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Babies with older siblings have a higher infection risk, but are less protected through vaccination

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Parents know how easily coughs, colds and other infections can move through a household after a child picks up a bug at childcare or school.

This puts babies with older siblings at greater risk of serious infectious illness, especially while their immune systems are still developing during the critical first months of life. Maternal vaccination during pregnancy helps boost babies' protection.

But my [new research](#) shows a worrying mismatch: vaccination uptake falls during later pregnancies, leaving babies who would benefit most from maternal immunisation less likely to receive that protection.

In Aotearoa New Zealand, vaccination against pertussis, also known as whooping cough, and influenza is [publicly funded and recommended](#) during every pregnancy.

These vaccines do not only protect the mother. The maternal antibodies are also transferred to the baby and help protect them.

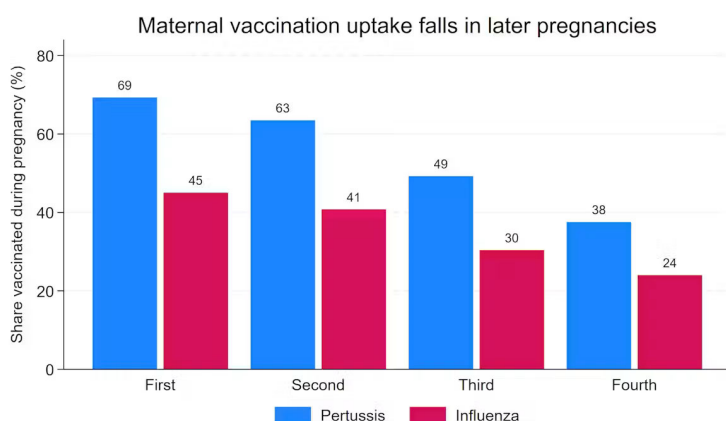
Previous studies confirm that maternal immunisation substantially reduces babies' risk of infection and hospitalisation from [pertussis](#) and [influenza](#), but my research shows a birth-order pattern of reduced protection.

Immunisation falls with each pregnancy

Vaccination uptake during pregnancy remains far from universal.

Analysis of current [Aotearoa Immunisation Register](#) data for births in the year to June 2025 shows 61% of mothers received a pertussis vaccine and 40% received an influenza vaccine during pregnancy.

But these overall figures hide a clear birth-order pattern. Among first pregnancies, uptake was 69% for pertussis and 45% for influenza. In second pregnancies, this decreased to 63% and 41% respectively. By the fourth pregnancy, these figures had fallen to 38% and 24%.



Share of mothers receiving pertussis or influenza vaccination during pregnancy, by birth order. Data cover pregnancies resulting in births in New Zealand from July 2024 to June 2025. CC BY

These recent figures show the birth-order pattern for one year of births. In my research, I examined a longer period, covering births from 2015 to 2023, which allowed me to compare vaccine uptake for the same mother across different pregnancies.

Part of the overall pattern reflects differences between families. Mothers who have more children tend to have lower vaccination uptake overall.

But the pattern also appears within families. The same mother is less likely to be vaccinated in later pregnancies than in earlier ones.

This finding fits with a growing body of evidence showing parents' health-related decisions can vary with a child's birth order. Previous studies have found later-born children are [breastfed at lower rates](#) and are less likely to attend health checks and receive [childhood immunisations](#). These differences can also begin before birth, with lower use of [prenatal care](#) in later pregnancies.

A double disadvantage for later-born babies

While later-born babies receive less protection through vaccination, they may also face a greater risk of infection.

The family environment plays a role in the spread of infectious diseases. Older children can bring infections home, exposing younger siblings. Studies in other countries have found later-born children have higher rates of [hospitalisation for respiratory conditions](#) and receive [more prescriptions for contagious diseases](#) early in life.

My study shows this pattern also holds in New Zealand for two diseases targeted by maternal immunisation: pertussis and influenza. Later-born babies were more likely to be hospitalised for these diseases than their earlier-born siblings.

This is concerning from a public health perspective. Babies with older siblings face a greater risk of infection, while their mothers are less likely to receive recommended vaccinations during pregnancy.

How health services can respond

There are several possible reasons maternal immunisation and other parental behaviours vary by birth order.

As families grow, parents have to divide their time, attention and other resources among more children. This may influence the care and support available during later pregnancies and early childhood.

Parents may also learn and adapt as they become more experienced, changing how they approach pregnancy and infant care.

These explanations also point to possible solutions. [Evidence from New Zealand](#) suggests gaps in awareness, time constraints and difficulty accessing services can contribute to missed maternal immunisation. These barriers may be exacerbated in later pregnancies, when parents are already caring for older children.

Policy and service efforts that provide clearer information and make vaccination easier to access could therefore be particularly effective if they include a focus on later pregnancies.

New Zealand has already been moving in this direction by expanding the settings where immunisation can be delivered, including pharmacies and community midwives. There is [evidence](#) that making maternal pertussis vaccination available through pharmacies increased uptake, particularly for Māori women.

If these changes make vaccination easier to access for busy families, they could help protect babies who currently face the double disadvantage of higher infection risk and lower maternal immunisation uptake.

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