Homeland Security

Red Cell Report

14 February 2006

(U) Three Potential Scenarios for Weaponizing Avian Influenza

(U//FOUO) *This Red Cell Report is a product of the DHS Alternative Analysis Division, which provides* ***independent, speculative, and alternative assessments,*** *intended* ***to provoke thought and stimulate discussion.*** *Papers represent an assimilation of opinions, sources, and methodologies, and are not necessarily derived from specific threat reporting. Red Cell Reports are not meant to represent a DHS or U.S. Government corporate view. Inquiries may be directed to Christopher Rosché, (202) 282-9838.*

(U) Scope Note:

(U//FOUO) This report explores how terrorists or other non-state adversaries could potentially facilitate an avian influenza outbreak within the United States. The report was primarily intended to assist the Secretary of Homeland Security, Chief Intelligence Officer, Deputy Assistant Secretary, and Chief Medical Officer as they consider the implications of avian influenza to the Homeland. **The scenarios explored in this paper are speculative and meant only to broaden the scope of thinking. They are not based on specific evidence or intelligence about terrorists' plans and capabilities, but are considered scientifically feasible, according to experts that were interviewed.**

(U) In addition to surveying the available related literature, Alternative Analysis Division analysts used structured alternative analysis techniques to produce this report. Analysts interviewed leading independent experts on health, food, and terrorism, and facilitated a structured, scenario-based brainstorming session with independent agriculture, food, and health experts inside and outside government.

(U//FOUO) In the scenarios described, the Alternative Analysis Division made the following key assumptions:

- **(U//FOUO)** The adversary's top concern would be to damage the economy and cause widespread fear. Human casualties would not be a primary goal.

- **(U//FOUO)** Al-Qa'ida and other sophisticated terrorist groups do not currently have the capability to easily manipulate and reproduce the genetic makeup of the avian virus (H5N1), although the experts indicated that recent advancements in technology and the proliferation of knowledge could make this type of research easier to conduct in the future.

(U//FOUO) Three Potential Scenarios for Weaponizing Avian Influenza

(U) Key Judgments

(U//FOUO) ***Terrorist organizations may find the avian influenza virus an attractive weapon for attacks against the U.S. agriculture sector or the human population. But even sophisticated terrorists would be hard-pressed to obtain the expertise and tools needed to exploit the current avian flu strain beyond instigating a poultry-only epidemic in the United States.***

(U//FOUO) ***The DHS Alternative Analysis Division's Red Cell developed three speculative scenarios to describe how terrorists may be able to exploit the avian flu as a weapon. These scenarios are not based on specific evidence or intelligence about terrorists' plans and capabilities.***

- **(U//FOUO)** *The most plausible scenario would be for terrorists to collect samples of avian flu from infected chickens in other parts of the world and introduce the disease to the U.S. poultry population, causing significant economic damage.*

- **(U//FOUO)** *Less likely, terrorists could amplify a naturally occurring outbreak of a human-transmissible form of the virus by spreading samples of avian influenza in public places, such as on countertops and handrails.*

- **(U//FOUO)** *The least likely, although potentially most damaging of the three potential scenarios, would be for a malicious actor with virology skills and equipment to modify the current strain to sustain transmissibility in humans. Recent advances in microbiology and the proliferation of sophisticated equipment and knowledge could make such a scenario easier to accomplish in the long term. The scientists consulted also described less sophisticated methods terrorists could use to attempt to create a dangerous virus.*

(U//FOUO) ***If terrorists managed to obtain samples of the avian flu virus, it would likely be difficult for law enforcement to prevent an attack on the U.S. homeland because of the ease of surreptitiously transporting viable samples of the virus.***

- **(U//FOUO)** ***The risk posed by terrorist exploitation of the avian flu virus could be moderated by becoming more vigilant at poultry farms and hospitals, using new medical technology to detect sick passengers at major transportation hubs, improving detection capabilities, intensifying medical intelligence collection efforts overseas, and enhancing communication with other countries.***

(U//FOUO) Avian Influenza Virus Useful to Terrorist Goals

(U//FOUO) ***A potential avian influenza outbreak represents a serious threat to the health and economy of the Homeland. Terrorists could attempt to capitalize on this threat to accomplish their stated goal of causing significant economic damage to the United States.***

— **(U)** If a human-transmissible form of the virus appears and spreads to the United States, a moderate outbreak could affect up to 90 million people, leading to 200,000 deaths, 865,000 hospitalizations, 45 million outpatients, and 45 million additional illnesses. A severe pandemic near in proportion to 1918 could cause up to 2 million deaths and nearly 10 million hospitalizations. Estimates for economic costs related to lost wages and productivity range from $167 billion to $675 billion.

