

STANDARD DEVIATIONS: Vaccination Vacillation

Greetings,

First, I'm going to tie up a loose end to a newsletter from April. Way back then (STANDARD DEVIATIONS: Noticing What's Not On Your Radar, 4/8/19), I mentioned a mysterious outbreak of peritonitis on a naval vessel, the USS Fort McHenry,



where a couple dozen crew members (25/704) were affected by a “mumps-like” illness. The ship was quarantined at sea for nearly **five months**! After the mandatory passing of two, 25 day, incubations the ship was finally allowed to land. A military statement has reported that the disease was indeed mumps and they have blamed an ineffective MMR vaccine as the cause.

Now, there's a lot to unpack in that. Like, why only 25 were affected, why no other naval personnel or vessels are reporting mumps, why initial reporting called it something other than mumps, why the vaccine failed, and where the disease originated. I don't see answers coming out anytime soon.

FYI. Fort McHenry is the, Baltimore MD, National Monument site of the 1814 battle where Francis Scott Key wrote his poem that became our Star Spangled Banner.



Well, how big a deal is vaccine efficacy? I think it's something we should, at least, think about. Like PPE, vaccines are tools in our arsenal of disease prevention. Unlike PPE, vaccines vary wildly in their ability to offer protection.

From Adenovirus to Yellow Fever, we've developed a slew of vaccine concoctions. Some are great and some are so-so. It's important to recognize their limitations.

Look at influenza. Seasonal variations are notoriously iffy. Last year is looking especially wobbly. The H1N1 pdm09 and H3N2 Influenza A numbers are less than 50% effective. And those values are massaged; the vaccine was better for ages <18 than adults and it was miserable for those over 50 (8 %!).

How about our sailors on the Fort McHenry? One dose of MMR vaccine is 93% effective against measles, 78% effective against mumps, and 97% effective against rubella. Two doses of MMR vaccine are 97% effective against measles and 88% effective against mumps. Does this help explain the outbreak? Somehow an exposure occurred and evidently a portion of the crew were not protected, even though vaccinated.

Why should we care? Well, the flu data is pretty obvious. Even though we see nearly 100% compliance with Healthcare Workers (HCW), some exposed but vaccinated workers are going to get sick with influenza, and maybe a bunch.

Yeah, well that's flu and it changes every year, right? We vaccinate for Hepatitis B, too; and probably everyone in your lab has been given the vaccine. The vaccine is 80% to 100% effective in preventing infection or clinical hepatitis in those who receive the complete vaccine series. Larger vaccine doses (2 to 4 times the normal adult dose), or an increased number of doses, are required to induce protective antibody in most hemodialysis patients and may also be necessary for other immunocompromised persons. There are HCWs who remain vulnerable. The highest risk for HBV infection is associated with lifestyles, **occupations**, or environments in which contact with blood from infected persons is frequent.

The experimental Ebola vaccine efficacy will an interesting study in HCWs when the data becomes available. There's some hocus-pocus going on with how any vaccine efficacy is calculated; this one, especially.

We can titer response to vaccines and use that information to protect staff. It's a good practice in our work. Hepatitis, meningococcal, rabies, even anthrax are some lab specific vaccines we see as having value, as long as they work.

Vaccines, isolation, compliance, and serology are important aspects of a HCW safety strategy. Awareness of efficacy and risk are details that you should employ to strengthen biosafety within the lab for vaccine preventable disease.

Have a great week and be safe,

Bryan



p.s. Here's a graph of positive influenza for last season (2 views).

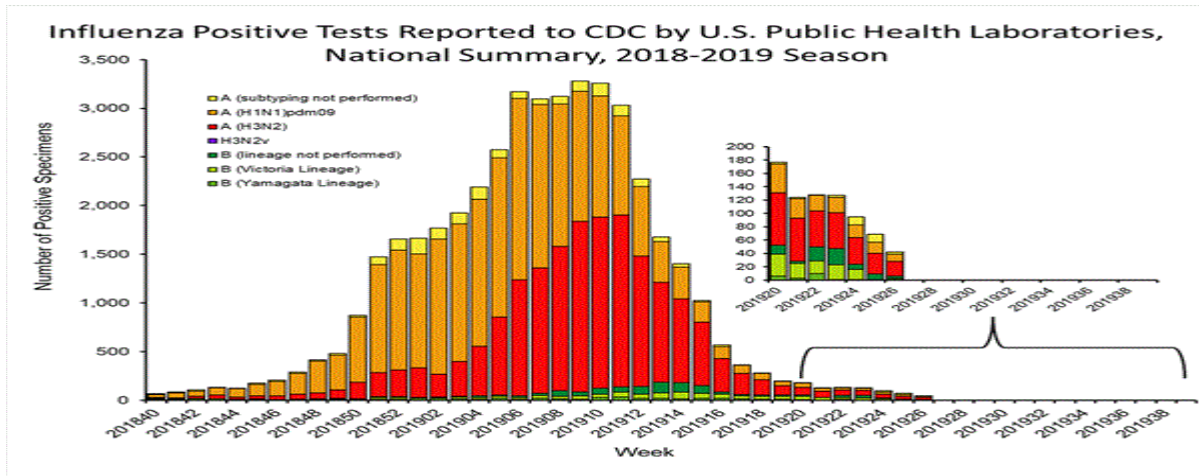
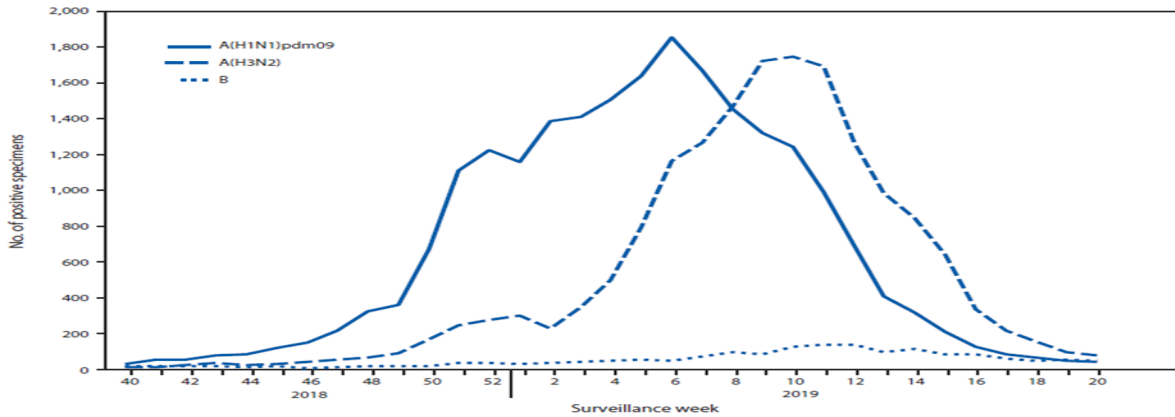


FIGURE 1. Number* of respiratory specimens testing positive for influenza reported to CDC by public health laboratories, by influenza virus type, subtype,[†] and surveillance week — United States, September 30, 2018–May 18, 2019[‡]



* N = 40,674.
[†] 1,629 influenza A viruses not subtyped are excluded.
[‡] As of June 14, 2019.

References:

www.nvic.org/vaccines-and-diseases/hepatitis-b/vaccine-effectiveness.aspx

www.cdc.gov/vaccines/pubs/pinkbook/hepb.html#vaccine

www.cdc.gov/mmwr/volumes/68/wr/mm6806a2.htm

