



Presidential Commission
for the Study of Bioethical Issues

TRANSCRIPT

Amy Gutmann, Ph.D.
Commission Chair

James Wagner, Ph.D.
Commission Vice-Chair

Roundtable Discussion

Meeting 20, Session 5 and Closing Remarks
February 5-6, 2014
Washington, DC

SESSION 5: ROUNDTABLE DISCUSSION

DR. GUTMANN: Well, first of all, welcome back. By unanimous agreement among the commission, we had the best group of presenters today, bar none, so that means that our expectations are very high for this final panel.

I always ask one question and go down and ask you all to give one succinct answer to it, and then we'll open up.

The question today is, if there were one thing, one thing you think could be improved moving forward in the U.S. response to public health crises, a crisis like Ebola -- you can think of it, if you're historical, if you want to do it retroactively, one thing that could have been improved in the U.S. response to the current Ebola epidemic, what would it be, or one thing that can be improved in our preparedness for the next epidemic, what would it be, using Ebola as the example, and since, Bill, you gave us many, if there are one -- and I know there are more than one thing. I'm not asking for the magic bullet, because there are many people -- we are not asking for the magic bullet, but just focus us on one thing that you think is changeable moving forward and that you -- or that you would have thought could have been done better and wasn't.

DR. FOEGE: Helene said you called on me first because you're going from oldest to youngest. And now she is wondering where she comes in that list.

DR. GUTMANN: I called on you first because you have the most experience --

DR. FOEGE: That's a nicer way of saying it, yeah.

DR. GUTMANN: And have done extraordinarily well in using your experience.

So, thank you.

DR. FOEGE: For all of our criticism of WHO, there is no substitute, and so, in order to have a strong global response, if the U.S. could do a better job of helping WHO to strengthen, I think that would be important.

There was a time when we did that, and that was when CDC realized they would never have big resources, and they asked the question, how could we most improve global health, and the answer was to put some of our best managers into WHO, free, to be supervised by WHO, so that they're not Americans working at WHO, they're WHO workers.

And so, what happened, we had D.A. Henderson, 11 years, head of the small pox program at WHO, all that time paid for by CDC; Rafe Henderson, head of the expanded program of immunization, paid for by CDC; Mike Merson, head of diarrheal diseases and then HIV, paid for by CDC, down the line.

We never -- CDC and the United States never took credit for it, but Hofton Maller always said I can't thank you publicly but this has made the difference, because you're putting people here who have a place to go back to.

They can make tough decisions and lose their job and it doesn't matter.

We need to be doing that for WHO.

DR. GUTMANN: Thank you.

Helene.

DR. GAYLE: Well, mine was going to be somewhat similar, because I think setting up a global system beforehand.

DR. GUTMANN: A globally coordinated system.

DR. GAYLE: I think WHO is key to it, because you know, that is our World Health Organization, and they ought to be leading the charge, but it does mean having all the other pieces there.

It means having a system that links with in-country systems so that we have a response network that is in place, that along with continuing to build the health infrastructure so that, you know, at the country level, people have the wherewithal to withstand health emergencies, cause you know, that's what happens. A crumbling health system only crumbles more. So, I think it's the two together and thinking about these things in the long run, as opposed to episodically, and I think that's -- you know, if we could -- and it won't take a huge amount of money, but we all know that it will be less money in the end.

But it's how do we build out that system and how do we build that on the backs of building and strengthening health systems for the long haul?

DR. GUTMANN: Yeah. So, overcoming the profound amnesia by institution building.

Peter.

DR. HOTEZ: Can I say two things?

DR. GUTMANN: One.

DR. HOTEZ: Just one. Okay. I'll just bring it up later.

DR. GUTMANN: You can bring it up later, that's exactly right. Just bring up one thing now.

DR. HOTEZ: Okay. So, you know, throughout this whole outbreak in the United States of one person, maybe three, I always thought wouldn't it be nice to have an empowered and independent and well-spoken U.S. Surgeon General that could have

spoken to the public in a clear, concise way and been out there every day in a very measured way.

Somebody who is not micromanaged by the White House or micromanaged by other agencies could have been a game changer for us.

DR. GUTMANN: So, an independent Surgeon General.

DR. HOTEZ: Independent and empowered --

DR. GUTMANN: Empowered.

DR. HOTEZ: -- Surgeon General.

DR. GUTMANN: Okay. We'll have to ask what it would take to empower.

Chernor. I meant to start at this end and you were around the corner. You became a Commission member for a while. If I were empowered to appoint, I would appoint you.

MR. BAH: It's well over my head, I guess. Well, I thought you were actually going to do most experienced to least experienced, so I was happy to take my place here. I think I will build on the points I have made before. I think an investment in -- I've said this before -- in human capital -- I mean, I work in education. Education globally is under-funded by 26 billion every year. We know what it takes to get every kid into school around the world.

We've seen incredible progress, but we still have 58 million kids who are out of school, 250 million young men and women who cannot read and write a single sentence, and I think, at the end of the day, you can have the best response and public health system, but you have to build the public health systems on the backs of educated locals in these communities for these structures and systems to be viable.

As part of the crisis we're facing now, about 5 million kids across 3 countries are in danger of missing out a whole year of school, and that has not been factored into the -- most of the response that was seen.

As I've said before, it's been crisis-driven. We are not being strategic and responsive. So, I think that that important consideration, the intersection between education and health, as the viable means of a long time sustainable solution, I think, is absolutely critical.

DR. GUTMANN: Thank you.

Unni.

DR. KARUNAKARA: So, I want to take off from where you left off.

For a moment, you know, let's go back to Haiti in 2010, which was another big outbreak that was botched, the 2010 cholera outbreak. Again, the international community failed to come together.

So, I agree that, if you look at the global response mechanism, I think WHO is the best place to sort of build on capacities and to deliver, but there are structural problems.

So, in Haiti, the problem was in fighting between Geneva and D.C. and the unwillingness to cede control over who should lead the response mechanism, and that came to head in December 2010 when, finally, the Geneva team was able to come to Haiti and take over the response.

We had a good opportunity recently when the new head of the Afro program was being nominated, and it's only been two months since they appointed the new head of WHO Afro, but I think it's more of the same.

We lost an opportunity to talk about -- raise some very important questions on how these different WHO offices relate together and how they coordinate.

So, we can put, you know, D.A. Hendersons and Mike Mersons in Geneva, but there also has to be equal attention and a little bit of arm-twisting to make sure that, in times of emergencies, these WHOs can come together to respond to outbreaks.

DR. GUTMANN: Dorothy.

MS. ROBERTS: I'm going to use the strategy of one now --

DR. GUTMANN: Right. Don't feel that it has to be the same. I don't want to band wagon -- there can be different ones.

MS. ROBERTS: Right.

DR. GUTMANN: There is no magic bullet here.

MS. ROBERTS: Yes. So, I would say to stress in all messaging to the public the vital importance of structural factors, including inequities in health care both in the United States and globally, to the spread and prevention of disease.

I think that that is not only what will improve people's health the most, but also, it's the best way to challenge stereotypes and myths about disease. So that's what I'll focus on now.

DR. GUTMANN: Thank you.

Seema.

