

**37th Union World Conference on Lung Health:
Plenary: Avian Influenza:
How Ready Are the Health Systems to Detect and
Manage the Purported Pandemic?
November 4, 2006**

¹ kaisernetwork.org makes every effort to ensure the accuracy of written transcripts, but due to the nature of transcribing recorded material and the deadlines involved, they may contain errors or incomplete content. We apologize for any inaccuracies.

**37th Union World Conference on Lung Health:
Plenary: Avian Influenza: How Ready Are the Health Systems
To Detect and Manage the Purported Pandemic?
11/04/06**

2

[START RECORDING]

ASMA EL SONY: Good day, ladies and gentlemen. It gives me great pleasure to introduce to you Dr. Enis Baris, who is a medical doctor with graduate degrees in public health and epidemiology and a wide range of experience in development and research in over 30 countries. Prior to joining the World Bank, Dr. Baris worked in academia for the World Health Organization's regional office in Europe, and more recently at the International Development Research Center of Canada as chief scientist and senior scientific advisor. Dr. Baris initiated and managed numerous single- and multi-country research and development projects on macroeconomic adjustment policies, health sector reform, and on public health challenges such as tuberculosis, malaria and HIV/AIDS. While with IDRC, he also was inhibitive director of the research for international tobacco control, a multi-donor-funded secretariat to promote public policies for tobacco control. He also served on the board of the Council of Health Research for Development and the Alliance for Health System and Policy Research.

Since joining the Bank in 1999, Dr. Baris, as a senior public health specialist, has been engaged in policy dialogue, preparation of projects on health and human development in the regions of East Asia and Pacific and

¹ kaisernetwork.org makes every effort to ensure the accuracy of written transcripts, but due to the nature of transcribing recorded material and the deadlines involved, they may contain errors or incomplete content. We apologize for any inaccuracies.

**37th Union World Conference on Lung Health:
Plenary: Avian Influenza: How Ready Are the Health Systems
To Detect and Manage the Purported Pandemic?
11/04/06**

3

Europe and Central Asia. His technical work at the Bank also includes development research on HIV/AIDS, tuberculosis, indoor air pollution and lung health, as well as other health system development issues. He is a board member and chair of the Coordinating Committee of Scientific Activities of the International Union against Tuberculosis and Lung Diseases. He also sits on the editorial board and frequently acts as peer reviewer for several international, peer-reviewed journals. He is going to speak to us on Avian Influenza: How Ready Are the Health Systems to Detect and Manage the Purported Pandemic. Ladies and gentlemen, welcome with me Dr. Enis Baris.

[Applause]

ENIS BARIS: So I guess after this presentation, the first question you will ask is why it is me who will be making the presentation on avian influenza, I guess. I think you wouldn't be that wrong because when I was asked by Nils and colleagues to make a plenary presentation on avian influenza about six months ago, I was quite excited about that because I was in the thick of preparing a number of avian influenza preparedness projects in four countries at the same time, so I was traveling a lot in the [inaudible] Region in Turkey and being quite frustrated with basically the lack of very immediate and very effective international

¹ kaisernetwork.org makes every effort to ensure the accuracy of written transcripts, but due to the nature of transcribing recorded material and the deadlines involved, they may contain errors or incomplete content. We apologize for any inaccuracies.

**37th Union World Conference on Lung Health:
Plenary: Avian Influenza: How Ready Are the Health Systems
To Detect and Manage the Purported Pandemic?
11/04/06**

4

response, including my own agency, to be able to go to these countries and give them the most up-to-date, scientifically validated, rigorous advice and work with them to solve the problem. So I was very much concerned with the readiness of the healthcare systems. On the other hand, if you go one year before – even though as Asma said, I am a medical doctor in epidemiologies – I knew next to nothing about avian influenza in general. Here I am a year later making a plenary presentation on avian flu, so let's see how it goes.

Basically, I will be talking very briefly about the virus, the influenza epidemiology, and the basic roots of transmission, clinical features and history, as well as the current [inaudible], but I think the bulk of my presentation will be on system response, how the systems have responded, what the potential is for a worldwide pandemic, what the socioeconomic impacts, what the priorities are in preparing for a potential pandemic, and how we can assess the degree of readiness and preparedness of different countries. I will conclude with some general remarks.

Let's first review very briefly the virus, which is called H5N1. This is a virus which is found generally in wild, aquatic ducks and geese. It is these animals, these wild animals that are vectored to the virus itself, but they don't necessarily get sick with the virus. The virus, when

¹ kaisernetwork.org makes every effort to ensure the accuracy of written transcripts, but due to the nature of transcribing recorded material and the deadlines involved, they may contain errors or incomplete content. We apologize for any inaccuracies.

it is transmitted from these ducks and geese to other animals like more territory geese, as we say – not wild ones – and turkeys and quails, they acquire a certain degree of pathogenicity; thereafter, when they go to the poultry [inaudible] domesticated animals, especially H5 and H7, they become highly become highly pathogenic. So we always make a distinction between what is low pathogenicity – basically in geese, turkeys, et cetera – and high pathogenicity, which basically means that the animals will die in about 24 to 48 hours after having acquired the virus.

We often talk about H5, H7 and H9. You know that these are proteins on the surface of the virus. H stands for hemagglutinin and N for how many days. These are the two proteins. Basically there are 16 H and 9 N, so there is a combination of – I think – 144 different subtypes of the same virus and their pathogenicity changes, of course, depending upon the H and N configuration, but also through a lot of mutation. Mostly, these viruses are transmitted from one animal to another animal through feces, but also through the use of contaminating the same kind of water or food. There is also some reports in the literature that the transmission can occur in other animals, especially in animals like cats and pigs and even the horses.

¹ kaisernetwork.org makes every effort to ensure the accuracy of written transcripts, but due to the nature of transcribing recorded material and the deadlines involved, they may contain errors or incomplete content. We apologize for any inaccuracies.

The transmission to humans – and this is a very important point – is not necessarily very clear. There is in the literature records of transmission from human to human, but that is really something that needs to be confirmed. I think we need to be very careful here because if you look at the pandemic classification in the world, we are in stage 3, which means that usually there is no real, proven human-to-human transmission. There may be some sporadic cases that really need to be confirmed. Actually, a virus like this, for it to be transmitted easily to humans – according to the literature – requires about 10 mutations, but sometimes what happens in avian influenza virus is basically reassociates genetic material with a human influenza virus and then all of a sudden it can become very pathogenic in humans.

