
Appendix 2: Planning immunisation catch-ups

It is essential that vaccinators have a sound understanding of the number of antigens and the most effective spacing of doses required for a primary course and subsequent boosters in order to assess an individual's immunisation requirements. The principles described below will help vaccinators in this process.

Section A2.2 discusses catch-up requirements for children aged under 18 years, and section A2.3 discusses the requirements for adults.

Plan and document your complete catch-up schedule in the patient notes and recall system to ensure continuity of care.

For assistance with planning catch-up schedules, contact your immunisation coordinator, the IMAC freephone line on 0800 466 863, or discuss with an experienced colleague.

A2.1 Eligibility for publicly funded vaccines

The *Health and Disability Services Eligibility Direction 2011* (the Eligibility Direction) issued by the Minister of Health sets out the eligibility criteria for publicly funded health and disability services in New Zealand. Only people who meet the eligibility criteria defined in the Eligibility Direction can receive publicly funded (ie, free or subsidised) health and disability services.

Note that regardless of their immigration and citizenship status, all children aged under 18 years are eligible to receive Schedule vaccines, and providers can claim the immunisation benefit for administering the vaccines.

A2.2 For infants, children and adolescents aged under 18 years who start their vaccinations late or who are more than one month behind a due vaccination date

When planning a catch-up schedule, start by focusing on the antigens already received and the additional antigens required, not the vaccine combinations available or trade names. There is no need to think in terms of events missed (eg, the 6-week, 3-month, 5-month, 15-month vaccination event). It is important to note the age of the child when the antigens were received.

Although catch-up tables are provided in this appendix, children may not fit these unless they are completely unvaccinated, or there is no documented history and they are assumed to be unvaccinated. Trying to fit a child's vaccine requirements to a table can result in too many or not enough antigens being administered.

Use the following principles to establish what antigens the infant, child or adolescent requires.

A2.2.1 Principles of catch-up for infants and children aged under 10 years

1. The best approach is to ascertain the antigens required for their current age, subtract any already given and then develop the individual's catch-up schedule.
2. There is considerable flexibility when planning catch-up schedules. To offer the best protection in the shortest time possible, most vaccines can be given simultaneously and the catch-up schedule shortened to four-weekly intervals to ensure the required number of doses are administered.
3. If the Schedule has been interrupted, do not repeat prior doses regardless of how long ago the previous doses were given. Exceptions to this principle are the following vaccines given to children aged under 12 months: MMR or measles-containing

vaccine (see point 8 below), Hib vaccine (see point 9) and PCV vaccine (see point 10).

4. If the immunisation status of a child is uncertain or unknown, plan the catch-up schedule assuming the vaccines have not been given.
5. If a child infrequently attends general practice and failure to return for future immunisation is a concern, it is prudent to administer as many antigens as possible at every visit.
6. For infants and children aged under 10 years, use DTaP-IPV-HepB/Hib or DTaP-IPV for primary immunisation. Tdap may be used as an alternative for primary immunisation of children aged 7 to under 18 years (note that Tdap [Boostrix] is not registered for primary immunisation, but there is no evidence of safety concerns).
7. The first dose of rotavirus vaccine (RV1, Rotarix) should be given before age 15 weeks (ie, the latest is 14 weeks and 6 days) and the second dose administered a minimum of four weeks later. An infant who has not had the first dose before age 15 weeks will not be eligible to commence the rotavirus course. Where the first dose is inadvertently given at age 15 weeks or older, the remaining dose should be given, but both doses should be given before age 25 weeks (ie, 24 weeks and 6 days). While it is preferable for infants to complete the rotavirus course with the same vaccine, both RV5 (RotaTeq) and RV1 (Rotarix) vaccines may be used interchangeably, providing the upper age limits are met. See Table A2.4 for infants who are transitioning from RV5 to RV1.
8. The first dose of MMR is scheduled at age 15 months but may be given to children from age 12 months at the parents'/guardians' request. If there are concerns about the child returning for follow-up visits, give MMR at the first visit from age 12 months. MMR or any single-antigen measles vaccine given before age 12 months is not counted as part of the two-dose MMR schedule.
9. A single dose of Hib is required for all children aged 12 months to under 5 years regardless of the number of doses given in their first year. Healthy children aged 5 years and older do not need Hib.
10. Ideally, the primary course of PCV should be completed with the same manufacturer's vaccine. Where this is not possible, it is acceptable to use the available PCV vaccine. For healthy infants

