



The Royal
Children's
Hospital
Melbourne

Immunisation Service Reports

2012-13 AND 2013-14

Immunisation Service

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Abbreviations

ACIR	Australian Childhood Immunisation Register
AEFI	Adverse Event Following Immunisation
BCG	Bacille Calmette-Guerin
CVU	Clinical Vaccinology Update
DH	Department of Health (Immunisation section)
FLACC	Face Legs Activity Cry Consolability (scale for pain measurement)
FFS	Fee for service
GP	General Practitioner
HHE	hypotonic-hyporesponsive episode
ICU	Intensive Care Unit
ID	Infectious Diseases
MCRI	Murdoch Children's Research Institute
MVEC	Melbourne Vaccine Education Centre
NCIRS	National Centre for Immunisation Research and Surveillance
NIP	National Immunisation Program
PAEDS	Paediatric Active Enhanced Disease Surveillance
PHAA	Public Health Association of Australia
RCH	Royal Children's Hospital
RSV	Respiratory Syncytial Virus
SAEFVIC	Surveillance of Adverse Events Following Vaccination In the Community
VHIMS	Victorian Health Incident Monitoring System
VIRGO	Vaccine and Immunisation Research Group

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Overview

The Immunisation Service at The Royal Children's Hospital

There are still many countries currently facing numerous challenges due to poor routine immunisation coverage, with deaths of unvaccinated children due to preventable diseases still commonplace. Australia has a comprehensive government funded vaccine program and as a result some diseases are no longer seen, or are very rare. It is important to ensure high immunisation coverage rates in Australia and inpatients, outpatients and visitors of the Royal Children's Hospital (RCH) Melbourne are no exception. Since March 2001, the Immunisation Service at the RCH has optimised every opportunity to immunise patients and visitors to the hospital. Through the establishment of the Drop-in Centre, there has continued to be an increase in service delivery, through the administration of vaccines as well as expert clinical advice. With numerous challenges, including the launch of new vaccines as well as outbreaks of vaccine preventable diseases such as pertussis (whooping cough), this has ensured that the telephone advice line and website has been well utilised by patients, parents, external health care professionals as well as RCH staff.

The Immunisation Service at RCH has core funding through a partnership with the Victorian Department of Health - 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.

The three core services provided by the RCH Immunisation Service remain;

- the Drop-in Centre
- Telephone advice line
- Immunisation outpatient clinic (weekly)

Additional services provided by the Immunisation Service;

Immunisation adverse event management (in collaboration with SAEFVIC)	Immunisation of RCH patients in special risk groups	Education (onsite and offsite)	Immunisation error management
Clinical research	Media and promotion of immunisations (in collaboration with the RCH Corporate Communications team)	Travel vaccines including a separate BCG clinic (in collaboration with the Infectious Diseases team)	Staff immunisations (in collaboration with Infection Control)

Internationally, the RCH Immunisation service is also having impact. The British Columbia Children's Hospital in Canada, were inspired to consider a hospital-based immunisation clinic for children and family members. They were able to get funds and space to offer influenza immunisation during November 2013 to January 2014. It was a very successful campaign and this exercise opened the eyes of hospital authorities to the fact that immunisation should be an ongoing part of the hospital's services.

Over the years the Immunisation Service at RCH has expanded considerably and this report details the vast range of work provided by the passionate and enthusiastic team of staff involved in immunisation at RCH.

IMMUNISATION SERVICE REPORTS 2012-13 & 2013-14

This document is a service activity report over two years [1 July 2012 - 30 June 2014]. It highlights the core service activity as well as additional immunisation programs undertaken by the RCH Immunisation Service team.

Key Highlights

Providing Bacille Calmette Guerin (BCG) vaccine for children <12 months of age

The Immunisation Service at the RCH has been providing BCG vaccine via the Monday afternoon Infectious Diseases (ID) clinic since November 1999. The main indication for the vaccine was children < 5 years travelling back to a country with a high incidence of Tuberculosis. There had been a gradual increase in demand over the decade. Due to changes in BCG vaccine supply in 2012, the Immunisation Service in collaboration with the RCH Infectious Diseases team put together a business case seeking additional funds for a dedicated weekly BCG vaccine clinic. Additional clinics were conducted in 2012-13 and then 12 months of pilot funding was approved and provided by the Department of Health - Immunisation section in November 2013. This funding included nursing, administration and medical time to run a weekly RCH BCG clinic. This dedicated clinic commenced on Tuesday 12 November 2013, alternating each week between Immunisation and Infectious Diseases physicians. The RCH Immunisation service currently administers between 80 to 100 BCG vaccines per month.

Administering RSV immunoglobulin

Another key project for the team in the past 12 months has involved taking on responsibility for administering Respiratory Syncytial Virus (RSV) immunoglobulin for at-risk children. RSV is a common respiratory virus that can be fatal in high-risk children. RSV immunoglobulin provides passive immunity when administered monthly in the bronchiolitis season from May to September.

In April 2013, the hospital provided \$44,000 of funding to the Immunisation team to facilitate RSV immunoglobulin for selected Cardiology patients. Patients are either booked in to the Drop-in Centre or immunised on the ward if current

inpatients. The Immunisation team grouped the patient appointments together, in an attempt to maximise sharing of vials, which cost \$1500. The team also ensures the patients and their families were provided with immunisation advice and opportunistic catch-up vaccines during the RSV visit.

In 2013, the Immunisation Team ensured 93 per cent of eligible cardiology patients received one or more doses of the RSV immunoglobulin and 39 per cent of these patients were also given other vaccines during the same visit.

The cost savings achieved by the team through sharing of immunoglobulin vials was estimated to be \$64,100. Importantly, none of the patients who received monthly RSV immunoglobulin were admitted to RCH with laboratory confirmed RSV infection. This program therefore minimised the impact of RSV associated bronchiolitis in this vulnerable patient group, with cost savings in both ward and intensive care admissions. The program is also important for the families whom often have prolonged stays at RCH and are keen to minimise the risk of infections.

Providing opportunistic immunisations for at-risk inpatients

In 2011, after conducting a pilot study looking at in-patient immunisations, the Immunisation Team was concerned to learn that 25 per cent of the hospital's in-patients were overdue for their vaccinations. As a result, the Department of Health - Immunisation section approved funding to create a program that would allow the nurses to check the immunisation status of in-patients. This would enable the team to be able to provide opportunistic vaccines on the wards, and bring the Australian Childhood Immunisation Register (ACIR) up-to-date.

STAFF**Medical**

Nigel Crawford (Head)

Teresa Lazzaro

Margie Danchin

Kirsten Perrett

Wonie Uahwatanasakul

Nursing

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Melanie Addison

Robin Cavanagh

Melissa Dallinger

Kelly Bernard

Peta Kilsby

Rebecca Feore

Melissa Nesbitt

Rachael McGuire

Kirsten Mitchell

Kerryn Williams

Administration

Julie Bond

Jessica Elia

Key Highlights continued

The initial program began in 2012 and involved ongoing consultation with key stakeholders including the hospital Executive, ward staff and pharmacy, with the aim of continually refining and streamlining the process of tracking and immunising this vulnerable cohort of children.

Since then, as a result of the team's proactive approach to finding unvaccinated inpatients and families, since September 2013 a total of 42% of due/overdue inpatients were brought up-to-date. This was either receiving catch-up vaccines or updating the ACIR with the parent-held record of immunisation. Of the patients, 54% were brought up-to-date at the RCH; the others were immunised within a month of discharge with 33% at the GP, 10% through local government and 3% through other immunisation providers.

Providing Clinical Vaccinology Updates for healthcare professionals

The inaugural Clinical Vaccinology Update (CVU) was held at The Royal Children's Hospital on 22 October 2012 to address the educational needs of immunisation providers as well as an opportunity to meet with colleagues and discuss topical immunisation issues. The program included vaccine updates, vaccine preventable disease epidemiology and vaccine safety forums.

Due to the very positive feedback by attendees, the CVU has continued in 2013 and 2014, with updates held twice a year and over 250 attendees each program. This demonstrates the importance that immunisation providers place on continuing education, as it is essential to maintaining improvements in disease prevention efforts.

Establishing the Melbourne Vaccine Education Centre [MVEC]

In February 2014, the RCH Immunisation service in conjunction with Melbourne Children's partners at SAEFVIC (MCRI) and the University of Melbourne Department of Paediatrics, launched the Melbourne Vaccine Education Centre website (www.mvec.vic.edu.au). The aim of MVEC is to provide relevant clinical information based on the latest available evidence, as well as practical tools to assist in education and decision-making around new vaccines. This education initiative is both for healthcare professionals and families and highlights the leadership role that the RCH has in Immunisation education at a state and national level.



