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The Next Pandemic?

Early in 2003, news began to trickle out of China that a very infectious “atypical pneumonia” was spreading rapidly in hospitals around Guangzhou (formerly known as Canton) in Guangdong Province. Symptoms included fever, chills, headaches, muscle pains, and a dry cough, but in many patients, especially the elderly, the disease would quickly turn into a deadly pneumonia. In February of 2003, a doctor from Guangzhou, who had contracted this disease from his patients, traveled to Hong Kong. There he passed the infection to other travelers, who carried what is now know as Severe Acute Respiratory Syndrome (SARS) to Beijing, Canada, Taiwan, Singapore, and Vietnam.

Within six months, SARS spread to 31 countries around the world, where more than 8,500 probable cases and 812 deaths were reported. Fear of SARS traveled even faster and farther than the disease itself. Rumors multiplied across the Internet as conferences and sporting events were canceled, factories closed, and tourism to China fell by as much as 85 percent after the epidemic was revealed. The economic impact of SARS is estimated to be at least $30 billion (U.S.) in 2003 alone. By July 2003, the World Health Organization (WHO) declared the outbreak contained, but suggested that the world remain vigilant for further infections.

The rapid transmission of this disease shows how interconnected we all are. A virus can travel in just a few days anywhere a plane flies. One flight attendant is thought to have been the source of infection for 160 people in seven countries. SARS also points to the need for better communication and identification of new diseases. Because the Chinese government hid the extent and severity of the disease for several months, patients with this highly infectious disease mingled with the general hospital population, spreading the illness. Medical professionals, not knowing how serious the infection was, treated patients without wearing protective clothing. Major hospitals in Beijing, Taipei, Hong Kong, and Singapore were closed because so many staff members were sick, making treatment of the contagion even more difficult.

While globalization helped spread SARS, it also helped in rapid recognition and treatment of the disease. It took centuries to discover the cause of cholera. Identifying the virus that causes AIDS took two years. But within weeks after the WHO issued its first warning about SARS, an electron microscopist at the Centers for Disease Control in Atlanta found a new coronavirus in cell cultures infected with tissue from SARS patients. Less than a month later, labs from Vancouver to Singapore were sequencing its RNA. In May 2003, Scientists at Hong Kong University announced they had found coronavirus nearly identical to those from SARS patients in civets, badgers, and raccoon dogs being sold in Guangdong meat markets.

Wild species had been suspected as a source of the SARS virus since some of the first infections occurred among chefs and animal merchants. Exotic animals are regarded as
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delicacies in southern China, where they are featured at banquets and dinners at expensive restaurants. In 2003, Chinese police raided animal markets and hotels and restaurants, seizing 838,500 animals including many rare and endangered species. The emergence of SARS may reduce animal smuggling, but the existence of a reservoir of this virus in wild bats may mean that it will be impossible to completely eradicate the disease.

As SARS infections decreased, a new, highly lethal disease emerged in Asia during 2004. A variant of bird flu appeared first in Thailand. Of 37 reported cases in that country in 2004, there were 29 deaths. Thailand had 17 cases and 12 deaths that same year, while Cambodia had one case and one death. This virus, dubbed H5N1 by virologists, appears to be much more deadly than the SARS virus. SARS killed about 10 percent of its victims. H5N1, while not nearly as widespread as SARS, killed about 80 percent of those who contracted it.

“There is no question about whether another influenza pandemic will sweep through the world's more than 6 billion people,” said Dr. Klaus Stohr, head of the global influenza program at the WHO, “only a question of when. And this virus is certainly the most likely one which will cause the next pandemic.” Major flu outbreaks occur every 30 years or so. The deadliest in the past century was the so-called Spanish flu pandemic of 1918–19 that killed between 20 and 50 million people worldwide. Epidemiologists predict that if Asian bird flu spreads the way that SARS did in 2003, the global deaths could easily exceed those of 1918, when the world population was one-third what it is now, and transportation was vastly slower and less pervasive than at present.

The H5N1 virus was first detected in Hong Kong in 1997. Between 1999 and 2002, more than 20 different samples of the virus were isolated. Virologists worried as they watched successive samples become increasingly virulent and better able to jump species barriers. In 2005, the H5N1 virus spread from a fatally ill Thai girl to her mother, the first recorded incident of human to human transmission. The 11-year-old girl probably acquired the virus from infected poultry, but her mother had no contact with birds. After caring for her daughter for less than 16 hours, the mother became ill and died the next day.

Asia represents a vast reservoir of viruses. It’s estimated that more than 1 billion pigs and many times that many ducks and chickens live in close daily contact with their owners in Asia (fig. 8.1). Those who raise, process, or cook these animals are at a high risk for contracting viruses. Pigs are an especially good conduit for infection of humans. Their respiratory system is very similar to ours. When they get flu, their symptoms—cough, fever, runny nose—are the same as ours. When a virus gains the ability to jump from birds to pigs, it is certain that it will soon spread to humans.
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Secrecy in China in 2003 helped SARS spread to many other countries before it could be brought under control. Whether we will have learned enough from the SARS crisis to avert similar spread of bird flu remains to be seen. The emergence of these diseases remind us of how susceptible we remain to infectious diseases in an interconnected world. In this chapter, we'll look at some principles of environmental health to help you understand some of the risks we all face and what we might do about them.