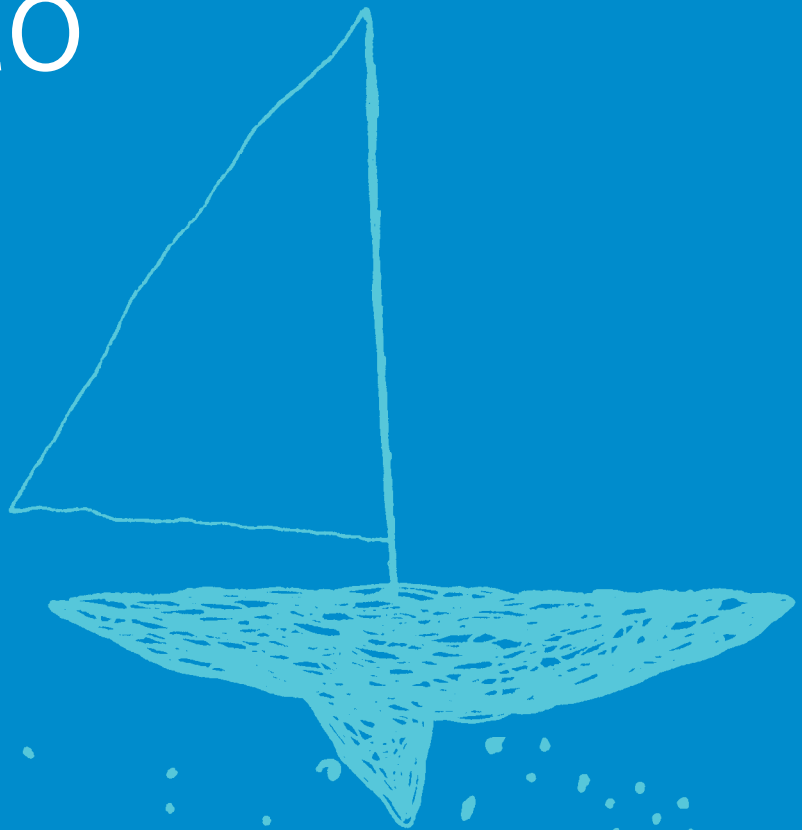




IMMUNISATION SERVICE

# Immunisation Service Report 2018-20



# Table of contents

<b>Section 1: Overview</b>	<b>5</b>
The Immunisation Service at The Royal Children's Hospital, Melbourne	6
Key highlights	7
Staff	10
<b>Section 2: Report on performance</b>	<b>13</b>
<b>A. Core service activity</b>	<b>14</b>
RCH Immunisation Drop-in Centre	14
Patients immunised	14
Outpatient clinics	15
Telehealth	16
Additional immunisation consultations	16
Telephone Advice Line	16
Inpatient immunisations	17
Elective admissions	18
Immunisations for newly-arrived immigrants	19
Influenza vaccine	19
RCH staff influenza vaccine campaign and meningococcal ACWY	20
<b>B. Additional RCH Immunisation Service programs</b>	<b>23</b>
Bacille Calmette-Guerin vaccine for children under 12 months of age	23
BRACE trial	23
Palivizumab prophylaxis for cardiac and respiratory patients	24
Special-risk patients	25
<b>Section 3: Communication and accountability</b>	<b>27</b>
Melbourne Vaccine Education Centre	28
Immunisation errors	28
Bimonthly meeting	29
Feedback on the RCH Immunisation Drop-in Centre	28
National Immunisation Teleconference	29
Immunisation policy	30
Australian Technical Advisory Group of Immunisation (ATAGI)	30
Surveillance of Adverse Events Following Vaccination In the Community (SAEFVIC)	30
Immunisation education provision	30
PHAA Immunisation Conference	30
Education at The Royal Children's Hospital, Melbourne	30
External education	31
<b>Section 4: Clinical immunisation research and publications</b>	<b>35</b>
Background	36
Advanced trainee and scholarly selective projects	36
Publications	37

# Index of figures

**Figure 1:** Patients immunised at the RCH Immunisation Drop-in Centre by 12-month period ..... 14

**Figure 2:** Patients immunised at the RCH Immunisation Drop-in Centre by 12-month period: non-outpatient drop-in patients versus outpatients ..... 15

**Figure 3:** Number of RCH Immunisation Service Clinic patients by year excluding BCG Clinic patients ..... 15

**Figure 4:** Number of RCH Immunisation Service telehealth consultations by year ..... 16

**Figure 5:** Immunisation advice calls at the RCH Immunisation Drop-in Centre by 12-month period ..... 17

**Figure 6:** Telephone advice calls at the RCH Immunisation Drop-in Centre by caller 1 July 2018–30 June 2020 ..... 17

**Figure 7:** Inpatients identified as due/overdue for immunisation and vaccinated 1 July 2019–30 June 2020 ..... 18

**Figure 8:** Inpatients vaccinated by site 1 July 2019–30 June 2020 ..... 18

**Figure 9:** Mantoux tests given by the RCH Immunisation Service by 12-month period ..... 19

**Figure 10:** Influenza immunisations at the RCH Immunisation Drop-in Centre by month and year ..... 20

**Figure 11:** Monthly RCH Bacille Calmette-Guerin Clinic attendees ..... 23

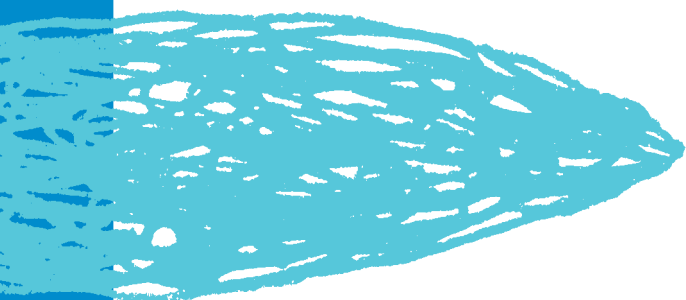
**Figure 12:** Number of patients provided monthly palivizumab by the RCH Immunisation Service ..... 24

**Figure 13:** Number of patients receiving each of the recommended palivizumab doses (2020) ..... 24

**Figure 14:** Opportunistic immunisations provided during palivizumab visits (2020) ..... 25

**Figure 15:** RSV vials saved from cohorting patients (2020) ..... 25

**Figure 16:** Actual vaccine errors from 1 July 2018 – 30 June 2020 by type ..... 29

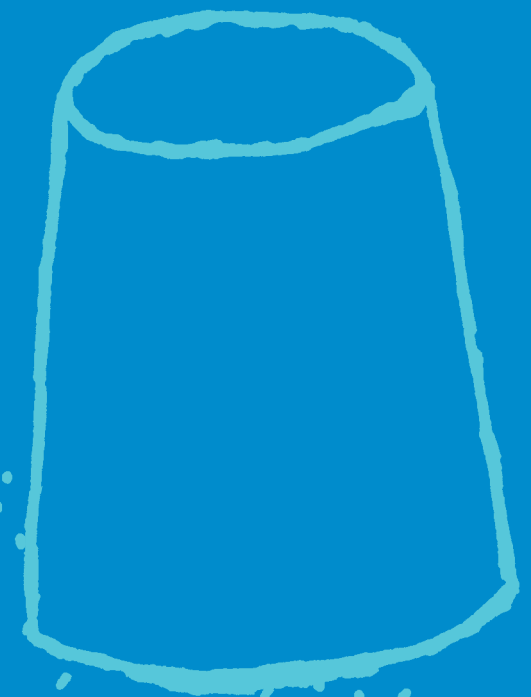


# Abbreviations

<b>AEFI</b>	Adverse event following immunisation
<b>AIR</b>	Australian Immunisation Register
<b>BCG</b>	Bacille Calmette-Guerin
<b>CVU</b>	Clinical Vaccinology Update
<b>DHHS</b>	Department of Health and Human Services Victoria Immunisation section
<b>EMR</b>	Electronic Medical Record
<b>FTE</b>	Full-time equivalent
<b>GP</b>	General practitioner
<b>HOD</b>	Heads of department
<b>HHE</b>	Hypotonic-hyporesponsive episode
<b>ID</b>	Infectious diseases
<b>MCRI</b>	Murdoch Children’s Research Institute
<b>MVEC</b>	Melbourne Vaccine Education Centre
<b>NCIRS</b>	National Centre for Immunisation Research and Surveillance
<b>NIP</b>	National Immunisation Program
<b>NP</b>	Nurse practitioner
<b>NUM</b>	Nurse unit manager
<b>PAEDS</b>	Paediatric Active Enhanced Disease Surveillance
<b>PHAA</b>	Public Health Association of Australia
<b>PI</b>	Principal investigator
<b>PICU</b>	Paediatric Intensive Care Unit
<b>RCH</b>	The Royal Children’s Hospital, Melbourne
<b>RSV</b>	Respiratory syncytial virus
<b>SAEFVIC</b>	Surveillance of Adverse Events Following Vaccination In the Community
<b>UR</b>	Unit Record
<b>VHIMS</b>	Victorian Health Incident Monitoring System
<b>VIRGO</b>	Vaccine and Immunisation Research Group
<b>WHO</b>	World Health Organisation

SECTION 1

# Overview



## The Immunisation Service at The Royal Children's Hospital (RCH)

### Our vision

To improve the health of children through the service's core business of providing:

- Clinical immunisation telephone advice
- Administering opportunistic immunisations
- Consulting specialised patient groups in the weekly outpatient clinic

The RCH Immunisation Service also provides:

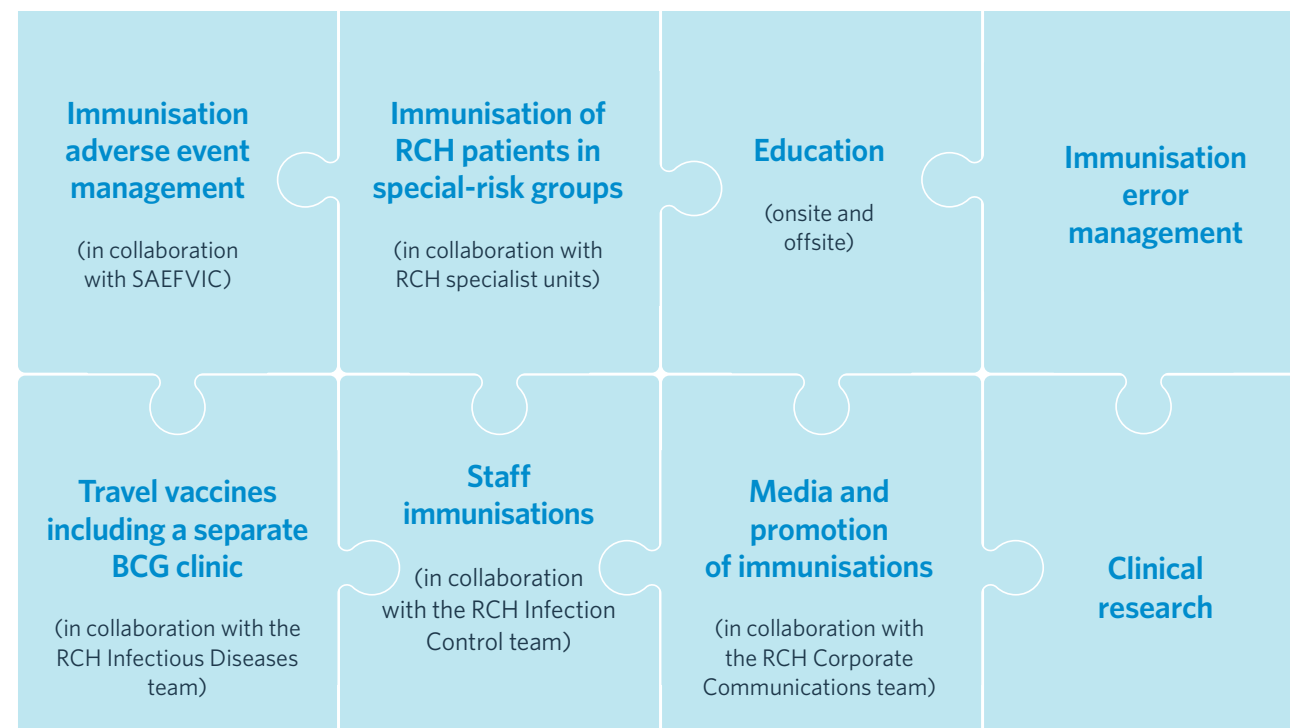
- Education
  - Across all of the campus: medical students, paediatric trainees, nurses and clinicians
  - External education, in collaboration with the Murdoch Children's Research Institute (MCRI) including through the Melbourne Vaccine Education Centre (MVEC) website [<https://mvec.mcricri.edu.au/>] and Clinical Vaccinology Updates (CVU)
- Research
  - A strong clinical research team including special-risk groups, vaccine safety, vaccine-preventable disease (VPD) surveillance; vaccine confidence and uptake, and vaccine trials
  - Epidemiological and clinical trial studies in current and potentially new vaccine-preventable diseases

### Our purpose

We deliver the highest-quality immunisation care to children and their families. The RCH Immunisation Service plays a vital role in increasing vaccine awareness, understanding and knowledge by assisting the community and health professionals through education, teaching and training. We do this by:

- Developing evidence-based immunisation guidelines
- A commitment to the training and development of paediatricians with a special interest in immunisation, clinical nurse consultants, nurse immuniser trainees and graduate nurse program participants.
- Delivering community education programs and resources
- Shaping clinical practice by actively participating in national and international immunisation conferences
- Leading internationally-recognised research
- Collaboration with community, government and professional stakeholders
- Involvement in immunisation policy at a state and national level
- A team of passionate and dedicated professionals committed to our purpose

### Additional services provided by the RCH Immunisation Service



### Links and partnerships

Whilst based within the RCH, the Immunisation Service has a broad reach within the Melbourne Children's campus, including; a clinical role across multiple RCH departments, research teams within the MCRI and affiliations with the University of Melbourne. The RCH Immunisation Service receives core funding through a partnership with the Victorian Department of Health and Human Services Immunisation section. The RCH Immunisation Service also has affiliations with Surveillance of Adverse Events Following Vaccination In the Community (SAEFVIC) — based at MCRI/RCH and Monash Health.

This report provides a detailed account of the RCH Immunisation Service's performance over the 2018-20 financial years and is designed to demonstrate the activities undertaken by the team of dedicated staff involved in immunisation at RCH. The strong relationships we have built with our patients, families, stakeholders and community is important to us and is vital to our continued success.

### Immunisation Service Reports 2018-20

This document is a service activity report over two years (1 July 2018-30 June 2020).

It highlights the core service activities as well as additional immunisation programs undertaken by the RCH Immunisation Service team.

### Key highlights

#### Nursing scholarships

Immunisation nurse, Narelle Jenkins, believes two novel devices Coolsense® and Buzzy® could be the key to reducing the anxiety and pain associated with children getting their immunisations. A new study led by Narelle and funded by Templestowe Auxiliary, is looking into the most effective distraction and pain reduction techniques for children when having their immunisations.