Report on Performance

(i) Core Service Activity

DROP-IN CENTRE

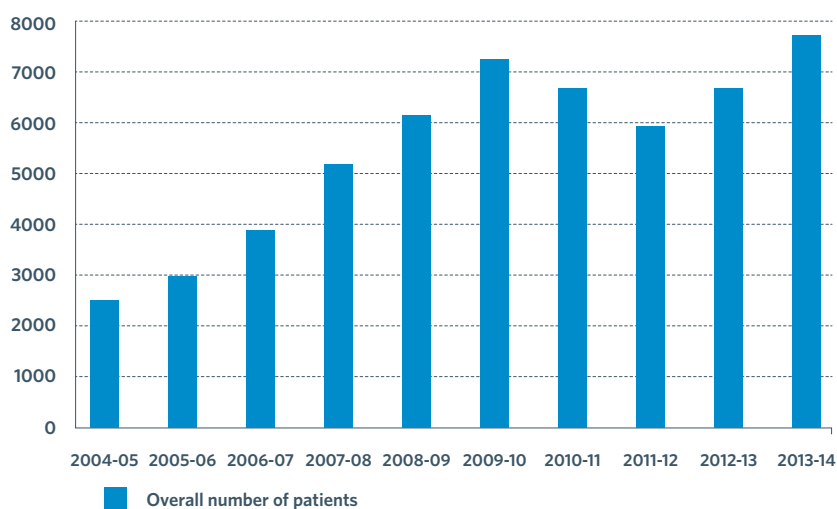
The Immunisation Drop-in Centre is located on the Main Street of the hospital and is in a high-profile location opposite a main café. It is physically accessible and is an integrated part of the hospital community. Collaboration between the Drop-in Centre and the hospital community ensures opportunities for immunisation are maximised.

Following a meeting with members of the RCH Executive as part of a Great Care Round, ideas to help improve patient care and satisfaction were discussed. The Immunisation Team identified improvement opportunities in the use of the Drop-in centre space. Currently the exit bay is under-utilised and was a suboptimal environment for patients and families. A Project initiated request form for minor works to the exit bay was completed to enable the room to be used as a third treatment room when required as well as art decals placed on the walls to make the room less clinical in appearance.

Overall Activity

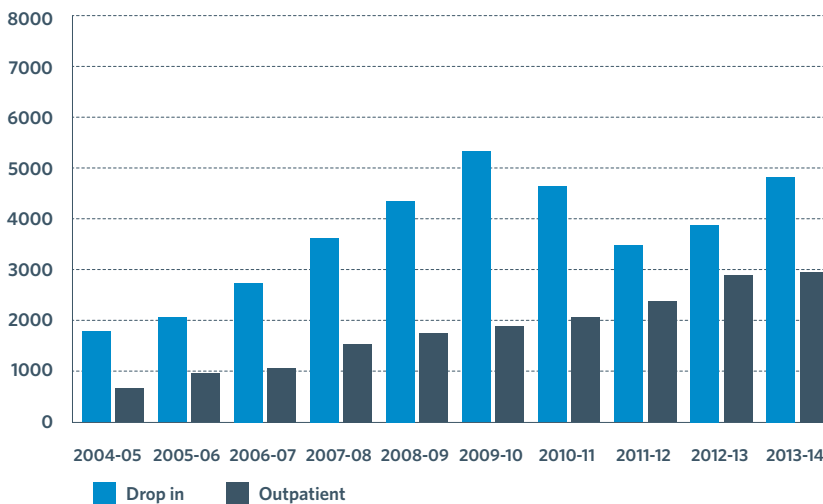
In 2012/13, 6,695 patients, siblings and parents were opportunistically vaccinated at the RCH Immunisation Drop-in Centre and in 2013/14, 7,591 opportunistic immunisations were provided. This represents an increase of 14% compared to the previous biennial report (2012). Figure 1 highlights the service activity over the last few years.

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



Patients either present to the Drop-in centre following a specialist clinic appointment or happen to be walking by the Centre. The service also provides vaccines for siblings and/or parents of a patient. Inpatients who are well enough can drop in to the Centre or the Immunisation nursing staff can attend the ward and provide inpatient immunisations. Figure 2 demonstrates an overview of the source of patients receiving immunisations at the Drop-in Centre.

Figure 2: Patients immunised at the Drop-in Centre by 12-month period: non-outpatient drop-in patients vs. outpatients



Outpatient clinics

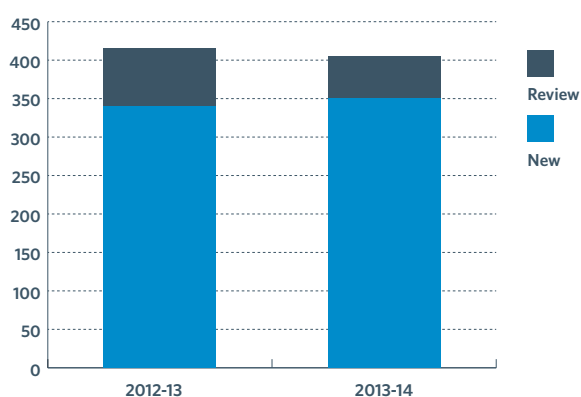
The weekly Immunisation Outpatient clinic is held on a Tuesday morning. It is a combined SAEFVIC and RCH Immunisation clinic. The Immunisation Service nurses provide immunisations for patients and their parents attending these clinics, including special risk patients, catch-up immunisations, vaccines for families worried about immunisations as well as immunisations for patients following a previous immunisation adverse event. In 2013, this clinic was also expanded with DH support to include BCG vaccine delivery for infant's < 12-months (see BCG report page 20).

There are five paediatricians who have been working in the clinic during this reporting period: Nigel Crawford, Teresa Lazzaro, Wonie Uahwatanasakul, Kirsten Perrett and Margie Danchin.

The clinic is well recognised by internal and external healthcare professionals, with the majority of appointments being new patients for expert advice. The overall number of patients seen in the RCH Immunisation clinic is detailed in Figure 3.



Figure 3: Number of Immunisation clinic patients* by year [2012-14]



*Excludes BCG clinic patients (see separate summary)

A 6-month snapshot of the wide range of complex immunisation issues that are referred to the clinic are detailed in Figure 4.

Figure 4: Immunisation outpatient clinic presenting issue: 1 July 2012 - 18 December 2012

	Number of patients
Immunisation adverse event	89
Immunisation concerns/advice	38
Catch-up immunisation options/plan	21
Special risk patients	30
Underlying complex medical condition	14
Drug error	3
Needle phobia/immunisations under sedation	3
Egg allergy questions	2
Review appointments	9
TOTAL	209

TeleHealth

In August 2012, we became one of the first RCH clinical services to provide TeleHealth.

Up until April 2014, a total of 29 patients have had a Telehealth immunisation consultation, 21 with their local GP or Paediatrician in attendance, 8 in the client's home. The reasons for consultation included: adverse reactions following immunisations; special risk patients such as solid organ transplant recipients and families with vaccine hesitancy queries. The distance of Victorian clients from Parkville, Melbourne, ranged between 106-729km, with 5 patients from interstate (NSW and TAS) and 1 consultation with an Australian resident in Bali. An Australian Childhood Immunisation Register review identified 16 patients (<7-years of age) who received vaccines from their GP following the Telehealth consultation. Overall our experience with Immunisation related Telehealth consultations has been extremely positive and an excellent way to provide a specialised service to regional and rural areas.

The Immunisation service acknowledges the support of Susan Jury in establishing TeleHealth and plans to expand use of this technology in its clinical services over the next 12 to 18 months.

Other immunisation consultations

The Immunisation service is about more than just administering vaccines, with immunisation nurse experts providing a wide range of advice. Consultations for families who require specialist immunisation advice is also provided at the Drop-in Centre, with these consultations including:

- individualised immunisation plan in patients with complex medical problems - special risk patients
- enquiries about new vaccines (e.g. Meningococcal B vaccine)
- enquiries about non-scheduled vaccines (eg. influenza vaccine, parent pertussis vaccine)
- parents/medical students/nursing staff seeking immunisation resources
- immunisation adverse event advice
- incomplete vaccination history requiring a catch-up immunisation plan
- overseas born patients requiring a catch-up immunisation plan
- incomplete Australian Childhood Immunisation Register (ACIR) data requiring updating

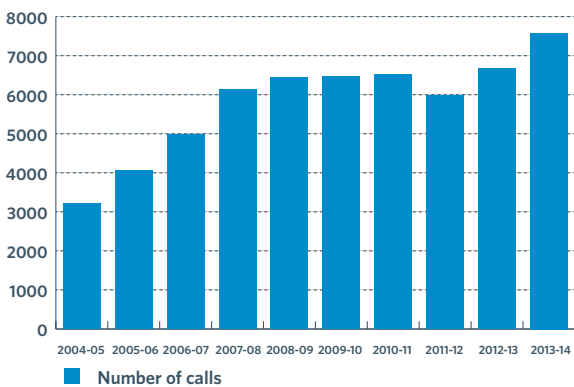
TELEPHONE ADVICE LINE 1300 882 924 (OPTION 2); DIRECT (03) 9345 6599

The telephone advice line is a critical element of the Immunisation Service daily activity. To help facilitate easier access to hospital based services we established an Immunisation Hotline in 2014. This 1300 number is accessible throughout the state of Victoria and helped triage calls between the RCH Immunisation service, SAEFVIC, Monash Immunisation and the DH.

