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CDC's Role in the Importation and Movement of Animals

Statement of
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Introduction

Good morning Chairwoman Bordallo, Ranking Member Brown, and other Distinguished Members of the Subcommittee. I am Dr. Nina Marano, Chief of the Geographic Medicine and Health Promotion Branch in the Division of Global Migration and Quarantine at the Centers for Disease Control and Prevention (CDC), Department of Health and Human Services (HHS). I am pleased to be here today to talk to you about HHS/CDC's public health activities related to the importation and movement of animals.

Under Section 361 of the Public Health Service Act (42 U.S.C. 264), HHS/CDC oversees regulations to prevent the introduction, transmission, and spread of communicable diseases from foreign countries into the United States. As part of these responsibilities, HHS/CDC currently regulates the importation of certain animals with known linkages to zoonotic diseases and also regulates the importation of etiologic agents, hosts, and vectors[1] known to cause or contribute to the spread of zoonotic diseases. Zoonotic diseases, or zoonoses, are diseases that are transmissible from animals to people. In addition to well known zoonotic diseases such as rabies, many other known and emerging diseases have been increasingly linked to animal sources.

Today, I would like to 1) describe why HHS/CDC regulates specific animal importation and movement; 2) provide examples of recent zoonotic threats to public health; 3) share HHS/CDC's concerns with potential transmission of disease to humans from other animal species; and 4) describe HHS/CDC's recent regulatory activities in this area.

[1] Etiologic agents are micro-organisms that cause disease. Hosts are defined as an animal or plant that harbors or nourishes another organism (parasite). A vector is carrier that transfers an infective agent from one host to another.

These issues illustrate why CDC welcomes the opportunity to work with other agencies to explore broader prevention strategies to reduce the risk of infectious diseases to humans from animals and vectors.

CDC works closely with other federal partners, including: USDA/APHIS in the intersection of human health, animal health and animal welfare; HHS/FDA in the interstate movement of animal species that represent a risk to public health; and DHS/CBP along with DofI/FWS which serve as the eyes and ears for CDC at U.S. ports of entry in detecting transported animals and animal products that represent a human public health threat.

Why HHS/CDC Regulates Animal Importation and Movement

HHS/CDC currently regulates the importation of nonhuman primates (monkeys), dogs and cats, small turtles, African rodents, civets, and birds from certain countries to prevent the entry of zoonotic diseases into the United States. These animal species have been linked to transmission of certain diseases to humans. Nonhuman primates, particularly those recently captured in the wild, may have infectious agents in their blood or other body tissues that can cause severe or fatal disease in humans. Persons working in temporary and long-term animal holding facilities and individuals involved in transporting animals (e.g., cargo handlers and inspectors) are especially at risk for infection. Examples of these serious pathogens include viruses (e.g., Ebola virus, hepatitis virus, and herpes B virus), tuberculosis, and parasites. Some monkeys imported into the United States have been found to be infected with a virus that is in the

same family of viruses that causes Ebola, a hemorrhagic fever. While Herpes B virus naturally infects and causes only mild or no illness in macaque monkeys, the infection is usually fatal in humans. Fatal cases of herpes B virus disease in humans have been caused by animal bites, scratches, or mucous membrane contact with infected materials. Nonhuman primates, especially macaques, are highly susceptible to tuberculosis, and most are imported from areas of the world with a high prevalence of tuberculosis in humans and animals. Nonhuman primates may also be a source of yellow fever virus, which may be transmitted to humans by mosquitoes that have previously fed on an infected nonhuman primate. Transmission of yellow fever to persons working in nonhuman-primate research has also occurred.

Because nonhuman primates imported into the United States from foreign countries often have an uncertain health history and may potentially carry diseases infectious to humans, quarantine requirements were established to reduce this infectious disease risk. Since 1975, CDC, through 42 CFR 71.53, has prohibited the importation of nonhuman primates except for scientific, educational, or exhibition purposes. Under this regulation, importers are required to register with CDC and to renew their registration every 2 years. Imported nonhuman primates are required to be held in quarantine for a minimum of 31 days following U.S. entry. This regulation also requires registered importers to maintain records on imported nonhuman primates and to immediately report illness suspected of being infectious to humans. Imported nonhuman primates and their offspring may not be maintained as pets.