commencing PCV vaccination at ages 7–11 months, a primary course is two doses with a minimum of four weeks between doses. A booster dose is given after age 12 months – at age 15 months or at least eight weeks after the completion of the primary course. Unimmunised healthy children aged 12 months to under 5 years require two PCV doses at least eight weeks apart. If a child did not complete their primary course when under 12 months of age, do not count the given doses when determining the number of PCV catch-up doses required. Healthy children aged 5 years and older do not need PCV. See chapter 15 ‘Pneumococcal disease’ for PCV13 schedules for high-risk children.

11. One dose of varicella vaccine is funded for children who were born on or after 1 April 2016.
12. Remember to check whether the infant/child has any specific health conditions that may make them eligible for additional vaccines or additional doses of vaccine (see chapter 4 ‘Immunisation of special groups’).
13. Once the child has received the appropriate vaccines for their age, they should continue on the Schedule as usual.

Table A2.1: Minimum number of antigens required, by age at time of presentation, for infants and children aged <10 years

<12 months	12 months to <5 years	5 years to <10 years
3 DTaP ^a	3 or 4 DTaP ^a	4 DTaP ^a
3 IPV ^a	3 or 4 IPV ^{a,e}	3 or 4 IPV ^e
3 HepB ^b	3 HepB ^b	3 HepB ^b
3 Hib	1 Hib ^f	2 MMR
2 or 3 PCV ^c	2 PCV ^c	
2 RV ^d	1 or 2 MMR ^g	
	1 VV ^h	

- a Use DTaP-IPV-HepB/Hib or DTaP-IPV for the 3-dose primary series (at a minimum of 4-weekly intervals), then continue on the usual childhood schedule with a booster dose of DTaP-IPV given at age 4 years. If the child commences immunisation at age 4 years or older, give the booster dose at least 6 months after the 3rd dose of the primary series.
- b If the child received HepB at birth, they will require a total of 4 HepB doses. Children born to HBsAg-positive mothers require serological testing – see section 8.5.2.
- c For healthy infants commencing PCV vaccination at ages 7–11 months, a primary course is 2 doses with a minimum of 4 weeks between doses. A booster dose is given after 12 months of age – at age 15 months or at least 8 weeks after the completion of the primary course. For healthy children aged 12 months to under 5 years who are commencing immunisation or with an incomplete course, 2 doses of PCV at least 8 weeks apart are required. (See chapter 15 ‘Pneumococcal disease’ for PCV13 schedules for high-risk children.)
- d The 1st dose of rotavirus vaccine should be given before age 15 weeks (ie, the latest is 14 weeks and 6 days) and the 2nd dose administered a minimum of 4 weeks later. Both doses must be given before age 25 weeks (ie, the latest is 24 weeks and 6 days). Where the 1st dose is inadvertently given at age 15 weeks or older, the 2nd dose should be given, but both doses must be given before age 25 weeks (24 weeks and 6 days). See Table A2.4 for infants who are transitioning from RV5 to RV1.
- e A minimum of 3 polio doses are required for the primary series (at a minimum of 4-weekly intervals) for children aged under 10 years, but 4 doses may be given when combination vaccines are used (eg, DTaP-IPV-HepB/Hib or DTaP-IPV).
- f A single dose of Hib is required for all children from age 12 months to under 5 years, regardless of the number of doses given before age 12 months.
- g Children commencing immunisation at age 12 months to under 4 years require 1 dose of MMR, then continue on the usual childhood schedule with a 2nd dose of MMR given at age 4 years, or at least 4 weeks after the 1st MMR dose at the parents’/guardians’ request. Children commencing immunisation at age 4 years require 2 doses of MMR 4 weeks apart.
- h One dose of varicella vaccine is funded for children born on or after 1 April 2016.

