

**DEPARTMENT OF HEALTH AND HUMAN SERVICES  
CENTERS FOR DISEASE CONTROL AND PREVENTION  
Centers for Disease Control and Prevention /  
Agency for Toxic Substances and Disease Registry**



**Joint Meeting of the  
Ethics Subcommittee of the  
Advisory Committee to the Director, CDC  
and the  
CDC Public Health Ethics Committee  
September 24, 2009**

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**Minutes**

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**JOINT MEETING OF THE  
ETHICS SUBCOMMITTEE OF THE  
ADVISORY COMMITTEE TO THE DIRECTOR, CDC  
AND THE  
CDC PUBLIC HEALTH ETHICS COMMITTEE  
September 24, 2009**

**Meeting held by Conference Call**

**Minutes of the Meeting**

**Welcome, Introductions, and Roll Call**

**Robert Hood, PhD  
Chair, Ethics Subcommittee**

At 10:33 a.m., Robert Hood called the Joint Meeting of the Ethics Subcommittee of the Advisory Committee to the Director, Centers for Disease Control and Prevention (CDC) and CDC's Public Health Ethics Committee (PHEC), to order. He reviewed the meeting agenda and stated that the purpose of the meeting was to review, discuss and vote on the ventilator guidance document. Dr. Hood asked Ethics Subcommittee members to declare any conflicts of interest. No conflicts of interest were declared.

A list of attendees is included as Attachment 1.

**Information and Discussion: Report on  
September Advisory Committee to the Director Meeting**

**Robert Hood, PhD, Chair, Ethics Subcommittee**

Dr. Hood noted that the two guidance documents developed by the Ethics Subcommittee on use of travel restriction tools were reviewed and unanimously approved, without changes by the Advisory Committee to the Director of CDC (ACD) during its September 1, 2009 meeting. These documents have been forwarded to the CDC committee management office, who will coordinate getting them through HHS.

## Information and Discussion: Establishing Priorities for the Ethics Subcommittee

### **Tanja Popovic, Chief Science Officer, Centers for Disease Control and Prevention**

Tanja Popovic addressed the group regarding new developments taking place within CDC. The new director, Dr. Frieden, has put in place a process called “Organizational Improvement” through which he is making substantial changes to the structure and leadership of CDC. He announced last week that there will be several new offices within CDC, including an office for support for state and local health authorities and an office for epidemiology, surveillance, and laboratory services. There will no longer be Coordinating Centers. Instead, there will be five Deputy Directors for different areas of CDC. Dr. Frieden is also establishing four new Associate Director positions for policy, communications, program, and science. His goal is to have CDC effectively functioning in the new organizational structure by January 2010.

Dr. Popovic pointed out that part of the reason for not having a full day meeting and for postponing Ethics Subcommittee work on social determinants of health and health reform was because Dr. Frieden felt that it was very important for him to focus on the urgent H1N1 influenza –related activities and organizational improvement activities that include putting into place some new units, and having some new leadership positions competed before charging the Ethics Subcommittee with any new long-term projects. Dr. Popovic stressed that it was certainly not lack of interest or lack of support for the committee, but that the reorganization and the H1N1 influenza response was absorbing all of Dr. Frieden’s time. Dr. Frieden has appointed a number of acting leaders. He has appointed Peter Briss to serve as Acting Associate Director for Science – the key scientific leadership role. Dr. Popovic reported that she has been asked to stay and work closely with Dr. Briss on agency’s scientific priorities.

In closing, Dr. Popovic assured the Ethics Subcommittee members that they would be given a more specific charge by the February 2010 meeting. She commended the group for being one of the most passionate, productive, and dedicated groups and stressed CDC’s deepest appreciation for their work.

Dr. Hood thanked Dr. Popovic for her support and for valuing the Ethics Subcommittee’s work as useful and of high interest.

## Review and Discussion of Ventilator Allocation Guidance

### **Bernard Lo, MD, Ethics Subcommittee Member Robert Hood, PhD, Chair, Ethics Subcommittee**

Dr. Hood acknowledged the work of the Ventilator Guidance Workgroup which includes two members of the Ethics Subcommittee (Bernard Lo and Robert Hood), members of PHEC and others at CDC, and two former members of the Ethics Subcommittee have have been serving as consultants (Kathy Kinlaw and Robert Levine).

