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News on the flu

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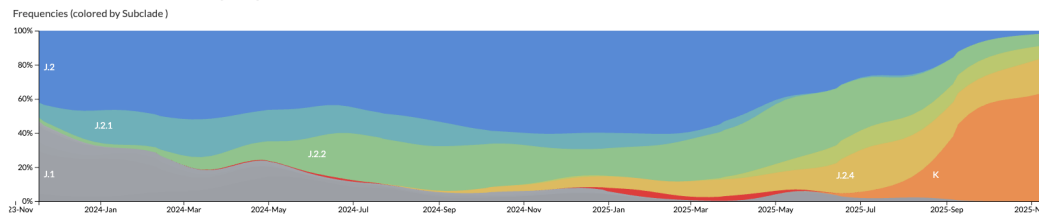
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There has been a lot of noise in the press, the blogosphere, and the socials about a new strain of influenza expected to appear this year. I thought that a few brief paragraphs about it might help.

First a bit of virus biology. This will be on the exam, so pay attention. Viruses (influenza is the one that causes flu) are not themselves alive. They cause infection by penetrating into the host's living cells and taking over their machinery, just like in "Alien." They then use the host cell to make many copies of themselves, thus eventually killing the host cell but getting their goal of reproduction met. That's how they cause disease. There are countless types of viruses. Many are harmless like the hundreds of thousands of different types of viruses that are living in your gut right now. Seriously, there are. A few are able to cause human disease and some are amazingly good at it. But killing you is an unintended consequence because then you are unable to spread the virus and that spread is the major goal of the virus (as if a dead hunk of nucleic acid and protein can have a goal!)

Viruses are divided into different families and within those families there are more divisions. Influenza, for example, has four major families, cleverly named A, B, C, and D. Within those families, there are many subtypes that are named by the proteins on their surface and the geographical location where they were first isolated. That's why we refer to Hong Kong flu, Russian flu, New Jersey, etc. The so-called "bird flu" is an influenza A but there are many subtypes in that category as well. One last thing, and this may be the most important thing to know, the surface proteins change year to year but your body's immune response only recognizes the virus it saw last. So, if you had last year's version of influenza, say the one called H1N1, it is likely to be different than this year's version. The reason for this has to do with the genetics of influenza virus, but that is in the next class and will not be on this exam. The change in the virus is called "antigenic drift" and it is the reason that you need a flu shot every year.

The current flu shot, the one that you just received (or will get after reading this) was designed last spring based on a best guess derived from last year's strain and the one circulating in the Southern Hemisphere when it was their winter and our summer. Some years the guess is very good, some years, not so much. This year, the guess was great but a few months later a new strain of influenza A called Subclade K emerged in the Southern Hemisphere. The current vaccine is not as good as we might have hoped in matching that subclade. But that is only one of the three or four strains in the vaccine. So, the coverage is still good. Subclade K is a virus called A/H3N2 (you know what that means if you have been keeping up. Don't fade out now, we're getting to the good stuff). Here is a nifty graph that shows how Subclade K is edging out other strains of H3N2 like J.2.4 that predominated last year.

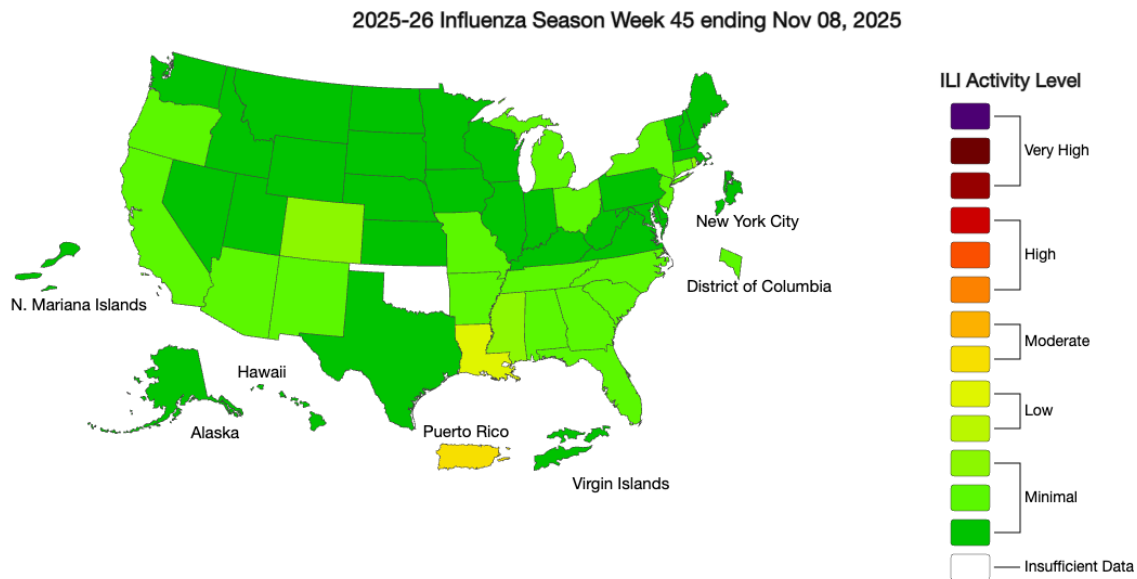


Source: nextstrain.org

And the vaccine is still effective against A/H1N1 and B. For you front-row kids who want extra credit, there is an influenza C but it causes an illness indistinguishable from the common cold in most cases. We don't think about it much. You shouldn't either.

There was a natural experiment in 2014 that informs decision making rather nicely. There was a major drift in H3N2 virus with a similar effect on the vaccine. Surprisingly, when the vaccine efficacy was examined, it turned out to be better than expected, particularly in preventing severe illness and hospitalization. The current formulation can be expected to behave similarly.

OK, so I got a bit carried away in this "short note." The importance of all this is that there is no time like the present, before influenza activity picks up, to get the vaccine. It takes about 2 weeks to produce protection so now is Goldilocks. Influenza activity is still low but it is increasing in children and that is usually a harbinger of disease in adults.



And a lot of this is H3N2 Subclade K. And now you know what that means and you can amaze your friends while having breakfast at the Gig!

Looking forward, the new mRNA technology for vaccine, like that used in the COVID shot, has a much shorter turn around time so soon we will be able to fine-tune vaccine production. Go and get a flu shot. One more thing. If you have a chronic disease, it is worth considering keeping oseltamivir (Tamiflu®) at home. Talk to your health care practitioner about this. You will need a prescription. This drug can shorten the duration of a flu infection and decrease the severity of the disease and it is safe.

As always, you can reach me at healthofficer@souththomaston.me for questions or clarifications.