Pandemic Influenza's Impact on Health Systems

by Max J. Rudolph

The world has endured three influenza pandemics during the past 100 years. It is likely to suffer through more in the future. How effective will health systems be under these severe stresses? Recently, an influenza virus has appeared that reminds many of the 1918 virus, which resulted in the most severe pandemic in recorded history. By jumping directly from birds to humans, the H5N1 virus has done something not seen since then. The lethality of the current virus is high, with more than 50 percent of the reported cases dying. Most feel the virus must mutate to a less deadly form before it spreads broadly. A global pandemic requires a virus that does not kill its host so quickly that he or she can't infect others.

Scenarios

The U.S. federal government has created two population scenarios. The moderate one, modeled after the 1957 and 1968 pandemics, is not expected to have a material impact on mortality. These historical pandemics maintained the normal "U" shape of the age-based mortality curve. The severe pandemic scenario would be expected to kill about 2 million Americans, less than 1 percent of the population. In addition to the higher overall level of deaths, the impact on the healthiest individuals differentiates this scenario. Following 1918 pandemic experience, the shape of the mortality curve is a "W," with excess mortality between ages 15 and 40.

A pandemic that impacts the strong requires a health system to be open to new realities and new solutions. Who will be the caregivers? Young health-care professionals would be among those most at risk. How will the virus interact with secondary infections? These will vary by country and, in 1918, included pneumonia and malaria. How will those with impaired immune systems cope? What about smokers? Will these groups be the most impacted, or will the virus attack elsewhere?

The moderate scenario assumes 90 million sick, with fewer than 1 million requiring hospitalization. If the severe scenario came to pass, the health system would clearly be overwhelmed with nearly 10 million seeking hospitalization. Many of the sick would not be able to get more than the most basic of care. Assuming that you would not be reimbursed for care not received, the legal system will likely be tested for firms that guarantee service without providing it.

Some prognosticators assume that health claims in the severe scenario will spike by as much as 40 percent, while others expect lower paid claims as the system shuts down and elective surgeries are postponed. Reinsurers have been studying pandemic risk and can help define scenarios, especially as they relate to insured versus population results. Those receiving continuing services such as dialysis and chemotherapy, or someone expecting to deliver a baby during this period, should consider alternatives.

Impact on People

With 30 percent of the population expected to be sick, and many more caring for them, work absences are expected to be as high as 40-50 percent. In a recent survey of individuals by the Harvard School of Public Health (Pandemic Influenza Survey September 28-October 5, 2006), knowledge of future pandemics and how the respondent would react was addressed. More than half, 57 percent, expected to face serious financial problems if they missed a month of work. While many firms have developed pay plans for employees in the event of a pandemic, 22 percent of respondents did not know if they would be paid. Honest communication, both in advance and

during a pandemic, will make a big difference toward successfully dealing with a pandemic.

Early in a pandemic situation no one will know which scenario is playing out, and reports will be vague. Fear and rumor will initially rule the day. Some families will go into lockdown mode. Others can't afford to miss work even to take care of family members, resulting in higher contact rates. The experience in Turkey, when H5N1 appeared, is enlightening. The health-care system was overwhelmed as many with cold symptoms were tested for bird flu. Health-care workers will be exposed to the virus more frequently than the general population. This will further strain the health system as they stay home to care for themselves and their families. While volunteer caregivers can perform basic measures, administering much of today's care requires advanced training. Families will need employers to be flexible, especially if schools, malls and places of worship are closed during a severe pandemic.

How long can a local health system operate if supplies are delayed? Oxygen for ventilators and basic supplies like laundry soap, antibiotics and rubber gloves are expected to be in short supply. Communities need a plan. This should include encouraging each home to stockpile food, water, communications gear and trash bags. Not only will this help reduce the impact of pandemics, but events such as snow storms, cyclones and earthquakes.

Insurance Products

In many countries, health-care is provided by the government. Even in the United States, almost half is paid by government agencies. An influenza pandemic will clearly put financial stress on all countries that attempt to provide care to citizens. The impact on a defined-benefit type pension system, such as Social Security in the United States, will depend on the shape of the mortality curve.

Of the products offered by health insurers, major medical will have the greatest immediate impact since this is the coverage used for doctor and hospital care. Less clear is the impact on policies like long-term care and disability income. Short-term disability will clearly be impacted. It is likely that future underwriting for these policies will look for conditions such as permanent damage to the lungs and heart as sales surge after a pandemic.

Those companies self insuring their employee benefits should also consider these scenarios. At the same time their business might be suffering due to the pandemic, employee benefit costs will spike.

One often-neglected aspect of reputational risk is the possibility that insurers may not be considered part of the solution during a stress event like a pandemic. If a life insurance benefit payment is delayed during a pandemic, it is unlikely to cause a public furor. Health insurers with major medical coverage will truly be overloaded with work at the same time as employees are focused on caring for their families.

Insurers might need to act as banks, loaning money to hospitals and employees. Even economic risk may be significant for health insurers. During a severe scenario, premiums may be waived or deferred. With claims spiking, a company's asset portfolio will need to provide liquidity.

Priorities

One of the major challenges facing the health system is determining who does not get care when the system is overburdened. While these public health decisions should be made in advance of a stress event, politicians don't want to be associated with telling potential voters they will not get care.

One group providing unsolicited advice on this topic is the Minnesota Center for Health-Care Ethics. This think tank assumed the "W" shaped mortality curve of 1918. They suggest that limited supplies of vaccine be prioritized first to support the community infrastructure (key government leaders, public health and public safety workers), groups expected to be high risk yet receptive to the vaccine (the healthy young), and caregivers. They assume it will take six months to develop a vaccine, suggesting a flexible game plan that can be adjusted on the fly as it becomes apparent which age groups are most at risk.

Notable in this plan is the conscious decision not to initially provide those who are likely to have lesser responses, such as the elderly and infants, with the vaccine. Those with compromised immune systems are also placed far down the list. The study assumes that someone with immunity to the virus through previous exposure can be identified and avoid a redundant vaccination. While this plan appears to be well thought out and useful, keeping a vaccine off the black market and making it available to all during such an event will be challenging.

For more information on pandemic influenza, monitor the Society of Actuaries' pandemic Web site and the current SOA research project being led by Jim Toole.

Max J. Rudolph, FSA, CFA, MAAA, recently formed Rudolph Financial Consulting. He is currently a member of the SOA Board of Governors. He can be reached at *max.rudolph@rudolphfinancialconsulting.com*.