

THE PATH OF A PANDEMIC

How one virus spread from pigs and birds to humans around the globe. And why microbes like the H1N1 flu have become a growing threat.

Laurie Garrett, May 18, 2009

Around Thanksgiving 2005 a teenage boy helped his brother-in-law butcher 31 pigs at a local Wisconsin slaughterhouse, and a week later the 17-year-old pinned down another pig while it was gutted. In the lead-up to the holidays the boy's family bought a chicken and kept the animal in their home, out of the harsh Sheboygan autumn. On Dec. 7, the teenager came down with the flu, suffering an illness that lasted three days. It was an H1N1 swine influenza. Largely ignored at the time, the Wisconsin virus was a step along the evolutionary tree, leading to a virus that four years later would stun the world.

Flash-forward to April 2009, and young Édgar Enrique Hernández in faraway La Gloria, Mexico, suffers a bout of flu, found to be caused by a similar mosaic of swine/bird/human flu, also H1N1.

Back in 2005, Centers for Disease Control scientists discovered that the H1N1 virus had pieces of its RNA genetic material that matched a human flu seen earlier, two swine types that had been circulating in Asia and Wisconsin for several years and an unknown avian-flu virus. Last year researchers from Iowa State University in Ames warned that pigs located in industrial-scale farms were being subjected to influenza infections from farm poultry, wild birds and their human handlers. As a result of the constantly changing genetic makeup of individual influenza viruses in pigs, the U.S. swine industry is continually scrambling to respond to the

influenza viruses circulating within individual production systems.

Investigation of the 1918 influenza pandemic, which is now estimated to have killed up to 100 million people worldwide in 18 months, revealed that the viral culprit was a type H1N1 human flu that had infected pigs, and then circulated back to humans. Today pigs are still an ideal mixing vessel for the creation of new avian/mammalian influenza viruses capable of causing novel diseases with the potential for producing pandemics in the human population. It is apparent that, in the U.S. swine industry, transmission of influenza viruses between swine and humans is fairly common.

It is a strange world wherein billions of animals are concentrated into tiny spaces, breeding stock is flown to production sites all over the world and poorly paid migrant workers are exposed to infected animals. And it's going to get much worse, as the world's once poor populations of India and China enter the middle class. In 1983 the world consumed 152 million tons of meat a year. The United Nations Food and Agriculture Organization estimates that by 2020 world consumption could top 386 million tons of pork, chicken, beef and farmed fish.

This is the ecology that, in the cases of pigs and chickens, is breeding influenza. It is an ecology that promotes viral evolution. And if we don't do something about it, this ecology will one day spawn a severe pandemic that will dwarf that of 1918.