

## **MCH/CSHCN Director Webcast**

December 8, 2005

PETER Van DYCK: Captain McNally served as HRSA's representative to the national vaccine advisory committee's planning group on pandemic influenza and assisted with the November 2005 report. She is a captain in the commission corps of the U.S. Public Health Service and served as HRSA's emergency coordinator. Welcome Laura.

LAURA McNALLY: Good afternoon. I would like to first start by setting up a scenario for you and giving you a little bit of context for why this is becoming more important to us. Over 1/4 of the nations population has been stricken by a communicative disease. A small but significant proportion of those die. In mere months the killer disease has left over half a million people dead nationwide and over 21 million dead globally. The death rates among youth adults are particularly high. Several shortages of nurses and doctors leave many to suffer alone without medical attention. Schools, churches and other community organizations close. Essential services such as police protection, transportation and telecommunications nearly grind to a halt due to the staggering number of people incapacitated by the disease. The economic impact is enormous and millions of dollars are lost. For many urban areas the bodies of the dead begin to pile up because the morticians are unable to keep pace with the number of fatalities adding to the public's sense of panic and despair.

To prevent disease spread Congress dedicates resources by identifying the cause of the disease and developing an effective treatment. There is a widely held theory that Bayer aspirin has been intentionally contaminated to spread the disease. Now this grim scenario might appear to be either modern day bioterrorism or it could be an episode of E.R. or some of these facts sound like they could be from the recent Hurricane Katrina events. It is, in fact, a description of the influenza pandemic that swept through the globe in 1918 and commonly referred to as the Spanish flu. Most experts believe it's simply a question of when, not if another influenza pandemic will confront us. I think these conditions, as we move along, address a number of the concerns we're talking about. The HHS pandemic influenza plan was released in early November and what I would like to do today is walk through the plan and some of the concerns and considerations that have gone into developing this plan. Basically, the HHS Pandemic Influenza Plan serves as the plan for all the preparedness and planning activities and contains three parts. The first part is the strategic plan, the second part is basically dealing with the public health state and local partners and this includes basically all of your local and community entities as well. Your health centers, any of your local providers that type of entity and the third part is all of the HHS agencies operating divisions and HRSA has been in the process this past week of developing HRSA's component to this plan. So I want to walk through that with you a little bit today and give you a sense of where the department is going.

Basically, the HHS pandemic influenza plan is intended to be the model to be used for the development of planning throughout federal government. This model is the beginning of planning that will then go out further to developing a nationwide plan that goes into the

other departments of the federal government. This first part is in Part 1 under the Strategic Plan, it is the planning and preparation that public health and medical support needs to pay attention to in the event of a pandemic. It identifies what the key roles are for Health and Human Services and its agencies and it provides some planning assumptions that go into why we are going to approach this pandemic the way we think we should. And a lot of it has to do with lessons learned either during the 1918 pandemic or the later ones in 1957 and 1968. And some of the lessons learned as well as lessons learned most recently during Katrina and what the impact would be as a nation and not just a number of states. We'll continue to move on. The second part of the plan is the public health guidance for state and local partners.

The first part of the plan is only about 40 pages. The remainder of the plan, which is a total of 396 pages, is part 2 on the public health guidance. There are a number of areas or chapters that address different issues such as surveillance, laboratory, diagnostics, healthcare planning which is a very important chapter for all of us to take a look at, as well as infection control, clinical guidelines, vaccine distribution and use. Antiviral distribution and use. Those two chapters also have an appendix which is appendix D which has been downloaded for you to take a look at. Those are very important because they do have some strong MCH implications. Community disease control and prevention and managing travel-related risks of the disease as well as public health communications. These are being developed along with CDC at the department level so the messaging is the same throughout the country and then workforce support.