Over the reporting period the telephone advice line usage has consistently increased. The majority of calls received are by parents, followed by immunisation providers, RCH hospital staff as well as other community based organisations. There were 6,664 telephone advice calls documented at the Drop-in Centre in 2012/2013 and 7,581 calls recorded over the last 12 months. This reflects a 26% increase in calls compared with 2011/2012.

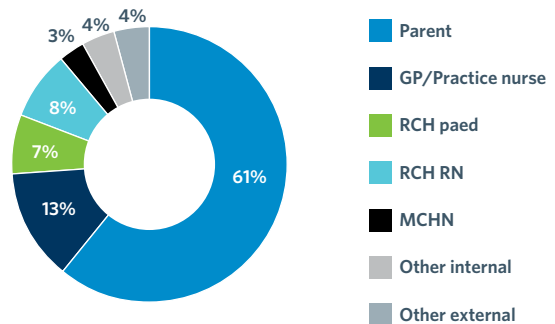
The telephone advice line is managed by the Immunisation Nursing staff, however when there is a particularly complex enquiry, the nursing staff can refer the call to the medical staff for a prompt reply to the caller. The advice line is answered between 9am – 5pm on working weekdays of the year. The number of calls received by year is detailed in Figure 5. This data is an underestimate of demand for the RCH Immunisation telephone advice line, as it is only a reflection of calls answered.

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



Over the past 12 months information was collected on the type of caller to the telephone advice line (figure 6).

Figure 6: Telephone advice calls at the Drop-in Centre by caller 1 July 2012 – 30 June 2014



INPATIENT IMMUNISATIONS

Achieving high immunisation coverage rates for children with medical conditions is vital as they are at higher risk of morbidity and mortality from vaccine preventable diseases. With an increase in DH funding in June 2010 to expand the delivery of inpatient immunisations, this project has continued to improve since then. Inpatient’s aged between 6 weeks and up to 7 years have their immunisation status checked using the ACIR. This highlights those inpatient’s who are due or are not up-to-date according to the National Immunisation Program (NIP). The details of children identified as due or overdue according to the ACIR is sent to the hospital unit Care Managers for follow-up. One month following discharge, the Immunisation nursing staff recheck ACIR to determine if vaccines were provided.

Since the pilot and following a presentation from the Immunisation Service to the RCH Board members, from September 2013 the Immunisation service began receiving a daily printout of inpatient’s aged between 6 weeks and 7 years of age, by ward. On average, 50% of inpatient’s identified as due or overdue for vaccines are immunised and predominantly at RCH. The Figure 7 and Figure 8 below demonstrates the month by month success of the program.

There are still a number of reasons some children are not able to have their immunisations brought up to date, and these include: too unwell on the day; already discharged; unable to view child’s status on ACIR and if the child is deceased. We are continually striving to improve the immunisation status of RCH inpatients.

There were 6,664 telephone advice calls documented at the Drop-in Centre in 2012/2013 and 7,581 calls recorded over the last 12 months

Figure 7: Inpatients identified as due or overdue for immunisation and consequently vaccinated 1 September 2013 – 30 June 2014

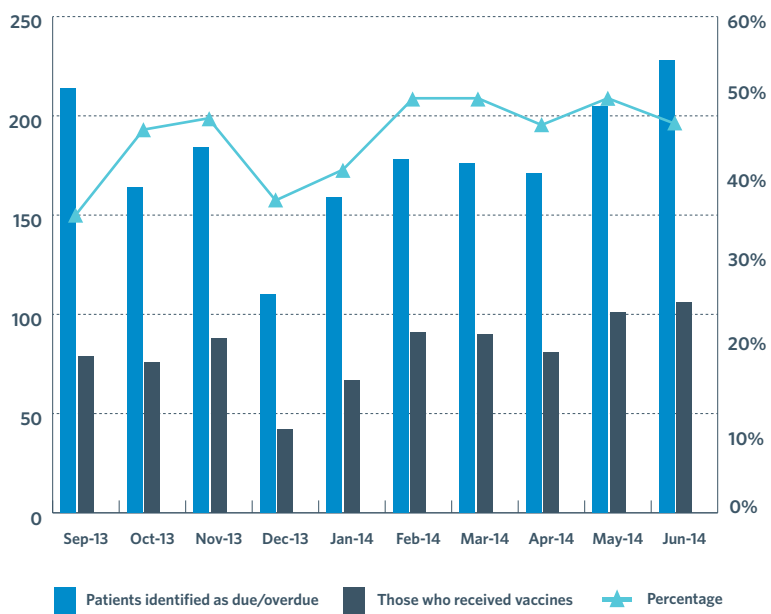
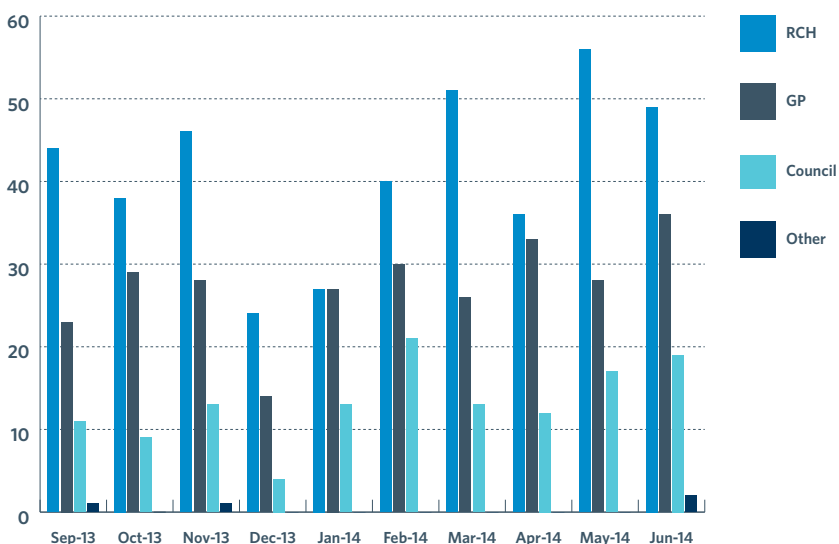


Figure 8: Inpatients vaccinated by site 1 September 2013 – 30 June 2014



ELECTIVE ADMISSIONS

Needle phobia is a medical condition that affects at least 10% of the population. Persons with needle phobia typically avoid medical care, including immunisations. It can be managed by reassurance and education, relaxation techniques or nitrous oxide gas and topical anaesthetic agents. Patients who are needle phobic have attended the Immunisation clinic to discuss strategies for vaccination. Some of these patients are then booked into the Day Medical Unit to have their vaccines with sedation and nitrous oxide gas.

IMMUNISATIONS FOR NEWLY ARRIVED IMMIGRANTS

The Immigrant health service is part of the Department of General Medicine at the Royal Children's Hospital. Children and adolescents of a refugee background will have typical paediatric health problems and in addition, may have health issues specific to their background. Assessment of newly arrived refugee children and adolescents should focus on:

- Parent (or self-identified) concerns
- Excluding acute illness
- Immunisation status and catch-up
- Tuberculosis screening
- Other infections, including parasites malaria and hepatitis
- Nutritional status and growth (including micronutrient and vitamin deficiencies)
- Dental issues
- Concerns about development, vision and hearing.
- Mental health issues
- Previous severe/chronic childhood illness or physical trauma
- Confirming the reported birthdate
- Issues arising from resettlement in Australia

Prior to the patient's clinic appointment, the Immunisation nurses perform an ACIR 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 Immunisation service collaborate with the Immigrant Health team in the regular updating of these catch-up guidelines [<http://www.mvec.vic.edu.au/immunisation-references/refugee-health-catch-up-immunisation-guidelines/>].

The Immunisation nurses have provided Mantoux tests and subsequent reading for many of these patients. Figure 9 outlines the total number of Mantoux tests performed by the RCH Immunisation Service nurses. The immunisation nurses assist in facilitating chest x-rays, medical review and explanation with the interpreter if the Mantoux test is positive.