Bernard Lo clarified the goals of the guidance and stated that the workgroup was trying to set out the reasons for and against different ethical principles that might be considered for decisions about allocation of ventilators during a severe pandemic influenza. He pointed out that the workgroup did not try to make an argument for a particular set of principles, but instead attempted to indicate that some principles that might be considered were unacceptable and should be excluded. They also did not want to try to recommend standards of care or model policies, but rather tried to provide background guidance to state officials who actually have the authority to draw up public health regulations.

This document represents the third in a series of documents that this subcommittee has produced, these include “*Public Guidance for Public Health Emergency Preparedness and Response*,” a 200-page document for which John Arras and Bruce Jennings took the lead. The guidance deals with the broad topic of the ethics of public health emergency preparedness and response. The other guidance, “*Ethical Guidance for Pandemic Influenza*” on which Kathy Kinlaw and Robert Levine took the lead in drafting, is focused on ethical issues for pandemic influenza.

The current document was intended to narrow the topic even further to the specific issue of allocation of ventilators during a severe pandemic influenza. The workgroup has drawn and built upon the first two documents. Their goal was to highlight areas where guidance for allocation of ventilators differed from the guidance on allocation of vaccines and antiviral medications addressed in the first pandemic guidance. Dr. Lo noted that an Institute of Medicine (IOM) Report entitled “*Guidance for Establishing Crisis Standards of Care for Use in Disaster Situations*,” would soon be published as well. Dr. Lo noted that this document would have considerable influence and should be read in parallel with the CDC documents. Drue Barrett noted that the “Standards of Care” document was released by IOM earlier in the morning and would be forwarded to everyone following the conference call.

Dr. Lo provided an overview of the ventilator guidance. He noted that to focus the workgroup’s task, they made a number of assumptions, including the assumption that the guidance would be applicable only in a severe pandemic with a dire scarcity of ventilators, ICU beds, critical care nurses, and respiratory therapists, and that surge capacity in a hospital or in a geographical area has already been exhausted. Therefore, all of the efforts that one would make to avert the need for allocation decisions have already been done.

Dr. Lo stressed that there were several background points that were essential in trying to understand the document. The allocation of ventilators is different from the allocation of influenza vaccine or antiviral drugs for several reasons. One reason is that the allocation of ventilators is more directly linked to grave consequences. Patients with respiratory failure, who have a medical need for mechanical ventilation, will die if they do not receive it. Secondly, one person can be sustained on a mechanical ventilator for many weeks despite a prognosis that he or she may not survive hospitalization. This would deprive many other patients who have a medical need for a ventilator, who are expected to survive, and would utilize the ventilator for only a few days. Third, because of the grave consequences, the workgroup believes that any variation in allocation policies from one hospital to another within a city, or even from city to city within a small geographical area, would impact the public’s perception of fairness and trust, and would call into question the public health effort.

The workgroup tried to make several main points: 1) to clarify and highlight the differences between the allocation of ventilators during routine clinical practice and during a public health emergency; 2) to analyze guiding ethical principles; 3) to establish the need for a systematic

triage system for prioritizing patients such that decisions about who will receive a ventilator will not be left to individual treating physicians; 4) to include other issues that do not directly pertain to allocation of ventilators, but come into play during a severe pandemic with regard to critical care (e.g., obligations of health care workers to provide services despite some personal risk to themselves, the obligation to provide supportive care to those patients with ventilatory failure who do not receive mechanical ventilation); and finally 5) to consider ethical issues relating to withdrawing patients from mechanical ventilation when their condition deteriorates so that a ventilator can be allocated to someone with a far better prognosis.

Dr. Lo noted that Norman Daniels had circulated an email with specific suggestions about modifying and extending the discussion of the principles. Dr. Daniels suggested that the document should address the tension between maximizing outcomes for the total society versus providing a large amount of people a fair opportunity even though the overall benefit to society might be somewhat diminished. Dr. Lo found the comments to be thoughtful, and suggested that the group try to incorporate them, calling upon Dr. Daniels to provide specifics on how the group could modify those parts of the report. Dr. Hood thanked Dr. Lo for his presentation and requested that the Ethics Subcommittee members begin with their questions and comments, followed by comments from PHEC members.

