

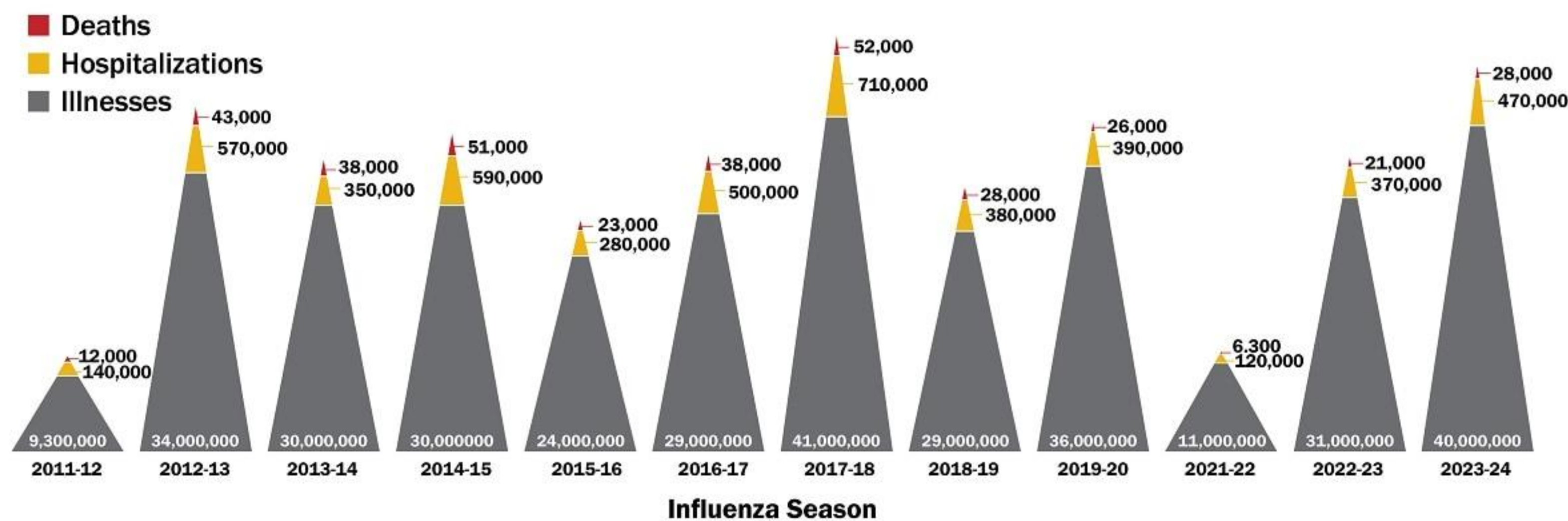
Recent changes in influenza viruses balance viral fitness and immune escape

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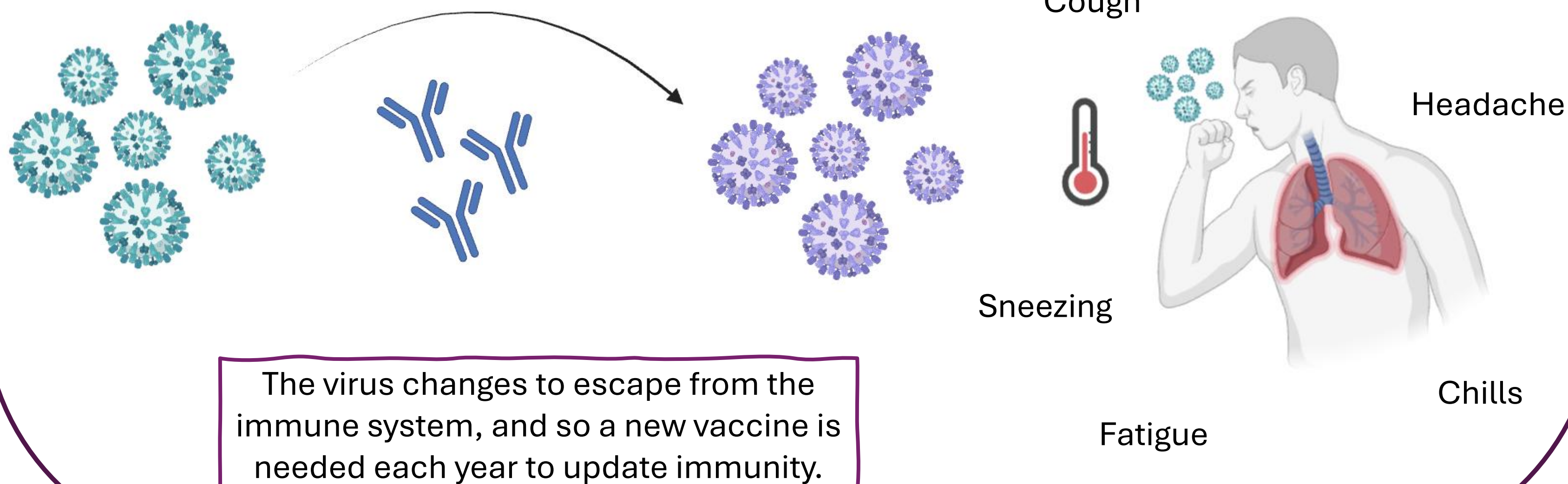
Why do we need to study influenza viruses?