A2.2.2 Principles of catch-up for children and adolescents aged 10 to under 18 years

1. The best approach is to ascertain the antigens required for current age, subtract any already given and then develop the individual's catch-up schedule.
2. There is considerable flexibility when planning catch-up schedules. To offer the best protection in the shortest time possible, most vaccines can be given simultaneously and the catch-up schedule shortened to four-weekly intervals to ensure the required number of doses are administered.
3. If the Schedule has been interrupted, do not repeat prior doses regardless of how long ago the previous doses were given.
4. If the immunisation status of an individual is uncertain or unknown, plan the catch-up schedule assuming the vaccine has not been given.
5. If an individual infrequently attends general practice and failure to return for future immunisation is a concern, it is prudent to administer as many antigens as possible at every visit. If aged 12 months or older administer MMR at the first visit.
6. For individuals aged 10 years to under 18 years, Tdap is recommended and funded for primary and booster immunisation. While Tdap is not approved for use (registered) as a primary course, no safety concerns are expected when using Tdap for primary immunisation in individuals aged 10 to under 18 years. Therefore, using Tdap should be considered for all catch-up schedules for primary and booster immunisations.
7. For individuals aged 11–15 years, an alternative two-dose hepatitis B catch-up schedule may be considered using the monovalent HepB (HBvaxPRO 10 µg), with the second dose given four to six months after the first.

8. Individuals aged 14 years and under receive two doses of HPV at 0 and 6–12 months. Individuals aged 15 years and older receive three doses of HPV at 0, 2 and 6 months. If a shortened schedule is required for those aged 15 years and older, give the 2nd dose at least 1 month after the 1st dose and the 3rd dose at least 3 months after the 2nd dose. Those who started with HPV4 may complete their remaining doses with HPV9. Non-residents who were under age 18 years when they commenced HPV vaccination are currently funded to complete the course, even if they are aged 18 years or older when they complete it. See Table A2.10 for HPV catch-up schedules.
9. One dose of varicella vaccine is funded for previously unvaccinated children turning 11 years old on or after 1 July 2017 who have not previously had a varicella infection.
10. Remember to also check whether the individual has any specific health conditions that may make them eligible for additional vaccines or additional doses of vaccine (see chapter 4 ‘Immunisation of special groups’).
11. Once the individual has received the appropriate vaccines for their age they should continue on the Schedule as usual.

Table A2.2: Minimum number of antigens required by individuals aged 10 to under 18 years at the time of presentation

10 years to <18 years	
4	Tdap ^a
3	IPV ^b
3	HepB (5 µg) for children aged 10 to <18 years; or 2 HepB doses (10 µg) for children aged 11–15 years ^c
2	MMR
2	HPV ^{d,e,f} for those aged 11–14 years, or 3 HPV ^{d,g} for those aged 15 years and older
1	VV ^h
a	If aged 10 years to under 18 years, use Tdap for the primary series and the booster dose, with a minimum interval of 6 months between doses 3 and 4 (the primary series and the booster dose).
b	A minimum of 3 polio doses are required for the primary series (at a minimum of 4-weekly intervals).
c	If aged 10 years to under 18 years, 3 doses of HepB (HBvaxPRO 5 µg) are required. An alternative 2-dose schedule of HepB (HBvaxPRO 10 µg) may be used for children aged 11–15 years with the 2nd dose given 4–6 months after the 1st.
d	Individuals who started with HPV4 may complete their remaining doses with HPV9.
e	For those aged 11–14 years, the 2nd HPV dose is preferably given at least 6 months after the 1st. If the 2nd dose is given earlier than 5 months after the 1st, a 3rd HPV dose is recommended and funded. Give the 3rd dose at least 6 months after the 1st dose.
f	Regardless of the age at the 1st dose, if the 2nd HPV dose is given at age 15 years or older a 3rd HPV dose is recommended and funded. Give the 3rd dose at least 4 months after the 2nd dose.
g	For those aged 15 years and older, give a 3-dose HPV course at 0, 2 and 6 months. If a shortened schedule is required for these older individuals, give the 2nd dose at least 1 month after the 1st dose and the 3rd dose at least 3 months after the 2nd dose.
h	One dose of varicella vaccine is funded for previously unvaccinated children turning 11 years old on or after 1 July 2017 who have not previously had a varicella infection.

