Pandemic—the Looming Peril?

Fear is circling the globe faster than the virus itself. Pandemic—the word alone evokes a feeling of helplessness. RATIONAL ANALYSIS AND CAREFUL PREPARATION help to minimize risks.

DISEASES ARE AS OLD AS mankind itself. In one of the earliest recorded reports, the Greek historian Thucydides described the outbreak of a plague in the besieged city of Athens. The city’s residents suffered from high fever, excruciating coughing and painful diarrhea. “The dead lay as they had fallen, one upon another, while others scarcely alive wallowed in the streets and crawled about every fountain craving for water,” wrote Thucydides.

The Athenians turned away from the helpless doctors, who couldn’t even prevent themselves from becoming infected, and streamed in droves to the temples. However, when the people’s prayers also failed to help, the city descended into chaos. “Neither the fear of the gods, nor laws of men, saved any man,” recalled Thucydides in horror. It remains unclear to this day what disease ravaged the city in the year 431 B.C.

Companions of humanity

From the dawn of time, mankind has been struck repeatedly by epidemics. Fear of disease is deeply ingrained into our collective memory.

In the 14th century, the bubonic plague may have claimed the lives of more than a third of the population of Europe. Nobody had any idea what was going on. Doctors had no clue as to why the disease struck randomly around Europe. The virus is spread by fleas that jump from rats to humans. The first case of bubonic plague in the United States was reported in San Francisco in 1876.

Infectious diseases were a mystery for thousands of years. When cholera was sweeping through Europe in the 19th century, people thought that bad odors, dirt or an immoral lifestyle were the reasons for the illness. Thanks to modern science, we now know that a short, comma-shaped bacteria in drinking water causes the deadly diarrhoea.

The influenza virus is currently the only pathogen that we expect to cause epidemics that sweep round the entire world,” says Marlen Suckau, Infection Protection Officer of the city of Berlin.

A sneezing illness

The influenza virus is spread with each sneeze and cough. Both cause invisibly tiny droplets to float through the air, possibly infecting people nearby. Because the virus sticks to people’s hands, it can be passed on when people shake hands or touch door handles, making it almost impossible to totally prevent the disease from spreading.

The illness can be very serious in some cases. The seasonal flu, for example, can kill some of those it infects. However, the flu season is not as severe as other recent epidemics such as SARS or swine flu. The latter originated in China last year when a strain of the flu virus spread rapidly through Europe and the United States after being brought back by American soldiers returning from Iraq.

Epidemics and pandemics—a never-ending story

| Around 3000 BC | Plague spreads out from the cities of Mesopotamia |
| 431 BC | Athenian Plague between the bubonic plague and Ebola |
| 434–444 AD | The plague spreads from Egypt to Europe |
| 14–18th century | Severe outbreaks of plague in Europe |
| Late 15th century | Syphilis spreads through Europe |

A sneeze can produce roughly 40,000 droplets at a speed of at least 150 kilometers per hour. Masks provide protection in a crowd.
It’s so easy...
...to protect yourself

» Avoid large gatherings of people
» Avoid unnecessary travel
» Avoid shaking hands
» Avoid contact with the eyes, nose, mouth
» Wash your hands thoroughly after touching other people, using the restroom and before eating
» Thoroughly ventilate closed rooms
» (Perhaps) wear a respirator
...to protect others:
» Stay home if you are sick
» Cough or sneeze into a disposable tissue or your elbow
» Wear a respirator

A particle measuring 10 micrometers in size floats in the air for 17 minutes before reaching the ground.
Around 1,940,000 viruses are released with each sneeze; coughing releases around 90,000 viruses.

It's still impossible to tell if the use of face masks might delay the spread of the pandemic. Studies made during the SARS epidemic showed that the masks protect medical staff against infection.

Paper masks are insufficient for this task, however, because viruses expelled by coughing are encapsulated within water droplets. If the droplets are bigger than 10 micrometers, they quickly fall to the ground. But since the cloud of water droplets can quickly evaporate, the droplets often leave behind small cores that float for extended periods in the air and can infect people at a distance of three meters. Only tight-fitting face masks that are equipped with special filters can effectively remove the tiny particles from the inhaled air.

Masks filter

The European standard (EN 149) defines three levels of protection. FFP1 masks filter at least 80 percent of the particles out of the air (FFP stands for “filtering facepieces”). FFP2 masks achieve a filtering level of at least 94 percent, while FFP3 masks remove at least 99 percent of particles. The European standard corresponds to the American NIOSH standard: An N95 mask filters at least 95 percent of the particles out of the air. These masks differ from simple face masks or surgical masks in that they typically fit much more snugly around the mouth and nose. During inhalation, the particles are retained in the filter material instead of leaking through and entering the respiratory tract.

The New South Wales School of Public Health and Community Medicine in Sydney, Australia, recently studied 143 families to determine whether the parents of children ill with the flu can protect themselves against infection by wearing FFP2 masks. The analysis shows that the masks do in fact provide substantial protection, but this hardly matters in practice. A large portion of the parents had stopped wearing the masks after just a short time. This is hardly surprising as long as the general level of concern is low. “Many people find wearing a mask to be uncomfortable because they are not used to it. The masks cause breathing resistance and a moist feeling,” says Alexander Grünke, an air purifying respirator expert at Dräger. Widespread use would only be conceivable if the flu pandemic was much more dangerous and there was much more concern.

After the bird flu scare, the industrialized nations used the intervening years to refine and increasingly harmonize their national pandemic plans. The differences remaining between the European countries lie primarily in the weighting of the measures, such as how much money will be invested in antiviral medications. However, it’s a different story when it comes to corporate pandemic plans. What will happen when, if at all, the measures we have been taken only correspond to Phase 4 because so few people in Germany have caught the Spanish Flu (as of July 2009)? No one can say what further course the disease will take. The Spanish Flu that killed between 25 and 50 million people worldwide, was also mild at first and did not turn deadly until a second wave circled the globe. We won’t know whether our precautions are sufficient until after the fact.

One thing is certain, though: There has never before been a virus whose appearance was predicted so far in advance. And never have such detailed preparations been made for a future pandemic. Whether it ever comes to that remains to be seen. Although WHO has announced that the pandemic has since moved into the final phase (Phase 6), the actual measures that have been taken only correspond to Phase 4 because so few people in Germany have caught the Spanish Flu (as of July 2009) so far. No one can say what further course the disease will take. The Spanish Flu that killed between 25 and 50 million people worldwide, was also mild at first and did not turn deadly until a second wave circled the globe. We won’t know whether our precautions are sufficient until after the fact.

Dr. Birgit Herden

Further information online, including:
Checklist for companies
www.dragee.com/98/pandemic

1916–17 The worst polio-epidemic in history rages across the U.S.A.

1918–1919 Spanish Flu is the largest flu pandemic of all times.

1961 to present Cholera in Asia, Russia, parts of Southern Europe, Africa, and South America

1979 Smallpox is the first disease to be eradicated worldwide

1981 First cases of AIDS reported in the U.S.A.

2006 World-wide, 65 million people are infected with HIV

2009 ‘New Flu’ spurs world-wide fear