

Immunisation Subcommittee of PTAC
Meeting held 23 May 2016

(minutes for web publishing)

Immunisation Subcommittee minutes are published in accordance with the *Terms of Reference for the Pharmacology and Therapeutics Advisory Committee (PTAC) and PTAC Subcommittees 2016*.

Note that this document is not necessarily a complete record of the Immunisation Subcommittee meeting; only the relevant portions of the minutes relating to Immunisation Subcommittee discussions about an Application or PHARMAC staff proposal that contain a recommendation are generally published.

The Immunisation Subcommittee may:

- (a) recommend that a pharmaceutical be listed by PHARMAC on the Pharmaceutical Schedule and the priority it gives to such a listing;
- (b) defer a final recommendation, and give reasons for the deferral (such as the supply of further information) and what is required before further review; or
- (c) recommend that PHARMAC decline to list a pharmaceutical on the Pharmaceutical Schedule.

These Subcommittee minutes were reviewed by PTAC at its meeting 3 & 4 November 2016, the record of which is available on the PHARMAC website.

Record of the Immunisation Subcommittee of the Pharmacology and Therapeutics Committee (PTAC) meeting held at PHARMAC on 23 May 2016

1 Therapeutic group review

- 1.1 The Subcommittee noted a paper by PHARMAC staff outlining the expenditure of the National Immunisation Schedule (NIS) vaccines, an update on action points from the previous meetings, and reviewing opportunities for funding new vaccines and/or widening access.
- 1.2 The Subcommittee noted that in February 2016, PHARMAC ran a Request for Proposals (RFP) for supply of various vaccines on the NIS with any changes to be implemented in July 2017. The Subcommittee noted PHARMAC also ran a separate RFP for the supply of influenza vaccine with any changes to be implemented in January 2017.

Adult diphtheria and tetanus

- 1.3 The Subcommittee noted that there would be no change to the adult diphtheria and tetanus (Td) product currently listed as a result of the RFP.
- 1.4 Members considered that it was not known whether the current Td strategy in NZ was effective as there was no baseline data, but noted that adult 45 and 65 years vaccines were now able to be captured by the National Immunisation Register (NIR) after recent changes were made to the NIR. Members noted that recording of data is an opt-out system – the same as the influenza vaccine which is more likely to better capture data than an opt-in system.
- 1.5 Members noted that vaccines for adults were not recorded by indication and there was no data available on the number of vaccines administered for dirty wounds; however, it may be possible to obtain some information on the extent of vaccine used for dirty wound management via immunisation benefit claims data. The Subcommittee requested such data be provided at a future meeting. Members considered that not all clinicians viewed the recording of Td vaccinations as standard practice, even less so in hospital emergency departments and community emergency clinics. The Subcommittee **recommended** that the Ministry provide additional messages to clinicians to emphasise the importance of recording vaccinations on the NIR, as it was already doing for flu vaccinations.

Bacillus Calmette-Guerin vaccine

- 1.6 The Subcommittee noted that there were international stock shortages of the bacillus Calmette-Guerin (BCG) vaccine which would result in New Zealand being out of stock by the end of May 2016. Members noted that the World Health Organization (WHO) had determined which countries had populations most at risk and was prioritising the available vaccine stock accordingly.

- 1.7 The Subcommittee noted that it may be possible to source an unapproved, Section 29, BCG vaccine but it was likely to be of a different strain. Members noted that in New Zealand in the past, an alternative strain BCG vaccine was provided which had resulted in a significant increase in reported adverse reactions and considered that if New Zealand was to source a vaccine with a different strain of BCG, more communication would need to be disseminated to clinicians to manage possible adverse reactions.
- 1.8 The Subcommittee considered that it could be appropriate for the Ministry to reinstate the Tuberculosis Advisory Group (TBAG), which was disestablished a couple of years ago, to provide advice on alternatives to the current strain of BCG vaccine, or alternative strategies if there was expected to be a long term outage of available BCG vaccine. Recent advice provided by a New Zealand paediatrician stated that having an unapproved vaccine of a different strain may be preferable over not having a product available. The Subcommittee considered that it would be appropriate for TBAG to review the current funding criteria to determine its suitability within the next three months.

