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A cocoon immunisation strategy against pertussis for infants: does it make sense for Ontario?

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Abstract: Pertussis deaths occur primarily among infants who have not been fully immunised. In Ontario, Canada, an adult booster dose was recently added to the publicly funded immunisation programme. We applied number-needed-to-treat analyses to estimate the number of adults that would need to be vaccinated (NNV) to prevent pertussis disease, hospitalisation and death among infants if a cocoon strategy were implemented. $NNV = 1 / (P(M) \times R) + 1 / (P(F) \times R)$, where P(M), P(F) (proportion of infants infected by mothers, fathers) were sourced from several studies. Rates of disease, hospitalisation or death (R) were derived from Ontario's reportable disease data and Discharge Abstract Database. After adjusting for under-reporting, the NNV to prevent one case, hospitalisation or death from pertussis was between 500-6,400, 12,000-63,000 and 1.1-12.8 million, respectively. Without adjustment, NNV increased to 5,000-60,000, 55,000-297,000 and 2.5-30.2 million, respectively. Rarer outcomes were associated with higher NNV. These analyses demonstrate the relative inefficiency of a cocoon strategy in Ontario, which has a well-established universal immunisation programme with relatively high coverage and low disease incidence. Other jurisdictions considering a cocoon programme should consider their local epidemiology.

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