.226 --> 00:02:10.387 It is a part of it, but our focus here is  
00:02:10.387 --> 00:02:14.253 as an expert panel covering various issues  
00:02:14.253 --> 00:02:16.970 from an academic and research perspective.  
00:02:16.970 --> 00:02:21.290 And there have been other panels in the past few  
days  
00:02:23.110 --> 00:02:25.660 and in the last week or so in the university,  
00:02:25.660 --> 00:02:27.650 but this one has a focus.  
00:02:27.650 --> 00:02:29.180 We want to do a comprehensive focus  
00:02:29.180 --> 00:02:32.130 on a few issues ranging from epidemiology,  
00:02:32.130 --> 00:02:35.184 to communications, to virology, to some aspects  
00:02:35.184 --> 00:02:38.180 of preventive measures  
00:02:38.180 --> 00:02:41.000 and the public health response, et cetera.  
00:02:41.000 --> 00:02:44.658 I wanna, before I start, I will start with  
00:02:44.658 --> 00:02:47.750 a few overview slides.

00:02:47.750 --> 00:02:51.860 And then, I'll welcome our distinguished panelists.  
00:02:51.860 --> 00:02:54.580 And most of the session will be based  
00:02:54.580 --> 00:02:56.540 on questions and answers.  
00:02:56.540 --> 00:02:59.250 I'll go through a couple of rounds of questions  
00:02:59.250 --> 00:03:01.152 from the panelists then we'll open  
00:03:01.152 --> 00:03:04.230 this forum for discussion.  
00:03:04.230 --> 00:03:08.450 We have a really good and solid, rich base of  
faculty  
00:03:08.450 --> 00:03:12.150 and students who have a lot to contribute.  
00:03:12.150 --> 00:03:14.310 So please, feel free to contribute.  
00:03:14.310 --> 00:03:18.590 I wanna thank, in terms of organizing this, specif-  
ically,  
00:03:18.590 --> 00:03:22.160 YSPH's Department of Epidemiology of Microbial  
Diseases,  
00:03:22.160 --> 00:03:24.910 especially, Albert Ko, who was very instrumental,  
00:03:24.910 --> 00:03:27.070 I don't know where he is, I don't see him right  
now,  
00:03:27.070 --> 00:03:28.654 but I'm sure he'll come.  
00:03:28.654 --> 00:03:33.040 And he was instrumental in choosing the panelists,  
00:03:33.040 --> 00:03:37.070 et cetera, and was very helpful in organizing this.  
00:03:37.070 --> 00:03:40.870 I also want to thank Global Health Justice Part-  
nership.  
00:03:40.870 --> 00:03:43.340 Gregg Gonsalves, who's one of the panelists,  
00:03:43.340 --> 00:03:48.260 and Amy Kapczynski, and a few others  
00:03:50.990 --> 00:03:53.040 who have been really helpful.  
00:03:53.040 --> 00:03:56.700 Yale is very privileged to have long-standing col-  
laborations  
00:03:56.700 --> 00:03:58.830 with our colleagues in China.  
00:03:58.830 --> 00:04:01.762 And there are a lot of efforts going on,  
00:04:01.762 --> 00:04:05.640 especially, for example, there's a coronavirus  
00:04:05.640 --> 00:04:08.740 working group focusing on a few research ques-  
tions,  
00:04:08.740 --> 00:04:12.670 which is very driven by our Starlight Fellows.

00:04:12.670 --> 00:04:17.570 And I would encourage colleagues with connections to China

00:04:17.570 --> 00:04:19.350 and of Chinese heritage,

00:04:19.350 --> 00:04:22.900 to contribute in today's discussion.

00:04:22.900 --> 00:04:24.300 So without further ado,

00:04:24.300 --> 00:04:29.083 I will start with my introductory slides.

00:04:33.470 --> 00:04:37.940 So we know that the initial cases were identified

00:04:37.940 --> 00:04:41.453 and reported from Wuhan City in China.

00:04:42.530 --> 00:04:44.130 And it is an unfortunate aspect

00:04:44.130 --> 00:04:47.470 that some people call it a Wuhan coronavirus.

00:04:47.470 --> 00:04:48.590 I'm very uncomfortable,

00:04:48.590 --> 00:04:50.280 and a lot of us are very uncomfortable,

00:04:50.280 --> 00:04:54.310 labeling this virus with a place

00:04:54.310 --> 00:04:57.570 and adding to a little bit of culture of stigma

00:04:57.570 --> 00:04:59.340 that sometimes evolves.

00:04:59.340 --> 00:05:01.360 But it was identified, it's appropriate to say,

00:05:01.360 --> 00:05:04.410 it was identified, initially, in that place.

00:05:04.410 --> 00:05:09.410 It has now, as of this morning, it's spread to 28 countries.

00:05:12.670 --> 00:05:15.501 And this is a map, but there's also,

00:05:15.501 --> 00:05:16.970 there's some sobering reflection

00:05:16.970 --> 00:05:19.033 on the status of the outbreak in the sense

00:05:19.033 --> 00:05:21.733 that the major chunk remains in China,

00:05:22.700 --> 00:05:27.083 and the major chunk remains in mainland China.

00:05:27.083 --> 00:05:32.083 There have been over 28,000 cases reported.

00:05:33.330 --> 00:05:35.970 There are model-based estimates that go

00:05:35.970 --> 00:05:37.060 much higher than that.

00:05:37.060 --> 00:05:41.573 But, in terms of reported cases are 28,353,

00:05:42.570 --> 00:05:47.451 including, unfortunately, 565 deaths.

00:05:47.451 --> 00:05:51.890 And that's a very sobering reflection

00:05:51.890 --> 00:05:54.120 on the status of the outbreak.

00:05:54.120 --> 00:05:56.170 But when it comes to emerging diseases,  
00:05:56.170 --> 00:05:58.140 it's not just that we are concerned  
00:05:58.140 --> 00:06:00.380 about what has happened so far.  
00:06:00.380 --> 00:06:03.480 And can you imagine that, during the holidays,  
00:06:03.480 --> 00:06:05.820 most of us had, in fact, yes, I was looking  
00:06:05.820 --> 00:06:06.653 at the reports,  
00:06:06.653 --> 00:06:10.630 there were emails circulating in early January,  
00:06:10.630 --> 00:06:12.840 starting in late December there was something  
percolating.  
00:06:12.840 --> 00:06:15.930 But we didn't know about this major outbreak.  
00:06:15.930 --> 00:06:18.750 Certainly, it wasn't common knowledge.  
00:06:18.750 --> 00:06:22.940 It wasn't a major concern and how quickly this  
disease  
00:06:22.940 --> 00:06:24.823 has become a major concern.  
00:06:26.090 --> 00:06:30.580 We think the family of viruses it comes from,  
00:06:30.580 --> 00:06:33.020 it sort of tells us that it is likely  
00:06:33.020 --> 00:06:38.020 to have the more prominent host as a bat virus.  
00:06:38.210 --> 00:06:41.310 You know, when you use icons sometimes,  
00:06:41.310 --> 00:06:43.651 they look closer to Batman symbol.  
00:06:43.651 --> 00:06:44.484 (audience laughing)  
00:06:44.484 --> 00:06:46.245 But, you know, take my word, it's a bat.  
00:06:46.245 --> 00:06:51.245 But there is a possibility of an intermediate host.  
00:06:52.450 --> 00:06:54.470 Having said that, there was a lot of rumors~  
00:06:54.470 --> 00:06:56.928 and sort of preprints that were shared.  
00:06:56.928 --> 00:07:01.928 Someone looked at the receptors and had some  
speculation  
00:07:02.510 --> 00:07:06.270 that we have a snake intermediate host.  
00:07:06.270 --> 00:07:07.667 And, no matter what you guys do,  
00:07:07.667 --> 00:07:10.281 don't call it a snake virus.  
00:07:10.281 --> 00:07:14.560 There was a headline, not in the Baltimore Sun,  
00:07:14.560 --> 00:07:18.063 in the Scottish Sun-- Baltimore Sun is a much  
better paper

00:07:18.063 --> 00:07:23.063 that the Scottish Sun --that had this snake flu headline.

00:07:24.020 --> 00:07:25.790 But, obviously, it got transmitted to humans.

00:07:25.790 --> 00:07:28.120 And what really concerned us,

00:07:28.120 --> 00:07:31.263 was the well-established human to human transmission.

00:07:32.260 --> 00:07:35.680 Because when things come from zoonosis,

00:07:35.680 --> 00:07:38.850 when there's a jumping of a virus or a pathogen

00:07:38.850 --> 00:07:43.210 from an animal host to a human,

00:07:43.210 --> 00:07:45.180 that happens with some frequency.

00:07:45.180 --> 00:07:47.150 But what really concerns us is when

00:07:47.150 --> 00:07:49.573 there's human to human transmission established.

00:07:50.630 --> 00:07:54.330 Just to give you a little bit of a big picture estimate,

00:07:54.330 --> 00:07:56.790 so one measure of transmit-ability

00:07:56.790 --> 00:07:59.680 is the so-called basic reproduction number.

00:07:59.680 --> 00:08:01.560 Some people call it basic reproductive number.

00:08:01.560 --> 00:08:03.170 That's not a preferable term.

00:08:03.170 --> 00:08:06.660 Basic reproduction number, meaning,

00:08:06.660 --> 00:08:11.620 one way of conceptualizing it is that in a naive population,

00:08:11.620 --> 00:08:16.620 where everyone is susceptible to this infection,

00:08:16.730 --> 00:08:20.818 if there is one case introduced of this disease,

00:08:20.818 --> 00:08:24.730 on average, how many cases they would infect?

00:08:24.730 --> 00:08:26.630 So that's one simple way of understanding this.

00:08:26.630 --> 00:08:29.240 And this is a measure of transmit-ability.

00:08:29.240 --> 00:08:32.370 This is not the sole predictor of how big,

00:08:32.370 --> 00:08:34.400 how dangerous the outbreak will be.

00:08:34.400 --> 00:08:35.580 But it is an important measure.

00:08:35.580 --> 00:08:40.580 There's some uncertainty about the magnitude of it.

00:08:41.024 --> 00:08:44.230 But we do know that it is not as transmittable as,

00:08:44.230 --> 00:08:45.870 let's say, measles, which is one  
00:08:45.870 --> 00:08:49.690 of the most transmittable common diseases  
00:08:49.690 --> 00:08:52.780 which has this R0 Number of 12 to 15.  
00:08:52.780 --> 00:08:55.870 In certain outbreaks, it has gone up to 17.  
00:08:55.870 --> 00:08:58.350 Ebola had this number of two.  
00:08:58.350 --> 00:09:02.820 And this is, the novel coronavirus is comparable  
to SARS.  
00:09:02.820 --> 00:09:04.690 It's more than the flu.  
00:09:04.690 --> 00:09:07.860 And so, this is some perspective to keep in mind,  
00:09:07.860 --> 00:09:11.320 with a caveat that our information is evolving.  
00:09:11.320 --> 00:09:13.790 We certainly know a lot more about this virus  
00:09:13.790 --> 00:09:15.950 than we knew a couple of weeks ago.  
00:09:15.950 --> 00:09:20.080 But our understanding is evolving and so keep  
that in mind.  
00:09:20.080 --> 00:09:24.880 Now, this is a natural phenomenon in all outbreaks  
00:09:24.880 --> 00:09:25.780 that are emerging.  
00:09:27.480 --> 00:09:29.150 So what can we do?  
00:09:29.150 --> 00:09:30.310 So I have thought about it a little bit  
00:09:30.310 --> 00:09:33.080 in terms of the big picture policy response,  
00:09:33.080 --> 00:09:35.987 and we will be, so the implicit focus will be,  
00:09:35.987 --> 00:09:40.420 the response, from an academic and research per-  
spective  
00:09:40.420 --> 00:09:41.650 for the rest of the panel.  
00:09:41.650 --> 00:09:44.439 But one of the things, those of you who don't  
know,  
00:09:44.439 --> 00:09:45.272 that the writers have  
00:09:45.272 --> 00:09:49.810 very little control over the headlines.  
00:09:49.810 --> 00:09:52.060 So there's separate editors who do the headlines.  
00:09:52.060 --> 00:09:55.430 So my op-ed was a little bit more nuanced  
00:09:55.430 --> 00:09:56.970 than the headline would suggest.  
00:09:56.970 --> 00:10:01.570 But we certainly have, I certainly didn't go,  
00:10:01.570 --> 00:10:04.467 for a call and response kind of a framework.

00:10:04.467 --> 00:10:05.300 "Are we ready?"  
00:10:05.300 --> 00:10:06.404 "No."  
00:10:06.404 --> 00:10:07.460 (audience laughing)  
00:10:07.460 --> 00:10:11.393 But we did talk about certain gaps.  
00:10:13.340 --> 00:10:17.680 First of all, what I postulated was, and this was,  
00:10:17.680 --> 00:10:19.120 I wrote this a few hours  
00:10:19.120 --> 00:10:20.877 after the first case were identified.  
00:10:20.877 --> 00:10:24.960 The government hadn't formulated its response.  
00:10:24.960 --> 00:10:29.960 So some of us were concerned about the response  
00:10:29.980 --> 00:10:33.530 being handled by the political leadership.  
00:10:33.530 --> 00:10:35.440 Look, it's not an unreasonable thing  
00:10:35.440 --> 00:10:39.420 to say that our elected leaders who we elect in a  
democracy  
00:10:39.420 --> 00:10:42.750 could be at the helm of a major emergency.  
00:10:42.750 --> 00:10:44.220 But this is slightly different  
00:10:44.220 --> 00:10:47.300 and it should vary from pathogen to pathogen  
00:10:47.300 --> 00:10:50.750 and emergency to emergency, and here's the reason why.  
00:10:50.750 --> 00:10:55.310 When you have an outbreak with substantial uncertainty,  
00:10:55.310 --> 00:10:57.300 we should acknowledge that uncertainty,  
00:10:57.300 --> 00:11:00.040 but the decision-making process should be structured  
00:11:00.040 --> 00:11:03.300 in a way that the assimilation of ever-changing  
00:11:03.300 --> 00:11:06.830 and ever-evolving information, and the decision-making  
00:11:06.830 --> 00:11:08.600 should be very proximal  
00:11:08.600 --> 00:11:11.570 and ideally led by the same set of people,  
00:11:11.570 --> 00:11:14.977 who have the detailed, nuanced knowledge,  
00:11:14.977 --> 00:11:18.000 intuitively of these things.  
00:11:18.000 --> 00:11:19.390 They should be calling the shots.  
00:11:19.390 --> 00:11:20.260 And who are those people?

00:11:20.260 --> 00:11:24.100 Fortunately, those in this country  
00:11:24.100 --> 00:11:26.996 who are leading our major public health agencies,  
00:11:26.996 --> 00:11:31.690 the NIH, the CDC, FDA, even the HHS,  
00:11:31.690 --> 00:11:33.880 various entities within the HHS,  
00:11:33.880 --> 00:11:36.800 are mainstream, well-respected scientists  
00:11:36.800 --> 00:11:38.440 or public health professionals.  
00:11:38.440 --> 00:11:42.460 And so, rather than sort of having this outbreak,  
00:11:42.460 --> 00:11:44.230 irrespective of the political perspective,  
00:11:44.230 --> 00:11:46.230 in this kind of a situation,  
00:11:46.230 --> 00:11:49.020 being handled at the White House level, for ex-  
ample,  
00:11:49.020 --> 00:11:52.853 it would be best for the agency heads to tackle  
this.  
00:11:53.770 --> 00:11:56.210 So similarly, let the scientists  
00:11:56.210 --> 00:11:58.440 and public health professionals lead.  
00:11:58.440 --> 00:12:03.210 But, look, it is hard, it's highly unsatisfying.  
00:12:03.210 --> 00:12:08.210 I was on an AMA Reddit half an hour before I  
came here,  
00:12:09.881 --> 00:12:13.348 where a lot of questions, it's easy to speculate.  
00:12:13.348 --> 00:12:17.830 It's very tempting to say, provide certainty.  
00:12:17.830 --> 00:12:21.590 We certainly know a lot about this outbreak than  
before.  
00:12:21.590 --> 00:12:23.580 But we owe it to the general public  
00:12:23.580 --> 00:12:25.690 to convey what we don't know.  
00:12:25.690 --> 00:12:30.690 But also, what is knowable and what will never  
be known.  
00:12:30.930 --> 00:12:34.460 And so, therefore, yes, saying that what  
00:12:34.460 --> 00:12:38.691 is happening right now, you shouldn't be walking  
around  
00:12:38.691 --> 00:12:42.010 in a spacesuit on College Street,  
00:12:42.010 --> 00:12:43.840 it is reasonable to say that.  
00:12:43.840 --> 00:12:44.850 But on the other hand,  
00:12:44.850 --> 00:12:48.530 we don't know the future risk of this outbreak.

00:12:48.530 --> 00:12:49.870 We have some things to go by,  
00:12:49.870 --> 00:12:53.470 and we'll flesh that out a little bit in more nuance.  
00:12:53.470 --> 00:12:56.370 So don't provide false assurances, don't alarm,  
certainly.  
00:12:57.420 --> 00:12:58.580 And the other thing that has happened,  
00:12:58.580 --> 00:13:03.580 as look universities have a unique space in our  
society.  
00:13:03.960 --> 00:13:08.380 Which is we are the guardians of evidence.  
00:13:08.380 --> 00:13:10.433 Lux et Veritas is not an accident.  
00:13:11.364 --> 00:13:15.930 And when we are guardians of evidence,  
00:13:15.930 --> 00:13:18.900 we should think about not just what knowledge  
00:13:18.900 --> 00:13:21.760 is being generated and how it's being imple-  
mented,  
00:13:21.760 --> 00:13:23.597 but the quality of that evidence.  
00:13:23.597 --> 00:13:25.640 And so, the preprint server movement,  
00:13:25.640 --> 00:13:27.610 where open science requires  
00:13:27.610 --> 00:13:32.610 and nudges us to share our data and our academic  
output  
00:13:33.470 --> 00:13:36.810 very quickly on these preprint servers without peer  
review.  
00:13:36.810 --> 00:13:39.360 Overall, is a really positive development  
00:13:39.360 --> 00:13:42.030 when it comes to speed of sharing knowledge  
00:13:42.030 --> 00:13:44.300 and can serve us really well.  
00:13:44.300 --> 00:13:47.710 The genomes were posted very quickly and very  
robustly,  
00:13:47.710 --> 00:13:49.780 in the sense that, in terms of the number,  
00:13:49.780 --> 00:13:52.341 obviously there was a proportion there was a lag.  
00:13:52.341 --> 00:13:55.934 But we should also be careful about  
00:13:55.934 --> 00:13:59.880 how valid that information is.  
00:13:59.880 --> 00:14:01.240 So one way to thread that needle,  
00:14:01.240 --> 00:14:02.563 and there have been incidents that things  
00:14:02.563 --> 00:14:05.100 have been retracted, even in the New England  
Journal.