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

	2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014
Mantoux tests	207	289	343	206	207	269

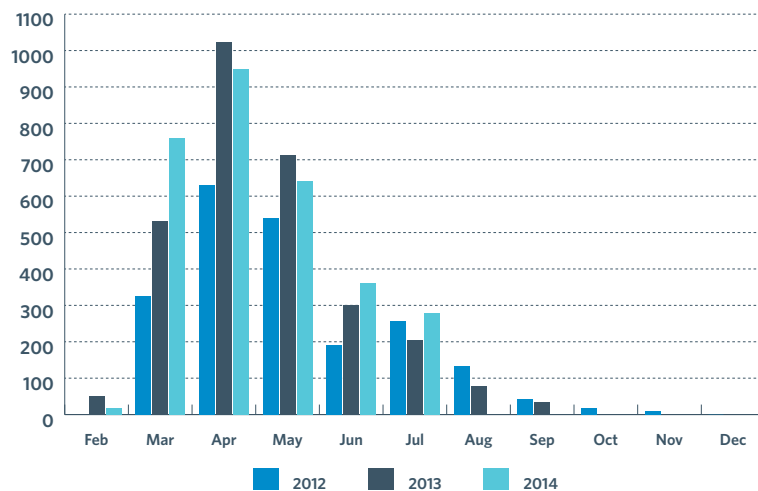
INFLUENZA VACCINE

More than 2,900 opportunistic influenza vaccines were administered at the Drop-in Centre in 2013 (Figure 10), which is a 27% increase compared with 2012. Annual influenza immunisation is nationally recommended for children with many underlying medical conditions who are at increased risk of morbidity and mortality from influenza disease. The RCH Immunisation Service ensures that information is shared throughout the hospital to help facilitate the special risk group patients, to not miss out on the annual influenza vaccine.

Parents and siblings who are not eligible to receive funded influenza vaccine can purchase the vaccine and have it administered at the Drop-in Centre. The 2013 data presented in Figure 10 includes patients, parents and siblings provided influenza vaccine at the Drop-in Centre. RCH patients represent 55% of those receiving opportunistic influenza vaccines at the Drop-in Centre. The remaining 45% are parents and siblings of RCH patients.

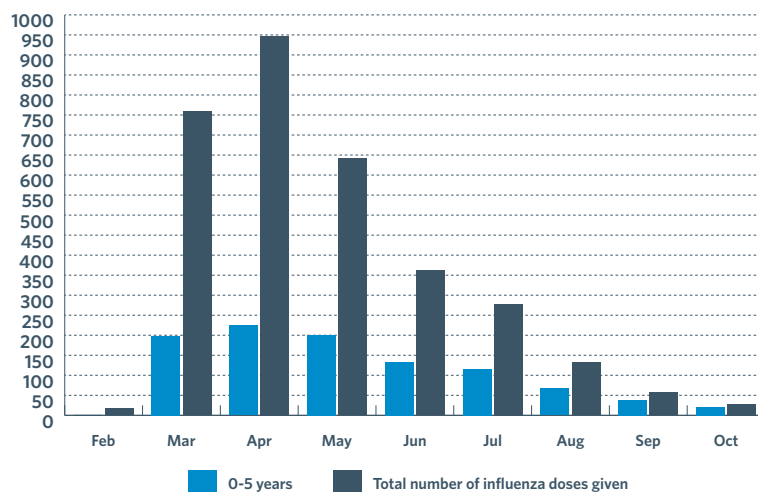
More than 2,900 opportunistic influenza vaccines were administered at the Drop-in Centre in 2013 which is a 27% increase compared with 2012

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



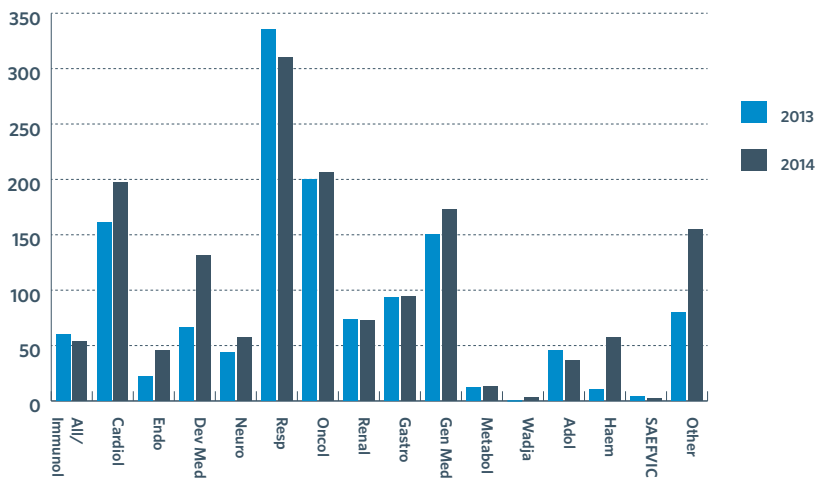
With surveillance systems in place to monitor adverse events following immunisation with influenza vaccine in children under 5 years of age, it is important that the RCH Immunisation service capture the number of doses of influenza vaccine by age group. Figure 11 below demonstrates this data.

Figure 11: Influenza vaccine doses by age group



The RCH patients immunised with influenza vaccine come from a variety of medical departments throughout the hospital. Figure 11 represents the total number of Influenza vaccines according to medical department during the 2013 and 2014 season.

Figure 12: Total number of influenza vaccines (2982) by medical department (2013-14)



STAFF INFLUENZA VACCINE

In 2014 the RCH executive outlined plans to obtain 75% coverage of staff vaccinated with the seasonal influenza vaccine. The RCH Immunisation service was very supportive of this 'Get the Job done' program led by the RCH Infection control. The Infection control team outlined the staff influenza program with a joint RCH Grand round in February 2014, coinciding with the Immunisation service MVEC launch.

The RCH Immunisation nursing team assisted in providing staff for an immunisation booth on the Main Street of the hospital as well for some of the mass vaccination sessions. The end result was 83% of staff being immunised, well above the 67% level achieved in 2013.

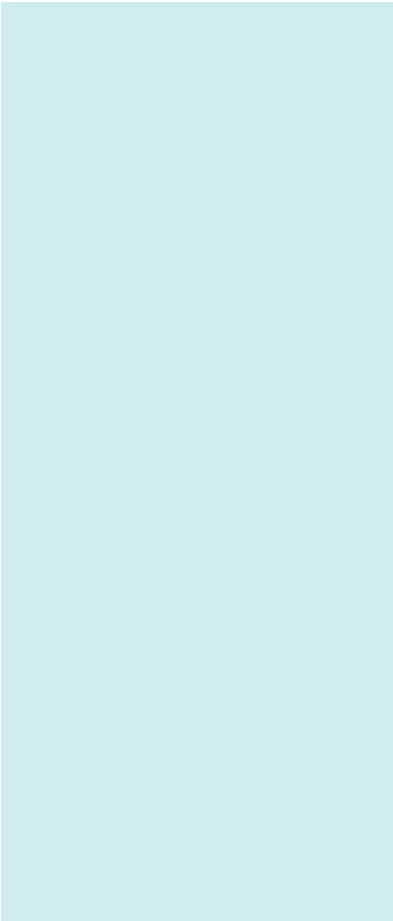
(ii) Additional Immunisation Service Programs

BACILLE CALMETTE GUERIN (BCG) VACCINE FOR CHILDREN <12 MONTHS OF AGE

As discussed under Key Highlights, the Immunisation Service in collaboration with the RCH Infectious Diseases team put together a business case seeking additional funds for a dedicated weekly BCG vaccine clinic. This was a crucial addition to our core activity, as the multi-dose vials and healthcare professional training for BCG vaccine administration was making delivery in Victoria difficult. It was decided that RCH and Monash Health would be the only sites for DH funded BCG vaccine delivery.

Additional clinics were conducted in 2012-13, with ongoing funding approved up to 30 June 2015. This funding included nursing, administration and medical time to run a weekly RCH BCG clinic. This commenced on Tuesday 12 November 2013 with the





clinic alternating each week between Immunisation and Infectious Diseases physicians.

The number of BCG vaccine doses administered at RCH over the reporting period is detailed in Figure 13. There were no vaccines administered in May or June 2014 due to supply issues. A number of BCG adverse events following immunisation were detected through this clinic, as our administration staff ensured a pre-clinic questionnaire was completed prior to the clinic appointment and the family were also contacted 6-months later regarding any possible reactions. The BCG vaccine is administered to children from across Melbourne and parts of regional Victoria (see Figure 14).