This particular virus, H5N1, replicates more easily in lower respiratory systems, rather than upper respiratory systems. This is one of the reasons given in the literature for its low degree of transmission to humans and between humans. It attacks the immune system. It's basically an immunopathology [inaudible] in the lungs and it becomes highly fatal. The fatality rate, depending upon the countries, is about 60-percent in general. Since it's an RNA virus, its genetic material is very unstable. That means that it really mutates very rapidly. As it mutates,

¹ kaisernetwork.org makes every effort to ensure the accuracy of written transcripts, but due to the nature of transcribing recorded material and the deadlines involved, they may contain errors or incomplete content. We apologize for any inaccuracies.

obviously, not only does its pathogenicity change, but also it may acquire resistance to different antiviral drugs. Amantadine is an example. It has been shown already that there is some resistance, but possibly to Oseltamivir, which is the Tamiflu, as you know, the brand name.

If you look at its epidemiology, basically, avian influenza virus is very widespread in nature. It has been isolated in more than 90 species. It occurs around the year in most tropical countries, often in the winter in moderate climates. If you go to Southern China, I think you will be able to find most kinds of strains there. As I said, the virus changes its genetic makeup. Basically, in the literature, we make a distinction between antigenic shift and antigenic drift. Antigenic drift is something that happens rather slowly, but regularly, and the virus changes its genetic makeup. It may also become more pathogenic and less pathogenic, but the most important and the most concerning one is what we call antigenic shift, which is basically re-assortment of the avian virus with the human virus that all of a sudden becomes highly pathogenic to humans and there is no immunity for human beings. Then it causes epidemics and I will give you examples in a few minutes.

Every year, we have more or less 700 million to 1.2 billion episodes of influenza. Obviously, these are regular

¹ kaisernetwork.org makes every effort to ensure the accuracy of written transcripts, but due to the nature of transcribing recorded material and the deadlines involved, they may contain errors or incomplete content. We apologize for any inaccuracies.

influenza A type influenza in humans. Every year, we lose more or less 300,000 people to influenza. But if you look at the surveillance systems around the world, the estimated number of samples collected around the world is about 158,000. So we are talking about 1.2 billion people – and this is a note that I'll get back to later – getting influenza a year and collecting samples on 160,000. Many people think that influenza surveillance is really still in dark ages. We don't know what is going on out there; we are not able to track all the mutations and pathogenicity. Lots of people may be acquiring it and some people may be dying of it and we don't really know how big the problem is. That is something that I think we have to keep in mind. As far as the Avian flu is concerned, the H5N1 type, there have been epidemics in Vietnam and Thailand, although the first cases were reported in Hong Kong in 1997. So far, as of October 2006, only 256 reported cases by WHO in 10 different countries.

I think this is how we should be seeing the whole transmission. Basically, you have the wild birds that are vectors and they don't get sick, then there is the terrestrial fowl, the chickens and hens, et cetera, and then the humans. The two key points here are when these three groups basically interact and be in touch with each other,

¹ kaisernetwork.org makes every effort to ensure the accuracy of written transcripts, but due to the nature of transcribing recorded material and the deadlines involved, they may contain errors or incomplete content. We apologize for any inaccuracies.

when the wild birds – obviously, wild birds with the virus – they are in touch with the terrestrial fowl, then we have episodes. Since 1959, we had 24 highly pathogenic avian influenza episodes in chicken and hens, in domesticated animals basically. Again, since 1959, there was only 1 case. We had a number of cases – not really pandemics – I should stress this point, that we are not talking about human influenza pandemics, but we are talking about avian influenza here, but there have been cases since 1959. So I think these two points – we will get back to that – are very important, the intersection between the wild bird, the terrestrial fowl and the humans.

If we continue with the routes of transmission, especially at the very beginning last year in November or December when we were talking about that, we were thinking of migratory birds and their flyways and how they will basically take off from a lake in China and through Siberia, will through Europe, to the Middle East, to Africa and to some of the European countries – that is obviously true, but we should not be thinking that that only way that the virus is transmitted is through migratory birds to terrestrial fowl. There is also other ways and most of them are manmade. In the literature, again, what is discussed is Trans Siberian Express. Basically, there is this train that leaves China

¹ kaisernetwork.org makes every effort to ensure the accuracy of written transcripts, but due to the nature of transcribing recorded material and the deadlines involved, they may contain errors or incomplete content. We apologize for any inaccuracies.

and crosses Siberia all the way to Moscow. Along the road, there is a lot of human and animal interaction, people basically buying eggs and chickens and the birds are there. People are now thinking that this may have also played a role in the transmission of the virus and its migration from Asia to Europe. But often the transmission is through the fecal/oral route, as I said, through contaminated feces and water, et cetera. For humans to acquire it, it requires very close animal/human contact. I put a picture here for you to see that in Indonesia these kinds of practices may be common and therefore may result in human infection. It is basically a woman kissing her chicken.

Let's see what to call the influenza-like illness. In most cases, as you know, we are not in a position to diagnose right away whether it is the usual human influenza or avian influenza. First, obviously, there is a syndrome we call influenza-like illness, which has an incubation period of 1 to 14 days, but usually it is 3 to 5 days. It is usually like the human flu, the same symptoms - more or less high fever, cough, shortness of breath, et cetera - there may be some radiologic evidence of pneumonia and some other symptoms in size like the area, et cetera, but often the death comes from complications of acute respiratory distress syndrome and multi-organ failure, basically causing the

¹ kaisernetwork.org makes every effort to ensure the accuracy of written transcripts, but due to the nature of transcribing recorded material and the deadlines involved, they may contain errors or incomplete content. We apologize for any inaccuracies.

respiratory system to collapse. Most people who are infected start shedding virus around even the day before the symptoms become visible. I think that is important to keep in mind because it has implications for therapy eventually. They stop basically transmitted the virus in the air about 5 days.