Diphtheria, tetanus and pertussis

- 1.9 The Subcommittee noted that there would be no change to the diphtheria, tetanus and pertussis (Tdap) vaccine product currently listed as a result of the RFP.
- 1.10 The Subcommittee noted an application from the Auckland and Waitemata DHB Immunisation Governance Group, supported by a letter from the Infection and Immunisation Special Interest Group of the Paediatric Society of New Zealand, requesting access criteria to diphtheria, tetanus and pertussis (Tdap) vaccine be widened to include parents and caregivers/close household contacts of premature babies who are born before 28 weeks and/or those admitted to the Neonatal Intensive Care Units (NICUs) and Special Care Baby Units (SCBUs). The Subcommittee noted current funded access for Tdap included pregnant women between gestational weeks 28 to 38.
- 1.11 The Subcommittee noted that infants born before 28 weeks would not have had the opportunity to be exposed to the Tdap vaccine maternally. Members noted that the Subcommittee had recommended Tdap pregnancy vaccinations in 2014 after evaluating this strategy was more effective than a cocooning strategy, including the concerns that cocooning was difficult to implement and required high rates of coverage in order to be effective, which was associated with significantly higher costs than a maternity strategy.
- 1.12 The Subcommittee considered that neonates needing admission to NICU and SCBU were different, as vaccinating parents/caregivers of admitted infants would be in part to protect the unit (NICU or SCBU): an adult (parent) case of pertussis would expose many babies and staff to this highly infectious disease; very premature babies can be in the unit for 3 months or more. Members considered that there is an inequity in access to the Tdap vaccine, as wealthy families were more able to afford to vaccinate an entire household whereas low socioeconomic families would find it difficult to fund vaccinations for entire households which tend to be larger than wealthier households. Members noted that there was a clear link between prematurity and the incidence of pertussis, and that Māori and Pacific

people experienced a higher prevalence of premature birth than non-Māori and Pacific people.

- 1.13 Members noted a paper (Eberhardt et al CID 2016:62(7):829-36) that reported that vaccination earlier in a pregnancy (for example at 13 weeks) resulted in high neonatal antibodies to pertussis. Members considered that while only the one paper had been published showing that result, it was too early to consider, making any changes to the current criteria.
- 1.14 The Subcommittee considered that if access to the Tdap vaccine was to be widened, it would suggest starting with high-risk infants who could not receive antibodies by maternal vaccination. Members considered that if vaccinations for parents/caregivers of infants admitted to NICU/SCBU were to be funded, it should be restricted to neonatal admissions that were long-term, so as not to include unnecessarily transient admissions for quickly-resolving indications such as transient respiratory distress or neonatal hypoglycaemia, as a way to manage the fiscal risk to the Pharmaceutical Budget. Members considered that most such transient admissions to NICU/SCBU would be for less than 48 hours, but this could fluctuate regionally based on bed availability in different units and wards.
- 1.15 The Subcommittee noted that before any recommendation could be made in relation to widening Tdap access to families and close household contacts of premature infants and infants admitted to NICU/SCBU, more data was required on the average size of households, prevalence of pertussis spread within households, and pertussis transmission rates to infants from family/household contacts. Members considered that infant pertussis fatality numbers were too small to determine risk factors related to prematurity and provide a meaningful model. The Subcommittee requested further information be provided at a future meeting.
- 1.16 The Subcommittee **recommended** widening of access to pertussis vaccine initially starting with parents only of either all infants born at 28 weeks or less and/or of infants admitted to NICU or SCBU for a minimum stay of 3 days who had not been exposed to maternal vaccination at least 14 days prior to birth, with a high priority. Members considered a minimum stay period of 1 week rather than 3 days in either of the units would also be appropriate, and discussion with parents about them being vaccinated could be part of developing the infant's ongoing care plan.
- 1.17 The Subcommittee acknowledged that it would need to be determined if fathers would be vaccinated onsite in the hospital units or if they would need to visit their general practitioner and recommended that PHARMAC obtain advice from paediatric and neonatal wards.
- 1.18 The Subcommittee noted that there was a significant difference in the annual number of Tdap vaccinations recorded on the NIR versus the number of vaccines dispatched from the distributor ProPharma. The Subcommittee considered that this was likely due to a combination of factors including the recording of vaccinations given at year 7 (11 year olds) on the NIR, and vaccinations being administered outside of the National Immunisation Schedule criteria. Ministry staff indicated that the recording issue for Year 7 vaccinations was being worked on but there was no confirmed timeframe for resolution. Members reported that some DHBs were