Figure 13: Number of doses of BCG vaccine from 1 January 2011 to 30 June 2014

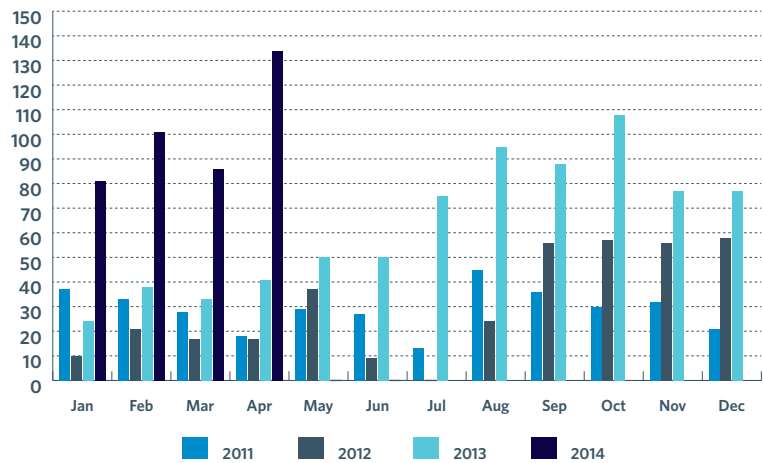
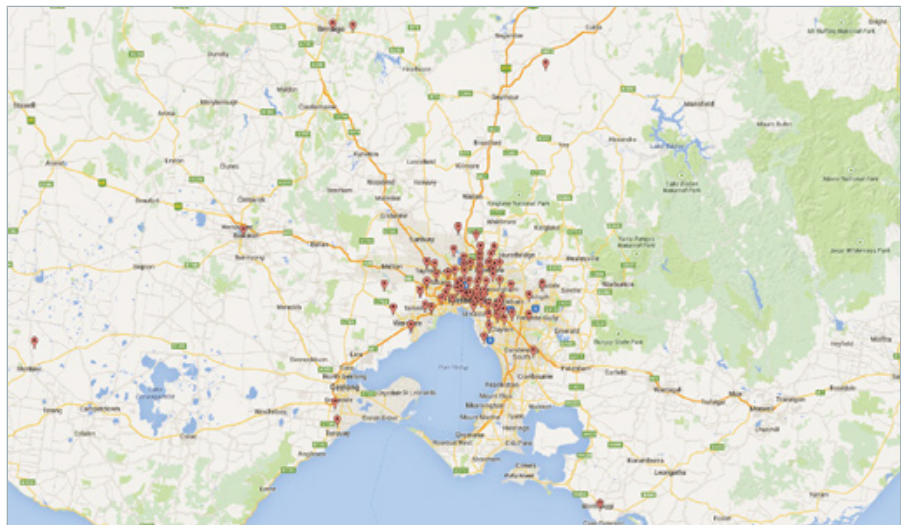


Figure 14: Postcodes RCH BCG clinic attendees [November 2013- June 2014]



RSV IMMUNOGLOBULIN PROPHYLAXIS FOR CARDIAC AND RESPIRATORY PATIENTS

Respiratory Syncytial Virus (RSV) is a highly contagious, devastating disease, especially in high-risk infants. RSV infection typically presents as an upper respiratory tract infection and then may progress to the lower respiratory tract, causing pneumonia and bronchiolitis. RSV immunoglobulin provides passive immunity against RSV infections and has been shown to decrease the incidence of RSV hospitalisation and the number of hospital days.

In 2013 the Cardiology Care Managers provided the list of 116 eligible patients from the Cardiology department (a 33% increase compared to 2012). In total, of the 116 eligible, 109 patients were provided with at least a first dose of RSV immunoglobulin. Patients were booked in to the RCH Immunisation Drop-in Centre or were immunised on the ward if a current inpatient.

The Immunisation Service nursing staff provided parental education with information about: RSV disease, RSV immunoglobulin, scheduled immunisations (2, 4, 6, and 12 months), extra immunisations recommended for special-risk patients (two doses of influenza vaccine, an extra conjugate pneumococcal vaccine at 1 year of age), and immunisations recommended for parents of infants with cardiac problems. The patients and their families were provided immunisation advice and catch-up vaccines during RSV visits as well as the RSV Immunoglobulin doses (see Figure 15).

Figure 15: Number of patients provided monthly RSV Immunoglobulin by the RCH Immunisation Service

	2007	2008	2009	2010	2011	2012	2013
No. of patients on monthly RSV immunoglobulin	10	45	79	95	72	70	109

The program commenced on 7 May 2013 with 2 patients receiving their first dose on the Koala ward. A total of 286 doses of RSV Immunoglobulin were administered, with 202 doses given at the Immunisation Drop-in Centre. Figure 16

indicates the number of patients receiving each of the doses in the Immunisation Drop-in centre, which identifies that some patients did not receive all of the recommended doses.

Figure 16: Number of patients receiving each of the recommended RSV immunoglobulin doses 2013

	1st dose	2nd dose	3rd dose	4th dose	5th dose
No. of patients	109	68	52	33	24

A total of 42 of the 109 (39%) patients were provided other vaccines at the time of the visit for RSV immunoglobulin. Some of the patients may have returned to the Immunisation Drop-in centre at another time for routine immunisations. If parents were not immunised, they were provided with information on influenza and adult pertussis booster vaccine (see Figure 17).

Figure 17: Opportunistic immunisations provided during RSV immunoglobulin visits [2013]

Immunisations	No. of patients/family members immunised
2 month	11
4 month	11
6 month	5
12 month	3
18 month	0
Extra 13vPCV	1
Patient influenza vaccine	11
Parent and sibling influenza vaccine	3
Parent dTpa vaccine	1
Total patients/family members administered vaccines at the time of RSV immunoglobulin visits	46

The 50 mg vials cost about \$800 each and the 100mg vials cost about \$1,500 each. This year the RCH Immunisation

Service saved 31 of the 100mg vials of RSV product as well as 22 vials of the 50mg vials. The total cost saving was estimated to be \$64,100 as outlined in Figure 18 below.

Figure 18: RSV vials saved from cohorting patients [2013]

	Vials would have used	Would have cost	Vials actually used	Actually cost
50mg vials	120	\$96,000	98	\$78,400
100mg vials	226	\$339,000	195	\$292,500
Totals		\$435,000		\$370,900

SPECIAL RISK PATIENTS

The RCH Immunisation Service in conjunction with Monash Children’s Hospital Immunisation service developed guidelines for patients at special risk for vaccine preventable diseases. These guidelines were prepared by affiliated immunisation staff and endorsed at a Monthly Immunisation meeting, held at the Royal Children’s Hospital. Attendees at this meeting include paediatricians, infectious disease physicians, nurse immunisation specialists, infection control team members and a representative from the Immunisation Section of the Victorian Department of Health. 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 the following conditions;

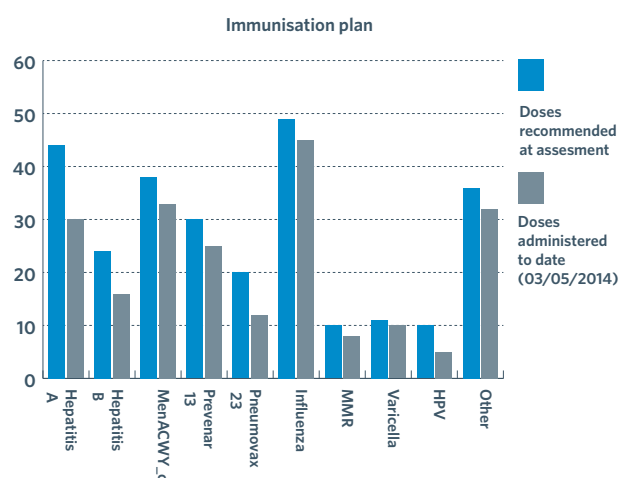
- Solid Organ Transplant Recipient
- Chemotherapy and Post Haematopoietic Stem Cell Transplant
- Asplenia / Hyposplenia

These guidelines have been placed on our Melbourne Vaccine Education Centre website [<http://www.mvec.vic.edu.au/immunisation-references/special-risk/>]. The additional recommended vaccines have been approved and funded by the RCH Drug Utilisation Committee.

LIVER TRANSPLANT AUDIT

In 2013, a 12 month audit of all liver transplant patients was undertaken and an immunisation assessment made. From 1 January to 31 December 2013, the RCH performed 14 liver transplants and in addition, 37 patients were reviewed by the RCH Immunisation Service. Immunisation advice was based on each patient’s previous vaccination history and current age, recent vaccine preventable disease serology, recent blood product administration and current immune suppressive medications. Recommended vaccines were administered by the RCH Drop-in Centre, GP practices or local hospitals. Figure 19 below demonstrates the uptake of vaccines following the recommendations based on the guidelines.

Figure 19: Number of doses recommended and doses administered from 1 January 2013 – 31 December 2013



3

Communication and Accountability

Melbourne Vaccine Education Centre



In February 2014, the RCH Immunisation service in conjunction with the Melbourne Children's partners at SAEFVIC (MCRI) and the University of Melbourne, Department of Paediatrics launched the Melbourne Vaccine Education Centre website (www.mvec.vic.edu.au). This site is hosted by the RCH Education Resource Centre. The aim of MVEC is to provide relevant clinical information based on the latest available evidence, as well as practical tools to assist in education and decision-making around new vaccines. This education initiative is both for healthcare professionals and families and highlights the leadership role that RCH has in Immunisation education at a state and national level.

MVEC includes an A to Z of immunisation references, linking to our special risk guidelines (detailed in the previous section) and other expert resources such as the Better Health Channel. It has also been used as a site to highlight the RCH and Monash Immunisation service position statements, for example regarding the seasonal influenza vaccine and the new Meningococcal B vaccine (Bexsero).

