

8-19-11 Science Based Public Health: Still Evolving

I wonder when people first began their attempts at improving public health. I don't think early examples of surgery qualify, as they would be examples of individual health measures. If someone's tooth hurt; take it out. Ancient people even drilled holes into the skull, perhaps to relieve a severe headache. The difficulty with public health is that when a trend is recognized, the measures to be taken to protect many, probably won't be effective unless the reasons and mechanisms for the increase in a particular disease are understood.

I say *probably* because sometimes the guesses were effective but for the wrong reasons. Take, for example, ancient Rome's draining swamps around areas of habitation in an attempt to control malaria. It helped, but for the wrong reasons. They did not suspect that malaria was spread by mosquitoes. They drained the swamps because the bad air, or bad vapors, floated out from the swamps, causing illness. The name *malaria* means bad air. It was not until 1880 that Charles Louis Alphonse Laveran discovered parasites in the blood of a malaria patient. Even more interesting, this surprised physicians and scientists at the time because they thought Louis Pasteur's discovery of bacteria was going to be the ultimate explanation for all disease. The discoveries of the causes of disease had only just begun.

Six years after Laveran's discovery of the parasite, Camillo Golgi, who had been studying the blood of malaria patients, identified two different parasites causing malaria. By following their life cycle, he was able to demonstrate that the division rate of the parasites exactly corresponded to the fevers in the human hosts.

But even that information was not enough information to go after the culprit correctly and sufficiently. In 1894 Patrick Manson was suggesting that mosquitoes were the culprit transporting the parasites. Several other scientists, such as Ross, Grassi, Shortt and Garnham offered more illumination on the full understanding of the mosquito species, the mosquito life cycle and the method of transmission.

This process of discovery involved many people driven by the motivation to reduce the hundreds of millions of annual malaria victims. These scientists also had technological breakthroughs assisting them unavailable to scientists of the past. Microscopes revealed what the human eyes could not see. Parasites and bacteria were seen and studied. Viruses weren't even a twinkle in their mind's eyes at that time.

And, yet, we still battle mosquitoes. Money and manpower are needed to prevent the millions of deaths from malaria. Education makes a difference, too. People can change their behaviors to avoid mosquitoes to at least reduce the chances of being bitten. However, that is

easier said than done if your livelihood depends on outdoor activities, you live in a hut that allows the entry of mosquitoes, you don't have netting for the beds and no one has access to repellants.

By comparison, I feel fortunate that in New England most of us can change our behaviors and avoid dusk to dawn outdoor activities. If we can't afford new screens, we can repair them in ways that are not attractive but still solve the problem. How well I remember, taking screens out and sewing little cloth or screen scraps over the holes. That was more effective and longer lasting than the temporary measure of taping the holes. There is no excuse for allowing standing water. Rinsing/flushing bird baths and children's toys at least every four days will prevent mosquito larvae from emerging into flying adults.

We are also fortunate to live in an areas served by Mosquito Control Programs. Call the Plymouth County Mosquito Control Program to request spraying your yard at 781 585 5450 or fax them at 781 582 1276. Better yet, talk to your neighbors and, if you are all in agreement, request them all to be sprayed. This results in better treatment for you and makes the scheduling easier by the program.

These measures should be routine by everyone, especially in late summer when we so often have Eastern Equine Encephalitis (EEE) and West Nile virus (WNV) in the mosquitoes. While this year's level of positive findings are not at the level triggering the declaration of an emergency, as last year, EEE and WNV have arrived and will stay until a hard frost. And you know what? It only takes the bite one infected mosquito to deposit into someone's blood, this life-robbing disease.

And you know what else? Mosquitoes do not recognize town boundaries. When EEE and WNV are in Bridgewater, as they are now, those mosquitoes can fly into Halifax. It also means that similar habitats in other towns probably have the diseases, also. For a daily update on mosquito, animal (none so far this year) and human data (none so far this year), by county, go to the Department of Public Health's arbovirus page at www.mass.gov/dph/wnv

At the State level and locally with our Mosquito Control Programs we are discussing the possibility of doing things differently to prevent these diseases rather than waiting until it is necessary to declare a state of emergency and then conduct a very expensive widespread aerial spraying. If we can make a big enough reduction impact on mosquitoes earlier in the season, it is only logical that we could prevent disease from spreading later in the season. How to go about it, what methods to use and what knowledge and/or theories to base the new tactics on, remains to be seen but it is an exciting discussion.

Well, it is an exciting discussion if you like talking about bugs, birds, ecology, weather patterns and saving lives. Count me in on this one!

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