electing to vaccinate parents with funded vaccines due to possible confusion around the funding criteria.

- 1.19 The Subcommittee noted that under the Need and Benefit quadrants of the Factors the impact on the family and whanau needed to be considered. Maori and Pacific access ante-natal care less and there is an equity issue in that mothers of those infants born at term have had time to provide protection for their infants by being vaccinated during the 28 and 38 gestational weeks.

Diphtheria, tetanus, pertussis and polio (DTaP-IPV) vaccine

- 1.20 The Subcommittee noted that there would be no change to the diphtheria, tetanus, pertussis and polio (DTap-IPV) vaccine product currently listed as a result of the RFP.
- 1.21 The Subcommittee considered that the current schedule of 3 doses of DTaP was appropriate and that travellers going to countries with high polio incidence should receive a booster.
- 1.22 The Subcommittee noted that it had considered at its October 2015 meeting the possibility of replacing the 4 year old event DTaP-IPV with Tdap, given the lower rate of local reactions to Tdap, but had considered that there was insufficient evidence to recommend the switch to Tdap at this time. Members considered it appropriate to provide a DTaP vaccine in place of a DTaP-IPV vaccine if the former was the less expensive option.

Diphtheria, tetanus, pertussis, polio, hepatitis B and haemophilus influenza type B vaccine

- 1.23 The Subcommittee noted that there would be no change to the diphtheria, tetanus, pertussis, polio, hepatitis B and haemophilus influenza type B (hexavalent) vaccine product currently listed as a result of the RFP.
- 1.24 The Subcommittee noted that PHARMAC had received a request from the Department of Haematology, Canterbury District Health Board, for the use of the hexavalent product following haematopoietic stem cell transplant (HSCT) and for pre- or post-splenectomy. Members noted that currently patients received 4 separate vaccinations and CDHB staff considered that use of the single injection hexavalent vaccine would increase uptake of immunisation.
- 1.25 The Subcommittee noted that there was a lack of data for use of the hexavalent vaccine in adults and it was currently being administered up to the age of 10 years in line with the registered indication for the use of this vaccine. Members further noted that there was a lack of data showing increased antibodies in HSCT patients and post-splenectomy, considered that immunogenicity and reactogenicity are not necessarily correlated, and commented that it would be a very interesting area of study. The Subcommittee noted that there is an increased risk of local adverse reactions in an adult group receiving this vaccine.
- 1.26 The Subcommittee **recommended** that the current listing of the hexavalent vaccine should not be changed. The Subcommittee noted that if an adult patient

wanted the hexavalent vaccine, a clinician could provide it under Section 29 of the Medicines Act which required them to explain to the patient that the vaccine was not registered and the patient would need to pay for the vaccine as the product is not funded for patients over the age of 10 years. The Subcommittee **recommended** that PHARMAC reply to the CDHB informing them of the lack of data for widening access to adults and the option of providing it while unregistered. Members considered that the market for an adult hexavalent vaccine was likely to be too small to entice suppliers to develop one, including applying for Medsafe registration for this widened indication.

Haemophilus influenza type b vaccine

- 1.27 The Subcommittee noted that there was a proposed brand change from Act-Hib to Hiberix on the National Immunisation Schedule and did not consider this to be an issue.

