

**FEDERATION OF AMERICAN HOSPITALS**

**ANNUAL CONFERENCE**

**REMARKS OF  
DR. JULIE GERBERDING,  
DIRECTOR, CENTERS FOR DISEASE CONTROL**

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**MORNING SESSION**

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CHARLES N. "CHIP" KAHN: Now let's move to some less controversial issues like bird flu – (laughter) – and bio-terrorism. I really am honored to have our next guest this morning, Julie Gerberding, who is director of the Federal Center for Disease Control and Prevention, and also is administrator for the Agency for Toxic Substances and Disease Registry.

Julie sits with me on the secretary of HHS's American Health Information Community, which is the commission which is working towards developing interoperability and working towards developing health IT for the country. And unfortunately the commission is meeting as we speak, and I deeply appreciate Julie and hope the secretary will forgive her because he really wants her sitting at that table when the group is meeting, being there. So it's really great of her to be willing to come and meet with us this morning.

She is an expert on infectious disease. She received much public acclaim for her handling of the anthrax attacks in 2001. In 2005, she was ranked number 12 in Forbes Magazine's list of the 100 most powerful women in the country, and it really is a great honor to present to you this morning, Dr. Julie Gerberding.

(Applause.)

DR. JULIE GERBERDING: Good morning. Thank you very much for including me in your program. I feel like I'm following some pretty tough acts, so I'll try to get your attention with some discussions about one of the threats that we are concentrating on right now, the avian influenza, but I'll be thinking about it not just as the only threat but rather from the perspective of what it means from our more comprehensive or all-hazards planning.

I think everyone is familiar with influenza. We know it happens every year and it has an impact on many of you every year independent of your own health associations. But globally, somewhere around 250,000 to 500,000 people die every year just from seasonal influenza, and about 36,000 people die each year in the United States. So the context for thinking about a pandemic influenza is occurring in the background of a situation that really is -- for most of us is intolerable because this is a vaccine-preventable death that we are talking about here.

So we are starting from a pretty deep hole as we begin to struggle with the concepts of what a pandemic would ultimately mean to people. And pandemics do happen. We have to emphasize this over and over again. Although they are unpredictable, we had three in the last 100 years. We have had 10 in the last 300 years that were caused by influenza, and there is no reason to suspect that this is somehow going to go away.

If you look at the maps of the pandemics that have occurred, each time a new protein appears on the outer surface of the flu virus, a new H protein. People are not immune to that new protein and so everyone is susceptible and it sets a stage for a pandemic. So when H1 appeared, we had the Spanish flu. When H2 appeared in 1957 we had the Asian flu and in 1968 when H3 appeared, we had the Hong Kong flu.

Now, H1 went away and when it came back we had the Russian flu. That wasn't a pandemic because there were still a lot of old people who had immunity based on previous exposure and so only the young people around the world were really affected by that that particular reappearance of flu strain.

But up in the upper-right-hand corner of this graphic, you can see a little flurry of other H's, H7, H5, H9; these are flu viruses that normally are only a problem in birds, but occasionally they spill over into people and do cause disease. And the one that we are most focused on right now of course is the H5N1, but I've include the others just to remind you that any one of these viruses – actually we know of 16 H's over time, so there are many options for a new flu virus emerging, and we can't tell when, where, or which one it will ultimately appear, but we do believe that sooner or later one of them will emerge and we will have global spread.

There are a couple of ways by which this occurs. One way is that we have a virus in birds, let's say an H5 virus, and then we have, let's say an H3 virus in people, one that is causing those seasonal outbreaks that I have talked about, and they both simultaneously infect some third species, usually a pig, but sometimes other mammals as well. And inside of that host, they re-assort their genes, and so you end up with the worst-case scenario of a new H strain on the backbone of a virus that already has proven its ability to be transmitted readily from person to person.