A2.2.3 National Immunisation Schedule catch-up guides for infants, children and adolescents aged under 18 years

Note, these are a guide only and the principles described in sections A2.2.1 and A2.2.2 should be followed. The vaccinator must subtract any previous doses given. It is important to note the age at which the antigens have been given.

Table A2.3: Age at presentation: 3–6 months

Note: Subtract previous doses given.

Dose	Vaccines		
First dose*	DTaP-IPV-HepB/Hib	PCV	RV*
4 weeks later	DTaP-IPV-HepB/Hib	PCV	RV*
4 weeks later	DTaP-IPV-HepB/Hib	PCV	

Once the child has received the appropriate vaccines for their age, continue on the Schedule as usual.

- * Only eligible for RV if the 1st dose is given before age 15 weeks (ie, 14 weeks and 6 days). The 2nd dose must be given before age 25 weeks (ie, 24 weeks and 6 days). See Table A2.4 for infants who are transitioning from RV5 (RotaTeq) to RV1 (Rotarix).

Table A2.4: Recommendations for infants aged under 25 weeks who are transitioning from RV5 (RotaTeq) to RV1 (Rotarix)

Number of RV5 doses previously received	Number of RV1 doses required
3 RV5	Fully immunised – no RV1 required
2 RV5	1 RV1* at least 4 weeks after the 2nd RV5
1 RV5	2 RV1* at least 4 weeks between each of the doses

- * All doses of RV1 must be given before age 25 weeks (ie, the latest is 24 weeks and 6 days).

Table A2.5: Age at presentation: 7–11 months

Note: Subtract previous doses given.

Dose	Vaccines	
First dose	DTaP-IPV-HepB/Hib	PCV*
4 weeks later	DTaP-IPV-HepB/Hib	PCV
4 weeks later	DTaP-IPV-HepB/Hib	

Once the infant has received the appropriate vaccines for their age, continue on the Schedule as usual.

- * Healthy infants commencing PCV vaccination at age 7–11 months require a primary course of 2 PCV doses. Those who received 1 PCV dose before age 7 months should receive 2 further doses of PCV whilst aged under 12 months to complete the primary course. (See chapter 15 'Pneumococcal disease' for PCV13 schedules for high-risk children.)

Table A2.6: Age at presentation: 12–23 months

Note: Subtract previous doses given.

Dose	Vaccines
First dose	DTaP-IPV-HepB/Hib ^a PCV ^b MMR ^c VV ^d
4 weeks later	DTaP-IPV-HepB/Hib ^e
4 weeks later or at age 15 months, whichever is applicable	DTaP-IPV-HepB/Hib ^e PCV ^b
Once the child has received the appropriate vaccines for their age, continue on the Schedule as usual.	

- a One dose of Hib is required from age 12 months to under 5 years regardless of previous doses.
- b Healthy children commencing immunisation at age 12–23 months require 2 PCV doses, with a minimum interval of 8 weeks between doses. If the child did not complete a primary course of PCV when under 12 months of age, do not count the previously given doses when determining the number of PCV catch-up doses required. If the child completed a primary course of PCV before age 12 months, give a booster dose at age 15 months or at least 8 weeks after the completion of the primary course. (See chapter 15 'Pneumococcal disease' for PCV13 schedules for high-risk children.)
- c The 1st dose of MMR is scheduled at age 15 months but may be given to children from age 12 months at the parents'/guardians' request. If there are concerns about the child returning for follow-up visits, give MMR at the 1st visit from age 12 months.
- d One dose of varicella vaccine is funded for children born on or after 1 April 2016.
- e Parents/guardians should be informed that their child will receive extra doses of Hib but there are no safety concerns with these extra doses. If the parents/guardians prefer, vaccinators may administer the DTaP-IPV and HepB vaccines as 2 separate injections instead of the combination DTaP-IPV-HepB/Hib vaccine.

Table A2.7: Age at presentation: 2 years to under 5 years

Note: Subtract previous doses given.