There are three different types of case definition. Obviously, there's the influenza-like illness that I just mentioned, then how we can say that it may be due to avian influenza, and then we have to look for history of close contact with other humans or animals. We have proven the H5N1 infection already. These are simply health professions who are using samples contaminated with H5N1. The probable definitely is, obviously, all of the above, but also there may be some signs of pneumonia and also some other symptoms due to the pneumonia, but also positive [inaudible] confirmation, which basically comes from samples you collect from the throat or trachea of people who are suspected of having influenza. The confirmation is made by isolating the H5N1 virus and also PCR tests, positive identification of H5 protein, and eventually you can look at the serum for antibodies as well. So it is important to think of the case definition in three steps. You may suspect cases, you may think that they are probable, but obviously confirmation is through isolation of the virus itself or its genetic material

¹ kaisernetwork.org makes every effort to ensure the accuracy of written transcripts, but due to the nature of transcribing recorded material and the deadlines involved, they may contain errors or incomplete content. We apologize for any inaccuracies.

through different tests. So history itself cannot necessarily confirm that these are avian flu cases.

If you look at the history of the influenza A epidemics in the 20th century, as I'm sure all of you know, the first pandemic was in 1918 and was called the Spanish Flu. It cost 40 to 50 million lives. It was during the First World War, so the numbers are obviously difficult to determine with certainty of exactitude. Asian flu, in 1957, is believed to have cost 1 to 4 million lives. Then there was another one in Hong Kong, more or less the 1 to 4 million lives, in 1968. H5N1 also basically began in 1997 with a cluster of cases in Hong Kong. So if you look at the timeline, basically from 1918 to 2005, you see that there have been a number of cases in animals over the course of the years. The first really human cases due to avian influenza began in 1997, as I said, in Hong Kong. Then we had some cases in 1999, 2003 in Vietnam and Thailand, et cetera, in about 10 countries. This is a slide which very nicely summarizes the cases in humans and different kinds of animals, how it began in China and then in Hong Kong, then it spread to Thailand and Vietnam and eventually to other countries. So, as you see, we have had human cases in 10 countries: Azerbaijan, Cambodia, China, Djibouti, Egypt, Iraq, Thailand, Turkey, Vietnam and Indonesia. But we had

¹ kaisernetwork.org makes every effort to ensure the accuracy of written transcripts, but due to the nature of transcribing recorded material and the deadlines involved, they may contain errors or incomplete content. We apologize for any inaccuracies.

avian influenza, obviously, in animals in many, many more countries, including a lot of European countries as well, except North America I should say.

This map summarizes the human cases. As you see, we have mostly East Asian countries, China, Vietnam, Cambodia, Thailand, and Indonesia. Then we had a few cases in Azerbaijan, Turkey, Iraq, Egypt and Djibouti.

This map summarizes both the countries with poultry and wild birds killed with H5N1 and also the countries where we also had the human cases. I think what is important here is that you see that the avian virus is very, very widespread across the Asian continent, the European continent and also the African continent. For the moment, the only continent that is spared is the Americas.

This is the number of cases, as of October 16, reported to WHO. As you will see, there are 10 countries for a total of 256 cases and 151 deaths so far. As you see, the case fatality rate is quite high at about 60-percent, although in some countries it is a bit different. Some people try to explain it by saying that in those countries the cases were detected early on and they were put on antiviral treatment and therefore the case fatality was lower, but the numbers are too small to make a really strong assertion.

¹ kaisernetwork.org makes every effort to ensure the accuracy of written transcripts, but due to the nature of transcribing recorded material and the deadlines involved, they may contain errors or incomplete content. We apologize for any inaccuracies.

Let's look at the system response now. The first thing, obviously, is the surveillance. In my opinion, it is the weakest link. First of all, the veterinary surveillance, especially in developing worlds, whether it is middle income or low income, is extremely bad. It is very, very difficult to find out unless there is a mass number of deaths in chickens and then you get samples. But often there is a problem with diagnosis. For example, we know that in India and Nigeria, when they had avian flu in chicken, the first diagnosis was Newcastle disease – Newcastle disease is a very common viral infection in chicken, which also has high mortality, but the diagnosis is often the problem on the veterinary side. On the human side, it is also a problem. I think if you look at the recent history of human disease, there have been 117 emerging new human diseases and more than 50 of them actually jumped from animals. We are not really, globally and frankly speaking, in a position to monitor them all. Flu monitoring is also not that developed, except in the USA where there is real-time disease reporting in about 120 cities surveyed by the CDC. In the rest of the world, it is not like that. You often have voluntary physicians who are part of a sentinel site in a country, and then they will report periodically the number of flu cases – or, I should say, ILI that they have, but often these are based on the

¹ kaisernetwork.org makes every effort to ensure the accuracy of written transcripts, but due to the nature of transcribing recorded material and the deadlines involved, they may contain errors or incomplete content. We apologize for any inaccuracies.

reports and not necessary case confirmation with the sampling. As I said, globally, there have only been 160,000 samples collected and confirmed by laboratories, so it is a major problem.

The other issue with regard to surveillance is the collaboration. In many countries you have, obviously, the ministries of health, ministries of environment, ministries of agriculture, ministries of finance, et cetera, and it is not always easy to bring them all together and work together and have a common surveillance scheme. It doesn't mean that they have to do the surveillance together all the time, but there has to be certain collaboration. Now, in some of the projects I'll talk about later, what we have developed is what we call the [inaudible] disease committee with representatives from different ministries informing each other regularly. There are also some other means and we'll talk about them a little bit later. This is something that is lacking in most countries, the surveillance and also the response, which I will, again, talk about later.

The other issue is the need for full international collaboration between WHO, OIE and FAO. As you know, WHO is in charge of global public health, FAO is mostly related to food hygiene and safety, and OIE is mostly related to what is called trade of animal and animal products. OIE is basically

¹ kaisernetwork.org makes every effort to ensure the accuracy of written transcripts, but due to the nature of transcribing recorded material and the deadlines involved, they may contain errors or incomplete content. We apologize for any inaccuracies.

based in Paris. FAO is in Rome. WHO is in Geneva. Until recently – and I think this may be one of the positive things that came out of this recent global experience with avian flu – they were pretty much working in parallel. Now I think there has been this initiative to put them all together, to work together, to put their efforts together for global surveillance on the veterinary side and also on the human side.

The key things – I'm coming back to this slide because I think it is important to show – are that we have to have a very well-developed veterinary surveillance system and we have to have a very well-developed epidemiologic surveillance system. I think that globally it will be unrealistic to expect that we will have a very effective veterinary surveillance system in place in most countries. What will be important, especially for us public health workers, is to make sure that we will have the epidemiologic surveillance in place so that we can identify that index case very, very quickly. I'll give you some examples of failing to do so.