Hepatitis A vaccine

- 1.28 The Subcommittee noted that it may be possible to change the currently listed Havrix and Havrix Junior vaccines to Avaxim, but considered this to be inappropriate given that there was no junior version of Avaxim available and the product is only registered for children aged 2 years and older. Members considered that if it was no longer possible to use a funded Hepatitis A vaccine for young children under 2 years of age, it would result in the use of more immune globulin (as alternative post-exposure prophylaxis), which would be more expensive to overall health expenditure than retaining the currently funded Havrix and Havrix Junior.

Hepatitis B vaccine

- 1.29 The Subcommittee noted that there would be no change to the hepatitis B vaccine product currently listed as a result of the RFP.
- 1.30 The Subcommittee considered that with the roll out of renal vaccinations in dialysis units, there was likely to be an increase of usage of higher dose hepatitis B vaccines and that there would be improved vaccination levels for hepatitis B.

Influenza vaccine

- 1.31 The Subcommittee noted that a separate RFP was run in February 2016 for supply of influenza vaccine in 2017, 2018, and 2019 influenza seasons. Members noted that the preferred supplier was BGP (formerly Abbott), with a sole supply proposal for the funded influenza market. Members noted that PHARMAC recognised that there was a degree of risk associated with sole supply and would take steps to mitigate the risk, including the first 3 deliveries of 250,000 doses each to be from different batches dispatched at 2 week intervals.
- 1.32 The Subcommittee noted that the 2017 influenza season supply would continue to be a trivalent vaccine after which New Zealand would switch to the quadravalent vaccine for the 2018 and 2019 influenza seasons assuming BGP's quadrivalent vaccine was registered for supply to the New Zealand market. The Subcommittee

noted that the quadrivalent vaccine was becoming the standard internationally. Members queried the availability of live attenuated influenza vaccine (LAIV) and noted that it was not registered in New Zealand.

- 1.33 The Subcommittee considered that in the future a herd immunity strategy should be considered, perhaps looking at vaccination at primary school age. As part of this consideration it would like to see an LAIV vaccine registered.
- 1.34 The Subcommittee reviewed 3 separate applications for widening the access of funded influenza vaccinations to include family members of high-risk paediatric patients, household contacts of cancer patients, and persons admitted into DHB forensic or long-stay inpatient mental health care units.

Family members of high-risk paediatric patients

- 1.35 The Subcommittee reviewed an application, in the form of a letter from the Infection and Immunisation Special Interest Group of the Paediatric Society of New Zealand, [REDACTED].
- 1.36 The Subcommittee noted that in 2015, Auckland DHB had funded family members of high risk infants and paediatrics in NICU, PICU and the medical specialties paediatric ward but had ceased funding in 2016 as it was considered this should be a national initiative. The Subcommittee noted that approximately 60 – 70 parents had been vaccinated but that number may increase as the renal, gastroenterology and respiratory teams were all interested in vaccinated family members of their young inpatients.
- 1.37 The Subcommittee noted that the number of additional people receiving vaccinations would be very high, as it would need to cover both inpatients and outpatients, and would involve all the members of a family either coming to a hospital ward to be immunised or visiting their general practitioner. Members suggested that if a broader influenza strategy was to be discussed later in the year, then family members of all high-risk patients should be considered for vaccination.
- 1.38 Ministry staff outlined that there was an influenza meeting due to be held on 2 November 2016, the findings of which could be reviewed by both the Subcommittee and PTAC. PHARMAC staff noted that for the level of funded vaccinations being considered, extending influenza coverage to family members of high-risk paediatric patients would likely be a significant cost per year and PHARMAC would need at least a good evidence base showing the disease burden and efficacy of widened vaccination access, as well as a tightly defined group, to consider the additional funding. The Subcommittee **recommended** PHARMAC request that the applicant supply supporting information and a refined group definition and this could be discussed at a future Subcommittee meeting.

Household contacts of cancer patients

- 1.39 The Subcommittee reviewed an application in the form of an email from the Planning and Funding Department of Canterbury DHB (following a request from a Member of the Subcommittee) and support for the application from the DHB

Immunisation Service Level Alliance, to widen access of funded influenza vaccine to household contacts of cancer patients.

