Long-term lesson of COVID-19: Preparation for potentially lethal pathogens requires a continuing, robust and well-funded research and monitoring system

By the time most of you read this column, with infections exceeding 10 million people, the US will be close to suffering from a quarter of a million deaths related to COVID-19. As we go into winter with people spending more time indoors, it appears that the rise in infections follows the pattern we have seen with the annual flu that blankets the Northern Hemisphere every winter.

COVID-19 is described as a zoonotic disease because it developed in animals and was then transmitted to humans where it a) was capable of being transmitted from one person to another through the air and b) resulted in deaths of less than 2.5 percent of those infected.

For those of us who live with and/or work with animals, it is likely that we share biological matter back and forth with those animals with few or no harmful effects.

When we were younger, we learned that we had to thoroughly cook our pork to kill the trichina worm that was in the meat and would cause Trichinosis in humans. Trichinosis is a zoonotic disease that is transmitted from animals to humans. Today we do not worry about this disease when we cook our pork because modern hog production systems have virtually eliminated the disease from the US herd.

Unlike trichinosis in the US and smallpox worldwide, there are many zoonotic diseases that continue to result in disease and death in the human population. The list currently runs from A (Angiostrongyliasis) through E (the Shiga toxin producing *E. coli* O157:H7 that we guard against in cattle production) to Z (Zika fever). Some occur only occasionally while others like Trypanosomiasis and Malaria are endemic in parts of the world.

But occasionally, we see an airborne influenza that spreads around the world and causes a large number of deaths creating a global pandemic. Though we have dodged the bullet several times in recent years, COVID-19 is the largest pandemic since the 1918 Spanish Influenza (despite the name it did not originate in Spain).

Our task as analysts is not to conduct basic research on the disease, but rather to take what we learn from the research scientists and identify policies that need to be put in place to allow us to reduce the remaining impacts of COVID-19 and minimize the impact of future diseases that have the potential to grow into a pandemic (the question is not “if” but “when”).

We offer the following discussion not as a complete list of activities needed to manage a disease outbreak, but rather as an exercise in reminding us of the importance of long-term steady work that may be relevant to most people only occasionally.

The US, in conjunction with other countries, needs to maintain a robust system of disease monitoring and research on potential lethal pathogens that could easily spread causing illness and death in the human population (as an aside we need to do the same kind of work with diseases that affect animals but have minimal impact on humans). After years of work and no outbreaks, it is easy to take a red pen to budgets for this type of research, but to do this is short-sighted. We need to continuously monitor potential infectious diseases in animals so we have the capability to be on top of a disease the moment it is identified in the human population.

In addition, regular drills need to be held among a wide range of public and private actors including researchers, medical systems, public safety personnel, government officials, and more to test alternative responses to various threats to human life, analyze response weaknesses, identify materiel and logistic needs and plan for the next simulation.

In the minds of many people this will appear to be a waste of time and money. And, the longer it has been since the last credible threat the greater the waste of money will seem. As governmental officials and other personnel change, it is important to carry out new exercises so the people in various positions know each other and are ready to act in concert with one another.

We need to hold stocks of supplies that will be needed in the case of a disease outbreak. These stocks will need to be rotated out on a regular basis so that they are up to date and operational if an outbreak occurs.

Just as those of us in the agricultural community never stop our work in developing the next farm bill, we must fund those in the public health sector to continuously prepare for the next pandemic. As our second grade teachers told us in the class on handwriting, "Practice, practice, practice." That is some of the best advice we ever received.

Policy Pennings Column 1052

Originally published in MidAmerica Farmer Grower, Vol. 37, No. 298, November 6, 2020

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