The two devices will be compared to current standard care; which involves blowing bubbles to distract younger kids or using iPads for older children. Narelle has no misconceptions that these distraction and pain reduction devices will take that apprehension away completely, but she is hopeful that by finding the most effective technique for each age group of children it will reduce ongoing anxiety.

'If we don't manage it right when children first come into the Immunisation Clinic it can lead to needle phobia. We don't want this fear or anxiety to effect anyone seeking medical attention in the future or not having vaccines in the future. Having that adequate pain management can reduce the risk of parental non-adherence with vaccinations.'

The study will incorporate two large randomised controlled trials of around 500 children each. One will focus on younger children aged three and a half to 10 and the other will focus





on older children aged 10 to 18 and investigate which of the three distraction and pain reduction techniques — Coolsense®, Buzzy®, or current ‘standard practice’ — is best in each age group. It is being undertaken in collaboration with the Melbourne Children’s campus Clinical Trials Centre, with Associate Professor Kirsten Perrett, one of our RCH immunisation paediatricians supervising the project.

In 2018, Narelle was awarded the **Volunteers Nursing Scholarship**, which enabled her to attend the Canadian Immunisation Conference and present *Minimising Immunisation Pain of Childhood Vaccines: the MIP Pilot Study* as well as meet with the Pain Hub/Be Sweet to Babies research team at the Children’s Hospital of Eastern Ontario.

The **Dame Elisabeth Murdoch Nursing Development Scholarship** is a unique opportunity for nurses in Victoria, and plays an important role in the RCH’s vision to lead the way in paediatric health care. Each year, the \$50,000 scholarship allows one outstanding nurse to develop skills and experience by exploring innovative practices and models of care across Australia and internationally.

In 2018, Sonja Elia was the successful recipient. With support from the Dame Elisabeth Murdoch Nursing Development Scholarship, Sonja dedicated her expertise to support some of Australia’s most at risks communities, Aboriginal and Torres Strait Islander children.

The delivery of successful immunisation programs within Indigenous communities depends on culturally-appropriate health services. Sonja aimed to close the gap and make lasting changes to improve Indigenous immunisation for the long term.

‘This scholarship enabled me to travel overseas and present data at international conferences on current immunisation rates for Indigenous children at the RCH, as well as learn from colleagues strategies to improve this work. Protecting all children from vaccine-preventable disease such as measles and whooping cough is important, and particularly significant for vulnerable patients.’ said Sonja.

Since this work began, Sonja has worked with the DHHS Victoria Immunisation section to develop *Are All Your Bubba’s Jabs Up to date?* brochures as well as develop key relationships with the Wadja team at RCH. The RCH Immunisation Drop-in Centre has strived to be more culturally sensitive, with Indigenous music sessions and having Indigenous football players as ambassadors. These initiatives have resulted in a 25% increase in Aboriginal and Torres Strait Islander patients at the RCH receiving an influenza vaccine and a 30% increase in Wadja clinic patients receiving due/overdue scheduled vaccines.

## Immunisation fellowships

In medicine the term ‘fellow’ is used to describe an individual who has completed advanced training in an area of medicine or surgery to become a specialist in that field. In August 2019, we advertised a 6-month immunisation fellow training position, funded by the DHHS Victoria Immunisation section. It is an ideal position for a paediatric trainee interested in public health and vaccine-preventable diseases.

The role of the immunisation fellow includes attending the weekly RCH Immunisation Clinic, supporting the activities of the RCH Immunisation Drop-in Centre, and discussing and reviewing patients receiving vaccines as required. There was also a requirement to support vaccine administration under supervision in the RCH Day Medical Unit and inpatient wards as required. The fellow also reviewed internal immunisation-related referrals, which were discussed with the on-call immunisation paediatrician. They assisted with co-ordinating the weekly education meeting as well as undertaking a clinical research project, attending research and statistic training courses as required. In addition, there was also close collaboration with SAEFVIC.

From August 2019 to February 2020, Nicole Wong and Kate Gazzard shared the 6-month fellowship, and Luisa Clucas, a haematology trainee undertook the fellowship from February to August 2020.

## Nitrous oxide delivery at the RCH Immunisation Drop-in Centre

Sedation for immunisation is of particular importance in patients with anxiety disorders and/or needle phobia. Patients with needle phobia were previously referred to the RCH Immunisation Clinic to consult a paediatrician, and if available a bed was booked on the same day in the RCH Day Medical Unit. The patient then received immunisations under nitrous oxide and/or midazolam sedation. The nurse practitioner (NP) at the RCH Immunisation Service has facilitated addressing the deficiencies in the current management of needle-phobic patients, by offering a unique immunisation-under-sedation service at the RCH Immunisation Drop-in Centre.

With the endorsement of an NP in the RCH Immunisation Drop-in Centre, the nitrous gases were installed so as to offer this service to patients in a less rigorous way. The sedation of patients in the drop-in centre using nitrous oxide commenced in August 2018. From 1 August 2018 to 31 August 2019, 81 patients have accessed this service. Of the 81 needle-phobic patients, 74 (91%) have been successfully immunised. Of the seven who were not immunised, the family was offered the midazolam and/or nitrous oxide Day Medical admission, but none have followed this up. One patient did have the vaccines at a GP visit. This work is to be presented at the National Immunisation Conference, Perth in June 2021.



## COVID-19

The COVID-19 pandemic, known as the coronavirus SARS CoV-2 pandemic began in Wuhan, China in December 2019. By January 2020, the World Health Organization (WHO) declared the outbreak of a public health emergency of international concern and a pandemic on 11 March. Millions of cases have been reported worldwide and more than a half million deaths.

In response to COVID-19, Australia like many countries, implemented a range of public health and social measures, including movement restrictions, closures of schools and business and international travel restrictions. This impacted the way the RCH went about providing patient care, and certainly resulted in changes to the service delivery model of the RCH Immunisation Drop-in Centre. In late March, the drop-in centre was closed to the general public, only providing opportunistic vaccines to special-risk RCH patients and their families. The Specialised Outpatient Clinic moved to a telehealth model of patient consultations and the BCG Clinic patients were postponed, particularly as travel restrictions were in place anyway.

The RCH Immunisation Centre nursing staff managed the 2020 staff influenza vaccination campaign, so as to assist the Infection Prevention and Control team to focus on managing COVID-19-related work pressures. Social distancing practices had to be maintained, which resulted in the opening of a ‘Flu Shop’ at 48 Flemington Road, and on the first day of the campaign, March 30, over 900 staff were vaccinated. This was run efficiently with the help of medical students from the

University of Melbourne, who were taught how to provide vaccines under the supervision of the RCH Immunisation Centre staff and supported by one of our immunisation paediatricians Wonie Uahwatanasakul who is also a lecturer and course coordinator for the medical students at the Department of Paediatrics, University of Melbourne.

We also saw changes in the way we deliver vaccines to RCH patients, with the successful implementation of the Hospital in the Home team providing influenza vaccines to those patients receiving care at home. The RCH Day Medical Unit and Day Oncology departments were also provided influenza vaccines on imprest, so that opportunistic ward-based immunisations could occur. A best-practice advisory model was developed in the Electronic Medical Record (EMR) by Daryl Cheng, which requires all clinical staff to acknowledge whether a patient has received an influenza vaccine in 2020. All these initiatives have resulted in an increase in uptake of influenza vaccines at the RCH.

The RCH Immunisation Service staff were also involved with a vaccine trial aiming to reduce the impact of COVID-19 in healthcare workers. The BRACE trial, launched by MCRI and endorsed by the WHO, tests if the Bacille Calmette-Guerin (BCG) vaccine can protect healthcare workers exposed to COVID-19 from developing severe symptoms. Led by Professor Nigel Curtis and supported by both the RCH Foundation and the Bill and Melinda Gates Foundation, the trial aims to recruit 10,000 healthcare workers in Australia and overseas.

## Staff

### Medical



#### Nigel Crawford (Medical Lead)

Nigel is a consultant paediatrician and Medical Head of Immunisation Services at The Royal Children's Hospital. Nigel is also the Director of SAEFVIC and MVEC. His research interests include vaccination of special-risk groups and adverse events following immunisation (AEFI). He also has an interest in vaccine policy and has been a member of the Australian Technical Advisory Group on Immunisation (ATAGI) since 2014.



#### Teresa Lazzaro

Teresa is a consultant paediatrician with extensive experience in the fields of immunisation and travel medicine. She has particular interests in adverse events following immunisation and vaccine hesitancy.



#### Margie Danchin

Margie is a consultant paediatrician with positions at both the RCH Immunisation Service and MCRI. She has a wealth of experience in vaccine research and clinical work and a particular interest in vaccine confidence, uptake and policy. She is the Chair of the Collaboration of Social Science on Immunisation (COSSI), a member of the Scientific Advisory Committee, National Centre for Immunisation Research and Surveillance (NCIRS) and a member of the ATAGI working group on vaccine safety, evaluation and confidence.

### Administration



#### Jessica Elia



#### Kirsten Perrett

Kirsten is a consultant paediatrician with extensive experience in vaccinology and allergy. She holds positions at both the RCH Immunisation Service and MCRI. Kirsten's interests are in vaccine allergy, clinical trials and vaccine safety research.



#### Shidan Tosif

Shidan is a consultant paediatrician with positions at both the RCH Immunisation Service and MCRI. He has particular interests in adverse events following immunisation, travel medicine and immigrant health.



#### Wonie Uahwatanasakul

Wonie is a consultant paediatrician with extensive clinical experience in paediatrics and child health. She holds positions at the RCH Immunisation Service and the University of Melbourne and is interested in adverse events following vaccination and special-risk vaccination.



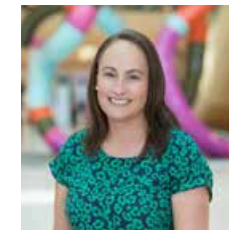
#### Jo Gleeson

### Nursing



#### Sonja Elia (Nurse Practitioner and Manager)

Sonja is the Nurse Practitioner and Manager of the RCH Immunisation Service and has a particular interest in vaccine hesitancy, special risk groups, needle phobia and immunisation education. She holds an honorary tutor position with the University of Melbourne, Nurse Immuniser Program and honorary research fellow with Murdoch Children's Research Institute.



#### Lynne Addlem

Lynne is a nurse practitioner candidate at the RCH Immunisation Service. She holds particular interests in vaccine hesitancy, improving at-risk inpatient vaccine coverage and immunisation education.



#### Skye Miller

Skye is a nurse coordinator at the RCH Immunisation Service. She holds a master's degree in public health, and her particular interests include overall vaccine coverage and herd immunity, as well as providing accurate and up-to-date immunisation education for health professionals and the community.

### Pharmacist



#### Annie Cobbletick

Annie is the pharmacist at the RCH Immunisation Service and she verifies, supplies and administers vaccines throughout the RCH. Her particular interests are vaccine access and equity.



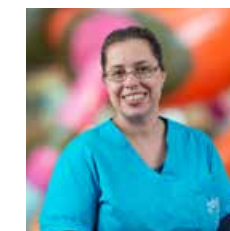
#### Narelle Jenkins

Narelle is a nurse coordinator at the RCH Immunisation Service. Her particular interests include improving patient experience during immunisation, particularly in relation to minimising pain and anxiety. She has led two large randomised-control trials in this area.



#### Nadine Henare

Nadine is a nurse coordinator at the immunisation service. She holds a master's degree in advanced nursing practice (Nurse Practitioner) and her particular interests include needle phobia, special-risk groups and immunisation education.



#### Phillippa Van Der Linden

Phillippa is a nurse coordinator at the RCH Immunisation Service. Her particular interests include vaccination of special-risk groups.

#### Past

Rebecca Feore  
Lucy Lam  
Ellie Wilson  
Nikki Marriner

#### Volunteer

Carmella

SECTION 2

# Report on performance





# A. Core service activity

## The RCH Immunisation Drop-in Centre

The opportunistic immunisation of patients whilst they are attending hospital is now well described in the literature, and the RCH Immunisation Drop-in Centre is the leader in this field internationally. Growth in activity continues each year, as shown below, with an incredibly high number of patients immunised. The RCH Drop-in Centre is easily accessible, on the Main Street of the hospital and is open Monday to Friday, 9am to 4.30pm. As well as providing vaccines, the RCH Drop-in Centre staff addresses vaccine concerns and hesitancy as well as reinforcing the importance and safety of vaccination to be able to close immunisation gaps, particularly of children in special-risk groups.

Improvements in the RCH Immunisation Drop-in Centre in this reporting period have been the inclusion of Aboriginal and Torres Strait Islander artwork and the employment of Indigenous ambassadors to the service. By implementing strategies that have enhanced our ability to be culturally safe, we have experienced improved engagement with our Wadja team, as well as Aboriginal and Torres Strait Islander patients at the RCH.

## Overall activity

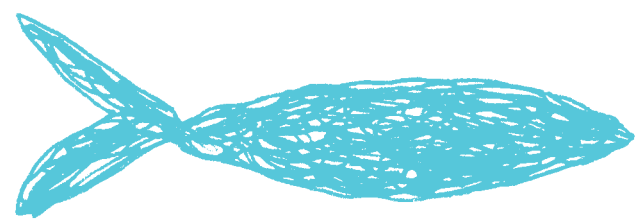
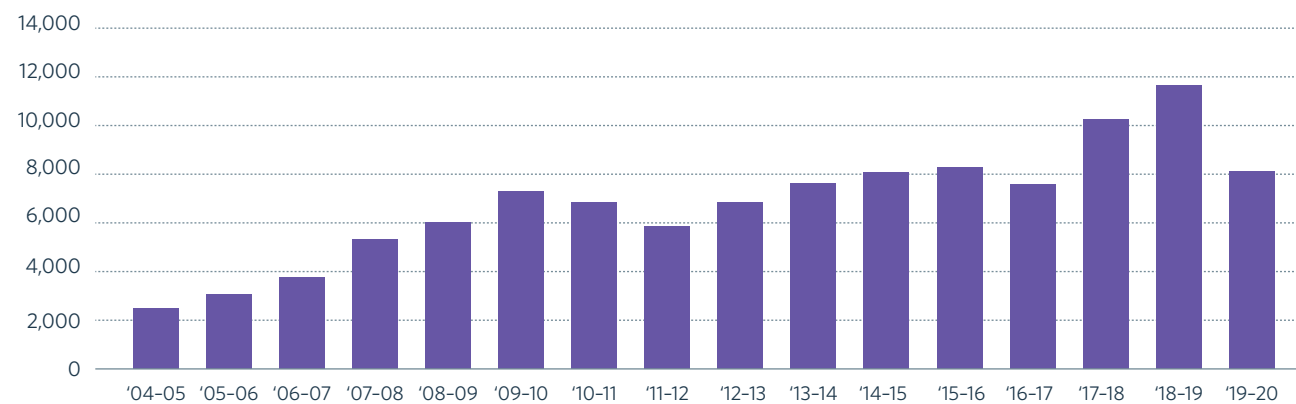
In 2018/19, 11,717 patients, siblings and parents were opportunistically vaccinated at the RCH Immunisation Drop-in Centre and in 2019/20, this decreased to 8,145 patients and their family members. This is due to the centre's closure to the general public in March 2020 due to COVID-19. **Figure 1** highlights the service activity over the last few years.