00:14:05.100 --> 00:14:07.930 So it's not just the new preprint servers  
00:14:07.930 --> 00:14:08.763 that have been vulnerable.  
00:14:08.763 --> 00:14:10.460 There have been other things on preprint servers  
00:14:10.460 --> 00:14:12.290 that have been revised, et cetera,  
00:14:12.290 --> 00:14:13.940 and people have changed their perceptions  
00:14:13.940 --> 00:14:16.490 around the outbreak based on that.  
00:14:16.490 --> 00:14:20.040 So one of the proposals I discussed there  
00:14:20.040 --> 00:14:23.398 is to have a preplanned rapid peer review system  
00:14:23.398 --> 00:14:27.830 that is already set up to evaluate information  
00:14:27.830 --> 00:14:30.490 on a quick turnaround basis.  
00:14:30.490 --> 00:14:32.680 I'm not going to go into the details right now.  
00:14:32.680 --> 00:14:35.330 But just to remind you of the response,  
00:14:35.330 --> 00:14:38.550 this is a public health emergency of international  
concern  
00:14:38.550 --> 00:14:40.416 declared by the WHO.  
00:14:40.416 --> 00:14:43.070 There have been travel restrictions, et cetera,  
00:14:43.070 --> 00:14:45.760 and there have been quarantine,  
00:14:45.760 --> 00:14:47.410 various measures akin to quarantine  
00:14:47.410 --> 00:14:48.530 that have been implemented.  
00:14:48.530 --> 00:14:50.690 We will discuss the matter to the value  
00:14:50.690 --> 00:14:54.910 and sort of nuances of these responses in a little  
while.  
00:14:54.910 --> 00:14:56.930 These are a couple of things WHO recommends  
00:14:56.930 --> 00:15:00.110 in terms of preventive measures:  
00:15:00.110 --> 00:15:02.490 covering mouth and nose when you're coughing  
and sneezing,  
00:15:02.490 --> 00:15:04.369 if you're using tissues  
00:15:04.369 --> 00:15:05.550 into closed bin immediately after use,  
00:15:05.550 --> 00:15:09.355 cleans hands, hand-washing is a very important  
00:15:09.355 --> 00:15:11.960 preventive measure, it's not a panacea,  
00:15:11.960 --> 00:15:14.480 that's gonna take care of all our wolves  
00:15:14.480 --> 00:15:16.420 when it comes to respiratory disease,

00:15:16.420 --> 00:15:18.870 but it is something that you can do now.

00:15:18.870 --> 00:15:23.090 It is evidence-based and this is something we can do now

00:15:23.090 --> 00:15:25.460 without any further technological development.

00:15:25.460 --> 00:15:27.230 And then, there are certain recommendations,

00:15:27.230 --> 00:15:28.379 without going into details, on the WHO side

00:15:28.379 --> 00:15:31.430 in terms of staying healthy while traveling.

00:15:31.430 --> 00:15:34.560 So I'll pause here and I will then introduce

00:15:34.560 --> 00:15:36.810 our panelists one by one.

00:15:36.810 --> 00:15:39.780 But before I do that, I wanna thank one of my postdocs

00:15:39.780 --> 00:15:41.710 who helped with some of those slides,

00:15:41.710 --> 00:15:45.340 Aryn Malik, and I already thanked Albert and others

00:15:45.340 --> 00:15:49.253 for helping organize this session.

00:15:49.253 --> 00:15:53.270 I'm gonna call the panelists in alphabetical order.

00:15:53.270 --> 00:15:55.053 The first one is Ellen Foxman.

00:15:56.290 --> 00:15:59.170 She's an assistant professor of lab medicine and immunology

00:15:59.170 --> 00:16:01.120 at the Yale School of Medicine.

00:16:01.120 --> 00:16:05.354 Her research focuses on understanding the natural mechanisms

00:16:05.354 --> 00:16:08.150 that protect the airway from respiratory viruses.

00:16:08.150 --> 00:16:09.920 And you can see how that is relevant

00:16:09.920 --> 00:16:12.120 to what we are talking about right now.

00:16:12.120 --> 00:16:14.530 And one of the interesting things that she's working on

00:16:14.530 --> 00:16:18.640 is rapid diagnostics for these kinds of emerging diseases

00:16:18.640 --> 00:16:19.960 for mass screening.

00:16:19.960 --> 00:16:23.040 So that straddles individual and public health response.

00:16:23.040 --> 00:16:25.723 And that's one of my favorite kinds of responses.

00:16:26.700 --> 00:16:29.763 The second panelist is Gregg Gonzalez.  
00:16:33.030 --> 00:16:35.620 He's an assistant professor of epidemiology  
00:16:35.620 --> 00:16:38.040 and associate adjunct professor of law  
00:16:38.040 --> 00:16:40.710 of Yale Law School, and he's the co-director  
00:16:40.710 --> 00:16:43.180 of the Yale Global Health Justice Partnership.  
00:16:43.180 --> 00:16:45.620 So he has two homes, Yale School of Public Health  
00:16:45.620 --> 00:16:46.903 and the Law School.  
00:16:50.469 --> 00:16:55.469 And he's a perfect example of an activist scientist.  
00:16:56.670 --> 00:16:59.590 He's a solid activist, a very passionate activist,  
00:16:59.590 --> 00:17:01.850 he has the fire in the belly that we all felt  
00:17:01.850 --> 00:17:03.287 on our first day of grad school.  
00:17:03.287 --> 00:17:04.544 (audience laughing)  
00:17:04.544 --> 00:17:07.050 Some of us get jaded,  
00:17:07.050 --> 00:17:09.513 others stay enthusiastic and passionate.  
00:17:10.390 --> 00:17:12.970 And he's also a top-notch scientist  
00:17:12.970 --> 00:17:17.544 and models impact of decisions and operation  
00:17:17.544 --> 00:17:21.840 instead of using quantitative techniques,  
00:17:21.840 --> 00:17:23.760 which are really fascinating.  
00:17:23.760 --> 00:17:27.930 The third panelist is Nathan Grubaugh.  
00:17:27.930 --> 00:17:30.430 He's also an assistant professor of epidemiology  
00:17:30.430 --> 00:17:33.170 of microbial diseases at the Yale School of Public  
Health,  
00:17:33.170 --> 00:17:35.610 and he has done some very interesting work  
00:17:35.610 --> 00:17:39.160 on genetic epidemiology and has be co-curating  
00:17:39.160 --> 00:17:41.540 with his colleagues these viral genomes  
00:17:41.540 --> 00:17:46.150 that have been posted or have been shared,  
00:17:46.150 --> 00:17:49.610 and sort of creating this, if you will,  
00:17:49.610 --> 00:17:52.420 the map of this genome as it evolves.  
00:17:52.420 --> 00:17:55.020 And this is realtime public health  
00:17:55.020 --> 00:17:59.752 that takes advantage of important immediate

00:17:59.752 --> 00:18:04.660 information sharing and brings it together for, hopefully,

00:18:05.650 --> 00:18:08.940 decision-making and response to an emerging threat.

00:18:08.940 --> 00:18:10.390 Then, we have Lisa Sanders.

00:18:10.390 --> 00:18:12.560 Dr. Sanders is a clinical educator

00:18:12.560 --> 00:18:16.380 in Internal Medicine and she's a primary care provider

00:18:16.380 --> 00:18:20.833 and an Emmy Award-winning producer of CBS News,

00:18:20.833 --> 00:18:22.490 as well as an author.

00:18:22.490 --> 00:18:26.910 And the other thing that I like, as a House fan,

00:18:26.910 --> 00:18:29.660 she was one of the inspirations for House.

00:18:29.660 --> 00:18:30.780 Is that correct?

00:18:30.780 --> 00:18:33.820 - [Lisa] My column, nothing personal, I'm way nicer.

00:18:33.820 --> 00:18:34.653 (audience laughing)

00:18:34.653 --> 00:18:36.230 - [Saad] Because I was trying to look for the resemblance

00:18:36.230 --> 00:18:37.321 with Hugh Laurie.

00:18:37.321 --> 00:18:38.994 - [Lisa] Sometimes, I win.

00:18:38.994 --> 00:18:41.920 (audience laughing)

00:18:41.920 --> 00:18:46.670 - [Saad] And then, our last panelist is David Vlahov.

00:18:46.670 --> 00:18:48.967 He's the PhD program director and professor

00:18:48.967 --> 00:18:50.360 at the Yale School of Nursing,

00:18:50.360 --> 00:18:53.680 and then he also has a joint appointment

00:18:53.680 --> 00:18:58.000 with Epi here in the School of Public Health.

00:18:58.000 --> 00:19:00.960 He was involved and he did some very fascinating work

00:19:00.960 --> 00:19:05.120 in early 2000 when SARS broke and anthrax happened

00:19:05.120 --> 00:19:07.880 on the response of healthcare providers

00:19:07.880 --> 00:19:09.400 or the public health workforce,

00:19:09.400 --> 00:19:11.410 including school nurses, et cetera,  
00:19:11.410 --> 00:19:14.756 who can be the tip of the spear of a mass response,  
00:19:14.756 --> 00:19:17.700 and was involved from that perspective.  
00:19:17.700 --> 00:19:20.010 But also, as a professor of nursing,  
00:19:20.010 --> 00:19:23.320 has thought about and would provide his expertise  
00:19:23.320 --> 00:19:25.240 on some of the healthcare  
00:19:25.240 --> 00:19:27.700 and workforce decisions, et cetera.  
00:19:27.700 --> 00:19:29.960 There are a couple of people who are in the audi-  
ence  
00:19:29.960 --> 00:19:33.400 who are not official panelists,  
00:19:33.400 --> 00:19:35.793 but I may sort of put them on the spot.  
00:19:36.920 --> 00:19:39.470 One is Dr. Paul Genecin.  
00:19:39.470 --> 00:19:41.020 He's the director of Yale Health.  
00:19:41.020 --> 00:19:42.810 So if there are any questions that come  
00:19:42.810 --> 00:19:45.800 from that perspective, I will point to you.  
00:19:45.800 --> 00:19:50.070 And Albert Ko, who's an overall smart person,  
00:19:50.070 --> 00:19:50.903 (audience laughing)  
00:19:50.903 --> 00:19:53.160 but also, in all of it,  
00:19:53.160 --> 00:19:56.090 has long-standing links with Chinese colleagues.  
00:19:56.090 --> 00:19:58.990 But, equally importantly, he's involved  
00:19:58.990 --> 00:20:03.990 with a WHO working group developing interven-  
tions  
00:20:04.130 --> 00:20:07.021 and evaluating interventions, more importantly,  
00:20:07.021 --> 00:20:09.240 developing a common protocol so that we are not  
00:20:10.746 --> 00:20:15.746 have a different playbook for developing counter-  
measures  
00:20:16.910 --> 00:20:18.163 against this outbreak.  
00:20:19.435 --> 00:20:23.200 So with that, I'll switch to the question and answer  
phase  
00:20:23.200 --> 00:20:24.033 of this forum.  
00:20:29.890 --> 00:20:34.720 So my first question will be from Nate,  
00:20:36.617 --> 00:20:38.530 "So where did this virus come from?"

00:20:38.530 --> 00:20:41.790 And I think our best bet to figure this out  
00:20:41.790 --> 00:20:44.423 is not to send Hugh Laurie and investigate,  
00:20:46.290 --> 00:20:49.800 but to look at the genetic data and look at other  
viruses,  
00:20:49.800 --> 00:20:52.930 et cetera, that could tell something about that.  
00:20:52.930 --> 00:20:54.460 Could you elaborate a little bit on that.  
00:20:54.460 --> 00:20:55.839 - [Nate] Yeah, sure, thank you.  
00:20:55.839 --> 00:20:57.480 First I would just like to say that it's really great  
00:20:57.480 --> 00:20:59.570 to see so many students in the audience,  
00:20:59.570 --> 00:21:00.900 so many people that are interested  
00:21:00.900 --> 00:21:03.440 from a lot of different backgrounds.  
00:21:03.440 --> 00:21:06.460 So the question really gets at something  
00:21:06.460 --> 00:21:08.210 that I'm very interested in with outbreaks  
00:21:08.210 --> 00:21:10.640 and that is misinformation.  
00:21:10.640 --> 00:21:13.660 So, if any of you are on Twitter  
00:21:13.660 --> 00:21:15.300 or are reading some columns,  
00:21:15.300 --> 00:21:17.970 maybe you see a lot of misinformation about the  
origins  
00:21:17.970 --> 00:21:19.430 of this outbreak.  
00:21:19.430 --> 00:21:22.560 For a second telling you this is not a deliberate  
release  
00:21:22.560 --> 00:21:24.090 from a laboratory.  
00:21:24.090 --> 00:21:27.832 Some of the evidence that people present for that  
00:21:27.832 --> 00:21:31.610 is a paper that did some, I'm gonna say, "shoddy"  
analysis,  
00:21:31.610 --> 00:21:35.580 to say that there is elements within the coron-  
avirus genome  
00:21:35.580 --> 00:21:38.680 that had an, "uncanny resemblance to HIV."  
00:21:38.680 --> 00:21:42.410 And therefore it was man-made and released from  
a lab  
00:21:42.410 --> 00:21:46.710 that they say there's a high-containment virology  
lab  
00:21:46.710 --> 00:21:48.570 in Wuhan which is actually perfect

00:21:48.570 --> 00:21:50.780 for being able to respond to these events  
00:21:50.780 --> 00:21:54.130 but then people are suggesting that the virus was  
manmade  
00:21:54.130 --> 00:21:55.150 and came from this lab.  
00:21:55.150 --> 00:21:56.200 That is absolutely not true,  
00:21:56.200 --> 00:21:58.304 there is no evidence to actually say that,  
00:21:58.304 --> 00:22:00.040 and the analysis was faulty.  
00:22:00.040 --> 00:22:02.540 Where this actually came from is like with Saad's  
slide,  
00:22:02.540 --> 00:22:04.770 is the group of viruses  
00:22:04.770 --> 00:22:07.490 that this virus belongs to are beta-corona viruses.  
00:22:07.490 --> 00:22:09.463 And they're ancient origins are in bats,  
00:22:09.463 --> 00:22:12.500 there's some 200 different known species  
00:22:12.500 --> 00:22:14.410 of beta-corona viruses in bats,  
00:22:14.410 --> 00:22:19.410 and from what we know there are seven of these  
viruses  
00:22:19.530 --> 00:22:21.510 that have spilled over into human populations  
00:22:21.510 --> 00:22:23.000 that caused outbreaks.  
00:22:23.000 --> 00:22:25.230 Four of 'em cause common cold,  
00:22:25.230 --> 00:22:26.950 they're right here in New Haven.  
00:22:26.950 --> 00:22:29.060 One of 'em is SARS, one of 'em is MERS,  
00:22:29.060 --> 00:22:31.600 and one of 'em is now this novel coronavirus.  
00:22:31.600 --> 00:22:33.860 So the question really is then,  
00:22:33.860 --> 00:22:36.220 looking at these genomes and looking at this data  
00:22:36.220 --> 00:22:39.840 of when and where did this happen?  
00:22:39.840 --> 00:22:42.470 So the when part of it, if we look at all the genetic  
data  
00:22:42.470 --> 00:22:45.340 that we have, we can estimate that the origins  
00:22:45.340 --> 00:22:48.530 of the outbreak was about early December,  
00:22:48.530 --> 00:22:50.405 maybe late November.  
00:22:50.405 --> 00:22:52.870 And there are some questions about whether

00:22:52.870 --> 00:22:56.760 this came directly from a live market that was in Wuhan,

00:22:56.760 --> 00:23:00.160 it's sort of uncertain if that is actually the case,

00:23:00.160 --> 00:23:03.130 the most epidemiological evidence would suggest that.

00:23:03.130 --> 00:23:05.880 But it certainly came from a mammal of sort,

00:23:05.880 --> 00:23:08.559 so beta-corona viruses infect mammals

00:23:08.559 --> 00:23:10.950 and this gets into another point of misinformation out there

00:23:10.950 --> 00:23:12.710 that maybe this was a snake virus,

00:23:12.710 --> 00:23:15.020 or maybe this actually spilled over from fish.

00:23:15.020 --> 00:23:16.970 We don't know of any of these viruses that have ever

00:23:16.970 --> 00:23:19.810 infected anything other than mammals.

00:23:19.810 --> 00:23:22.500 So what exactly that intermediate host was,

00:23:22.500 --> 00:23:24.180 if there was an intermediate host,

00:23:24.180 --> 00:23:27.540 before we had a human outbreak is sort of unknown.

00:23:28.790 --> 00:23:31.680 - [Saad] So that brings me to the question about

00:23:31.680 --> 00:23:36.680 the viral pathogenesis, so Ellen, do you mind elaborating

00:23:36.768 --> 00:23:41.768 a little bit on that part of how the virus effects our cells

00:23:41.906 --> 00:23:44.060 and us as humans?

00:23:44.060 --> 00:23:45.600 - [Ellen] Yeah, sure.

00:23:45.600 --> 00:23:47.239 Hello everyone, it's great to be here.

00:23:47.239 --> 00:23:51.710 So my life study's respiratory viruses

00:23:51.710 --> 00:23:55.862 and there's a lot of those as we were all familiar with

00:23:55.862 --> 00:23:58.700 the common cold, the flu, and these viruses that we get,

00:23:58.700 --> 00:23:59.990 year after year.