As for case detection and outbreak investigation, obviously, we need more epidemiologists. I don't think that we have enough. I'm not talking about epidemiologists in the general sense of the word. Obviously, there are

¹ kaisernetwork.org makes every effort to ensure the accuracy of written transcripts, but due to the nature of transcribing recorded material and the deadlines involved, they may contain errors or incomplete content. We apologize for any inaccuracies.

epidemiologists and the numbers will vary from one country to another. I'm talking about field epidemiologists who can go and very quickly mount a survey for case detection, identifying the index case and the second cases, et cetera, and then come up with a report on which one can [inaudible]. That is lacking. That is lacking even in European countries. I will refer to that later. You need national coordination – not only, as I said, between the government agencies, but also between villagers, health workers and scientists. That also means that there has to be very good communication that is open, transparent and impartial between all these groups. Then we need real-time intersectoral action to be able to go to the field and basically extinguish the fire on the spot. But all of these will require better laboratory capacity as well, as you know.

Confirmation of cases is very important. I'll give you an example from my own experience recently from two countries. For example, in Turkey, when they first detected the case in the eastern part of Turkey, close to the Iranian border, the sample was taken and analyzed by the reference laboratory in Ankara about 20 hours. It took less than 24 hours for the first sample to be taken from the patient and to go to Ankara to the laboratory. Now, this is quite good. I will say that it is really very good, especially given the

¹ kaisernetwork.org makes every effort to ensure the accuracy of written transcripts, but due to the nature of transcribing recorded material and the deadlines involved, they may contain errors or incomplete content. We apologize for any inaccuracies.

fact that there is about 1,000 km between the city where the sample was taken and where the reference laboratory was located. Compare this with what happened in Azerbaijan when there was first sample taken and the sample was not transported to the capital Baku. There was no laboratory test that could make a quick confirmation. They had to wait for the sample to be taken out of the country to another reference laboratory. There was not a container that would be acceptable to international carriers like [inaudible] to take the sample and to carry it to another country.

Therefore, it took about two weeks, if I remember correctly, for some bilateral agencies to bring the PCR [inaudible] from another country to Azerbaijan to analyze the samples and then they had to procure a new container that would be acceptable to international carriers to take the sample to London to the reference laboratory and to Egypt eventually. So this is obviously very, very important and I just gave you two examples from two different countries. I'm sure most of the countries would be somewhere in between, but in a case like that, it is extremely important to be able to confirm the cases right away.

The treatment is also important? Why? Obviously, the literature says that if you put people on antivirals during the first two days or so when they are mildly symptomatic,

¹ kaisernetwork.org makes every effort to ensure the accuracy of written transcripts, but due to the nature of transcribing recorded material and the deadlines involved, they may contain errors or incomplete content. We apologize for any inaccuracies.

that may reduce hospitalization and eventually death. I think there is some report that up to 60-percent of the hospitalization may be reduced with early treatment and maybe 30 to 40-percent of deaths. But these are some reports and are based on a limited number of studies as well.

Case management is extremely important. Imagine in a situation like that where people don't know what they are really handling, how to transport these patients, whether they are contagious, how to give protective gear to people, whether the hospitals have ventilators, whether you can put them in the ICUs, whether you can check the blood gases, et cetera, and how to protect the personnel. These are all very important aspects of case management and I can assure you based on my experience of visiting several countries and hospitals and ICUs and looking at the ventilators, outdated equipment and protective equipment, et cetera, it is obvious that the countries are not ready for this. Counseling, as well, is very important because there is always media hype where people are talking about a new pandemic that's at the door and you have to obviously talk with the parents, the villagers, the larger community and, indeed, with the whole nation.

Antivirals – as I said, they may help contain the outbreak and delay the pandemic if administered early. They

¹ kaisernetwork.org makes every effort to ensure the accuracy of written transcripts, but due to the nature of transcribing recorded material and the deadlines involved, they may contain errors or incomplete content. We apologize for any inaccuracies.

should not be used for general prophylactic reasons. First of all, you can simply induce resistance, obviously, and it may not be cost effective. In most cases, the countries do not have enough in stock to be able to give it to the general population, so it has to be localized and targeted use. The production of Oseltamivir has increased from 190 million doses to 400 million. I believe WHO also received about 8 million or so from [inaudible] company freely for using it in emergency conditions. But one has to keep in mind the potential for resistance and that there is also a need for injectable antivirals so that they can be used directly and more effectively.

It is estimated that in most countries, if you have enough in stock to cover 20 or 25-percent of the population – usually it is said in an influenza pandemic situation, about 20-percent of the population will get infected. That means that if you have stocks for 20 or 25-percent of the population – like 80 or 90-percent of the population may be get affected – than this may help contain the pandemic. But obviously, first use, especially if the stocks are not there, should be reserved for persons at high risk. In terms of stocks, again, based on my experience in many countries, there are not enough stocks. Obviously, it is a very, very contentious area because, if I remember correctly, it costs

¹ kaisernetwork.org makes every effort to ensure the accuracy of written transcripts, but due to the nature of transcribing recorded material and the deadlines involved, they may contain errors or incomplete content. We apologize for any inaccuracies.

about 10 Euro a dose. If you make such a huge investment to put 1 million doses, for example, in stock and if it doesn't happen, what do you do with that? So, obviously, there is a cost for readiness, but this has to be [inaudible] very carefully.

In terms of the containment of pandemic, I maintain that the most important thing is hand washing. It is as simple as that. That is the most important public health message. If people keep on washing their hands, probably there will be less infection. Vaccinating is important. We don't have vaccines. I will talk about that in a minute. Vaccination against influenza always comes a few steps behind the mutation. As you know, for example, there is usually a human influenza vaccine that comes to the market in the fall, but is often based on the viruses isolated the year before, so this is something that we have to keep in mind. But, obviously, if we can have efficacious vaccines, that can be a very effective tool to use.