This is what happened in 1957 and 1968 that caused those H2 and H3 pandemics, a re-assortment of the genes from two related virus species. But of course the other way that this happens is what we are most concerned about right now and that is that an avian virus will drift and will acquire the ability through some ongoing genetic changes to become more transmissible to humans and then be efficiently transmitted from person to person. And this is the mode of development that occurred in 1918 with the most dreaded pandemic, was a gradual evolution of a bird virus into a human strain that then literally took off around the world.

I spoke to my 97-year-old English teacher this week. I asked her does she remember anything about influenza in Estelline, South Dakota, which is my home town, and indeed, she is sharp as a tack, and she had vivid memories of what that 1918 pandemic was right, including the fact that her family, her immediately family was not really affected – no one in the family got ill – but her mother systematically went to many of the other families in their rural community to take care of the children. One family – everyone was ill including nine children, and several died. And her dad spent that time of his life digging graves for all of the people in the community that died.

So that pandemic which happened – you know, 100 years ago basically is something that most of us have no memory of, but if we talk to the older people in our families, almost everyone recalls someone who died from the Spanish flu or someone who knew someone who was lost during that period of time. It was a devastating pandemic and it truly changed the shape of our entire society. It changed our profession of nursing, it changed the way we think about preparedness, and it certainly motivated our strong interests in developing technologies to ward against this disease.

Now, when we are planning for a pandemic, we make some assumptions. We don't know how bad the next pandemic will be and we can choose to plan from the framework of a not-so-bad virus or we can try to do the worst-case scenario planning something along the lines of 1918. We have chosen the 1918 scenario for the planning that is going on in the government and cascading throughout our country right now and indeed cascading around the globe.

But regardless of whether we are dealing with a virus that caused not such bad disease, or one that caused the kind of devastating disease we saw in 1918, we estimate that about a third of people will actually get the virus, and that is pretty typical. Even in regular flu season, somewhere between 15 and 20 percent of people usually pick up the flu. Whether or not they are sick is another story.

This is going to have a tremendous impact on outpatient medical care, all things being considered. But if we have a severe virus, the real difference will be in hospitalizations, intensive care, and of course deaths. So if we have a virus like the 1918 virus, we are estimating about 2 million people in the country will ultimately succumb regardless of our interventions, and that about 745,000 people will need mechanical ventilation.

Now, granted, they are not going to need that all in the same day. These pandemics move through the country in waves, usually lasting six to eight weeks in a given community, often reappearing two or three times as the pandemic moves through society. But nevertheless, even if you annualize this, we don't have the capacity to provide intensive care to 745,000 people on a surge basis in the United States. We know this, and not much is going to happen fast to be able to prepare for something this severe.

So we do recognize the profound impact that even a mild pandemic will have on our health system. We know that some years we struggle even during regular flu season with overcrowded emergency rooms, no beds, no ICU beds, et cetera. So this is a real bottleneck of planning, and one that we have got to come to grips with, with you and with our healthcare system at large, and certainly within our communities. It is not very often in this country that we truly have to proactively plan about how we are going to ration care or how we are going to provide ongoing critical care to people outside of an intensive care setting.

Now, does it make sense to be planning for a scenario this severe? Well, I don't know, but when I read the stories of the people who are acquiring the H5N1 virus, I am impressed with how similar the clinical course of that virus is with what we read about from 1918, 1919. These are X-rays from just a single patient who acquired the infection in Vietnam, and for those who are familiar with chest X-rays, you can see how rapidly this patient progressed to adult respiratory distress syndrome.

But the other picture here is what this means from pathologic perspective. When you look at the tissues in these patients, this is not just a mild inflammation, this is a very severe, very aggressive pneumonitis that in and of itself causes death from airway dysfunction independent of any secondary pneumonias or the other things that we typically think of as the actual cause of death in people with influenza.