00:23:59.990 --> 00:24:02.090 And so I thought I'd talk about this virus

00:24:02.090 --> 00:24:04.680 in the context of that, what are similarities

00:24:04.680 --> 00:24:06.270 and what are some differences?  
00:24:06.270 --> 00:24:08.530 So as many of you probably know,  
00:24:08.530 --> 00:24:13.230 the way a virus causes illness is it is able to enter  
a cell  
00:24:13.230 --> 00:24:16.130 or several cells of your body and hijack those cells  
00:24:16.130 --> 00:24:17.920 and basically turn those cells into factories  
00:24:17.920 --> 00:24:21.693 for making more virus, which can be damaging to  
the cells.  
00:24:21.693 --> 00:24:25.950 But then your immune system realizes that's hap-  
pening  
00:24:25.950 --> 00:24:28.870 and comes to that area of the body to fight it,  
00:24:28.870 --> 00:24:30.610 fight the virus and get rid of it.  
00:24:30.610 --> 00:24:32.330 And wherever that battle is going on  
00:24:32.330 --> 00:24:33.410 is where you get the symptoms.  
00:24:33.410 --> 00:24:35.680 So if you get the common cold virus in your nose,  
00:24:35.680 --> 00:24:37.490 the immune system's fighting it in your nose,  
00:24:37.490 --> 00:24:40.760 you get the symptoms of the runny nose and so  
forth.  
00:24:40.760 --> 00:24:42.420 If that battle's going on in the lungs,  
00:24:42.420 --> 00:24:44.074 then you're going to get lung symptoms,  
00:24:44.074 --> 00:24:46.240 breathing problems and whatnot,  
00:24:46.240 --> 00:24:48.690 the things we associate with pneumonia.  
00:24:48.690 --> 00:24:51.550 So this virus can do both of those things.  
00:24:51.550 --> 00:24:54.713 It can effect the nose or it can effect the lungs or  
both.  
00:24:56.314 --> 00:24:59.337 So you might ask, "Well, why are we more con-  
cerned  
00:24:59.337 --> 00:25:02.346 "about this, we get these viruses every year,  
00:25:02.346 --> 00:25:04.616 "they're going on in New Haven right now.  
00:25:04.616 --> 00:25:07.197 "We've got lots of other respiratory viruses."  
00:25:07.197 --> 00:25:10.900 And the main thing is, is the fact that it's new  
00:25:10.900 --> 00:25:12.770 to the human population.  
00:25:12.770 --> 00:25:15.880 So as I'm sure many of you are also familiar with,

00:25:15.880 --> 00:25:18.689 is the idea that when our body fights a virus  
00:25:18.689 --> 00:25:21.270 there's a memory immune response that's formed,  
00:25:21.270 --> 00:25:23.240 that makes it so if we see a virus,  
00:25:23.240 --> 00:25:25.580 that virus or a similar virus again,  
00:25:25.580 --> 00:25:27.560 our body is much better at blocking it  
00:25:27.560 --> 00:25:29.460 before it even gets into cells.  
00:25:29.460 --> 00:25:33.130 So that's always the concern about a new virus  
00:25:33.130 --> 00:25:35.270 is that none of us have  
00:25:35.270 --> 00:25:38.590 that pre-existing immune defense up and going.  
00:25:38.590 --> 00:25:41.440 And that makes it potentially easier for the virus  
to spread  
00:25:41.440 --> 00:25:44.680 from person-to-person and also if it gets into your  
body,  
00:25:44.680 --> 00:25:46.680 you don't have that first line of defense  
00:25:46.680 --> 00:25:48.590 that could maybe prevent disease  
00:25:48.590 --> 00:25:50.840 as well as if you had seen the virus before.  
00:25:50.840 --> 00:25:52.690 And that's why, like a new virus,  
00:25:52.690 --> 00:25:57.690 is always a cause to be alert, it's a cause to be  
vigilant.  
00:25:57.776 --> 00:25:59.090 Just because it's new,  
00:25:59.090 --> 00:26:02.760 doesn't mean it's worse than other viruses that  
we know,  
00:26:02.760 --> 00:26:06.170 that we're familiar with but it means there's a  
potential  
00:26:06.170 --> 00:26:08.170 and that's why there's a reason  
00:26:08.170 --> 00:26:10.070 for the heightened vigilance about it.  
00:26:11.276 --> 00:26:13.680 - [Saad] That's a very important point to remem-  
ber,  
00:26:13.680 --> 00:26:18.110 that just because it's new, doesn't necessarily  
mean  
00:26:19.800 --> 00:26:21.785 it's worse, unless it's a disaster movie.  
00:26:21.785 --> 00:26:23.753 (audience laughs)  
00:26:23.753 --> 00:26:24.586 You get that, it's not-

00:26:24.586 --> 00:26:25.419 - [Ellen] Yeah, we just don't know  
00:26:25.419 --> 00:26:26.657 a lot of those things yet.  
00:26:27.514 --> 00:26:28.540 - [Saad] Yeah, exactly.  
00:26:28.540 --> 00:26:31.960 And so Lisa, you're practically a doc  
00:26:31.960 --> 00:26:35.790 and tell us a little bit about what preventive  
measures  
00:26:35.790 --> 00:26:40.790 we can take now and perhaps if the outbreak  
expands  
00:26:40.920 --> 00:26:41.770 in the community.  
00:26:43.770 --> 00:26:47.268 - [Lisa] Well, it seems now, we all know what to  
do,  
00:26:47.268 --> 00:26:52.020 hand-washing and coughing into your elbow  
00:26:52.020 --> 00:26:53.930 and things like that.  
00:26:53.930 --> 00:26:58.930 Not probably getting too close to people  
00:26:59.050 --> 00:27:03.130 who have obvious infections, giving them their  
space,  
00:27:03.130 --> 00:27:06.350 there's probably pass-through fomites  
00:27:06.350 --> 00:27:10.597 or other kinds of respiratory-borne particles.  
00:27:11.820 --> 00:27:14.930 So I don't think there's anything particularly wild  
00:27:14.930 --> 00:27:16.697 that we can do, I'm not sure that,  
00:27:16.697 --> 00:27:19.020 certainly if you had a cold  
00:27:19.020 --> 00:27:21.100 perhaps it might help if you wore a mask.  
00:27:21.100 --> 00:27:23.670 But certainly there's no evidence that wearing a  
mask  
00:27:23.670 --> 00:27:26.180 is going to keep you from getting it.  
00:27:26.180 --> 00:27:28.970 Nor does there seem like there're very many people  
who  
00:27:28.970 --> 00:27:31.370 have it now to get it from.  
00:27:31.370 --> 00:27:36.190 So I think having ordinary levels of precaution  
makes sense.  
00:27:36.190 --> 00:27:38.080 I mean, I assure you,  
00:27:38.080 --> 00:27:41.090 most people don't wash their hands nearly enough.

00:27:41.090 --> 00:27:43.940 So if people just washed their hands just a little bit more,  
00:27:43.940 --> 00:27:45.883 it would probably go a long way.  
00:27:46.760 --> 00:27:48.420 - [Saad] Yeah, that's certainly aligned with  
00:27:48.420 --> 00:27:51.536 CDC recommendations and specifically,  
00:27:51.536 --> 00:27:52.369 at least at this point,  
00:27:52.369 --> 00:27:55.680 CDC doesn't recommend wearing face masks.  
00:27:55.680 --> 00:27:59.660 It's probably perhaps one of the reasons people wear them  
00:27:59.660 --> 00:28:04.130 is for self-efficacy, they want to feel in charge.  
00:28:04.130 --> 00:28:06.500 It's a situation of helplessness,  
00:28:06.500 --> 00:28:09.070 when there is a lot of uncertainty.  
00:28:09.070 --> 00:28:12.150 So perhaps those of us who, there's a few who work  
00:28:12.150 --> 00:28:14.180 on health behavior and communications,  
00:28:14.180 --> 00:28:16.380 perhaps we should have a message of self-efficacy  
00:28:16.380 --> 00:28:17.490 in the form of saying, "You can wash hands."  
00:28:17.490 --> 00:28:21.130 Which is not going to take care of everything,  
00:28:21.130 --> 00:28:24.570 you can practice some level of social distancing  
00:28:24.570 --> 00:28:27.810 without being paranoid about this,  
00:28:27.810 --> 00:28:29.620 especially when you have someone infected,  
00:28:29.620 --> 00:28:32.400 social distancing doesn't mean that start discriminating  
00:28:32.400 --> 00:28:36.841 against people willy-nilly, it means if you have someone,  
00:28:36.841 --> 00:28:38.950 if you are specifically in that kind of a situation,  
00:28:38.950 --> 00:28:41.530 you take some of these precautions.  
00:28:41.530 --> 00:28:45.780 And also, the original prevention to public health response  
00:28:45.780 --> 00:28:49.625 David, do you have any thoughts in terms of the response  
00:28:49.625 --> 00:28:52.610 at the mass level and some of the things  
00:28:52.610 --> 00:28:55.773 that you were involved with earlier on,

00:28:57.430 --> 00:28:59.230 in previous similar outbreaks?  
00:28:59.230 --> 00:29:00.680 And the second part of that question  
00:29:00.680 --> 00:29:03.268 of some of the things that have been employed  
00:29:03.268 --> 00:29:06.060 by various countries, including China, including  
the US,  
00:29:06.060 --> 00:29:07.210 and some of the others.  
00:29:08.362 --> 00:29:09.195 - [Assistant] Here you go, sir.  
00:29:09.195 --> 00:29:10.497 - [David] Oh, okay (laughs).  
00:29:11.840 --> 00:29:13.193 Thank you for the question.  
00:29:16.160 --> 00:29:19.850 In terms of what's going on in China,  
00:29:19.850 --> 00:29:24.850 there's quite a bit of discussion about whether  
quarantine  
00:29:26.560 --> 00:29:30.040 makes things better or makes things worse.  
00:29:30.040 --> 00:29:33.240 And the idea of having people  
00:29:33.240 --> 00:29:35.610 that are separated and protected,  
00:29:35.610 --> 00:29:38.830 seems like it would be a good idea,  
00:29:38.830 --> 00:29:41.730 but it also has a stigmatizing effect  
00:29:42.624 --> 00:29:47.624 where people can under report, go underground,  
if you will.  
00:29:48.840 --> 00:29:51.830 And if we take the example of Ebola,  
00:29:51.830 --> 00:29:53.630 which again's a very different,  
00:29:53.630 --> 00:29:57.750 it's an analogy that doesn't work at a lot of levels,  
00:29:57.750 --> 00:30:02.320 but again just that stigma of being confined  
00:30:04.000 --> 00:30:09.000 and not trusting in a particular environment,  
00:30:09.270 --> 00:30:14.270 there's a lot of discomfort and anger and acting  
out  
00:30:17.810 --> 00:30:19.343 that can happen with that.  
00:30:20.852 --> 00:30:24.743 So what's the process that can be a middle ground.  
00:30:26.639 --> 00:30:29.737 And the approach that I think seems better,  
00:30:31.800 --> 00:30:35.140 although you have to look at what is the local  
situation,  
00:30:35.140 --> 00:30:40.140 what are cultural considerations that go with that,

00:30:40.740 --> 00:30:44.700 are to be able to have a conversation with people,  
00:30:44.700 --> 00:30:49.700 in terms of what is your likelihood of having been  
exposed  
00:30:50.230 --> 00:30:52.030 given what we know  
00:30:52.030 --> 00:30:57.030 and taking that person to have the individual  
responsibility  
00:30:57.340 --> 00:31:01.350 for staying at home, for example, right?  
00:31:01.350 --> 00:31:04.702 Secluding oneself for a period of time,  
00:31:04.702 --> 00:31:08.510 that's a social contract that happens,  
00:31:08.510 --> 00:31:12.943 and for many people that seems very reasonable  
00:31:12.943 --> 00:31:14.920 and there're going to be others  
00:31:14.920 --> 00:31:19.920 that may need a little bit more assistance in that  
area.  
00:31:21.260 --> 00:31:25.473 So I think that's one of the larger issues that  
comes up  
00:31:25.473 --> 00:31:28.010 and has certainly been in the news,  
00:31:28.010 --> 00:31:33.010 is quarantine or cordon sanitaire, right?  
00:31:33.460 --> 00:31:37.660 What are the different levels of protection one can  
have?  
00:31:37.660 --> 00:31:41.620 Now another part of the question is  
00:31:41.620 --> 00:31:44.073 what is a public health response?  
00:31:45.544 --> 00:31:50.544 And Robin Gershon and Chris Korechi were doing  
a study  
00:31:50.870 --> 00:31:54.710 of nurse preparedness in New York City  
00:31:56.349 --> 00:32:00.170 and found that if there was some sort of disaster  
00:32:00.170 --> 00:32:03.490 that was about to happen, what barrier,  
00:32:03.490 --> 00:32:06.270 how many of you would have at least one barrier,  
00:32:06.270 --> 00:32:09.450 that would stop you from showing up to work,  
whatever?  
00:32:09.450 --> 00:32:14.360 So turns out it was 90%, like a childcare,  
00:32:14.360 --> 00:32:18.763 all those different issues and then, it was not by  
design,  
00:32:19.807 --> 00:32:23.350 but the Anthrax, hit New York City and they  
followed up

00:32:23.350 --> 00:32:25.740 and they found out that every single person,  
00:32:25.740 --> 00:32:28.180 every single one of the nurses, showed up to work,  
00:32:28.180 --> 00:32:32.210 and did what their job was, right?  
00:32:32.210 --> 00:32:37.210 So part of it is recognizing that people will rise  
up  
00:32:37.950 --> 00:32:39.810 to what that challenge is,  
00:32:39.810 --> 00:32:43.360 what their professional responsibilities are,  
00:32:43.360 --> 00:32:48.360 and part of that also is having the education and  
support  
00:32:49.880 --> 00:32:51.130 to be able to do that.  
00:32:51.130 --> 00:32:55.119 So I'll pause, 'cause I could keep going, I'll pause.  
00:32:55.119 --> 00:32:55.952 (audience laughs)  
00:32:55.952 --> 00:32:58.240 - [Saad] Yeah. No, so very insightful.  
00:32:58.240 --> 00:33:00.310 So you mentioned quarantine  
00:33:00.310 --> 00:33:02.207 and Gregg I want to sort of switch to you,  
00:33:02.207 --> 00:33:04.250 there was some really interesting work,  
00:33:04.250 --> 00:33:08.020 I wasn't here in New Haven in the area at that  
time,  
00:33:08.020 --> 00:33:11.540 but there was Ebola-related quarantine, as I un-  
derstand,  
00:33:11.540 --> 00:33:15.162 in the area and even as an outsider,  
00:33:15.162 --> 00:33:17.870 as someone who looks at these issues,  
00:33:17.870 --> 00:33:21.607 I found Yale Law School's and some of the people  
who were  
00:33:23.134 --> 00:33:24.240 involved in the Global Health Justice Partnership,  
00:33:24.240 --> 00:33:25.730 collaborated with the ACLU,  
00:33:25.730 --> 00:33:28.760 on a report that came out of that experience.  
00:33:28.760 --> 00:33:32.529 Which is a very, very helpful, very pragmatic tool,  
00:33:32.529 --> 00:33:36.410 that a lot of public health practitioners  
00:33:36.410 --> 00:33:37.243 should pay attention to.  
00:33:37.243 --> 00:33:40.100 Could you elaborate, in terms of, if we quarantine  
00:33:40.100 --> 00:33:43.450 or whatever the parameters of quarantine should  
be?

00:33:43.450 --> 00:33:46.230 And if we do that, how should that look like?  
00:33:46.230 --> 00:33:50.353 - [Gregg] So if you were here in 2014, 2015,  
00:33:52.080 --> 00:33:55.270 in wake of the Ebola epidemic in West Africa,  
00:33:55.270 --> 00:33:57.840 several governors across the country,  
00:33:57.840 --> 00:34:01.079 decided to quarantine individuals returning from,  
00:34:01.079 --> 00:34:06.079 West Africa healthcare workers, in absence of  
symptoms,  
00:34:07.140 --> 00:34:08.400 confine them under quarantine.  
00:34:08.400 --> 00:34:09.620 Including two Yale students,  
00:34:09.620 --> 00:34:12.130 who were not infected with Ebola,  
00:34:12.130 --> 00:34:15.489 and including a West African family from West-  
haven,  
00:34:15.489 --> 00:34:17.430 who were not infected with Ebola,  
00:34:17.430 --> 00:34:19.810 this was done by former Governor Dan Malloy.  
00:34:19.810 --> 00:34:21.113 We're still in a lawsuit,  
00:34:22.796 --> 00:34:26.580 the law school's immigration clinic is partnering  
with us  
00:34:26.580 --> 00:34:27.990 in a suit against the State of Connecticut  
00:34:27.990 --> 00:34:29.370 against these quarantines,  
00:34:29.370 --> 00:34:33.110 but we wrote a paper with the ACLU  
00:34:33.110 --> 00:34:34.680 and Doctors Without Borders that talked about  
00:34:34.680 --> 00:34:38.550 what would happen, the epidemiological and the  
legal  
00:34:38.550 --> 00:34:42.180 implications of the Ebola quarantine on healthcare  
workers  
00:34:42.180 --> 00:34:44.360 in the wake of the Ebola epidemic.  
00:34:44.360 --> 00:34:46.910 And Dan Bausch who was one of our evening  
speakers  
00:34:47.804 --> 00:34:49.524 two weeks ago was one of the scientific advisors  
on that  
00:34:49.524 --> 00:34:50.859 (murmurs) illness and helped out.  
00:34:50.859 --> 00:34:54.040 You can see the report on the GHJP website  
00:34:54.040 --> 00:34:56.530 at the Yale Law School, but the back of the report

00:34:56.530 --> 00:34:59.890 has recommendations about what happens next time?

00:34:59.890 --> 00:35:01.240 Guess what, it's next time.

00:35:02.150 --> 00:35:03.820 A couple of things to remember,

00:35:03.820 --> 00:35:06.990 one is to use the least restrictive measures possible,

00:35:06.990 --> 00:35:08.470 so not to overreact.

00:35:08.470 --> 00:35:11.350 So in the case of the Ebola epidemic the quarantines

00:35:11.350 --> 00:35:13.680 were absolutely unnecessary, unjustified.

00:35:13.680 --> 00:35:17.210 As David is saying, there may be self-isolation

00:35:17.210 --> 00:35:19.010 and staying at home if you feel sick

00:35:20.850 --> 00:35:23.780 or quarantined if necessary, but really to use

00:35:23.780 --> 00:35:27.790 the least restrictive measures for a start,

00:35:27.790 --> 00:35:31.000 rather than sort of going full-steam ahead for quarantines.

00:35:31.000 --> 00:35:34.020 The other thing is to ensure robust procedural protections.

00:35:34.020 --> 00:35:36.899 You have rights, under the US constitution,

00:35:36.899 --> 00:35:39.550 to bodily autonomy and due process.