(U//FOUO) ***The health and terrorism experts interviewed believe terrorists like al-Qa'ida remain committed to conducting biological attacks against the Homeland and that sophisticated terrorist groups would consider a naturally occurring avian influenza strain to be an attractive biological agent.***

(U//FOUO) Three Possible Scenarios for Exploiting the Avian Flu Virus

(U//FOUO) To stimulate alternative thinking on the topic, the Red Cell developed several scenarios showing how terrorists might spread the avian influenza virus. The scenarios involve infecting poultry and humans, and modifying the strain to make it highly pathogenic and infectious.

— **(U)** ***The scenarios are not based on specific evidence or intelligence but are considered scientifically feasible, according to the experts interviewed.***

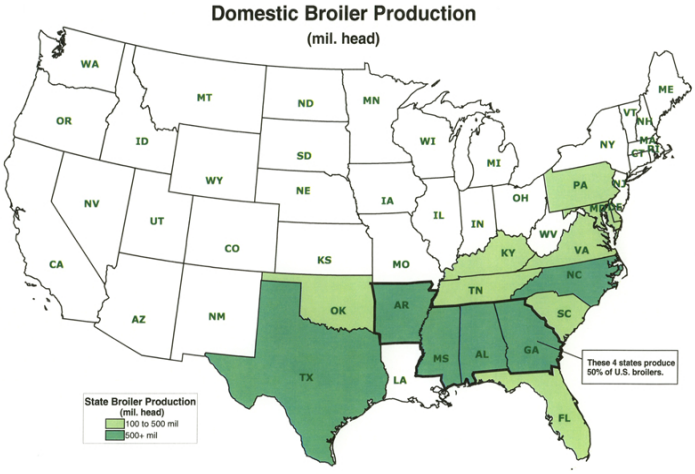
(U//FOUO) Most Likely Scenario—Infecting U.S. Poultry

(U//FOUO) ***Public health and biological security experts believe the most likely scenario would be for terrorists to collect samples of avian influenza virus from infected poultry in Asia, Turkey, Romania, Iraq, or parts of Africa; allow the samples to multiply in a laboratory; and distribute the virus among the U.S. chicken population. The main purpose of this attack would be to cause economic damage.***

— **(U//FOUO)** ***This scenario would be the most likely of the three examined because of the relative ease of execution, high probability of successful infection, and potentially large economic impact.***

— **(U//FOUO)** The highly virulent strain of avian flu currently circulating in Asia—nearly 100 percent fatal in domesticated poultry—spreads quickly among chicken populations. It would be simple to smuggle the virus into the Homeland by obtaining a sample, placing it in a vial, and hiding it in a pocket or in luggage. The World Health Organization notes that such a sample could remain viable for between 6 and 35 days, depending on the temperature. An individual could travel by automobile, plane, or train with high confidence that the small vial and its contents would not be detected. Spreading the virus also would be relatively simple—a cloth could be contaminated with both the virus and organic material, such as poultry fecal matter, and placed in a farm's feeding area.

(U) ***Almost 80 percent of the U.S. chicken population is concentrated in the Southeast Atlantic region, according to the U.S. Department of Agriculture. An attack in this area could have significant economic consequences***. For example, recent efforts to control the virus in Southeast Asia have cost billions of dollars.



— **(U)** When a mild strain of avian flu infected U.S. chickens in 2004, the outbreak spread to five states within a month. China, Japan, Malaysia, Singapore, Korea, and Russia—the top foreign markets for U.S. poultry—banned imports.

— **(U)** Responding to a 2002 outbreak in Virginia of a mild strain of avian flu cost $130 million (excluding trade losses), killed 4 million birds, and forced a quarantine of 197 farms. The 1983-84 outbreak of a more virulent strain raised the retail prices of eggs by 30 percent.