DR. YASMIN: We need to better incorporate communication strategies and health literacy into public health preparedness efforts.

We can't rush it, we can't botch it. During the epidemic we need to take that as seriously as we do surveillance, for example, make it a key part of public health preparedness.

DR. GUTMANN: Thank you. Thank you. That's a point we have not in the past focused on enough, and I think it's -- it runs through -- it's key if we're going to break down stereotypes, if we're going to actually educate when people are listening. So, thank you.

Howard. All these are excellent. And one focus is -- I like to not exempt us from all of the human psychology frailties, if you will. We all have them. I mean, we are just not capable of focusing on everything at once. Hence, the one thing.

Howard.

DR. MARKEL: I'll leave the global politics to Unni, but I'd like, given that we're serving under the President here --

DR. GUTMANN: Yes.

DR. MARKEL: Everyone needs a civics lesson of what states' rights allows and what the Federal Government can do. So, the CDC was lambasted in the early days of the Dallas event because they didn't come in there and save the day, without knowing that they have to be invited to do so, and states' rights really say that public health is in their own domain, and that dates back to the early 1800s when miasma theory ruled and the notion that epidemics would be local rather than national or global.

And so, I not only would prefer that the American people understand that but that our legislators understand that from the state to the Federal level and see how they could bring our public health laws up to date or at least up to the 1960s to know that these are national problems and the various advices that people have been giving could actually be implemented.

DR. GUTMANN: Kate.

DR. ARRAS: Could I follow up on that?

DR. GUTMANN: Not yet. We're going to go down because there will be many – you will be able to. Just not yet. Just hold it. Yes, Kate.

MS. HURLEY: Mine is totally operational, boots on the ground kind of strategy.

It would be nice if you had a cadre of health care workers -- for instance, I went over with the World Health Organization -- that sort of have some sort of relationship with the World Health Organization such that, if they need to be deployed subsequently, that there's some sort of relationship there such that I am not negotiating with my employment to go and do this again, much like you do with the reservists.

I think that would really keep a cadre of people available to go out and do this work quickly.

DR. GUTMANN: Another important point. Thank you very much.

Oretha.

MS. BESTMAN-YATES: The U.S. response. One of the things I realized -- and I think the U.S. need to do -- from the beginning of the Ebola outbreak -- the first outbreak took place in December 2013. It was an African issue then, until Eric Duncan came to Texas and died.

Then everybody got involved. It became a global issue. And we need to actually try to get to the root of it before it spread, because we saved a lot of lives in those countries with the kind of help that went in later on, after Eric came to Texas and died.

DR. GUTMANN: Thank you. Another important point.

Trish.

DR. HENWOOD: Thanks.

So, from my perspective, I think it all comes down to education.

I think the focus -- the early focus on health system strengthening in these contexts and the idea that you're capacity building during this, you know, working with the International Medical Corps -- we were working with only 50 ex-pats to 500 local staff, right, the idea being that we're actually building capacity in the setting of this emergency response, and I think more focus on that local capacity building and then having, actually, the ability then to have local epidemiologists and actual other training to be able to manage this on their own the next time this might happen.

I can't underscore the importance -- and the work that I do, you know, in east Africa, at the baseline, on actually building capacity so it exists locally, so we don't have to always kind of import international expertise for this.

DR. GUTMANN: Right. Building capacity. And I have everybody. So I will start with John and then go to Christine, Nelson, over to Raju, Dan, and Barbara, and you can keep that order in mind, and then everyone else who I haven't heard from.

DR. ARRAS: So Howard, you can't hide. I just wanted to follow up on your comment about the need to bring the public health infrastructure up to date, you know, in terms of the laws and regulations vis-a-vis Federal authority.

So, I just wanted to push that a little bit farther. Like, what, in particular, would you recommend? I mean, like CDC, as far as I know, can't really make legally binding rules, for example. Do you think they should be able to do that?

DR. MARKEL: There actually has been a law on the books, beginning in 1893, with the National Quarantine Act that Benjamin Harrison signed, that in the event of a contagious crisis, he could impose a quarantine.

He could only impose longer than the individual state. He could not supersede what the state did, but he could make it longer.

And then there have been various iterations of that, but they have always bowed down to the states' primacy.

And I think the time is long since gone and the country is far smaller in terms of how you get from one place to the other not to have either presidential authority or the CDC in concert with the president making those calls of when to call in the Feds or those who are more qualified to come into a particular crisis situation and handle it.

Right now, they have to be invited. So, when that happened in the early days of Dallas, I can't tell you how many people I heard from -- it was that the CDC blew it. They dropped the ball.

No matter how many times you explain to them that, no, they -- once they got invited in, things actually did rather well, and in fact, the evidence that they did rather well is that Mr. Duncan and the two nurses who were taking care of him were the only people who got it in Dallas.

The system worked beautifully, really, but that negative concept seemed to prevail.

DR. GUTMANN: Seema wants to say something on this.

DR. YASMIN: It was fascinating to me that Americans didn't know that the CDC could not helicopter in to an epidemic.

I was asked that when I was -- by Anderson Cooper, I think, on CNN one day. He knew the answer, but he knew that a lot of the public did not know, and I only knew, as a British person, because I had worked for the CDC as an EIS officer.

We couldn't just turn up without a formal letter of invitation, but again, it speaks to the idea that it was great that suddenly the world was focused on public health.

I loved it cause I'm obsessed with public health, but we haven't done a good job of educating the public how the public health system works here.

DR. MARKEL: Well the public schools haven't either. Civics or government used to be an essential part of your high school education. And that's where you would learn that concept. And we don't teach that anymore.

DR. ARRAS: Yeah, I'm remembering Hurricane Katrina, right, and a lot of people just naturally thought that the CDC would come in and start doing stuff, but there was a lot of delay because of that need for an invitation.

DR. GUTMANN: Peter, on this?

DR. HOTEZ: I think the CDC was called in pretty early. I was on Governor Perry's task force, and the CDC was called in, and the state and local health departments did an excellent job containing the outbreak in Dallas. The big problem and one that's still very murky in my mind is what was the set of events that happened that allowed Mr. Duncan to be taken care of in an acute care hospital, actually a very good acute care hospital, as opposed to going to Emory or going to Montana or going to -- and that was the mistake, to think that any acute care hospital could -- every acute care hospital should be able to identify and triage an Ebola patient, potential Ebola patient, but not every acute care hospital should be expected to manage a patient in the ICU.

So, I think, ultimately, it was a mistake to manage that patient in the ICU at Texas Presbyterian. I actually think it was a mistake to manage that patient in the ICU at Bellevue Hospital. I don't think that should have been done either when that happened, for reasons which we can discuss.

DR. GUTMANN: Christine.

DR. GRADY: First I want to just make a quick statement, so it's public, in response to Unni's comment in the last session about heroes. I want to say that I think that -- I agree with you that doctors and nurses have a responsibility to take care of patients, and in many settings around the world, every day, they do hard work.

That doesn't mean they're heroes, and that's not what we should expect from people, but people who do that kind of work should not be treated as pariahs. What they do should be respected. They shouldn't be subject to penalties when they come back from working in difficult circumstances. So, that's an important statement.

DR. GUTMANN: They shouldn't be subjected to unnecessary restrictions.