00:35:39.550 --> 00:35:42.897 So when our students were put into quarantine,

00:35:42.897 --> 00:35:47.897 we could appeal their cases immediately to the courts,

00:35:48.720 --> 00:35:51.802 but it was a 14 day quarantine and we ended up saying,

00:35:51.802 --> 00:35:55.720 afterwards because the time-period was too short.

00:35:55.720 --> 00:35:57.980 But you do have robust- you do have rights

00:35:57.980 --> 00:36:00.540 under the constitution to due process.

00:36:00.540 --> 00:36:04.757 Kaci Hickox was a nurse, with MSF, who came back to the US

00:36:04.757 --> 00:36:06.640 and was quarantined by Governor Christie,

00:36:06.640 --> 00:36:09.610 a republican in New Jersey,

00:36:09.610 --> 00:36:12.010 her quarantine was overturned by a judge in Maine,

00:36:12.010 --> 00:36:14.100 who said it was epidemiologically unjustified.

00:36:14.100 --> 00:36:16.780 So in one case the law worked out.

00:36:16.780 --> 00:36:21.550 The other thing is ensure humane conditions of confinement.

00:36:21.550 --> 00:36:25.120 Now I saw on the news today that China is thinking about

00:36:25.120 --> 00:36:28.920 quarantining or taking all the infected people,

00:36:28.920 --> 00:36:30.060 in Wuhan and other places,

00:36:30.060 --> 00:36:32.813 and putting them into quarantine camps.

00:36:34.850 --> 00:36:36.610 What are the conditions going to be like for them?

00:36:36.610 --> 00:36:38.400 Are they gonna get adequate health care?

00:36:38.400 --> 00:36:40.703 Is there gonna be adequate infection control?

00:36:41.670 --> 00:36:43.210 We're thinking about the risks

00:36:43.210 --> 00:36:44.330 to us here in the United States,

00:36:44.330 --> 00:36:47.150 but think of the thousands of Chinese patients

00:36:47.150 --> 00:36:51.553 with coronavirus now whose health status

00:36:51.553 --> 00:36:54.690 is going to be put into precarious position

00:36:54.690 --> 00:36:56.480 if they are isolated in these facilities

00:36:56.480 --> 00:37:00.490 that we have no idea of who's overseeing their quality

00:37:00.490 --> 00:37:04.600 and their ability to prevent onward transmission

00:37:04.600 --> 00:37:05.593 from these sites.

00:37:06.443 --> 00:37:07.276 So there's lots of things we can do,

00:37:07.276 --> 00:37:08.300 I'm not gonna go through all the recommendations,

00:37:08.300 --> 00:37:12.220 but follow the science, as Saad said.

00:37:12.220 --> 00:37:13.363 Follow the evidence.

00:37:14.580 --> 00:37:17.280 If you hear the words, "abundance of caution," beware,

00:37:19.191 --> 00:37:22.749 because it means, "Damn the evidence and we're gonna do

00:37:22.749 --> 00:37:23.582 "what we want to do."

00:37:23.582 --> 00:37:25.270 And that's what Governor Daniel Malloy,

00:37:25.270 --> 00:37:27.520 Governor Chris Christie, and Governor Andrew Cuomo did

00:37:27.520 --> 00:37:31.491 in 2014, 2015, which was bi-partisan stupidity.

00:37:31.491 --> 00:37:33.420 (audience laughs)

00:37:33.420 --> 00:37:38.111 - [Saad] On that note of bi-partisan Kumbaya, I guess

00:37:38.111 --> 00:37:40.167 (audience laughs)

00:37:40.167 --> 00:37:43.000 So I want to switch to a lot of those decisions were made

00:37:43.000 --> 00:37:44.670 in a communications environment, in a public,

00:37:44.670 --> 00:37:49.670 in the view of an interesting, to say the least,

00:37:50.009 --> 00:37:51.830 public discourse.

00:37:51.830 --> 00:37:55.200 So, Lisa, as someone who has been involved, as an author,

00:37:55.200 --> 00:37:58.500 as a producer, obviously as a physician,

00:37:58.500 --> 00:38:01.507 on top of all of this, what do you think,

00:38:01.507 --> 00:38:05.193 what is your initial impression of what is happening now?

00:38:06.500 --> 00:38:07.770 What are some of the nuances,

00:38:07.770 --> 00:38:09.455 what are some of the adequacies,

00:38:09.455 --> 00:38:12.460 what are the things that we should have learned

00:38:12.460 --> 00:38:14.460 from previously that we could do better?

00:38:16.050 --> 00:38:18.488 - [Lisa] Well, if you, I don't know how accurate

00:38:18.488 --> 00:38:21.720 a representation of the country Twitter is,

00:38:21.720 --> 00:38:23.870 but you don't have to look very deep in Twitter

00:38:23.870 --> 00:38:28.870 to start seeing real crazy about this proliferate.

00:38:31.180 --> 00:38:36.180 And to some degree I think that's completely natural

00:38:37.452 --> 00:38:41.087 because of the disconnect between the messaging that we have

00:38:41.087 --> 00:38:45.317 "You're much more at risk of the flu, just wash your hands,

00:38:45.317 --> 00:38:47.950 "don't worry about it, it's going to be okay."

00:38:47.950 --> 00:38:50.282 Versus closing the country off  
00:38:50.282 --> 00:38:54.717 to people from different countries, who've been to  
China,  
00:38:54.717 --> 00:38:59.717 imposing quarantine, sending people to concen-  
tration camps  
00:39:02.670 --> 00:39:03.770 when they're diseased.  
00:39:03.770 --> 00:39:08.320 I mean, that suggests a level of concern,  
00:39:08.320 --> 00:39:12.130 that doesn't really match what we're told to do,  
right?  
00:39:12.130 --> 00:39:15.660 So we're told to calm down and yet everybody  
00:39:15.660 --> 00:39:19.320 in the government seems to be extremely excited.  
00:39:19.320 --> 00:39:22.360 And nobody's really trying to make that connec-  
tion  
00:39:22.360 --> 00:39:24.770 and when you have big gaps like that,  
00:39:24.770 --> 00:39:28.000 it's inevitable that crazy creeps in  
00:39:29.120 --> 00:39:33.120 because people are worried and that's how people  
express it.  
00:39:33.120 --> 00:39:36.884 I think that we need to acknowledge that we have  
to  
00:39:36.884 --> 00:39:41.410 try to make sure that nothing bad happens,  
00:39:41.410 --> 00:39:45.750 while saying the risk right now seems limited,  
00:39:45.750 --> 00:39:47.940 and acknowledge that we don't know what the  
future holds.  
00:39:47.940 --> 00:39:50.650 I mean, I think that those are the reasonable steps.  
00:39:50.650 --> 00:39:55.430 But this kind of "pooh-poohing" concern, of  
course,  
00:39:55.430 --> 00:39:59.002 makes everybody crazy and really worried  
00:39:59.002 --> 00:40:01.143 and I think it's completely natural.  
00:40:02.612 --> 00:40:07.612 As journalists, of course, we need the snappy  
headline,  
00:40:08.290 --> 00:40:11.270 it's essential, I mean, maybe the New York Times  
00:40:11.270 --> 00:40:13.212 doesn't need a snappy headline,  
00:40:13.212 --> 00:40:15.300 although I think they have been tempted

00:40:15.300 --> 00:40:19.160 by that once or twice, but certainly other publications

00:40:19.160 --> 00:40:21.780 need that, television needs that.

00:40:21.780 --> 00:40:24.700 I mean, people are, this is a competitive environment.

00:40:24.700 --> 00:40:27.200 So some of that is understandable,

00:40:27.200 --> 00:40:29.530 I don't know that it's forgivable.

00:40:29.530 --> 00:40:33.320 But as public health people, we have to step in

00:40:33.320 --> 00:40:38.320 and try to make it make sense to the people around us.

00:40:38.720 --> 00:40:41.610 We can't depend on the media necessarily to do it.

00:40:41.610 --> 00:40:46.610 - [Saad] So the frontline of this response, in this country,

00:40:47.040 --> 00:40:50.790 because of the way certain powers are given to the state

00:40:50.790 --> 00:40:54.610 and local health departments, a lot of people don't realize

00:40:54.610 --> 00:40:58.380 that yes, CDC provides technical guidance,

00:40:58.380 --> 00:41:01.520 but actual action, in terms of outbreak prevention

00:41:01.520 --> 00:41:03.760 and control, on the ground happens

00:41:03.760 --> 00:41:06.443 at the state and local health departments.

00:41:06.443 --> 00:41:10.240 Over the past 20 years, there has been a lot of investment.

00:41:10.240 --> 00:41:14.373 The investment in terms of resources have stalled.

00:41:16.180 --> 00:41:21.180 Should we be reassured, in one way, by the head-start

00:41:22.480 --> 00:41:27.069 we have had, since SARS and Anthrax and the 2009 epidemic

00:41:27.069 --> 00:41:32.069 and/or should we be concerned because of the cuts

00:41:32.080 --> 00:41:36.870 that the public health system has seen over the last,

00:41:36.870 --> 00:41:38.690 at least, six, seven years?

00:41:38.690 --> 00:41:40.240 So any thoughts on that, David?

00:41:42.583 --> 00:41:46.473 - [David] I'm not sure except, how best to start on that.

00:41:49.586 --> 00:41:52.960 You know it's a crisis like this that can be a stimulus

00:41:54.672 --> 00:41:57.192 to get the public health funding.

00:41:57.192 --> 00:42:00.060 I mean, we certainly saw that in earlier crises,

00:42:00.060 --> 00:42:05.060 it may be delayed, but I think there's a opportunity here

00:42:06.230 --> 00:42:09.702 to say we've gotta take the public health preparedness

00:42:09.702 --> 00:42:14.702 very seriously and to generate the resources

00:42:14.830 --> 00:42:16.790 to be able to respond to this.

00:42:16.790 --> 00:42:19.458 - [Saad] But isn't that, usually vanished after,

00:42:19.458 --> 00:42:23.200 sort of we get this bolus, this sugar rush of investment

00:42:23.200 --> 00:42:25.520 in global health and then we have

00:42:25.520 --> 00:42:27.500 this seven years of crankiness

00:42:27.500 --> 00:42:29.570 after that sugar rush dies down.

00:42:29.570 --> 00:42:31.831 In terms of where we, the public health system,

00:42:31.831 --> 00:42:36.831 after building up, having this surge,

00:42:37.120 --> 00:42:39.943 then suffers from these consequences.

00:42:41.020 --> 00:42:43.550 Any thoughts on a sustainable way

00:42:45.275 --> 00:42:47.090 of investing in public health this way?

00:42:47.090 --> 00:42:51.000 I know Sten, Development had a very good op-ed,

00:42:51.000 --> 00:42:52.940 in terms of the global health investment

00:42:52.940 --> 00:42:54.770 and not having these boom, bust cycles

00:42:54.770 --> 00:42:56.580 and sustaining the infrastructure.

00:42:56.580 --> 00:43:00.756 But domestically speaking, sort of any thoughts

00:43:00.756 --> 00:43:02.456 on how to maintain that infrastructure that doesn't

00:43:02.456 --> 00:43:05.373 go through these cycles?

00:43:07.460 --> 00:43:08.692 Sten, do you want to contribute?

00:43:08.692 --> 00:43:09.859 - [Sten] Sure.

00:43:13.406 --> 00:43:18.406 The reality is that public health is faced  
00:43:18.650 --> 00:43:20.573 with an inherent challenge.  
00:43:22.190 --> 00:43:25.700 It's hard to convince policy-makers to pay you  
00:43:25.700 --> 00:43:28.450 to do something to prevent something from hap-  
pening.  
00:43:28.450 --> 00:43:33.450 It's much more intuitive to invest in hospitals,  
00:43:33.740 --> 00:43:35.160 to care for the ill,  
00:43:35.160 --> 00:43:37.110 than it is in public health infrastructure  
00:43:37.110 --> 00:43:39.240 to prevent the illness to begin with.  
00:43:39.240 --> 00:43:41.900 So that is part of the theme I think this evening  
00:43:41.900 --> 00:43:43.490 of all the panelists,  
00:43:43.490 --> 00:43:47.053 that we're up against tremendous communications  
challenges.  
00:43:48.340 --> 00:43:51.790 How do we advocate for infrastructures  
00:43:51.790 --> 00:43:55.343 for disease prevention, for rapid response?  
00:43:56.773 --> 00:44:00.440 To be prepared for something that might or might  
not happen?  
00:44:00.440 --> 00:44:04.140 And there's so many compelling demands,  
00:44:04.140 --> 00:44:08.210 in a developing country you advocate for public  
health  
00:44:08.210 --> 00:44:11.280 and you're up against the minister of defense,  
00:44:11.280 --> 00:44:12.890 you're up against the minister of tourism,  
00:44:12.890 --> 00:44:15.770 you're up against the minister of education.  
00:44:15.770 --> 00:44:18.763 Where we have more resources and high-income  
settings,  
00:44:19.938 --> 00:44:23.270 it's almost equally challenging.  
00:44:23.270 --> 00:44:25.730 The NIH budget is in the neighborhood of  
00:44:28.556 --> 00:44:30.641 \$33 billion dollars a year  
00:44:30.641 --> 00:44:31.474 and the CDC budget is a fifth of that.  
00:44:32.799 --> 00:44:34.920 So people understand disease, research to treat  
disease,  
00:44:34.920 --> 00:44:39.670 tremendous investments in clinical trials,  
00:44:39.670 --> 00:44:43.760 the prevention budget is far more modest.

00:44:43.760 --> 00:44:45.870 So I think it's part of our duty,  
00:44:45.870 --> 00:44:47.090 here in the school of public health,  
00:44:47.090 --> 00:44:51.010 to work more diligently on how to communicate  
00:44:51.010 --> 00:44:55.230 with lay audiences about public health and prevention.  
00:44:55.230 --> 00:44:57.830 How to communicate with policy makers  
00:44:57.830 --> 00:45:01.910 so that they appreciate that an ounce of prevention  
00:45:01.910 --> 00:45:03.610 is worth a pound of cure,  
00:45:03.610 --> 00:45:06.790 which I suspect our grandmothers told us.  
00:45:06.790 --> 00:45:11.790 And at the end of the day, integrating acute care settings,  
00:45:13.160 --> 00:45:17.860 with chronic care maintenance,  
00:45:17.860 --> 00:45:21.030 as with the HIV investments in Africa,  
00:45:21.030 --> 00:45:23.330 where a tunnel vision approach,  
00:45:23.330 --> 00:45:26.510 that these are for HIV, HIV and nothing but HIV,  
00:45:26.510 --> 00:45:29.920 when people may be dying of untreated hypertension,  
00:45:29.920 --> 00:45:33.450 where there may be an Ebola virus epidemic around the corner  
00:45:33.450 --> 00:45:35.640 in which those infrastructures could be helpful,  
00:45:35.640 --> 00:45:37.860 a coronavirus epidemic.  
00:45:37.860 --> 00:45:41.220 I think we need to be broader in our thinking,  
00:45:41.220 --> 00:45:46.220 less siloed and more attentive to how infrastructures  
00:45:46.250 --> 00:45:51.170 can be very potent, they can serve a function today,  
00:45:51.170 --> 00:45:52.331 for an investment today,  
00:45:52.331 --> 00:45:54.770 but keeping in mind that there may be  
00:45:54.770 --> 00:45:56.770 an investment in near future,  
00:45:56.770 --> 00:46:00.683 for which these infrastructures can be highly valued.  
00:46:02.510 --> 00:46:05.510 Ultimately, that's a challenge we're facing.

00:46:05.510 --> 00:46:07.940 I know that the Bloomberg philanthropies are investing

00:46:07.940 --> 00:46:12.940 in precisely that with Tom Friedman's initiative

00:46:14.370 --> 00:46:16.862 in New York City and the whole philosophy of that initiative

00:46:16.862 --> 00:46:21.058 is chronic disease care, upgrading that care globally,

00:46:21.058 --> 00:46:25.810 but having each chronic disease investment, be prepared

00:46:25.810 --> 00:46:28.090 for acute responses to outbreaks

00:46:28.090 --> 00:46:30.223 and I think that's a very wise philosophy.

00:46:31.160 --> 00:46:33.230 - [Saad] That's a really good point.

00:46:33.230 --> 00:46:37.210 In terms of, coming back to a little bit more science,

00:46:37.210 --> 00:46:38.820 and one of the misconceptions

00:46:38.820 --> 00:46:39.890 and one of the more frequent questions

00:46:39.890 --> 00:46:41.867 some of us get asked by the press is,

00:46:41.867 --> 00:46:43.810 "Is this virus mutating?"

00:46:43.810 --> 00:46:45.380 And that's such a general question,

00:46:45.380 --> 00:46:47.006 I'm not gonna go into the details of

00:46:47.006 --> 00:46:51.640 why is that a non-specific question because we have someone

00:46:51.640 --> 00:46:54.070 who knows a lot more about it than I do, so Nate,

00:46:54.070 --> 00:46:57.800 would you like to elaborate on the various layers

00:46:57.800 --> 00:46:59.100 of that question?

00:46:59.100 --> 00:47:01.210 - [Nate] So this is one of my favorite topics

00:47:01.210 --> 00:47:03.610 of misinformation during outbreaks

00:47:03.610 --> 00:47:06.400 and the answer is, "Of course, it's mutating."

00:47:06.400 --> 00:47:08.130 But go back a second.

00:47:08.130 --> 00:47:13.130 So mutations sort of conjure up these inherent fears

00:47:13.800 --> 00:47:17.840 of something unexpected and some major change,

00:47:17.840 --> 00:47:21.800 think of American pop culture - X-Men, right?

00:47:21.800 --> 00:47:25.200 These mutant humans have these extraordinary abilities.

00:47:25.200 --> 00:47:28.090 You think about, have you ever read "Andromeda Strain"

00:47:28.090 --> 00:47:29.510 or watched the movie "Outbreak"?

00:47:29.510 --> 00:47:32.850 As soon as a mutation is introduced into the picture,

00:47:32.850 --> 00:47:34.350 something new is happening.

00:47:34.350 --> 00:47:38.520 So of course, the people that grew up on this,

00:47:38.520 --> 00:47:40.700 when you hear the word mutation, right,

00:47:40.700 --> 00:47:41.810 this is what you're thinking about.

00:47:41.810 --> 00:47:44.570 You're thinking about these crazy changes that can happen,

00:47:44.570 --> 00:47:49.321 not about the fundamental evolutionary processes.