We have also recreated the 1918 virus at CDC and have studied how it affects tissues. And the amazing thing from those studies – at least it was amazing to me – is how similar the tissue consequences of the 1918 virus are compared to this H5N1. This is a bad virus. If you saw a chicken that had it you would be horrified at the tissue destruction, and when you see what it does to the tissues of the few human beings that have acquired it, it's impressive, it's frightening, and we are taking it very seriously.

We also recognize that if you are a bird, it already is a pandemic. This graphic just shows the map now of where the H5N1 birds are located both in poultry flocks as well as in wild birds, and this is a globally distributed virus already, and that is not really even taking into consideration how the flyways that these migratory birds who are carrying the virus overlap.

We need to expect this virus in the United States in the form of a bird imminently. We are planning for that. We are doing everything to be prepared for it. We don't think that we will see the same consequence in terms of domestic flocks because we have bio-security and excellent screening of our poultry produce in the commercial sector, but nevertheless you can imagine what the public consequences of coming to grips with this really will be based on what we are seeing in Europe, and we need to prepare people and be prepared to answer their questions and reassure them when that first bird arrives.

Now, there is a lot of emphasis on culling birds, and that makes sense because if you can lower the global burden of the virus, you can decrease the chances that it will evolve and also decrease the chances that it will spill over into human populations. But this of course is easier said than done.

First of all, people have a very strong motive to not report their sick birds because their income and their protein source depends on their backyard birds in many parts of the world. For example, one of the countries in the Mekong Delta we visited last fall, 70 percent of the people living in the country have several birds in their backyard. So getting an individual citizen to recognize how important it is to report birds, especially since they get sick with other things, not uncommonly, and when birds get sick, people usually kill them and eat them.

So it's a tremendous cultural change required to really effectively deal with the bird problem. I have shown some pictures that we took when we were in Asia, in the upper left-hand picture, a basket of chickens, and migratory birds, in this case water fowl, just showing how easy it is for a migrating bird who has the virus to infect someone's chicken because they are co-housed and co-located.

The rice paddy in the center photo is the backyard of someone's home. People live in that house. Their children wade in the water where the ducks are swimming that are excreting the virus, and there are at least two reports of children who probably got H5N1 from swimming in the canal, and acquired it through the oral route, not the respiratory route.

And then lastly, the people sleeping are sleeping with their chickens. And this is often the case when the weather gets cold and people don't have the kinds of housing for their flocks that we would have here in this country. So they bring them indoors. And part of the reason why we think there was this flurry of increase of cases of human avian influenza in Turkey was because the weather got cold and people were bringing their chickens inside, so there was much more chance for human-to-chicken contact and spread through that method.

So that's a really hard problem to solve. Probably the most poignant example of this that I have observed is the story of a little boy, who like children everywhere had a pet. In this case it was a pet chicken. And his chicken got H5N1 and that little boy did what every child does with a sick pet – picked him up, held the chicken, trying to coax it back into good health. This little boy got H5N1 and died, and so it's a human tragedy but it's happening in the context of potential global catastrophe.

Fortunately right now we are able to track the virus and where it is going. This is a complicated picture of the genetics of the virus as it has evolved from its first emergence in Hong Kong a couple of years ago. The first cluster of virus strains, called Clade 1 here, are individual viruses that we have collected from people mainly in the Mekong Delta. Each line there represents a drifted virus. So you can see that even within last year's strains from Vietnam and Thailand, there is certain genetic variability because there are many lines.

Over the season the virus evolved enough so that it is characterized as a whole second cousin or a second clade of virus indicating that drift is still ongoing, and yesterday Secretary Leavitt announced that we were going to be making a new prototypic H5 vaccine to the Clade 2 strains because they are enough different from the Clade 1 that the prototype we had originally made to Clade 1 is not likely to cause much cross-protection with Clade 2. So what that tells you is that we're going to have to constantly be catching up with where the virus is going as it drifts. It also tells you this really is happening and so the concern about ongoing evolution of the virus is not somebody's worst-case imagination. It's a fact. It's what flu viruses do. That's why we get a flu shot every year.