### **Discussion Points**

Ronald Bayer found that the document was unclear about what level of the system was being addressed. For example, if there are several hospitals in a city, and some of them have reached capacity and some have not, what is the relationship between those hospitals in terms of allocating scarce ventilators? How will ventilators in the non-public sector be used? There is no attention to the question of whether efforts will be made to redistribute resources from those who have greater access to life saving interventions to those who have less access. He wondered whether the resources of ventilators under this schema were to be “socialized” and in what geographical region ventilators were open to all who needed them, or if there would be separate systems within the private/non-private sectors.

Ruth Gaare Bernheim indicated that in Virginia, she has been involved at the local and state level of these types of discussions. Not only is it a system issue, but it is also a question of who generates the sense of responsibility and authority to bring these questions to the forefront in terms of civic or public engagement.

Dr. Hood responded that one of the challenges in developing the guidance is the fact that local public health systems throughout the country vary widely. Some states have centralized emergency response systems. Other states’ emergency response systems vary from county to county from jurisdiction to jurisdiction. Some public health agencies have responsibilities to coordinate with hospitals.

Dr. Daniels emphasized that as many resources are in private hands, what is most important is public/private coordination. He questions whether government public health officials can seize private assets during public health emergencies,

Deborah Levy, responded that once supplies are released from the Strategic National Stockpile they become assets of the state. The state is free to make decision on how to best distribute the supplies. They may hold them for later distribution or push them out to the local level or healthcare facilities.

Dr. Bayer thought that if they were going to speak about the notion of equity in allocation, it had to be on a region wide basis. Especially in the context of an emergency, it did not seem reasonable or fair to apply a system only to public hospitals, while excluding private hospitals. He believed that the ethical guidance must be directed to the highest responsible level of public health governance for a region.

Regarding equity and justice, Dr. Hood pointed out that on page 13, they recommend that institutions within a region adopt uniform criteria. Trying to make that expectation clear to the medical community and the public in advance of a pandemic helps to create a common framework and establish a community standard of care. This section may not fully address the questions, but it could be a start.

Dr. Levy added that the states have also received funding from HHS to purchase ventilators. Some have taken advantage of this funding and have stockpiled ventilators. CDC has also funded eight states and one metropolitan area to assess their ability to deliver essential health care services during an emergency, including an assessment of what services they would cut and/or potentially withhold. The nine grantees have examined ethical issues and legal considerations, and have been considering a regional approach, not only within a locality, but also within the state.

Dr. Lo noted that the HHS document on vaccine allocation spends a lot of time discussing the importance of allowing individual businesses to stockpile vaccine for their employees, and how businesses should be encouraged to do this. The committee should clearly distinguish how stockpiling ventilators and keeping them out of the public pool would not be acceptable; whereas, it has been considered acceptable for private purchase for vaccine supply.

Dr. Barrett reviewed options for moving forward with the ventilator guidance document. She pointed out that the Subcommittee could vote to approve the document under conditions that the workgroup address the issues raised during today's call. If the Subcommittee wanted to review the changes before voting to approve, then another meeting of the Ethics Subcommittee would need to be scheduled. In order to allow time to post a meeting announcement, the earliest that another meeting could be held would be October 15. The goal is to finalize the document in time to have it reviewed by the ACD at their October 29<sup>th</sup> meeting. If they miss the October 29<sup>th</sup> meeting, ADC is not currently scheduled to meet again until April 2010.

Dr. Bayer did not believe he heard any resistance from the workgroup to raising the issue of region-wide equity as part of this framework, which would affect all medical institutions in possession of ventilators. If there was disagreement, it needed to be stated. Dr. Lo's distinction between vaccine and ventilators in this regard suggested that they may all be in agreement.

Leslie Wolf noted that since some of that language was already in the document, it simply needed to be raised a little higher. She reminded everyone that Dr. Hood pointed out the language on page 13.

Ruth Gaare Bernheim affirmed Ms. Wolf's comments and supports the notion that the language was all there, but needed to be reemphasized or moved around. For instance, on page 14, the last lines of the first paragraph states, "In general, state and local health departments are strongly encouraged to work with hospitals." To this she suggested adding, "in health care systems by region . . ."

