
Risk of Invasive Pneumococcal Disease Varies by Neighbourhood Characteristics: Implications for Prevention Policies

Date:

Aug 2013

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This study investigates neighbourhood variation in rates of pneumococcal bacteraemia and community-level factors associated with neighbourhood heterogeneity in disease risk. We analysed data from 1416 adult and paediatric cases of pneumococcal bacteraemia collected during 2005-2008 from a population-based hospital surveillance network in metropolitan Philadelphia. Cases were geocoded using residential address to measure disease incidence by neighbourhood and identify potential neighbourhood-level risk factors. Overall incidence of pneumococcal bacteraemia was 36.8 cases/100,000 population and varied significantly (0-67.8 cases/100,000 population) in 281 neighbourhoods. Increased disease incidence was associated with higher population density [incidence rate ratio (IRR) 1.10/10,000 people per mile², 95% confidence interval (CI) 1.0-1.19], higher percent black population (per 10% increase) (IRR 1.07, 95% CI 1.04-1.09), population aged ≤5 years (IRR 3.49, CI 1.8-5.18) and population aged ≥65 years (IRR 1.19, CI 1.00-1.38). After adjusting for these characteristics, there was no significant difference in neighbourhood disease rates. This study demonstrates substantial small-area variation in pneumococcal bacteraemia risk that appears to be explained by neighbourhood sociodemographic characteristics. Identifying neighbourhoods with increased disease risk may provide valuable information to optimize implementation of prevention strategies

Journal:

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