DR. GRADY: Unnecessary restrictions or any kind of penalties that don't make sense. I think we agree, but I wanted to make sure that, publicly, that was stated.

But I do have a question, because I notice that none of the people from our first panel are here. So, one of the things that we've spent the day talking about a little bit this morning and that we've talked about in this group and that has been in the news is the question of research in this context.

And so, I wonder if -- and I don't know who wants to address it, but how important do you think research is in this context, how urgent you think it is, and whether or not there is a negative that we should be thinking about.

DR. GUTMANN: I know Trish is actively involved in that, so you may want to say something about the overlap between the interest in therapeutic care and research, because without research, we are not going to make progress on this.

DR. HENWOOD: Yeah, exactly. I think that it's obviously complicated for humanitarian organizations that might not be used to having a research arm to try and

incorporate that in the course of this, but I think, particularly considering the scale of this, it's really important.

You know, I'm doing some analysis looking at the association of our patients' viral load with their outcomes, right, and if we look back in the data, the PCR for this, for Ebola, only started being used in, you know, around 2000 or so, the real-time PCR, in 2004-2005.

So, if you just think about the fact that if we did not have real-time PCR to actually diagnose these patients, to be able to move patients from our suspect ward to be discharged, the patients that are negative, right, because of the nosocomial risk of transmission on an Ebola ward when you're a suspect patient, if we're very busy and cohorting patients, that's huge.

So, our ability to actually get that test, you know, within a day, hopefully, if we had lab capacity nearby, if you think about situations earlier, right, where it might take days of travel for that test to go and then that test days to run -- so, I think when we think about, you know, storage of bio-specimens and other issues like this, it's so important for us to be doing that ahead of time, right, so that when this happened, we actually had the ability to get a test result to send it to our Navy lab a mile away and get a result in three hours and get that patient out of the ward before they're contracting Ebola on our ward.

So, I think that's just one example to kind of underscore the importance of actually looking at that and trying to think about novel ways -- you know, like I was very frustrated by the sudden death of several patients and not understanding, you know, what was happening, and our limited lab capacity, and was able to procure an ultrasound and then actually started seeing a lot of interesting things

pathophysiologically that, you know, a lot of people were saying, oh, it's not going to make any difference, you know, it's going to be just for sort of academic purposes, but you know, I was seeing findings that actually were changing our management in real time.

So, I think that the -- the importance of thinking about novel approaches and then also doing research in terms of, as quickly as we can, trying to figure out, especially in the context of this ongoing epidemic, right, are there things that we can be doing better.

You know, earlier, in the first research conversation, I think it was very interesting for me, thinking of best supportive care, right, and we still don't know what that is, and the levels of care and the protocols at different Ebola treatment units across the region are totally variable right now in terms of people that are doing standard anti-malarial treatment, people that are doing standard oral antibiotics, standard IV antibiotics, standard IV fluids.

So, there is no standard in terms of what the best supportive care is.

I think that we'll probably see, as outcomes improve in some of the centers that have the most aggressive supportive care, including IV antibiotics at the beginning, IV fluids, and all of these empiric treatments, are seeming to have better outcomes, right?

So, that's probably going to become the standard, but it's not the standard right now.

So, I think looking and analyzing what's going on as fast as we can is really important.

DR. GUTMANN: Helene.

DR. GAYLE: Just to add to that, I think research is critically important.

I think, in situations like this, we have to ask ourselves what's the right balance and research for what purpose and who is it being directed towards and who is going to benefit from it, and I think, with those caveats, research is incredibly important and that we think broadly about what research -- and your comments alluded to a whole array of types of research, and we tend to think, let's go get a vaccine, let's develop therapeutics, and there's a whole range of research, from operational research to behavioral research, and I think have that balance and again, you know, making sure that it is for the benefit of the people who are bearing the brunt of it and that we think as much about -- particularly in the area of new tools development -- think as much about getting the answer as making sure that, once we get the answer, those tools are available to the people who need it the most.

DR. GUTMANN: Trish and Helene said something that underscores a theme we've had in the past but we really need to bring to bear here. We need research on what works taking human psychology into account to have people be able to trust medical treatments, effective medical treatments.

So, there needs to be behavioral research here, as well as medical research, and I think a number of comments have strongly reinforced that -- we have to know what works in particular communities to enable health care workers to succeed with those populations and be accepted by them.

We can't go in just with medical findings. Somebody once said to me, it's not what you teach, it's what they learn. It's not the, you know -- the medical technology and knowledge you have. It's how well it works on the ground in saving lives.

So, we need to find that out, too.

DR. HENWOOD: Yeah. I think -- I can't underscore the importance of the psycho-social team that we were working with. I think that their job was as important or more important than my job medically, right?

It was not complex medical decision-making. It was kind of do as much as we can with what we have, but our psycho-social team, you know, running this ambulance service, we always had a psycho-social counselor with us to come into the village to do education as we were getting the patients, decontaminating their homes, and then be able to contact the families, let them know, update them, follow up with them, us inviting them if the patient was actually to pass away for burial, and sort of all of those psycho-social factors actually led a lot more patients to actually present to RETUs and things like that.

So, I think that it's so, so, so important in the context, in particular, of this type of epidemic, that there's a focus --

DR. GUTMANN: We need some research that underlines best practices.

Unni gave an example which I love, because the last thing you said in the previous panel, you had -- you changed to a procedure that was literally transparent, right, that members of the family and community could see in to what was happening, which takes some of the mythology out of it, and to have some research rather than only stories, research about what actually works, would be extremely helpful.

DR. KARUNAKARA: That measure came out of sending an anthropologist for a few months to understand health seeking behavior among those communities.

That's why we were able to sort of take that step. So, there's a lot of work that needs to be done.

DR. MARKEL: This came up in Federal discussions for bird flu in 2005 and again for H1N1 in 2009. Are there an established set of ethical criteria for doing research during an epidemic or any other type of crisis?

And to my knowledge, that has not been elaborated in a very clear and transparent way, and that would help enormously, as well as having special fast track IRBs that could go through all this. So, that's my question to you.

DR. GUTMANN: So, we have actually anticipated this earlier on in our deliberations, in talking about it, but we are, in this report -- we want to focus not only on what you can do during a crisis but what we can do in preparation for a crisis, one of which is to figure out what the protocols are during a crisis, which -- so, Nelson, I want to get through everybody in the queue. I just need to keep it going, but we can come back. Nelson.

COL. NELSON: I'll queue you up, don't worry. I feel your pain brother. So what I was going to say first and foremost, and I'm looking at you Seema, is that the community engagement plan that a lot of us talk about is still what I worried about from the beginning, about doing intervention research in the context of this epidemic -- and my group is doing those kinds of studies right now in east Africa, as well as west Africa -- we've been working there for a very, very, very long time.

I have people that literally have lived in Uganda for 20-plus years, married to Ugandan nationals. So, it's about as good a knit with the community as you can imagine.

But I live and breathe by a communications plan. If you don't do that right, nothing works. You'll never be able to do that science well. Whatever answer you get, no one is going to trust.

So, I think, even those hard core scientists like myself tend to sometimes push that stuff away. Scientific programs in this part of the world and, frankly, in our own communities will live and die based on the strength of communication plans and community engagement.