- 1.40 The Subcommittee considered that the application required evidence showing the disease burden and **recommended** PHARMAC request that the applicant supply supporting information including the incidence of influenza being contracted by a patient undergoing treatment for cancer from a member of the patient's household. The Subcommittee considered that this group could be discussed at the wider influenza meeting later in the year if sufficient information is received from the applicant the findings of which could be reviewed by both the Subcommittee and PTAC.

People admitted to DHB forensic or long-stay inpatient mental health care units

- 1.41 The Subcommittee reviewed an application from the New Zealand Pharmacists Association – Mental Health Special Interest Group to widen funded access of the influenza vaccine for people admitted to DHB forensic or long-stay inpatient mental health care units. Members noted that funding for long term forensic patients had been approved for the 2015 influenza season and has since been extended to all influenza seasons.
- 1.42 The Subcommittee reviewed the evidence provided in the application. The Subcommittee noted that Kuo et al (Second-Generation Antipsychotic Medications and Risk of Pneumonia. Schizophrenia. 2012) reported an increased risk of influenza for patients who were taking antipsychotic drugs. The Subcommittee noted that a review of the Mason Clinic's (the Auckland and Northland Forensic Psychiatry Service) clinical notes in 2015 found that only 50% of the service users who wanted to be vaccinated against influenza met the criteria.
- 1.43 The Subcommittee considered that many patients in long-term mental health care were under compulsory treatment orders rather than voluntary admission, and many were high-risk physically, socially, and mentally. The Subcommittee supported access to funded influenza vaccines be widened to include inpatients of long-term mental health care units with high priority and **recommended** that PHARMAC seek advice from the Mental Health Subcommittee of PTAC to define criteria for funding.
- 1.44 The Subcommittee considered that in terms of the Factors for Consideration, vaccinating long-stay inpatients may be cost saving to the health system by protecting patients from an outbreak and that this may be particularly true for those in sheltered accommodation. The Subcommittee considered these patients suffered from health disparities – they are unable to leave the hospital to access primary care and Maori make up a greater percentage of patients than the national population percentage. Vaccination would improve the health needs of the inpatients and those caring for them.

Measles, mumps and rubella vaccine

- 1.45 The Subcommittee noted that there was a proposed supply change from the currently supplied M-M-R II brand to Priorix, which contained the attenuated

Schwarz strain of the Edmonston strain of measles, and considered there to be no issues with the proposed switch. No concerns were raised regarding this change.

Meningococcal (groups A, C, Y and W-135) conjugate vaccine and meningococcal C conjugated vaccine

- 1.46 The Subcommittee noted that there was low use of the meningococcal C vaccine but considered it necessary and appropriate to fund both types of meningococcal vaccines. The Subcommittee noted there were no changes proposed for either of these vaccines.

Pneumococcal vaccine

- 1.47 The Subcommittee noted that there was a proposal to change the pneumococcal conjugate vaccine from Prevenar 13 (PCV13) back to Synflorix (PCV10) [REDACTED]. The Subcommittee noted there would be no change to the brand of pneumococcal polysaccharides vaccine, 23 valent (PPV23) currently listed on the NIS.
- 1.48 The Subcommittee noted that it had discussed the suitability of either PCV10 or PCV13 being listed on the Immunisation Schedule in October 2015 and, based on the evidence available at that time, considered that both vaccines were suitable for inclusion on the NIS. Members noted that Medsafe recently approved a change medicine notification in April 2016 to include a reference to Synflorix being cross-reactive to serotype 19A in the data sheet.
- 1.49 Members noted that Pfizer, supplier of Prevenar 13, had responded to the minutes from the October 2015 meeting and provided additional data on the increased incidence rate of notified cases of invasive pneumococcal disease (IPD) caused by serotype 19A *S. pneumoniae* following the implementation of PCV10 in 2011 and some decrease in incidence following the implementation of PCV13 in 2014. Members noted additional, immature seasonally-unadjusted data covering most of 2 years showing there were 17 cases of children who were fully vaccinated with PCV10 and a further 14 who were fully vaccinated with PCV10 and PCV7 (a total of 33 children) who had cases of serotype 19A, indicating that, in Pfizer's opinion, New Zealand did not have good control of 19A during 2013 and 2014.
- 1.50 The Subcommittee considered that the numbers provided in the new data from Pfizer were very small and noted that there were fluctuations in incidence rates from year to year. Members noted that it was not possible to predict future incidence of 19A cases as there was no baseline. The Subcommittee considered that it was not possible to attribute the changes in incidence of serotype 19A cases directly to the change to PCV10 use. Members noted that there were a number of European countries that had switched back to PCV10 from PCV13 without ostensible increases in IPD, although those countries did not necessarily have high rates of IPD prior to switching.
- 1.51 The Subcommittee considered that further data was needed on the disease burden of IPD 19A and noted that the laboratory-based notification system for IPD 19A