The activity demonstrated below is a reflection of the number of drop-in patients, siblings and/or parents of the patient as well as outpatients directed to the centre. The actual number of vaccinations administered is significantly higher than this. In the 2018/19 reporting period, 22,154 vaccines were administered and in 2019/20, 16,107 vaccines were given.

The RCH Immunisation Centre nursing staff also attend the various wards throughout the hospital and provide the required immunisations. **Figure 2** demonstrates an overview of the source of patients receiving immunisations in the RCH Immunisation Drop-in Centre.

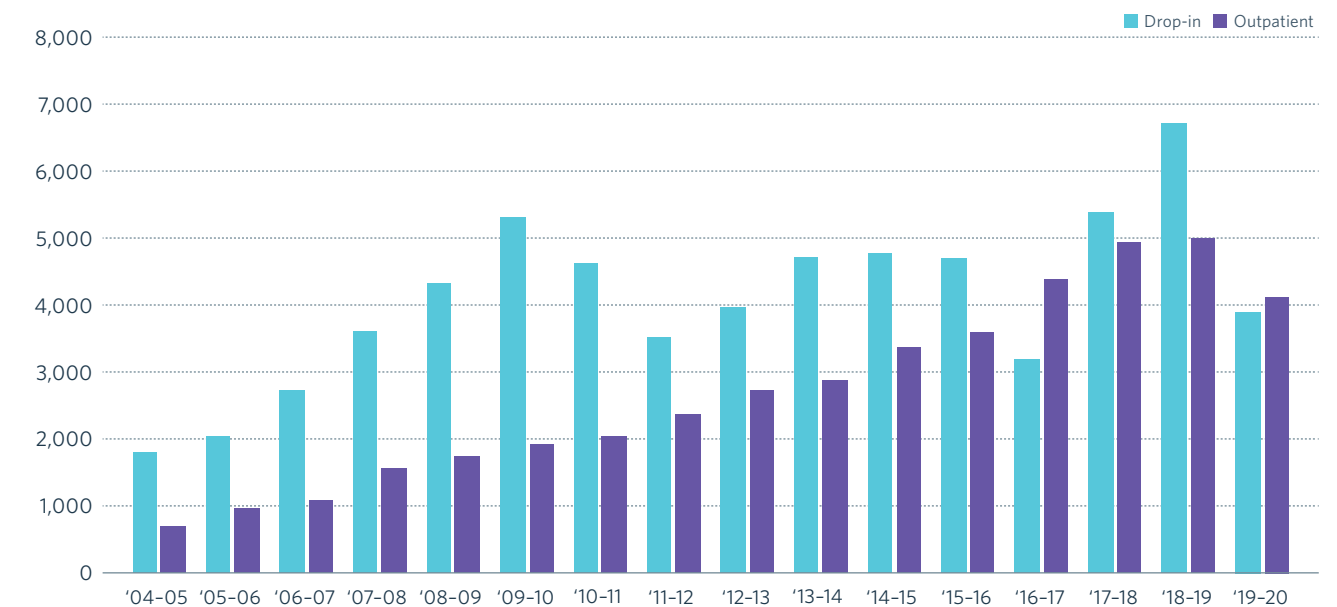
**Figure 1:** Patients immunised at the RCH Immunisation Drop-in Centre by 12-month period

### Immunisation service activity



**Figure 2:** Patients immunised at the RCH Immunisation Drop-in Centre by 12-month period: non-outpatient drop-in patients versus outpatients

### Immunisation service activity



## Outpatient clinics

The weekly RCH Specialist Immunisation Clinic provides a service to children with complex medical health problems and specialist immunisation needs. This Tuesday morning clinic combines SAEFVIC and the RCH Immunisation Clinic and has six paediatricians; Nigel Crawford, Teresa Lazzaro, Wonie Uahwatanasakul, Kirsten Perrett, Shidan Tosif and Margie Danchin as well as the NP Sonja Elia and nurse practitioner candidate Lynne Addlem.

The patients who should be referred to this clinic are:

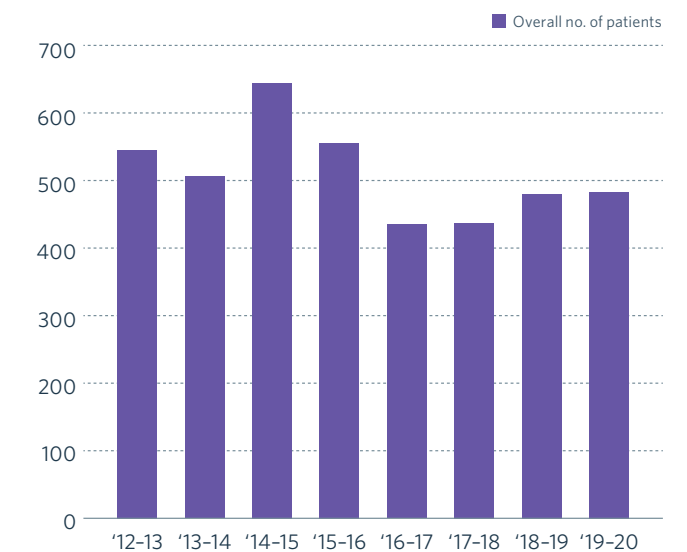
- those who have previously experienced an adverse event following immunisation.
- at risk of an adverse event following immunisation.
- children with underlying complex medical health problems (includes oncology, transplant, immune suppression)
- those with significant needle phobia who require deeper sedation than nitrous oxide alone.
- children who require supervision following immunisation.
- families with immunisation needs unable to be met within a community setting.
- families requesting medical or special exemptions in the context of the 'No jab, No pay' (national) and 'No jab, No play' (state) based policies.
- those requiring BCG vaccination.

The clinic continues to be an important resource for internal and external healthcare professionals, with the number of appointments remaining consistent over the reporting periods. The overall number of patients seen in the RCH Immunisation Clinic is detailed in **figure 3**.

The lead role of the RCH Specialist Immunisation Clinic has been highlighted by its being the lead site for the Adverse Event Following Immunisation – Clinical Assessment Network (AEFI-CAN). Funded by the Commonwealth via AusVaxSafety (NCIRS) [<http://www.ncirs.edu.au/vaccine-safety/ausvaxsafety/>], this collaboration means clinical immunisation cases are shared around the country and the most up-to-date advice and vaccine plans are given to families who attend our clinics.

**Figure 3:** Number of RCH Immunisation Service Clinic patients\* by year \*excluding BCG Clinic patients (see separate summary)

### Immunisation clinic activity



## Telehealth

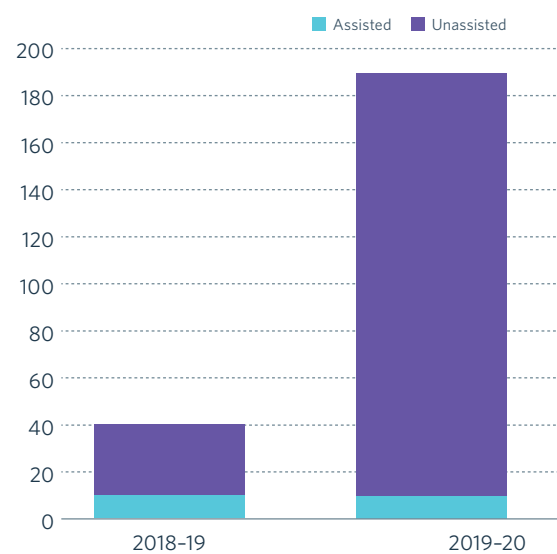
Telehealth is defined as the 'use of telecommunication techniques for the purpose of providing telemedicine, medical education, and health education over a distance'. From 30 March 2020, the federal government expanded the eligibility criteria for all patients, with or without COVID-19, to receive funded access to a medical specialist via a telehealth platform during the COVID-19 health emergency. This initiative reduced the risk and burden in clinics, hospitals and pharmacies and was critical in the fight against COVID-19. Hence, the significant increase in telehealth immunisation consultations in 2020.

A telehealth consultation can be unassisted (with the child and family) or assisted (with the child's GP or paediatrician, or other local healthcare provider).

In 2018-19 there were 42 telehealth immunisation consultations, and in 2019-20 there were 188 (see figure 4).

**Figure 4:** Number of RCH Immunisation Service telehealth consultations by year

### Telehealth 2018-20



## Immunisation consultations at the RCH Immunisation Drop-in Centre

In addition to the fact the nursing staff are busy answering telephone enquiries and vaccinating patients and family members, there is often much more activity that is difficult to capture. The immunisation nurses provide expert advice on a range of topics, including:

- vaccine hesitancy consultations, including individualised, tailored immunisation schedules.
- overseas immunisation records requiring translation and reporting to the Australian Immunisation Register (AIR).

- individualised immunisation plans, including serology for patients with complex medical problems — special-risk patients.
- enquiries about new vaccines (e.g. meningococcal B and ACWY vaccines).
- enquiries about non-scheduled vaccines (e.g. influenza vaccine, parent pertussis vaccine, BCG vaccine).
- enquiries about medical and special immunisation exemptions.
- Parents/medical students/nursing staff seeking immunisation resources
- Immunisation adverse event advice and reporting
- Incomplete AIR records requiring updating

## RCH Telephone Advice Line 1300 882 924, (03) 9345 6599 (internal)

The telephone is an important and effective means of communicating and sharing information in society. In many healthcare settings, telephone services are providing innovative approaches to delivering services and providing advice. For parents and immunisation providers in particular, the RCH Telephone Advice Line is invaluable, because the nurses provide immediate expert advice to assist their decision-making.

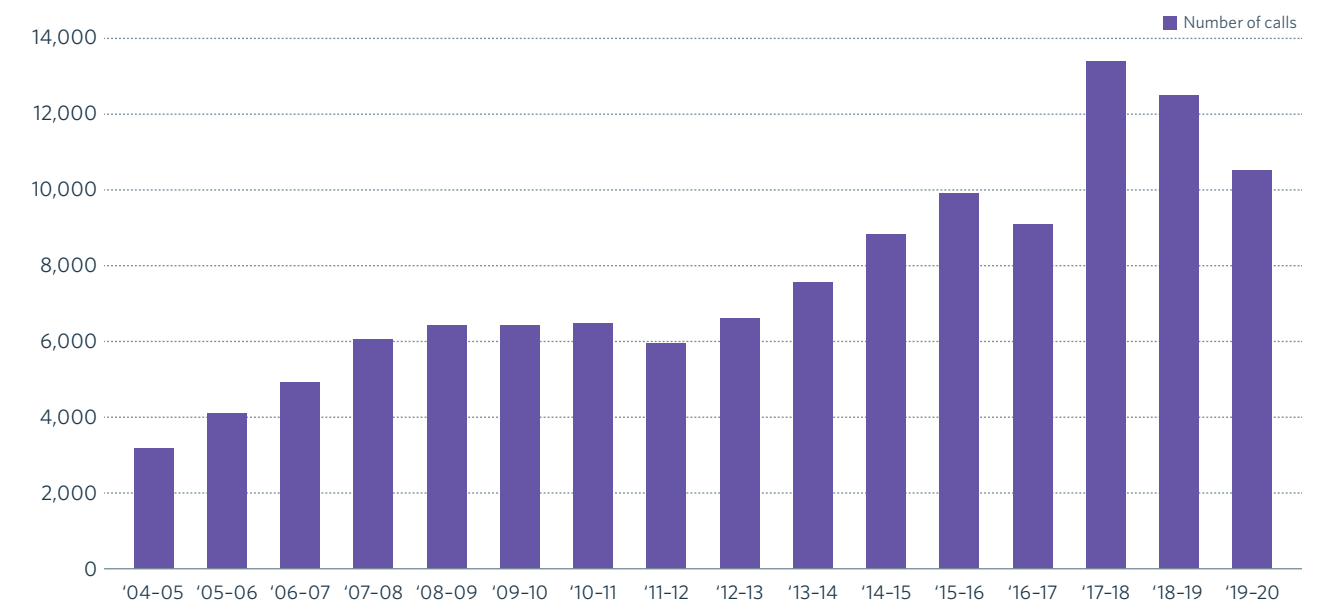
Over the reporting period the telephone advice line has increased compared to the previous reporting period, despite the reduction in 2020 due to COVID-19. In the past two years, telephone calls have increased by 3%. Consistently the majority of calls were received by parents, followed by immunisation providers, RCH hospital staff as well as other community-based organisations. There were 12,489 telephone advice calls documented at the RCH Immunisation Drop-in Centre in 2018-19 and 10,673 calls recorded over the last 12 months.

The RCH Telephone Advice Line is managed by the Immunisation Service nursing staff however, when there is a particularly complex enquiry, the nursing staff can refer the call to the medical staff for a prompt reply to the caller. The advice line is answered between 9am-4.30pm on working weekdays of the year. This is shown in figure 5 which reflects the immunisation calls answered.

In this reporting period, information was collected on the caller type to the telephone advice line (figure 6).

