



Influenza vaccination for healthy adults

Paul Dugdale, Chief Health Officer, Australian Capital Territory, Canberra

Summary

Seasonal influenza is a vaccine preventable disease that affects around 20% of the population each year. In healthy adults it is usually a brief illness, often resulting in a short amount of time off work. Influenza vaccination for healthy adults is recommended by the National Health and Medical Research Council, but is not universally funded through the National Immunisation Program. It is funded by a number of employers, particularly in health and aged care facilities. Healthy people who are not covered by the National Immunisation Program or their employers must pay for the vaccine themselves. Vaccination partially protects healthy adults from the disease with around six out of a hundred people vaccinated experiencing a benefit. It produces an additional benefit for those they care for, if they too have been vaccinated. The economic and perceived benefit of influenza vaccination for all healthy adults is related to the setting in which they live and work. This makes personal choice an important component of the decision to vaccinate, and reduces the strength of arguments to publicly fund vaccinations for healthy adults.

Key words: healthy adults, influenza vaccination, public funding.

(*Aust Prescr* 2007;30:35–7)

Introduction

The National Health and Medical Research Council's (NHMRC) Australian Immunisation Handbook¹ contains a general recommendation for annual vaccination against influenza for 'any person who wishes to reduce the likelihood of becoming ill with influenza', using the vaccine composition recommended by the World Health Organization (WHO) for the current southern hemisphere winter. The handbook goes on to make specific recommendations for vaccination of the following groups:

- everyone 65 years and older
- people with chronic illness
- residents of long-term care facilities

- contacts of people who have a high risk of developing complications from influenza, including household members, healthcare providers and staff of long-term care facilities.

These groups are among those who qualify for free vaccination under the National Immunisation Program.

The US Centers for Disease Control and Prevention currently recommend vaccination for similar population groups.² Ontario, Canada, is into its fifth year of a free influenza vaccination program for everyone aged six months or more. A review of this program has shown it is 'feasible, encourages vaccination in targeted and high-risk groups, and improves pandemic preparedness' and should lead to reductions in all measures associated with the burden of disease for influenza.³ Clearly, there is argument about the merits of providing influenza vaccination to the healthy adult population.

Seasonal influenza

The family of influenza viruses includes many subtypes. The virus rapidly mutates and re-assorts to produce new variants. Influenza circulates endemically around the globe and the most successful subtypes produce seasonal epidemics. It is spread by respiratory droplets and fomites*. Previous exposure will protect against reinfection with the same subtype and may provide partial protection against different subtypes.

The case definition of 'influenza-like illness' is presentation with fever, cough and fatigue.⁴ The disease itself is quite variable including asymptomatic (but contagious) infection, short-lived upper respiratory tract symptoms including coughing and sneezing, debilitating systemic effects such as fever, fatigue, generalised aches and pains that may last up to two weeks, through to primary viral pneumonia and secondary infections. Life-threatening complications are more common in people with chronic illness, the elderly and young children.

The effect of influenza on a population is measured by various means including the notifications of laboratory-confirmed influenza (recognising that only a small portion of cases have isolates tested), consultation rates for influenza-like illness, absenteeism from work and hospitalisation and mortality data. In 2005, Australia had 4575 cases of laboratory-confirmed influenza, with a peak rate of 40 influenza-like illness cases per 1000 general practice consultations in August 2005 (observed by a national network of 29 general practices). The 'all causes' weekly absenteeism rate, a non-specific index of

* objects or materials which are capable of transmitting infection

influenza activity, peaked in winter to 1.21%, up 0.4% from the annual average of 0.81% (based on Australia Post as a representative workforce).⁴ In 2003–04, the national rate for hospital separations for influenza and pneumonia was 0.7 per 1000 population.⁵ In 2004, 18 305 people died from influenza and pneumonia, which was the underlying cause in 2.6% of all deaths.⁶ In summary, influenza epidemics occur every year in winter, often affecting 20–25% of the population.