Additional requirements for importers of nonhuman primates were developed and implemented in response to specific public health threats. In January 1990, CDC published interim guidelines for handling nonhuman primates during transit and quarantine in response to identification of Ebola virus (Reston strain) in nonhuman primates imported from the Philippines. In April 1990, confirmation of asymptomatic Ebola virus infection in four caretakers of nonhuman primates along with serologic findings suggested that cynomolgus, African green, and rhesus monkeys posed a risk for human filovirus infection. As a result, CDC placed additional restrictions and permit requirements for importers wishing to import these species.

HHS/CDC restricts the importation of dogs primarily to prevent the entry of rabies. Rabies virus causes fatal disease in humans and animals, especially dogs. In the United States, widespread mandatory vaccination of dogs has eliminated canine strains of rabies, and dramatically reduced the number of human cases in this country. However, canine strains of rabies remain a serious health threat in many other countries, and preventing the entry of infected animals into the United States is an important public health priority. HHS/CDC requires rabies vaccination for dogs entering the United States. Dogs that do not have current vaccination prior to importation must be vaccinated and confined for 30 days to enable the animal's immune system to respond to the vaccine and build protection against the rabies virus.

Under 42 C.F.R. 71.54, HHS/CDC also regulates the importation of etiologic agents, hosts, and vectors to prevent human disease. Under this regulation, a person may not

import into the United States, nor distribute after importation, any etiologic agent or any arthropod[2] or other animal host or vector of human disease, or any exotic living arthropod or other animal capable of being a host or vector of human disease unless accompanied by a CDC-issued permit. As an example, all live bats require an import permit from CDC or the U.S. Department of Interior, Fish and Wildlife Services. Live bats may not be imported as pets because they are known to carry a number of pathogens including rabies that can be transmitted to people. Similarly, any living insect or other arthropod that is known or suspected to contain an etiologic agent (infectious to humans) requires a CDC import permit; snail species capable of transmitting a human pathogen require a permit as well. HHS/CDC also implemented regulations regarding importation of small turtles in 1975 after these animals were found to frequently transmit salmonella to humans, particularly young children.

Recent Zoonotic Threats

Today's highly globalized world has given infectious agents ready access to new populations and areas. Moreover, the increasing overlap between human and animal environments has served to facilitate transmission of zoonotic infections. A notable example is the 2003 outbreak of severe acute respiratory syndrome (SARS), a newly recognized human disease that spread worldwide, causing more than 8,000 cases and 770 deaths. The causative agent, SARS coronavirus, was found in civets, a carnivorous mammal sold for food in marketplaces in China. HHS/CDC issued an order to ban the importation of civets because of concerns that these animals were involved in the transmission of SARS to humans. The emergence of SARS is an example of how a

[2] Arthropods are a group of animals that includes insects, spiders, and crustaceans.

previously unrecognized zoonotic disease can spread rapidly, with devastating consequences. In addition to its tremendous public health impact, the disease had profound economic consequences. Worldwide, the economic impact of SARS was estimated at $30-$50 billion.

Another recent zoonotic threat is highly pathogenic avian influenza (HPAI) H5N1. Since 2003, HPAI H5N1 has become established as a threat to both human and animal health throughout the world. Although bird populations in several countries have been affected, cases among humans have been less frequent, with no evidence of sustained human-to-human transmission. Live birds used for consumption, live birds used as pets, and bird products (including eggs) imported into the United States from countries with HPAI H5N1 could pose a risk for human or avian infection. In 2004, HHS/CDC issued orders to ban the importation of birds and bird products from specific countries with HPAI H5N1; these orders mirror similar regulatory actions taken by USDA/APHIS to prevent the importation of birds with avian influenza H5N1.

I would like to describe in more detail an outbreak of human monkeypox that occurred in the United States in May and June of 2003. These cases represented the first outbreak of monkeypox in North America and clearly show why HHS/CDC continues to be concerned about the importation of wild animals into the United States.