The third part we really can't talk about today because that's the part that is really being developed by each of the operating divisions throughout HHS and the HRSA plan -- the external plan basically the internal plan is looking at continuity of operations since we do have a number of grants and pandemic flu does tend to fall in the seasonal flow is in the fall we would need to make sure our grant funds could still be distributed in a timely manner. That's our internal plan as well as planning for large numbers of individuals who might be sick during peak periods of a pandemic. The external plan is what we'll need to do and communicate to each of our grantees in order to ensure that they have the information they need to continue with their programs. So that is part 3 and you'll hear more about that as we begin to move forward with it. OK. Let me take a look. Looking at a little bit of an overview, what we're looking at is influenza A. Influenza A is the type of influenza -- there is an A, B and C, it's influenza A that we're most concerned about because that's the type of influenza that does become pandemic. The other two types have not been known to become pandemic. Influenza A is found in a variety of animals, obviously we're most concerned right now about birds, fowl, ducks. But it's also found in other mammals such as pigs, horses, whales, those types of mammals.

It is normally seen in one species such as we're seeing right now in fowl but it does have the capacity to cross over into these other animals and it's when it becomes to cross over or mutate is when we become the most concerned about it. So that right now there have been a few cases of cross over into humans but most times because it's so virulent the human dies so it doesn't continue the transmission. We're most concerned is when the virus is able to survive in the mammal or human population and it mutates sufficiently or

crosses over to where it can survive and it becomes a virus that is able to be transmitted more easily among the human population. Right now we're dealing with a virus that has been around now for a number of years. I think it was first identified in 1998. And it has stayed pretty much in the fowl population with a few isolated cases that have shown up in pig and other mammals but not to any great extent. Once there is a sufficient mutation and it becomes a virus that is identified in mammals and is able to survive it's what's called a novel virus and it's at that point that we become concerned about this novel or new virus and its ability to transmit and become a pandemic.

Some of the assumptions we're looking at is 25% to 35% of the population could become infected with this new novel virus once it is identified. And these assumptions are based basically upon the 1918 numbers. During that point in time, we'll talk about it a little later. During that point in time there were large numbers of deaths within the U.S. as well as nationally. We're looking at a 25% to 35% of the population developing the disease and at this point in time a large number of those individuals could die. You'll have to remember this is a new virus so there is no immunity. The regular flu shots that we receive during the year are likely not going to provide us any level of protection or immunity against this new circulating virus because those flu shots have viruses that are different from this new one that has been identified. The direct and indirect healthcare costs could be as high as \$181 billion. That is looking at just basically the healthcare costs. It's not looking at the rest of your infrastructure and societal impact. So it is a very costly virus as well.

At the moment the threat does exist in the H5N1 virus which is what is circulating in the avian flu. Now, that does not mean that by the time a pandemic occurs it could come out in the form of an H6 or an H2 or one of the other forms of the virus. The 1918 flu was actually an H1 and the 1957 was an H2 and the 1968 was an H3 so we have various forms that are circulating at all times. H5N1 is considered a novel virus if it came into human circulation. It is being spread widely throughout Europe and Asia and there have been isolated cases throughout Europe but the one thing I want to emphasize is there are no cases at this point in time in the U.S. We have not identified it in any birds and there are no human cases. It is something being tracked because it's occurring in other countries. The virus is very endemic in the bird species and cannot be eradicated. There is no way for us to eradicate it. All we can do is track it. I know in China and some of the other countries they've tried doing inoculations to get it under control with the fowl. One of the problems with this is as they begin doing inoculations with the birds, it could set up problems with resistance against some of the drugs that we might be trying to use. So this is a problem that we do need to pay attention to as well.

The current mortality rate still sits at about 50% in cases where there has been human transmission. And one of the things that we're paying attention to is as the mortality rate begins to drop, it means that the ability for the virus to spread among humans is greater because these individuals are living and able to transmit or shed the virus to other household members or other individuals. So as long as the mortality rate remains high the ability for the virus to continue spreading to other humans is a little bit lower but 50% is where it's sitting at right now. We do have over 130 cases that have been identified of

human H5N1 virus. The emergence of a human influenza virus with pandemic potential really does provide for us a challenge that we've not seen before. We certainly saw an incredible challenge with our response to Hurricane Katrina followed by Rita and then the last hurricane but nothing like what we would see with a pandemic. And our ability to be able to respond to what needs to be done on a nationwide basis.

