STANDARD DEVIATIONS: Forget Forgetting

Greetings,

“Those who fail to learn from history are doomed to repeat it.” — George Santayana

“It's *Deja vu* all over again.” -Yogi Berra

Pandemics come and go. Then they come back, again.

The Black Death is named for the **plague pandemic** that lasted seven years. From 1346 to 1353, over 100 million people died from plague. That’s a lot.

But it was not the first plague pandemic. Or the last.

Between the years 542 and 546 epidemics in Asia, Africa and Europe killed nearly 100 million people.

Between 1665 and 1666 a fifth of London’s population died, some 100,000 people.

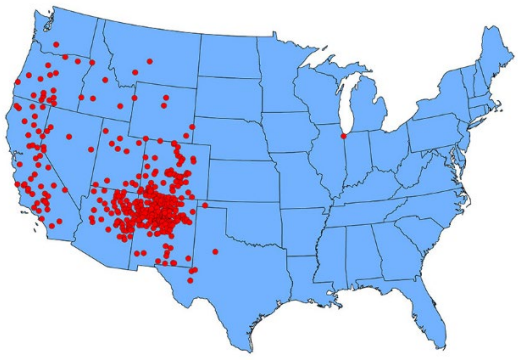
There were 12 major outbreaks of plague in Australia from 1900 to 1925.

The pandemic waves waxed and waned until 1959, killing over 15 million throughout India and Asia.

Oh, wait, there’s more.

Outbreaks have occurred in China and Tanzania (1983), Zaire (1992), India, Mozambique, and Zimbabwe (1994); and Madagascar is affected yearly by outbreaks of endemic disease (the 2017 outbreak is the reason vanilla became so expensive).

While Democratic Republic of Congo, Madagascar, and Peru record the most cases worldwide, we still routinely detect the pathogen here in the Western U.S.



{*Yersinia pestis* in US 1970-2019. CDC.gov}

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Seven **cholera pandemics** have occurred in the past 200 years. The first six happened consecutively and overlapped for a century (1816-1923) and killed upwards of 45 million people.

The seventh cholera pandemic lasted 14 years (1961-1975).

Oh, wait, there's more.

Cholera remains a serious disease. Hundreds of thousands of cases and thousands of deaths have been blamed on cholera just in the last two decades.

Every year outbreaks occur in nations where sanitation and hygiene are problematic. While most cases are recorded in African countries, Vietnam, Venezuela, and Haiti/Dominican Republic have had outbreaks.

Oh, yeah, we have a vaccine for cholera. One of the first ever developed, cholera vaccine has been around since Pasteur and the late 1800's. Oral vaccine has been used for 30 years and is one of the WHO Essential Medicines. Three doses are recommended and last only two years in adults (ring any bells?).

Pandemics come and go. Then they come back, again.

Global outbreak of a new **influenza A virus** has happened over and over. Influenza A viruses are constantly changing, making it possible for variants to emerge that spread more efficiently and infect even those who have had disease before (ring any bells?).

- 1918 Pandemic (H1N1 virus)
- 1957-1958 Pandemic (H2N2 virus)
- 1968 Pandemic (H3N2 virus)
- 2009 H1N1 Pandemic (H1N1pdm09 virus)

Yearly, three to five million people will get a seasonal flu (WHO), and between 290,000 and 650,000 people die from it worldwide.

Oh, wait, there's more.

Flu reassortment in birds and swine is constantly creating novel strains that will eventually become pandemic in humans. It ain't if but when.

Oh, yeah, we have a vaccine for influenza. Since the 1940's we've been fighting a battle with the virus and its ability to mutate. Seasonal strains of each type of influenza mutate and change very quickly, so the flu shot needs to be continually updated (bells, anyone?).

Pandemics come and go. Then they come back, again. Sometimes the pandemic just comes and comes.

HIV/AIDS has been circulating around the globe for four decades and has killed millions. Thirty-eight million people are infected, right now. Do you think there is still a pandemic? Consider just the US:

- By Age. The annual number of HIV infections (2019 compared with 2015) decreased among persons aged 13–24 and persons aged 45-54, but remained stable among all other age groups.
- By race/ethnicity. The annual number of HIV infections (2019 compared with 2015) decreased among persons of multiple races, but remained stable for persons of all other races/ethnicities.
- By sex. The annual number of new HIV infections (2019 compared with 2015) decreased among males, but remained stable among females.
- By HIV transmission category. The annual number of HIV infections (2019 compared with 2015) decreased among males with transmission attributed to male-to-male sexual contact, but remained stable among all other transmission categories.

Oh, wait, there's more.

Our COVID-19 pandemic has distressed the efforts to treat and diagnose HIV around the world. Incidence is expected to rise as a result.

Oh, yeah, there is no vaccine for HIV.

Pandemics come and go. Then they come back, again.

Don't even get me started on measles, malaria, TB, syphilis, and myriad other "pandemics" that cycle in and out of our awareness. Smallpox and polio (mostly) are the only pandemic pathogens we've managed to overcome.

The current SARS-CoV2 pandemic is still raging but we, already, hear pundits and authorities describe it in terms of the past. While everyone wants this over, we must understand that we are in the midst and probably will be for a long time to come. Even when we can put a date to the end of this pandemic, another variant is likely brooding somewhere.

Oh, yeah, we have vaccines. Vaccines are available but they are required in multiple doses and efficacy has been shown to wane. Like influenza, we'll probably be lining up each year for boosters to face the new strains.

Do pandemics really come and go? All of these pathogens are still around.

We may think that these pathogens and their pandemics come and go but the fact is that the risk is always present and just waiting for opportunity.

The biosafety message here is that we mustn't forget the past. Our understanding of risk requires that we constantly be vigilant and prepared for exposure to occur. Every time we don gloves, lab coats, and safety glasses it's not because the pathogens come and go; it's because they are always there.

So, don't forget: If influenza, and coronavirus, and the cycles of pandemic can teach us anything, it's that the future holds more risk in store than can know.

Have a great week and be safe,

Bryan