Mass communication is exceedingly important. Again, if I can give you an example, I think in Turkey they did it quite well. They set up a crisis group in the ministry of health and started passing messages. I was looking at the messages at that time and they were very consistent. They were very consistent within the nation and also

¹ kaisernetwork.org makes every effort to ensure the accuracy of written transcripts, but due to the nature of transcribing recorded material and the deadlines involved, they may contain errors or incomplete content. We apologize for any inaccuracies.

internationally. Usually, when you don't have a good mass communication strategy, what happens is some person might say that we have 20 more cases and 5 people died and the international media says something different and there is no more trust in the system. Mass communication is extremely important to basically alleviate the fear, telling people what is happening, whether they can eat eggs, whether they can eat chicken, whether they have to cook chicken at a certain temperature, et cetera, and also how they have to behave. In many developing countries, as you know, people sell chicken on the street. Live chicken can be bought and slaughtered right on the spot. Actually, I would really highly recommend that you look at some of the pictures coming from East Asia to see the ecology in which chickens and humans live together. With all this interaction, there are so many public health messages to pass. Social distancing can be effective measure. School closure can be effective, as can cancellation of mass events like concerts and mass gathering football games. Domestic travel should be discouraged, but, on the other hand, we don't really have any evidence that isolation and quarantine can be effective or that border closing can be effective. As you know, viruses pass from one country to another very easily. Let me give you another example. I was once going by land – again during

¹ kaisernetwork.org makes every effort to ensure the accuracy of written transcripts, but due to the nature of transcribing recorded material and the deadlines involved, they may contain errors or incomplete content. We apologize for any inaccuracies.

the preparation of this avian flu project – from Armenia to Georgia we were stopped at the border. We saw this man with some kind of device on his back and he was spraying all the cars. He had protective gear that was half open and he was smoking and spraying the tank on the tires of our car. When I asked him what he was doing, he said that this would kill all the viruses. I think that is a border control measure of very dubious effectiveness I would say. I'm not saying that this should not be done – if it is done effectively, it may help – but at the end of the day, the borders are porous, as you know, for many [inaudible] and viruses, there are no passport controls. That is in development.

Several studies are ongoing. It takes about nine months from development to availability. Obviously, you have to develop and you have to test for safety and efficacy and then they have to be available worldwide. World capacity, for the moment, is estimated to be around 300 million doses a year. Also, the virus is mutating rapidly, so a vaccine that may be developed now and may be effective now, may not be effective in two or three month's time. According to the first results of vaccine studies, it may require two different doses, which may be given even three weeks apart. Obviously, this will have logistic problems. Imagine having two doses of vaccine and inviting people to come back in 21

¹ kaisernetwork.org makes every effort to ensure the accuracy of written transcripts, but due to the nature of transcribing recorded material and the deadlines involved, they may contain errors or incomplete content. We apologize for any inaccuracies.

days later on. It is not necessarily the most effective way to secure compliance. Many vaccines that are being developed are also adjuvants, which apparently improve their immunogenicity. Maybe, through the use of different adjuvants, one may reduce the number of doses to one, which may obviously increase compliance eventually. But adjuvants have also the added benefit of giving some cross-protection between different strains of the virus. For most influenza vaccines, the immunity usually lasts about two years. That is also something that we have to keep in mind. Most of the vaccines are still developed using eggs as a medium. The companies obviously have good reason to do so because that is a matter that has been proven and, therefore, they don't have to go back to the FDA or other agencies to get the new method cleared again, so it would reduce the time from first testing to getting it on the market, but also it still takes nine months. I think that we need new methods, cell-culture-based methods to develop vaccines more quickly. The other issue is the protection from litigation. As you may know, during this one flu epidemic in 1976 in the US there were a number of deaths after the administration of vaccines. This is an area where the state can jump in and say, "Okay, I'll protect those who develop vaccines against litigation," which gives more incentive to vaccine producers.

¹ kaisernetwork.org makes every effort to ensure the accuracy of written transcripts, but due to the nature of transcribing recorded material and the deadlines involved, they may contain errors or incomplete content. We apologize for any inaccuracies.

Let's talk about the potential for pandemic. What is a pandemic? I think it is a word that, in my opinion, is used quite indiscriminately. Basically, you make a distinction between epidemic, pandemic and endemic, as you know. Pandemic, unlike the epidemic, is unlimited in place, limited in time. An epidemic is usually limited in place and limited in time. So that means that it may last 6 months, 3 months, 1 year, et cetera, but it will be all around the world, in many countries at the same time. According to one survey in the US, 56-percent of the doctors think that there will be a pandemic of avian influenza in the next four years. The United Nations estimates that there may be between 5 and 150 million deaths worldwide. Obviously, this is a very wide range and the main reason for that is because we don't have good mathematical modeling to come up with more rigorous estimates and more narrow confidence bars.

What are the prerequisites for a pandemic? Obviously, it has to be a new, novel virus against which there is no human immunity, it has to replicate very fast and it has to cause disease, obviously, but it also has to be very efficient human-to-human transmission. Does H5N1 have that? No, not for the time being, but, again, it may acquire it, especially through re-assortment with a common human

¹ kaisernetwork.org makes every effort to ensure the accuracy of written transcripts, but due to the nature of transcribing recorded material and the deadlines involved, they may contain errors or incomplete content. We apologize for any inaccuracies.

influenza virus which affects human beings. That is the way for re-assortment.

In case of a pandemic, what is the likely scenario? First of all, I think most of the people will require some kind of medical care. If you look at, again, some studies coming from the US, it is estimated that there may be an increase of up to 50 or 60-percent in outpatient visits. Imagine the workload of doctors doubling in a case like that. Most countries obviously will not have enough staff, hospital beds, facilities and treatment necessary to cope with such large numbers of people. If there no early antiviral is given to people, many of them may require hospitalization as well and can totally overwhelm the facilities. Obviously, vaccines are the best method for the time being, but as I said, given the world production capacity, we may not have enough to go around. Obviously, there will be a huge market and there will be all kinds of market distortion. Some countries would like to stockpile – I don't even want to get into the chaos that may ensue from limited supply in the case of a very increased demand.

What is important in situations like that is that we can ensure that personal hygiene is improved, reasonable, commonsense travel and quarantine restrictions. These are the kinds of things that we may control a bit with mass

¹ kaisernetwork.org makes every effort to ensure the accuracy of written transcripts, but due to the nature of transcribing recorded material and the deadlines involved, they may contain errors or incomplete content. We apologize for any inaccuracies.

communication and maybe we can reduce, contain and delay the pandemic. Obviously, at the end of the day, the health systems will be very severely tested in terms of their preparedness.