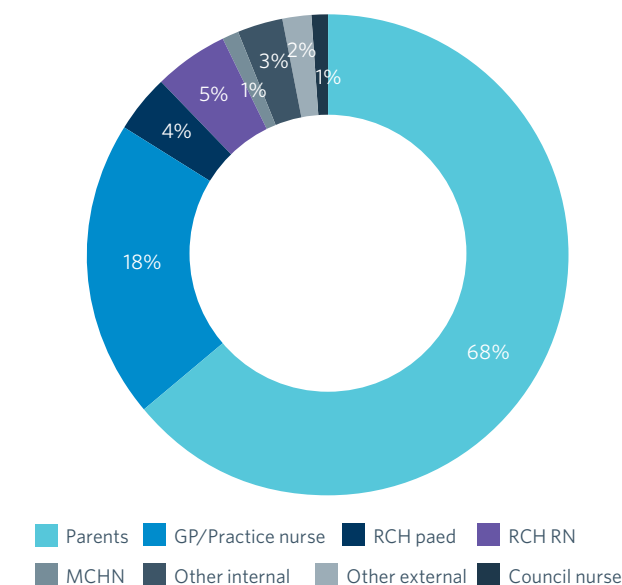
**Figure 5:** Immunisation advice calls at the RCH Immunisation Drop-in Centre by 12-month period

### Immunisation telephone advice



**Figure 6:** Telephone advice calls at the RCH Immunisation Drop-in Centre by caller 1 July 2018-30 June 2020

### Telephone advice - caller type



## Inpatient immunisations

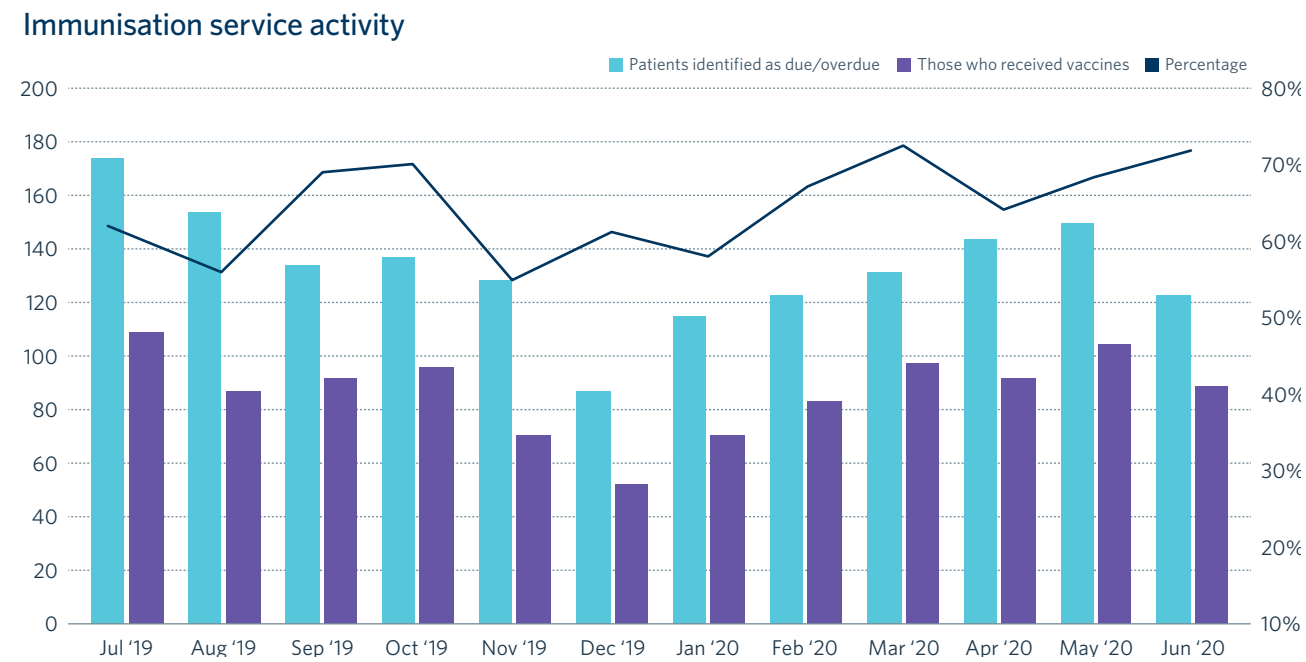
Children who are hospitalised have been shown to have lower immunisation rates compared to the general population and yet hospitalisation represents a potential setting to opportunistically improve vaccine uptake. For some years now, the RCH Immunisation Service team has been checking all ward inpatients immunisation status using

the AIR. This has been primarily children aged six weeks to seven years, until 2019, when patients aged eight years and older were added. This includes identifying whether special-risk vaccines are clinically indicated. Inpatients are considered 'overdue' for immunisations if they are 30 days or more overdue for the age-appropriate vaccines at the date of admission to hospital; 'due' for immunisations if the immunisation due date is less than 30 days prior. Due to the No Job, No Pay legislation, this work is even more important, as families of inpatients may be subjected to financial disadvantage.

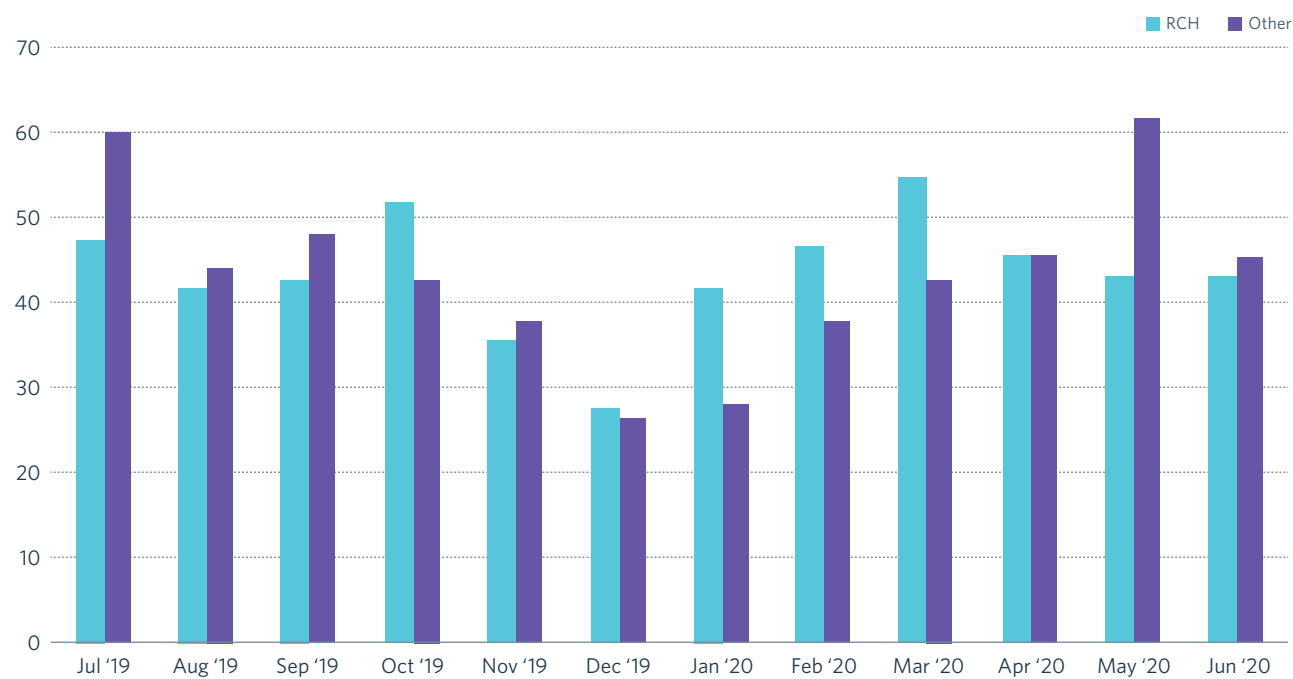
The RCH Immunisation Service nurses flag patients as due or overdue in the EMR. As well, the ward-based nurse coordinators are emailed the list of identified patients, and liaise with the service to either facilitate administration of vaccines whilst an inpatient, or make a plan for vaccination post-discharge. The immunisation status of these patients is re-checked one month later to determine whether the child's immunisation status is now up-to-date. Since the implementation of reviewing immunisation records of patient's eight years and older, approximately 24 patients per month have been immunised at the RCH whilst an inpatient. The vaccines administered have included overdue human papillomavirus (HPV) doses, year ten meningococcal ACWY as well as vaccines for special-risk categories. We will continue to monitor the success of this program.

The Figure 7 and Figure 8 below demonstrates the month-by-month success of the program for children aged six weeks to seven years.

**Figure 7:** Inpatients identified as due/overdue for immunisation and vaccinated 1 July 2019–30 June 2020



**Figure 8:** Inpatients vaccinated by site 1 July 2019–30 June 2020



### Elective admissions

As described in the key highlights section, the sedation of patients in the RCH Immunisation Drop-in Centre using nitrous oxide commenced in August 2018 and has proved to be an extremely positive service for needle-phobic patients. Over the reporting period, 144 patients utilised this service, and consistently 91% of patients successfully vaccinated. As one of the strategic priorities of the RCH, an evaluation of

this service was arranged. A sedation survey was developed based on a satisfaction questionnaire previously used following pediatric anesthesia (Iacobucci T, 2005). Over eight months, 26 families completed the survey. The median age of patients was 12 years, 17 female and nine males. Respondents scored 8.9 out of 10 for the environment being comfortable, with suggestions for improvement being ceiling decorations or wall hangings, and the treatment room being separate to the consultation room. The sedation nurse's

gentleness and care scored 9.8 out of 10. The overall judgment of the child's experience for the procedure scored 8.7 out of 10, where 0 was a very bad experience and 10 was excellent. Overall, excellent feedback received was from families, with some slight adjustments to be made to the physical setting of the procedure room.

There are still patients who will require other adjunctive therapies including oral midazolam (0.3–0.5mg/kg per dose, maximum of 20mg) and play or distraction therapy. These patients are booked into the Immunisation Nurse Practitioner Clinic on Tuesdays with a planned admission to the Day Medical Unit immediately following the appointment.

Over the reporting period, 246 patients received vaccines under some form of sedation. Specifically, 113/246 (46%) patients were admitted to the Day Medical Unit and 8/246 (3%) in Specialist Clinics via the nurse-led clinic for vaccines under sedation, whilst the remainder were opportunistically immunised under general anaesthetic in other settings; 96/246 (39%) in operating theatre; 2/246 (1%) in Day Oncology Unit and 27/246 (11%) in Medical Imaging. These have included patients with needle phobia, as well as severely autistic patients with a fear of medical procedures.

### Immunisations for newly-arrived immigrants

Victoria continued to have an influx of asylum seeker children with significant health needs over the past 2 years. The RCH has been working proactively — and thinking outside the square — to manage and promote the health of refugee children and families.

The RCH Immigrant Health Service consultants and fellows see children from over 30 countries, speaking over 30 languages, and interpreters assisted for over two thirds of clinic consultations. Attendance rate has been documented previously at 87%, which is a testament to the care and work of the team.

In addition to hospital-based initiatives, the RCH has made valuable contributions to state and national efforts to improve refugee child health, and is working closely with other sectors to maximise outcomes for these children. With a focus on providing education, clinical care and mentoring, the team also continues to be involved in research, advocacy

and policy development at a state level, working closely with the Victorian Department of Health and Human Services Victoria Immunisation section and the Victorian Refugee Health network.

The RCH Immunisation Service assists with any catch-up immunisations and/or Mantoux testing of the patients attending the RCH Immigrant Health Service. Prior to the patient's clinic appointment, the Immunisation nurses perform an AIR check on all immigrant health patients to assist with further catch-up vaccines required and to reduce immunisation errors at the time of the appointment. The RCH Immunisation Service collaborates with the Immigrant Health Service team in the regular updating of catch-up guidelines [https://www.rch.org.au/immigranthealth/clinical/Catchup\\_immunisation\\_in\\_refugees//](https://www.rch.org.au/immigranthealth/clinical/Catchup_immunisation_in_refugees//)

The immunisation nurses have provided Mantoux tests and subsequent reading for many of these patients and other patients requiring testing for tuberculosis (TB). **Figure 9** outlines the total number of Mantoux tests performed by the RCH Immunisation Service nurses.

### Influenza vaccine

In 2019, Australia experienced its worst influenza season on record, with more than 310,000 people presenting to hospitals and health services nationwide. It was one of the most successful vaccination years to date but early outbreaks occurred before vaccines were given out. In 2019, 7,620 influenza vaccine doses were administered at the RCH. This is an increase of 30% compared with 2018. As a result of the cultural improvements in the RCH Immunisation Drop-in Centre, the rates of influenza vaccinations amongst RCH Aboriginal and Torres Strait Islander patients increased by 25%.

In contrast, hundreds of Australian influenza deaths have been avoided in 2020 because of the COVID-19 lockdown. From January to June 2020, there were just 36 deaths from influenza, compared to 430 deaths in the same period for 2019. The school closures, physical distancing, hand hygiene and border closures have all played a part in reducing the number of influenza cases. There was also increased uptake in influenza vaccinations in 2020, with two million more doses being administered in Australia. Whilst this increase could be

**Figure 9:** Mantoux tests given by the RCH Immunisation Service by 12-month period

	'09-10	'10-11	'11-12	'12-13	'13-14	'14-15	'15-16	'16-17	'17-18	'18-20
Mantoux tests	289	343	206	207	269	332	243	165	92	220



seen at the RCH in March and April 2020, once the lockdowns occurred, the rates of influenza vaccinations decreased.

The RCH Immunisation Service again worked with the Paediatric Intensive Care Unit (PICU) in 2019, to ensure that extremely vulnerable children were immunised with influenza vaccine. 76/92 identified PICU patients received an influenza vaccine over the 12-week period, with a comparable rate to 2018 of 83%, however a greater number immunised. As described in the Key Highlights section, in 2020 we initiated additional strategies to increase uptake of influenza vaccines at the RCH. Hospital in the Home team began providing influenza vaccines to those patients receiving care at home and the Day Medical Unit and Day Oncology Unit were provided influenza vaccines on imprest, so that opportunistic ward-based immunisations could occur. Daryl Cheng developed a best-practice advisory model in the EMR, requiring all clinical staff to acknowledge whether a patient has received an influenza vaccine in 2020.

Also via EMR, a reminder letter was sent to special-risk groups, in particular patients with cystic fibrosis and complex medical care, and evaluation of the success of this initiative will take place to inform use next year in more special-risk areas.

The RCH Immunisation Service recommends influenza vaccine for all parents and siblings of eligible patients, however they are required to purchase the vaccine and have

it administered at the RCH Immunisation Drop-in Centre. The data presented in **Figure 10** includes patients, parents and siblings provided influenza vaccine at the RCH Immunisation Drop-in Centre.

### RCH staff influenza vaccine campaign and meningococcal ACWY

The meningococcal ACWY (Menactra®) vaccine was previously provided by DHHS Victoria Immunisation section to adolescents in year ten at school. The Commonwealth announced funding the program in 2019 using the Nimenrix® brand which resulted in DHHS Victoria Immunisation section having a surplus Menactra® stock close to expiry (15 February 2019). The RCH Immunisation Service received correspondence on 8 October from the DHHS Victoria Immunisation section, advising that we have been specifically targeted as a service able to freely administer a time-limited meningococcal ACWY (Menactra®) vaccine program for adults. DHHS Victoria Immunisation section (Ms Helen Pitcher) advised the RCH that they could provide the vaccines to adults i.e. parents of RCH patients through the RCH Immunisation Service, as well as more broadly to RCH staff.

On 28 November 2018, the RCH Immunisation service ran a one-day walk-in clinic where RCH staff could receive the meningococcal ACWY vaccine for the discounted price of

\$10 (to cover the consumables and staff costs in providing the service). More than 770 staff attended the one-day walk-in clinic to receive the meningococcal ACWY vaccine and a further 105 staff attended the RCH Immunisation Drop-in Centre after that date. It was a very successful and important program.