The second comment I wanted to make is that one of the officers that, a long time ago, I saved his life, because he was going to go into cardiology, but I was his attending on internal medicine for two weeks. So, he went and did infectious disease, thank goodness.

Now, he's a Navy commander, infectious disease guy, seconded to the World Health Organization, just in the model that you described. He's one -- you know, a one-off person.

When these epidemics began to become apparent, he was sent in succession, in three quick deployments, to each of these countries, and in Nigeria, when he arrived, he was the only physician in the country that had any experience with Ebola.

He was the first guy that walked into the hospital at Lagos. He took care of the physician that passed away, unfortunately, but he was really the lead when Nigerian docs and nurses saw that this expertise was -- was there, was there to support -- I mean, he took great risk, obviously, personally, but because of his leading by example, the Nigerian health care system had an exemplar of somebody that was willing to take risk, was not one of their own citizens, and it was really highly enabling.

So, this is, I think -- again, we don't do a lot of support. We send one person every couple of years to the World Health Organization. We don't send dozens.

So, I just, you know, look back historically to what was probably a much richer period of time and there was much more engagement along these lines with WHO.

We have one of my people there right now that's been seconded to help with Ebola vaccines, because we're an HIV vaccine program. So, I really think that's a critical thing that we could recommend going forward.

The last point I want to make, since I was actually raised by a public health service officer who, at age 37, became an admiral -- I was just a major by the same age, so my dad is pretty amazing, but I watched the transition of the Public Health Service's top officer being the Surgeon General being from the person that actually led the commissioned corps, had line authority -- I'm the Army officer, so I can speak freely about those guys.

But we still have that in all the services. My surgeon general is my boss, and up the chain of command, she tells me what to do, and it's not the case in the Public Health Service. That person is more of a bully pulpit kind of individual, and I really think that -- you're talking about a reserve corps that could be sent -- it's the Public Health Service.

I mean, that's what their mission could be. Their flag is yellow. It's quarantine yellow. It's the Marine Hospital Service from 1798.

DR. GUTMANN: There is a recommendation.

COL. NELSON: So, I mean, I think that's something -- I will tell you that, if you could professionalize, from top to bottom, the United States Public Health Service commissioned corps, I think you would be on the right track.

DR. GUTMANN: Here, here. That's really worth our running with or marching to, as the case may be.

Peter, I'm going to recognize you now. I just wanted to keep the flow going.

DR. HOTEZ: Thank you. I just wanted to make one additional comment about the research piece.

I think Helene nicely gave the full spectrum of research activities, but with regard to new tools, I mean it was a tragedy that we did not have those two Ebola vaccines stockpiled and ready to roll for this epidemic, and so, we have to address what we're going to do about vaccines and other products for which there's total market failure.

Again, the science behind these vaccines was available a decade ago, and it just sat there while waiting for industry to pick it up.

The problem is you can't go -- I don't think you can go back to the NIH and set aside yet more money for something new. I mean, the budget has been flat for over a decade.

We need a new revenue source to develop these products, and what I've proposed is if we could set aside 1 to 2 percent of the Global Health Initiative through State Department USAID for new products, that would do it, at least a good start.

It would put 100 to 200 million new dollars into the system for that purpose.

DR. GUTMANN: Seema, on Nelson's question and comment on communications, having a communications plan.

DR. YASMIN: Really important. I was so glad to hear that.

I actually wanted to comment on the second point about Nigeria. Nigeria had 20 cases of Ebola, right? But they were able to stop the chain of transmission before it went further, and it's because Nigeria has an epidemic intelligence service of sorts.

It's called the FELTP, the Field Epidemiology and Laboratory Training Program. There are a few of these around the world, and I spoke to an officer there who said,

when Ebola came, we were kind of ready. We were working on polio, and so, we just switched hats.

We took off our polio hats, we put on Ebola hats, and we got to work. We knew how to do contact tracing, we knew how to do surveillance. We were kind of ready. We were trained.

We need more of those.

DR. GUTMANN: Bill said something earlier about we don't pay attention to budgets. So, I just want to say, we all believe in communications, but there is a science to communication, too.

There is evidence about what communications are counterproductive and what are productive. To give you an example, the early ads which everybody was against smoking were in favor of -- the early ads to stop smoking actually increased the amount of smokers among youth, because it didn't come to grips with the fact that if you simply show people that a lot of other people are doing something dangerous, they think, oh, well, then, there are a lot of other people doing this, it can't be that bad.

So, we do need to fund good research that shows us what works in communication on the ground in cases of Ebola, and we have some now, a case study, to actually do it. So go ahead now, you were going to answer the other question.

DR. YASMIN: Public health communication, especially during a time of crisis, is complicated. It's psychology, it's sociology, it's medicine, it's all of those things. It's communicating fear to an already, you know, panicked audience.

You could do a Ph.D. in it, and the University of Texas at Austin does an entire program within their communications school that is just public health communication.

So, again, I'm so happy to hear that you all work with that kind of framework, and that's a key component of your public health preparedness plan, but it's not for every agency and it's for everyone who's preparing.

I think it's often overlooked as an additional thing, that we'll just figure that out during the epidemic, but there's a science to it.

DR. GUTMANN: Raju, you're on.

DR. KUCHERLAPATI: I was struck by a comment that Howard and Unni made during their presentations.

Howard, you said that, you know, despite, you know, all of these epidemics that we had over the 200 years, that we haven't learned anything. Maybe not so stark but something similar.

And specifically with regard to Ebola, Unni said that, you know, we had an epidemic and we had experience with it, but we haven't learned anything from that.

But obviously, you know, in each of these cases, everything is unique, the way of -- you know, what the agent is, how it gets transmitted, you know, what the incidence -- everything is different, right? So, we can't really predict what the next epidemic is going to be.

So, the question is, can we truly prepare for something that we don't know, and you know, if we're truly successful in preventing something, obviously we'd never recognize it, right?

It's only in cases where we actually have an epidemic of this nature that we have, that we have this conversation.

So, I mean, when I listened to all of the conversations today, I certain kinds of things that you could do, but the question is, can you truly be able to prevent or be able to have a kind of robust response that, you know, we would like to have had?

DR. KARUNAKARA: You're absolutely right. So, let's just set aside this particular very freaky, freak Ebola epidemic, because this is just unlike any other in the past.

If you look at it, it's very hard to predict where the next Ebola outbreak will be. So, in the past 20 years, we had a division of labor. So, outbreak is announced. The government is in charge, usually, of community relations, you know, all of the movement restrictions, all the communications.

CDC comes and does the lab work, all of that. Most often than not, it's MSF and the local doctors who do the case management.

Now, this was okay, this work, because the case loads were small, but this one, it just completely sort of exploded, and then what happened -- all of these agencies had their capacity stretched, right?

MSF couldn't take on more, and the fact that -- because national governments and also internationally there's a lot of abdication of responsibility.

So, it was left to agencies like MSF to do case management. When a big outbreak happened, there was very little capacity. New agencies going into Ebola had to learn, and it's not just about doctors and physicians, the logistics involved in setting up an Ebola ward is just amazing.

So, research -- we do a lot of research in the organization.