On the socioeconomic impact side, according to my own institution, a severe pandemic could cost the global economy about 3.1-percent of the world GDP, which is a very huge number, obviously. It will be due to cost of increased illness among humans and animals, the costs of all kinds of preventive strategies, but also because people do not report to work and there will be all kinds of destruction in production processes. There are direct costs related to healthcare obviously, but also indirect costs due to loss of productivity. There will also be economic consequences and trade implications. I'm not going to go into detail about this, but, at the end of the day, most of the small-scale farmers, the poorest parts of the population, will suffer the most. Here are some numbers, some estimated, some coming from the countries – for example, the poultry accounts for about up to 2-percent of GDP in East Asia. In case of a single large outbreak in Southeast Asia, the GDP growth can be curtailed by a 1.5-percent reduction in the GDP growth overall. One estimate from Vietnam is that it cost them \$50 million due to a 15-percent reduction the poultry sector.

¹ kaisernetwork.org makes every effort to ensure the accuracy of written transcripts, but due to the nature of transcribing recorded material and the deadlines involved, they may contain errors or incomplete content. We apologize for any inaccuracies.

The same estimate for Indonesia is about 10-fold or \$500 million. In Romania, for example, the sales fell by about 80-percent after the first avian flu cases – obviously, this is the of chicken and eggs, et cetera. In Turkey, there was a reduction of 30-percent. Actually, one estimate we had in Turkey was that the sector was losing about \$3 billion or \$1 million a day. Just image, all of a sudden the market capitalization of the sector goes down 30 or 40-percent in a wake of a crisis like that in a matter of a couple of days. But often what happens is that people, especially the small farmers, lose their livelihood. They are forced to give away their chicken for culling and at the end, this is often staple food, the only source of protein for them, and they lose that as well. So there are implications, economic and socioeconomic implications at the household level and all the way up to the national level.

What are the key challenges? Lack of effective vaccine is a major challenge. The healthcare systems don't have the search capacity to all of a sudden expand their activities. Actually, in most countries, they don't even have the capacity accommodate even the modest pandemics. There is, obviously, the high risk of healthcare workers being affected during a pandemic like that. A bit of a longer-term concern and challenge is that the world is really

¹ kaisernetwork.org makes every effort to ensure the accuracy of written transcripts, but due to the nature of transcribing recorded material and the deadlines involved, they may contain errors or incomplete content. We apologize for any inaccuracies.

increasing in population, increasing in mortality, increasing the "agribusiness" which has been becoming more and more effective and efficient. More pieces of land are claimed by human beings for all kinds of production activities, whether it's poultry, husbandry, et cetera. That means it makes the ecology all the tighter and brings people together. Again, I'm referring to the three intersecting circles. Zoonotic diseases, including the avian influenza, will be a major challenge for us to overcome.

Let me go through a few slides here. In terms of the preparedness, obviously WHO asks all countries to prepare a plan and about 40 countries have done so. But if you look at these plans, they are very good on paper – I don't want to generalize because I obviously didn't see all of the papers, but I saw a few of them and they look good on paper – but if you ask them whether they have the resources to implement those plans, whether they have had any dry run based on those plans, there are very, very few countries that have done so. If you ask them whether they have the material in stock, like antivirals, et cetera, it is also a case that the stockpiles are nowhere near what the need would be. So there is this issue of working on the national plans, of putting the stocks there, training the people, even simple things like transportation material, vials to collect samples et cetera,

¹ kaisernetwork.org makes every effort to ensure the accuracy of written transcripts, but due to the nature of transcribing recorded material and the deadlines involved, they may contain errors or incomplete content. We apologize for any inaccuracies.

so that in the case of a pandemic, quick action can be taken. To date, as I said, there are about 40 or countries that have made their plan publically available. You will look at this list and you will notice that some of the key countries – for example, Vietnam and China – have not made their plans publically available, at least when this was put. Some of the other countries, especially in Africa – for example, Egypt – where we continue to hear that new cases are happening, haven't made their plans publically available either. If you look at the European example very quickly – for example, in Europe, there is this European Program for Intervention Epidemiology Training and by 2001, they had only 43 epidemiologist at that time and 15 Europeans countries trained. According to one survey, they find a number of critical points that were missing. Failure to identify and report cases across countries and within countries, failure to inform other countries, as I said, they didn't necessarily have the preparedness planning, they didn't have the funding arrangements or where the money would come from in the case of increased numbers of cases and samples, et cetera. The information was not necessarily linked to action, et cetera, et cetera.

I think even in Europe – although this is a little bit dated, I just wanted to highlight the critical points

¹ kaisernetwork.org makes every effort to ensure the accuracy of written transcripts, but due to the nature of transcribing recorded material and the deadlines involved, they may contain errors or incomplete content. We apologize for any inaccuracies.

because they are applicable to many countries – even as recently as 2001 and 2002, there weren't enough epidemiologists and there major failures in the area of preparedness. This is a more recent survey coming from the WHO Europe Unit. If you look at this, they basically sent out questionnaires to 56 countries of the WHO European Region and 89-percent of them had some kind of a [inaudible], but in terms of plans, only 55-percent of them. I will not go into details. The degree of readiness and preparedness, depending on the components of the plan, varied quite a lot. For example, one question is "Has the national plan been tested through an exercise?" Only 13-percent of the countries had had some kind of a mock or simulation exercise. Here are different components of the national influenza program. Again, based on this European survey, if you look at the whether the governments – this is Europe, the most developed part of the world, together with North America – if you look at it and whether the government maintains a stock of antiviral drugs, only 43-percent of the countries said that yes, they do. If you go Far East to Vietnam, for example, the situation is not very encouraging. First of all, if you look at the poultry production, most of the poultry production is backyard farming, maybe 80 or 90-percent. It is all the more difficult to intervene at that level, so

¹ kaisernetwork.org makes every effort to ensure the accuracy of written transcripts, but due to the nature of transcribing recorded material and the deadlines involved, they may contain errors or incomplete content. We apologize for any inaccuracies.

humans and the poultry live all together in the same ecology. If you go to the market on the street, you can buy a live chicken and have it slaughtered on the spot. If you look at the country's healthcare system, in terms of antiviral drugs, there is a lack of stockpile and treatment and laboratory capacity, hospital facilities, et cetera. It requires a lot of preparedness for a country like Vietnam, which may not have the resources. Therefore, there is a need for international cooperation obviously. Laboratory isolation is extremely important as a challenge for non-[inaudible] countries because laboratory facilities are often not there, especially the hierarchy in laboratory, having reference laboratories, for example, before the sample could be taken out of the country to an international reference center.