This was basically three or four states and it consumed just about all of our resources at the local, state and federal level. So you can imagine if we had a national pandemic where we had something going on in multiple states at the same time it would truly consume all of our resources very, very quickly. The containment would need to be something that was a very large process. It may include quarantine, we may need to shut down schools. We may need to shut down local gathering places, theaters, large group gatherings, those kinds of things, in order to keep the community risk lowered. So isolation is something that will be taken into consideration to try to keep the spread down to a minimum. The resources that will be required will be extensive and they will be based basically upon the National Response Plan. And the federal government is required to use the National Response Plan for responding to any kind of an event so I encourage all of you, if you haven't looked at the National Response Plan to take a look at it because that is the model that federal government uses to respond to any kind of an event. It is based upon the national incident management system or incident command and control. And I'm sure any of you that are working in hospitals or that type of a setting are familiar with that because hospitals, as well as local facilities, do use it. Our efforts to contain the virus, if they are

unsuccessful, it will continue to spread very, very rapidly and it is very possible that we would have simultaneous outbreaks in a number of communities.

Not only do we have simultaneous outbreaks but these outbreaks could come in waves where community might have an initial outbreak and then several weeks later have the second wave of an outbreak. During the first outbreak what you would see is you would see large numbers of individuals who are affected. During the second wave it would be smaller numbers of individuals because there would be some immunity based on those individuals who were infected the first time around and survived and are now healthier and able to withstand resistance against the second wave of the pandemic. But basically all of the communities resources will need to go being able to handle the pandemic and the hallmark of what a pandemic is. It overwhelms the community, it overwhelms the area affected by it and it takes every single resource in that area to be able to deal with responding to the outbreak. And it is something that is over a sustained period of time.

The waves generally could last as long as six to eight weeks. So it's not something, whether it's just a quick hit and then it moves on. It is something where there is a sustained level of illness and as you're dealing with your surge capacity in your hospitals, your health departments, your community health centers and any of your other local providers, you're looking at medical surge over a period of time with sustained high levels of individuals coming in for care. It's thought that about 50% of the population that is affected will go for outpatient healthcare and that there will also be a large number, they're not quite sure what that number is, but a very large number who will require hospitalization

and who will come in through the emergency rooms. So you can see that the level of surge on medical care is not going to be just at the hospital level, but it will be throughout the community and it will involve all medical providers and responders. And the other thing that is really important to remember is unlike an event such as Katrina or 9/11 or something like that where it was in one area.

Other communities, states, localities could respond and send resources, teams could come into the area and medical providers would be there. They could share some of their other resources, ambulance, healthcare providers, medical supplies, all those kinds of things. In a pandemic that is not going to occur. Basically the resources that are in that community are going to need to stay in the community in order to be able to address the needs of the community. Your E max systems, the emergency medical systems for sharing across state lines will not be available and your communities will become very, very overwhelmed and it will be presented very, very quickly. As we look at some of the planning assumptions that have gone into the HHS plan, some of the characteristics to keep in mind are things such as the fact that the virus will have the ability to spread very, very rapidly and it will spread quickly worldwide due to the way that we do business today. People are likely to be asymptomatic while they are infectious so the virus will be spreading and shedding long before people realize that they are ill.

