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Zika, Ebola, MERS & More Pandemic Threats Must Be Monitored

Executive Summary

Monitoring pandemic risk is a key consideration in global risk management. While Zika headlines remind us that new risks are always emerging, a review of recent outbreaks illustrate the low risk of outbreaks becoming pandemics.

While the Zika virus may have minimal impact to mortality, headlines about the spread of Zika and the recently concluded Ebola outbreak remind us that new risks for potential pandemics continually emerge. Companies must prepare risk management and mitigation plans in case of extreme loss scenarios such as pandemics. One tool used to measure enterprise risk is footprint scenario analysis, where we look at historical events and assess the nature and magnitude of losses if the same event were to occur today.

Two historical pandemic events that we can use for footprint scenario analysis are the influenza pandemics of 1918 and 2009. The death toll of the 1918 flu is usually estimated to be 20 million to 50 million victims worldwide, although other estimates run as high as 100 million victims. The exact number is hard to know given the lack of accurate record keeping in many parts of the world. Mortality associated with the 2009 flu is estimated between the World Health Organization's officially reported 18,500 laboratory confirmed deaths to "hundreds of thousands" according to a study published in the *Lancet Infectious Diseases journal* in September 2012.

Using detailed data such as age, health conditions and socio-economic status of the affected portfolios, we can estimate how our insurance portfolio may be impacted if such an event were to occur today. Typically, we consider both a true footprint (assuming the same conditions are prevailing) and a current day scenario (assuming medical advances and other interventions are available). In this way, an insurer can estimate the potential impact of a pandemic, no matter how remote, on the portfolio.

Potential Pandemic Losses

What are the potential losses if pandemics of this same magnitude were to occur today?

Some experts claim the next pandemic is overdue. A pandemic has occurred every 20 to 30 years for the past few centuries, and the most recent one, the H1N1 influenza pandemic, originated in 2009. Pandemics often develop when humans have little or no immunity to viruses created by genetic mutation.

By reviewing a few recent outbreaks, we can assess the potential pandemic risk (Figure 1).

Editor

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Pandemic Threats (cont.)

Though we see from the chart that the risk of a pandemic developing as a result of the most recent headline outbreaks is low, what might a modern pandemic look like? During his 2006 TED prize acceptance speech, Dr. Larry Brilliant shared results of a study he did with top epidemiologists who predicted effects of the next pandemic:

- A billion people get sick and as many as 165 million people die
- Global recession and depression occur as just-in-time inventory systems and the rubber band of globalization break
- Economic cost would be at one to three trillion dollars, as those who escape death lose their jobs and healthcare benefits

Dr. Brilliant estimated that a global pandemic today could spread from one discreet site of origination to global infections within three weeks, given the frequent and widespread use of international travel.

Historian Dr. Mark Humphries has found evidence that the 1918 influenza may have originated in China, when a new and deadly virus appeared in the winter of 1917-18. The subsequent mobilization of the Chinese Labor Corps, sent by the Chinese government to the Western front of World War I to assist the Allies, may have been the catalyst for the global spread of the virus.

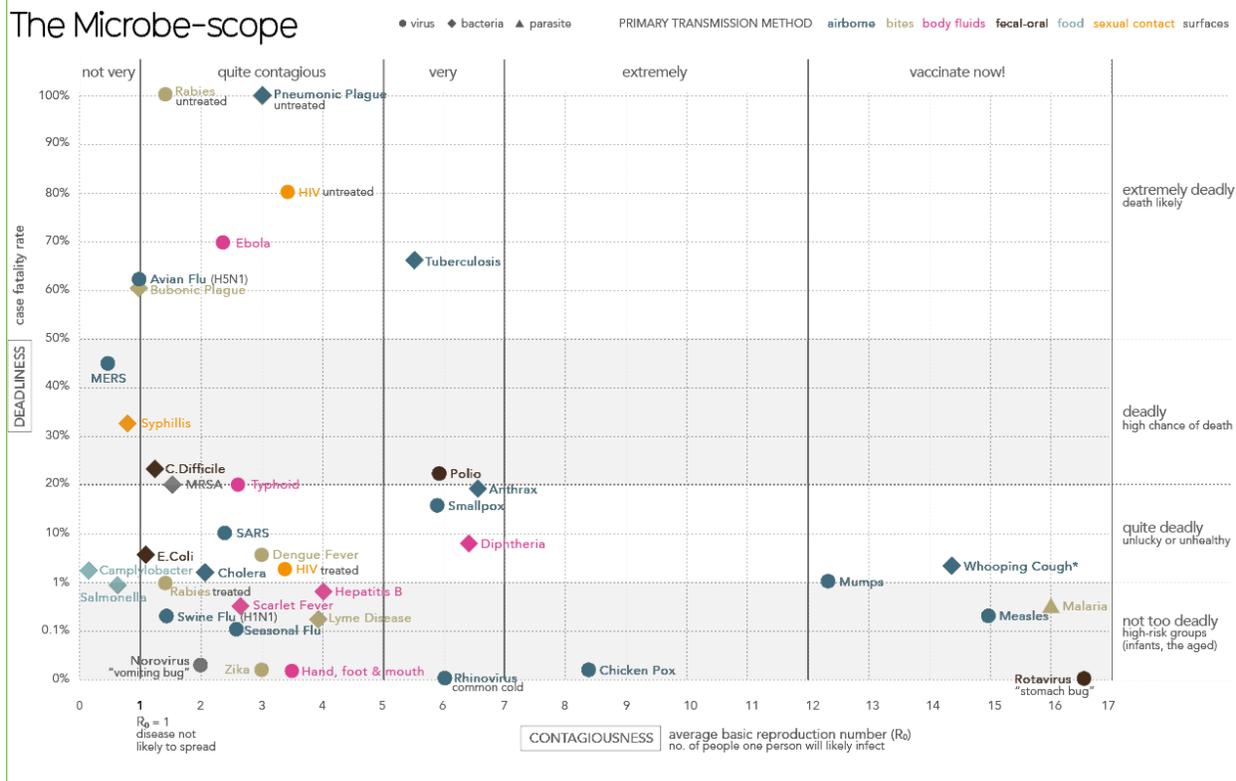
There are other theories as to the geographic origin of the 1918 influenza, but it is clear that the massive movement of people between relatively isolated locations due to the war may have accelerated its spread. Other historical epidemics have occurred under similar situations whereby new pathways of travel opened up, allowing contact between previously isolated groups. In our modern day scenario, we need to consider potential triggers that could cause local outbreaks such as MERS or Ebola to become global pandemics.