Dr. Daniels offered the following illustration: Suppose the principle that one wanted to implement in the region was “save as many lives as possible” and it took the form of the use of ventilators only for people most likely to recover. There is still a problem of whether people who fit that description will have equitable access to the machines. Coordinating how the machines are put into use is something that would fall to local coordination. Dr. Daniels offered the following illustration: Suppose people are being rated for probability of survival on a scale of 1-10, and suppose X number of people score a 9 with access to a ventilator. Another group of people score a 7 with access to a ventilator. Is it fair to ask people with a 7 to give up all chances of survival in favor of someone who has a somewhat better chance of survival? It is not obvious why people with a 70% chance of survival should give up all chance of survival in order for someone with 90% chance of survival to have access to the machine. It might be the maximizing outcome, but it raises issues of fairness. ,

Dr. Levine indicated that he would argue that having a lower probability on a reliable battery of probability scores would be a morally relevant distinction that justified giving the machines to those with the higher probability score.

Dr. Daniels clarified that he was not saying it was not morally relevant. He was reflecting there are strong philosophical arguments that it is unfair to someone with worst chances to ask them to give up all of their chances to someone who simply has a better chance.

Given that fairness did not equal maximization, Kathy Kinlaw wondered what criteria might be proposed to operationalize fairness as a construct.

Dr. Daniels responded fairness has many dimensions, and that there is no simple metric for saying something is fair or more fair than something else.

Dr. Bayer suggested thinking about this at the population level rather than at the individual level. Framing the question as, “Is it fair to ask someone who has a 70% chance of survival to give up that chance to someone who has a 90% chance of survival” was very different than framing it as, “If we do this we know we can save X lives overall.” The issue is not whether it is fair to an individual to ask him/her to give up a respirator to someone else, but how to best save lives on a population level.

Jennifer Ruger indicated that her interpretation of the document was that it was best to incorporate multiple principles by using an algorithm or index that would incorporate weight a number of different issues.

Leonard Ortmann pointed out that Dr. Daniels did not specify the algorithm, but if one were trying to balance the notion of fairness in the sense of having a chance at survival versus the other criteria of maximization of best outcomes, consideration might be given to doing something similar to drafting players into professional sports. In at least two leagues the order in which teams draft players is determined by the team's standing in the previous year, the lower the standing the higher the draft pick. Theoretically any team could land the first draft pick, although it becomes increasingly improbable for teams with better standings in the previous year. The upshot is that the draft becomes a kind of weighted lottery in which higher or lower ranking determines higher or lower probability of one's pick. Something similar might be imagined for ventilator triage, in which groups that have a chance of survival are ranked based on both medical criteria for survival and a chance factor directly proportional to these rankings. That is, those with a higher triage ranking would have a higher probability of getting a ventilator than those with lower triage ranking.

Dr. Daniels added that in the philosophical literature regarding this issue, one element proposed is a weighted lottery. A weighted lottery takes into account benefit but also gives people with lower chances of survival some statistical chance of getting access to a machine, even if it is at a lower level than people with a higher benefits outcome.

Dr. Daniels responded that Frances Kamm had discussed this extensively in her work. Dan Brock originally proposed the weighted lottery for the best outcomes in 1988 relating to organ transplantation. Dr. Daniels has also written on this issue in a paper published in 1993 in *Bioethics*.

Acknowledging that these were all very good points, Dr. Hood stressed that in this document, they were trying to provide some framework or criteria for states and local jurisdictions and hospitals to think through. Public engagement has been discussed. If they engaged the public and described different options, they could also speak with communities about other options, such as maximizing, provided that it did not increase preexisting inequalities. With the example of the weighted lottery, he wondered whether this could be integrated into the document.

Dr. Lo thought that what they were really doing was raising ethical points to consider, and not trying to decide what the ultimate results should be. Other issues must be addressed with respect to the weighted lottery proposal, transparency being one of those. How this will work on the ground in real time during an event remains to be seen. He stressed that there was a major difference between the discussion they were having and those in which decisions must be made in emergency settings. He liked the idea of calling for a public engagement. However, they must also point out some of the pragmatic problems that would be faced in trying to implement a system along the lines proposed by Dr. Daniels and others.

Dr. Daniels believed the document was right in not taking a stand on a particular recommendation, and instead highlighting some of the pros and cons of different principles. He said that a clearer statement early in the document specifying the document's exact purpose would be useful.

Dr. Ruger said she read the document as implicitly supporting the multiple principle idea. Dr. Daniels agreed, pointing out that where this seemed to come out most strongly was in the proposal that multiple principles be combined into a composite priority score or index. However, he pointed out that different people might want to weight principles differently. The assumption in the index is not based on empirical evidence about people's attitudes or commitments. Pointing that out may balance the discussion.