So if we could just summarize the situation, where we are today is that we've got ongoing propagation in poultry, probably mainly spread through migratory birds, perhaps also in some cases through licit or illicit bird trade. We have the virus that we know can infect mammals in addition to humans. There have been many deaths of tigers in zoos that were fed infected animal meat and some cases of tiger-to-tiger transmission. More recently, the reports have been focusing on domestic cats, which occasionally seem to have the virus. Whether they can transmit it is another question, but a very broad host range for a virus, and it is evolving. While there have only been a very small number of human cases considering how many birds are infected, we know that it is a very deadly disease, and even if the mortality rate is inflated because we're missing less symptomatic people, this is a very lethal virus and it causes very severe tissue destruction, as I mentioned. And lastly, we have had person-to-person transmission, although fortunately not efficient.

So if you were checking all the boxes necessary to produce a pandemic, we've checked every box except the last box, the efficient person-to-person transmission. And we hope we never have to check that box. But hope is not a strategy. And in this context of what we're seeing and watching around the world, we would, I think, be completely irresponsible if we didn't take this seriously and do whatever we need to do to get as prepared as possible as quickly as possible, and it's a tough job because we have a long way to go, as you know, just dealing with vaccine shortages has tied us, how complicated it is to really prepare.

So it takes a government, of course, a federal government in our case, a global government in the perspective of our broader responsibilities around the world, and we do have strategies and plans, and I'm going to lay out for you a bit of the framework of that. But of course, this is all evolving as we go, and was given a big push with the president's proposed 7.1 billion budget that Congress has so far appropriated about 3.8 billion, so we got a good infusion of cash to get us going, but we have a lot more work to do.

I wanted to explain what exactly it is that we will do or at least what our thinking is at this point in time. The first principle is that if there is a threat, if there is an outbreak of a sustained person-to-person transmission anywhere in the world, we will consider it a global threat and it will trigger us to do certain things in this country like make the decision to convert from producing seasonal vaccine to pandemic strain vaccine as quickly as that makes practical sense. If there is a global outbreak or an outbreak anywhere – it could happen here, but assuming it happens in the non-United States context – we will do everything that we can do as an international partner to try to quench it the first time, and we have pre-positioned people; we are building laboratory detection capability; we have rapid response teams that we're putting in target countries, but also working collaboratively with the World Health Organization. We will share a limited portion of our stockpile to try to contain the virus where it emerges and prophylax people in those communities, and we will do absolutely everything to try to contain it and quench it in the setting where it may erupt.

Now, if it happens in a rural area and only a few people are affected and we learn about it quickly, our models tell us there is a real good chance that an aggressive approach really could contain the virus. But if it happens in an urban area or it's gone on for a while or lots of people have it, it's too late. And the chances of us really being able to contain it just are very slim to none. We will try, but we recognize that it would be very, very difficult and so of course we have to plan on some additional strategies. We will take advantage of the CDC global workforce and we, as I mentioned, have people already pre-positioned. We have staff in 45 countries now, a couple more are being added as we speak. And that is, in our opinion, a great asset to have that on-the-ground capability from CDC and other health agencies.

CDC is also working with the World Health Organization to build regional capacity, because we know no matter how fast we are, how good we are, how much money we have, we can't build public health in 108 countries simultaneously fast enough to prepare, so we've got to adopt some regional capabilities that get us there fast, but aren't necessarily in every single country. And we're also building a global virtual network using all of the kinds of electronic communications systems that we have invested in linking to the Department of Defense labs that are so critical to flu surveillance globally as well as our domestic information systems that are being rapidly augmented and improved as we speak. So we do intend to use all of our resources to try to contain and delay this kind of epidemic.