Estimated U.S. Influenza Burden, By Season (2011-2024)*

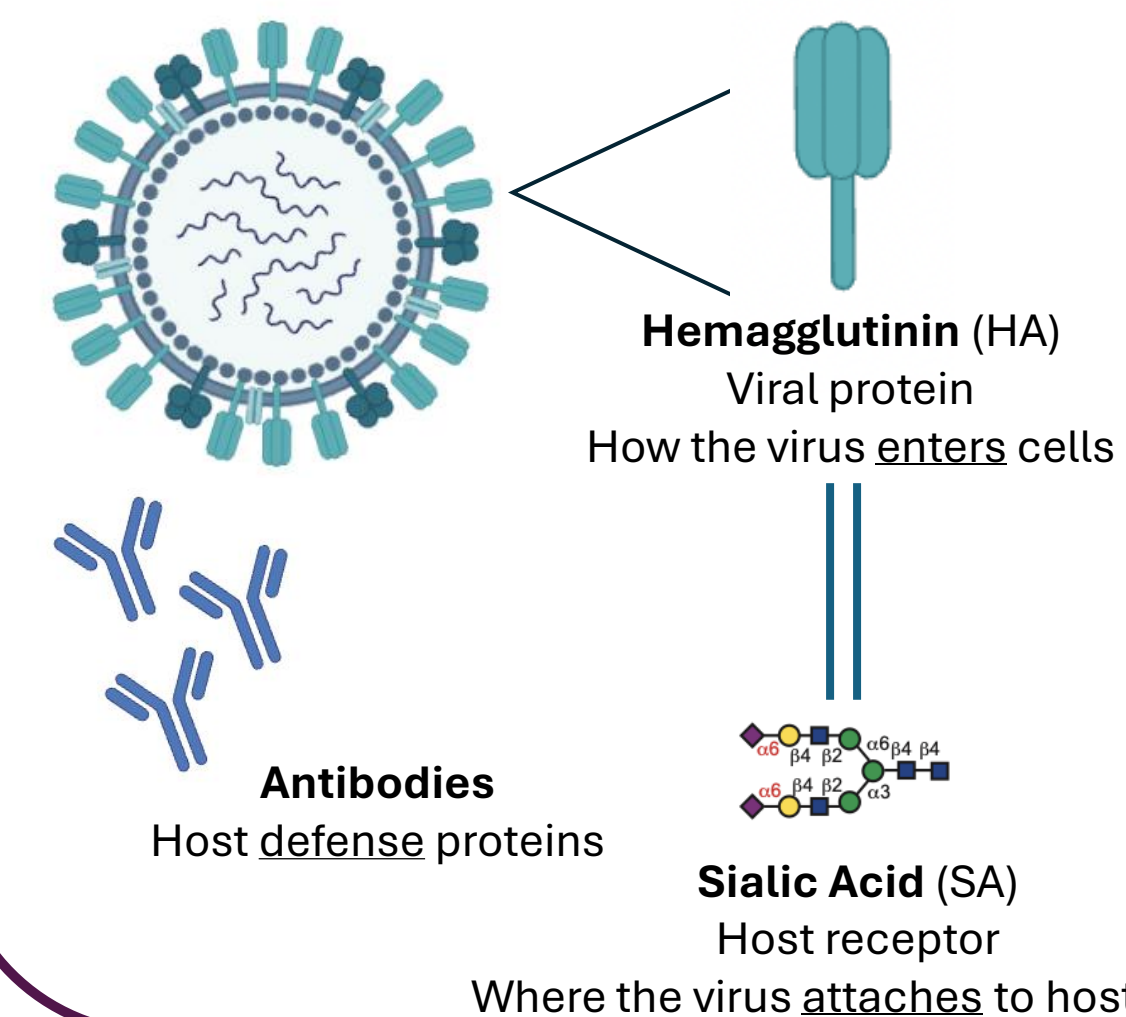


*Estimates are not available for the 2020-2021 season due to minimal flu activity.

Every new infection and host is an opportunity for the virus to evolve.



How are we studying influenza virus evolution?



- Make new versions of virus entry protein (HA)

- Add mutations into these HA proteins

How does HA change to evade host defenses?

- Measure binding of new HA proteins to antibodies

How do these changes affect receptor binding?

- Measure binding of new HA proteins to receptor (SA)

Broader Impacts

Influenza viruses infect multiple hosts

- The hosts the virus can infect are determined by the receptors that the HA can bind.
We need to understand how viral evolution affects receptor binding



More effective vaccines are desperately needed

- Seasonal vaccine effectiveness is typically low (42% effective in the 2023-24 season)
- Vaccines are critical because they can still prevent severe disease, hospitalization and death.

We need to understand how influenza is evolving to evade antibodies so future vaccines can elicit better immune responses.



Guthmiller Lab Website!

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Data on estimated annual flu
burden from the CDC

