

Strategy 1. Facilitate the generation of high quality, relevant population health research

Strategy 1.1:

Focus on NSW Health priorities

Effectiveness of maternal pertussis vaccination in preventing infection and disease in infants: the NSW Public Health Network case-control study

Infants are at the highest risk of severe complications – including death – as a result of pertussis (whooping cough) infection. Controlling pertussis in this group has been challenging, particularly in those too young to be vaccinated. Following revised national recommendations in March 2015, NSW Health introduced a funded maternal vaccination program at 28–32 weeks of gestation using tetanus-diphtheria-acellular pertussis vaccine (Boostrix® GSK).

The NSW Public Health Network aimed to assess the effectiveness of maternal vaccination and add to the growing body of evidence for this strategy by conducting a case-control study. The study was coordinated by Health Protection NSW, and overseen by a working group of officers from the Network, with expert advice from the National Centre for Immunisation Research and Surveillance.

All public health units in NSW participated in the case-control study between 16 August 2015 and 17 August 2016. Cases were NSW infants with confirmed whooping cough and aged under 6 months at onset. Public health unit staff randomly selected a control infant from public hospital births in the same geographical area born in the period up to 3 days before and after the case's birthdate. Odds Ratios (OR) were calculated using conditional logistic regression. Vaccine Effectiveness (VE) was calculated.

In total, 117 cases and 117 controls were recruited. The overall VE estimate was non-significantly protective for infants <6 months old (VE 39%, 95% CI: –12% to 66%). Higher VE was observed for infants <3 months old (VE 69%, 95% CI: 13%–89%) and against hospitalisation (VE 94%, 95% CI: 59%–99%).

The study concluded that maternal vaccination with Boostrix was highly effective at preventing severe whooping cough disease in infants, but was less effective at preventing disease which did not require hospitalisation. The overall vaccine effectiveness reported in this study was lower than in prior studies and suggests that maternal vaccination, while an effective strategy at preventing severe pertussis, is less effective at protecting against infection or mild disease.

The report of the study was published in the international journal *Vaccine*, and contributed to the evidence base reviewed by the Pharmaceutical Benefits Advisory Committee to recommend that maternal whooping cough vaccination be added to the National Immunisation Program. The Australian Government funded maternal whooping cough vaccination in each pregnancy from July 2018.

This Public Health Network statewide research initiative is an example of *Population Health Research Strategy 1.1 (Generation of research: Focus on NSW Health priorities)*, as it evaluated the impact of a NSW Government funded program (maternal pertussis vaccination) and demonstrated that the program was effective in preventing hospitalisation of infants from whooping cough.

Further reading

Saul N, Wang K, Bag S, Baldwin H, Alexander K, Chandra M, et al. Effectiveness of maternal pertussis vaccination in preventing infection and disease in infants: The NSW Public Health Network case-control study. *Vaccine* 2018; 36(14): 1887-92.