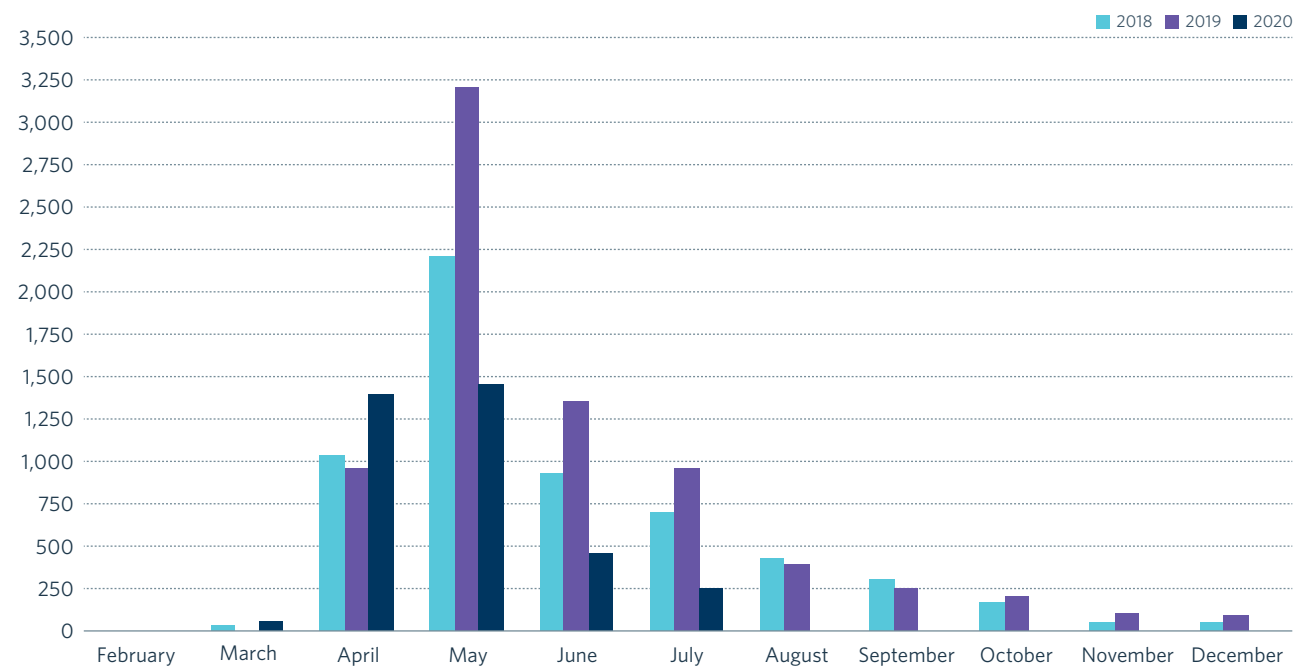
Vaccination is important for the healthcare workforce as it helps to protect both patients and staff. All hospitals are required to develop, implement and monitor a risk-based workforce vaccination program. The RCH staff influenza vaccine campaign has usually been led by the Infection Prevention and Control team, however in 2020, they suddenly found themselves in extremely high demand, as their expertise was sought on every aspect of delivering safe care in the time of COVID-19. Therefore the RCH Immunisation Service stepped in to provide assistance and took over the 2020 RCH staff influenza vaccination campaign.

To ensure physical distancing between staff, this year we implemented an appointment-only system, where staff could

log on and book an influenza vaccine. The bookings were spaced five minutes apart and four bookings were available at a time, however walk-ins were still accepted. To assist with the demand, Wonie Uahwatanasakul (immunisation paediatrician) arranged for medical students to learn the process of administering influenza vaccines, and this was done under the supervision of the nurse immunisers. On the first day, 30 March, over 900 staff were vaccinated and in the first three weeks of the program, almost 4,000 staff vaccinated. The RCH staff influenza vaccination campaign ran for 20 weeks, between 30 March and 14 August 2020. Despite the fact that many staff were working off-site during the COVID-19 pandemic, the 2020 program achieved the whole-of-health-service target of 90%, with 4,962 staff vaccinated.

The 2020 RCH staff influenza vaccination campaign achieved a vaccination rate of 90.1% (DHHS Victoria target 90%, aggregate 93.1%). The number of staff who refused the influenza vaccine was 2.6% (aggregate 2.9%).

**Figure 10:** Influenza immunisations at the RCH Immunisation Drop-in Centre by month and year







## B. Additional RCH Immunisation Service programs

### Bacille Calmette-Guerin vaccine for children under 12 months of age

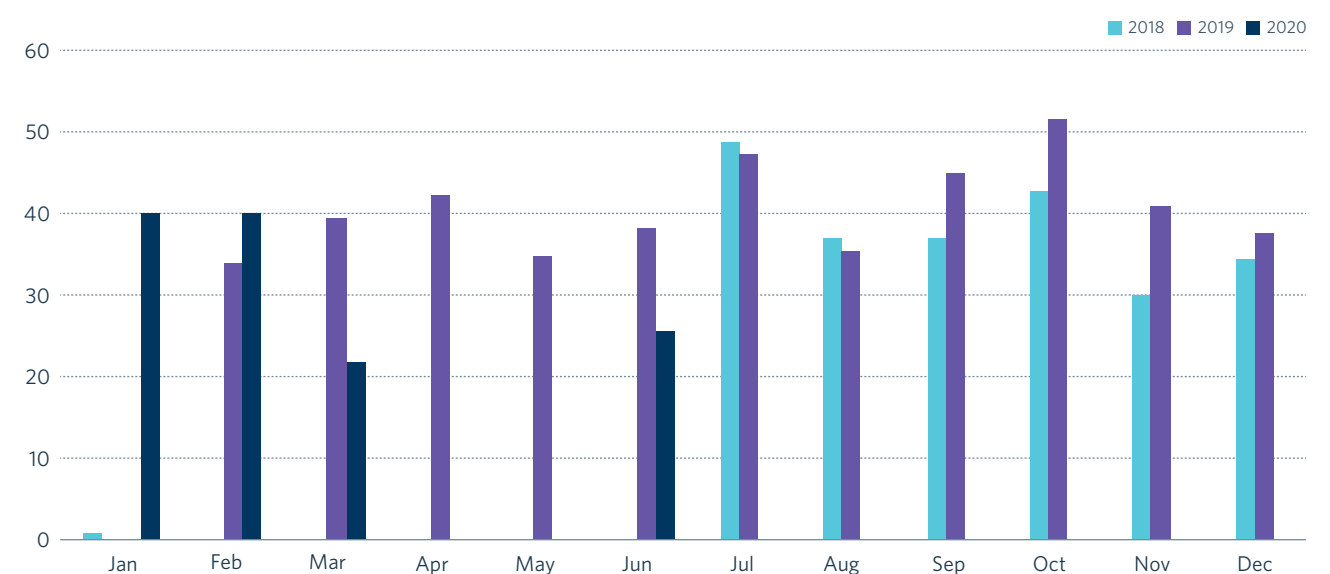
In Victoria, the Immunisation Services at RCH and Monash Health have been the major providers of BCG vaccine since 2013. The BCG Clinic runs weekly, for infants less than 12 months of age and is undertaken by the RCH Immunisation Service medical team. The clinic was interrupted in March 2020 due to COVID-19, with most specialist clinic appointments moving to telehealth and with restrictions on travel overseas, the BCG clinic was deemed a non-essential service. To get through some of the backlog of referrals, the Immunisation Fellow consulted some families via telehealth in June and following this, the families presented for the vaccine at a later date in the same month. We aim to reactivate the BCG Clinic more broadly once international travel restrictions are lifted. BCG vaccine is still available if required, for example close contacts referred by the RCH TB Clinic.

### BRACE trial

The BCG vaccination to Reduce the impact of COVID-19 in healthcare workers following Coronavirus Exposure (BRACE) trial was launched by MCRI in March 2020. The purpose of the BRACE trial is to find out whether BCG

vaccination protects against COVID-19 or reduces the severity of COVID-19 in Australian healthcare workers. In total, the randomised controlled trial will test 10,000 healthcare workers across Australia, and thanks to a \$A10 million grant from the Bill and Melinda Gates Foundation will extend to other countries, including the Netherlands and Spain. Participants will be tracked over a period of 12 months to record if they contract COVID-19 and the severity of their symptoms. The trial has been endorsed by the Director-General of the WHO, Tedros Adhanom, who has called for global support and assistance in the fight against COVID-19. Led by Professor Nigel Curtis, a clinician-scientist who leads MCRI's Infectious Diseases Research Group, the BRACE trial builds on previous studies which showed that BCG reduces the level of virus when people are infected with similar viruses to COVID-19. Associate Professor Kirsten Perrett is a member of the trial leadership team, Associate Professor Nigel Crawford is involved in safety and quality monitoring, Sonja Elia assisted with workforce training/management and Annie Cobbleddick provided pharmacy and product-management support. The RCH Immunisation Service nursing staff were involved in BCG vaccine administration during the trial, both on site at RCH as well as at other participating hospitals in Victoria.

Figure 11: Monthly RCH Bacille Calmette-Guerin Clinic attendees



## Palivizumab for cardiac and respiratory patients

The RCH Immunisation Service has provided respiratory syncytial virus (RSV) monoclonal antibody (palivizumab) to high-risk infants for the past 14 years (see figure 13). RSV is the most common cause of respiratory infections in babies and young children. In premature infants, as well as cardiac and chronic lung disease patients, RSV infection can lead to other more serious illnesses. Infection can last about a week, but some cases may last several weeks. For at-risk infants, an admission to intensive care is likely. To prevent serious RSV-related complications, high-risk infants can receive monthly palivizumab, which provides passive immunity against RSV infections. This has been shown to decrease the incidence of RSV hospitalization and the number of hospital days.

In 2020, the program commenced on the 1 May. In total, 94 patients were placed on the list of eligible patients, which is consistent with previous years. Seventy nine of these patients were Cardiology, whilst the other patients were under other risk categories; pre-term infants under Neonatal Medicine (12), Respiratory (2) and Neurodevelopment and disability (1). Patients were booked in to the RCH Immunisation Drop-in Centre or were immunised on the ward if a current inpatient. With assistance and coordination from the Immunisation Service pharmacist, one patient received all doses locally in Warrnambool.

Patients were booked in to the RCH Immunisation Drop-in Centre (199 doses) or were immunised on the ward if a

current inpatient (126 doses). Figure 14 indicates the number of doses administered, which highlights that some patients did not receive all of the recommended doses. This can be due to the timing of when they commenced the program.

**Figure 13:** Number of patients receiving each of the recommended palivizumab doses (2020)

	1st dose	2nd dose	3rd dose	4th dose	5th dose
<b>No. of patients</b>	93*	80	64	49	37

\*one patient received doses in Warrnambool

The RCH Immunisation Service nursing staff educated families with the use of the RSV handouts, informing them about RSV disease and how the palivizumab program works. This group of eligible patients are at increased risk of vaccine-preventable diseases, and therefore the importance of routine scheduled immunisations (two, four, six, and 12 months) and giving these on time is reinforced with the families.

In addition to the National Immunisation Program list of vaccines, these patients require extra vaccines (i.e. two doses of influenza vaccine and an extra conjugate pneumococcal vaccine at six months of age). The parents of infants with cardiac problems are also recommended to receive influenza as well as pertussis booster vaccines (see figure 15). The patients and their families were provided immunisation advice and catch-up vaccines during RSV visits as well as the palivizumab doses.

**Figure 12:** Number of patients provided monthly palivizumab by the RCH Immunisation Service



**Figure 14:** Opportunistic immunisations provided during palivizumab visits (2020)

Immunisations	No. of patients/ family members immunised
6 week	9
4 month	17
6 month	13
12 month	3
18 month	1
Extra 13vPCV	18
Patient influenza vaccine	38
Parent and sibling influenza vaccine	22
Meningococcal ACWY and B	11
<b>Total patients/family members administered vaccines at the time of RSV immunoglobulin visits</b>	<b>132</b>

The 50mg vials cost about \$800 each and the 100mg vials cost about \$1,500 each. In 2020, the RCH Immunisation Service saved 40 of the 100mg vials of RSV product and used 63 less vials of the 50mg. The total cost saving was estimated to be \$110,400 (see table 16). This was an increase in savings compared to 2019 due to the coordination of doses from the RCH Immunisation Service pharmacist.

**Figure 15:** RSV vials saved from cohorting patients (2020)

	Vials would have used	Would have cost	Vials actually used	Actual cost
50mg vials	124	\$99,200	61	\$48,800
100mg vials	257	\$385,500	217	\$325,500
<b>Totals</b>		<b>\$484,700</b>		<b>\$374,300</b>

## Special-risk patients

In Victoria, some special, at-risk groups are eligible to receive some vaccines for free: vulnerable people, pre-term infants, children and adolescents in out-of-home care, medically at-risk people, Aboriginal and Torres Strait Islander people and refugees and asylum seekers. In addition, the Drug Usage Committee (DUC) also funds additional vaccines for special at-risk groups, as determined by the RCH Immunisation Service. It is therefore a responsibility to determine if individuals presenting for immunisation are eligible to receive additional vaccines. With a nurse practitioner at the RCH Immunisation Drop-in Centre, these vaccines, i.e. meningococcal B and hepatitis A/B can be prescribed and then dispensed by RCH Pharmacy.

Clinical guidelines for these at-risk patients have been developed by affiliated RCH Immunisation Service staff and endorsed at the monthly RCH Immunisation Service meeting. These guidelines are based on the latest available evidence and may be different to the recommendations in the latest edition of the Australian Immunisation Handbook. Some of the recommendations in these guidelines are outside the scope of the National Immunisation Program (NIP).

The special-risk guidelines have included updates for the following:

- Aboriginal and Torres Strait Islander people
- Solid organ transplant recipients
- Rituximab patients
- Chemotherapy and post-haematopoietic stem cell transplant recipients
- Asplenia/hyposplenia patients
- Children with cardiac disease
- Pre-term infants
- Inflammatory bowel disease (IBD) patients
- Cystic fibrosis patients
- Rheumatology patients

These guidelines have been placed on our MVEC website

[<https://mvec.mcri.edu.au/immunisation-references/>].

SECTION 3

# Communication and accountability





## Melbourne Vaccine Education Centre



The Melbourne Vaccine Education Centre ([www.mvec.mcri.edu.au](http://www.mvec.mcri.edu.au)) was established in 2013 and is designed as a hub for complete and up-to-date immunisation information. It has evolved and expanded to incorporate innovations such as the Clinical Vaccinology Update (CVU) — a biannual vaccine symposium co-ordinated by MVEC and MCRI in collaboration with Monash Health. The content of MVEC reflects a collaborative effort by immunisation paediatricians and adult physicians, immunisation nurses, infectious disease specialists, allergy specialists and infection control teams. A highlight was being included as a member of the WHO's Vaccine Safety Net (VSN) in 2019. All VSN members are endorsed by the WHO as a source of reliable and credible vaccine safety information.