cases was good, but notifications did not record immunisation status, and the Subcommittee suggested that the Ministry monitor this closely.

1.52 The Subcommittee expressed concern that the preliminary data could be a prelude to higher disease burden becoming evident; however, the Subcommittee noted that the [REDACTED] very relevant to the overall health of the Community and to the Pharmaceutical Budget (CPB).

1.53 [REDACTED].

1.54 The Subcommittee **recommended** that PCV13 continue to be funded for high-risk patients, as previously defined, with high priority.

1.55 The Subcommittee considered the two proposed dosing schedules for PCV10, 2+1 versus 3+1, and considered that if a change was to be made from PCV13 to PCV10 it would be appropriate to maintain the dosing schedule at the current 3+1 doses at 6 weeks, 3 months and 5 months and a booster at 15 months. Members considered that it would be more beneficial to monitor the change from PCV13 to PCV10 without an additional change to a 2+1 dosing schedule at this stage.

1.56 The Subcommittee **recommended** that the Ministry review the overall scheduling of all immunisations to maximise vaccination uptake, taking into account that 6-month coverage was low at approximately 70%. One possible aspect on this lower rate may be parents returning to work at that time.

Poliomyelitis vaccine

1.57 The Subcommittee noted that there was no proposed change to the brand of the product currently listed on the NIS and had no comments.

Rotavirus vaccine

1.58 The Subcommittee noted that a rotavirus vaccine had been listed on the NIS since 1 July 2014 and uptake had been rapid, with approximately 170,000 doses distributed on a moving annual total, which represented an approximate 95% coverage.

1.59 The Subcommittee noted that there was a proposal to change brands from RotaTeq to Rotarix which was registered and indicated for a 2-dose schedule rather than the current 3-doses schedule with RotaTeq. Members considered this to be appropriate and **recommended** that the 2-dose schedule be administered at 6

weeks and 3 months, which would provide a 3 month 'window' for ensuring the second dose was received before the age of 6 months.

Varicella vaccination

- 1.60 The Subcommittee noted that there were no proposed changes to the brand of varicella vaccine listed on the NIS, and that PHARMAC staff sought advice on the number of additional vaccine doses that would be required to include universal vaccination of all children.
- 1.61 The Subcommittee noted that ideally universal access for all children would allow older children who had not had chickenpox to have access, which would improve health benefits for family, whanau, and wider community as cases of chickenpox often required caregivers to take 2 weeks domestic leave or otherwise not work in order to care for the sick child.
- 1.62 As per the recommendations made by the PTAC at its February 2015 meeting, the Subcommittee **recommended** varicella vaccine be listed on the Pharmaceutical Schedule funded for one infant dose at age 15 months and one catch up dose for 11 year olds who have not previously been vaccinated and who are naïve to varicella, with all vaccinations to be handled by the patients' general practices. Members considered it would be difficult to include a school-based catch up programme for varicella, as the numbers would be small (it is estimated that 90 to 95% of 11 year old would have either had chickenpox or been vaccinated) and it would not be easy to ascertain who had either been immunised or had had chickenpox.

Mantoux test

- 1.63 The Subcommittee noted that PHARMAC was proposing to form an agreement with the supplier of Mantoux tests. The Subcommittee suggested that if the Ministry's Tuberculosis Advisory Group (TBAG) was to be reinstated, it would be the appropriate group to review the use and supply of Mantoux tests and provide advice on whether access criteria was necessary and/or appropriate.

