

How well will the flu vaccine work this winter?

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The most effective way of preventing seasonal influenza is to be vaccinated each autumn. The reason that people are encouraged to get

vaccinated annually is because flu virus can cause severe disease. One of the problems is that there are many different flu viruses circulating around the world and which ones circulate changes over time.

Each year, pharmaceutical companies produce vaccines against the flu viruses predicted to be dominant during the upcoming flu [season](#). How well the [vaccine](#) works varies from year to year because of how much the circulating flu viruses evolve between the time that the vaccine is produced and the beginning of flu season. For this reason, in most years, the flu vaccine is 50 to 70 percent effective.

During the Australian 2017 flu season, the flu vaccine was only 10 percent effective because of the emergence of variant H3N2 that was "vaccine resistant".

Scientists from UTMB and Biomed Protection have published this prediction almost two years in advance demonstrating that the prediction of flu vaccine efficacy may be possible. In their study, they predicted which H3N2 variants would become "vaccine resistant", and this prediction has been now confirmed during the 2017 Australian flu season.

"It's important every year that we monitor the Australian flu season because the following flu season in the U.S. and Europe could be similar," said Slobodan Paessler, UTMB professor in the department of pathology. "When the flu vaccine isn't terribly effective in Australia, U.S. and European health authorities prepare for a potentially severe flu season."

In a new paper published in *F1000 Research*, Paessler and Veljko Velkovic, co-founder of Biomed Protection, used the same bioinformatics platform to determine how well the current seasonal flu vaccine might protect against H3N2 flu viruses isolated in the U.S and

Australia between July and September 2017. Virus gene sequences from currently circulating strains were obtained from the Global Initiative on Sharing All Influenza Database.

The results published suggest that the current flu vaccine will work better during the 2018 U.S. flu season than the 2017 Australian flu season. In Australia, there were two groups of H3N2 viruses circulating, and the vaccine was projected to protect against the minority of viruses but not the majority viruses. In the U.S., the vaccine is projected to be effective against the majority H3N2 flu viruses so far.

Update: On December 8, The U.S. Centers for Disease Control laboratory has published a report showing that the flu vaccine is similar to the flu viruses afflicting people in the U.S. this season, suggesting that the flu vaccine should offer similar protection as past seasons.

"Nevertheless, this situation could change if any of the viruses from the minority group, which is not covered by the vaccine, were to become dominant," said Paessler and Veljkovic. "For this reason, its very important that we closely monitor the evolution of the H3N2 [flu viruses](#) throughout the 2018 U.S. [flu season](#)."

Recently, lack of effectiveness in the [flu vaccine](#) has been linked to a specific mutation generated during the vaccine production process. Paessler and Veljkovic analyzed the effect of the mutation and found that it is shifting the vaccine [virus](#) from the majority group to the minority group, potentially decreasing the vaccine's effectiveness.

Provided by University of Texas Medical Branch at Galveston

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