So, for outbreaks, what we do is we have generic research protocols that are pre-approved that we can -- so, we have our own -- where we have pre-approved research protocols that we can apply in terms of emergency, so that we don't lose time.

So, there are certain things that we do to do things faster.

DR. GUTMANN: Let me just say, before you go on to the next point. While everybody agrees that nobody could have predicted when the next Ebola epidemic happened, the experts in the field, Peter Piot, for example, said with great scientific background and certainty, it will happen sometime again, and when it happens in an urban setting, it will not be contained, and we have to do things to prepare to contain it, even though we cannot possibly predict where and when.

DR. KARUNAKARA: Exactly.

DR. GUTMANN: It's just the epidemiology of this disease was ripe for, you know, an epidemic.

DR. KARUNAKARA: So, the question is, where do you actually situate the response capacity.

DR. GUTMANN: Yes.

DR. KARUNAKARA: So, they had an outbreak in Congo, in Congo Brazzaville, in 2002 and 2003, exactly 12 months later.

So, we said, okay, we have to build capacity here. We have to kind of -- for the next time it happens, the local responders should be able to do it. Huge capacity-building program. Trained a lot of people. Left a lot of materials there.

The next outbreak was in 2008-2009. By that time, everything had expired.

All of the materials had -- you know, so we also have to have a capacity situated at the right place with the ability to replenish materials, the ability to kind of provide -- and the people who were trained were not the people in charge in 2008.

So, these are things to worry about.

DR. GUTMANN: Helene.

DR. GAYLE: Picking up on what both Peter and Nelson were saying, you know, I think one of the real challenges, also, is that there is no clear authority for who is in charge of global health within the government, and you know, we saw it played out with this epidemic, and we've seen it played out again and again. There is clearly not a whole of government approach.

You've got USAID feeling that it should have primacy. There is the CDC feeling that it has a certain role. There's NIH that feels it has a certain role.

I'm not being critical of any of the organizations, but I think it is very clear that, within the government, there is not a clear sense of who is in charge of global health and a global health response, and so, it gets back to this having a system in place, and you know, whether it is the Surgeon General and commissioned officers, of which I was one for 20 years, you know, and know the capacity they have, but there isn't, there just isn't, and I think as long as we keep -- you know, and there was a huge amount of jockeying, who was going to be the one who called the shots and all the rest of it, and we just -- we lost a lot of time, because there is no clear authority.

So, it's another thing, you know, I think that, from the standpoint of the Commission making a recommendation, that once and for all, let's just say, you know, who is in charge of global health.

Is it the international agency or is it the domestic agency that has health that we now think is a global concern and be very clear on where the authority lies.

DR. GUTMANN: Or if there is a division of labor, what it is.

DR. GAYLE: Yeah, but still, I think that there needs to be somebody who is ultimately accountable and in charge.

There is going to be a division of labor, cause I think there's a different role for a development agency, I think there's a different role for a health agency, but as long as it's not clear who actually is accountable.

DR. GUTMANN: The reason I say that is I don't think the U.S. Government will ever say hand over -- I mean, ever in my -- you know, in the next decade -- hand over sovereignty -- you know, basically say we just cede sovereignty in public health emergencies to WHO or --

DR. GAYLE: I think WHO has a different role.

DR. GUTMANN: Right.

DR. GAYLE: I'm thinking just within the U.S. Government itself.

DR. GUTMANN: I misunderstood you.

DR. GAYLE: WHO for the world should be the global leader, but within the U.S. Government, we shouldn't have to -- every time we have a global health crisis --

DR. GUTMANN: point fingers and wonder, and I think each one has a different role to play. A development agency has a role to play.

But just call it. Who is the one who's going to be in charge and accountable?

DR. GUTMANN: Bill.

DR. FOEGE: Let me give a positive spin on things, because the question has come up, what has improved. So many things have improved. I mean, I mentioned the measles example, small pox example.

Meningitis. I mean, just in the last few years, suddenly we have a private and corporate reunion to develop a vaccine for 50 cents a dose. It's changing everything west Africa. Lots of things have changed.

It's also changed that --

DR. GUTMANN: Very important for us to point those things out.

DR. FOEGE: Fifteen years ago, global health was not an important subject in colleges and universities. Fifty years ago, I couldn't find three people in my school that were interested in it.

Now it is the consuming passion of students every place.

DR. GUTMANN: I can testify to that, it really is.

DR. FOEGE: So, that has changed, and in addition to that, what's changed is the research in global health, because 15 years ago, there really wasn't a career.

If you wanted to do research in global health, where were you going to get the funding?

I think this changed when Rockefeller Foundation put \$10 million into AIDS vaccine research. GAVI was founded; Seth Berkley became the head of that.

The Gates Foundation said, if that is that important to Rockefeller, we'll put in \$100 million. Then the critics came and said you'll dry up the research funding for everyone else if you put that in. A person at NIH who was in charge of this told me, and said he will always deny it, that they then had a meeting at NIH to say we can't afford

for outside people to come up with the vaccine, what do we have to do to take a lead in this, and they started getting more money, more people.

So, everything was improved by having an outside group, foundations, putting money in.

Finally, to Helene's point, she's absolutely right. We know if we have a health problem in this country, ultimately it's the Secretary of HHS that is held accountable. Doesn't matter how many other groups, military -- it doesn't matter.

We should do the same thing globally and it should be the same person. That just makes sense.

DR. GUTMANN: Terrific. Howard.

DR. MARKEL: A really important point that has not come up and that is the biology of each of these microbes is quite different, and that, on top of all the other unknowns of human society, really does make things very difficult for predictive value.

For example, nobody predicted Ebola, and nobody would have put several hundred million dollars in the budget in 2013.

Similarly, when we had the 2009 flu, it came from Mexico. We were all looking at Asia.

That said, if you look at what has happened since 2000 -- I don't mean to be that negative at all -- including the bioterrorism movement and Homeland Security, the bird flu, and then the 2009 planning, all the way to Ebola, with the containment centers, the four different containment centers that you mentioned, which were not for Ebola originally, all of those were pieces that were there.

So, instead of making a bespoke suit, we are getting a decent off-the-rack suit. It doesn't fit all sizes, but it can be altered and arranged for the situation.

So, I think that's a huge positive that's gone on in the last 15 years or so.

DR. GUTMANN: These isolation units, which started with the four that CDC had, you know, worked with -- at University of Pennsylvania, we now have two isolation units, and I think there are 45 all together.

They're not only for Ebola but for other highly contagious diseases which we don't yet, you know, have normal ways of treating, and that's going to serve us very well moving forward, because whether the patient should have stayed at Dallas or not, the patient has to enter into a local -- you know, there's an emergency, you get to a local unit, and the more there are these centers which have some isolation units, the better.

So, there is some progress that we can build on.

DR. WAGNER: Those are success stories, having had that general purpose infrastructure, rather sophisticated infrastructure in that sense, but don't forget Seema's comments about what happened in Nigeria.

They were not preparing for Ebola but were able to remobilize, redirect what they were doing around polio, to great effect.

DR. GUTMANN: To great effect, and that's terrific. And we move onto Dan.