Vaccination

The virological epidemiology of the different influenza strains is reasonably well understood. Effective vaccines with negligible serious adverse effects are made and available for circulating strains within months. This sets up the conditions for a public vaccination strategy.

The arguments against mass vaccination are that it is required annually, the attack rate varies widely from year to year and place to place, the vaccine does not protect against all cases of clinical influenza, and healthy adults that do get influenza rarely succumb to serious complications.

Influenza vaccination commonly causes local pain and swelling at the injection site (greater than 10%). It can also cause a mild influenza-like illness including fever and myalgia commencing a few hours after vaccination and lasting 1–2 days (1–10%). These adverse effects may put people off being vaccinated, especially if they have experienced them before. Treatment with paracetamol is effective.

For the southern hemisphere in 2007, the WHO recommended a vaccine composition that should protect against: A/New Caledonia/20/99(H1N1)-like virus, A/Wisconsin/67/2005(H3N2)-like virus and B/Malaysia/2506/2004-like virus.⁷ This mix is available commercially from four pharmaceutical companies.

Currently, a live influenza vaccination delivered by nasal spray is undergoing phase III trials. If the trials are successful, it can be expected to have greater patient acceptability compared to vaccination by injection.

Evidence for vaccination

While the NHMRC has recommended that vaccination be provided to everyone who wishes to reduce their likelihood of becoming ill with influenza, it could not justify universal public vaccination programs for healthy adults. The reasoning for this is that the beneficial effect for the population group is relatively small. However, the benefit varies according to the setting that population members are within.

For healthy adults in the general community setting, a Cochrane review (of 25 studies involving almost 60 000 people) found that the recommended inactivated parenteral vaccines had a vaccine efficacy of 70% against the strains for which they were formulated. These vaccines have an efficacy of 25% against clinical influenza, resulting in a 6% reduction in people experiencing clinical influenza.⁸

This means that in a season where influenza will cause illness in say 24% of the unvaccinated population, vaccination will reduce the risk of influenza by 6% from 24% to 18% (6 is 25% of 24). Out of every 100 people vaccinated, 6 will benefit and 94 will not. Put another way, 17 people need to be vaccinated for one to benefit.

Vaccination of healthy adults caring for people at risk of complications from influenza aims to reduce the exposure of those they care for to influenza. However, a Cochrane review of this strategy in aged-care settings found staff vaccination was only associated with reduced influenza-like illness in patients when the patients were vaccinated too.⁹

We can surmise that in the residential care setting, vaccination of staff reduces the patient's **chance of being exposed** to the influenza virus, but vaccination of patients, which reduces the exposed patient's **chance of becoming infected**, is also required to synergistically reduce patient infection rates.

Should healthy adults be vaccinated?

The upshot of the available evidence and expert recommendations is that at a personal level, it is quite reasonable for healthy adults not to be vaccinated against influenza, with the expectation that if they do contract influenza it will be a brief illness from which they will fully recover. Of course, many healthy adults will have views on how much they wish to avoid influenza and this may be influenced by forthcoming events such as international travel, weddings, exams and conferences.

However, when healthy adults are in the setting of caring for people who have a high risk of complications from influenza, the duty of care makes for a clear-cut recommendation to vaccinate.

While such a 'settings' approach to clinical decision-making is intuitively sensible, it is often not given the prominence it deserves in public health thinking. Nevertheless, it is central to understanding the difference between the NHMRC recommendation that all adults who wish to lower their risk of influenza should consider vaccination, and the lack of coverage of healthy adults (without caring responsibilities) in the free National Immunisation Program.

Funding for vaccination

For healthy adults who work, vaccination is reasonably cost-effective, and may even be cost saving if more than two and a half days of work are lost for every episode of influenza.¹⁰ This makes it reasonable for employers to offer influenza vaccination to their staff, as many employers now do. Self-employed and casually-employed people who do not receive sickness benefits may be particularly attracted to vaccination.