2 Gardasil 9

Application

- 2.1 The Subcommittee reviewed an application from Seqirus to include Gardasil 9, a new 9 valent human papillomavirus (HPV) vaccine, on the Pharmaceutical Schedule.

Recommendation

- 2.2 The Subcommittee **recommended** that Gardasil 9 be listed on the Pharmaceutical Schedule for the vaccination of Year 7 girls and boys for HPV, on a 2-dose schedule 5 to 13 months apart, with the first year of vaccinations to include Year 8 girls and boys, with a high priority.

- 2.3 The Subcommittee **recommended** that Gardasil 9 be funded for the vaccination of males and females up to and including 26 years of age who had not previously received HPV vaccination. The Subcommittee **recommended** Gardasil 9 be listed on the Pharmaceutical schedule on a 3 – dose schedule for males and females between the ages of 15 and 26 inclusive.
- 2.4 The Committee took into account, where applicable, PHARMAC's relevant decision-making framework for these recommendations.

Discussion

- 2.5 The Subcommittee considered the evidence for Gardasil 9 vaccine was strong and noted that it had the potential to prevent 90% of cervical cancers and 80% high grade pre-cancerous lesions. Members noted it had demonstrated high efficacy against the 5 additional human papillomavirus (HPV) serotypes not in the quadravalent Gardasil 4 (31, 33, 45, 52, 58) and was non-inferior to Gardasil 4 for the existing 4 valencies. (6, 11, 16, 18). Members further noted that Gardasil 9 had a similar safety profile to the quadravalent vaccine but there was an increase in injection-site swelling which was likely due to the increased dose of adjuvant used in Gardasil 9.
- 2.6 The Subcommittee noted that Seqirus (previously CSL Biotherapies) had applied to Medsafe for registration of a 2-dose regime of Gardasil 9 in addition to the already registered 3-dose regime. Members noted that the 2-dose schedule for boys and girls aged 9-14 years had been approved by the European Medicine Agency in April 2016. Members considered data from ClinicalTrials.gov that reported non-inferiority of the 2-dose regimen for 9-14 year old girls and boys and increased seroconversion using 0 and 12 months compared with 0 and 6 months. Members considered that the increased seroconversion reported with the long duration between doses was minimal and sufficient seroconversion was still obtained at a minimum of 6 months between doses.
- 2.7 The Subcommittee considered that the 2-dose regime would be appropriate for a school vaccination programme to be completed within a school calendar year, which could coincide with the current Tdap school vaccine programme in Year 7 students. Members considered that providing the HPV vaccine during Year 7 would provide the opportunity for Year 8 students who did not receive both doses during the previous year to receive a catch-up dose. Members noted that catch-up vaccinations required in Year 9 would be more difficult logistically, as many students could have changed schools after completing Year 8.
- 2.8 The Subcommittee considered that a gender-neutral vaccination program would help normalise the vaccine and potentially increase uptake and coverage. Members noted that Gardasil 9 was registered for males between the ages of 9 and 26 inclusive and considered that, if funded, males who were not vaccinated through a school programme would be able to access the vaccine from their general practitioner. Members noted that girls and boys over 15 years of age would require 3 doses of Gardasil 9.
- 2.9 Members further noted that Māori and Pacific populations had a higher prevalence of cervical cancer.

- 3.10. The Subcommittee did not agree with the supplier's claim that a patient who had received a first dose of quadravalent Gardasil could not receive booster doses of Gardasil 9, which would otherwise require school vaccination programmes to stock and coordinate the administration of both types of Gardasil in the first year of change-over. Members considered that it would be appropriate for patients who had received a first dose of quadravalent Gardasil to be given Gardasil 9 for their second dose. The Subcommittee **recommended** that PHARMAC and/or the Ministry seek advice from public health services and school nurses regarding any issues that would require addressing, prior to implementing a 2-dose HPV vaccine programme for both girls and boys in Year 7.