THE POST
12•05 / 01•06

Due for the Flu?

12

Hatching answers to the next global threat

UF Health Science CENTER
Celebrating 50 Years

DENTISTRY • MEDICINE • NURSING • PHARMACY • PUBLIC HEALTH & HEALTH PROFESSIONS • VETERINARY MEDICINE

Bird flu:

Hatching answers to the next global threat

By Ann Griswold

Chicken Little has never looked more menacing.

The World Health Organization has predicted that the bird flu might mutate into a form capable of spreading among people. If this happens, global health experts warn that the virus could cause a pandemic similar to the Spanish flu of 1918 that killed an estimated 40 million people, rapidly infecting millions more around the globe and causing health-care costs to soar into the billions.

But is the sky truly about to fall?

Influenza outbreaks are a fact of life. New strains of influenza regularly emerge separately in bird and human populations. And the potential for danger is compounded when an avian influenza virus mingles with a human flu virus and begins to spread from person to person, as is possible with the newly emerged H5N1 strain of bird flu.

"We know that bird influenza viruses have been around for hundreds of years. The problem is the severity of illness that this particular virus has caused in humans," explains Lennox Archibald, M.D., F.R.C.P., a medical epidemiologist at Shands at UF medical center and a member of the UF Infection Control Team.

The H5N1 bird flu has infected more than 100 people to date, most of whom have had prolonged contact with infected birds. Experts are concerned that the H5N1 strain appears far more deadly than most influenza viruses: More than half the people infected have died.

"When you've got a strain of flu that has that high of a mortality rate, that's really dangerous," says Mary Peoples-Sheps, Dr.P.H., director of public health programs at the UF College of Public Health and Health Professions. "When you think about all of the people you've known in your whole life who have had the flu… relatively few people actually die from the disease. With this one, the death rate could be much higher."

Paul Gibbs, D.V.M., Ph.D., a UF professor of veterinary medicine and public health, agrees. If the bird flu acquires the ability to spread among people and continues to kill half its victims, he says, "the ensuing pandemic could be horrific."

All the major flu pandemics of the 20th century originated from avian viruses. The Spanish flu of 1918 was by far the most deadly. Since then, the 1957 Asian flu and the 1968 Hong Kong flu have raised the combined death toll to 50 million.

"The epidemiologists say pandemics occur in 30-year cycles – we are due," Archibald says. "That said, I don't think one can ignore it and I don't think we are over-reacting."

Mutation mystery

Fortunately, several factors limit the ability of the bird flu to infect humans, which explains why so few people have become ill. Most notably, the H5 protein, which enables the virus to attach to specific receptor sites on host cell surfaces, is designed to recognize birds, not humans.

For example, imagine putting together a jigsaw puzzle. While it is occasionally possible to force together two mismatched pieces, the resulting link will not be very effective. In the same way, the bird virus does not fit snugly into the receptor on the human cell surface. To spread efficiently among people, the H5 protein of the bird flu must change to allow better attachment to human cells.

The likelihood that such a modification will occur is not very high, speculates virologist Richard Condit, Ph.D., a professor of molecular genetics and microbiology at the UF College of Medicine who says it would probably require multiple mutational events.

It also would be more likely to happen in Southeast Asia than in the United States, adds Gibbs, because of the close contact between birds and people in everyday life. In addition to infecting poultry, the bird flu has also been observed in village ducks, which act as reservoirs for the disease.

As a result, Gibbs predicts, "If a pandemic strain of avian flu ever arrives in the United States, it will most likely arrive in the form of an infected traveler from Asia, not from a mutation of the bird strain here."

While experts debate the odds the bird flu will become capable of efficient human-to-human spread, most agree on one thing: The results would be disastrous.

"If a pandemic hits, a lot of people are going to be affected. There are no two ways about it," states Archibald, who worked for the Centers for Disease Control and Prevention as a medical epidemiologist before coming to UF. "People feel sick, it's hit the headlines, and they are going to aggregate in an ER with limited resources, a hospital with limited rooms. The risk at the moment is low, but God forbid it does happen – how are hospitals going to cope? And to be honest, I don't have the answer."

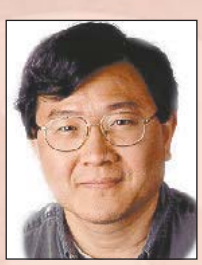
Fear factor

The H5N1 strain of bird flu originated in China and spread to Hong Kong in 1997. Since then, the virus has infected chickens and wild birds in 15 countries across Asia and Europe. The possibility of bird flu spreading to the United States has sparked a flurry of planning and preparation.