DR. SULMASY: I'm going to take us back to research and placebo controlled trials again from this morning, and even though that panel is gone, I'll give all of you an opportunity to weigh in on it.

It seems to me that -- as I was sort of listening to the discussion, the desiderata are these, that we first wanted -- a lot of people were saying we wanted the best scientific information we could and we wanted to get it efficiently, good scientific public health goals, largely utilitarian in structure, and good in and of themselves.

But we also heard some things about wanting to be respectful of the population affected and to do community engagement, some things about being respectful of the people who volunteer for the trial and their own dignity, and then cognizant in some ways, I think, of the desperation of the people who will enroll in this because of the high case fatality rate and the sort of demand for access that that kind of disease pushes, and those are sort of non-utilitarian concerns, right?

And we want to try to get a design that would do that, and you know, we sort of vaguely were saying we'll be flexible about some kind of, you know, adaptive trial design, but one slide of Nancy Kass' flashed by maybe too quickly of adaptive trial design number one. I don't know if any of you remember seeing that.

Which says that, right, we should -- one way to do this that might in some ways split the difference would be to start with something -- like the first 40 people all get the drug.

It's like a quick phase one, where you can find out whether it's highly toxic or if it is the homerun, right, that it's quite efficacious, and then -- but if you don't, right, if neither of those two things happens, then you could go on, and you're still in a position of equipoise, to the kind of more standard adaptive randomization design with a placebo.

Now, it passed by, we didn't talk about that specifically, but it seems to me that that might actually be a good way of balancing the sort of concerns for efficiency against the sort of demands for access to the drug, and I was just wondering what people thought about that.

Did that slide sort of not come to our attention?

DR. GUTMANN: Nelson?

COL. NELSON: So, I'll make a comment on the vaccine side, then I think we can look to our esteemed colleagues to make comment, because one thing that wasn't in the presentations other than either a randomized control trial -- and that design is just -- you know, it's a flavor of an RCT.

You simply have more than one experimental arm versus a common placebo.

So, just -- I mean, I wouldn't put that up as the apotheosis of clinical trials, I mean -- and like I said earlier, getting everyone to agree to get all the products that could be tested on the starting line at the same time is virtually impossible.

This is a really remarkable situation that's happening in Liberia, but there is another way to do it, and it's called the step wedge approach, where there's no placebo, and there are going to be certain cases where groups, you know, target populations will say I will not accept the placebo, full stop, just quit talking about it, I mean, and I think those situations will probably occur.

In that case, what you could do -- we're all under some threat of something bad happening -- you guys over there, you four, get the first treatment, and then, about a month later, you guys get it, and then, a month later, we get it, and finally, all you folks get it.

Now, what you see is, during the period of time in which you may be protected by -- I'm talking again about a vaccine -- all the rest of us are at risk without the vaccine, and so, you then can compare the attack rates, assuming that we're all at some constant degree of risk over time.

So, all these kinds of studies are being discussed. As a matter of fact, in Sierra Leone, this is exactly what the CDC is thinking about in terms of testing the chimp ad 3 Ebola vaccine, one of the two that's going to be tested in Liberia, against each other.

So, I think there are lots of ways to go, but I think the primacy of how the community would uptake that science needs to be thought through very carefully, as you said.

DR. GUTMANN: Raju.

DR. KUCHERLAPATI: That's exactly the way things are done. I mean, you know, nobody starts with a placebo at phase one. Phase ones are toxicity studies, and that's exactly what you do.

In the past, you know, you could do either healthy volunteers or take patients, and in a case like this, you'd take patients and be able to see, and usually they're small numbers, you know, 20 or so, but you know, 30 or 40 is not, you know, unusual, and certainly in other instances, you know, the results around those things are so fantastic that the FDA sometimes approves the drug.

The most recent example, three months ago, there was a cancer drug that was approved on phase one data, because the results were such blowout results, you know, for that.

So, what you suggested is actually the most appropriate way to do that, and you don't need to worry about this placebo controlled trials.

DR. SULMASY: That's terrific, cause it seemed to me that part of what we were hearing was go straight into this adaptive trial with this sort of first phase which could give this opportunity for people to have access and meet some of those demands while also giving an opportunity for the homerun or the terrible thing to be weeded out that, you know, is more harmful.

DR. GUTMANN: Christine.

DR. GRADY: I think that part of the reason that there's confusion is that there are different drugs in the pipeline, and some of the drugs in the pipeline have been tested in other populations or other -- for other indications.

And so, for those studies, for those drugs, excuse me, the need for a phase one safety trial is less, because you already have safety data in another population.

DR. GUTMANN: That's precisely right. It was not an example that was a test case against whether to do Nancy's first phase.

It was one that you don't need to do the first, because you have drugs that are -- and you have competing drugs that you want to -- you know, you want to test.

DR. GRADY: I think the other, I lost the other thing.

DR. WAGNER: Nancy was suggesting, in those cases, should we consider another phase one, so to speak, and that's what you were picking up on, Dan.

DR. GUTMANN: If the facts present themselves so that the drug needs that early phase, it can be done, ethically.

Helene.

DR. GAYLE: On that, in a different life, when I thought a lot about trial and trial designs, you know, I think it is very easy to talk yourself in and out of lots of different trial designs.

And so, you know -- and I think, ultimately, there is -- you know, there are both scientific as well as societal things to balance, but I think, for me, anyway, the guiding issue is always who are you involving in the design, when are they involved and engaged, and how are you making sure that those issues around communication and community engagement and ultimately what you're going to do with the information once it's done helps tremendously.

And I think where we've made the biggest mistakes in doing trials has not been because the trial design couldn't be justified but it was because we didn't have engagement of affected communities up front.

And so, I just think that, you know, has to be key to it, and you know, earlier I think you made the comment, Bill, about science being neutral but scientists not, or something of that sort, and I think we have to keep reminding ourselves -- we always think about science as this greatly neutral endeavor, and it just isn't.

We all bring to it our own biases, we all bring to it our own perspectives, and if we're not honestly -- if we don't honestly believe that affected populations have something to offer us in the design of trials, then I think we end up losing out.

DR. GUTMANN: Amen. Barbara.

DR. ATKINSON: My first couple of questions were already asked, but I would like to know -- I'm concerned about the public science non-awareness or distrust, and I wondered if there was any recommendation that you would have about how this Ebola epidemic, sort of, could inform people in better ways about the science piece of it. Is there something we could say as part of our report or suggest as part of our report that would help the public actually recognize that science was important and should be taken seriously?

DR. GUTMANN: Seema.

DR. YASMIN: I think that what I mentioned earlier about building on health literacy as a long-term process as part of preparedness, not just curing the panic, so that we build up that communication, we build up that knowledge base, and we're not just trying to play catch-up during the actual epidemic when people are so scared that they're not absorbing the information.

We did learn that in trying to debunk some of the myths, people dug deeper into their conspiracy theories and would come back to us with more and more of what they deemed evidence that the science was wrong or that scientists were being dishonest and holding back certain information.

So perhaps just realizing that it takes time and the consistent and repetitive messaging is key, and consistency, my gosh, is really important. It was difficult when there was inconsistent messaging from some media outlets or from some public health agencies. Counteracting that took a long time.

DR. GUTMANN: Yes, Peter.