Dose		Vaccines		
First dose	DTaP-IPV-HepB/Hib ^a	PCV ^b	MMR	VV ^c
4 weeks later	DTaP-IPV-HepB/Hib ^d		MMR ^e	
4 weeks later	DTaP-IPV-HepB/Hib ^d	PCV ^b		
6 months later	DTaP-IPV ^f			

Once the child has received the appropriate vaccines for their age, continue on the Schedule as usual.

- a One dose of Hib is required from age 12 months to under 5 years regardless of previous doses.
- b For a healthy child who presents at age 2 years to under 5 years: if previously unvaccinated, give 2 PCV doses at least 8 weeks apart; if they completed a primary PCV course before age 12 months, give 1 PCV dose; if they started but did not complete a primary PCV course before age 12 months, give 2 PCV doses at least 8 weeks apart (this is the exception to the principle of counting previous doses given). (See chapter 15 'Pneumococcal disease' for PCV13 schedules for high-risk children.)
- c One dose of varicella vaccine is funded for children who were born on or after 1 April 2016.
- d Parents/guardians should be informed that their child will receive extra doses of Hib, but there are no safety concerns with these extra doses. If the parents/guardians prefer, vaccinators may administer the DTaP-IPV and HepB vaccines as 2 separate injections instead of the combination DTaP-IPV-HepB/Hib vaccine.
- e Administer the 2nd MMR dose at age 4 years or a minimum of 4 weeks after the 1st dose at the parents'/guardians' request. If the child is older than age 4 years at presentation, administer the 2nd MMR dose a minimum of 4 weeks after the 1st dose.
- f Administer DTaP-IPV at age 4 years, a minimum of 6 months after the 3rd DTaP-IPV-HepB/Hib dose. If the child is aged 4 years or older at presentation, administer DTaP-IPV a minimum of 6 months after the 3rd DTaP-IPV-HepB/Hib dose.

Table A2.8: Age at presentation: 5 years to under 10 years

Note: Subtract previous doses given.

Dose	Vaccines
First dose	DTaP-IPV-HepB/Hib ^{a,b} MMR
4 weeks later	DTaP-IPV-HepB/Hib ^{a,b,c} MMR
4 weeks later	DTaP-IPV-HepB/Hib ^{a,b,c}
6 months later	DTaP-IPV ^c

Once the child has received the appropriate vaccines for their age, continue on the Schedule as usual.

- a Healthy children aged 5 years and older do not need Hib. However, DTaP-IPV-HepB/Hib should be offered to reduce the number of injections at each visit. Parents/guardians should be informed that their child will receive extra doses of Hib but there are no safety concerns with these extra doses.
- b If the parents/guardians prefer, vaccinators may administer DTaP-IPV and HepB vaccines as 2 separate injections instead of the combination DTaP-IPV-HepB/Hib vaccine.
- c If a child turns 10 years old before completing their catch-up programme, they should continue on the 10 years to under 18 years catch-up schedule (refer to Table A2.9).

Table A2.9: Age at presentation: 10 years to under 18 years – excluding HPV

Note: Subtract previous doses given.

Dose	Vaccines			
First dose	Tdap ^a	IPV ^b	HepB ^c	MMR
4 weeks later	Tdap ^a	IPV ^b	HepB	MMR
4 weeks later	Tdap ^a	IPV ^b	HepB	
6 months later, or at age 11 years	Tdap			
At age ≥11 years				VV ^d

- a Use Tdap for the primary series and the booster dose, with a 6-month interval between the primary series and the booster (doses 3 and 4).
- b A minimum of 3 IPV doses are required for the primary series (at a minimum of 4-weekly intervals).
- c A two-dose HepB catch-up may be considered for children aged 11–15 years (use HBvaxPRO 10 µg), with the 2nd dose given 4–6 months after the 1st.
- d One dose of varicella vaccine is funded for previously unvaccinated children turning 11 years old on or after 1 July 2017 who have not previously had a varicella infection.

Table A2.10: Age at presentation: 11 years to under 18 years – HPV only

Note: Subtract previous doses given.