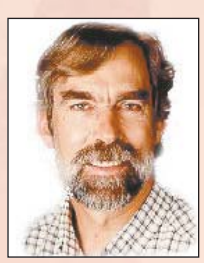
President George W. Bush recently proposed a $7.1 billion plan to combat the spread of bird flu. Even Kentucky Fried Chicken has stowed away a slew of advertisements aimed at convincing chicken-craving consumers that KFC meat will remain safe to eat if American birds become infected. Many Americans are living in an atmosphere of apprehension. In a recent online CNN poll, 73 percent of the 23,400 respondents thought world officials should be doing more to prevent the spread of bird flu.

"The epidemiologists say pandemics occur in 30-year cycles – we are due. I don't think one can ignore it and I don't think we are over-reacting."
— Lennox Archibald, M.D.

"This is not the kind of virus that you can just touch and get the disease. You need overwhelming exposure, and you don't get that kind of exposure from holding a chicken carcass that's infected."
— Gary Butcher, D.V.M., Ph.D.



"It's good to pay attention and to monitor, so when the pandemic happens we can catch it sooner and develop a vaccine against that strain immediately."
— Lung-Ji Chang, Ph.D.



"The big step is [for it] to mutate to a form that is transmissible from one human to another. My assumption is that it's going to involve multiple mutational events."
— Richard Condit, Ph.D.

But there's no need to panic, says Gary Butcher, D.V.M., Ph.D., a professor of veterinary medicine at UF's Institute of Food and Agricultural Sciences who recently traveled to Russia to assist the poultry industry with a regional outbreak of bird flu.

"This is not the kind of virus that you can just touch and get the disease," Butcher says. "You need overwhelming, overwhelming exposure, and you don't get that kind of exposure from holding a chicken carcass that's infected.

"When people think about Thailand or Russia, they're imagining that birds are sick everywhere, birds are dying left and right. This is just not the case," he adds. "If a single commercial chicken even sneezes, they check it. If there's any evidence of disease, they kill every animal around. So you may hear about how they killed half a million chickens, but only six of them died from disease – they killed the rest."

Still, some public health officials argue that if a pandemic occurred now, the world would be caught unprepared. Only about 40 countries have made contingency plans, Archibald says.

Peoples-Sheps agrees, but acknowledges there may be an unreasonable level of fear among the public.

"In public health, you're always walking the fine line between overstating a case to the point where people get fearful – they panic because they don't know enough about it – and stating the case strongly enough so that people really do take it seriously," she says.

The delicate balance between fear and information is especially crucial in bird flu-infected countries.

"Everybody's quite nervous and quite confused," Butcher says. "The Russians are trying to make a decision, but they don't know what kind of a decision to make. As a result, some pretty unusual things are being said and done."

The H5N1 bird flu entered Russia via migratory birds from the neighboring country Kazakhstan.

"Their immediate response was to line up volunteers and soldiers along the border with Kazakhstan, give them bullets and guns, and tell them to shoot anything that flies in," Butcher says, citing an August article from a Russian newspaper, the Kommersant-Daily. "It's comical."

UF Health Science Center faculty members seem less willing to call in the heavy artillery.

"It's good to pay attention and to monitor, so when the pandemic happens we can catch it sooner and develop a vaccine against that strain immediately," says virologist Lung-Ji Chang, Ph.D., a professor of molecular genetics and microbiology. "But it's not good if people stop eating Kentucky Fried Chicken."

