

Pigs Look Healthy But Test Positive for Flu at Fairs; Flu Transmission Seen Between Pigs and Humans

More **than 80 percent of pigs** that tested positive for influenza A virus at Ohio county fairs between 2009 and 2011 showed no signs of illness, according to a new study.

Ohio State University researchers tested 20 pigs each at 53 fair events over those three summers and found at least one flu-positive pig at 12 fairs - almost a quarter of fairs tested.

The influenza strains identified in pigs in this study include H1N2 and H3N2 viruses - strains that have been circulating in pigs since 1998. In 2011, all of the H3N2 and H1N2 isolates found in pigs at the fairs contained a gene from the 2009 pandemic strain of H1N1, which is similar to the H3N2v strain causing human illness this year.

Though this finding alone is no cause for panic, it does show how quickly influenza viruses can change, said Andrew Bowman, lead author of the study and a Ph.D. candidate in veterinary preventive medicine at Ohio State.

In a second study led by Bowman, researchers compared the genomic sequences of influenza A viruses recovered in July 2012 from pigs and people. The analysis, showing a greater than 99 percent genetic similarity among the viruses, confirms that pigs and humans were infected with the same virus, indicating interspecies transmission.

As of Sept. 25 this year, the Centres for Disease Control and Prevention (CDC) had confirmed 107 human cases of H3N2v influenza in Ohio since July 2012, with the majority linked to exposure to pigs at agricultural fairs. While most of the human illness caused by H3N2v has been mild, one person, who had a compromised immune system, has died.

The more often that flu viruses are transmitted, the better their chances are of evolving into a strain to which humans are not immune, which is the big-picture concern among scientists monitoring these viral infections.

"Pigs can be infected with human-, avian- and swine-origin influenza viruses, making it possible for these viruses to easily swap their genetic material, which could allow for a new strain to emerge," Bowman said. "The potential is there for newly emerged strains to be the next pandemic we never saw coming."

Bowman and colleagues will continue to investigate strategies to protect swine and public health. In the meantime, the research group has offered potential risk mitigation strategies for fairs with swine competitions to consider: shortening the pig exhibition period, avoiding movement of pigs from one fair to the next, and vaccinating exhibition swine for appropriate influenza A viruses. In addition, the CDC recommends that people with compromised immune systems avoid pig displays at fairs.

Both studies appear online and are scheduled for later print publication. The three-year surveillance at Ohio fairs is published in the journal *Emerging Infectious Diseases*, and the analysis of human and pig viruses appears in *Emerging Microbes & Infections*.