[<http://www.mvec.vic.edu.au/immunisation-references/meningococcal-b/>]

The MVEC site also highlights our Immunisation hotline contact details and an online Victorian Immunisation schedule

[<http://www.mikesouth.org.au/immunisation/AUSIMMWELCOME.html>].

Developed by Mike South, with input from the RCH Immunisation service team and DH, this App is updated regularly, highlighting any recent changes to the Immunisation schedule. This is the place we direct RCH staff regarding our current immunisation schedule, aiming to minimise the risk of drug administration errors.

Immunisation Errors

All immunisation providers strive to ensure that the 5 rights of medication administration are performed. However, errors can still occur. There are two types of errors, the 'near-misses' and the 'actual' errors. The Immunisation Service reports all errors to the Victorian Health Incident Management System 'VHIMS'. By investigating each incident and discussing these at the Monthly Immunisation meeting, we can understand the factors which contribute to vaccine errors and develop strategies to further prevent the errors from re-occurring. Figure 20 below demonstrates the actual vaccine errors in 2012/14 by type and Figure 21 represents the 'near-miss' errors by type for the same reporting period.

Figure 20: Actual vaccine errors from 1 July 2012 – 30 June 2014 by type

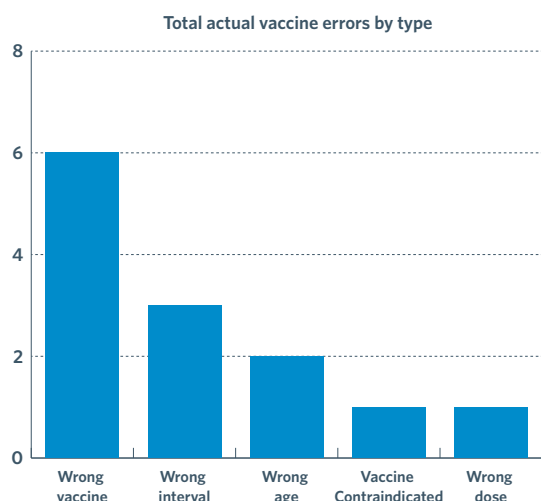
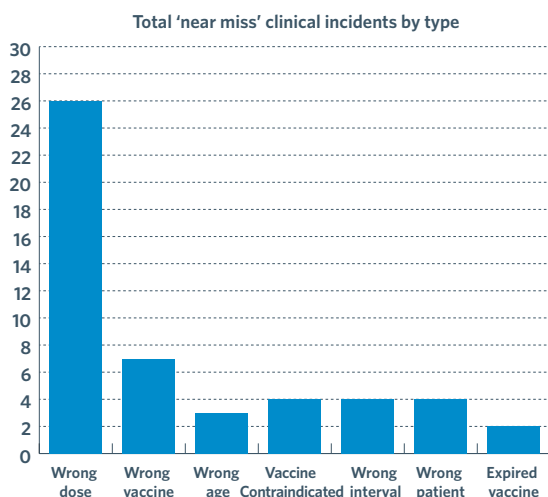


Figure 21: 'Near-miss' vaccine errors from 1 July 2012 – 30 June 2014 by type



Of the total 40 'near-miss' incidents, half of these are related to the BCG vaccine. So when patients are presenting for the BCG vaccine to the Immunisation Drop-in centre, the Immunisation nursing staff are always vigilant to double check the prescription, the age of the child and previous administration of other parenteral live vaccines. These errors have also been fed back to the treating medical teams,

particularly new staff who may not be aware of the high rates of errors associated with vaccines such as BCG.

Immunisation Service Monthly Meeting

Once a month the RCH Immunisation team meet to conduct discussion about various immunisation issues and this is a great forum for exchanging ideas. This group 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: DH Immunisation section, Vaccine and Immunisation Research Group (VIRGO) and Monash Health Immunisation service.

In 2014, the Immunisation service also coordinated a monthly internal business meeting. This allowed us 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, Neonates and Respiratory Medicine). The aim is to improve collaboration between the treating teams and the Immunisation service, with outcomes to be monitored including inpatient vaccine rates and influenza vaccine delivery.

Feedback on the RCH Immunisation Drop-in Centre

While the Immunisation Service loves to hear when we're doing a good job, we are aware that there are times when patients and families are unhappy with their experience of hospital service or care. It is important that we are informed of such events as the information provided enables us to improve our services and care. Feedback forms are available in the Immunisation Drop-in Centre and all feedback is treated with the utmost confidentiality.

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 three complaints and seven compliments.

National Immunisation Teleconference

In 2013, SAEFVIC received funding from the Commonwealth DH for a coordinated vaccine safety clinical network. Nigel Crawford, Margie Danchin, Kirsten Perrett and Jim Buttery are members of the Adverse Events Following Immunisation-Clinical Assessment Network [AEFI-CAN].

The network also includes representatives from the National Centre for Immunisation Research and Surveillance (NCIRS) based at the Westmead Children's Hospital (Sydney), Women's and Children's Hospital (Adelaide), Princess Margaret Hospital (Perth) and Royal Children's Hospital (Brisbane). The teleconference group holds discussions every month, initially focusing on HPV vaccine, following introduction of males to the program in 2013. Other topics discussed at these teleconferences include immunisation adverse events, immunisation policies, topics of interest as well as advice on complex individual patients seen at the adverse event clinics at each site.

Victorian Immunisation Advisory Committee

Nigel Crawford and Jim Buttery are on the Victorian Immunisation Advisory Committee chaired by Rosemary Lester, Chief Medical Officer, DH Victoria. Participants in the committee represent Maternal Child Health Nurses, General Practitioners, Infectious Diseases Paediatricians and others. The group meets quarterly and provides an invaluable sharing of information between DH and the RCH Immunisation Service. Quarterly data on cases of vaccine preventable diseases provides invaluable local information and highlights areas of target immunisation needs. Immunisation program up-dates provided by the Communicable Disease Control Unit allow the RCH Immunisation Service to be aware of ensuing changes or priorities.

Nigel Crawford was appointed to the Australian Technical and Advisory Group on Immunisation (ATAGI) in June 2014.

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

The RCH Immunisation Service continues a close working relationship with SAEFVIC. The SAEFVIC unit is based at the RCH campus and is a partnership between DH, RCH Department of General Medicine, RCH Immunisation Service and the Murdoch Children's Research Institute and Monash Health. Nigel Crawford holds a joint position as Deputy Director of SAEFVIC. The RCH Immunisation Paediatricians (Nigel Crawford, Teresa Lazzaro, Wonie Uahwatanasakul, Kirsten Perrett and Margie Danchin) all see SAEFVIC vaccine safety patients as part of the weekly immunisation clinic.

There have been over 8,000 adverse events following immunisation reported to SAEFVIC following its formation in 2007. This equates to 1,000 reports per year with approximately 30% or 300 vaccinees seen in vaccine safety clinics per annum. The SAEFVIC clinic is incorporated into the Tuesday morning RCH Immunisation service clinic, with follow-up vaccines administered in the outpatient treatment rooms or Drop-in centre if required. In some instances, patients are admitted to the Day Medical Unit or overnight in the Dolphin short stay ward for vaccination as required. SAEFVIC administration and nursing staff help facilitate the outpatient and inpatient follow-up in close collaboration with the RCH Immunisation service nursing team.

Immunisation Education Provision

Immunisation education is an important part of the service provided by the RCH Immunisation team of Specialist Nurses and Paediatricians.

PHAA IMMUNISATION CONFERENCE [MELBOURNE JUNE 2014]

The 2-yearly Public Health Association of Australia (PHAA) Immunisation conference was held in Melbourne in June 2014. As this was a unique opportunity to contribute to national vaccine education, RCH Immunisation had a prominent position at the conference. We had a conference stand, shared

with our Monash Immunisation service colleagues. RCH and SAEFVIC team members staffed this stand with lots of queries from conference attendees.

RCH Immunisation service and SAEFVIC also presented a number of presentations and posters at this conference as detailed in our external education activities (see below).

EDUCATION AT RCH

Weekly vaccine education sessions continue at RCH, being held each Tuesday morning (8:30 – 9:00). This session includes discussion of new vaccines, research, articles of interest, vaccine safety and programmatic issues. It is always well attended and gives all staff the opportunity to present and discuss topics of interest. There is also a patient discussion forum following the Tuesday clinic (12:30-13:00).

RCH NURSING AND MEDICAL IMMUNISATION UPDATES

RCH Immunisation Staff Education (48)

Formal weekly education sessions commenced on Tuesday mornings in 2012 as detailed above. Each week an Immunisation staff member presents a topic of interest and shares with the team. Topics covered include; Rotavirus, Pneumococcal, influenza, varicella, allergies, haemodialysis and Hepatitis B, Typhoid, RSV immunoglobulin, Tuberculosis, SAEFVIC reports, Cardiac patients and immunisation, immunology and adolescent immunisation.