Monitoring pandemic risk is a key consideration in SCOR's global risk management process. SCOR has sponsored global forums where academicians, epidemiologists, industry experts and other stakeholders come together to discuss looming challenges and best practices. Our team of pandemic analysts around the world consult frequently with each other and with external experts on events in their respective regions and any implications they may have to progress from outbreak to pandemic. We continuously and conservatively model potential pandemic impacts to our block of business. ∞

Figure 1 - Potential Pandemic Risks

Outbreak	Contagion Ranking	Fatality Ranking	Pandemic Potential
1918 H1N1 (historical)	Moderate - Low	Low	Pandemic
2009 H1N1 (historical)	Moderate - Low	Very Low	Pandemic
Ebola	Moderate - Low	High	Low. Symptoms arise quickly after infection so new cases can be quarantined quickly.
Middle East Respiratory Syndrome (MERS)	Low	High	Low, though no vaccine or specific treatment currently available.
H5N1 influenza	Low	High	Low. Candidate vaccine already developed.
H7N9 influenza	Low	High	Low. Candidate vaccine already developed.
Zika	Moderate	Extremely low	Low

Figure 2 - Pandemic Transmission and Contagion



Viruses related to the most recent outbreaks can be found towards the left section of the graph (lower contagiousness). Most, except for Zika, are considered highly fatal. While the pandemic potential of many of these viruses seem low, we need to consider other factors that would provide conditions resulting in a "perfect storm" that would create a pandemic resulting in extreme losses. Source: www.informationisbeautiful.net/visualizations/the-microscope-infectious-diseases-in-context/

Figure 3 - Pandemic Risk Factors

Conditions Favorable to Pandemics

- New viral strain develops that people have little or no immunity to
- No preventative vaccine immediately available to stop spread of new infections
- No effective antiviral or antibiotic treatment available to prevent fatalities
- Inability to detect the epidemic in its early stages and lack of coordinated communication during pandemic development
- Population growing and increasingly centralized, in closer proximity which increases risk and spread of contagious diseases

Current Conditions that Lower Pandemic Risk

- CDC takes routine preparedness actions whenever a new virus with pandemic potential is identified, including developing a candidate vaccine virus to make a vaccine in case needed
- Antibiotics since the 1940s and antivirals since the 1960s are now widely used and continuously developed
- Sophisticated surveillance monitoring and global communication plan plus 24/7 internet news

Resources:

- www.cdc.gov/flu/avianflu/h7n9-virus.htm
- www.who.int/influenza/human_animal_interface/influenza_h7n9/RiskAssessment_H7N9_23Feb20115.pdf?ua=1
- www.history.com/topics/1918-flu-pandemic
- www.mphonline.org/worst-pandemics-in-history/
- www.medicalnewstoday.com/articles/148945.php?page=3
- www.elsevier.es/es-revista-medicina-universitaria-304-articulo-history-progress-antiviral-drugs-from-S166557961500037X
- wih.sagepub.com/content/21/1/55.abstract
- www.informationisbeautiful.net/visualizations/the-microscope-infectious-diseases-in-context/
- www.ted.com/talks/larry_brilliant_wants_to_stop_pandemics