00:47:49.321 --> 00:47:54.321 So every time a virus replicates, when it copies its genome

00:47:54.580 --> 00:47:57.350 on average about one mutation is introduced.

00:47:57.350 --> 00:48:00.930 And most of these mutations don't do anything to the virus,

00:48:00.930 --> 00:48:03.130 some of 'em make the virus worse than their loss,

00:48:03.130 --> 00:48:05.300 and some of them provide a benefit.

00:48:05.300 --> 00:48:07.240 But what we're actually thinking about, I think,

00:48:07.240 --> 00:48:09.330 when people ask about mutations

00:48:09.330 --> 00:48:11.290 are actually natural selection.

00:48:11.290 --> 00:48:15.550 So are these viruses becoming better adapted at something,

00:48:15.550 --> 00:48:19.147 So I think it's a perfectly reasonable question to ask,

00:48:19.147 --> 00:48:22.340 "Is this novel coronavirus, adapting to humans?"

00:48:22.340 --> 00:48:26.103 So during the Ebola epidemic, in West Africa, we found

00:48:26.103 --> 00:48:29.719 that early on in the outbreak,

00:48:29.719 --> 00:48:31.000 there was a mutation that appeared

00:48:31.000 --> 00:48:33.690 and through a lot of experiments and everything,

00:48:33.690 --> 00:48:35.890 we found that it eventually dominated the outbreak.

00:48:35.890 --> 00:48:37.900 And it looked to be a human adaptation.

00:48:37.900 --> 00:48:40.160 But when we look at the epidemiological evidence,

00:48:40.160 --> 00:48:42.740 so that people who are infected with this mutation,

00:48:42.740 --> 00:48:45.509 or with not, there wasn't a difference in the death rates,

00:48:45.509 --> 00:48:49.070 there wasn't a difference in how much virus you had.

00:48:49.070 --> 00:48:50.611 It was a human adaptation that didn't really have a major

00:48:50.611 --> 00:48:55.200 epidemiological impact, the same with SARS.

00:48:55.200 --> 00:48:56.940 SARS, after it was introduced,

00:48:56.940 --> 00:48:58.330 we found these changes that happened

00:48:58.330 --> 00:49:00.990 that looked like they were human adaptations,

00:49:00.990 --> 00:49:02.070 but when you look back at the data

00:49:02.070 --> 00:49:06.380 you can't actually determine if this had any major impact

00:49:06.380 --> 00:49:07.743 on the overall epidemic.

00:49:08.758 --> 00:49:10.370 So could this novel coronavirus

00:49:12.432 --> 00:49:13.265 adapt better to infect humans?

00:49:13.265 --> 00:49:14.500 Sure, possibly could.

00:49:14.500 --> 00:49:16.780 Will it have a major impact on the epidemic?

00:49:16.780 --> 00:49:19.110 Will it cause more deaths?

00:49:19.110 --> 00:49:22.090 There's not really any evidence to suggest that.

00:49:22.090 --> 00:49:24.480 - [Saad] So my last question of this phase,

00:49:24.480 --> 00:49:27.140 before I open up, is from Ellen,

00:49:27.140 --> 00:49:31.540 and I want you to talk about a little bit about diagnostics.

00:49:31.540 --> 00:49:33.300 So our ability to detect this,

00:49:33.300 --> 00:49:36.250 especially from the perspective of being Global Health,

00:49:36.250 --> 00:49:38.593 you always think about inequities.

00:49:39.998 --> 00:49:42.610 For example, in Africa, one of the questions is,  
00:49:42.610 --> 00:49:46.600 the fact that we haven't detected a lot of cases,  
00:49:46.600 --> 00:49:51.400 is because is it the absence of the virus  
00:49:53.230 --> 00:49:54.063 or the absence of detection, et cetera?  
00:49:54.063 --> 00:49:55.800 So could you talk a little bit about our ability  
00:49:55.800 --> 00:49:58.239 to have these diagnostics and it's implications  
00:49:58.239 --> 00:50:02.730 for an equitable response through knowing the  
burden  
00:50:02.730 --> 00:50:06.460 and the ability from a scientific perspective,  
00:50:06.460 --> 00:50:08.410 to detect these viruses in populations.  
00:50:09.410 --> 00:50:10.964 - [Ellen] Okay, sure.  
00:50:10.964 --> 00:50:11.898 (alarm rings)  
00:50:11.898 --> 00:50:13.880 So one thing that was really quite amazing  
00:50:13.880 --> 00:50:16.680 about this outbreak compared to other ones  
00:50:16.680 --> 00:50:20.100 is how quickly the actual genome sequence  
00:50:20.100 --> 00:50:22.360 of the virus was online.  
00:50:22.360 --> 00:50:25.220 It took about a week, I mean, it was amazing  
00:50:25.220 --> 00:50:28.726 and so advance in technology,  
00:50:28.726 --> 00:50:33.726 we all know that it's much easier to sequence genes  
00:50:34.720 --> 00:50:35.800 than it used to be,  
00:50:35.800 --> 00:50:37.740 but this is really a great example of that,  
00:50:37.740 --> 00:50:42.235 where as soon as that outbreak was recognized,  
00:50:42.235 --> 00:50:46.330 that scientists were able to actually,  
00:50:46.330 --> 00:50:47.550 right from the patient sample,  
00:50:47.550 --> 00:50:49.500 get the whole sequence of the virus.  
00:50:49.500 --> 00:50:51.690 In the past you had to try to grow it  
00:50:51.690 --> 00:50:53.170 and there was a many steps.  
00:50:53.170 --> 00:50:55.170 And that was really an example of the application  
00:50:55.170 --> 00:50:57.780 of a pretty expensive technology actually,  
00:50:57.780 --> 00:50:59.510 but in a way that's gonna benefit  
00:50:59.510 --> 00:51:00.898 a lot of people very quickly.

00:51:00.898 --> 00:51:05.898 As far as diagnostic tests, that's discovery,  
00:51:06.130 --> 00:51:09.275 that's virus discovery and this has really been quite  
00:51:09.275 --> 00:51:12.970 like a poster-child for amazing infrastructure  
00:51:12.970 --> 00:51:14.343 for virus discovery.  
00:51:16.455 --> 00:51:19.670 As far as diagnostics, having that genome sequence  
00:51:19.670 --> 00:51:24.330 online immediately, the way that we detect viruses,  
00:51:24.330 --> 00:51:26.290 here in our hospital right here in Yale,  
00:51:26.290 --> 00:51:29.460 is often by doing a detection of the snippet of the genome.  
00:51:29.460 --> 00:51:31.700 And having that genome sequenced that quickly means  
00:51:31.700 --> 00:51:33.550 you can quickly make a diagnostic test.  
00:51:33.550 --> 00:51:35.883 Which the CDC has done.  
00:51:36.980 --> 00:51:41.106 But then the other issue comes of  
00:51:41.106 --> 00:51:44.390 if you do a diagnostic test enough times,  
00:51:44.390 --> 00:51:47.050 on a population that doesn't have the disease,  
00:51:47.050 --> 00:51:48.740 you're gonna get some false positives.  
00:51:48.740 --> 00:51:50.390 Any positive would be a false positive.  
00:51:50.390 --> 00:51:54.820 So right now what's happening is, there's a lot of criteria,  
00:51:54.820 --> 00:51:59.160 before people will be tested by the CDC,  
00:51:59.160 --> 00:52:02.020 that they actually have a chance of having the virus,  
00:52:02.020 --> 00:52:04.890 before they will be tested in the US.  
00:52:04.890 --> 00:52:09.660 As far as around the world, I mean, these kinds of tests  
00:52:09.660 --> 00:52:11.400 are not super cheap.  
00:52:11.400 --> 00:52:14.454 These PCR based tests, it's a little bit complicated,  
00:52:14.454 --> 00:52:17.391 you need a special machine,  
00:52:17.391 --> 00:52:22.391 you need people who are trained to perform the test.

00:52:23.570 --> 00:52:26.940 So for all those reasons, it's not something that you can

00:52:26.940 --> 00:52:29.640 quickly and cheaply get out to tons of people.

00:52:29.640 --> 00:52:31.710 So there are a lot of efforts now to say,

00:52:31.710 --> 00:52:35.080 how can we use our new technologies that we have now,

00:52:35.080 --> 00:52:37.730 that we're developing on a research scale,

00:52:37.730 --> 00:52:41.730 to make cheap, quick tests that could be distributed

00:52:41.730 --> 00:52:46.260 and could allow people to be diagnosed more widely.

00:52:46.260 --> 00:52:48.813 - [Saad] Before I open up for questions,

00:52:48.813 --> 00:52:51.170 I just want to remind everyone that outbreaks,

00:52:51.170 --> 00:52:56.170 as the plague in Europe or the 1918 flu pandemic

00:52:56.190 --> 00:52:58.520 or more recent Ebola outbreak, et cetera,

00:52:58.520 --> 00:53:00.930 can bring the best and the worst out of people.

00:53:00.930 --> 00:53:03.620 It's extremely important for us to treat each other

00:53:03.620 --> 00:53:06.570 with dignity and respect and compassion.

00:53:06.570 --> 00:53:11.570 Dignity and respect and tolerance is somewhat passive

00:53:11.704 --> 00:53:16.240 ways of looking at the world

00:53:16.240 --> 00:53:21.240 and in my short time at Yale, I think I can fairly say

00:53:21.863 --> 00:53:24.970 with some confidence, this is not a passive community.

00:53:24.970 --> 00:53:29.223 So it also demands that we are active in our compassion,

00:53:30.440 --> 00:53:34.210 for our peers, for our students, not just when the outbreak

00:53:34.210 --> 00:53:38.070 is in China, but when we have a scenario,

00:53:38.070 --> 00:53:41.901 that your mom or uncle or cousin from Colorado calls

00:53:41.901 --> 00:53:46.083 and says, "I've heard this thing on Twitter"

00:53:46.960 --> 00:53:51.287 and there is that tone of concern and fear,

00:53:51.287 --> 00:53:54.726 that is part of that conversation.  
00:53:54.726 --> 00:53:57.280 So as part of the Yale community,  
00:53:57.280 --> 00:54:01.860 it our responsibility to in these kinds of situations,  
00:54:01.860 --> 00:54:04.190 I'm not saying this is gonna happen,  
00:54:04.190 --> 00:54:06.203 with this and uncertainty doesn't mean  
00:54:06.203 --> 00:54:07.960 that it's gonna explode,  
00:54:07.960 --> 00:54:12.960 it means that it could go on the other side as well.  
00:54:13.560 --> 00:54:17.870 But if it does happen, my hope is that all of us,  
00:54:17.870 --> 00:54:20.020 would look back on this year,  
00:54:20.020 --> 00:54:23.780 as part of the Yale community, most of us who  
are here,  
00:54:23.780 --> 00:54:27.250 and we'll be proud of our response as a group of  
people.  
00:54:27.250 --> 00:54:30.340 So let's just remember that before I open this  
00:54:30.340 --> 00:54:32.900 and have no doubt that it's not gonna happen,  
00:54:32.900 --> 00:54:34.470 absolutely gonna happen.  
00:54:34.470 --> 00:54:37.350 But my hope is that we go one step beyond that,  
00:54:37.350 --> 00:54:42.010 we bring the same passion and compassion  
00:54:42.010 --> 00:54:45.620 and lack of passivity to this as we bring to the  
other  
00:54:45.620 --> 00:54:48.400 parts of our endeavors at this campus.  
00:54:48.400 --> 00:54:50.930 So the way, there is a microphone somewhere,  
00:54:50.930 --> 00:54:54.710 yes, there're a couple of microphones on either  
side.  
00:54:54.710 --> 00:54:59.550 So please ask your questions, state your name, et  
cetera  
00:54:59.550 --> 00:55:04.518 and if you have an affiliation one way or another,  
00:55:04.518 --> 00:55:07.123 if you're comfortable please state that as well.  
00:55:08.930 --> 00:55:10.130 Please raise your hands.  
00:55:12.540 --> 00:55:13.633 Yes, this one here.  
00:55:18.590 --> 00:55:21.736 - [Mark] Hi, Mark Russi, Yale School of Medicine  
and also  
00:55:21.736 --> 00:55:23.514 Yale health system.

00:55:23.514 --> 00:55:28.514 In 2003, there was a lot of discussion about the phenomenon

00:55:28.690 --> 00:55:33.220 of a super-spreader (mumbles) of Hong Kong,

00:55:33.220 --> 00:55:35.493 the index patient at the Metropole Hotel.

00:55:36.540 --> 00:55:38.570 Are you seeing, perhaps this is question

00:55:38.570 --> 00:55:42.980 for Nathan and Ellen, are you seeing anything, either

00:55:42.980 --> 00:55:46.450 potentially ascribable to host factors or to some

00:55:46.450 --> 00:55:51.280 combination of low levels of humidity, directional airflow,

00:55:51.280 --> 00:55:55.470 et cetera, that leads you to believe that there are cases

00:55:55.470 --> 00:55:59.360 where there is a substantial excursion from the R0 that

00:55:59.360 --> 00:56:02.780 we're seeing of about two and a half for this disease?

00:56:08.430 --> 00:56:11.080 - [Ellen] I will start by saying I don't really know

00:56:11.080 --> 00:56:12.710 the answer to your question.

00:56:12.710 --> 00:56:14.973 The only thing that comes to mind is this.

00:56:16.299 --> 00:56:21.240 There was a report in several Chinese media outlets,

00:56:21.240 --> 00:56:23.890 that they tested environmental samples,

00:56:23.890 --> 00:56:25.110 at that Wuhan market,

00:56:25.110 --> 00:56:28.760 and there was a good number of them

00:56:28.760 --> 00:56:32.052 tested positive for the virus.

00:56:32.052 --> 00:56:35.740 So that suggests that at least at that market,

00:56:35.740 --> 00:56:40.080 there was a spot where there was a lot of this virus.

00:56:40.080 --> 00:56:42.847 Why that was is not clear, but there was a spot

00:56:42.847 --> 00:56:45.270 where there was a lot of this virus.

00:56:45.270 --> 00:56:47.620 Was it from an individual who was shedding it?

00:56:47.620 --> 00:56:49.785 Was it from an animal?

00:56:49.785 --> 00:56:54.210 I don't know the answer to that, but that's the only thing

00:56:54.210 --> 00:56:56.260 that I can think of that I've read about  
00:56:56.260 --> 00:57:00.420 or heard about that would suggest what you're  
talking about.  
00:57:00.420 --> 00:57:03.630 I don't really know the answer to that with regards  
to any,  
00:57:03.630 --> 00:57:05.950 I have not heard of any reports of super-spreaders  
00:57:05.950 --> 00:57:07.480 or anything like that at this point.  
00:57:07.480 --> 00:57:09.850 I don't know if anyone else might know.  
00:57:12.850 --> 00:57:14.750 - [Saad] Do you want to say something?  
00:57:16.622 --> 00:57:20.250 So there's a question at the back, right hand side.  
00:57:20.250 --> 00:57:22.183 - [Wu] Hello, Wu from School Of (murmurs).  
00:57:22.183 --> 00:57:23.810 Okay so I have some questions, first one is,  
00:57:23.810 --> 00:57:27.020 is there any scientific way to learn the quality  
00:57:27.020 --> 00:57:29.760 of the data published by Chinese officials?  
00:57:29.760 --> 00:57:32.499 And the second question is emphatically, if the  
initial  
00:57:32.499 --> 00:57:34.670 outbreak is happening in New York,  
00:57:34.670 --> 00:57:38.304 which has the closest resemblance to high-  
insurance filled  
00:57:38.304 --> 00:57:41.460 population and mobility and if the public health  
official  
00:57:41.460 --> 00:57:44.280 was notified two weeks after the initial outbreak  
00:57:44.280 --> 00:57:46.197 how can things handle different?  
00:57:47.390 --> 00:57:50.489 - [Saad] So I will, so Nate, you have thought  
00:57:50.489 --> 00:57:53.190 a little bit about sort of information quality  
00:57:53.190 --> 00:57:56.840 around this Rpeg, do you have nay thoughts to  
contribute  
00:57:56.840 --> 00:57:58.173 to on this?  
00:57:59.684 --> 00:58:00.536 - [Nate] You can start it, I'll join in.  
00:58:00.536 --> 00:58:01.611 - [Saad] I'm sorry?  
00:58:01.611 --> 00:58:02.444 - [Nate] I said you can go ahead and start me.  
00:58:02.444 --> 00:58:03.430 - [Saad] So I can start.

00:58:03.430 --> 00:58:07.708 So that's a really good question, so we don't have a direct

00:58:07.708 --> 00:58:11.750 sophisticated way of saying that what a given paper

00:58:13.850 --> 00:58:16.880 is saying is valid, other than we do have tools,

00:58:16.880 --> 00:58:19.888 they are tools that have been with us and have served us

00:58:19.888 --> 00:58:23.440 overall well, but not perfectly, for decades,

00:58:23.440 --> 00:58:25.810 if not centuries and that, the most effective tool,

00:58:25.810 --> 00:58:27.456 is called peer review.

00:58:27.456 --> 00:58:31.280 And that's where someone else, who's not involved

00:58:31.280 --> 00:58:33.617 with this whole process, says,

00:58:33.617 --> 00:58:36.600 "But there's something odd about this."

00:58:36.600 --> 00:58:39.640 And then they sort of, they question, they push back,

00:58:39.640 --> 00:58:44.460 and if the responses are not satisfactory,

00:58:44.460 --> 00:58:47.950 then sometimes the paper doesn't get published, et cetera.

00:58:47.950 --> 00:58:50.730 So that has changed, we are in a very different

00:58:50.730 --> 00:58:52.680 communications environment now.

00:58:52.680 --> 00:58:55.003 Scientific communications environment,

00:58:55.003 --> 00:59:00.003 in this kind of situation, the results of these products,

00:59:04.771 --> 00:59:08.060 intellectual products, are being shared on Twitter

00:59:08.060 --> 00:59:09.260 before they are even submitted

00:59:09.260 --> 00:59:12.350 they are on preprint servers, et cetera.

00:59:12.350 --> 00:59:14.066 Which is okay, which is overall sharing

00:59:14.066 --> 00:59:17.460 the viral genome quickly and publishing that

00:59:17.460 --> 00:59:19.380 has a lot of value.

00:59:19.380 --> 00:59:24.190 I think we'll have to compliment that with a rapid,

00:59:24.190 --> 00:59:27.000 standing peer review system.