So as you have individuals coming back from foreign countries or even state to state it's very likely they could be bringing the virus with them and the virus will be shedding and infecting other individuals long before people realize that they are ill. There will be these

simultaneous outbreaks occurring. As you look at individuals who get off a plane and go to their local communities, you could see outbreaks occurring fairly quickly. And that the support for this is going to be very, very limited. The demands on the healthcare system are going to be extreme. We're very clear on that. We don't have all of the resources that we need. Some of the other planning assumptions to keep in mind are the fact that the magnitude is unknown. We are planning for a pandemic much like the 1918 Spanish flu but the range is fairly significant. With the 1918 pandemic, there were 500,000 U.S. deaths and it caused 34,000 -- I'm sorry, there were 500,000 U.S. deaths but then in 1968 it was down to 34,000. So you can see that the number and the range was very significant between the two different pandemics. A usual flu season still has about 36,000 deaths so the 1968 pandemic was much closer to a usual seasonal flu season.

A lot of the difference between the severity between the 1918 and the later pandemics had to do with the virulence of the virus, as well as our medical skills and knowledge -- knowledge at that point in time. For the 1918 the only thing we had as a resource was -- most of what went on during the 1918 pandemic was isolation of individuals infected in an attempt to try to keep it under control. By 1957, we did have the introduction of vaccine and so you used isolation and vaccine in order to try to keep the pandemic under control. By 1968, we also had antivirals that were used to try and keep the shedding of the virus under control. So with each succession there was a little bit more to work with. The characteristics for these pandemics were that about 30% of the U.S. population developed illness so you can see that's why we're using the 25% to 35% spread of those that are expected to be infected with the virus. About half of those seek medical care. The other

thing is children tend to have a higher rate of illness, although they also tend to be able to recover more quickly.

The geographic spread on all of these was very, very rapid and it covered all parts of the nation. The epicenter for the 1918 pandemic was actually in Kansas. It was sort of in a more rural area. Now today we're not sure whether that would truly occur. It could be with the migration of the birds that if the initial epicenter for a pandemic were to occur in the U.S. it could possibly be part of the migratory path of birds. On the other hand it easily could be on one of our major coasts where there is significant travel coming in from Europe and Asia. The susceptibility to the pandemic or to the virus is going to be great given that there is no immunity. The attack rate, like I said, will be 25% to 35% which is the number of individuals who become ill. And the illnesses while they will be large in children they will decline with age. Children have a little less immunity and are more likely to pick up the disease, as well as the fact that because of the way they congregate. Their hygiene habits, their sharing, those kinds of things, make children a little bit more susceptible to the virus than adults who tend to be a little bit more concerned with washing their hands and using a little bit better hygienic practices. Among working adults it is anticipated that about 20% of the population at an point in time will be ill with the virus.

This has implications for our workforce environment because we have to worry about the number of individuals who will out, either ill themselves or caring for family member who are ill. So as you are beginning to look at your own planning, you need to take into consideration the number of people who will not be at work at any single point in time

because they are dealing with the pandemic on their own or caring for family members who may be ill. The risk groups are really hard to predict. During the 1918 pandemic it affected young adults most frequently. They were healthy adults. This was your 15 to 49 year old population. On the other hand, the 1957 and 1968 pandemics, they effected your younger children and infants as well as the elderly, which is little bit more what we see with the elderly with our seasonal flu. So it's very hard at this point in time for us to be able to predict what the impact is going to be until we see what the virus is doing. This will have an impact on adjusting priority levels for vaccines and antivirals. The typical incubation period for influenza is about two days before you begin seeing symptoms and the normal course of the disease is going to run about five days for an uncomplicated case.

If you have any kind of secondary bacterial infections, you could be looking at two weeks for individuals to out of work or longer depending on how ill they become. Viral shedding is the greatest during those first two days when an individual does not realize that they are ill. They may not feel well, but they may not exhibit any clinical symptoms until after that two days when they shared the virus with family members and those around them. On the average it is thought that most individuals will experience about two secondary infections along with the primary influenza virus. Sometimes these will be severe and require hospitalization, and sometimes they will be more insignificant and outpatient care will be sufficient in order to treat the symptoms of the disease. Like I said, usually a wave will last six to eight weeks in a community and there will be two to three waves that occur in that particular community. So we're looking at virus that could last anywhere from one to three

years before we see the end of it. With some of the viruses, they reoccur a few years later and other we never see again.