We also, very importantly, are with NIH and others in the field doing the research. One of the highest priorities for us as an agency is get the virus. We must always get the virus to Atlanta so that we can create the seed viruses that then lead to the vaccine or that we can characterize the virus and keep our diagnostic tests up to speed with where the virus is evolving and really understand the genetic determinants of what is happening.

Now, if we are not lucky and we have to move into a more forward-leaning phase, we would either sequentially or more likely, simultaneously implement some changes in our border security using our global health and quarantine stations that exist now in eighteen ports of entry in the United States. That's one of CDC's functions and we would initiate likely exit and entry screening procedures, and we have the capacity now in these quarantine stations to be able to isolate a 747 full of passengers, evaluate them, treat them with prophylaxis if necessary, and isolate the first cases that may arrive or be recognized upon arrival. This is not a fail-safe method, as you know, but we learned during SARS that it was a very important component and a very helpful way of early detection of introductions that would be important to recognize to try to slow down the spread of this virus through our communities. This is just a map of where our existing field stations are, and you can see they don't cover every airport, but we're working on building our capacity in this regard.

The mainstay of our approach domestically is really to slow spread at the community level and buy time while we're gearing up vaccine production. Ultimately,

with the investments that we're making in vaccine development, we would hope that we would be able to produce enough vaccine to treat the 300 million people in our country who need it in a six-month timeframe. But we can't do that right now. Even if we had the right virus for the vaccine, we have nowhere near that kind of production capability, especially since so far, the studies have shown that the H5 vaccine takes a much higher dose and probably has to be given twice. So there's a lot of work to do to improve the vaccine and it is not a magic bullet, nor is Tamiflu a magic bullet or a performance measure of preparedness. We believe that the primary means of protecting people for the first several months of a pandemic will rely on the traditional measures of social distancing, not having meetings like this, and asking as many people as possible to reduce their face-to-face contact.

And this is where the true planning gets very tough. If you look at estimates of impact, we're suggesting absentee rates of up to 40 percent as a pandemic wave moves through a community for several weeks, and so this kind of slowing down is going to have a profound impact on business, on supply teams, on patient care, and on any number of other intersections with the health care delivery systems. So I'm not minimizing the impact that this will have in a society. What we are not talking about here is shutting down communities or closing state borders or restricting people's freedom of mobility from one community to another, because those things won't work. There is very little evidence that any of that, once a pandemic is established, would have any impact on the shape of the curve. So these things have to be handled at a very local level, and that's why we've been very upfront about what is the federal role; what is the state role; and most importantly, what is the community role in dealing with a pandemic, because this will happen community by community by community. And there is nothing that we can do in Washington or in Atlanta to solve the problems of all the communities who would be simultaneously affected by a pandemic. It's not a hurricane, and we can't rely on other people to come in and help us out. It would have to be handled locally.

And of course, communication is going to be the mainframe by which this all happens across our nation and really the world. When anthrax occurred, CDC learned a lot about the importance of communication. And one of the things we did was bring in experts and consult with academicians to try to understand the frame for emergency communication. And we learned that people in general in our country in our cross-sectional sample of Americans really preferred to get their information from the CDC director compared to the head of the FBI. Now that's not surprising. Health information -- you would hope they would prefer to receive that information from someone with a health background. But only about 50 percent of people really thought that would be the best resource. Almost everyone preferred to get their information in an emergency from their doctor, and not some doctor they don't know, but the doctor they have a relationship with or a doctor in their community that they trust.

And so, we know that if we want to really be able to handle any health threat, all hazards included, and this one in particular, we're going to have to help clinicians be prepared to be that voice of information and reassurance and advice. When people are frightened, they don't think with their forebrain. They are not thinking rationally,

objectively. They are not processing information in a logical manner and making rational, deductive decisions. They are thinking with their midbrain, with their emotions. And the one thing you can guarantee they will always do is they will do something. It might not be the right thing, but they will always want to take some action, so we have to be there, right there at that point in time with good advice about steps people can take to protect themselves and help them avoid doing the wrong things that really could result in a panic or a response that would cause more harm to one or one's family than good.