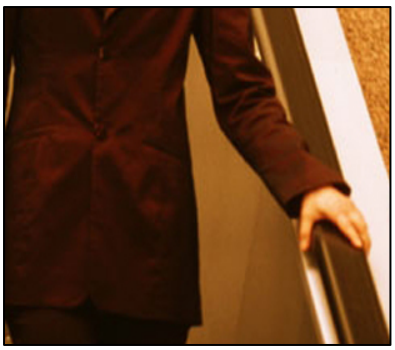
(U//FOUO) Spreading a Human Virus Plausible but Less Likely

(U//FOUO) ***If the avian influenza virus were to mutate into a human-transmissible form, terrorists could attempt to create or accelerate the spread of a human pandemic by contaminating public areas with samples.***

— **(U//FOUO)** ***This scenario would be relatively easy to execute if the avian flu virus were to mutate to a form that easily sustains human-to-human infection.*** As of mid-January 2006, only two possible human-to-human cases and one "likely" had been confirmed. The virus has not evolved sufficiently to spread easily among humans; therefore, the experts assessed this scenario to be less likely than the first.

— **(U//FOUO)** Interviewees suggested terrorists could spread the disease by planting live cultures on countertops, chairs, and handrails in public areas.

— **(U//FOUO)** ***Several experts suggested that terrorist "suicide sneezers" could intentionally infect themselves with the virus, travel to the United States, and spread the virus by sneezing in crowded, poorly ventilated areas, such as commercial airliners or trains, shopping malls, schools, or movie theaters.*** Dissemination tactics would be as elementary as sneezing into one's hands and spreading the resulting contaminated mucous particles by touching doorknobs, handrails, or bathroom faucets.



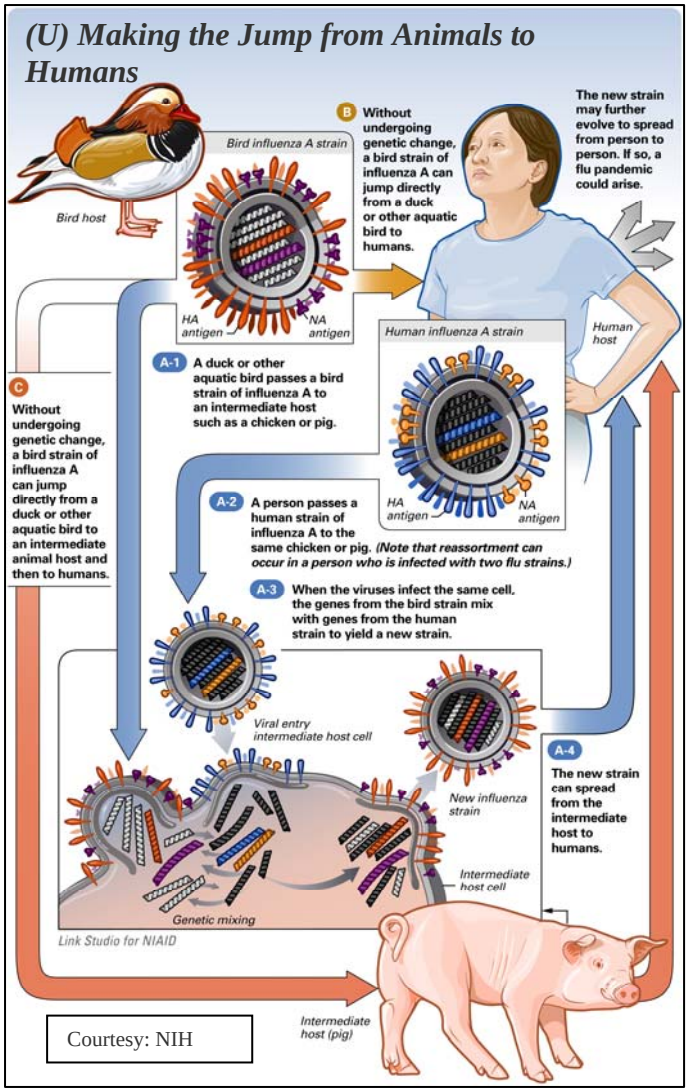
(U//FOUO) One public health expert stated that technologically and financially equipped terrorists seeking a "big bang" could aerosolize the virus and introduce it into the ventilation system of a large building, which could infect many people.