I will very briefly talk about some of the examples from my own personal involvement in four countries: Armenia, Azerbaijan, Georgia and Turkey. This is the European Region in terms of the distribution of the avian flu in birds and in the poultry sector. As you see, a lot of countries and a lot of zones in the same country have been affected. If you look at the [inaudible] regions, Romania, Azerbaijan and Georgia, I think there are a number of things. One is the laboratory system is not in place, although there is a bit of variation. For example, in Georgia, they have a better laboratory

¹ kaisernetwork.org makes every effort to ensure the accuracy of written transcripts, but due to the nature of transcribing recorded material and the deadlines involved, they may contain errors or incomplete content. We apologize for any inaccuracies.

because they happen to have received assistance from the US government recently to build a high-tech laboratory. But in others, they do not have the necessary laboratory capacity. Information systems for mass communication, but also for training of the healthcare workers, were not necessarily there. The sanitary control of markets especially was not necessarily there. We prepared projects in each one of those countries with an animal health component, human health component, and public awareness components so that we can beef up the laboratories first and create, in some reference hospitals, the basics to treat severe cases and transport the cases there and also for public awareness. In Turkey, the situation was a little bit different. After all, it is a middle income and quickly becoming a high-middle-income country. The preparedness was much more advanced. There was good cooperation also between the minister of agriculture and the minister of health. As I said, the cases were detected rather quickly. The overall case fatality was a bit lower, probably because of early action, but, even there, there is a need to have more public health laboratories with target biosafety levels, not only on in Ankara and Istanbul, but also in other places as well.

Am I running late?

MALE SPEAKER: Two minutes.

¹ kaisernetwork.org makes every effort to ensure the accuracy of written transcripts, but due to the nature of transcribing recorded material and the deadlines involved, they may contain errors or incomplete content. We apologize for any inaccuracies.

ENIS BARIS: Two minutes? Okay, I am finishing.

These are the closing remarks. I think the key thing is the permanent state of vigilance. If you think about it, there are 16 billion chicken and 1 billion ducks in the world. The land use is ever increasing. Cattle and poultry production is ever expanding and there is a high mobility of population masses within the countries and across borders. We have several strains of the virus quickly mutating and re-assorting. When you have that kind of a scenario, obviously that means we have to be highly vigilant.

The second thing is that we have to understand that we cannot eradicate this. It will be there. As long as you have wild birds, the virus will be there and there will be different types of virus. The problem itself cannot be solved, but it may be managed. First, we need a much better surveillance of the flu, which is important, and constant subtyping and following very closely all the mutations in different subtypes. We have to have a better surveillance on the veterinary side. Vaccinating poultry has been advanced as one measure. Some countries like China and Vietnam tried, but it is a very tricky thing. If you are highly effective and you can vaccinate all the poultry, it may help. If you don't, then the chicken will not die right away and they will be carriers and the risk of infections for humans will be

¹ kaisernetwork.org makes every effort to ensure the accuracy of written transcripts, but due to the nature of transcribing recorded material and the deadlines involved, they may contain errors or incomplete content. We apologize for any inaccuracies.

higher and also there may be all kinds of resistance to the vaccines that you may be developing for humans. There is a very tricky area that if it can be done effectively, it may be a measure, but otherwise, it is not necessarily highly recommended.

Culling of infectious flocks is a measure. Approximately 200 million chickens have already been culled in the world, but, again, it is not necessarily totally effective, especially in countries where there is a lot of backyard farming. If you look at Turkey, 95-percent of the chicken is in the poultry industry, so it is better circumscribed and you can control. Only 5-percent is backyard farming, in terms of numbers. But if you go to other countries, 80-percent is backyard farming. How are you going to go and ask every villager to be compliant and give you their chickens to cull, especially if there are no compensation schemes, which many countries do not have? That is something that needs to be managed.

Obviously, vaccine production is extremely important. As you know – this will go without saying, but is a bit of a platitude – intersectoral collaboration and international cooperation, especially in cases like this of global nature, will be all the more important. Thank you very much for your attention.

¹ kaisernetwork.org makes every effort to ensure the accuracy of written transcripts, but due to the nature of transcribing recorded material and the deadlines involved, they may contain errors or incomplete content. We apologize for any inaccuracies.

[Applause]

NULDA BEYERS: Thank you very much. I think you should stay there. I think there will be a few questions. [Chuckles] We have time for a few questions.

KEN: Enis, thank you. For a person who started out this presentation saying he didn't know anything about avian influenza, I hereby declare you a subject matter expert; I appreciate it. I have a couple of questions. Has the Global Committee considered a very epidemiologically based approach? I'm disturbed about what you've presented. The places at highest risk are the ones most poorly prepared for the immediate response. How can we not come together as a global community and help these places be prepared, as opposed to having we in the West be prepared and waiting for the Far East to go up in flames? So there is that question. Has that approach been considered? And, of course, I can't help but ask you how do we, as a global community, leverage the preparedness infrastructure for these urgent threats to address the urgent realities, such as tuberculosis, while we wait for the bad things to happen?

ENIS BARIS: I think that there has been relatively quick, I would say, response from the global community. I mean, I know that WHO has made major efforts in putting teams together, epidemiologists, and dispatching them to countries.

¹ kaisernetwork.org makes every effort to ensure the accuracy of written transcripts, but due to the nature of transcribing recorded material and the deadlines involved, they may contain errors or incomplete content. We apologize for any inaccuracies.

I think that the efforts were really there, although I personally think that there are not enough experts around to go from one country to another. Most of these people work very long hours and are traveling from one country to another. The same applied to FAO, based on my own experience in a number of countries, and to the World Bank as well. I mean, yes, I am an epidemiologist medical doctor, but when I started this, as I said, I didn't know much about avian flu. All of a sudden I had to immerse myself in the literature, while traveling at the same time and trying to build programs for different countries. Actually, I raised this with my colleagues at the IUATLD as to why they don't have a SWAT team in the IUATLD that we could dispatch quickly and easily from one country to another to help them. But multidisciplinary teams are needed, not only epidemiologists, but virologists, et cetera. I think this has been an eye-opener and wake-up call for the global community. We are extremely lucky that this virus doesn't transmit so easily from animal-to-human and from human-to-human. If it did, we would have had I don't know how many millions of cases. This is important.