MVEC includes an A to Z of immunisation references, a repository for over 100 pages highlighting various aspects of immunisation practice. These range from Aboriginal and Torres Strait Islander immunisation recommendations to zoster vaccines Frequently Asked Questions (FAQ's). The most visited pages in 2019 were:

1. Meningococcal disease and vaccines
2. Administration of injected vaccines — correct technique
3. Influenza vaccine recommendations
4. Vaccine schedule by country
5. BCG vaccine

### Immunisation errors

The RCH Immunisation Service rigorously follows correct vaccine storage, handling and preparation procedures to ensure that vaccines are administered safely. On occasion, errors can occur and cause concern for the patient/parent/guardian as well as the immuniser. The effective management of errors is imperative to ensure patient safety as well as maintain public confidence in vaccination programs. The RCH Immunisation Service reports all errors to the Victorian Health Incident Management System (VHIMS). Incident reporting is important to help drive improvements in quality and safety, by identifying the cause and corrective actions to eliminate the risks involved and prevent similar future occurrences. There are four types of incidents that should be reported:

1. Sentinel events — result in serious physical or psychological injury or death
2. Near misses — no injury but could have been potentially harmed by the risk detected
3. Adverse events — results in unintended harm to the patient by an act of commission or omission rather than by the underlying disease or condition of the patient
4. No harm events — incidents communicated across an organization to raise awareness of any harm that may happen

The majority of incidents reported by the RCH Immunisation Service over this reporting period were incident types 2 and 4 — near misses and no-harm events. Figure 16 below demonstrates the actual vaccine errors in 2018-20 by type.

### Bi-monthly meeting

Every two months the RCH Immunisation Service team leads a discussion around topical immunisation issues and this is a great forum for exchanging ideas. This group meeting includes representatives from RCH related departments including SAEFVIC, department of General Medicine and the Infectious Diseases Paediatricians and Infection Control. There are also representatives from external immunisation groups including DHHS Victoria Immunisation section, Vaccine and Immunisation Research Group (VIRGO), Monash Health and Sunshine Immunisation Services.

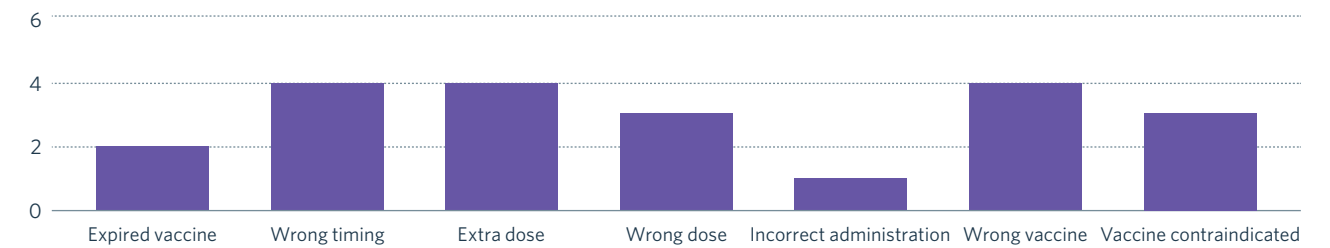
A monthly internal business meeting is also held to discuss topical issues and improved communication between the medical and nursing staff. One important outcome has been to allocate physicians and nurses to different special risk groups (e.g. Cardiology, Wadja, Neonatal Medicine and Respiratory Medicine). The aim is to improve collaboration between the treating teams and the RCH Immunisation Service, with outcomes to be monitored including inpatient vaccine rates and influenza vaccine delivery.

### Feedback on the RCH Immunisation Drop-in Centre

Customer feedback is information provided by clients about whether they are satisfied or dissatisfied with a product or service and about their general experience with a provider. It is important to work with healthcare consumers to improve the quality and safety of our health service. The RCH Immunisation Service wants to hear what is good, what is bad and what we can do to make the service better. Information is collected through consumer feedback forms available in the RCH Immunisation Drop-in Centre, or via telephone to the RCH Consumer Liaison Officer. Each feedback item is entered into VHIMS and followed up. All feedback is treated with the utmost confidentiality.

Figure 16: Actual vaccine errors from 1 July 2018 – 30 June 2020 by type

### Actual clinical incidents by type



Over the past two years, we have continued to receive a great deal of informal positive feedback from families. Of the formal feedback provided to the Consumer Liaison Officer, there were a total of six feedback items; two complaints and four compliments.

### National Immunisation Teleconference

Nigel Crawford (co-lead), Margie Danchin, Kirsten Perrett and Jim Buttery are members of AEFI-CAN. As detailed above, this group is coordinating RCH Specialist Immunisation Clinic activities nationally and collaborating with colleagues internationally in Canada and the United States of America.

The AEFI-CAN network also includes representatives from the NCIRS based at the Westmead Children's Hospital (Sydney), Women's and Children's Hospital (Adelaide), Princess Margaret Hospital (Perth) and Queensland Children's Hospital (Brisbane). Topics discussed at these teleconferences include immunisation adverse events, immunisation policies, topics of interest (e.g. vaccine allergy; seizures) as well as advice on complex individual patients seen at the adverse event clinics at each site. They are also leading the national discussion around medical and special exemptions for vaccines.





# Immunisation policy

## Australian Technical Advisory Group on Immunisation (ATAGI)

This is the peak advisory committee for the Australian Government on immunisation issues. Nigel Crawford's membership was extended in 2019 (appointed 2014) with his areas of expertise being special-risk groups and vaccine safety. He is the current Chair of the Meningococcal working party and Special Risk working parties. In September 2020 ATAGI convened a new COVID-19 working group. The key objectives of this group is to provide advice on COVID-19 immunisation programs and policies, to improve confidence in COVID-19 vaccines and to ensure equitable access to COVID-19 vaccines as they become available in Australia. Margie Danchin is a member of this COVID-19 ATAGI working group on vaccine safety, evaluation and confidence.

## Surveillance of Adverse Events Following Vaccination In the Community (SAEFVIC)

The RCH Immunisation Service continues a close working relationship with SAEFVIC. Nigel Crawford (Director), Teresa Lazzaro, Wonie Uahwatanasakul, Kirsten Perrett, Shidan Tosif and Margie Danchin all work in the RCH Immunisation Service which now includes SAEFVIC patient follow-up. It involves partnerships with DHHS Victoria Vaccination section, RCH department of General Medicine, the RCH Immunisation Service and MCRI. The SAEFVIC unit is based at the RCH campus with clinical services also at Monash Health. There have been over 18,000 AEFI reports to SAEFVIC since commencement in 2007. The SAEFVIC clinic is incorporated into the Tuesday morning RCH Immunisation Service Clinic, with follow-up vaccines administered in the outpatient treatment rooms or RCH Immunisation Drop-in Centre if required. In some instances, patients are admitted to the Day Medical Unit or overnight for vaccination as required.

## Immunisation education

Providing immunisation updates is essential, as vaccine providers require access to current information on all aspects of immunisation and the opportunity to enhance immunisation knowledge. The funding from DHHS Victoria Vaccination section for the RCH Immunisation Service does not include the provision of immunisation education, yet it is an important and busy part of the service provided by the RCH Immunisation Service team. The annual Clinical Vaccinology Update (CVU) has become an integral part of

continuing professional development for immunisation providers and is always well attended (<https://mvec.mcri.edu.au/category/events/>). The CVU was held in September 2018, April 2019 and November 2019. The CVU scheduled for April 2020 was postponed due to the COVID-19 pandemic and plans are underway for a virtual update later in December 2020.

## PHAA Immunisation Conference (Perth June 2020)

Due to the COVID-19 situation the 17th National Immunisation Conference, Conference Advisory Committee and the Public Health Association of Australia (PHAA) made the decision to postpone the conference originally planned in Perth for Tuesday 23 to Thursday 25 June 2020, until 2021 in Perth. The conference will now be held from Tuesday 29 June to Thursday 1 July 2021 at the Perth Convention and Exhibition Centre, WA. Staff from the RCH and SAEFVIC have had multiple abstracts accepted for presentation and will be detailed in the next biennial report.

## Education at RCH

Education meetings help doctors, nurses and other healthcare professionals keep up-to-date in important evolving areas and the RCH Immunisation Service has their own specialised, often weekly, teaching sessions. These education meetings enable staff to see the bigger picture, including patient experiences, the newest research as well as simulation-based training in emergency management. Some of the topics covered have included influenza vaccination (multifaceted interventions to increase rates), needle-phobic patients, live vaccines in patients receiving regular red cell transfusions, pneumococcal vaccination in patients with cystic fibrosis and MMR vaccine rash case discussion. There is also a weekly meeting following the Tuesday Immunisation Clinic (12.30-1:00pm), where interesting clinical cases are discussed. Recently this meeting has moved to a telecall and colleagues from Monash and Sunshine Immunisation Services have been joining these case discussions.

## RCH nursing and medical immunisation up-dates

### RCH ward nursing immunisation up-dates (20)

- Respiratory department (1, Nadine Henare)
- Emergency Department — tetanus update (3, Lynne Addlem)

- Emergency Department — managing anti-vaccination families (1, Sonja Elia)
- Cardiology (1, Phillippa van Der Linden)
- Rheumatology department (1, Narelle Jenkins)
- Koala ward (1, Annie Cobblestick)
- Long term follow-up Oncology (1, Nadine Henare)
- Pharmacy (3, Annie Cobblestick)
- Wadja (1, Sonja Elia)
- Butterfly (NICU) ward (1, Lynne Addlem)
- Gastroenterology department (1, Narelle Jenkins)
- Wallaby ward (HITH) (1, Annie Cobblestick)
- Banksia (Mental health) ward (3, Lynne Addlem)
- Children's Cancer Centre (1, Sonja Elia)

### Clinical observation for medical and nursing staff (17)

Throughout the year nurses and medical staff have attended the RCH Immunisation Drop-in Centre to learn about giving vaccines and observe the techniques and communication style of the RCH Immunisation Service nurses.

- RCH nursing staff (6)
- Sunshine Immunisation nurses (2)
- Monash Immunisation nurse (1)
- Nurse Practitioner Alfred ED (1)
- Yarra Glen General Practitioner (1)

We have also supported the clinical placement of undergraduate nursing students, in preparation of students for entry into the nursing profession, with the opportunity to experience authentic learning that enables them to consolidate knowledge. The students were from Holmesglen Institute, The University of Melbourne and Latrobe University.

Immunisation clinical placement for undergraduate nurses (6)

### RCH student immunisation teaching sessions (7)

- Paediatric Specialist Program (4, Phillippa Van Der Linden, Nadine Henare, Sonja Elia)
- Immunisation Update for Graduate Nurses (2, Sonja Elia)
- Immunisation Update for Postgraduate certificate nursing students (1, Sonja Elia)

### Clinical mentoring of immunisation nursing students (19)

Following successful completion of an accredited nurse immuniser course, some nurses complete their clinical mentorship with the RCH Immunisation Service. The nursing staff who provided this clinical supervision over the reporting

period includes Lynne Addlem, Phillippa Van Der Linden, Nadine Henare, Skye Miller, Nikki Marriner and Sonja Elia.

## RCH medical and nursing staff immunisation up-dates

- CPD funding — 'Oh the things you can do, the places you can go', Nursing Forum RCH, August 2018 (Narelle Jenkins)
- ACE/AFP presentations — Neurologists meeting, November 2018 (Nigel Crawford, Cheryl Jones)
- RCH career opportunities session, November 2018 (Sonja Elia)
- RCH Grand Round, May 2019: RSV @ RCH (Nigel Crawford)
- RCH Grand Round, May 2019: Collaborate, Innovate and Advocate: The contribution of nurse-led research within this Academic Health Science centre (Sonja Elia, Fiona Newall, Rose Boland, Sophie Jones)
- Nursing scholarships @ RCH, Nursing Forum, August 2019 (Sonja Elia)
- RCH Grand Round, March 2020: No spleen? Spleen Australia gives people a routine! The value of clinical registries (Sonja Elia, Penny Jones, Denis Spelman)

## External education

### General practitioners and immunisation providers

#### 2018

- Legislating vaccines? A comparative look at the role of law in different countries in promoting vaccination. World Vaccine Congress, April 2018, Washington (Margie Danchin)
- The ABCWY of Meningococcal disease and principles of performing catch up immunisation, Western Victoria Primary Health Network, July and October 2018, Geelong and Ballarat (Sonja Elia)
- Immunisation update, Victorian Aboriginal Health Service, July 2018, Fitzroy (Sonja Elia)
- Immunisation — what's new and what changes to the schedule do I need to know about now? RCH GP Update, August 2018 (Margie Danchin)
- Global Health: Ideas forum — vaccines workshop, Melbourne University, August 2018, Melbourne (Nigel Crawford)
- Prick up your ears: When you don't like the story — vaccination refusal. Don't Forget the Bubbles, August 2018, Melbourne (Margie Danchin)

- The use of an Electronic Medical Record (EMR) to improve opportunistic immunisations for inpatients at RCH Melbourne, Nursing Research and Clinical Innovations symposium RCH, September 2018 (Sonja Elia)
- New Interventions to address vaccine hesitancy. 12th Vaccine Congress, September 2018, Budapest Hungary (Margie Danchin)
- Vaccine Allergy, Clinical Vaccinology Update, September 2018, Melbourne (Kirsten Perrett)
- WHO RSV pilot: clinical features (BMGF funding), October 2018, Bangkok Thailand (Nigel Crawford)
- NCIRS: Vaccine safety webinar, October 2018, Sydney (Nigel Crawford)
- Maternal Immunisation and Midwifery: state of the evidence and practice enhancement. Workshop presentation. Australian College of Midwives (ACM) Annual National Conference, October 2018, Perth (Margie Danchin)
- Implementation of an Immunisation Pharmacist during a nation-wide influenza vaccine shortage, SHPA Medicines Management Conference, November 2018, Brisbane (Annie Cobbleddick)
- Anaphylaxis following immunization: Is it vaccine allergy? Immunisation Nurses Special Interest Group meeting, November 2018, Melbourne (Kirsten Perrett)
- Emergency anaphylaxis/HPV/Meningococcal update, Murray Primary Health Network, November 2018, Mildura (Sonja Elia)

Emergency anaphylaxis / HPV / Meningococcal update, Gippsland Primary Health Network, November 2018, Traralgon (Sonja Elia)

GAS - state-wide workshop: IGAS national surveillance via the PAEDS network, Melbourne University, November 2018, Melbourne (Nigel Crawford)

- Minimising Immunisation Pain (MIP) of childhood vaccines: The MIP Pilot study, Canadian Immunization Conference, December 2018, Ottawa, Canada (Narelle Jenkins)
- The use of an Electronic Medical Record (EMR) to improve opportunistic immunisations for inpatients at RCH Melbourne, Canadian Immunization Conference, December 2018, Ottawa, Canada (Narelle Jenkins)
- Get the facts: commonwealth vaccine safety and confidence messaging <https://campaigns.health.gov.au/immunisationfacts/resources/videos/get-facts-dr-nigel-crawford-explains-how-vaccines-are-tested-and> (Nigel Crawford, Margie Danchin)

## 2019

- Tackling Vaccine Hesitancy to improve vaccine uptake and confidence, Perth Immunisation Educate Update, February 2019 (Margie Danchin)

