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Emerging Diseases

By **Sheilarae Lau** /Special to the TAB
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Epidemics associated with emerging infectious diseases are occurring in historically unprecedented numbers, according to the World Health Organization. An emerging disease is one that suddenly appears in humans, such as AIDS, Ebola and Hanta virus. Also in this category are existing diseases, like West Nile virus and cholera, which suddenly increase or move into new geographic areas. Although some emerging diseases are caused by genetic changes in pathogens, often related to antibiotic drug resistance, most emerging infectious diseases originate in animals and spread to humans.

Globalization and climate change are driving the spread of infectious diseases into new areas. As humans intrude into wild animal habitats, they come into close contact with host animals. And the Intergovernmental Panel on Climate Change predicts that global warming will cause in increase in human mortality due to infectious disease. As warmer climates allow tropical animals and insects to thrive in new regions, diseases move with them.

It's already happening. Dengue fever, a tropical disease carried by mosquitoes, which cannot survive frost, is steadily spreading northward. There have been outbreaks in Texas, and the mosquito that carries Dengue has been found as far north as Chicago. Similarly malaria, also carried by tropical mosquitoes, has expanded its range, with human cases appearing as far north as New York and New Jersey.

Migratory wild birds are efficient abettors to the global spread of emerging diseases, delivering pathogens and pathogen-carrying parasites to new places. Limiting future disease outbreaks requires monitoring bird migratory patterns, but this is becoming more difficult as migratory patterns are being increasingly disrupted by climate change.

The 2003 outbreak of SARS was a sobering example of how quickly an emerging disease can spread throughout the world today, turning a regional outbreak into a global health crisis in a matter of weeks.

David Naparstek, head of Newton's Health and Human Services Department, is concerned about the parade of microbes he monitors locally.

West Nile virus first appeared in the Western hemisphere in 1999, in Queens, New York, when it caused 63 human cases of severe encephalitis and 7 deaths. The virus survived the winter. It had spread to birds and mosquitoes in Newton by the following year, and had swept the continent within three years. By 2005, Newton had human cases of encephalitis caused by the West Nile Virus.

The number one reportable disease in Newton is Lyme disease, which is now endemic. The tick that carries Lyme disease, originally found only around Lyme, CT, is now widely spread throughout New England and beyond.

"The thing we are holding our breath and waiting for is a pandemic flu," says Naparstek. A devastating flu would be a different strain of virus than what we typically see each flu season. It is thought that all mammalian influenza viruses derive from the avian influenza reservoir. The influenza virus evolves, and new strains are constantly

emerging. A strain of the flu virus in birds -- avian flu – could be spread from one continent to the next by migratory waterfowl. It would likely affect susceptible domestic chickens, duck and geese and they would infect humans. In Southeast Asia, where people live in close proximity to their bird flock, 373 human cases of avian flu have appeared over the last five years, and two thirds of those have been fatal. We have not yet seen this flu virus in birds in the western hemisphere, but if this virus mutates into a form that can be transmitted efficiently, we will have pandemic flu.

Flu pandemics appear about every forty years. The last century saw Spanish flu (1918), Asian flu (1957) and Hong Kong flu (1968). Public health officials are continuously monitoring global networks to be alert to emerging disease and are prepared to direct resources to any area of concern. In Newton, “we’ve quietly done an awful lot of work on the pandemic with the knowledge that it will serve us in an emergency,” says Naparstek. “We cannot prevent a pandemic, but we can prepare for it, and Newton is doing that.”

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