

**Effectiveness of the 23-valent pneumococcal polysaccharide vaccine against Invasive Pneumococcal Disease incidence in European adults aged 65 years and above: Results of SpIDnet/I-MOVE+ multicentre study (2012-2016)**

Savulescu, C., Valentiner-Branth, P., Mereckiene, J., Winje, B., Ciruela, P., Latasa, P., Guevara, M., Carragher, R. B., Dalby, T., Corcoran, M., Vestrheim, D., Munoz-Almagro, C., Sanz, J., Castilla, J., Smith, A., Colzani, E., Pastore-Celentano, L., Hanquet, G

**Background and Aims:** We measured the effectiveness of 23-valent pneumococcal polysaccharidic vaccine (PPV23) against invasive pneumococcal disease (IPD) in 65+ year-olds, pooling surveillance data from seven European sites. PPV23 vaccination is recommended in all sites (8-69% uptake) and PCV13 in high risk groups in two sites (<5% uptake). **Methods:** We compared the vaccination status of IPD cases caused by PPV23 serotypes (cases) to that of nonPPV23 IPD (controls) notified between 2012 and 2016. We defined PPV23 vaccination as at least one dose. PPV23 pooled effectiveness was calculated as  $(1 - \text{odds ratio of vaccination}) * 100$ , adjusted for site, age, sex, underlying conditions and year. We stratified PPV23 effectiveness by time since last dose of vaccine: <2, 2-4, 5-9 and 10+ years. **Results:** We included 2011 cases and 878 controls. Compared to controls, cases were younger ( $p=0.001$ ), less likely to have an underlying condition ( $p=0.025$ ), more likely to be admitted for intensive care ( $p=0.038$ ) and to have pneumonia ( $p=0.005$ ). PPV23 effectiveness was 24% (95%CI: 4; 41) against PPV23-serotypes. By serotype, PPV23 effectiveness ranged between -2% (95%CI: -48; 30) against serotype 3 ( $n=687$ ) and 55% (95%CI: 15; 76) against serotype 9N IPD ( $n=540$ ). By years since vaccination, PPV23 effectiveness was 43% (95%CI: 3-66) and 15% (95%CI: -25; 43) for <2 years and 10+ years, respectively. **Conclusion:** Our findings suggest a low PPV23 effectiveness against IPD caused by PPV23 serotypes in the elderly, varying by serotype, and higher in the first two years after vaccination. Despite low effectiveness, PPV23 in the elderly may prevent at least 25% of cases among vaccinated.

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