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## **Pig Boom Raises Health Issues**

By PATRICK BARTA and NGUYEN ANH THU

HO CHI MINH CITY, Vietnam -- The recent emergence of A/H1N1 flu highlights a wider concern among scientists: Pig and other animal populations are growing too rapidly, raising the odds of disease outbreaks and other environmental problems.

The world's pig population has surged in recent years, to about one billion animals from less than 750 million 30 years ago, according to the Food and Agriculture Organization of the United Nations. Agricultural economists believe the number of hogs and other livestock will keep rocketing higher in the long term, as developing-world incomes rise and meat demand booms.

Pigs provide a relatively cheap source of protein. But like chickens and cows, they also present enormous health and environmental challenges, especially in places where they aren't monitored carefully, including parts of Asia. As with other livestock, they are increasingly linked by scientists to water pollution and land degradation, and more recently, to diseases that sometimes spread to humans.

What potentially makes pigs more problematic, scientists say, is that they often live in close proximity to people and they are more likely than some animals to share viruses with humans.

"Fundamentally, it's too many people and too many animals of various species crowded together," says James Roth, a professor at the College of Veterinary Medicine at Iowa State University. With more animals, and more of them living near humans, "it's easier for infectious agents to replicate" and spread, he says.

Animal-health experts have said there isn't any evidence that the latest A/H1N1 flu was transmitted to humans from pigs, though some of the genetic components are common to swine. Health experts and the global pork industry also have emphasized that people aren't at risk from eating cooked pork.

Still, scientists have warned for a long time that the world is adding too many livestock animals. In recent years, the reasons have become more evident around the world. Runoff from animal waste has contaminated rivers, especially in places like East Asia. Illnesses linked to animals -- including bird flu, a deadly disease that spread through Southeast Asia several years ago and involved domestic chickens -- have become more common.

China, for one, has been plagued by repeated outbreaks of pig disease, including one known as "blue ear" that doesn't usually affect humans but can kill hogs or disrupt their reproductive systems. The disease, which can turn pigs' ears blue, infected tens of thousands of Chinese hogs in 2007, driving up local pork prices and contributing to a broader surge in inflation in China. Vietnam reported as many as 250,000 blue-ear cases last year, and at one point Cambodia closed its borders to pigs from neighboring countries for fear of the virus.

Other pig-related diseases have spread to humans. In Malaysia, more than 100 people died during a 1998-1999 outbreak of the Nipah virus, which kills humans and is believed to have emerged from hog farms there. Although Malaysia got a handle on the problem after culling more than a million pigs, subsequent outbreaks occurred in Bangladesh.

The most recent scare came earlier this year in the Philippines, where a handful of pig-farm workers tested positive for a strain of the Ebola virus that had appeared in local pigs. Although the particular strain of virus wasn't deadly, the outbreak worried health officials who feared such viruses could mutate into more harmful forms and move to humans.

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In 1998, veterinarians discovered a new flu virus in North Carolina hogs that most likely came from human contact. Strains of that 1998 flu virus -- the first identified with human, swine and bird parts -- circulate widely. The new human virus that erupted in Mexico in April shows that the 1998 virus is a major ancestor.

Most modern U.S. and European hog farms now have strict biosecurity procedures, such as requiring visitors to shower and don special clothing before coming into contact with their pigs.

But many developing-world farms aren't as fastidious.

Vietnam is a case in point. Years ago, the country's pig population wasn't much of a concern. Although many residents owned hogs, the animals were mostly found in rural areas or in smaller concentrations.

But as demand soared with Vietnam's economic boom, farmers have added more than 10 million of the animals since the mid-1990s, bringing Vietnam's pig population to about 27 million, among the largest in the world. The pigs generally are owned by local farmers or companies rather than large, international meat producers.

There isn't enough farmland for all the animals in densely populated Vietnam. As a result, pig farmers increasingly locate operations near urban areas.

That increases the odds of disease. More worrisome, says Jan Slingenbergh, a senior officer in the Animal Health office at FAO, the U.N. agency, is that the growth in pig numbers "has only just started."

Sometimes, pig farms are located in the middle of heavily-populated areas. One such operation was found last year near a busy intersection in a suburb of Ho Chi Minh City, Vietnam's commercial center, down an alley from a hair salon, a grocery store and a tire repair shop. The operation included 300 or more honking pigs that squirmed around in tight pens under corrugated metal roofs, behind a giant wall and invisible to passersby.

Nguyen Van Tan, the owner of the farm, told a visiting reporter that the operation will have to move eventually, because city land is too valuable. But "finding land for raising pigs is a big problem" around the city, he said. Reached again by phone again late last month, he didn't comment further.

Neighbors were blasé about the feeding operation, and said they generally have grown accustomed to it even though it dumps waste into a nearby field.

Nguyen Thanh Son, an official at the Institute of Animal Husbandry, a part of Vietnam's Ministry of Agriculture and Rural Development, says the country's large, industrialized pig operations often follow healthy practices, but he acknowledges there are some "household" pig farms that have environmental problems. He said the government has been trying to work with these operations to make them adopt better practices and that the government is also investing in breeding programs to develop stronger and healthier pigs as well as vaccination programs to deal with diseases.

But some experts worry anyway. Given the continued increase in animal populations, "we should really have a close look" at the risks, says Mr. Slingenbergh at FAO.

—Scott Kilman in Chicago contributed to this article.