- RCH Immunisation service: Past, present and the future, Perth Children's Hospital, February 2019, Perth (Nigel Crawford)
- Identifying and Addressing Influenza Vaccine Hesitancy and Demand Issues, Technical meeting, WHO, February 2019, Geneva, Switzerland (Margie Danchin)
- Improving vaccination rates for Aboriginal and Torres Strait Islander patients at The Royal Children's Hospital, Melbourne, 8th International Meeting on Indigenous Child Health, March 2019, Calgary, Canada (Sonja Elia).
- P3-MumBubVax: Development of a multi-component antenatal intervention to promote maternal and childhood vaccine uptake. NCIRS Seminar, Webinar Series 2019, March 2019 (Margie Danchin)
- WHO RSV presentation, April 2019, Kathmandu, Nepal (Nigel Crawford)
- Vaccine Acceptance, Uptake and Policy Research. MCRI Directors Forum, May 2019 (Margie Danchin)
- Communication with Vaccine hesitant Parents. Expert Consultation on Rebuilding Public Confidence and Uptake of Vaccination in the Philippines, WHO Philippines Expanded Programme on Immunization Team, May 2019, Manila, Philippines (Margie Danchin)
- Educating our communities, Melbourne MD Student Conference — Melbourne Convention and Exhibition centre, June 2019 (Sonja Elia and Daryl Cheng)
- Vaccine hesitancy — potential impact on global health security. MCGH-Doherty Institute Global Health Seminar Series, June 2019 (Margie Danchin)
- Vaccine Allergies and SAEFVIC, Western Victoria Primary Health Network Immunisation Forum, July 2019, Geelong (Kirsten Perrett)
- P3-MumBubVax: Development of a multi-component antenatal intervention to promote maternal and childhood vaccine uptake, Australian Government Department of Health, July 2019 (Margie Danchin)
- RSV and vaccine update, Canberra Hospital, July 2019 (Nigel Crawford)
- Addressing vaccine hesitancy and principles of performing catch up immunisation, Western Victoria Primary Health Network, July and October 2019, Geelong and Ballarat (Sonja Elia).
- Mumps and Rubella Update, Immunisation Nurses Special Interest Group Biennial Immunisation conference, August 2019, Melbourne (Kirsten Perrett)
- Maternal Immunisation and Social Science in Immunisation, HNE and Central Coast LHD and PHN Immunisation Conference 'Vaccine Heros', August 2019, Newcastle (Margie Danchin)

- Improving vaccination rates for Aboriginal and Torres Strait Islander patients at the Royal Children's Hospital, Melbourne, Nursing Research and Clinical Innovations symposium, September 2019, RCH Melbourne (Sonja Elia).
- To vaccinate or not: Immunisation disputes in the Family Law system, 11th National Paediatric Bioethics Conference, September 2019, RCH Melbourne (Sonja Elia and Nigel Crawford).
- Minimising Immunisation pain of childhood vaccines: The MIP study, Nursing Research and Clinical Innovations symposium, September 2019, RCH Melbourne (Narelle Jenkins).
- P3-MumBubVax: Development of a multi-component antenatal intervention to promote maternal and childhood vaccine uptake in Australia, 7th Vaccine Acceptance Meeting, Les Pensieres Center for Global Health, September 2019, France (Margie Danchin)
- Immunisation update, Victorian Aboriginal Health Service, October 2019, Fitzroy (Sonja Elia)
- Delivery of Multiple injections on a single visit, South Australian Postgraduate Medical Education Association, October 2019, South Australia (Narelle Jenkins)
- Australian Influenza symposium, October 2019, Brisbane (Nigel Crawford)
- AVS-AEFI CAN, October 2019, Sydney (Nigel Crawford)
- Delivery of Multiple injections on a single visit, October-November 2019, South Australia (Narelle Jenkins)
- The ABCWY of meningococcal vaccines: The what, who and why of meningococcal vaccines, November 2019, Melbourne (Nadine Henare)
- NIP update and vaccine errors, Clinical Vaccinology Update, November 2019, Monash (Nigel Crawford)
- Reviewing pneumococcal immunisation rates of children with cystic fibrosis, Monash University Internship Foundation Program, November 2019, Melbourne (Annie Cobbleddick and Sarah Hafda)

## 2020

- RSV surveillance and vaccine update, Immunisation Coalition meeting, February 2020, Melbourne (Nigel Crawford)
- Long Term Social and financial Impacts of COVID19 and Effective Risk Communication Thoracic Society of Australia and New Zealand (TSANZ), March 2020 (Margie Danchin)
- Immunisation: Barriers, Evidence and Possibilities, International Women's day (IWD) Burnet Institute, March 2020 (Margie Danchin)
- Vaccines: Benefit, public opinion and ethics. Danks Seminar, May 2020 (Margie Danchin)
- AEFI-CAN: an internationally recognized Australian vaccine safety clinical network, 17th National Immunisation

- conference, Public Health Association of Australia, Perth, June 2020 (Nigel Crawford)
- What is needed for community confidence and acceptance of a new COVID vaccine? Grand Round RCH, June 2020 (Margie Danchin)
- Re-immunisation for children ≥10 years old. Post oncology treatment. A prospective audit, 17th National Immunisation conference, Public Health Association of Australia, Perth, June 2020 (Nadine Henare)
- The broader role of the Immunisation pharmacist, 17th National Immunisation conference, Public Health Association of Australia, Perth, June 2020 (Annie Cobbleddick)
- Tetanus Prone Wounds and Vaccine coverage in the Paediatric setting, 17th National Immunisation conference, Public Health Association of Australia, Perth, June 2020 (Lynne Addlem)
- Establishing RSV surveillance at a tertiary children's hospital — preventative therapies are coming! 17th National Immunisation conference, Public Health Association of Australia, Perth, June 2020 (Nigel Crawford)
- Using an Electronic Medical Record (EMR) to optimize seasonal influenza vaccine uptake, 17th National Immunisation conference, Public Health Association of Australia, Perth, June 2020 (Kate Gazzard)
- Feasibility and acceptability pilot of the multi-component P3-MumBubVax antenatal vaccine promotion intervention, 17th National Immunisation conference, Public Health Association of Australia, Perth, June 2020 (Margie Danchin)
- Influenza vaccine for Paediatric Intensive Care Unit (PICU) patients, 17th National Immunisation conference, Public Health Association of Australia, Perth, June 2020 (Sonja Elia)
- Minimising Immunisation Pain of childhood vaccines in Younger children: The MIPY Study, 17th National Immunisation conference, Public Health Association of Australia, Perth, June 2020 (Narelle Jenkins)
- To vaccinate or not: Immunisation disputes in the Family Law System, 17th National Immunisation conference, Public Health Association of Australia, Perth, June 2020 (Sonja Elia)
- Immunisation under nitrous oxide sedation at the Royal Children's Hospital Melbourne, 17th National Immunisation conference, Public Health Association of Australia, Perth, June 2020 (Sonja Elia)
- Safety of the Polish Moreau BCG-10 vaccine: a Victorian experience, 17th National Immunisation conference, Public Health Association of Australia, Perth, June 2020 (Nicole Wong)
- Immunisation with vaccine hesitant parents and the impact of COVID-19? Immunisation Nursing Special Interest Group (INSIG), July 2020 (Margie Danchin)

SECTION 4

# Clinical immunisation research and publications





## Background

As detailed above, the RCH Immunisation Service has strong research links across the campus, with both the MCRI and University of Melbourne (UoM)

We have four staff with honorary appointments at the UoM;

- Nigel Crawford
- Kirsten Perrett
- Margie Danchin
- Sonja Elia

We also conduct a number of collaborative projects with universities and tertiary children's hospitals around the country. These are predominantly in the sphere of vaccine-preventable diseases, including epidemiological studies, vaccine safety, communication/social science research and vaccine trials. A number of these specific projects are detailed below:

- AusVaxSafety – national collaboration regarding vaccine safety, led by the National Centre for Immunisation Research and Surveillance (NCIRS) – Sydney University  
– <http://www.ncirs.edu.au/vaccine-safety/ausvaxsafety/>  
– RCH Investigator Nigel Crawford

This project also incorporates our Adverse Event Following Immunisation- Clinical Assessment Network [AEFI-CAN], with Nigel Crawford (PI), Margie Danchin and Kirsten Perrett as investigators.

- Paediatric Active Enhanced Disease Surveillance (PAEDS)- a national collaboration of tertiary paediatric hospitals, monitoring the epidemiology and clinical outcomes of vaccine preventable diseases (e.g. varicella and whooping cough), vaccine adverse events (e.g. intussusception (Rotavirus vaccine) and syndromic evaluation (acute flaccid paralysis; Australian Childhood Encephalitis study) – PIs Kristine Macartney and Cheryl Jones (Sydney University)  
– <http://www.paeds.edu.au/>  
– RCH Investigator- Nigel Crawford
- Vaccine Social Science – Vaccine confidence and uptake - RCH / UoM. Leadership from Margie Danchin, as part of a collaboration with PI Julie Leask (Sydney University and NCIRS)  
– <http://www.ncirs.edu.au/research/social-research/sarah-project/>
- The University of Melbourne. RCH Immunisation Paediatrician Margie Danchin leads the vaccine confidence research.

- Melbourne Children's Trials Centre (MCTC) – RCH Immunisation Paediatrician Kirsten Perrett is a senior Clinician Scientist with MCTC and assists in the development of new clinical trials research initiatives across the campus.

- MNsc nursing students

RCH Immunisation also work closely with Monash Children's Hospital and University.

## Advanced trainee and scholarly selective projects (completed 2018-20)

### Advanced trainees

**Jeremy Pratt** – RSV infection at a tertiary children's hospital (2019) [Supervisor: Nigel Crawford]

**Rowena Silcock** – Subcutaneous Nodules following vaccination (2019) [Supervisor: Kirsten Perrett]

**Dr Raff Armiento** – Impact of Australian mandatory 'No Jab, No Pay' and 'No Jab, No Play' immunisation policies on immunisation services, parental attitudes to vaccination and vaccine uptake in a tertiary Paediatric hospital, the Royal Children's Hospital, Melbourne (2019) [Supervisor: Margie Danchin]

### Scholarly selective – MDRP

**Sarah Calvert** – Understanding live vaccinations as a trigger for status epilepticus in children with Dravet syndrome (2018) [Supervisor: Margie Danchin]

**Lauern Ognjanov** – Systematic review of errors in administration of vaccines requiring reconstitution (Honors) in Population and Global Health (2020) [Supervisor: Margie Danchin]

**Hayley Archibald** – Vaccine hesitancy and moral values in decision making, University of Melbourne (2020) [Supervisor: Margie Danchin]

## Publications

1. Singh-Grewal D, Lucas R, McCarthy K, Cheng AC, Wood N, Ostring G, Britton P, **Crawford NW**, Burgner D. Update on the COVID-19-associated inflammatory syndrome in children and adolescents; paediatric inflammatory multisystem syndrome temporally associated with SARS-CoV-2. *Journal of Paediatrics and Child Health*. 31 July 2020.
2. Marshall HS, Koehler AP, Wang B, A'Houra M, Gold M, Quinn H, **Crawford N**, Pratt N, Sullivan TR, Macartney K. Safety of meningococcal B vaccine (4CMenB) in adolescents in Australia. *Vaccine*. 2020;38(37):5914-5922.
3. Wong, NX, Buttery J, McMinn A, Azhar Z, **Crawford, NW**. Safety of the Polish BCG-10 Vaccine During a Period of BCG Vaccine Shortage: An Australian Experience. *Pediatric Infectious Disease Journal*. 2020;39(6):p e66-e68.
4. McRae JE, Quinn HE, Saravanos GL, Carlson SJ, Britton PN, **Crawford NW**, Wood NJ, Marshall HS, Macartney KK, Paediatric Active Enhanced Disease Surveillance (PAEDS) network. Paediatric Active Enhanced Disease Surveillance (PAEDS) 2017 and 2018: Prospective hospital-based surveillance for serious paediatric conditions. *Communicable Diseases Intelligence* (2018). 2020 Jun 15;44.
5. Tuckerman J, **Crawford NW**, Marshall HS. Seasonal influenza vaccination for children with special risk medical conditions: Does policy meet practice? *Journal of Paediatrics and Child Health*. 2020; June 1.
6. Ibrahim LF, Tosif S, McNab S, Hall S, Lee HJ, Lewena S, Daley AJ, **Crawford NW**, Steer AC, Bryant PA, Babl FE. SARS-CoV-2 Testing and Outcomes in the First 30 Days after the First Case of COVID-19 at an Australian Children's Hospital. *Emergency Medicine Australasia*. 2020; May 10.
7. Madhi SA, Polack FP, Piedra PA, Munoz FM, Trenholme A, Simoes EAF, Swamy GK, Ahmed K, Baqui AH, Calvert A, Cotton MF, Cutland CL, Englund JA, Gonik B, Hammit L, Heath PT, de Jesus J, Jones C, Khalil A, Kimberlin D, Libster R, Lucero M, Llapur C, Marc GP, Marshall HS, Martínón Torres F, Nolan T, Osman A, **Perrett KP**, Richmond PC, Snape MD, Shakib JH, Stoney T, Tita AT, Varner MW, Vatish M, Vrbicky K, Zaman K, Zar HJ, Meece J, Plested J, Agrawal S, Cho I, Chen C, Thomas DN, Wen J, Fix AB, Shinde V, Glenn GM, Fries LF. Vaccination of pregnant women with respiratory syncytial virus vaccine and protection of their infants. *New England Journal of Medicine* 2020;383:426-39.

8. Armiento R, Hoq M, Kua E, **Crawford N**, **Perrett KP**, **Elia S**, **Danchin M**. Impact of Australian mandatory 'No Jab, No Pay' and 'No Jab, No Play' immunisation policies on immunisation services, parental attitudes to vaccination and vaccine uptake, in a tertiary paediatric hospital, The Royal Children's Hospital, Melbourne. *Vaccine* 2020;38(33): 5231-5240.

9. Habersaat KB, Betsch C, **Danchin M**, Sunstein CR, Bohm R, Falk A, et al. Ten considerations for effectively managing the COVID-19 transition. *Nature Human Behaviour*. 2020;4(7):677-87.

10. Kaufman J, Attwell K, Hauck Y, Leask J, Omer SB, Regan A, **Danchin M**. Designing a multi-component intervention (P3-MumBubVax) to promote vaccination in antenatal care in Australia. *Health Promotion Journal of Australia*. 2020 Jul 3

11. Tuckerman J, Kaufman J, **Danchin M**. How to use qualitative methods for health and health services research. *Journal of Paediatrics and Child Health*. 2020;56(5):818-20.

12. **Danchin MH**, Bines JE, Watts E, Cowley D, Pavlic D, Lee KJ, et al. Rotavirus specific maternal antibodies and immune response to RV3-BB rotavirus vaccine in central java and yogyakarta, Indonesia. *Vaccine*. 2020;38(16):3235-42.

13. O'Neill J, Newall F, Antolovich G, Lima S, **Danchin M**. Vaccination in people with disability: a review. *Human Vaccines and Immunotherapeutics*. 2020;16(1):7-15.

