

# Vaccinations are more effective when administered in the morning

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Credit: National Cancer Institute

New research from the University of Birmingham has shown that flu vaccinations are more effective when administered in the morning.

The findings, published in the journal *Vaccine*, suggest administering vaccinations in the morning, rather than the afternoon, could induce greater, and thus more protective, antibody responses.

24 general practices in the West Midlands, UK, were analysed between 2011 and 2013 in a cluster-randomised trial during the annual UK influenza vaccination programme.

276 adults aged over 65 were vaccinated against three strains of influenza, either in morning surgeries (9-11am) or afternoon surgeries (3-5pm).

In two of the three given influenza virus strains, those in the morning cohort saw a significantly larger increase in antibody concentration one month following vaccination, when compared with those in the afternoon cohort. In the third strain, there was no significant difference between morning and afternoon.

Dr Anna Phillips, the Principal Investigator of the study from the School of Sport, Exercise and Rehabilitation Sciences at the University of Birmingham explained, "We know that there are fluctuations in immune responses throughout the day and wanted to examine whether this would extend to the antibody response to vaccination. Being able to see that morning vaccinations yield a more efficient response will not only help in strategies for [flu vaccination](#), but might provide clues to improve [vaccination strategies](#) more generally."

The influenza vaccination is part of the seasonal vaccination programme carried out by [general practices](#) across the UK, and in many other countries, with a particular focus on patients over 65 years old.

Despite this, the influenza virus is responsible for between 250,000 and 500,000 deaths each year worldwide. The age-related decline in immunity reduces the ability of older adults to produce adequate antibody responses following vaccination, compromising the given protection.

Other interventions to improve outcomes of vaccination have been attempted with limited success, including exercise routines and additives to the vaccine itself.

Professor Janet Lord, a co-investigator on the study from the Institute of Inflammation and Ageing at the University of Birmingham, said, "A significant amount of resource is used to try and prevent flu infection each year, particularly in older adults, but less than half make enough antibody to be fully protected. Our results suggest that by shifting the time of those vaccinations to the morning we can improve their efficiency with no extra cost to the health service."

The team will now look to investigate further in a large scale study. This is important to see if the morning vaccination strategy benefits a wide range of over 65s including those with conditions like diabetes, liver and kidney disease that impair immunity. They will also look to see if the morning vaccination strategy is effective for the pneumococcal vaccine that protects against pneumonia; a [vaccine](#) recommended to all individuals aged 65 years old in the UK.

**More information:** "Morning vaccination enhances antibody response over afternoon vaccination: a cluster-randomised trial," *Vaccine*, [DOI: 10.1016/j.vaccine.2016.04.032](#)

Provided by University of Birmingham

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