00:59:27.000 --> 00:59:29.612 That looks at that and says,

00:59:29.612 --> 00:59:31.727 "We are gonna perform peer review."

00:59:31.727 --> 00:59:33.652 "You have posted it on a preprint server."  
00:59:33.652 --> 00:59:35.470 The preprint server flags it,  
00:59:35.470 --> 00:59:38.410 sends it out to this group that has signed contracts,  
00:59:38.410 --> 00:59:41.190 maybe pay them to have this commitment.  
00:59:41.190 --> 00:59:44.380 Say, I'm gonna turn around because there's a finite  
00:59:44.380 --> 00:59:46.759 types of people that you would need  
00:59:46.759 --> 00:59:51.759 in an emerging pathogen kind of a situation.  
00:59:51.850 --> 00:59:54.130 You would need epidemiologist, you would need virologists,  
00:59:54.130 --> 00:59:58.210 you would need a few clinicians who would pay attention  
00:59:58.210 --> 00:59:59.150 to these kinds of things.  
00:59:59.150 --> 01:00:02.330 So you can have them on a retainer in future situations  
01:00:02.330 --> 01:00:06.170 where you say that this paper is submitted  
01:00:06.170 --> 01:00:07.410 to this preprint server.  
01:00:07.410 --> 01:00:11.535 We evaluate quickly and we say does that make sense or not  
01:00:11.535 --> 01:00:14.880 before you know while the information is still out there  
01:00:14.880 --> 01:00:16.850 we give it a stamp of approval or otherwise.  
01:00:16.850 --> 01:00:18.925 So that would be a way to do that?  
01:00:18.925 --> 01:00:20.870 Any other thoughts, Nate?  
01:00:20.870 --> 01:00:22.243 - [Nate] Yeah, I'll just say something  
01:00:22.243 --> 01:00:24.840 on the quality of the data that's coming out.  
01:00:24.840 --> 01:00:27.973 So one thing that's really important to keep in mind here,  
01:00:29.298 --> 01:00:32.320 is the sheer number of cases that are being reported a day  
01:00:32.320 --> 01:00:34.820 now into like the 3 thousands.  
01:00:34.820 --> 01:00:37.054 Those are at least then, 3000 tests  
01:00:37.054 --> 01:00:38.540 that are being performed a day

01:00:38.540 --> 01:00:40.650 and probably not all of them are positive.  
01:00:40.650 --> 01:00:44.050 So you gotta think about some of it may,  
01:00:44.050 --> 01:00:47.010 the quality it may not really reflect what is hap-  
pening,  
01:00:47.010 --> 01:00:49.010 I don't think it has anything to do with the quality  
01:00:49.010 --> 01:00:50.930 of the reporting per se.  
01:00:50.930 --> 01:00:53.050 It's just like, how many tests can you actually do  
01:00:53.050 --> 01:00:54.890 in some of these places everyday,  
01:00:54.890 --> 01:00:56.400 to get that information out.  
01:00:56.400 --> 01:00:59.930 So there's going to be under-reporting that's hap-  
pening,  
01:00:59.930 --> 01:01:03.057 that isn't necessarily deliberate by any means,  
01:01:03.057 --> 01:01:06.583 but it's just sort of a function of overloading sys-  
tems.  
01:01:09.422 --> 01:01:11.000 - [Sten] I mean, the only thing we can say is  
01:01:11.912 --> 01:01:12.850 that data-sharing is important at this moment.  
01:01:12.850 --> 01:01:15.336 It's like, whoever has data needs to share it  
01:01:15.336 --> 01:01:18.240 at a global scale among the scientific communities.  
01:01:18.240 --> 01:01:19.950 'Cause it's not just what you see in the publication  
01:01:19.950 --> 01:01:21.730 that's important, it's the raw data  
01:01:21.730 --> 01:01:23.620 that people can run re-analysis on  
01:01:23.620 --> 01:01:26.210 and there's some question about whether all the  
data's  
01:01:26.210 --> 01:01:29.030 being shared in sort of a transparent way  
01:01:29.030 --> 01:01:30.520 at the current moment.  
01:01:30.520 --> 01:01:33.410 - [Saad] That's a very important point.  
01:01:33.410 --> 01:01:34.243 - [Ellen] One more comment about  
01:01:34.243 --> 01:01:36.560 the preprint servers though, it is quite amazing  
01:01:36.560 --> 01:01:40.581 that Nate talked about that sort of wrong analysis  
01:01:40.581 --> 01:01:44.290 misconcluding about the HIV present  
01:01:44.290 --> 01:01:45.845 in the coronavirus genome, but I have to say

01:01:45.845 --> 01:01:50.462 that went up on a preprint server, many scientists read it,

01:01:50.462 --> 01:01:53.087 many scientists commented about it, and said,

01:01:53.087 --> 01:01:54.050 "This is a problem."

01:01:54.050 --> 01:01:56.610 And the authors took it down and apologized.

01:01:56.610 --> 01:01:59.000 And that all happened like within a few days.

01:01:59.000 --> 01:02:02.030 So actually in a way, the system is, there is sort of this

01:02:02.030 --> 01:02:04.371 informal peer review going on.

01:02:04.371 --> 01:02:07.590 Likewise, with the New England Journal article

01:02:07.590 --> 01:02:08.615 that was retracted.

01:02:08.615 --> 01:02:12.940 So there is sort of an informal process that's kind of

01:02:12.940 --> 01:02:15.300 coming out of our global connectivity,

01:02:15.300 --> 01:02:17.270 which is sort of encouraging.

01:02:17.270 --> 01:02:19.890 - [Saad] So I'm generally a glass 10% full kind of person,

01:02:19.890 --> 01:02:22.550 It's always something to be hopeful about.

01:02:22.550 --> 01:02:26.140 With this exception, after having worked in vaccines,

01:02:26.140 --> 01:02:29.425 I've interacted with a few swamps of 4chan,

01:02:29.425 --> 01:02:34.425 where these conspiracies live and thrive and multiply

01:02:35.050 --> 01:02:39.130 and my concern is, even after all the retractions,

01:02:39.130 --> 01:02:43.207 some of that stuff will find a life of its own.

01:02:43.207 --> 01:02:45.970 But it is, there is always these kinds of things

01:02:45.970 --> 01:02:47.180 have trade-offs.

01:02:47.180 --> 01:02:50.510 I think having access to especially raw data,

01:02:50.510 --> 01:02:52.943 but also some of the analysis quickly,

01:02:53.930 --> 01:02:57.750 my tendered objective is, it's a net positive.

01:02:57.750 --> 01:03:02.220 A net positive not by sort of close margin,

01:03:02.220 --> 01:03:07.220 but substantially, but it has had, to quote Batman,

01:03:09.360 --> 01:03:10.193 or actually, Spider-man,

01:03:10.193 --> 01:03:12.840 "With great power, comes great responsibility."  
01:03:12.840 --> 01:03:14.070 Voltaire said it,  
01:03:14.070 --> 01:03:16.179 but he probably didn't say it wearing tights.  
01:03:16.179 --> 01:03:18.550 (audience laughs)  
01:03:18.550 --> 01:03:23.550 But so with the power of sharing that information,  
01:03:23.830 --> 01:03:27.890 it is our responsibility to guard the veracity  
01:03:27.890 --> 01:03:29.370 and the quality of that information,  
01:03:29.370 --> 01:03:31.213 through the full scientific process.  
01:03:33.780 --> 01:03:35.904 - [Ley] I can talk without the mic, I'm Ley Chen-  
01:03:35.904 --> 01:03:38.450 - [Saad] So we have broadcasting, so  
01:03:38.450 --> 01:03:39.600 - [Ley] So I will wait.  
01:03:40.656 --> 01:03:42.123 - [David] Who was the person in the back  
01:03:42.123 --> 01:03:43.753 that was there first.  
01:03:45.880 --> 01:03:47.950 - [Lay] Should I wait, Lay Chen, School of  
Medicine,  
01:03:47.950 --> 01:03:50.470 Department of Pediatrics.  
01:03:50.470 --> 01:03:52.870 I have a question about the,  
01:03:52.870 --> 01:03:54.960 seemingly the difference in mortality  
01:03:54.960 --> 01:03:57.580 between Wuhan patients and those outside.  
01:03:57.580 --> 01:04:00.440 Do you think that's simply a question of not know-  
ing  
01:04:00.440 --> 01:04:02.650 the denominator of how many people are really  
sick  
01:04:02.650 --> 01:04:05.660 outside of Wuhan or it's something specific  
01:04:08.029 --> 01:04:09.862 about the environment?  
01:04:11.744 --> 01:04:12.858 - [Saad] So, Albert, do you have any thoughts on  
that?  
01:04:12.858 --> 01:04:13.691 - No, go ahead, I don't know.  
01:04:13.691 --> 01:04:15.757 - The mic right there.  
01:04:15.757 --> 01:04:17.870 - [Albert] So I think that of course the numbers  
01:04:17.870 --> 01:04:19.970 coming out of Wuhan are very concerning,  
01:04:19.970 --> 01:04:21.880 especially because of the number of deaths

01:04:21.880 --> 01:04:23.450 and the proportion of deaths.

01:04:23.450 --> 01:04:28.350 But this is kind of very much like many epidemics that occur

01:04:28.350 --> 01:04:33.070 at the epicenter, the cases that were identified were

01:04:33.070 --> 01:04:34.670 primarily severe cases.

01:04:34.670 --> 01:04:37.770 You can tell by the age, the average age is around 60,

01:04:37.770 --> 01:04:40.400 in cases that were reported.

01:04:40.400 --> 01:04:44.810 If you compare that to what we're seeing among travelers

01:04:44.810 --> 01:04:47.060 or evacuees that are being identified,

01:04:47.060 --> 01:04:48.307 we're seeing that all ages

01:04:48.307 --> 01:04:51.710 and many of them are having mild symptoms.

01:04:51.710 --> 01:04:55.900 So this is probably as you're suspecting, we call it

01:04:55.900 --> 01:04:57.744 case ascertainment bias, in that many of the cases

01:04:57.744 --> 01:05:02.744 in the initial part of the epidemic were more severe.

01:05:02.770 --> 01:05:03.857 - [Saad] So I'm gonna come back to the question

01:05:03.857 --> 01:05:05.560 that was asked, it was a two part question.

01:05:05.560 --> 01:05:08.089 And one of them was what would happen if something like this

01:05:08.089 --> 01:05:10.364 was reported in New York City?

01:05:10.364 --> 01:05:12.130 And I think that's an important question,

01:05:12.130 --> 01:05:14.850 and we should keep it in mind before we criticize other

01:05:14.850 --> 01:05:18.570 entities, countries, in Africa or in Asia or in wherever,

01:05:18.570 --> 01:05:19.690 in terms of what would happen.

01:05:19.690 --> 01:05:21.710 Both in terms of, it's a good counter-factual,

01:05:21.710 --> 01:05:23.590 both positive and negative as well.

01:05:23.590 --> 01:05:24.833 So any thoughts on that?

01:05:26.819 --> 01:05:27.652 - [David] Well, in New York City,

01:05:27.652 --> 01:05:30.920 you have quite a bit of history,  
01:05:30.920 --> 01:05:35.920 and it's also a major, in New York City I think there's  
01:05:36.028 --> 01:05:41.028 greater preparedness based on a history  
01:05:41.230 --> 01:05:44.650 and certainly a recent history of events that have happened.  
01:05:44.650 --> 01:05:48.067 So there's memory, if you will, and preparedness  
01:05:48.067 --> 01:05:50.587 that goes along.  
01:05:50.587 --> 01:05:55.587 The second part is that the information and decision-making,  
01:05:56.470 --> 01:05:59.100 is much more de-centralized  
01:05:59.100 --> 01:06:03.210 and so that decisions can be made much faster  
01:06:03.210 --> 01:06:08.010 than what's being reported overseas.  
01:06:08.010 --> 01:06:11.530 So again, how much preparedness is there?  
01:06:11.530 --> 01:06:15.260 The experience with it, what's the level of decision-making,  
01:06:15.260 --> 01:06:17.830 I think those would be three of the bigger buckets  
01:06:17.830 --> 01:06:20.840 and we could probably flesh that out more.  
01:06:20.840 --> 01:06:22.340 - [Saad] So we were fortunate to have folks from  
01:06:22.340 --> 01:06:24.970 the health department or experience with health department  
01:06:24.970 --> 01:06:27.590 so as the mic goes there,  
01:06:27.590 --> 01:06:29.863 I want to talk to Paul a little bit.  
01:06:29.863 --> 01:06:34.863 Dr. Jensen, any thoughts about hospital preparedness  
01:06:34.907 --> 01:06:36.654 in this kind of a situation?  
01:06:36.654 --> 01:06:37.487 - [Paul] For Yale?  
01:06:37.487 --> 01:06:38.541 - [Saad] For Yale.  
01:06:38.541 --> 01:06:41.479 - [Paul] Yeah. Well, first just to say  
01:06:41.479 --> 01:06:42.312 that the Wuhan hospital is full,  
01:06:43.710 --> 01:06:48.113 the capacity for surge is a real question.  
01:06:50.100 --> 01:06:54.680 We have a fairly elaborate preparedness plan,  
01:06:54.680 --> 01:06:58.770 including the capacity to setup a field hospital

01:06:58.770 --> 01:07:03.170 at the Lanman Center at the gym in a case of need,  
01:07:03.170 --> 01:07:07.931 but the concern about how we would be able to respond  
01:07:07.931 --> 01:07:10.210 to a large number of pupils with serious illnesses,  
01:07:10.210 --> 01:07:15.053 is a real one.  
01:07:15.053 --> 01:07:18.500 I just can't say, but there's a balance on one hand between  
01:07:19.670 --> 01:07:21.910 trying to balance anxiety and concern,  
01:07:21.910 --> 01:07:24.990 which is predominately what we're dealing with now  
01:07:24.990 --> 01:07:27.339 over against the issues of what would really happen  
01:07:27.339 --> 01:07:30.363 in the event of an outbreak.  
01:07:31.640 --> 01:07:33.090 And then just speaking to one point that she made,  
01:07:33.090 --> 01:07:36.041 a little bit tangential about self-efficacy  
01:07:36.041 --> 01:07:38.679 and the need that people have  
01:07:38.679 --> 01:07:40.840 to feel like they're doing something,  
01:07:40.840 --> 01:07:43.722 anyone hasn't had their flu shots, please get one.  
01:07:43.722 --> 01:07:46.555 (audience laughs)  
01:07:47.500 --> 01:07:51.270 - [Drew] Sir, I'm Drew Hadler, I was a former Connecticut  
01:07:51.270 --> 01:07:52.630 state epidemiologist.  
01:07:52.630 --> 01:07:55.404 For the last 11 years I've been working in emerging  
01:07:55.404 --> 01:07:56.321 infections program here, but also as a consultant  
01:07:56.321 --> 01:07:58.710 to New York City Health Department.  
01:07:58.710 --> 01:08:02.331 So I think I came from a control perspective, I can't say  
01:08:02.331 --> 01:08:05.420 what the reaction would have been, but I think  
01:08:05.420 --> 01:08:07.400 from the information-gathering perspective,  
01:08:07.400 --> 01:08:10.197 it would have been much, much more focused  
01:08:10.197 --> 01:08:12.345 and the information will be out there

01:08:12.345 --> 01:08:14.320 a lot of the information that we need.

01:08:14.320 --> 01:08:19.320 So for example, I was there when pandemic flu hit in 2009

01:08:19.887 --> 01:08:21.785 and New York City had a huge high school outbreak

01:08:21.785 --> 01:08:23.960 it was one you could see through the city,

01:08:23.960 --> 01:08:27.565 where four or five kids came back from vacation from Cancun,

01:08:27.565 --> 01:08:30.800 turned out they had H1N1 they went to the same high school

01:08:30.800 --> 01:08:33.570 and within two weeks, there were 900 cases

01:08:33.570 --> 01:08:37.143 in that high school and at least that many family members.

01:08:37.143 --> 01:08:42.081 That was a fair amount of resources went into that,

01:08:42.081 --> 01:08:44.790 it was fully described, transmission issues were described,

01:08:44.790 --> 01:08:48.670 speculant disease within that context was described,

01:08:48.670 --> 01:08:50.220 the city also setup surveillance

01:08:50.220 --> 01:08:53.430 for hospitalized cases of H1N1 right away,

01:08:53.430 --> 01:08:55.300 'cause they didn't have it going on quaran,

01:08:55.300 --> 01:08:58.854 and quickly had counts of am I in trouble, is this going on.

01:08:58.854 --> 01:09:03.854 They also had mortality surveillance and so within a month

01:09:04.130 --> 01:09:08.390 we had a full spectrum of really good information

01:09:08.390 --> 01:09:13.330 to say that H1N1 was no more (mumbles) can sense,

01:09:13.330 --> 01:09:16.240 then any seasonal influenza.