14. Randall S, Leask J, Robinson P, **Danchin M**, Kinnersley P, Witteman H, et al. Underpinning of the sharing knowledge about immunisation (SKAI) communication approach: A qualitative study using recorded observations. *Patient Education and Counselling*. 2020;103(6):1118-24.

15. Kaufman J, Attwell K, Tuckerman J, O'Sullivan J, Omer SB, Leask J, Regan A, Marshall H, Lee KJ, Snelling T, **Perrett K**, Wiley K, Giles ML, **Danchin M**. Feasibility and acceptability of the multi-component P3-MumBubVax antenatal intervention to promote maternal and childhood vaccination: A pilot study. *Vaccine* 2020;38(24):4024-4031.

16. Silcock R, **Crawford NW**, Selvaraj G, McMinn A, **Danchin M**, **Lazzaro T**, **Perrett KP**. Subcutaneous nodules following immunization in children; in Victoria, Australia from 2007 to 2016. *Vaccine* 2020;38(15):3169-3177.

17. Sharma K, **Perrett KP**, Wood N. Yellow Fever Vaccination in Egg-Allergic Children. *The Pediatric Infectious Disease Journal* 2020;39(6):e76-e78.

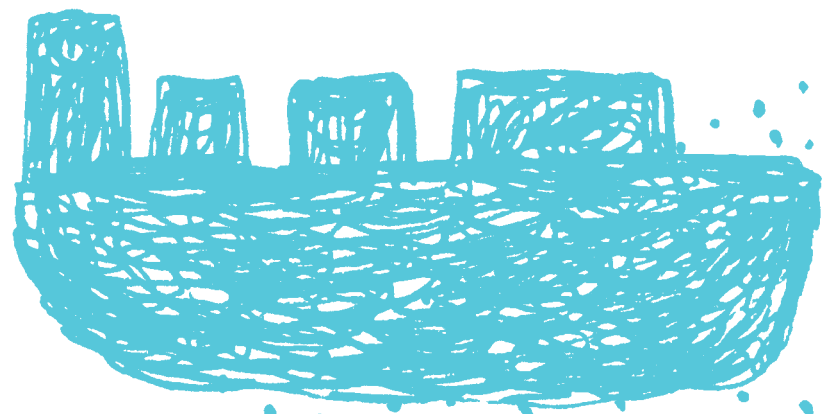
18. Tuckerman J, **Crawford NW**, Marshall HS. Disparities in parental awareness of children's seasonal influenza vaccination recommendations and influencers of vaccination. *Plos One*. 2020 Apr 9;15(4).



19. Zimmermann P, **Perrett KP**, Ritz N, Flanagan KL, Robins-Browne R, van der Klis FRM, Curtis N; MIS BAIR group. Biological sex influences antibody responses to routine vaccinations in the first year of life. *Acta Paediatrica* 2020;109(1):147-157.
20. Patel C, Chiu CK, Beard FH, **Crawford NW**, Macartney K. One disease, two vaccines: challenges in prevention of meningococcal disease. *The Medical Journal of Australia*. 2020;212(10).
21. **Perrett KP**, Halperin SA, Nolan T, Martínez Pancorbo C, Tapiero B, Martinon-Torres F et al. Immunogenicity, transplacental transfer of pertussis antibodies and safety following pertussis immunization during pregnancy: Evidence from a randomized, placebo-controlled trial. *Vaccine* 2020;38(8):2095-2104.
22. Blyth CC, Cheng AC, **Crawford NW**, Clark JE, Buttery JP, Marshall HS, Francis JR, McRae J, Kotsimbos T, Kelly PM, Macartney KK. The impact of new universal child influenza programs in Australia: Vaccine coverage, effectiveness and disease epidemiology in hospitalised children in 2018. *Vaccine*. 2020 Mar 17;38(13):2779-2787.
23. **Perrett KP**, Halperin SA, Nolan T, Carmona Martínez A, Martínón-Torres F, García-Sicilia J et al. Impact of tetanus-diphtheria-acellular pertussis immunization during pregnancy on subsequent infant immunization seroresponses: follow-up from a large randomized placebo-controlled trial. *Vaccine* 2020;38(8):2105-2114.
24. Damiano JA, Deng L, Li W, Burgess R, Schneider AL, **Crawford NW**, Buttery J, Gold M, Richmond P, Macartney KK, Hildebrand MS, Scheffer IE, Wood N, Berkovic SF. SCN1A Variants in vaccine-related febrile seizures: A prospective study. *Annals of Neurology*. 2020 Feb;87(2):281-88.
25. Harris A, **Lazzaro T**, **Crawford NW**. Blistering post 4-year old Infanrix® IPV. *Vaccine*. 2020 Jan 16;38(3):705-706.
26. Harrison LC, **Perrett KP**, Jachno K, Nolan TM. Honeyman MC. Does rotavirus turn on type 1 diabetes? *PLOS Pathogens* 2019;15(10):e1007965.
27. Zimmermann P, **Perrett KP**, Messina N, Donath S, Ritz N, Van der Klis F, Curtis N. The effect of maternal immunisation during pregnancy on infant vaccine responses. *EClinicalMedicine* 2019 Jul 26;13:21-30.
28. Oliver J, Thielemans E, McMinn A, Baker C, Britton PN, Clark J, Marshall HS, Blyth CC, Francis J, Buttery J, Steer AC, **Crawford NW** & on behalf of the PAEDS investigators. Invasive group A Streptococcus disease in Australian children: 2016 to 2018 – a descriptive cohort study. *BMC Public Health*. 2019 Dec 30;19(1):1750.
29. **Perrett KP**, Jachno K, Nolan TM. Role of Rotavirus Vaccination in Decline in Incidence of Type 1 Diabetes—Reply. *JAMA Pediatrics* 2019;173(9):894.
30. Hirve S, **Crawford N**, Palekar R, Zhang W, WHO RSV surveillance Group. Clinical characteristics, predictors, and performance of case definition-Interim results from the WHO global respiratory syncytial virus surveillance pilot. *Influenza and Other Respiratory Viruses*. 2019 Oct 31.
31. Middleton BF, Jones MA, Waddington CS, **Danchin M**, McCallum C, Gallagher S, et al. The ORVAC trial protocol: a phase IV, double-blind, randomised, placebo-controlled clinical trial of a third scheduled dose of Rotarix rotavirus vaccine in Australian Indigenous infants to improve protection against gastroenteritis. *BMJ Open*. 2019;9(11):e032549.
32. Kaufman J, Ryan R, Betsch C, Parkhill A, Shapiro G, Leask J, Menning L, Tugwell P, Costa DSJ, **Danchin M**, Rada G, Hill S. Instruments that measure psychosocial factors related to vaccination: a scoping review protocol. *BMJ Open*. 2019;9(12):e033938.
33. Karras J, Dube E, **Danchin M**, Kaufman J, Seale H. A scoping review examining the availability of dialogue-based resources to support healthcare providers engagement with vaccine hesitant individuals. *Vaccine*. 2019;37(44):6594-600.
34. O'Neill J, Newall F, Antolovich G, Lima S, **Danchin MH**. Adolescent immunisation in young people with disabilities in Australia. *Medical Journal of Australia*. 2019;211(5):199-200 e1.
35. **Danchin M**. Does informing or educating parents about early childhood vaccination improve uptake? *Journal of Paediatrics and Child Health*. 2019;55(9):1142-4.
36. Kaufman J, Attwell K, Hauck Y, Omer SB, **Danchin M**. Vaccine discussions in pregnancy: interviews with midwives to inform design of an intervention to promote uptake of maternal and childhood vaccines. *Human Vaccines and Immunotherapeutics*. 2019;15(11):2534-43.
37. Norman DA, **Danchin M**, Van Buynder P, Moore HC, Blyth CC, Seale H. Caregiver's attitudes, beliefs, and experiences for influenza vaccination in Australian children with medical comorbidities. *Vaccine*. 2019;37(16):2244-8.
38. O'Neill J, Newall F, Antolovich G, Lima S, **Danchin M**. The uptake of adolescent vaccinations through the School Immunisation Program in specialist schools in Victoria, Australia. *Vaccine*. 2019;37(2):272-9.
39. Zimmermann P, Donath S, **Perrett KP**, Messina N, Ritz N, Netea M, Flanagan K, Van der Klis F, Curtis N. The influence of neonatal Bacille Calmette-Guérin (BCG) immunisation on heterologous vaccine responses in infants in a randomised trial. *Vaccine* 2019 Jun 19;37(28):3735-3744.
40. Tuckerman J, Misan S, **Crawford NW**, Marshall HS. Influenza in Children with Special Risk Medical Conditions: A systematic Review and Meta-analysis. *The Pediatric Infectious Disease Journal*. 2019 Sep;38(9):912-919.
41. Rowe S, **Perrett KP**, Morey R, Stephens N, Cowie B, Nolan T, Leder K, Pitcher H, Sutton B, Cheng A. Influenza and pertussis vaccination of women during pregnancy in Victoria, 2015-2017. *Medical Journal of Australia* 2019;210(10):454-462.
42. Silcock R, **Crawford NW**, **Perrett KP**. Subcutaneous nodules: an important adverse event following immunization. *Expert Review of Vaccines* 2019 Apr;18(4):405-410.
43. Zimmermann P, **Perrett KP**, Berbers G, Curtis N. Persistence of pneumococcal antibodies after primary immunisation with a polysaccharide-protein conjugate vaccine. *Archives of Disease in Childhood* 2019;104(7):680-684.
44. Addison M, **Lazzaro T**, **Crawford N**. Injection site abscess (ISA) following an infant vaccine. *Vaccine*. 2019 Feb 21;37(9):1151-1152.
45. Zimmermann P, **Perrett KP**, van der Klis FRM, Curtis N. The immunomodulatory effects of measles-mumps-rubella vaccination on persistence of heterologous vaccine responses. *Immunology and Cell Biology* 2019;97(6):577-585.
46. Nolan T, Santoloya ME, de Looze F, Marshall H, Richmond P, Henein S, Rheault P, Heaton K, **Perrett KP**, Garfield H, Gupta A, Ferguson M, D'Agostino D, Toneatto D, O'Ryan M.. Antibody Persistence and Booster Response in Adolescents and Young Adults 4 and 7.5 Years after Immunization with 4CMenB Vaccine. *Vaccine* 2019 Feb 21;37(9):1209-1218.
47. Quinn HE, Gidding HF, Marshall HS, Booy R, Elliott EJ, Richmond P, **Crawford N**, McIntyre PB, Macartney KK; PAEDS (Paediatric Active Enhanced Disease Surveillance) Network. Varicella vaccine effectiveness over 10 years in Australia; moderate protection from 1-dose program. *Journal of Infection*. 2019;78(3):220-225.
48. Cheung A, Choo S, **Perrett KP**. Vaccine Allergy? Skin Testing and Challenge at a Tertiary Pediatric Hospital in Melbourne, Australia. *Journal of Allergy and Clinical Immunology: In Practice*, 2019;7(5):1541-1549.
49. Tuckerman J, **Crawford NW**, Lynch J, Marshall HS. Are children with special risk medical conditions receiving influenza vaccination? Validity of parental and provider report, and to a National Immunisation Register. *Human Vaccines and Immunotherapeutics*. 2019;15(4):951-958.
50. Marshall HS, Clarke M, Heath C, Quinn H, Richmond PC, **Crawford N**, Elliott E, Toi C, Kynaston A, Booy R, Macartney K; PAEDS Investigators. Severe and complicated Varicella and Associated Genotypes 10 Years After Introduction of a One-Dose Varicella Vaccine Program. *The Journal of Infectious Diseases*. 2019 Jan 9;219(3):391-399.
51. McHugh L, Marshall HS, **Perrett KP**, Nolan T, Wood N, Lambert SB, Richmond P, Ware RS, Binks P, Binks MJ, Andrews RM. The safety of influenza and pertussis vaccination in pregnancy in a cohort of Australian mother-infant pairs, 2012-2015: The FluMum study. *Clinical Infectious Diseases* 2018;68(3):402-408.
52. Tuckerman J, Misan S, Salih S, Joseph Xavier B, **Crawford NW**, Lynch J, Marshall HS. Influenza vaccination: Uptake and associations in a cross-sectional study of children with special risk medical conditions. *Vaccine*. 2018;36(52):8138-8147.
53. **Perrett KP**, Jachno K, Nolan TM, Harrison LC. Association of Rotavirus Vaccination With the Incidence of Type 1 Diabetes in Children. *JAMA Pediatrics* 2019;173(3):280-282.
54. **Danchin MH**, Costa-Pinto J, Attwell K, Willaby H, Wiley K, Hoq M, Leask, J, **Perrett, KP**, O'Keefe, J, Giles, M. L, Marshall, H. Vaccine decision-making begins in pregnancy: Correlation between vaccine concerns, intentions and maternal vaccination with subsequent childhood vaccine uptake. *Vaccine*. 2018;36(44):6473-9.
55. Paxton GA, Spink PCG, **Danchin MH**, Tyrrell L, Taylor CL, Casey S, Graham HR. Catching up with catch-up: a policy analysis of immunisation for refugees and asylum seekers in Victoria. *Australian Journal of Primary Health*. 2018;24(6):480-90.
56. Wood N, Nolan T, Marshall H, Richmond P, Gibbs E, **Perrett KP**, McIntyre P. Immunogenicity and Safety of Monovalent Acellular Pertussis Vaccine at Birth: A Randomized Clinical Trial. *JAMA Pediatrics*. 2018;172(11):1045-1052.
57. Wong NX, **Crawford N**, Lawrie J, Hickman J, Elia S, Buttery J. Distribution of Bacillus Calmette Guerin (BCG) Vaccine in Victoria 2013-15. *Communicable Diseases Intelligence*, 2018;42.

58. **Crawford NW**, McMinn A, Royle J, **Lazzaro T**, **Danchin M**, **Perrett KP**, Buttery J, **Elia S**, Orr K, Wood N. Recurrence risk of a hypotonic hyposensitive episode in two Australian specialist immunisation clinics. *Vaccine* 2018 Oct 1;36(41):6152-6157.

59. O'Grady KF, Chang AB, Cripps A, Mulholland EK, Smith-Vaughan H, Wood N, **Danchin M**, Thornton R, Wilson A, Torzillo PJ, Morris PM, Richmond P, Rablin S, Arnold D, Connor A, Goyal V, Stoney T, Perrett KP, Grimwood K. The clinical, immunological and microbiological impact of the 10-valent pneumococcal-Protein D conjugate vaccine in children with recurrent protracted bacterial bronchitis, chronic suppurative lung disease and bronchiectasis: A multi-centre, double-blind, randomised controlled trial. *Human Vaccines & Immunotherapeutics* 2018;14(11): 2768-2779.





**Immunisation Service**

The Royal Children's Hospital Melbourne  
50 Flemington Road Parkville  
Victoria 3052 Australia  
[www.rch.org.au/immunisation](http://www.rch.org.au/immunisation)