Once we do have a pandemic like this, then that virus will be included in the vaccine in future years if we feel there is a risk. One of the things to keep in consideration is your vaccines in your flu shots that we're getting now are comprised of -- they're comprised of viruses from previous years. The vaccine that would be given during a pandemic is only the virus strain that is circulating at that point in time. So that is a big distinction. At this point we think that seasonality will be preserved. Basically the flu season is the fall season. It may start as early as June or July but it would not peak until much later in the fall or early winter which is the seasonality that we follow with the seasonal flu right now. We feel that because the virus does survive the colder weather so much better, that that is the process that we continue to track with and follow. There will be a major disruption as well with the rest of the societal infrastructure. Not only will health and medical be severely challenged but you'll also see severe challenges with everything else that goes into supporting the infrastructure of a community so you have to take into consideration your truckers. Because those are the individuals who will be moving your supplies, moving your food supplies, moving your medical supplies, moving your pharmaceuticals, everything into place. You have to look at your utility people.

Keeping your heat, keep your water, keeping those kinds of things going. Most of our systems are based on what is called just in time which is basically a three-day supply. It goes for your groceries stores as well as your drugstores and your hospital supply. And so

if you take into consideration that we only have a three-day supply we can see what happens during the snowstorm where our shelves become empty very quickly. It would be very difficult to replenish if a large number of our infrastructure individuals, the individuals who work in the stores doing the stocking and the individuals who bring the supplies in by trucks or rail or whatever method are not there to do that and we would become very short on supplies very quickly. There is a doctrine that HHS feels is very important to be followed. And there are a number of components to it. These are outlined for you on the slides. Basically the first one is that preparedness will require tremendous coordination at all levels from the local level up to not only federal government but internationally as well. And it is also essential that the public be very well informed. So we're beginning to look at what kinds of messaging needs to occur at this point in time.

While we may not see a pandemic this year or next year, it is important to begin educating the public so there is not panic and fear and that individuals are able to help themselves. The domestic vaccine production is going to be very, very critical. You may have already heard that vaccine production is a problem and we're trying to address that in a number of different ways through clinical trials and increased production at this point in time. The quantities of antivirals need to be stockpiled. What they're looking at is treatment for 25% of the population which we currently do not have but they're trying to beef up this production. Sustained human-to-human transmission is going to occur throughout the U.S. as well as internationally. And protective public health measures will need to be employed. Public health will become a critical component of the response. Not only in the planning stages but also during the response as well as in the aftermath. Vaccine will be in short

supply. You have to remember that the vaccine cannot be -- production on it really can't be begun until the virus is identified and at that point in time it is going to take several months before vaccine production is actually completed and we begin seeing vaccine.

The antiviral drug which will be in the strategic national stock piles will be our first line of defense. Those, too, will be limited and not available to everyone. Some of the things to keep in mind as well in terms of response are the fact that the nature of the response is going to be driven a little bit by the epidemiology and features of the virus. I talked about it earlier as to whether or not it will affect your younger population or your older population. So that's a key element. Surveillance is going to need to be done at all levels. We do it now globally but it needs to be done locally within your community as you're talking with your parents -- patients and individuals. We need to address the antivirals a little bit because it does affect your population. The vaccine will be in limited supply. There will be a priority list that has been developed. This is in appendix D in the handouts you've downloaded and you can take a look at not only what the priority lists are for receiving vaccine but what the rationale is for why those individuals were selected and you'll notice that children are fairly low on the priority list for vaccine. There is a couple reasons for that but one of them is the fact that they feel the children are going to be more able to resist the disease and have a healthier outcome.

The second reason is that the children do well with the flu mist which is something that can be used with that population of individuals. And this could change if we find that children are the population most affected, they may come up higher on the priority list.