Dose	Vaccine
Age 11–14 years^{a,b} at presentation	
First dose	HPV
6–12 months later ^{c,d}	HPV
Age 15 years and older^{b,e} at presentation	
First dose	HPV
2 months later	HPV
4 months later	HPV

- a Although the usual schedule is at age 11 or 12 years (school year 7 or 8), HPV vaccine may be given from age 9 years.
- b Individuals who started with HPV4 may complete their remaining doses with HPV9.
- c For those aged 11–14 years, the 2nd dose is preferably given at least 6 months after the 1st. However, if the 2nd dose is given less than 5 months after the 1st, a 3rd HPV dose is recommended and funded. Give the 3rd dose at least 6 months after the 1st.
- d Regardless of the age at the 1st dose, if the 2nd HPV dose is given at age 15 years or older, a 3rd HPV dose is recommended and funded. Give the 3rd HPV dose at least 4 months after the 2nd.
- e If a shortened schedule is required for those aged 15 years and older, give the 2nd dose at least 1 month after the 1st dose and the 3rd dose at least 3 months after the 2nd dose.

A2.3 Immunisation catch-up for eligible adults aged 18 years and older

When seen at general practice or by vaccination providers, adults should be checked to see that they have received protection against the following diseases and have received a primary immunisation course as in Table A2.11 below.

1. If the requisite number of doses has not been received, catch-up vaccination is recommended. There is flexibility when planning catch-up schedules. To offer the best protection in the shortest time possible, most vaccines may be given simultaneously and the catch-up schedule shortened to four-weekly intervals to ensure the required number of doses are administered.
2. Do not repeat prior doses regardless of how long ago the previous doses were given.

3. All adults should be reminded of the necessity for age-appropriate boosters for tetanus and diphtheria at 45 and 65 years of age.
4. Pertussis (Tdap; given between 28 and 38 weeks' gestation) and influenza vaccines are recommended and funded in every pregnancy. A single dose of unfunded Tdap and influenza vaccines may be considered for adults requesting pertussis and influenza protection, especially for those in close contact with young babies.
5. Women of childbearing age should know whether they are immune to rubella. If the patient does not have two documented doses of MMR, two doses of funded MMR should be offered four weeks apart (MMR cannot be given in pregnancy and pregnancy should be avoided for four weeks following vaccination). If they have received one documented dose of MMR, a second dose should be administered.
6. Previously unvaccinated males and females aged 15 years to 26 years inclusive may receive three doses of HPV vaccine. Those who started with HPV4 may complete their remaining doses with HPV9. Those who were aged under 27 years when they commenced but did not complete HPV vaccination are currently funded to complete the three-dose course even if they are aged 27 years or older when they complete it. Non-residents who were under age 18 years when they commenced HPV vaccination are currently funded to complete the course, even if they are aged 18 years or older when they complete it.
7. Check whether the individual has any additional immunisation requirements, such as specific health conditions or occupational risk (see chapter 4 'Immunisation of special groups').

Table A2.11: Primary immunisation requirements for adults

Antigens and number of doses required

3 Td^a

3 polio (IPV)^b

2 MMR^c

3 HPV^{d,e} (aged 26 years and under)

- a A primary course of 3 doses of Td vaccines (at a minimum of 4-weekly intervals) is recommended and funded for unimmunised or partially immunised adults. Unfunded Tdap may be offered as an alternative to Td for pertussis protection. At ages 45 and 65 years, the Td booster immunisation administration (the immunisation benefit) is not funded, although the vaccine is free.
- b A primary course of 3 polio (IPV) doses (at a minimum of 4-weekly intervals) is recommended and funded for unimmunised or partially immunised adults.
- c Two doses of MMR (given a minimum of 4 weeks apart) are recommended and funded for unimmunised adults who are susceptible to any one of the three diseases. Those born in New Zealand before 1969 are considered to be immune to measles.
- d HPV vaccine is recommended and funded for all individuals aged 26 years and under. Give the 3-dose course at 0, 2 and 6-months. If a shortened schedule is required, give the 2nd dose at least 1 month after the 1st dose and the 3rd dose at least 3 months after the 2nd dose.
- e Those who were under age 27 years when they commenced HPV vaccination are currently funded to complete the 3-dose course, even if they are aged 27 years or older when they complete it. Non-residents who were under age 18 years when they commenced HPV vaccination are currently funded to complete the course, even if they are aged 18 years or older when they complete it.