

## Public Health Approaches to Immunosenescence in an Older Population

Immunosenescence, a natural age-related decrease in immune function, can lead to diminished vaccine efficacy in older adults who are at higher risk of complications from infectious diseases. As the proportion of elderly persons has grown in the US, so have public health efforts aimed at reducing influenza and pneumonia morbidity and mortality in this vulnerable population.

### Vaccine-related public health interventions

Immunosenescence may reduce individual vaccine efficacy. Therefore, comprehensive vaccination programs are needed to increase community-wide protection against infectious illnesses, especially those that can severely impact older adults such as influenza and pneumococcal disease. These programs succeed by targeting vaccination among **all** age-groups, and providing specific vaccines that target older adults. Public health strategies to improve protection for this population include:

- vaccinating a specific percentage of individuals to create community (“herd”) immunity
- achieving sufficient immunity among people who may be at risk
- developing more immunogenic vaccines for older adults

### Recommendations

Current influenza recommendations of the Advisory Committee on Immunization Practices (ACIP) include:

- **Targeted Vaccines** -- Consider use of vaccines that specifically target people 65 years of age and older who may have reduced response due to immunosenescence. In 2010 ACIP recommended a flu vaccine for people 65 years of age and older that contained a higher concentration of antigen. Providing formulations with higher doses of influenza antigen has been shown to produce higher hemagglutinin titers, and such vaccines may reduce immunosenescence-related protection decrements. A comparative efficacy study is underway.
- **Routine Vaccination to Improve Community Immunity** -- Since 2008 the ACIP has been changing influenza vaccine recommendations to be more inclusive of the entire community, not just those at higher risk. In 2010, ACIP recommended routine influenza vaccination for all persons 6 months and older. Exposure to the virus among high risk individuals can be successfully reduced once a sufficient percentage of the community is immunized.

### Vaccines of the Future

Scientists are working to create vaccines with enhanced features that will both increase the duration of protection, and improve the efficacy against multiple strains (reducing the need to tailor vaccines to the strains predicted to circulate each year). For example, researchers have recently identified a neutralizing antibody that may be effective against a conserved region of the influenza A hemagglutinin molecule. While time will tell if vaccines can generate such broad protection, these findings support hope that they will.  
([www.sciencemag.org/content/333/6044/850.full.pdf](http://www.sciencemag.org/content/333/6044/850.full.pdf)).

