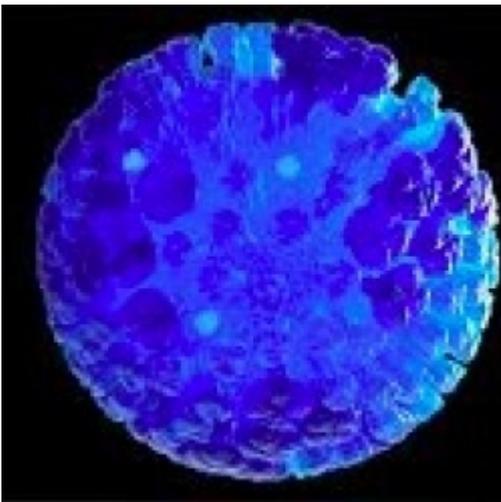


The Flu Is a Killer. Get Vaccinated



By Henry Miller — October 21, 2019

Influenza, commonly known as the flu, is more than a bad cold. Seasonal outbreaks cause not only tremendous misery but huge numbers of hospital admissions and fatalities. Although the "holy grail" – a universal flu vaccine that recognizes all strains, including newly-arising ones – is not yet available, this does not mean that you should not get the seasonal vaccine. You should, and soon.



An influenza viral particle. Photo: CDC

[1]

Influenza, “the flu,” is more than a bad cold. Seasonal outbreaks yearly cause not only tremendous misery and debility but huge numbers of hospital admissions and deaths. The last flu season, which ran from October 2018 until May 2019, caused up to 42.9 million flu illnesses, up to 647,000 hospitalizations and up to 61,200 flu deaths, according to preliminary numbers from the [CDC](#) [2]. Those figures are only slightly higher than the average over the past decade.

What can we expect this year? Well, Australia’s flu season, which runs six months ahead of ours (May to October), is often an accurate indicator of what’s to come in the U.S. Australia’s season has been marked by an earlier onset and a higher than average number of flu cases, so our flu season should be well underway by the end of this month. We should prepare accordingly.

Vaccination is the key to prevention. According to [estimates from the CDC](#) [3], in six flu seasons starting in 2005-06, flu vaccination against a variety of strains prevented almost 14 million cases.

In spite of that, many members of the public continue to resist getting flu vaccine: While 60% of adults think that a flu shot is the best preventive measure against flu-related deaths and hospitalizations, only 52% said they planned to get one this season, according to [a survey](#) [4] by the National Foundation for Infectious Diseases. That puts not only individuals, but all of society at risk, because a high level of vaccination can create “herd immunity,” a kind of biological barrier to the spread of an infectious disease.

Because in some years the vaccines are not a good match to circulating strains of flu virus, many vaccinated people still get the flu (but the illnesses are less severe and of shorter duration). When it comes to research funding to address this problem, however, the feds have seemed little exercised about it. Fortunately, that seems about to change:

The Trump administration is making flu vaccines the high priority it deserves. On September 19, the president issued an [executive order](#) [5] establishing a task force to spur the modernization of flu vaccine production, support research on a universal vaccine and promote vaccination. And earlier this month, a \$130 million National Institutes of Health grant to the Center for Vaccines and Immunology at the University of Georgia garnered headlines: “Universal flu vaccine may be one step closer to reality.”

We know a lot about the flu virus and humans' immune responses to it. Because flu viruses mutate frequently, vaccines are reformulated early in the year as a mixture of virus strains predicted to prevail during the next fall and winter. Depending on how good the selection of strains is, the effectiveness of a flu vaccine from year to year can vary widely; since the 2004-2005 season, it has varied from 10 to 60 percent. One of the factors that lowers their ability to protect against certain strains is that many vaccines are still grown in chicken eggs, so manufacturers should shift to growing virus for vaccines in “cultured cells” – cells derived from animals and grown under controlled conditions.

That method would produce vaccines with greater fidelity to the targeted flu strains. [Many U.S.-licensed vaccines are already produced this way](#) [6], such as those for rotavirus, polio, smallpox, hepatitis, rubella, and chickenpox, plus at least [two flu vaccines](#) [7]. Thus, regulators should require manufacturers to phase out flu vaccines produced with inferior, 70-year-old technology.

However, the holy grail of flu vaccines would be a “universal” vaccine that recognizes all strains, including newly-arising ones. [Several different approaches are being pursued](#) [8], but significant challenges remain. The major obstacle is that the most immunogenic part of the flu virus – [the proteins on the surface of the virion](#) [9]– is the part that mutates, or drifts, from year to year, which is why vaccines need to be constantly updated. That contrasts with the vaccines for other viral diseases such as measles and mumps, which confer long-standing immunity.

In spite of the importance of research on universal vaccines and the [variety of approaches](#) [10], there is surprisingly [meager federal research funding](#) [11] in this area.

We also need more research on vaccine “[adjuvants](#) [12],” chemicals mixed with the viral antigens to

boost the immune response, That would be especially important in seniors: Although people 65 and older make up only 15 percent of the U.S. population, on average they account for about 60 percent of the hospitalizations and 90 percent of the deaths attributed to seasonal flu. Seniors respond less well to vaccines than younger people because, as we age, the functioning of our immune system diminishes. There is currently a flu vaccine for people over 65 that contains four times as much antigen as regular flu shots, and one that contains an adjuvant, but those tweaks have improved effectiveness only marginally.

An increase in research funding on adjuvants, more effective dosing regimens (especially for seniors), and better production methods are achievable changes that would better prepare us for flu outbreaks. In the short term, President Trump, the U.S. Surgeon General, and the CDC director should be saturating the airwaves and Internet with public service announcements, encouraging vaccination. Their message should also mention a much-neglected intervention: the availability of anti-flu medications [Tamiflu](#) [13], [Relenza](#) [14], and [Rapivab](#) [15], that can both prevent the flu and also shorten the duration and severity of the illness, should it occur.

We need to redouble our efforts to prevent and treat the flu, especially via the development of improved vaccines. In the meantime, get your flu shot.

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Links

[1] <https://www.cdc.gov/flu/about/viruses/index.htm>

[2] <https://www.cdc.gov/flu/about/burden/preliminary-in-season-estimates.htm>

[3] <https://www.medpagetoday.com/infectiousdisease/uritheflu/39983>

[4] <https://www.nfid.org/national-poll-attitudes-about-flu-and-pneumococcal-disease-prevention/>

[5] <https://www.whitehouse.gov/presidential-actions/executive-order-modernizing-influenza-vaccines-united-states-promote-national-security-public-health/>

[6] <https://www.cdc.gov/flu/protect/vaccine/cell-based.htm>

[7] <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4359798/table/tab2/>

[8] <https://www.sciencenews.org/article/universal-flu-shot-may-be-nearing-reality>

[9]

<https://www.google.com/search?hl=en&tbm=isch&source=hp&biw=1024&bih=472&ei=fbNiWr>

[10] <http://www.iavireport.org/vol-22-no-1-2018/1900-a-mean-flu-season-swings-a-spotlight-on-vaccines>

[11] <https://www.nytimes.com/2018/01/08/opinion/flu-pandemic-universal-vaccine.html>

[12] <https://www.cdc.gov/vaccinesafety/concerns/adjuvants.html>

[13] <https://www.fda.gov/Drugs/DrugSafety/ucm188859.htm>

[14] <https://www.webmd.com/drugs/2/drug-17483/relenza-diskhaler-inhalation/details>

[15] <https://www.rapivab.com/>