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Stopping an Avian Influenza Threat to Animal and Public Health

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Introduction

Good morning Chairman Johnson, Ranking Member Carper, Members of the Committee. I am Dr. Anne Schuchat, Director of the National Center for Immunization and Respiratory Diseases at the Centers for Disease Control and Prevention (CDC).

Today, I am here to discuss the potential human health implications of the outbreaks of highly pathogenic avian influenza (HPAI) H5 in U.S. domestic, captive, and wild birds and the steps CDC is taking to prepare for one or more human infections with these viruses. Influenza viruses are unpredictable and constantly changing. Influenza viruses in animals provide a reservoir of viruses that can contribute to the emergence of novel influenza viruses with pandemic potential for humans. When a novel influenza virus emerges that can infect and spread readily among people with little or no immunity against the virus, a pandemic can occur. The viruses currently circulating in U.S. birds are novel viruses against which people have little or no immunity – but thus far they do not seem to be able to easily infect humans. Regardless, the circulation of H5 influenza in U.S. birds is of concern to public health, and from a CDC perspective requires vigilance and preparedness.

Over the last decade with the support of Congress, we have made great strides in our ability to detect, respond to, and mitigate influenza virus threats. At CDC we have enhanced surveillance and diagnostic capabilities to rapidly detect new influenza viruses. Our systems provide the scientific basis for vaccine virus strain selection – both for each season's influenza vaccine as well as for pre-pandemic influenza vaccines. We diligently monitor for genetic changes in the circulating viruses, and identify how those genetic changes affect disease, transmission, and/or severity. CDC invests resources in seasonal influenza surveillance systems, laboratory capacity, and vaccination efforts that help prepare for and inform pandemic responses.

Avian H5 Influenza

Avian influenza viruses are influenza type A viruses that circulate in birds. These viruses commonly infect wild birds worldwide and can also infect domestic poultry, other birds, and some other animal species. Avian

influenza A viruses are classified as either low or highly pathogenic viruses, based upon pathogenicity of the virus in chickens, as well as molecular criteria.

In December 2014, the United States Department of Agriculture (USDA) confirmed the presence of highly pathogenic avian influenza (HPAI) H5 viruses in domestic, captive, and wild birds in the United States. As of June 18, 2015, USDA reports that HPAI H5 viruses have been detected in 21 U.S. states, 15 states have experienced outbreaks in domestic poultry or infections in captive birds, and six states have detected H5 in wild birds only. The HPAI viruses detected include an H5N8, reassortant H5N2 and a reassortant H5N1 virus. Reassortment is the process through which two or more influenza viruses can swap genetic information by infecting a single human or animal host. When reassortment does occur, the virus that emerges will have some gene segments from each of the infecting parent viruses and may have different characteristics than either of the parental viruses. These viruses were not detected among domestic poultry or birds in the United States prior to December 2014.

Human Health Implications

CDC considers the human health risk to the general public from HPAI H5 outbreaks in U.S. birds to be low at this time. Thus far there have been no human infections with domestic HPAI H5 viruses associated with the ongoing outbreaks among birds in the United States. Initial laboratory studies at CDC suggest these viruses do not possess molecular properties associated with adaptation to mammalian hosts and do not cause severe disease in animal models as other HPAI H5 viruses have caused severe disease in people in other parts of the world. In general, human infections with avian influenza A viruses are rare. When they have occurred elsewhere in the world, person-to-person spread has been extremely rare. Most of these human infections with avian influenza A viruses occurred in people who had close, prolonged, unprotected contact with infected birds or the excretions/secretions of infected birds (*e.g.*, droppings, oral fluids). Sustained person-to-person transmission with avian influenza A viruses has not been documented to date anywhere in the world.

We must remain vigilant and be prepared: other HPAI H5 viruses, such as the Eurasian H5N1 and H5N6 have resulted in severe illness or death in humans. It is possible that human infections with HPAI H5 viruses may occur in the United States. With more infections occurring in birds in the United States, there are more opportunities for exposures to these viruses. CDC is preparing not only for the possibility of human infections in the United States, (despite limited human transmission to date) but also for the unlikely event that one or more of these viruses could acquire the ability to spread efficiently among people.

CDC Activities

CDC has made significant investments in seasonal and pandemic influenza preparedness and control, and our efforts are only one part of the broader U.S. Government effort toward pandemic preparedness.