So we're building the communication network; we're building the preparedness network, but we do believe it is a network of shared responsibility. Has anyone here gone to a flu summit? A few people have attended. I think what you saw there was a remarkable situation where we had federal agency officials, including the secretary, we had governors and cabinet members from the state, we had the CEOs of the important business, the deans and chancellors of the academic community, the leaders of the faith-based organization, all of the other leaders in the health care system, and the public health leaders all coming together to talk about how to do this at a community level. This had never happened in my wisdom at least in the history of public health where we had this kind of focus cross-cultural, multi-disciplinary attention on a health problem. And it's amazing what kind of energy and thinking can go into the planning at the local level when you get the right leaders to the table to really accept their share of the responsibility.

We have the responsibility of getting the vaccine as a department -- the Department of Health and Human Services. And there are several things going on, including modernizing production, as well as scaling up the current egg-based production, more research to try to make what vaccine we can make go further in the population, and a variety of other experimental and new technologies. So this is the ultimate solution. And someday, we ought to be able to take pandemic flu off the table as a health threat, but not yet, because this is all going to take time. We're also working hard to drive the market for vaccine, because we know from the vaccine manufacturers that if we create more demand, they will meet that demand with more supply. And the investments that we're making to try to ease the way forward on this in terms of reducing the risk to the companies for stepping up and taking these measures is one part of it. But increasing the demand is another.

Based on our evidence, 180 million Americans a year should get a seasonal flu vaccine, and we've been pushing that number upward. We're just going to go up again because we've augmented the recommendations to include kids up to age five. But we've never had a demand for the virus that exceeded 85 million people, no matter how hard we've pushed. So we need your help. We need people in the health system to really make strong recommendations and strong support for getting people vaccinated. We also obviously have to solve the distribution problem, but if the supply increases, the distribution dilemmas will hopefully improve as well.

We also recognize that anti-virals are important. As I said, they're not the magic bullet, and they're not a performance measure of preparedness, but we do have a strategy

to stockpile at least 81 million doses of anti-virals to protect our citizens. That's what our models tell us would be a prudent amount to have on hand. And we're working with the manufacturers to assure domestic production, because right now the supply line revolves around one or two other countries, and in a time of catastrophe, we would expect nationalization of our anti-viral supply, so we would not be able to necessarily guarantee future delivery beyond what we already had in the stockpile. And we're working on new drugs as well, but I just really want to emphasize that while this is important and there's a role for the health system to play in thinking about how to assure access to anti-flu drugs, we are not in a situation right now where we have the robust supply that we need. And this past year, when supplies were more limited, we were not recommending stockpiling or individual stockpiling. We were recommending that we use the drugs for treating seasonal flu patients first to make sure that we could take care of any patients that emerged.

We've put out a number of checklists and more are coming to help people with their planning exercise. I would just refer you to [www.pandemicflu.gov](http://www.pandemicflu.gov) where all of the governmental resources for influenza are appearing, and there will be more of these checklists with toolkits to support them rolling out over the next several weeks, so we are trying to help support the state and local planning in the various sectors, but we know we can't do it ourselves.

So let me just end with a bit of good news. We deal with a lot of hazards. We deal with anthrax. We deal with smallpox. We deal with radiation. We deal with all kinds of things that keep me awake at night. But the one thing I can say about influenza is that with this hazard, we will get a return on our investment because as we deal with pandemic influenza, we will save lives during seasonal flu. We will have a vaccine for people who need it, when they need it, where they need it. We will have better and more anti-viral drugs for treating people who are sick or who don't respond to vaccine. We will have systems of preparedness in our health care and other sectors that will have generic value for whatever threat comes our way. Those systems are tough to build in the abstract, but we have a very focused need to build them right now. And the same communications system or the same care system or the same product delivery system that we would use for pandemic will serve us in a variety of other all-hazard contexts as well. And I think the most important thing is here we'll have some peace of mind. We will not be having frightening conversations about this virus causing a global pandemic and my mom will be able to get her flu shot. So thank you for your attention and if I am allowed to take questions I would be happy to.