One reason for public funding of health care for those who can afford it, is that individuals are not readily able to decide for themselves what health care is in their best interests. Where individuals can decide for themselves, the arguments for

public funding for this group become significantly weaker. For healthy consenting adults, their individual judgement about the importance of avoiding influenza is central to determining the value to them of being vaccinated. This increases the likelihood that adults with the means, or their employers, will pay for vaccination, and reduces the imperative for governments to take over the responsibility of funding vaccination for this group.

Future directions

Influenza vaccination policy, like the influenza virus, evolves at a relatively rapid rate. Emerging evidence from the Ontario experience of universal vaccination will be closely assessed by policy makers, including the NHMRC in its review of the National Immunisation Handbook and the US Advisory Committee on Immunization Practices, which is currently considering universal influenza vaccination. If this is recommended, vaccine production will need to be increased considerably.

A key issue is whether indirect costs of illness (for example, days off work) will be considered in cost-effectiveness calculations used to develop the case for public funding. If these costs are included, it is likely that cost-effectiveness ratios will improve significantly. Making public funding available on this basis will amount to a slight increase in taxation funding and a slight increase in health expenditure, and should result in slightly improved national productivity. Whether our governments are ready to accept arguments that preventive health expenditure is a useful public investment that drives productivity growth, remains to be seen.

Acknowledgement: Meagan Morrison provided research assistance in the preparation of this article.

References

1. The Australian Immunisation Handbook. 8th ed. Canberra: National Health and Medical Research Council; 2003.
2. Advisory Committee on Immunization Practices (ACIP). Prevention and control of influenza. MMWR recommendations and reports 2006;55(RR10):1-42.
3. Abramson JS, Neuzil KM, Tamblyn SE. Annual universal influenza vaccination: ready or not? Clin Infect Dis 2006;42:132-5.
4. Firestone SM, Barr IG, Roche PW, Walker JC. Annual report of the national influenza surveillance scheme, 2005. Commun Dis Intell 2006;30:189-200.
5. Review of government service provision. Report on government services 2006. Canberra: Australian Government Productivity Commission; 2006. <http://www.pc.gov.au/gsp/reports/rogs/2006/index.html> [cited 2007 Mar 6]
6. Causes of death. Australia 2004. 3303.0. Australian Bureau of Statistics; 2006. <http://www.abs.gov.au> [cited 2007 Mar 6]
7. World Health Organization. Recommended composition of influenza virus vaccines for use in the 2007 influenza season. Weekly epidemiological record No 41, 2006. <http://www.who.int/wer/2006/wer8141.pdf> [cited 2007 Mar 6]
8. Demicheli V, Rivetti D, Deeks JJ, Jefferson TO. Vaccines for preventing influenza in healthy adults (Cochrane Review). The Cochrane Database of Systematic Reviews 2004, Issue 3. Art. No.: CD001269. DOI:10.1002/14651858.CD001269.
9. Thomas RE, Jefferson T, Demicheli V, Rivetti D. Influenza vaccination for healthcare workers who work with the elderly. Cochrane Database of Systematic Reviews 2006, Issue 3. Art. No.: CD005187. DOI:10.1002/14651858.CD005187.
10. Rothberg MB, Rose DN. Vaccination versus treatment of influenza in working adults: a cost-effectiveness analysis. Am J Med 2005;118:68-77.

Conflict of interest: none declared

Self-test questions

The following statements are either true or false (answers on page 55)

1. The influenza vaccine protects 90% of healthy adults against clinical infection with influenza.
2. Vaccinating staff working in aged care facilities reduces influenza-like illness in unimmunised residents.

Dental notes

Prepared by Dr M McCullough of the Australian Dental Association

Influenza vaccination for healthy adults

Very few dentists fall into the groups eligible for free vaccination under the National Immunisation Program. However, it is likely that all dentists working in both private and public practice

are routinely having an annual vaccination against influenza. This decision to be vaccinated and the discussion about it, is likely to strongly influence work colleagues, dental nurses, oral hygienists and therapists, as well as patients.