The U.S. Department of Interior and the U.S. Department of Agriculture are the lead Federal Departments for response to outbreaks in wild birds and domestic poultry respectively. HHS and CDC are closely coordinating and collaborating with these Departments to provide guidance for the people working on the frontlines of the animal response, to better understand the genetic and antigenic properties of the viruses, to prepare for the possibility of spread of these new viruses to and among people, and to develop medical countermeasures such as human vaccines.

Public Health Guidance

CDC has issued specific public health guidance related to prevention, detection, and response for H5 viruses currently circulating in birds in North America. Although CDC considers the risk to the general public from these newly-identified US HPAI H5 viruses to be low, people with close, prolonged, unprotected contact with infected birds or the excretions/secretions of infected birds may be at greater risk of infection. Until more is known about these newly-identified HPAI H5 viruses, public health recommendations are largely consistent with guidance for novel influenza A viruses associated with severe disease in humans (*e.g.,* HPAI H5N1 viruses that have caused human infections with high mortality in other countries). First, CDC has worked with USDA and the

Department of Labor's Occupational Safety and Health Administration (OSHA) on the development and posting of guidance on the proper use of personal protective equipment for those who work or have close contact with infected flocks or contaminated environments. Second, CDC has developed guidance for clinicians and public health professionals on the collection and testing of clinical specimens from patients who may be infected with HPAI H5 viruses. Finally, CDC has developed influenza antiviral prophylaxis and treatment guidance for persons exposed to or possibly infected with HPAI H5 viruses. In addition to the proper use of personal protective equipment, antiviral medications can be an important tool in reducing the risk posed by H5 viruses to humans. CDC recommends their use in the treatment of human infections with avian influenza A viruses, and recommends that physicians and other health care providers consider prescribing them to persons with exposure to HPAI H5 viruses circulating in North American birds. Chemoprophylaxis is not routinely recommended as a control measure for personnel involved in culling non-infected or likely non-infected bird populations, or for personnel involved in handling sick birds or decontaminating affected environments (including animal disposal) who properly used personal protective equipment. To help ensure health care providers have access to antiviral drugs, CDC issued guidance to state preparedness directors allowing the use of Federally-subsidized antivirals stockpiled at the state level, as well as directions for requesting antivirals from CDC's Strategic National Stockpile (SNS). CDC will continue updating and issuing guidance related to human health as the situation evolves.

Epidemiologic Response

CDC has long-standing protocols in place for field investigations and contact tracing in the event of a suspected novel influenza case. CDC is working with state public health officials and USDA to ensure that these protocols are appropriately tailored to the current avian response efforts. CDC has equipped and trained public health laboratories to be capable of detection of novel influenza strains, including recent H5 strains. States use CDC developed and distributed molecular diagnostic assays. CDC is working with FDA to refine assays to make them sensitive to hypothetical future variants of circulating viruses. These assays will be distributed to state public

health laboratories. CDC is working with FDA to refine and distribute assays to state public health laboratories that would be sensitive to hypothetical future variants of circulating viruses.

Vaccine

Seasonal influenza vaccines will not protect against avian influenza. CDC is conducting evaluations in its laboratory to determine how H5 influenza vaccines currently in the federal stockpile may be used to offer some protection against H5 viruses circulating in birds in the United States. Simultaneously, CDC has already developed a candidate vaccine virus (CVV) specific to a strain currently circulating in birds in the United States, and shared it with FDA. This candidate vaccine virus is available to manufacturers and other public health partners should production of vaccine become necessary.

Laboratory investigations

CDC is collaborating with USDA and other partners working on the domestic response to avian H5 outbreaks to evaluate virus specimens and genetic sequence information. Together, we are working to better understand and characterize these viruses with the goal of evaluating their potential to cause a pandemic. CDC uses several types of laboratory studies to evaluate avian influenza A viruses for the risk they might pose to humans. We conduct genetic analysis, through which we evaluate a virus' genome to look for mutations that may indicate mammalian adaptation, and other markers such as those that would indicate the possibility of resistance to antiviral drugs. We also use animal models and human cell culture models to understand how the virus infects and transmits in mammals.

The ever-changing nature of influenza viruses requires that CDC and its public health partners remain vigilant regarding novel influenza threats. The impact of the H5 circulation on agriculture is substantial, but we also take seriously the potential risks to human health posed by circulation of new H5 viruses in U.S. birds. I appreciate the opportunity to update you on our assessment of human risks and the preparedness efforts we have taken, and look forward to your questions.