
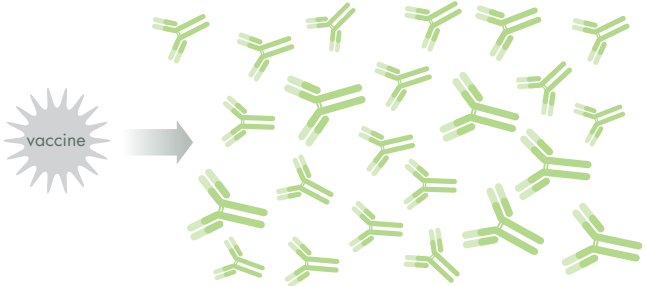
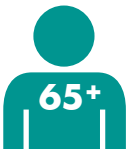
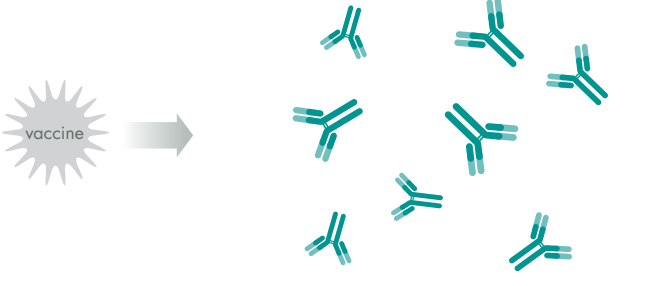
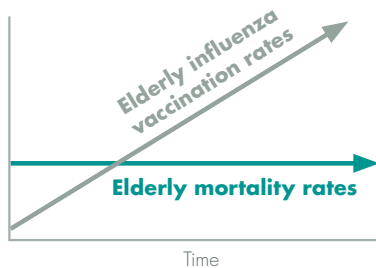


Aging immune system puts the elderly at increased risk for complications from influenza¹

The elderly often generate fewer antibodies from standard influenza vaccines compared to a younger adult²

 <p>Adult</p>	<ul style="list-style-type: none">The immune system responds to the vaccine by producing specific antibodies, preparing the body for when it is exposed to the actual virus³ 
 <p>Elderly Adult</p>	<ul style="list-style-type: none">As adults age, the immune system naturally weakens and the body produces fewer antibodies¹There is a decreased response to the vaccine and, eventually, the actual virus² 

Influenza vaccine and the elderly: the need for better protection



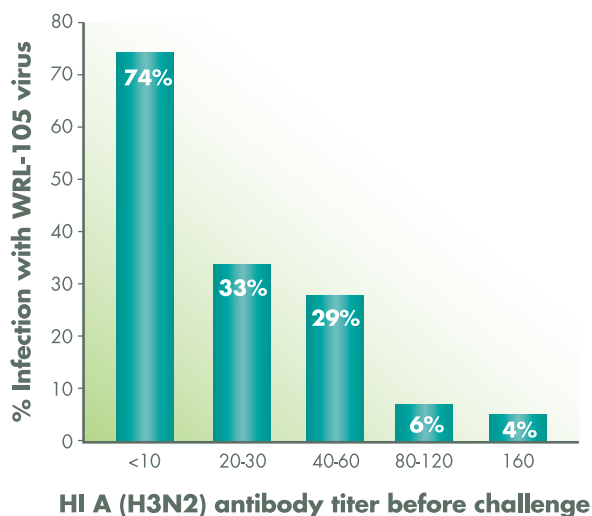
Despite an increase in influenza vaccinations over time, elderly mortality rates have flattened, suggesting a failure to respond to the vaccine⁴

There is a need for influenza vaccines that are specifically for the elderly^{5,6}

The relationship between HI^a antibody levels and the likelihood of influenza infection has been known for more than 30 years

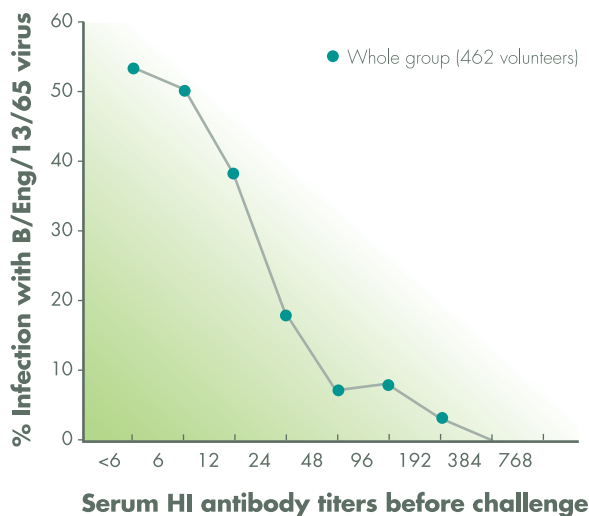
Multiple studies over time have demonstrated a clear correlation between resistance to influenza infection and the levels of HI antibody present in the body^{7,8}

Inverse relationship between antibodies and the likelihood of infection^{7,9}



^a HI = hemagglutination inhibition.

Infection rates of volunteers in relation to their prechallenge antibodies⁸



Higher levels of HI antibodies are associated with a lower likelihood of influenza infection⁷⁻⁹

References: **1.** Goronzy JJ, Fulbright JW, Crowson CS, Poland GA, O'Fallon WM, Weyand CM. Value of immunological markers in predicting responsiveness to influenza vaccination in elderly individuals. *J Virol.* 2001;75:12182-12187. **2.** Monto AS, Ansalidi F, Aspinall R, et al. Influenza control in the 21st century: optimizing protection of older adults. *Vaccine.* 2009;27:5043-5053. **3.** Centers for Disease Control and Prevention. Immunity types. <http://www.cdc.gov/vaccines/vac-gen/immunity-types.htm>. Accessed May 24, 2011. **4.** Simonsen L, Reichert TA, Viboud C, Blackwelder WC, Taylor RJ, Miller MA. Impact of influenza vaccination on seasonal mortality in the US elderly population. *Arch Intern Med.* 2005;165:265-272. **5.** Poland GA, Mulligan MJ. The imperative of influenza vaccines for elderly individuals—an evolving story. *J Infect Dis.* 2009;200:161-163. **6.** Simonsen L, Taylor RJ, Viboud C, Miller MA, Jackson LA. Mortality benefits of influenza vaccination in elderly people: an ongoing controversy. *Lancet Infect Dis.* 2007;7:1-9. **7.** Hannoun C, Megas F, Piercy J. Immunogenicity and protective efficacy of influenza vaccination. *Virus Res.* 2004;103:133-138. **8.** Hobson D, Curry RL. The role of serum haemagglutination-inhibiting antibody in protection against challenge infection with influenza A2 and B viruses. *J Hyg.* 1972;70:767-777. **9.** Potter CW, Oxford JS. Determinants of immunity to influenza infection in man. *Br Med Bull.* 1979;35:69-75.

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