DR. HOTEZ: That's a great question. I am reminded of a study Research America did a couple of years back where they found that 70 percent of Americans could not name a living scientist, and a significant percentage of Americans believe that Albert Einstein is still active.

Sixty percent of Americans cannot name an institution where biomedical research is conducted. Only 9 percent of American ever heard of the NIH. Nobody heard of the University of Pennsylvania. Nobody heard of Emory University as a place where biomedical research gets conducted.

They did mention the Mayo Clinic. Mayo Clinic came up pretty high.

And I've turned that around and said, you know, that's partly our fault as scientists, because the scientists -- what do we do? We focus on our grants to write the papers, to get the grants to write the papers, to get the grants to write the papers, and the idea that a young scientist or a mid-career scientist is going to engage in social media, is going to be out there in the public, it's not in our culture, and now it's coming back to haunt us.

It happened with Ebola. It's happening with measles.

We need a mechanism to train a cadre of young mid-career scientists who are going to actively engage the public, creating civic scientists, and there are some mechanisms which we can talk about that I've thought about and written about.

DR. GUTMANN: Dorothy.

MS. ROBERTS: I think that these recommendations are very, very important to improve the communication with the public, but I also think that the reason why, as I was stating in my remarks, the public disbelieves certain scientific evidence and even the way in which scientific evidence is produced and communicated is affected by prior assumptions that are so deeply embedded that they overwhelm the evidence right in front of you.

You know, so we have to also deal with those prior assumptions about race, about gender, about poverty, these biological explanations for inequality, and get that on the table and figure out how to do it.

It's difficult, but I'm just saying that has to be -- it's not just lack of information. It's that the information is interpreted according to these prior frameworks that are so powerful, and it's not just the public who is ignorant about it.

We have politicians who are stating things that are just false, for political reasons.

Now, whether they believe them or not, I don't know.

So, the politics affects it, and I also have to say that scientists also -- as Helene was saying, scientists also are affected.

I gave the example of the crack baby stereotype, and in my remarks, I blamed the media, but the media often were quoting doctors and nurses who were describing how

crack deprived black women of maternal instinct. That was a quote, sorry, from a nurse who said that in, I think, the Wall Street Journal -- I can't remember what -- a major newspaper.

Now, of course, it was then doctors and nurses and medical researchers who debunked that myth.

DR. GUTMANN: There are doctors who still say that homosexuality is a disease, certified doctors. So, this knows no socioeconomic bound --

MS. ROBERTS: Right.

DR. GUTMANN: Part of what you're saying is we have -- we have to be willing to criticize politicians who pander to prejudice, right?

There is no doubt -- there has been no doubt from the beginning that the President of the United States of America was born in the United States, and I use this as an example, because it's the clearest case of, you know, denial of the fact, and there is as much evidence as you could have for that as anybody skeptical could -- and yet, there are still people who will deny it for whatever reasons, but certainly one has to say that, to deny it means that you are -- you are demonstrating racial prejudice.

There is no other reason to deny this. If you're denying it for political reasons, you're pandering to racial prejudice.

So, we have to be willing -- there are times when people deny the facts, and there are times when you just have to call them out for it and then move on, right?

I mean, we can't -- in the case of Ebola and measles, you can't hold up -- this is, I think, the point of our commission. You can't hold up the progress of protecting health, in this country and around the world, by prejudice.

MS. ROBERTS: I agree.

DR. GAYLE: On the issue of trust and communication, a couple of additional points.

One, I think that people have to be willing to state what is but also be comfortable with stating what isn't or what they don't know, and I think one of the mistakes in the messaging around Ebola was, at some points, people went beyond what was known and stated unequivocally things that we just didn't know, and it is a natural tendency, particularly if you are a government official, to want to over-reassure, and I think it leads to mistrust, when, in fact, you can't always state unequivocally.

So, I think, you know, be very, very clear over and over again about the things we know but then stop at the things that we don't know.

I think who the messenger is is also very important, and I think that it is important that we have different people giving different messages, and you know, when it is -- particularly communities where there is a longstanding history of mistrust and you don't see somebody who looks like you who is giving the message, it's only going to feed into the mistrust, and you know, I think it is, finally, the issue of conspiracy theories continue not just because of lack of information.

They continue because people have those conspiracies reconfirmed by their reality.

So, that's a long-term issue to deal with, but I think recognizing that people believe conspiracies because they then have things in their day-to-day reality that reinforce those, and we shouldn't, you know, neglect that that's a reality. It's not that people -- you know, we can't just wipe it clean and pretend that it doesn't exist.

DR. GUTMANN: Absolutely, Bill.

DR. FOEGE: Could I bring up a subject that has not come up, and that is that when you look at the last 30 years, we've had, on average, one new disease problem, unexpected, per year, but the -- I mean, it includes green monkey disease and Lassa fever and Legionnaire's disease.

But the interesting thing is the vast majority of those have included an animal someplace in the lifecycle, and we don't actually deal with that except on an ad hoc basis with each problem, and the CDC, WHO -- they don't do ongoing animal surveillance.

They do it for rabies and specific things, but I wonder if that shouldn't be included in your recommendation.

I know of only one place in the world -- maybe that's changed -- where there's a biological class four lab for animals and one for humans in the same city, and that's in Winnipeg, and not because anyone planned for it. It was two people had strong interest.

DR. GUTMANN: So, we, at the University of Pennsylvania happen to have a school of veterinary medicine which is very actively involved -- does really cutting edge research.

In fact, the first veterinarian ever to win the National Medal of Science is Ralph Brinster, who does really important genomic research, but we also -- schools of veterinary medicine also do research on the transmission of human diseases through animals.

As my dean always reminds me, we are animals, and so, making sure that the research into deadly diseases that are transmitted through animals is robust is important.

Any final questions from a Commission member?

Steve, do you have anything you would like -- anyone?

Raju and John.

DR. KUCHERLAPATI: So, it's a comment and question for both the Commission members and our guests, and that's the following, and with regard to, you know, the clinical trials that we talked about.

Obviously, in cases like this, you cannot conduct the clinical trials before there are patients, and so, when the patients come in, now we have to hustle.

So, the question that I wanted to ask everybody is that, you know, so we're talking about whether the ethical principles that govern, whatever measures that we take, before -- or when there is no epidemic -- are different than the ones that we have when we actually have an epidemic of the nature that we have.

DR. GUTMANN: Ethical principles do not change.

DR. KUCHERLAPATI: I'm not so sure. I'll give an example.

Bill talked about the fact -- how clinical trials should be conducted and the most ethical way to do that is to be able to do a placebo controlled trial like the ones we talked about, and we had a discussion and said that may not be the most appropriate thing to do.

So, those are two different things.

Now, they may be subtle distinctions, but they are nevertheless distinctions.

DR. GUTMANN: The most appropriate thing to do is the principle, that is you can specify what the principle is, which would equal the most appropriate thing to do, and then, it may be different in the context -- the principle doesn't change, but what the application of the principle is changes just like the application of a principle changes with the facts on the ground.

But the principles of how you -- what you have to take into account -- nobody -- let me just put it this way. For evidence-based, nobody has given an example of how the principle -- nobody has made the case for changing principles in the case of an epidemic.