Same thing with antivirals. Not everyone will receive antivirals, that would be done on a priority basis as well and also in appendix D. You might want to take a look at it. I'm going to move a little quicker through some of the strategic plan because I do want to make sure that we get to some of the key elements and don't run out of time. The response roles for HRSA are basically dealing more with communication, as well as coordination and surge capacity. I think that what we saw was during Katrina, many of our HRSA programs played a key role in trying to provide services to populations that were affected and this included not only our health centers and healthcare for the homeless programs but it also included some of the MCH programs so we are paying attention to the fact that HRSA does have a large number of programs that could be very adversely affected in our populations. Our populations could be affected. One of the things going on is the department is doing a little bit of field testing with MEDI kits. They contain antivirals as well as -- I'm not sure what else will be in them. They'll be distributed in two pilot communities to see what would happen if individuals had these kits available at the start of some type of an outbreak. So this may be something that is done in the future and we're pilot testing it at this point in time to see what happens. The WHO has come up with a global pandemic influenza phases and basically those phases are laid out on the slide. During the interpandemic phase there are no new influenza viruses circulating. We aren't at that point in time. We're past phase one. Phase two there is no new viruses circulating in humans but there is an animal virus circulating. We passed phase two. We are actually now in the pandemic alert phase, phase three.

Basically what we're seeing is that there is human infection going on but that there is not a lot of human-to-human spread. It's fairly rare. We're already in the pandemic alert period and we're in phase three. Phase four would be when we begin to see these clusters occurring on a more regular basis. And then phase five is where we begin to be concerned about moving into an actual pandemic period, which is your phase six. So these are the phases that are being used to kind of keep a handle on what is going on with the pandemic. Part of what we're looking at now is why H5N1 virus has become such a concern for us to take a look at. One of the -- one of the main reasons is that our population is much larger now than it was in 1918 or even in 1957 and 1968. It is much more urbanized and the virus is able to transmit within these populations much more quickly.

We live in much closer confines. We have a lot more international travel. And this allows the virus to be able to spread much more quickly. Then the third thing is we have a lot more elderly than we had in past pandemics. Those with a lot of chronic medical conditions. We have a lot more immune disease, autoimmune diseases and a lot more conditions that make our populations perhaps a little bit more susceptible to the effects of a very virulent virus. The virus spread in four to five months from China in 1957. In 1968 it spread within two to three months from Hong Kong. The major take away message from this is the fact that there will be very minimal time for preparation once this virus is identified. So the planning and the preparation is critical to begin now because once it is identified we're already past the point of being able to do major preparation. It will spread very, very quickly. The primary goal in the pandemic response still continues to be to

decrease the major health impacts on morbidity and mortality but the secondary goals have to be to minimize societal and economic impacts. Those are the things I talked to you about regarding your other infrastructures. Your trash collectors, your truckers, your utility workers. Everything else that goes into supporting the societal infrastructure. And this is also important when you begin to look at who receives vaccines and antivirals. Of course healthcare providers need it but there are many other individuals who need consideration as well to keep our infrastructure going.

Some of the critical assumptions that were taken into consideration when the national vaccine advisory committee began taking a look at the recommendations for prioritization for vaccines, they looked at the workforce figuring 25% to 35% of the population would become ill and you would have a large number of the working adults who would experience illness as well. And that the critical infrastructure would need to be protected but we don't have a lot of information on what that critical infrastructure will look like and how many number of individuals will need to be protected. It is expected that the vaccine, like I said, will not be available for a minimum of four months. It could be as many as six to eight months before production capacity actually is ready for us to receive vaccine. It is expected that we will need to receive two doses of the vaccine much like you see when infants and young children begin receiving vaccine. These doses will occur about a month apart from each other and so as they're doing the priorities they'll need to be able to set aside sufficient vaccine for that second dose to be given.