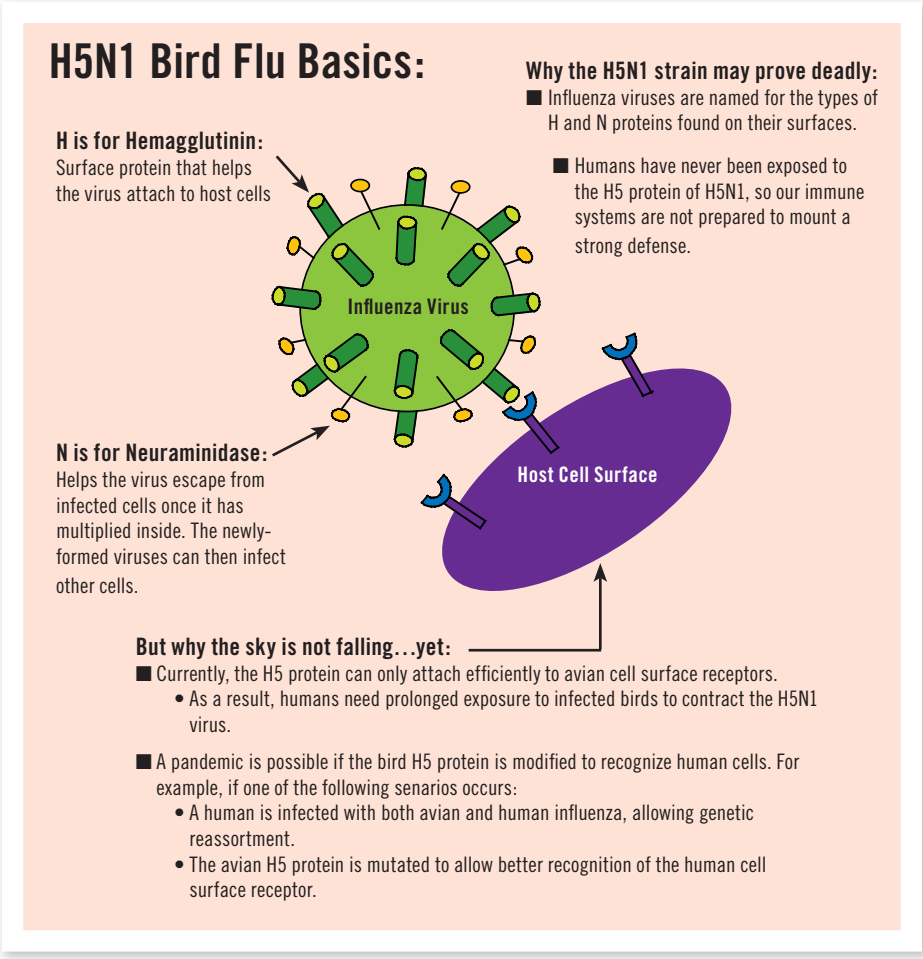
A native of Taiwan, Chang recalls that bird flu outbreaks, commonly referred to as "chicken plague," were simply a fact of life in rural areas of the country.

"We had chicken plague in village after village periodically, every five, 10 years," he says. "The whole flock of chickens would die in my village, the next village. If you had chickens in your house or your yard, you tried to harvest them, cook them, because it's going to spread."

Of the recent outbreaks, Chang muses, "I don't think it's any more severe than what has happened in history. It's just that we have newspaper, TV and Internet now, airplanes and broadcast, and we're paying more attention."

Butcher agrees. Despite the widespread attention garnered by the H5N1 strain, he says the current situation is much less severe than what the media portrays.

"There are not many flocks infected, there's not much spread of virus from bird to bird, and there's very little contact between infected birds and people," says Butcher. "I think people are picturing every day, every flock in these countries is infected, they're all shedding viruses, and people are walking by all day long handling the chickens. We have to put all of this into perspective."



Watchful waiting

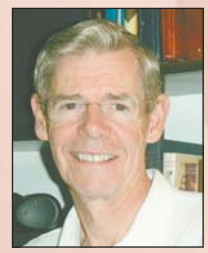
While the likelihood of the bird flu reaching the United States is debated, most agree vigilance is key.

Early warning systems are crucial, Archibald says. One example is the National Nosocomial Infection Surveillance System, a network of approximately 354 U.S. hospitals that voluntarily communicate with the CDC in an effort to curb potential outbreaks of hospital-acquired illness. If health officials detect the spread of disease early on, an appropriate vaccine could be produced before a widespread pandemic occurs.

"If they're able to develop and produce large quantities of a vaccine before this thing gets too big, we can implement a wide-scale vaccination program and we won't have to worry about it quite as much," says Peoples-Sheps. "But until that happens, we could be at great risk."

CONTINUED ON PAGE 21

"I don't want to sound like Chicken Little, but we have had examples before of false alarms."
— Paul Doering, M.S.



"If a pandemic strain of avian flu ever arrives in the United States, it will most likely arrive in the form of an infected traveler from Asia, not from a mutation of the bird strain here."
— Paul Gibbs, D.V.M., Ph.D.

