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### TEN YEARS ON Should Defence Force personnel receive Influenza Vaccine?

by  
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THE ATTITUDE TOWARDS INFLUENZA in Australia appears quite different to that of many other countries. Whereas mass immunisations have been conducted in the United States in response to threats of major epidemics, and there is a widespread use of the influenza vaccine in the Defence Forces in Europe and North America, there is little call for it in Australia. There are potential benefits to the Defence Force from mass immunisation of personnel, both financial and medical. What is needed is a realistic scrutiny of the costs involved and the benefits accruing from an influenza vaccination program.

The National Health and Medical Research recommendations for influenza vaccination in 1991 were:

- a) Individuals at greater risk of complications:
  1. Adults and children with a chronic debilitating disease, especially those with chronic cardiac, pulmonary, renal and metabolic disorders
  2. Persons over 65 years
  3. Residents of nursing homes and other chronic-care facilities
  4. Persons receiving immunosuppressive therapy.
  
- b) Persons engaged in medical and health services, and essential public utilities if these individuals are at increased risk owing to medical disorders such as those above. In the event of a pandemic or other major outbreak, advice should be given about vaccination of staff particularly liable to exposure.

I suppose the Defence Force could be considered a public utility, but this reactive policy is at the mercy of the speed of transmission of the virus through the population and the supply of the vaccine. Even in response to the threat of a pandemic, mass immunisation is not recommended. Mr Brian Howe, the Minister for Health and Community Services, stated on 7 December 1990..."The shortage of influenza vaccine experienced earlier this year gives some indication of the extent of public concern about influenza and the awareness of the existence of a safe and effective vaccine. It is therefore important that, in implementing a vaccination strategy, the public health professionals, vaccine manufacturers and vaccine recipients understand the aims and objectives of the strategy in reducing the potential for serious morbidity in at-risk groups, in promoting the role of natural immunity in the remaining population and in monitoring the efficacy of the vaccine and it's potential for side- effects..."

When the demand for the vaccine went up, then, the response was not to reassess the recommendations but to suppress the demand. This is fair enough if there is a strong argument for the policy as is. The argument alluded to by Mr Howe was that, despite the existence of a "safe and effective vaccine, natural, herd immunity should be relied on by the general population." Unfortunately, the vaccine is not wonderfully effective; the only epidemics of influenza experienced at the United States Air Force Base Lowry were when there was an antigenic shift in the influenza virus, resulting in widespread diseases in the vaccinated and unvaccinated population. Theory goes that exposure to influenza virus provides a stronger antibody response and better resistance to influenza in the future for the individual, and also provides a pool of relatively protected people who should limit the spread of the virus through the community.

I consider that the arguments for vaccinating the Defence Force, and other working populations as well, are good. Firstly, it is not proposed to vaccinate the entire population; natural immunity would still be pre-sent. The extent

of natural immunity for it to be effective on a population basis is not really known. The great advantage of reduced morbidity and mortality is the economic benefit; a cost-benefit analysis for employers shows a cost-saving, given certain assumptions. As this would be wholly employer-funded, there would be a saving for the health care system, and improved productivity would improve the country as a whole.

A cost-benefit model requires the calculation, in dollar terms, of both expenses due to, and gains from, intervention. Calculating human suffering is difficult. The effects are not only to the victim but also to the family and others directly and indirectly affected by the illness. As such, the benefits of avoided suffering tend to be ignored, and gains underestimated. Attempts to produce a cost-benefit analysis have been conducted, with varying conclusions. Many assumptions had to be made based on inadequate data.

The incidence of influenza varies among populations and across years. It is only once every few years that an influenza epidemic occurs in Australia. If a group is to be vaccinated, the costs may outweigh the benefits three times out of four, but the year of an epidemic could very well tip the balance in favour of the intervention.

At the heart of this influenza vaccine cost-benefit analysis is an estimation to be soundly based. This is an area of research that is crying out for study. A major problem with such research is that it has to continue until an epidemic occurs to be able to get a meaningful assessment of the difference between vaccinated and unvaccinated individuals. Studies estimating reduction in sickness absence among workers have had to base their estimates on less than optimal information. To give you an idea of the sort of figures that we may be dealing with, I will outline a possible scenario. A mass vaccination campaign in the Defence Force may cost in the vicinity of \$15 per patient, including vaccine, materials, facilities, medical staff costs and time lost from work by the employee. If a vaccinated individual had 0.5 days less in sick leave on average over the influenza season than an unvaccinated individual, then using pay as a proxy for productivity in Defence Force, there is a saving of around \$75 per person. This level of saving need only be achieved every five years to make it viable, excluding savings to the health system and to human suffering.

The case for vaccination is not watertight by any means. There are problems of adverse reactions, resistance to vaccination by some personnel, and possible loss of herd immunity. However, if there is a desire to lessen the possibility of a marked reduction in the responsiveness of the Australian Defence Force due to an influenza epidemic, and to reduce the excess morbidity and mortality due to the infection, while actually saving money, then the idea needs to be taken seriously and further investigated.