RCH ward nursing Immunisation Up-dates (18)

- Emergency department (1, Sonja Elia)
- Cardiac Unit (1, Rachael McGuire)
- Outpatient department (1, Kate Wall)
- Short Stay Unit (7, Sonja Elia, Melissa Dallinger)
- Pharmacy department (1, Sonja Elia)
- Neurology and Gastro unit (1, Kate Wall)
- General Medical Unit (5, Rachael McGuire)
- Neonatal Unit (1, Sonja Elia)

Clinical teaching for Graduate nurses, ward nurses, work experience students (7)

- Throughout the year nurses from within and external to RCH request to attend and observe at the Immunisation Drop-in Centre to learn about giving vaccines and observe the techniques and communication style of the RCH Immunisation Nurses (4)
- Immunisation update for Graduate nurses (3, Sonja Elia, Rachael McGuire)

RCH student immunisation teaching sessions (8)

- Paediatric Foundation Program (5, Sonja Elia, Kate Wall, Mel Addison)
- Postgraduate Diploma in Advanced Practice Nursing (2, Kate Wall)
- Neonatal Emergency Transport Service videoconference on Pertussis (1, Sonja Elia)

Clinical mentoring of Immunisation Nursing students from LaTrobe University (23)

Following successful completion of the LaTrobe University Nurse Immuniser course some nurses complete their clinical mentorship with the RCH Immunisation Service. LaTrobe University approved mentors at RCH include Rebecca Feore, Mel Addison, Kate Wall, Kirsten Mitchell, Sonja Elia and Rachael McGuire.

RCH MEDICAL STAFF IMMUNISATION UPDATES

- RCH Clinical Practice Review – ‘Medication safety: Vaccine errors, more than just a booster’ (Nigel Crawford and Sonja Elia)
- RCH Grand Round (May 2013): Maternal antibodies to rotavirus and their potential interference with live, oral rotavirus vaccines in developing countries (Margie Danchin)
- RCH Grand Round (February 2014): Launching the Melbourne Vaccine Education Centre (MVEC) and keeping RCH Flu-free in 2014 (Nigel Crawford)
- RCH Campus Clinical and Public Health Research Seminars (June 2014): Clinical Immunisation and Vaccine Safety Research at RCH (Nigel Crawford and Sonja Elia)

MELBOURNE UNIVERSITY MEDICAL STUDENT TEACHING AT RCH

- Immunisation lecture during the introductory week of each University term (Kate Wall)

EXTERNAL EDUCATION

Victorian Maternal and Child Health Nurses

- Immunisation up-date held at the Midwives and Mothers Association (Sonja Elia)
- Maternal and Child Health Nurse tour of the RCH and the Immunisation Drop-in centre (Sonja Elia)
- What's new and what's different in immunisation. Australian College of Children and Young People's nurses, Victorian Chapter meeting, February 2013 (Sonja Elia)
- Choosing not to immunise: myths and misconceptions. Australian College of Children and Young People's nurses, Conference masterclass, Melbourne, August 2013 (Sonja Elia)
- The Immunisation Service at the Royal Children's Hospital, Melbourne. Australian College of Children and Young People's Nurses Conference, Melbourne, August 2013 (Sonja Elia)
- Importance of Timeliness in Immunisation. Australian Practice Nurses Association, Movers and Shakers Conference, Melbourne, October 2013 (Sonja Elia)

General Practitioners and Immunisation Providers

- Hypotonic Hyporesponsive Episodes following immunisation. 14th National Immunisation Conference, Public Health Association of Australia, Melbourne, June 2014 (Nigel Crawford)
- Clinical evaluation of Adverse Events Following Immunisation: the Australian experience (Plenary). 14th National Immunisation Conference, Public Health Association of Australia, Melbourne, June 2014 (Nigel Crawford)
- Antibody persistence in Australian adolescents following meningococcal C conjugate vaccination in Childhood. 14th National Immunisation Conference, Public Health Association of Australia, Melbourne, June 2014 (Kirsten Perrett)

- New approaches to tackling Vaccine Hesitancy in Australia: the role of the paediatrician. 14th National Immunisation Conference, Public Health Association of Australia, Melbourne, June 2014 (Margie Danchin)
- Getting the jabs done: Working with the community and parents to overcome barriers to immunisation – can we immunise everyone? Public Health Association of Australia, Melbourne, June 2014 (Margie Danchin)
- Providing opportunistic immunisations for inpatients at the Royal Children's Hospital. 14th National Immunisation Conference, Public Health Association of Australia, Melbourne, June 2014 (Sonja Elia)
- Immunisation update, Clinical Paediatric Update (CPU), RCH, Melbourne, June 2014 (Nigel Crawford)
- To Jab or not to jab, Victorian Pharmacy Association Congress, May 2014 (Nigel Crawford)
- Communication with the Vaccine Hesitant parent: new approaches. Immunisation Nurses Special Interest Group Tasmania, March 2014 (Margie Danchin)
- New Influenza vaccines [panel discussion] – live attenuated vaccine. Influenza Specialist Group, Annual Scientific Meeting, Melbourne, February 2014 (Nigel Crawford)
- Conjugate pneumococcal vaccines for children and adults. Influenza Specialist Group, Annual Scientific Meeting, Melbourne, February 2014 (Margie Danchin)
- Influenza and the role of Pneumococcal Vaccination. Influenza Specialist Group, Annual Scientific Meeting, Melbourne, February 2013 (Nigel Crawford)
- The Immunisation Service at the RCH, Clinical Vaccinology Update (CVU), December 2013 (Sonja Elia)
- What's new in vaccines? Royal Children Hospital Clinical Vaccinology Update (CVU), December 2013 (Margie Danchin)
- New approaches to tackling vaccine hesitancy, Immunisation Local Council Forum, Victorian Department of Health, November 2013 (Margie Danchin)
- Impact of maternal antibodies on rotavirus vaccine immunogenicity in developing countries, National Centre for Immunisation Research and Surveillance, The Children's Hospital at Westmead, November 2013 (Margie Danchin)

- FRACP written exam lectures: Immunisation and vaccine safety, October 2013 (Nigel Crawford)
- Vaccine Education: An evidence based approach. Immunisation Advisory Centre, 8th Immunisation Conference and workshop, New Zealand, September 2013 (Nigel Crawford)
- Preterm infants immunisation. Immunisation Advisory Centre, 8th Immunisation Conference and workshop, New Zealand, September 2013 (Nigel Crawford)
- Vaccine Safety: HPV vaccine as a case study. Immunisation Advisory Centre, 8th Immunisation Conference and workshop, New Zealand, September 2013 (Nigel Crawford)
- Vaccine Safety, Adverse Events and What's New? Nestle Infant Nutrition and Paediatric Update, August 2013 (Margie Danchin)
- Medicare Local Immunisation Update, Barwon Region, Vaccine Safety and Adverse Events, July 2013 (Margie Danchin)
- Medicare Local Immunisation Update, Macedon Ranges and North-Western Melbourne, Vaccine Safety and Adverse Events, May 2013 (Margie Danchin)
- Optimising Immunisation in Special Risk Groups, Australian Society of Infectious Diseases, Plenary, Canberra, April 2013 (Nigel Crawford)
- Immunisation in Childhood Cancer, Australian and New Zealand Children's Haematology Oncology Group, Plenary, June 2013 (Nigel Crawford)
- Meningococcal Vaccines: Filling the alphabet. Clinical Vaccinology Update (CVU), October 2012 (Kirsten Perrett)
- Pneumococcal vaccines: the 7up Project. Clinical Vaccinology Update (CVU), October 2012 (Nigel Crawford)

Staffing

MEDICAL STAFFING

Nigel Crawford has an appointment with RCH Immunisation service (2 sessions) and SAEFVIC MCRI (1 session). Margie Danchin has an appointment for 2 medical sessions, with 1 session being maternity leave cover for Kirsten Perrett (returning to RCH November 2014). Teresa Lazzaro has an appointment for 1 medical session and a weekly immunisation clinic and Wonie Uahwatanasaku has a weekly Fee for Service (FFS) immunisation clinic.

NURSING STAFFING

Over the past 2 years, Kelly Bernard has moved on from the Immunisation Service to take up a full time Nurse Unit Manager role on Possum ward. The Immunisation Service has also had some new staff join the team, particularly over the course of the RSV Immunoglobulin program. We would like to formally thank them for their contribution to the high quality care delivered by the immunisation team. This includes: Isabelle Legrigore, Melissa Kennedy, Kerryn Williams and Peta Kilsby.

ADMINISTRATIVE SUPPORT

Jessica Elia and Julie Bond have continued their work with the Immunisation Service in an administrative role and this has been extremely helpful to the nursing and medical staff who had previously taken on all of the administrative duties. They are both extremely knowledgeable about Immunisation and on occasion have prevented clinical immunisation errors, through initial screening of patient held immunisation records. This administrative support has also been extremely helpful in establishing the dedicated BCG clinics. Ongoing funding for administrative support is crucial to ensure the continual efficiencies of the Immunisation Service.

