

Death, Taxes and Emerging Infections

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The philosopher who came up with the world's short list of life's certainties was seriously remiss in excluding emerging infectious diseases. Not only are they a life certainty, they predate taxes, and will certainly be around after we're gone. Philosophical indiscretions aside, today's policy makers would be well-served to become aware of the dynamic nature of disease, and its impact on populations and politics.

The emergence of infectious diseases on this planet is not a new-age phenomenon; it has been going on throughout history. Realize that Columbus brought more than just settlers when he sailed the ocean blue. He also brought along their parasites, including the ones that cause measles, smallpox and tuberculosis, which at the time were completely absent from the Western Hemisphere. Similar occurrences happen today and will certainly continue into the future.

The appearance of new microbial threats to human health should not be surprising; it should be expected. We all know that nature exists in very delicate balance, and when that balance is perturbed, Mother Nature will seek to restore it—with very predictable results. Of the many new, emerging, or re-emerging infectious diseases that have surfaced over the years, they have, with few exceptions, been the result of nothing other than man either directly or indirectly, and knowingly or unwittingly tinkering with nature.

Take for example, Legionnaire's disease. It is caused by a bacterium that is ubiquitous in soils and waters the world over. It has been that way forever without a problem. Then in July of 1976 at a Legionnaire's convention in Philadelphia, the organism surfaced as a new human pathogen. The organism was growing in the water of the cooling towers on the roof of the convention center. A new human disease emerged; brought from ancient obscurity by man's modern invention of air conditioning.

Next consider Lyme disease. The cork- screw-shaped bacterium that causes this disease has been transmitted harmlessly by ticks among deer and rodents in our forests for centuries. But then some changes occurred. Human population growth and urban sprawl resulted in townhouses and swing sets displacing wolves, coyotes, foxes, cougars, hawks, owls, eagles, etc., from our fields and forests. The absence of predators controlling deer and rodents among encroaching hordes of humans resulted in unnatural parasite swapping situations—with quite untoward effects on the interfering human invaders. And Lyme disease was born.

Then there's toxic shock syndrome. Over 2,500 cases were reported to the Centers for Disease Control between 1975 and 1984. The cause of toxic shock syndrome was debated for over a decade. We now know that it is caused by certain strains of yet another ancient and ubiquitous organism, the common skin germ, staph. The emergence

of toxic shock syndrome is generally attributed to technologic improvements in feminine hygiene products, most notably the development of carboxymethyl cellulose (synthetic cotton) and its subsequent inclusion in such products because of its superabsorbent characteristics. Since CM-cellulose is a polysaccharide, it can serve as an energy source for some bacteria including staph. It is believed to have promoted the growth of staph by serving as an unnatural source of sugar, resulting in toxic shock syndrome.

And how about West Nile virus? It appeared “mysteriously” in 1999, of all places in the middle of New York City—not a particularly natural place for an exotic, African virus. Given the unprecedented speed and reaches of travel by today’s people and their products, the appearance in America of a virus from the Nile should not be much of a wonder. Such occurrences have caused the Institute of Medicine to opine that in the context of infectious disease, there is no place in the world from which we are remote, and no one from whom we are disconnected. We are all inexorably linked and living anew today in what has become, truly, a global village—and not without consequence.

From the above examples, we must learn that we cannot afford to be complacent regarding infectious diseases. It is a life certainty that they will continue to plague humankind, even in far-flung places like Montana. Both naturally occurring and intentionally introduced biological agents hold increasing potential to threaten health. Important steps must be taken to address the threat; not the least of which is political resolve by local boards of health. The magnitude of the problem requires their commitment. A robust public health system is the best defense against these emerging microbial threats to health.