Monkeypox is a sporadic, zoonotic, viral disease that occurs primarily in the rain forest countries in central and western Africa. The illness was first noted in a monkey in 1958,

but serologic evidence of monkeypox infection has been found in other animals in Africa, including some species of primates and rodents. African rodents are considered to be the most likely natural host of the monkeypox virus. In humans, monkeypox is marked by skin rashes that are similar to those seen in smallpox; other signs and symptoms include fever, chills and/or sweats, headache, backache, swelling of the lymph nodes, sore throat, cough, and shortness of breath. A person develops signs and symptoms of the illness about 12 days after becoming infected. In Africa, the death rate from monkeypox for humans ranges from 1%-10%, although higher mortality rates have been seen.

In 2003, an outbreak of monkeypox in Midwestern United States caused nearly 50 probable or confirmed cases of the disease. Public health investigations revealed that the patients had become infected primarily as a result of contact with pet prairie dogs that had contracted monkeypox from imported diseased African rodents. These rodents had been included in a shipment of more than 800 small mammals, including rodents, imported from Ghana by a Texas animal distributor in April 2003. Laboratory testing confirmed the presence of monkeypox virus in six rodent species[3] from the shipment. Rodents from the original shipment were traced to animal distributors in six states, including one distributor in Illinois who also sold prairie dogs. In early May 2003, this Illinois distributor sold some prairie dogs and one rodent from the Ghana shipment to another animal distributor in Wisconsin. It was at this time that several of the prairie dogs appeared to be ill, and several of the animals died. By late May, the first human

[3] The six rodent species are: Tree Squirrels, Rope Squirrels, Dormice, Gambian Giant Pouched Rats, Brush-tail Porcupine, and Striped Mice.

cases were reported in Wisconsin (including the Wisconsin animal distributor). Other human cases were later reported in Kansas, Missouri, Illinois, Indiana, and Ohio.

Most patients in the outbreak had direct or close contact with prairie dogs. For example, 28 children at an Indiana day care center were exposed to two prairie dogs that later became ill and died. Twelve of these exposed children reported handling or petting the prairie dogs, and seven of these children later became ill with symptoms that were consistent with monkeypox infection. In Wisconsin, more than half of the human monkeypox cases occurred through occupational exposure to infected prairie dogs, with veterinary staff being at greater risk of acquiring monkeypox than pet store employees. The human cases in the United States included children as young as 3 years old. Nineteen people were hospitalized, although some were hospitalized primarily for isolation purposes. The initial signs or symptoms seen in some patients included skin lesions or fever with drenching sweats and severe chills. Two children suffered serious clinical illnesses. One child had severe encephalitis that improved during a 14-day hospital stay. Another child had pox lesions on many parts of her body, including lesions inside her mouth and throat which created difficulty in breathing and swallowing. At least five patients (three adults and two children) developed fevers and severe rashes, and one adult patient had symptoms for about five months.

In June 2003, HHS/CDC and HHS/FDA issued a joint order[4] prohibiting, until further notice, the transportation or offering for transportation in interstate commerce, or the

[4] HHS/CDC has regulatory responsibility for the importation of these animals to the U.S. HHS/FDA has regulatory responsibility over the interstate transportation of these animals within the U.S.

sale, offering for sale, or offering for any other type of commercial or public distribution, including release into the environment of prairie dogs and six implicated species of African rodents. In addition, HHS/CDC implemented an immediate embargo on the importation of all rodents from Africa. These emergency orders were superseded in November 2003 when the two agencies issued an interim final rule creating two complementary regulations restricting the domestic trade of prairie dogs and the six implicated rodent species and importation of all rodents of African origin. This rule was intended to prevent the further introduction, establishment, and spread of the monkeypox virus in the United States.