(U//FOUO) Creating a Human Strain of Avian Influenza— Most Damaging, But Unlikely…for Now

(U//FOUO) ***Terrorists alone—or working with state actors with the necessary virology skills and equipment—could attempt to modify the current strain of avian influenza virus so that it spreads efficiently among humans.***

— **(U//FOUO)** ***Scientists who were queried concluded that this scenario was the most difficult and least likely of the three examined because of its significant technological, financial, and logistical hurdles. Despite its relatively lower risk, the Red Cell included this scenario because of its potential impact in the future.***

— **(U//FOUO)** ***Independent experts interviewed noted that trained scientists with a well-equipped laboratory and the requisite expertise could attempt to manipulate the virus to enable its spread among humans***. One independent expert suggested that a team of "Nobel-laureate level" scientists with a state-of-the-art laboratory could accomplish such a task over a period of years. Microbiology laboratories ranging in capability are located worldwide at numerous universities and private and state-sponsored research facilities, such as the School of Animal and Microbial Sciences in Reading, United Kingdom, which has genetically modified an H5 virus closely related to the current strain of avian influenza.



Courtesy: NIH

— **(U//FOUO)** ***Scientists also suggested that terrorists could take a less sophisticated route to create a human-transmissible strain.*** One scientist interviewed noted that human subjects could serve as hosts to facilitate the reassortment (mixing) of avian and human flu genes. Theoretically, terrorists could locate an individual already ill with a conventional human flu virus and intentionally infect him with the H5N1 strain of avian flu. If the two viruses mixed sufficiently, terrorists could distribute samples of this human-transmissible form of the avian flu virus in public areas to create, or accelerate, the spread of a human pandemic. Scientists admitted, however, that such reassortment is untested and the results are unpredictable.

(U//FOUO) Could Terrorists Infect U.S. Pigs to Damage Economy, Sicken Humans?

(U//FOUO) The strain of avian influenza that has killed millions of birds in Asia has also infected pigs in China and Indonesia. Scientists have warned that pigs, like humans, could support the genetic reassortment of the avian virus, potentially resulting in a strain capable of sustained human transmission. Transference between swine and human populations is a hit-or-miss proposition, but terrorists may attempt to use pigs as a logical intermediary to precipitate a pandemic.

(U//FOUO) Interdiction Possibilities Scant; Public Health Preparations Necessary

— **(U//FOUO)** ***Encourage employees to be alert for suspicious behavior at poultry farms, recombinant virus banks, hospitals, and other public places.*** Be aware that terrorists may seek employment at these facilities to obtain insider access, which could facilitate their efforts to spread a contagion. (Conversely, many employees at large poultry farms are migrant workers who may speak little English and may be reluctant to approach intruders or report suspicious activity.)

— **(U//FOUO)** ***Enhance U.S. detection capabilities and strategies.*** Law enforcement and border control officials should carefully scrutinize individuals traveling with viral samples or makeshift biological equipment.

— **(U)** ***Form a task force of representatives from law enforcement, the Centers for Disease Control and Prevention (CDC), Transportation Security Administration, Customs and Border Protection, other DHS organizations, and additional appropriate agencies to explore the use of emerging prodromic technologies for spot detection of influenza carriers***. Hong Kong and other major metropolitan areas, for example, used infrared thermal imaging systems with some success at airports and bus terminals to detect sick travelers during the 2003 Severe Acute Respiratory Syndrome (SARS) outbreak.

— **(U)** ***Quickly and accurately assess the cause of any avian outbreak in the Homeland.*** Determining the cause is crucial, particularly to identifying mitigation strategies and investigating perpetrators. Consider revisiting CDC computer models of an avian influenza outbreak to determine what the virus might look like if it were spread intentionally instead of naturally.

— **(U//FOUO)** ***The Department of Health and Human Services has launched a campaign to increase communications with foreign governments and health officials in countries of concern. The Alternative Analysis Division suggests that, where possible, appropriate agencies open lines of communication with foreign governments and health organizations concerning potential terrorist exploitation of avian influenza.***

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