Dr. Ruger agreed. She got the impression that people would flock to a framework with a point system in an effort to acquire tangible and concrete guidance. In that case, what needed to be fleshed out was a framework that would be applied in a particular scoring and weighting system. They should also address what should be done in terms of ties (e.g., individuals who score equally in that particular framework).

Dr. Ortmann noted that in other meetings with state public health officials and physicians, he often heard the comment, "We want something simple and straightforward with a clear recommendation." He wondered whether that was a fair reflection of what often occurred at the local level, and if so, whether there was a way of bridging the divide between those who wanted clear, simple, straightforward recommendations and those who wanted suggestions or a toolkit relative to their particular situation and context.

Dr. Hood replied that he had heard this comment from physicians, and that it was perfectly understandable. Sometimes this was motivated by simply wanting clear direction, and other times it was motivated by a desire to address what people perceive as litigation concerns. There could also be tension between clear guidance from a group like this one versus a recommendation that considered a number of points. Transparency and community engagement are extremely important. It is imperative for local officials to work with their communities so that they clearly understand what is being considered and have the opportunity to offer feedback.

Dr. Hood summarized the main issues that needed to be addressed regarding the document: 1) revise the materials on regional coordination; 2) address the concern about distinguishing the issues of what they were calling a straightforward maximization approach versus other conditions with regard to whether people with a slightly less chance of survival would be willing to give up those chances; in that discussion, they might want to incorporate a point made by Dr. Bayer about distinguishing a population level versus an individual level, which might be helpful to communicate to state and local health departments; 3) clarify at the beginning of the document, in a strong and clear manner, the direction and scope of the document (e.g., to suggest points versus making specific recommendations).

Dr. Daniels disagreed with the point Dr. Bayer made about individual versus population level. He pointed out that all people with a 70% probability of survival surrendering their chance of survival to all who have a better chance was a population question—not just an individual entering the emergency room.

Dr. Barrett asked whether a fourth point to be addressed was the issue of relying upon multiple principles. Dr. Daniels replied this should be addressed and would be a minor revision of that section. Dr. Lo understood the issue to mean that they needed to be equal-handed when discussing the shortcomings of that approach, as they had done with other principles. He encouraged everyone on the call to submit language for inclusion, noting that it was difficult to translate ideas into words and welcoming their assistance.

Dr. Lo also pointed out that the IOM report titled, “Guidance for Establishing Crisis Standards of Care for Use of Disaster Situations” provides important context that the group might consider incorporating into the CDC report. There is a national panel that will make recommendations on uniform standards of care; therefore, it addresses the next steps several people on the call expressed concerned about. The report places a lot of emphasis on public engagement. They define “fairness” as “standards to the highest degree possible, recognized as fair by all those affected by them.” They were very concerned about the role of treating physicians and their duty not to abandon patients under their care. The report emphasized the continuity in ethics from duties of fidelity to patients and non-abandonment, which speaks to some of the points at the end of the ventilator guidance. At the same time, they recognize that crisis standards of care would involve a substantial change in usual health care operations at the level of care that is possible to deliver under the circumstances.

Dr. Barrett received an e-mail from Nancy Kass who indicated that she was having problems with her phone and thus her comments could not be heard by others on the call. She wanted the group to know that she agreed with the points raised by Dr. Daniels and she raised a new issue of reciprocity, a principle she thought should be discussed in the document. She noted that just because health care workers may not be able to return to work quickly, this should not

be rejected as a reason for giving some priority for access to a ventilator. Dr. Barrett indicated that she would ask Dr. Kass to forward an email clarifying her comments.

Regarding Dr. Lo's remarks pertaining to fairness as it is in the minds of those affected by the decision, Dr. Daniels pointed out that this offered some evidence about whether a decision should be thought of as fair or legitimate. It was not a substantive description of what it meant for a decision to be fair. Someone may believe that a racist practice is fair, even though most people would disagree. He strongly endorsed the remarks in the document, but suggested strengthening them, with a call for community engagement. This is important for two reasons: 1) identifying / addressing disagreement; and 2) taking ownership of results.

Dr. Bernheim raised an additional point about strengthening the language regarding community engagement. She is working with local health departments, and every document is being read and understood as a call for community engagement; however, no one is doing this. There is an opportunity to use this document to clarify that community engagement is important from an ethics point of view. LaVera Crawley agreed completely, stressing that additional language should be included to illustrate that true community engagement should be representative of a whole community, as opposed to just those who show up.