01:09:16.240 --> 01:09:19.880 We do know it was effecting children more than older adults,

01:09:19.880 --> 01:09:21.431 which the (mumbles) seem to believe

01:09:21.431 --> 01:09:23.554 there's good explanations for that,

01:09:23.554 --> 01:09:25.187 because older adults, people in their 50s,

01:09:25.187 --> 01:09:27.800 40s, 50s, and older, actually it turned out  
01:09:27.800 --> 01:09:30.290 did have some immunity to H1N1.  
01:09:30.290 --> 01:09:35.290 And weren't quite as severely as effected as  
younger people.  
01:09:36.721 --> 01:09:38.150 So basically we could put it in perspective  
01:09:38.150 --> 01:09:40.420 and then base control measures on that.  
01:09:40.420 --> 01:09:43.240 Again, I don't know what the immediate control  
measures  
01:09:43.240 --> 01:09:45.500 were dealing with this but there would have been  
01:09:45.500 --> 01:09:48.910 surveillance setup that would have attempted to  
find,  
01:09:48.910 --> 01:09:53.083 full measure of the disease, how severe it was, and  
CDC  
01:09:53.946 --> 01:09:56.113 would be invited in as it was then.  
01:09:57.191 --> 01:09:59.369 Which actually helped the CDC (mumbles) station  
because  
01:09:59.369 --> 01:10:00.900 we can see the life department anyway  
01:10:00.900 --> 01:10:04.103 and so there would be a lot of communication  
with CDC,  
01:10:04.103 --> 01:10:08.120 daily conference calls with jurisdictions around  
the country  
01:10:08.120 --> 01:10:11.043 to explain what would be happening if New York  
City  
01:10:11.043 --> 01:10:15.750 is the one that was affected and we'd have the  
information  
01:10:16.730 --> 01:10:19.350 we need to try and have a rational response to it.  
01:10:19.350 --> 01:10:22.087 Not one that's sort of all desperate.  
01:10:29.120 --> 01:10:31.227 - [Saad] There's someone in the back, there.  
01:10:35.340 --> 01:10:38.383 - [Thatcher] Thank you, Thatcher, School of Pub-  
lic Health,  
01:10:39.776 --> 01:10:40.609 New (mumbles) Health.  
01:10:40.609 --> 01:10:42.100 So my question is about the large number of pa-  
tients  
01:10:42.100 --> 01:10:46.173 so since the outbreak a large number of patients,

01:10:49.421 --> 01:10:50.890 with mild or severe, no matter mild or severe,  
01:10:50.890 --> 01:10:54.620 they rush to the hospitals so I believe the number  
01:10:54.620 --> 01:10:58.143 is quite more than 10 times,  
01:10:58.143 --> 01:11:01.730 10 times more than the hospital can feed.  
01:11:01.730 --> 01:11:06.730 So my question is, so would you recommend people  
with mild  
01:11:06.940 --> 01:11:11.940 symptoms not to go to hospital and just to stay  
at home?  
01:11:12.795 --> 01:11:17.417 - [Saad] So I can start the response,  
01:11:17.417 --> 01:11:19.140 and if anyone has anything to add  
01:11:19.140 --> 01:11:21.050 or you have any thoughts on that.  
01:11:21.050 --> 01:11:22.210 So this is very important.  
01:11:22.210 --> 01:11:24.850 So at the big public health response level,  
01:11:24.850 --> 01:11:26.110 in an emerging situation,  
01:11:26.110 --> 01:11:28.869 having clear evidence-based communication,  
01:11:28.869 --> 01:11:30.960 is extremely important.  
01:11:30.960 --> 01:11:35.337 So talking to people that at certain stage of the  
outbreak  
01:11:35.337 --> 01:11:40.337 and response, certain kinds of symptoms, need to  
stay home  
01:11:41.640 --> 01:11:44.360 for the "abundance of caution" in terms of the  
individual  
01:11:44.360 --> 01:11:47.027 response may require, if there is a judicious use,  
01:11:47.027 --> 01:11:52.027 to self-isolate without disrupting the more old-  
fashioned  
01:11:54.110 --> 01:11:56.610 society in that sense.  
01:11:56.610 --> 01:12:00.220 But also, so Dr. Jensen mentioned, Paul men-  
tioned,  
01:12:00.220 --> 01:12:03.606 something very important, getting your flu shot.  
01:12:03.606 --> 01:12:08.220 And the reason why you say it's not biological, is  
that  
01:12:08.220 --> 01:12:10.900 flu shot doesn't protect against the coronavirus.  
01:12:10.900 --> 01:12:14.840 But it does protect against a major respiratory  
illness.

01:12:14.840 --> 01:12:15.810 So it helps in two ways.

01:12:15.810 --> 01:12:20.810 First of all, it has it's own benefits in terms of

01:12:20.945 --> 01:12:25.110 reducing morbidity and mortality in several age groups.

01:12:25.110 --> 01:12:28.680 But also it reduces, if you are reducing symptoms,

01:12:28.680 --> 01:12:31.690 of respiratory illness in a population,

01:12:31.690 --> 01:12:34.260 then unnecessary visits

01:12:34.260 --> 01:12:37.173 that were not caused by Coronavirus go down.

01:12:38.060 --> 01:12:43.060 So again, we're not helpless, passive, spectators

01:12:43.130 --> 01:12:45.800 to something that is unfolding.

01:12:45.800 --> 01:12:50.090 We have inherent self-efficacy in the form of

01:12:51.060 --> 01:12:53.560 for example, hand-washing, which is evidence-based

01:12:57.190 --> 01:12:58.550 measure for all respiratory illness, flu shot,

01:12:58.550 --> 01:13:00.390 and some of the other measures.

01:13:00.390 --> 01:13:02.770 Do you want to say something more, Paul or Albert,

01:13:02.770 --> 01:13:03.820 any thoughts on this?

01:13:05.068 --> 01:13:07.097 - [Paul] Yeah, I think that's very important.

01:13:08.600 --> 01:13:13.600 Also just to, a less likely influenza is in the community,

01:13:15.700 --> 01:13:16.841 the more likely it is to be able to

01:13:16.841 --> 01:13:19.540 assess people with respiratory infection quickly

01:13:19.540 --> 01:13:21.762 and efficiently in the event

01:13:21.762 --> 01:13:24.313 that we do have an outbreak of coronavirus.

01:13:27.640 --> 01:13:29.840 - [Sten] That's an interesting point, I did it in a study

01:13:29.840 --> 01:13:33.610 awhile back, looking at if you have syndromic surveillance

01:13:33.610 --> 01:13:36.290 in New York City, looking for outbreaks,

01:13:36.290 --> 01:13:38.050 can you immunize people enough

01:13:38.050 --> 01:13:41.660 so that you have greater specificity.

01:13:41.660 --> 01:13:45.610 And the challenge of getting enough people immunized

01:13:45.610 --> 01:13:49.480 is there, so from a population perspective as a concept,

01:13:49.480 --> 01:13:54.480 I think it's great, but that could also add to the case

01:13:54.880 --> 01:13:57.850 that we want to make, is that's another reason

01:13:57.850 --> 01:14:00.693 why we should be encouraging immunization.

01:14:01.730 --> 01:14:02.712 - [Saad] Yes, there's a question there.

01:14:02.712 --> 01:14:07.712 - [Hadjur] Hadjur from the (mumbles) So as a Chinese,

01:14:08.330 --> 01:14:09.767 all my family is still in China

01:14:09.767 --> 01:14:13.565 and my friends share me all these information all day.

01:14:13.565 --> 01:14:18.565 So my question or wondering is when will this end?

01:14:18.616 --> 01:14:22.720 I think the correct question is when do you expect

01:14:22.720 --> 01:14:24.840 the turning point will be?

01:14:24.840 --> 01:14:29.840 Some experts say we have incubation period of two weeks,

01:14:30.660 --> 01:14:34.770 and since the quarantine of the whole, has seen

01:14:34.770 --> 01:14:38.052 a lot of quarantined have been taken,

01:14:38.052 --> 01:14:41.233 there is roughly 10 days or two weeks already passed,

01:14:44.247 --> 01:14:47.197 So if you're doing some modeling or forecasting when do you

01:14:48.105 --> 01:14:50.503 expect this (mumbles) will show?

01:14:53.910 --> 01:14:55.740 - [Nate] I'll just start with something basic on this.

01:14:55.740 --> 01:14:58.190 So just based on one model that I've seen,

01:14:58.190 --> 01:15:00.470 and I don't know necessarily if this is going to be

01:15:00.470 --> 01:15:03.030 the most accurate prediction, but it was looking like

01:15:03.030 --> 01:15:05.870 mid to late February would be the peak.

01:15:05.870 --> 01:15:07.980 But there's a lot of things that can happen,  
01:15:07.980 --> 01:15:11.030 between now and then, that would even change  
those estimates  
01:15:11.030 --> 01:15:12.573 and then you have to wonder, the data  
01:15:12.573 --> 01:15:14.490 that this is all based on.  
01:15:14.490 --> 01:15:18.360 So I don't know if we have a really great handle  
01:15:18.360 --> 01:15:21.280 on when this is going to be peaking  
01:15:21.280 --> 01:15:23.542 and when it's going to start coming down.  
01:15:23.542 --> 01:15:26.320 - [Saad] An enough providing false assurances,  
01:15:26.320 --> 01:15:28.420 I think it's reasonable to share experience  
01:15:28.420 --> 01:15:30.623 with other corona viruses, especially SARS,  
01:15:31.654 --> 01:15:34.210 but there does seem to be a seasonality associated  
01:15:34.210 --> 01:15:36.400 with those viruses.  
01:15:36.400 --> 01:15:41.400 And they seem to be more transmissible using the  
term  
01:15:41.430 --> 01:15:43.710 loosely in this kind of a situation,  
01:15:43.710 --> 01:15:48.230 the peaks are higher in winter.  
01:15:48.230 --> 01:15:53.230 So there is, again, tentative hope that some of  
those months  
01:15:54.705 --> 01:15:56.930 will have a positive impact.  
01:15:56.930 --> 01:16:00.660 But again, it's tentative, we are dealing with,  
01:16:00.660 --> 01:16:04.201 I would be providing false assurances by providing  
01:16:04.201 --> 01:16:06.090 some certainty around that.  
01:16:06.090 --> 01:16:06.923 - [Sten] I think the fairest thing  
01:16:06.923 --> 01:16:09.020 is that we don't know, during the Ebola outbreak  
01:16:10.111 --> 01:16:11.790 there were multiple mathematical models that  
predicted  
01:16:11.790 --> 01:16:14.154 wide sort of trajectories of the epidemic.  
01:16:14.154 --> 01:16:18.200 So I think that information is trickling out,  
01:16:18.200 --> 01:16:21.770 to parametrize these models, so until we have  
more data,  
01:16:21.770 --> 01:16:24.010 until we have more sort of examination

01:16:24.010 --> 01:16:26.250 of how these parameters were put together,  
01:16:26.250 --> 01:16:28.750 I think the safest thing is to say, we don't know.  
01:16:33.663 --> 01:16:37.450 - [David] I taught with Alex Langmuir, who was  
the founder  
01:16:37.450 --> 01:16:40.590 of the immunologic intelligence service.  
01:16:40.590 --> 01:16:44.863 And the one thing that we used in class was Farr,  
right?  
01:16:45.760 --> 01:16:50.657 Farr's law, and it's the first law of epidemics which  
is,  
01:16:50.657 --> 01:16:54.010 "Whatever goes up, must come down."  
01:16:54.010 --> 01:16:58.518 So we don't know where that point is-  
01:16:58.518 --> 01:17:00.590 - [Saad] Sorry, did you say that you sort of  
01:17:00.590 --> 01:17:02.894 talked to Langmuir himself?  
01:17:02.894 --> 01:17:05.050 - [David] We taught together.  
01:17:05.050 --> 01:17:06.360 - [Saad] Oh, you taught together, okay.  
01:17:06.360 --> 01:17:08.309 So you were professor at the age of 12, I guess.  
01:17:08.309 --> 01:17:09.844 (audience laughs)  
01:17:09.844 --> 01:17:12.235 (mumbling)  
01:17:12.235 --> 01:17:15.400 - [Jerry] Hi I'm Jerry Friedlander, School of  
Medicine,  
01:17:17.318 --> 01:17:19.602 School of Public Health.  
01:17:19.602 --> 01:17:23.287 So one of the real unusual characteristics of this  
01:17:23.287 --> 01:17:26.777 is how rapidly it's spread globally  
01:17:26.777 --> 01:17:30.129 and in a month's period of time this is (mumbles)  
01:17:30.129 --> 01:17:34.569 so many countries. It's very different (mumbles)  
precipice.  
01:17:34.569 --> 01:17:38.179 Unfortunate time in which this occurred  
01:17:38.179 --> 01:17:39.929 and people traveling.  
01:17:41.464 --> 01:17:44.790 So I wonder what we know about the response in  
other places?  
01:17:44.790 --> 01:17:48.299 We're most concerned about what happens here  
01:17:48.299 --> 01:17:50.540 in the US, but this is a global epidemic now,  
01:17:50.540 --> 01:17:53.297 of some magnitude that we don't really know.

01:17:53.297 --> 01:17:56.876 The response will be different in different places  
01:17:56.876 --> 01:17:58.443 and that's gonna have consequences actually  
01:17:58.443 --> 01:18:02.857 for the global nature of this and (mumbles)  
01:18:02.857 --> 01:18:03.690 and the future.  
01:18:03.690 --> 01:18:08.360 So is there any coordination, on an international level  
01:18:08.360 --> 01:18:09.797 at this point?  
01:18:09.797 --> 01:18:14.400 Can we, somehow or other, advocate for this  
01:18:14.400 --> 01:18:18.206 if it's not going on in a way that's actually functional  
01:18:18.206 --> 01:18:22.030 and important and the information coming from other  
01:18:22.030 --> 01:18:24.970 places will be very, very important in terms of what  
01:18:24.970 --> 01:18:27.320 we understand and how we can respond.  
01:18:27.320 --> 01:18:28.153 - Albert might-  
01:18:28.153 --> 01:18:28.986 - [Saad] Albert, you wanna?  
01:18:28.986 --> 01:18:29.819 (mumbling)  
01:18:29.819 --> 01:18:32.744 - [Albert] I think this is being videotaped.  
01:18:32.744 --> 01:18:35.740 (audience laughs)  
01:18:35.740 --> 01:18:38.840 So the politically correct answer is that, of course,  
01:18:38.840 --> 01:18:39.710 there is coordination,  
01:18:39.710 --> 01:18:42.107 and that coordination is being done by WHO,  
01:18:43.520 --> 01:18:46.270 on many different levels in terms of operating response,  
01:18:46.270 --> 01:18:49.670 in terms of training, capacity and so forth.  
01:18:49.670 --> 01:18:51.700 But we all know the situation with WHO  
01:18:52.710 --> 01:18:54.340 has been essentially neutered  
01:18:54.340 --> 01:18:58.090 because of the lack of multi-level funding.  
01:18:58.090 --> 01:19:01.727 Much of the funding is bilateral and which is really  
01:19:01.727 --> 01:19:06.727 incapacitated some effective responses and coordination.

01:19:07.090 --> 01:19:10.990 So I'm being a little harsh on that, but I think that is

01:19:10.990 --> 01:19:14.810 a gap and that's why we have this myriad of bilateral

01:19:14.810 --> 01:19:19.040 responses which are potentially not well-coordinated.

01:19:19.040 --> 01:19:21.970 And I think the concern and I'm just gonna jump on to,

01:19:21.970 --> 01:19:24.710 I think what Kai said, and others, is that

01:19:24.710 --> 01:19:29.710 I mean, this is I think we're still in the exponential phase

01:19:30.010 --> 01:19:32.900 of the epidemic in many of the cities

01:19:32.900 --> 01:19:35.567 of the 5 million people who left Wuhan before.

01:19:36.540 --> 01:19:39.460 We don't know the exact proportion of who's effected but

01:19:39.460 --> 01:19:42.470 I think it's fair to say, with regard to provinces,

01:19:42.470 --> 01:19:45.880 Shanghai and Guangdong are in the exponential phase.

01:19:45.880 --> 01:19:47.960 And that delay of models,

01:19:47.960 --> 01:19:49.180 which has been modeled three days,

01:19:49.180 --> 01:19:50.760 and maybe much longer,

01:19:50.760 --> 01:19:52.832 so I think we're in for the long-term.

01:19:52.832 --> 01:19:53.665 I think the big question is, is that

01:19:53.665 --> 01:19:57.370 in places that have weaker surveillance systems,

01:19:57.370 --> 01:20:00.450 I'm thinking about Southeast Asia, South Asia, maybe

01:20:00.450 --> 01:20:03.427 there's only three cases, but how many kits are available?

01:20:04.495 --> 01:20:07.786 And so the concern is we can go all the way

01:20:07.786 --> 01:20:10.523 back to the beginning of what Nate said,

01:20:10.523 --> 01:20:13.800 this is probably one of seven pandemics or so,

01:20:13.800 --> 01:20:18.140 of the coronavirus, it would be good to be optimistic

01:20:18.140 --> 01:20:20.650 it would be good to think that we can push this

01:20:20.650 --> 01:20:23.210 into a season that has low-transmission.

01:20:23.210 --> 01:20:27.547 But I think we have to tie it on this being, spreading

01:20:30.020 --> 01:20:32.550 and not necessarily peaking early.

01:20:32.550 --> 01:20:35.740 And I think we also have to plan on what's gonna happen

01:20:35.740 --> 01:20:39.130 in the most vulnerable populations around the world.

01:20:39.130 --> 01:20:41.481 And what happens when it gets there,

01:20:41.481 --> 01:20:43.645 and this is a case fatality rate, that may not be as high

01:20:43.645 --> 01:20:46.050 as MERS or SARS,

01:20:46.050 --> 01:20:48.200 but it's not going to be negligible either.

01:20:49.436 --> 01:20:51.069 - [Participant] It's going to be heterogenous

01:20:51.069 --> 01:20:53.307 in different parts of the world, seasonally.

01:20:54.574 --> 01:20:56.330 - [Lisa] So, I want to go back to a question that was asked

01:20:56.330 --> 01:21:00.320 earlier about the people going to, with mild infection,

01:21:00.320 --> 01:21:01.920 going to the hospital.

01:21:01.920 --> 01:21:04.780 And I think that a lot of that could be prevented

01:21:04.780 --> 01:21:08.490 if we had a very good sense of what the natural history

01:21:08.490 --> 01:21:10.465 of this disease was and what it looked like

01:21:10.465 --> 01:21:12.330 when it was bad.

01:21:12.330 --> 01:21:16.200 Like, does it start off mild and become bad?

01:21:16.200 --> 01:21:17.620 That's one disease pattern.

01:21:17.620 --> 01:21:20.300 Or does it start off bad and stay bad?

01:21:20.300 --> 01:21:22.557 If it starts off bad and stays bad,

01:21:22.557 --> 01:21:24.980 then if you got a mild case, then you shouldn't go

01:21:24.980 --> 01:21:26.290 to the hospital.