The production capacity at the moment we only have one company in the U.S. which is in Pennsylvania who is producing vaccine. This is the same company who produces our seasonal vaccine. So basically once the pandemic influenza virus begins circulating they'll stop seasonal production and begin pandemic production. They don't have the capacity to do both at the same time. They can only produce about 1% of the vaccine that will be needed for the population per week and so you can see very quickly that it is going to take almost a year before we have sufficient vaccine to cover the entire U.S. population. When it comes to antiviral drug use, basically there are two classes of drugs at this point in time. One is what they call the N1 inhibitors, these are the ones we're looking at for use with treatment of H5N1 virus. The virus is already sensitive to this class of drugs and that's the class of drugs that is the cheapest and the most abundant in the national strategic stockpile at this time. We're looking really at Tamiflu on the open market. It decreases the shed of the virus and it decreases the number of days of hospitalization. This will be our first line of defense along with isolation early on in the pandemic. It cannot probably be used for prophylaxis, only treatment. Treatment doses are two pills per day for five days. Where as prophylaxis would be two pills per day for the period of the wave of the pandemic which could be six to eight weeks.

Given that we have very limited production of Tamiflu at this point in time it won't be possible to do that with a number of people at this time. The antivirals production is in Switzerland made by Roche but beginning production in U.S. plants. It will be 2007 before the production capacity is sufficiently large to cover 25% of the U.S. population. During 2005/2006, early 2007 we'll be limited in the amount of Tamiflu that's available.

There is a second drug which is Sonanivere and this is basically an inhaled antiviral and it's thought to be a better drug to use with pregnant women because there is less absorption but still be effective. The drawback to that you would need not only the drug itself but you would also need the device in order to be able to administer the drugs. It has its drawbacks for some populations of people. The antivirals will be in the stockpile. The vaccines cannot be stockpiled because of production. I guess at this point in time what I want to do is just sort of direct you to a couple of the handouts. As I said, the appendix D is the national vaccine advisory committee recommendations on antiviral and vaccine priority use. And I think that those two documents are critical for you to take a look at.

I've also given you the linkages to the HHS pandemic influenza plan as well as the homeland security council strategic plan for influenza planning and there is one other one. I don't know what it is at the moment. Let's see. Oh, OK, the third one is just the department's website on pandemic flu. This is a good resource because we will be posting things to it on a regular basis to keep you updated as to what is happening across the federal government on pandemic flu. I encourage all of you to take a look at those websites and to just kind of monitor them. The third document that I have included for you is the trust for America's health entitled a killer's flu which provides a good background for you and some of the history and why we're concerned about it. I can take questions at this point.

PETER Van DYCK: Thank you, Laura, very much. Very, very informative. Are there -- remember, you can type your question in and we'll read it off here and get it answered for you. Chris, are there any questions?

Chris deGRAW: We have one question at this point. Are there any contraindications of live virus flu vaccination or use of antivirals during pregnancy?

LAURA McNALLY: Yes. And that is part of the reason why it's thought that the inhaled form of the antivirals is going to be a better choice of drug to use for pregnant women. I think that vaccine is also considered to be a good choice for pregnant women and part of the reason habit will allow some immunity to the unborn child or infant if the mother is given the vaccine. So yes, that's discussed in the appendix D as well.

CHRIS deGRAW: That's all the questions we have at this point.

LAURA McNALLY: OK. I have included my contact information if something comes up later on. And I thank you.

PETER Van DYCK: Well, we want to thank you all very much for participating in our monthly call. I would like to thank our contractor, the Center for the advancement of distance education at the University of Illinois in Chicago School of Public Health for making all this technology work. Today's webcast, as with all the other mchcom.com will be archived and usually available on the website mchcom.com. We would like to make

these mchcom.com webcasts as responsive as we can to your information needs so it's always helpful to receive suggestions for topics that you would like addressed on future broadcasts. And if you have comments you would like to make in general, then you can email them to info @ mchcom.com. On behalf of Chris DeGraw and Laura McNally, our speaker and myself, have a wonderful week and holiday season and we look for your participation again next month. Thanks very much.