(Applause.)

Q: Good morning. My question is, is there an intermediate stage that the vaccine can be either frozen or stored where it doesn't have to be fresh made from the beginning as soon as the pandemic arises?

DR. GERBERDING: But the problem with pre-development is the virus changes, so there's really no way to make what we need now and use it later, because the

virus that we will be dealing with is not the virus that we have to make the vaccine with. So we're going to have to have just in time vaccine development capability with whatever virus emerges that is efficiently spread from person-to-person. Take the second question here.

Q: Dr. Gerberding, first of all, congratulations on the huge amount of work that you've done. A couple of quick questions. Given the fact that vaccine is a problem, and given the fact in the example given, if I remember correctly, that was the daughter who was resistant to Tamiflu but the mother was sensitive and both died, so Tamiflu may not be an answer to our problem. You've laid out an international/national community approach, but I haven't heard anything about the fact that it's going to boil down to individual responsibility for hand washing, for respiratory etiquette, for somehow getting your hands on a mask or finding other methods of preventing the spread of this. And I'm curious what the CDC is doing for just in time training for individuals in a community should we do this.

Plus, if this were just a cultural change in Americans, we would limit the spread of a lot of other problems. So in Dallas, for example, where I'm a consultant to the Health Department, basically they have been told that whenever a large company has questions on this, they are to call the Health Department, and that the government is sort of stepping away from that educational process. How do you look forward to sort of dealing with that individual piece?

DR. GERBERDING: Let me address first the issue of the efficacy of Tamiflu, because that's a very important point. We have done no clinical trials with Tamiflu for H5, so we basically don't know if it works or not. It works in the test tube or in the animal model, but we haven't done proper clinical trials in people, and there are certainly failures, but we also see failures with penicillin for pneumococcal pneumonia, so that is not an argument against any value. There is a suggestion in Turkey where people had more access to Tamiflu earlier that the survival rate was better among the people who were treated, so we do feel there is a role for this drug and we need to learn a lot more about how it's used, are we using the right dose, are we using it – should we be using it in combination with something else, so on and so forth. We've got a lot of clinical medicine and clinical research to do in this regard.

With respect to individual actions to help prevent flu, we actually have a checklist for families that is included on that web address that has the kinds of things that an individual family or person should and could do to help prepare and prevent a pandemic or any other respiratory disease from affecting them in their home, and they are all the things that you suggested. We sometimes refer to this being people who like to talk in governmentese as respiratory hygiene, but what we really mean are the things that you've suggested, the common sense methods of hand washing. We have a big campaign in schools about hand washing. We have a big campaign in health care facilities around hand hygiene and we know that health care environments are going to be hot spots for flu transmission to vulnerable people so the kinds of precautions and protections that we need are going to be especially important there.

As we approach the next flu season, the seasonal flu season, we are also going to be doing some very specific studies to help understand the practical issues around masks, what do they do, what don't they do; should people in the workplace wear a mask? Will there be lower absentee rates in the workplace if people do screen and mask? There are a number of very simple, not very molecular studies that we can do that would give us some common sense answers that might help us have a little bit better evidence base for our guidance than just it's what my mom taught me or what I learned in kindergarten. So we'll work on that, and I appreciate that information is not penetrating as widely as it should, so we'll get to work on trying to be better distributors of what we do have.

Q: Okay, and one last comment. In addition, our company is changing our actions based on your alerts. So every level that comes out, we change our actions and our surveillance levels. So we appreciate what the CDC has done.

DR. GERBERDING : Well, thank you. I'll bring that back to the people there who are working real hard on this. They'll appreciate your perspectives. Thank you.

(Applause.)

(END)