01:21:26.290 --> 01:21:29.990 But until we know what that is, until we can describe it

01:21:29.990 --> 01:21:33.110 and make that public, people, of course,  
01:21:33.110 --> 01:21:34.710 are going to go to the hospital  
01:21:34.710 --> 01:21:37.160 with even the mildest symptoms 'cause of course  
01:21:37.160 --> 01:21:38.680 they're worried.  
01:21:38.680 --> 01:21:41.250 And rightfully so perhaps,  
01:21:41.250 --> 01:21:44.010 but I think that's one of the pieces of information,  
01:21:44.010 --> 01:21:45.990 that we really need to get out to people.  
01:21:45.990 --> 01:21:49.850 Is what does it look like when it happens.  
01:21:49.850 --> 01:21:52.300 Like, is it bad all the time?  
01:21:52.300 --> 01:21:54.980 Or does it start off mild and get bad?  
01:21:54.980 --> 01:21:57.060 That's an important distinction.  
01:21:57.060 --> 01:21:58.360 - [Saad] So, in the interest of time,  
01:21:58.360 --> 01:22:00.315 I want to finish on time, I'll take only a couple of  
more  
01:22:00.315 --> 01:22:04.880 questions and there were a few questions on this  
side.  
01:22:04.880 --> 01:22:07.543 We spent some time on this side for awhile,  
01:22:08.397 --> 01:22:10.541 so you had a question for awhile  
01:22:10.541 --> 01:22:11.950 and then there was one more in there.  
01:22:11.950 --> 01:22:14.880 So unfortunately we will have to stop here  
01:22:14.880 --> 01:22:18.677 and I'll be happy to stay back and maybe others  
01:22:18.677 --> 01:22:20.529 will also stick around.  
01:22:20.529 --> 01:22:23.906 - Hi I'm (murmurs) from the department of inter-  
nal medicine  
01:22:23.906 --> 01:22:24.739 and herbology.  
01:22:24.739 --> 01:22:28.270 I was wondering, you mentioned seven of these  
corona viruses  
01:22:28.270 --> 01:22:30.523 some causing cold and yet some like SARS  
01:22:30.523 --> 01:22:34.380 with a lot of fatality do we know, biologically,  
01:22:34.380 --> 01:22:37.740 what is different about the SARS  
01:22:37.740 --> 01:22:39.780 versus the ones that cause colds  
01:22:41.410 --> 01:22:43.460 and causes this without fatality

01:22:45.597 --> 01:22:46.430 and can use that information

01:22:46.430 --> 01:22:49.160 when we're studying mutations in this current coronavirus

01:22:49.160 --> 01:22:54.160 to predict potentially what might be more of a problem?

01:22:56.444 --> 01:22:57.314 - [Saad] Start?

01:22:57.314 --> 01:23:01.010 - [Ellen] I can start, I can start on that one.

01:23:01.010 --> 01:23:05.570 Well, one interesting thing is there's a coronavirus,

01:23:05.570 --> 01:23:08.660 the corona viruses that circulate every year in New Haven

01:23:08.660 --> 01:23:11.230 and throughout the US, sometimes cause colds

01:23:11.230 --> 01:23:12.760 and they can cause serious illness,

01:23:12.760 --> 01:23:16.360 particularly in people who have other health conditions

01:23:16.360 --> 01:23:17.960 kind of like what we've seen a little bit

01:23:17.960 --> 01:23:19.113 with this virus too.

01:23:19.960 --> 01:23:23.209 As far as the receptor the virus uses to enter cells,

01:23:23.209 --> 01:23:26.290 this virus uses the same receptor as SARS

01:23:26.290 --> 01:23:28.500 and the same receptor as a different Coronavirus

01:23:28.500 --> 01:23:32.039 that causes colds, so that's not the key thing.

01:23:32.039 --> 01:23:36.539 With SARS there was some information about it suppressing

01:23:36.539 --> 01:23:40.010 the anti-viral response pretty well,

01:23:40.010 --> 01:23:42.080 which you can imagine would allow the virus

01:23:42.080 --> 01:23:46.060 to get to a higher level in the body.

01:23:46.060 --> 01:23:49.260 But as far as this virus, I really don't know.

01:23:49.260 --> 01:23:52.140 So it's interesting that people have studied already

01:23:53.020 --> 01:23:57.040 where those receptors are found, the receptor the virus

01:23:57.040 --> 01:24:00.524 uses to get into cells, they're in the upper airway,

01:24:00.524 --> 01:24:03.030 they're in the lower airway where the gas exchange occurs

01:24:03.030 --> 01:24:05.910 in the lung and also in other tissues of the body,

01:24:05.910 --> 01:24:07.920 like in the liver and the blood vessels  
01:24:07.920 --> 01:24:09.708 and things like that.  
01:24:09.708 --> 01:24:12.050 But I think there still needs to be more work  
01:24:12.050 --> 01:24:16.703 on the pathogenesis of this one to figure out exactly.  
01:24:17.700 --> 01:24:21.431 It's not totally clear, kind of getting back to something  
01:24:21.431 --> 01:24:24.230 that was said earlier is  
01:24:24.230 --> 01:24:26.586 at the beginning when a lot of people  
01:24:26.586 --> 01:24:30.510 who are presenting to a hospital are very, very sick,  
01:24:30.510 --> 01:24:33.900 a lot of those initial people were also people  
01:24:33.900 --> 01:24:35.380 with other medical conditions,  
01:24:35.380 --> 01:24:38.410 who you might expect to get ill.  
01:24:38.410 --> 01:24:41.870 More ill than somebody who's perfectly healthy and young.  
01:24:41.870 --> 01:24:45.020 So it's still not totally clear,  
01:24:45.020 --> 01:24:47.300 how that factors into the pathogenesis we're seeing  
01:24:47.300 --> 01:24:48.903 and the mortality rates too.  
01:24:51.590 --> 01:24:54.290 - [Nate] Really quick, so we can go to the next question.  
01:24:54.290 --> 01:24:56.303 So it does seem to be,  
01:24:56.303 --> 01:24:57.610 if the virus can use the ACE2 receptor,  
01:24:57.610 --> 01:24:59.213 it can infect humans, if it cannot use it,  
01:24:59.213 --> 01:25:01.550 then it can't infect humans.  
01:25:01.550 --> 01:25:02.740 That's one of the parts of it,  
01:25:02.740 --> 01:25:06.930 but whether this is gonna be SARS or a common cold?  
01:25:06.930 --> 01:25:10.040 We can't just look at the genome and sort of gaze at it yet.  
01:25:10.040 --> 01:25:12.220 We don't have the tools or enough data to say  
01:25:12.220 --> 01:25:15.593 how bad this is gonna be, that's not quite possible.  
01:25:17.410 --> 01:25:19.474 - [Saad] So there was another question from there

01:25:19.474 --> 01:25:20.859 or that has been answered by?  
01:25:20.859 --> 01:25:24.400 So I'll come to Evelyn and then I think we have,  
01:25:24.400 --> 01:25:26.730 I said two or one more, sort of  
01:25:26.730 --> 01:25:29.920 time for one more question, et cetera.  
01:25:29.920 --> 01:25:31.403 So Evelyn, do you want to?  
01:25:31.403 --> 01:25:34.580 - [Assistant] Michael can we do this question and then I-  
01:25:34.580 --> 01:25:35.550 - [Saad] Okay.  
01:25:35.550 --> 01:25:38.830 - [Evelyn] So I know China just finished building  
01:25:38.830 --> 01:25:42.500 a thousand person hospital isolation ward.  
01:25:42.500 --> 01:25:43.670 What do y'all think?  
01:25:43.670 --> 01:25:46.860 Is this an efficient way to contain the outbreak  
01:25:46.860 --> 01:25:47.930 or are we gonna end up  
01:25:47.930 --> 01:25:49.830 with more issues than we started with?  
01:25:51.290 --> 01:25:56.290 - [David] I'm curious about the construction and the quality  
01:25:56.530 --> 01:25:59.780 and the resources that go into that,  
01:25:59.780 --> 01:26:03.920 supplies that are available, what's the access?  
01:26:03.920 --> 01:26:08.107 Really don't have enough information about the specifics.  
01:26:08.107 --> 01:26:10.917 But I am gonna turn it over to Gregg, who does.  
01:26:12.135 --> 01:26:13.153 (audience laughs)  
01:26:13.153 --> 01:26:15.300 - [Gregg] No, but that's not the point, the point is that  
01:26:15.300 --> 01:26:19.210 we can't abandon our Chinese brothers and sisters  
01:26:19.210 --> 01:26:21.960 and say like, "Let 'em do what..."  
01:26:21.960 --> 01:26:24.260 The point is that the conditions of confinement  
01:26:24.260 --> 01:26:26.840 have to be clinically suitable  
01:26:26.840 --> 01:26:28.330 and meet human rights norms.  
01:26:28.330 --> 01:26:29.540 And if they're being dumped in a hospital  
01:26:29.540 --> 01:26:31.420 with poor infection control  
01:26:31.420 --> 01:26:33.840 and without sufficient clinical capacity

01:26:33.840 --> 01:26:36.151 to take care of people, it's not the right thing to do.

01:26:36.151 --> 01:26:38.690 We all have friends in China

01:26:38.690 --> 01:26:40.850 and we need information to get out

01:26:40.850 --> 01:26:43.577 so that people are taken care of both in their communities

01:26:43.577 --> 01:26:45.777 and in any facilities they might be sent to.

01:26:48.300 --> 01:26:50.067 - [Evelyn] Hi, Evelyn Shay from the School of Medicine

01:26:50.067 --> 01:26:51.630 and Public Health.

01:26:51.630 --> 01:26:55.290 I actually wanted to follow up on Jerry's question

01:26:55.290 --> 01:26:58.070 and hear from Albert, when you said there are myriad

01:26:58.070 --> 01:27:02.500 bi-lateral initiatives, is that countries with China?

01:27:02.500 --> 01:27:05.513 I'm curious to know sort of the degree to which

01:27:05.513 --> 01:27:09.200 there's a partnership with China,

01:27:09.200 --> 01:27:10.980 whether it's CDC or government

01:27:10.980 --> 01:27:13.913 and how effective that has been?

01:27:14.880 --> 01:27:19.880 How much are they doing this on their own domestically?

01:27:19.980 --> 01:27:24.422 How much is their engagement, it's a little bit hard to tell

01:27:24.422 --> 01:27:26.068 from the outside.

01:27:26.068 --> 01:27:27.180 (presenter chuckles)

01:27:27.180 --> 01:27:29.930 And I think this goes along with what Gregg was saying,

01:27:31.003 --> 01:27:34.003 to what degree is there-

01:27:38.590 --> 01:27:43.299 - [Albert] So I'd very much like Sten or David to answer

01:27:43.299 --> 01:27:44.510 this question.

01:27:44.510 --> 01:27:49.510 (presenter laughs) (audience laughs)

01:27:51.110 --> 01:27:55.336 - [Sten] My authority is my friends in China on WeChat.

01:27:55.336 --> 01:27:57.693 Who've been lighting up my phone all week.

01:27:58.690 --> 01:28:00.640 And it does seem like the Chinese  
01:28:00.640 --> 01:28:02.680 are pretty much on their own on this one.  
01:28:02.680 --> 01:28:05.580 There isn't any substantial international help  
01:28:05.580 --> 01:28:09.140 infrastructure in Hubei province in Wuhan city.  
01:28:11.061 --> 01:28:16.061 The US CDC has a presence in Beijing but I'm  
going to guess  
01:28:17.750 --> 01:28:20.820 that there isn't a coronavirus control expert in  
the group.  
01:28:20.820 --> 01:28:22.920 But they do have good, solid (murmurs),  
01:28:22.920 --> 01:28:26.920 just that it's not improbable that there's commu-  
nication  
01:28:26.920 --> 01:28:28.910 with the China CDC.  
01:28:28.910 --> 01:28:31.490 China's CDC's a pretty sophisticated operation.  
01:28:31.490 --> 01:28:36.270 They have a sort of a command center  
01:28:36.270 --> 01:28:39.760 for outbreak investigations some I visited that  
reminded me  
01:28:39.760 --> 01:28:43.210 of the CDC command center and was modeled  
after it.  
01:28:43.210 --> 01:28:47.063 And I am thinking that the Chinese  
01:28:47.063 --> 01:28:48.800 are largely tackling this on their own.  
01:28:48.800 --> 01:28:50.860 I have no evidence to the contrary  
01:28:50.860 --> 01:28:54.410 and my friends at WHO are not deeply engaged.  
01:28:54.410 --> 01:28:57.540 I know people high up in the state department  
01:28:57.540 --> 01:29:00.400 that I talk to and they're helping the Chinese,  
01:29:00.400 --> 01:29:03.810 but they're helping them from Geneva and from  
Atlanta.  
01:29:03.810 --> 01:29:06.810 So I think there's a lot of communication,  
01:29:06.810 --> 01:29:10.200 a lot of consultation, but on the ground,  
01:29:10.200 --> 01:29:12.060 the Chinese are handling this on their own.  
01:29:12.060 --> 01:29:13.910 I think that's fair to say.  
01:29:13.910 --> 01:29:14.880 - [Evelyn] Can I just...  
01:29:14.880 --> 01:29:16.261 - [Sten] Yeah.  
01:29:16.261 --> 01:29:18.493 - [Evelyn] Sorry just to follow-up,

01:29:21.519 --> 01:29:22.920 if this is helpful at all, but I was speaking,  
01:29:22.920 --> 01:29:23.997 I was in Beijing recently  
01:29:23.997 --> 01:29:26.880 and I was speaking to a documentary filmmaker  
01:29:28.854 --> 01:29:31.843 about a film she made about emerging epidemics  
01:29:31.843 --> 01:29:35.000 and she was focusing on the Ebola virus  
01:29:35.000 --> 01:29:40.000 but when she was in Africa she said that the best  
01:29:40.348 --> 01:29:45.348 makeshift hospital that she had encountered were  
the ones  
01:29:45.590 --> 01:29:49.740 built from China so I think that if that's reassuring  
01:29:50.790 --> 01:29:52.010 that's great infrastructure-wise  
01:29:52.010 --> 01:29:52.933 but I understand-  
01:29:54.540 --> 01:29:56.980 - [Sten] Just put things in perspective  
01:29:56.980 --> 01:30:00.780 and I think there's a lot of issues coming around  
01:30:00.780 --> 01:30:04.880 freedom of information and dissemination of in-  
formation.  
01:30:04.880 --> 01:30:05.890 As I said,  
01:30:05.890 --> 01:30:09.650 the Chinese CDC is a very sophisticated organi-  
zation  
01:30:09.650 --> 01:30:13.450 and once, and I think this is up to debate  
01:30:13.450 --> 01:30:14.850 and this is all speculation,  
01:30:14.850 --> 01:30:17.927 but once the outbreak was shown,  
01:30:17.927 --> 01:30:20.090 I mean it was identified.  
01:30:20.090 --> 01:30:25.090 And there are probably policy reasons why it  
wasn't  
01:30:26.784 --> 01:30:29.900 the early warning system didn't work  
01:30:29.900 --> 01:30:31.763 as it had worked with H7N9.  
01:30:33.168 --> 01:30:36.220 And they detected other emerging pathogens,  
01:30:36.220 --> 01:30:38.725 in the interim time between SARS and are very  
efficient,  
01:30:38.725 --> 01:30:41.490 why it didn't work now is unclear.  
01:30:41.490 --> 01:30:42.323 And that's something that  
01:30:42.323 --> 01:30:44.530 I think we really don't have a good answer,

01:30:44.530 --> 01:30:46.550 but once they had detected it, and once it went into

01:30:46.550 --> 01:30:49.360 the early warning, through IHR.

01:30:49.360 --> 01:30:52.900 They followed all IHR regulations very sophisticated

01:30:52.900 --> 01:30:53.808 responses, they sequenced the genome,

01:30:53.808 --> 01:30:56.879 they are now doing,

01:30:56.879 --> 01:31:01.560 many randomized controlled trials for treatments,

01:31:01.560 --> 01:31:03.740 many of those are probably gonna come out with information

01:31:03.740 --> 01:31:06.150 in the next one or two weeks about how to cure.

01:31:06.150 --> 01:31:10.593 So very sophisticated responses on many fronts.

01:31:11.940 --> 01:31:13.540 I think we have to just put this

01:31:14.465 --> 01:31:15.553 all kind of into perspective.

01:31:16.580 --> 01:31:19.800 - [Saad] Yeah, so I'll then wrap up, I wanna wrap up

01:31:19.800 --> 01:31:21.010 exactly at seven.

01:31:21.010 --> 01:31:22.330 I know there are other questions

01:31:22.330 --> 01:31:25.390 and that's an indication of the importance of the issue

01:31:25.390 --> 01:31:27.360 and the engagement so I'd be happy to stay back.

01:31:27.360 --> 01:31:32.360 I can't speak for other people, but I'd stay back

01:31:32.390 --> 01:31:34.881 if you have other questions, et cetera.

01:31:34.881 --> 01:31:39.020 But I don't want to wrap up as we wrap for seven on time,

01:31:39.020 --> 01:31:42.353 colleagues who put it together and helped to organize

01:31:42.353 --> 01:31:43.186 on a quick notice.

01:31:43.186 --> 01:31:46.040 I'm not going to be able to go through the full list,

01:31:46.040 --> 01:31:51.040 but specifically Ros and Alyssa and Mike Skonieczny and Jen

01:31:51.946 --> 01:31:56.946 and many others from different parts, and Colin and others

01:31:58.950 --> 01:32:01.690 from YSPH and YGH et cetera.  
01:32:01.690 --> 01:32:04.270 Who made this possible at a very short notice.  
01:32:04.270 --> 01:32:08.050 But I will wrap up, as I wrap up, I want you to remember  
01:32:08.050 --> 01:32:13.050 the intensity of response, mounted by health workers,  
01:32:13.169 --> 01:32:17.320 both clinical workers, but also public health workers  
01:32:17.320 --> 01:32:19.790 in China as we speak.  
01:32:19.790 --> 01:32:22.250 They keep all of us safe,  
01:32:22.250 --> 01:32:25.920 they have risen up to the challenge.  
01:32:25.920 --> 01:32:29.910 Set aside all the politics, individual health workers  
01:32:29.910 --> 01:32:33.230 and the health system, folks on the ground,  
01:32:33.230 --> 01:32:37.145 have responded, not just on behalf of their own community  
01:32:37.145 --> 01:32:39.780 but on behalf of us.  
01:32:39.780 --> 01:32:42.610 And if there was any doubt of the sacrifice,  
01:32:42.610 --> 01:32:45.170 we should remember one of the physicians  
01:32:45.170 --> 01:32:49.210 who was initial canary in the coal mine, passed away.  
01:32:49.210 --> 01:32:50.460 There are reports that he passed away.  
01:32:50.460 --> 01:32:52.910 There were mixed reports, but I think it's now confirmed,  
01:32:52.910 --> 01:32:54.570 that he passed away today.  
01:32:54.570 --> 01:32:57.950 On that somber note, we should also remember  
01:32:57.950 --> 01:33:02.950 that we are not helpless observers, we have self-efficacy,  
01:33:03.030 --> 01:33:07.680 both as humans and as compassionate beings  
01:33:07.680 --> 01:33:10.030 and as scientists, public health professionals-