The U.S. monkeypox outbreak illustrates the serious public health threat resulting from introduction of non-indigenous pathogens from exotic species of animals and the risks associated with the exotic species interacting with U.S. animals, including pets. keeping wild animals as pets. During the monkeypox outbreak, HHS/CDC investigators could not locate many potentially infected animals because no accurate records were available to trace their movements. The importation of these types of animals poses a health risk because most shipments involve a high volume of animals, most of which are wild. Many shipments also include different species co-mingled or kept in close proximity in confined spaces, conditions ideal for disease transmission. For most species, there is no screening for the presence of diseases infectious to humans prior to shipment, with no holding or testing required upon their entry into the United States. This creates an opportunity for the widespread exposure of humans to the pathogens that these animals could be carrying. High mortality rates among some imported

animals, such as rodents, are common. Imported animals shipped over long distances in uncontrolled environments are more likely to suffer ill affects. In addition, current U.S. statutes and regulations do not require importers to determine whether the animal's death is from a pathogen that could adversely affect humans.

HHS/CDC Concerns about Disease Transmission from Other Animal Species

Although HHS/CDC already regulates importation of some animal species, numerous other species present concerns. HHS/CDC recently analyzed data from the U.S. Fish and Wildlife's Law Enforcement Management Information System (LEMIS) to assess the impact of the African rodent ban on the importation of rodents to the United States. The LEMIS database records the entry of wildlife species to the United States. HHS/CDC analysis showed that, since 2003, the ban has effectively limited legal importation of African rodents. The illegal trade of such rodents and other prohibited animals is difficult to quantify and difficult to prevent. CDC partners with industry to educate the public about zoonotic disease risks at the point of purchase in pet stores, and CDC's 'Healthy Pets Healthy People' website is one of the most popular websites for pet lovers, physicians and veterinarians seeking to counsel their clients. CDC also participates with USDA and FWS to enhance surveillance of animal contraband imported from known high-risk origins.

However, the commercial pet market has found a new niche in rodents from other parts of the world, as the number of rodents from Asia, Europe, and South America has increased by 223%. Rodents harbor Hantaviruses, which have caused more than

100,000 hospitalized cases of hemorrhagic fevers in Europe and Asia. Rodents are also associated with rickettsial diseases such as Scrub typhus and murine typhus, which cause hundreds of thousands of cases annually. Rodents have several traits that make them good hosts for zoonotic diseases. They reproduce rapidly and, unlike other species of wild mammals, can be found in our gardens, storage buildings and our homes.

HHS/CDC is also concerned about other animals, such as shrews. There is some new evidence that Hantaviruses are associated with shrews, although it is not clear whether these shrew-associated hantaviruses are human pathogens. While humans rarely have contact with shrews, this could change if shrews begin to be imported as pets.

In May 2006, HHS/CDC hosted a public meeting on the subject of infectious disease threats associated with the growing importation and trade of exotic animals. Stakeholders, including the National Association of State Public Health Veterinarians, the Wildlife Conservation Society, and the American Veterinary Medical Association, submitted a variety of positions and views for the public meeting. Of the 22 statements received, 7 indicated a measure of support for increased restrictions on the importation and sale of exotic species, while 15 expressed support for alternatives to regulatory or legal restrictions, or opposition to possible restrictions.

Animal Importation: Current Activities and Future Challenges

HHS/CDC's current approach to controlling zoonotic disease threats has involved issuing emergency orders or rules prohibiting importation of implicated animals. These actions are usually taken after an outbreak occurs, rather than proactively preventing outbreaks from animals well documented in the literature to harbor pathogens that can directly or indirectly effect humans, regardless of geography. This approach cannot fully prevent the introduction of zoonotic diseases, and HHS/CDC would welcome the opportunity to participate in the development of broader prevention strategies -- in concert with other federal agencies -- including risk-based, proactive approaches to preventing the importation of animals and vectors that pose a public health risk.

In July 2007, HHS/CDC published an Advance Notice of Proposed Rulemaking (ANPRM) to begin the process of revising our animal importation regulation, soliciting public comment and feedback on the issue of animal importation to determine the need for further rulemaking. More than 800 comments to the ANPRM were received, and HHS/CDC is currently reviewing these comments to assist in new rulemaking.

In conclusion, there are a number of serious yet preventable risks to public health, and we welcome the opportunity to work collaboratively to explore new strategies for their prevention.

Thank you for the opportunity to testify today. I am happy to take any questions you may have.