#### **Motion**

The Ethics Subcommittee agreed that they would like to review the revised document prior to having a final vote of approval. The group agreed to reconvene on October 15, 2009 to review the final draft.

#### **Public Comment Period**

At 12:23 PM Dr. Hood called for public comment. Hearing none, the agenda continued.

#### **Wrap-Up and Final Comments**

Dr. Barrett asked for all final comments and draft language to be emailed to her by Monday, September 28, 2009. The workgroup will reconvene sometime during the week of October 2, 2009 to discuss the proposed revisions. A revised document will be emailed to Subcommittee members by October 9, 2009. The Ethics Subcommittee will meet on October 15, 2009 from 10:00 AM until 11:00AM.

Before closing, Dr. Barrett provided updates on the development of the web-based basic public health ethics course. This web-based course is targeted to CDC staff and will have three main modules: Module 1) basic concepts of public ethics; Module 2) Public Health Ethics in Action, which uses case examples to illustrate ethical principles; and Module 3) Public Health Ethics at CDC. They are currently at the point of reviewing the final storyboards and hope to have it finished by October 7, 2009. The anticipated release date to CDC staff is early 2010. The

course will be listed as a prerequisite for another course entitled *Foundational Public Health*. It will also be potentially incorporated into training for health policy staff and public health readiness training.

In addition, a survey of CDC staff has been developed that will be administered prior to releasing the web-based course that will deal with the views of CDC staff about the values and importance of public health ethics at CDC, awareness of CDC's public health ethics activities, and a self-assessment of the staff comfort level of being able to apply basic public health ethics principles.

Finally, work is continuing on developing a *Genomics Best Practices Guidance* for incorporating genomics into public health research at CDC, which deals with informed consent, returning results, storage, and future use of the data. Sara Giordano has taken on the task of drafting the best practices document. The intent is to have Dr. Giordano develop this document and present it to the Ethics Subcommittee to obtain input. A draft of this document is hoped to be made available at the February 2010 meeting.

Dr. Hood thanked everyone for their valued participation.

*With no further business posed or comments raised, the meeting was adjourned at 12:37 PM.*

### Certification

I hereby certify that to the best of my knowledge, the foregoing minutes of the September 24, 2009 Ethics Subcommittee meeting are accurate and complete.

\_\_\_\_\_  
Date

\_\_\_\_\_  
Robert Hood, PhD  
Chair, Ethics Subcommittee, Advisory  
Committee to the Director

## Attachment 1: List of Attendees

### Ethics Subcommittee, Advisory Committee to the Director

Ruth Gaare Bernheim, University of Virginia  
Ronald Bayer, Columbia University  
Vivian Berryhill, ACD Member, National Coalition of Pastors' Spouses  
LaVera Marguerite Crawley, Stanford University  
Norman Daniels, Harvard University  
Robert Hood, Chair, Florida Department of Health  
Nancy Kass, John Hopkins University  
Bernard Lo, University of California, San Francisco  
Jennifer Prah Ruger, Yale University  
Leslie Wolf, Georgia State University

### Ethics Subcommittee Consultants

Kathy Kinlaw – Emory University  
Robert Levine – Yale University

### Centers for Disease Control and Prevention

Drue Barrett (Designated Federal Officer, Ethics Subcommittee)  
Diana Bartlett  
Fred Bloom  
Scott Campbell  
Jan Devier  
Laurie Dieterich  
Dave Dotson  
Barbara Ellis  
Neelam D. Ghiya  
Sara Giordano  
Sean Griffiths  
Annie Latimer  
Deborah Levy  
Eileen Malatino  
Josephine Malilay  
Mary Neumann  
Leonard Ortmann  
Philip Peters  
John Piacentino  
Lauretta Pinckney  
Scott Santibanez  
Anne Sowell  
Antonia Spadaro  
Pat Sweeny  
PerStephanie Thompson  
Mark White

Office of the Assistant Secretary for Preparedness and Response, HHS  
Lewis Rubinson

Members of the Public

Brooke Courtney – Center for Biosecurity

Asha Devereaux – Critical Care Practitioner, Consultant to the Ventilator Guidance Workgroup

Claire Stroud – Institute of Medicine