

# Another Flu Shot Benefit?

## Vaccination for influenza may reduce the risk of Alzheimer's dementia

An estimated 6.2 million Americans over age 65 have Alzheimer's disease. That number is on track to triple by 2050. We don't have any effective therapeutics to prevent or delay Alzheimer's disease and available medications have limited effectiveness. Therefore, prevention and risk reduction are very important. This study showed a possible benefit of the annual flu shot in the prevention of Alzheimer's disease. To learn more about the reasons for this relationship, continue reading below.



### Abstract

**Background:** Prior studies have found a reduced risk of dementia of any etiology following influenza vaccination in selected populations, including veterans and patients with serious chronic health conditions. However, the effect of influenza vaccination on Alzheimer's disease (AD) risk in a general cohort of older US adults has not been characterized.

**Objective:** To compare the risk of incident AD between patients with and without prior influenza vaccination in a large US claims database.

**Methods:** Deidentified claims data spanning September 1, 2009 through August 31, 2019 were used. Eligible patients were free of dementia during the 6-year look-back period and  $\geq 65$  years old by the start of follow-up. Propensity-score matching (PSM) was used to create flu-vaccinated and flu-unvaccinated cohorts with similar baseline demographics, medication usage, and comorbidities. Relative risk (RR) and absolute risk reduction (ARR) were estimated to assess the effect of influenza vaccination on AD risk during the 4-year follow-up.

**Results:** From the unmatched sample of eligible patients ( $n = 2,356,479$ ), PSM produced a sample of 935,887 flu-vaccinated-unvaccinated matched pairs. The matched sample was 73.7 (SD, 8.7) years of age and 56.9% female, with median follow-up of 46 (IQR, 29–48) months; 5.1% ( $n = 47,889$ ) of the flu-vaccinated patients and 8.5% ( $n = 79,630$ ) of the flu-unvaccinated patients developed AD during follow-up. The RR was 0.60 (95% CI, 0.59–0.61) and ARR was 0.034 (95% CI, 0.033–0.035), corresponding to a number needed to treat of 29.4.

**Conclusion:** This study demonstrates that influenza vaccination is associated with reduced AD risk in a nationwide sample of US adults aged 65 and older.

*This retrospective study matched senior flu vaccine recipients with unvaccinated people. The vaccinated group received between 1-6 flu shots over the 6 years before the period studied. They found that people who had at least one flu vaccine were 40% less likely to develop Alzheimer's disease over the 4-year follow-up period (5.1% vaccinated vs 8.5% non-vaccinated). For every 29 people who receive the flu vaccine, there will be one fewer developing Alzheimer's dementia. The more vaccines received, the lower the risk of dementia so the lowest group was the group who got annual vaccinations over 6 years.*

*What does a flu vaccine have to do with dementia? We don't know for sure what the mechanism is. There are a few possibilities and certainly a few confounding factors. The big confounding factor is the healthy user bias. Those who receive flu shots may tend to be more health conscious and thus have better exercise and nutrition habits. The most likely factor is the prevention of influenza infection. Influenza can cause injury to the brain from direct viral infection or the systemic immune response causing lots of inflammation and collateral damage in multiple organ systems. This study did not evaluate the incidence of influenza infection to see if this is the case. We know common infections are linked to an increased risk of dementia and it is safe to assume influenza would increase risk as well. So perhaps the vaccine itself didn't decrease the risk of dementia but the prevention of influenza infection (and the damage throughout the body) decreases the risk of dementia. Since we don't have any effective therapeutics to reduce the risk of dementia, perhaps the flu shot may be something that we can do to help reduce our risk.*

Bukhbinder, Avram S. et al. 'Risk of Alzheimer's Disease Following Influenza Vaccination: A Claims-Based Cohort Study Using Propensity Score Matching'. *Journal of Alzheimer's Disease*, vol. 88, no. 3, pp. 1061-1074, 2022.