"When you think about all of the people you've known in your whole life who have had the flu, relatively few people actually die from the disease. With this one, the death rate could be much higher."
— Mary Peoples-Sheps, Dr.P.H.

R. DIXON WALKER, M.D., a professor emeritus of urology, received the urology medal from the American Academy of Pediatrics Section on Urology at the group's 2005 National Conference Exhibition in October.


Walker

Walker, who earned his medical degree at the University of Miami and completed his residency in urology at UF, has been a College of Medicine faculty member since 1970.

VETERINARY MEDICINE

CARLOS RISCO, D.V.M., received the 2005 Florida Blue Key Distinguished Faculty award along with five other UF faculty members at the Education Celebration luncheon on Sept. 28.

A professor in the department of large animal clinical sciences, Risco is a board-certified theriogenologist (animal reproduction specialist) and an internationally recognized lecturer on dairy cattle. He was chosen for the award because of his dedication to the university, research, students and the greater Gainesville community, said Matthew Wein, Homecoming general chairman. Florida Blue Key has been giving the Distinguished Faculty award to outstanding UF faculty members since 1945.

PUBLIC HEALTH AND HEALTH PROFESSIONS

CHRISTY LEMAK, Ph.D., an associate professor, is the first recipient of the Bice Professorship in Health Services Research, Management and Policy.


Lemak

Michael O. and Barbara Bice established the UF health services administration professorship fund in 1999. As a challenge endowment, the Bices' $100,000 commitment helped to raise another $100,000 in new gifts. Major contributors included Munroe Regional Healthcare System, Martin Memorial Healthcare Systems, Lakeland Regional Health System, Health First and Shands at the University of Florida. A matching gift from the state of Florida brings the total gift to $300,000.

Lemak, associate chair in the department of health services, research, management and policy, is the director of the master's in health administration degree program. A department faculty member since 1998, Lemak's primary areas of teaching include health-care management and strategic management of health-care organizations. Her research focuses on the study of organizations providing health care to underserved populations.

VERA HEMPHILL and **JESSIE RUNGE** were honored as Employees of the Year at the college's annual Faculty/Staff appreciation dinner, held Oct. 14.


Hemphill

Hemphill, senior clerk in the department of clinical and health psychology, is described by her co-workers as the "go-to" person who keeps the psychology clinic running smoothly every day. She is highly respectful and sensitive to the special needs of each person with whom she comes in contact.


Runge

Runge, office manager in the department of communicative disorders, was recognized for her resourcefulness and willingness to pitch in to help others, going beyond her job duties to help other staff and faculty keep the department well organized.

Hemphill and Runge each received a plaque and $500.

BIRD FLU, CONTINUED FROM PAGE 12

The problem, says UF pharmacy professor Paul Doering, M.S., is that flu vaccines take months to manufacture. Until the bird flu mutates and begins to spread among people, scientists simply don't have enough information about the strain to develop an effective vaccine.

Are there other options?

Not any good ones, says Doering, co-director of the Drug Information Center at Shands. The antiviral drug Tamiflu has been widely publicized as a possible remedy, but many experts question the drug's effectiveness and practicality. For the drug to work, patients must obtain a prescription and begin taking Tamiflu within 48 hours of developing symptoms. Even if patients are treated quickly, they may not notice a difference. On average, the drug reduces the length of illness by about one day.

Still, a large portion of President Bush's $7.1 billion plan is dedicated to stockpiling massive amounts of Tamiflu and a similar antiviral drug, Relenza.

"I think this allows the government the solace of knowing that there is a plan. It's a curious mixture, probably of more politics and public policy than science," Doering says. "It comes on the heels of a debacle last year, when we didn't have enough influenza vaccine. Nothing would frustrate the American public more than knowing that there is a treatment out there, but [the government] just can't supply it.

"I don't want to sound like Chicken Little, but we have had examples before of false alarms," Doering says.

In the end, however, even skeptics agree preparedness can't hurt.

"If I were a betting man, I would bet that this thing is going to burn itself out in birds and not cause a pandemic," says Condit. "But at the same time, I will virtually guarantee you — in fact, absolutely guarantee you — that there will be another pandemic of some kind of flu, sometime. It's just the nature of the game. And the way the health organizations are behaving, we're going to be readier than ever when that happens, and that's a good thing." P

PHOTO BY GARY BUTHCHER


A Russian chicken infected with the H5N1 virus.