As international finance organizations, if I may go to World Bank and others, I think we moved rather quickly in putting together a global facility where we – in the World

¹ kaisernetwork.org makes every effort to ensure the accuracy of written transcripts, but due to the nature of transcribing recorded material and the deadlines involved, they may contain errors or incomplete content. We apologize for any inaccuracies.

Bank first – if I remember, made about \$400 million available to countries who would seek funding from the World Bank right away, and most of those funds were concessionary funds, so without getting any interest. But also, there have been meetings, like the one in Beijing, where the donor community came together – EU, DFID, et cetera – in pledging money. But the problem often is how to spend this money, how to disperse it right away. It is not necessarily the amount of money because you still have to have a project, you still have to have a program and you have to identify your needs. How many doses of Tamiflu are you going to buy? How many ventilators are you going to buy? That always takes a bit of time, so preparing global response with international agencies in a very brief period of time is not necessarily that quick. Even in Azerbaijan, Georgia, Armenia and Turkey, where we prepared the project, it took us about three to four months to prepare and identify this project and take it to the World Bank Board. They were done really very, very fast compared to the average duration of a project preparation; they were done in 20-percent of the time that it would usually take. To me, that is like a wake-up call. I think we learned from this experience that we have to get our act together – WHO, IE and FAO should get together for surveillance especially and all other agencies also have to put their efforts

¹ kaisernetwork.org makes every effort to ensure the accuracy of written transcripts, but due to the nature of transcribing recorded material and the deadlines involved, they may contain errors or incomplete content. We apologize for any inaccuracies.

together to be able to dispatch multidisciplinary teams, as I said, on-the-spot.

NULDA BEYERS: Ken's question about TB and waiting for disasters to happen?

ENIS BARIS: Could you expand on it a bit.

KEN: The whole point is that we're building this whole new infrastructure for the urgent threat and I think it is very appropriate. The only thing – as I heard Bruce Gallen [misspelled?] say – that is worse than having to prepare for pandemic flu is explaining why you were not prepared, having forecasted it. So I very much accept that at face value. There are so many other unmet needs and yet we have all these resources that are going to building this infrastructure. I think we're challenged to determine how can we leverage that so that while we wait for the pandemic influenza to occur, we deploy the outreach workers that are needed for case identification and case containment for TB – just to name one of multiple unmet health needs?

ENIS BARIS: Okay, excellent question. I will fully agree with you. Actually, when we started putting these projects together, we really had to make sure to the countries that this is not just for avian flu. You have to have a surveillance system period, not just a surveillance system for avian flu. I think that the people that we are

¹ kaisernetwork.org makes every effort to ensure the accuracy of written transcripts, but due to the nature of transcribing recorded material and the deadlines involved, they may contain errors or incomplete content. We apologize for any inaccuracies.

trying to train through this and in buying the laboratory [inaudible], the emphasis has always been for the overall health system development. Obviously, there may be some particular areas where it has to be for influenza and nothing else if you need special equipment like PCR or whatever, but the emphasis is really on building the surveillance system globally because that is lacking. A few years ago it was SARS; now it is avian flu. Who knows what is going to happen in two or three year's time. In my own personal view, we will keep on having these kinds of threats and challenges, especially of the respiratory type. One of the things that I have been advocating in the Union is that we have to put more and more emphasis on lung health in general because most of the diseases of this nature will have lung health implications. Thank you.

NULDA BEYERS: Thank you. Two more questions – you and you.

MALE SPEAKER: Thank you. This is a comment, rather than a question, to save time. Thank you very much for raising the importance of the avian influenza. No doubt we have lots to do. I just want to give a case of how the TB people can contribute for the avian influenza. For example, you have [inaudible] needs at the international level and national level, but there is also the effort for the district

¹ kaisernetwork.org makes every effort to ensure the accuracy of written transcripts, but due to the nature of transcribing recorded material and the deadlines involved, they may contain errors or incomplete content. We apologize for any inaccuracies.

level. For example, how is the local doctor going to detect the patients with influenza from thousands of them who have backyard chickens in developing countries? Secondly, for the public health actions – for example, the investigation and there's a contact tracing and there's the infection, et cetera, [inaudible] we have collaborated with WHO and tried to produce operational guidelines for the local public health doctors to do the jobs and validate cases, so there is a way that the TB people can contribute to this emerging pandemic if possible.

ENIS BARIS: That's excellent. I think, yes, obviously when you make a presentation like that, you put the emphasis international and national, but most of the work of the outbreak investigation happens at the local level. Again, if I can give you an example from Turkey, where I followed up a bit – if it weren't for the local doctor who suspected that it is maybe avian flu, who sent the patient to a university facility where they have ventilators – although many of the patients died, maybe this would not have been detected so quickly. So everything, at the end, is local. I fully agree with you.

NULDA BEYERS: One more question.

PAUL SUMMERFIELD: Paul Summerfield [misspelled?],
International Society for Influenza and Other Respiratory

¹ kaisernetwork.org makes every effort to ensure the accuracy of written transcripts, but due to the nature of transcribing recorded material and the deadlines involved, they may contain errors or incomplete content. We apologize for any inaccuracies.

Virus Diseases. I just wanted to say, first of all, thank you to you for that very fine summary of the flu situation. Thank you also to the Union for including this session on flu within the congress. I just wanted to make mention of a new initiative trying to assist in one small way with improved scientific responses to the potential flu pandemic. There has not previously been an international society focused specifically on flu and respiratory virus disease. A year ago, what we're not calling ISERVE [misspelled?] was launched. With Blackwell's [misspelled?], we'll be launching in January a new scientific journal on influenza and respiratory virus disease. I'm afraid this is a bit of a marketing ploy, but there are leaflets about the association and the new journal on the front of the podium. Thank you very much.

NULDA BEYERS: Thank you very much. I just want to thank everyone for attending this session. I want to thank Dr. Baris very much for a very enlightening talk. Now, at least, I know a little bit about it. Thank you.

[Applause]

[END RECORDING]

¹ kaisernetwork.org makes every effort to ensure the accuracy of written transcripts, but due to the nature of transcribing recorded material and the deadlines involved, they may contain errors or incomplete content. We apologize for any inaccuracies.