

Title: Estimated human and economic burden of four major adult vaccine-preventable diseases in Nebraska, 2013

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Purpose: Low uptake of routinely recommended adult immunizations is a public health concern. We developed a customizable model to estimate the human and economic burden in the state of Nebraska in 2013 caused by four major adult vaccine-preventable diseases (VPD): i) influenza, ii) pneumococcal disease (both invasive disease and pneumonia), iii) herpes zoster, and iv) pertussis.

Design: Data were derived from peer-reviewed literature and the 2013 US Census. Three primary estimates were developed for each VPD to populate the model: i) estimated number of cases per year, ii) estimated direct medical costs of a single case, and iii) estimated indirect medical costs related to morbidity/lost productivity.

Findings: Estimated annual cost for the four adult VPDs was \$157 million for age ≥ 50 (\$92 million for age ≥ 65). Among adults ≥ 50 indicated for vaccination, the direct and indirect cost for the four VPDs, influenza, pneumococcal disease, herpes zoster, and pertussis made up 60%, 20%, 19%, and 1% of the total annual cost, respectively. Among those aged ≥ 65 years, influenza, pneumococcal disease, herpes zoster, and pertussis made up 54%, 25%, 20%, and 1% of the cost, respectively. Direct medical costs accounted for 91% of total pneumococcal burden, in comparison to 80%, 37%, and 42% of total economic burden due to influenza, herpes zoster, and pertussis, respectively. Sensitivity analysis revealed that estimated influenza rates and costs per case, nonbacteremic pneumococcal pneumonia (NNP) incidence and direct costs, and herpes zoster incidence rates and indirect costs had the largest impact on the model.

Implications: Cost attributable to adult VPD in the state of Nebraska is substantial. Broadening adult immunization efforts beyond influenza only may help reduce the economic burden of disease.