And in the case just for the facts, we were not as nimble and able to start trials as we might have been had some of the recommendations that have been put forward today been taken proactively.

So, starting the trials now, which is better than not having them, is not as good as we could have done had we been more prepared when there were even more cases on the ground.

John.

DR. ARRAS: I just want to pick up on a comment that Helene made at the end regarding the difficulty of public health communication and the difficulty -- you know, the risk of excessive reassurance of the public about various facts on the ground.

I mean, I've just seen too many depressing television interviews with scientists and physicians where the reporter has the microphone up to them and says, well, can you then assure us that -- you know -- then, you know, as a responsible physician or researcher, the person will say, well, I mean, as far as we know, you know, or you know, as far as science -- you know, as far as, you know, the research results tell us, I'm reasonably certain that, you know, dot, dot, dot.

And at that point, I can just imagine half of the television audience going, oh my god, you know, it is going to happen, it is true.

So, this gets to Seema's field, right?

So, how do you convey that sense of honesty and being true to science? You know, like how much can be expected, you know, without -- you know, without stepping over the line and promising more than you can, and then having everybody --

DR. GUTMANN: Can you assure me that going to a bowling alley, going bowling with my bowling league, which -- footnote, Bob Putnam says nobody bowls anymore on bowling leagues. Okay. Going bowling, I will not contract Ebola?

DR. YASMIN: Well, as far as I know. [Laughter].

DR. MARKEL: Are you sharing the lane with Craig Spencer or not?

DR. YASMIN: Communicating uncertainty is difficult, but you kind of answered the question yourself when you talked about honesty, and as Helene mentioned, if you overstep that mark and you say more than what is certain, you've done yourself some damage there, because you lose any trust that you may have built up with the audience.

So, there are unknowns in science, and we have to be clear that there are unknowns, but you can strongly communicate what we do know, and I think that's where the consistency, the repeated messaging -- that's where it comes in.

DR. ARRAS: I think this is where your theme of health literacy comes in, right?

Because you don't want the public to expect more than can be delivered, and you don't want them to take an expression of honesty about, you know, the gap in our knowledge to be an alarmist, you know, confession that Amy is going to get Ebola by going bowling.

DR. GAYLE: What they really want to know is can they go bowling, and then we try to answer everything on the face of the earth. They just want to know can they go bowling?

DR. GUTMANN: You take far greater risks in your life than going bowling, and there is no evidence whatsoever that Ebola is transmitted other than by -- and you have to emphatic, but be honestly emphatic.

Steve.

DR. HAUSER: We also spoke this morning about the speculation by experts, and sometimes, at least in the Ebola situation, that was something that took me back, people who are very good virologists, and so, the question is, going back to the amnesia point and the, you know, distraction of the media point for today's news story, given that we have at least more information about the sequence of this epidemic now than we did in the fall, are there opportunities to revisit what happened then, for a learning moment for all of us that could be conveyed?

How can we make that case to people?

DR. MARKEL: I'm afraid they won't pay attention.

But you know, it's not just virologists making these remarkable speculations. What we haven't brought up are popular cultural references such as best-selling books.

So, no one mentioned *The Hot Zone*, and yet that spent 80 or 90 or whatever weeks as number one on the New York Times best-seller list, and I no longer assign it to my students, because it's so disgusting, you know, but the notion of this guy melting while he's sitting on an airplane is very powerful stuff.

A similar example would have been a book about the history of the 1918 flu epidemic, which historians have just ripped it to shreds, because there are so many incorrect comments and so many speculations of what the flu virus may or may not be that don't even match our biological knowledge, and yet, those things have intercalated themselves into the common discourse not just among people at their book clubs or the

bowling alleys, but I've heard them at conferences like this or at the Institute of Medicine or at the CDC, because we try to keep an open mind and so on.

So, it's very hard, once that gets out into the zeitgeist to actually pull that thing back in. It's like toothpaste coming out of the tube.

DR. GUTMANN: Well, you have -- Chernor, I will let you have the last word.

MR. BAH: I found it really fascinating to hear you talk about communication challenges when you're dealing with a population where you have more than a reasonable amount of people who are illiterate and then you're dealing with, as well, you know, access to media. You talk about the use of social media in Sierra Leone.

My challenge was how to even get people basic radio drama pieces. We had to put them in these little USB sticks and take them into communities and try to play them on Chinese-made radios that we play out of solar panels, because there's no electricity, and people don't have money for batteries.

But on the question of the tension between facts which you know and which you may or may not know, once thing that has not been raised here, particularly, is, as well, the viability of the Ebola virus in male semen up to certain points after -- I mean, again, I'm by no way a scientist, but I know that this has been part of the question that we've been struggling with, as well, in our communities.

When I was in Sierra Leone, there was a male who was saying that he was so worried about this, he felt that men were supposed to be quarantined even when they had been certified as, you know, cured of Ebola and they should be kept out of their communities, because one, they don't have any incentive, because they're not going to get the infection anymore, and you know, the power structures and lack of education,

and now they have a paper that says you're well, you're fine, you can come back into your community. So, that happens.

I mean, I was wondering whether there was any definite knowledge on that.

DR. WAGNER: I think that is one of the areas of new research, right, these so-called immune-privileged reservoirs, semen, ocular fluid, and some others. Maybe that's how I could wrap up.

Today was not only fascinating for me but it actually built on an optimism that the Ebola virus disease gives us an opportunity, it seems to me, to advance medical research, to understand better behavioral and bias issues, to be developing tools of education and communications, as well as imagining operational structures, both global leadership structures and local fundamental infrastructure.

We may have a real exciting moment in history right now, because there are still some people paying attention to this, and you folks have just helped fuel that optimism.

Those would be my closing comments.

DR. GUTMANN: Nelson, did you want to say something?

COL. NELSON: This is a very small technical point. I think, you know, you were talking, Trish, about the exciting promises of the chain reaction and PCR. The problem with these semen analyses is that no one knows what PCR positivity means in terms of actually be infectious.

So, you can pick up five or six RNA molecules in semen. Number one, you don't know if those are even intact RNA molecules. You just know there's a really teeny little pieces of the virus that they can amplify are there. There is really a dis-link between the biological and medical significance of that and the ability to detect RNA.

So, I think there's still a lot of work to be done, but you know, Seema's job of trying to communicate that kind of complexity -- I am glad you are around, because I don't know how you could explain that to the general populace, but it is intense.

DR. GUTMANN: I'm going to wrap up with a couple of just important messages out there. Anyone listening on a web cast, anyone in the audience, write us with anymore comments. Submit your comments on our website, bioethics.gov.

Number two, we are reconvening tomorrow morning where we are going to deliberate as a commission our recommendations, and I think the staff knows we have some that have just come up. So, if you could formulate some of them, including to know where the authority is in the U.S. Government, so we're prepared with a understanding at least internally of where decisions are made, that was a very -- there are many other things that came out today that we already had thought of, but that was -- and we'll refine on the basis of this discussion.

But you've been enormously generous with your time, enormously helpful to us, and I think, by extension, to President Obama, and we all feel privileged, actually, to have this opportunity to do what we can in public service for public health.

So, with that, I just want to close by saying thank you.

(Applause.)