4

Clinical Immunisation Research and Publications

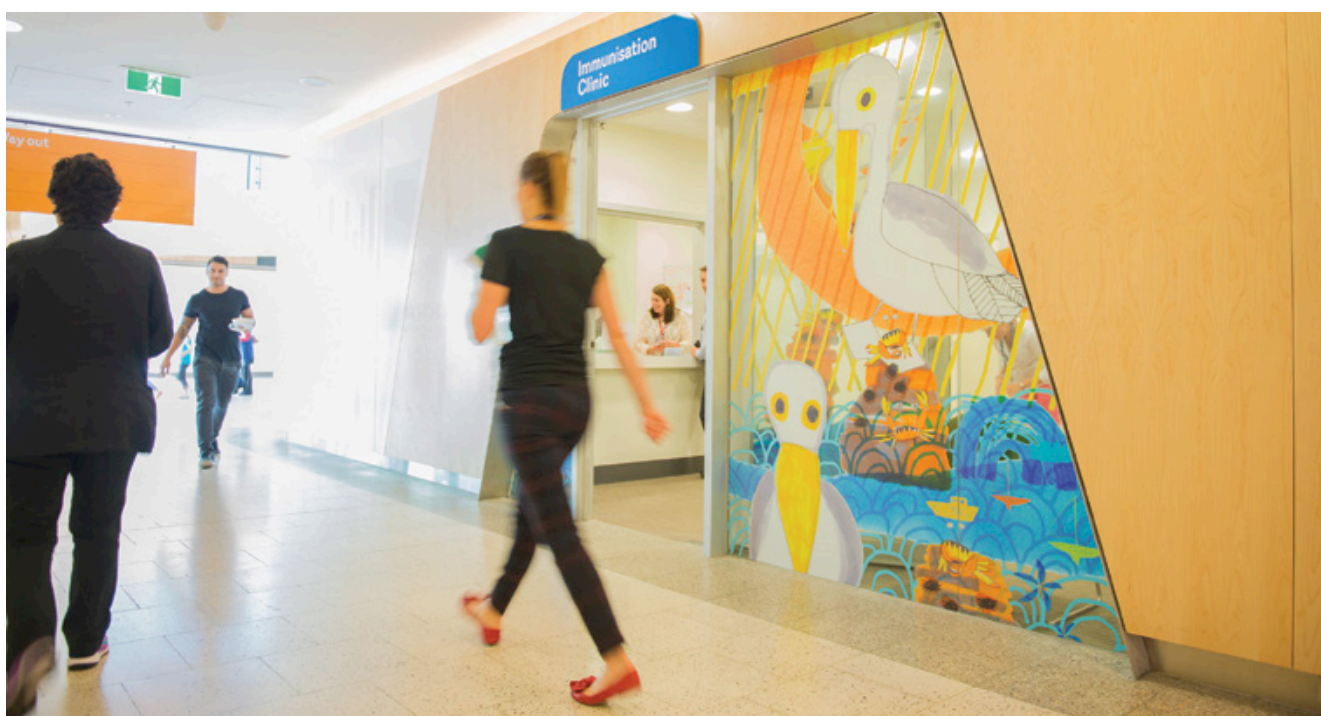
Publications

1. Harrison D, **Elia S**, Royle J and Manias E. Pain management strategies used during early childhood immunisation in Victoria. *Journal of Paediatrics and Child Health* 2013; 49(4): 313-318
2. Harrison D, **Elia S**, Manias E, Royle J. Sucrose and lollipops to reduce immunisation pain in toddlers and young children: Two pilot randomised controlled trials. *Neonatal, Paediatric and Child Health Nursing* 2014; 17(1):20-28.
3. Gomez R, Barrowman N, **Elia S**, Manias E, Royle J and Harrison D. Establishing intra- and inter-rater agreement of the Face, Legs, Activity, Cry, Consolability scale for evaluating pain in toddlers during immunization. *Journal of Pain Research and Management* 2013; Nov-Dec; 18(6):e124-8.
4. Donato CM, Manuelpillai NM, Cowley D, Roczo-Farkas S, BATTERY JP, **Crawford NW**, et al. Genetic characterization of a novel G3P[14] rotavirus strain causing gastroenteritis in 12 year -old Australian child. *Infection, Genetics and Evolution*. 2014;25(0):97-109.
5. **Crawford NW**, Hunt RW. Rotavirus vaccine timeliness in special care nurseries. *Archives of Disease in Childhood - Fetal and Neonatal Edition*. 2014 March 4, 2014;DOI:10.1136/archdischild-2014-306107.
6. **Crawford NW**, Clothier H, Hodgson K, Selvaraj G, Easton ML, BATTERY JP. Active surveillance for adverse events following immunization. *Expert Review of Vaccines*. 2014;13(2):265-76.
7. **Crawford NW**, Barfield C, Hunt RW, Pitcher H, BATTERY JP. Improving preterm infants immunization status: A follow- up audit. *Journal of Paediatrics and Child Health*. 2014;50(4):314-8.
8. Akikusa J, **Crawford N**. Vaccination in Paediatric Rheumatology. *Curr Rheumatol Rep*. 2014 2014/06/13;16(8):1-7.
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10. **Crawford NW**, Graham SM. EV71 vaccine: protection from a previously neglected disease. *The Lancet*. 2013;[http://dx.doi.org/10.1016/S0140-6736\(13\)61124-1](http://dx.doi.org/10.1016/S0140-6736(13)61124-1).
11. **Crawford NW**, BATTERY JP. Adverse events following immunizations: fact and fiction. *Paediatrics and Child Health*. 2013;23(3):121-4.
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13. Campbell S, **Crawford NW**. Varicella infection in infants less than 12 months. *Vaccine*. 2013;31(2):295-6.
14. Tran D, Clothier H, BATTERY JP, **Crawford NW**. Surveillance of adverse events following H1N1/09 influenza immunisation in Victoria, Australia. *Nature Science*. 2012;4(12):1065-73.
15. Richards S, Chalkiadis G, Lakshman R, BATTERY JP, **Crawford NW**. Complex regional pain syndrome following immunisation. *Archives of Disease in Childhood*. 2012;97(10):913-5.
16. Donato CM, Chông LS, Boniface KF, **Crawford NW**, BATTERY JP, Lyon M, et al. Identification of Strains of Rotavirus Vaccine RotaTeq in Infants with Gastroenteritis Following Routine Vaccination. *Journal of Infectious Diseases*. 2012;doi: 10.1093/infdis/jis361.

- 17 **Crawford NW** et al. Guillain-Barré syndrome following pandemic (H1N1) 2009 influenza A immunisation in Victoria: a self-controlled case series. *Medical Journal of Australia* 2012;197(10):574-78.
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- 19 **Crawford NW**. The Australian Immunisation system. *Vaccines in Practice*. 2012;4(4):4-5.
- 20 Chin LK, **Crawford NW**, Rowles G, BATTERY JP. Authors' reply: Australian immunisation registers: established foundations and opportunities for improvement.[Letter]. *Euro Surveill*. 2012;17(21).
- 21 Chin LK, **Crawford NW**, Rowles G, BATTERY JP. Australian immunisation registers: established foundations and opportunities for improvement. *Euro Surveill*. 2012;17(6).
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- 23 **Danchin M**, Nolan T. A positive approach to parents with concerns about vaccination for the family physician. *Australian Family Physician*, 2014. *In press*.
- 24 Leask J, Cheater F, Kinnersley P, Willaby H, **Danchin M**. Presumptive initiations in vaccine discussions with parents: acquiescence but at what cost? Letter in response to: Opel et al. The Architecture of Provider-Parent Vaccine Discussions at Health Supervision Visits. *Pediatrics* 2013; 132:6 1037-1046.
- 25 Dunne EM, Marshall JL, Baker CA, Manning J, Gonis G, **Danchin MH**, et al. Detection of group A streptococcal pharyngitis by quantitative PCR. *BMC infectious diseases*. 2013;13(1):312.
- 26 **Danchin M**, Kirkwood CD, Lee KJ, Bishop RF, Watts E, Justice FA, et al. Phase I trial of RV3-BB rotavirus vaccine: A human neonatal rotavirus vaccine. *Vaccine*. 2013;31(23):2610-6

Conference Abstracts

- (i) Immunisation of pre and post liver transplant recipients at the Royal Children's Hospital Melbourne (poster). Rachael McGuire, Lauren Herd, Kathe Beyerle, Thao Nguyen, George Alex, Winita Hardikar and Nigel Crawford. 14th National Immunisation conference (PHAA), Melbourne, June 2014
- (ii) Respiratory Syncytial Virus Immunoglobulin for Cardiology patients at the Royal Children's Hospital (poster). Sonja Elia, Nigel Crawford, Mailei Krippner, Kate Wall, Melissa Dallinger, Rachael McGuire, Robin Cavanagh, Mel Addison, Rebecca Feore, Kirsten Mitchell, Melissa Nesbitt, Kerryn Williams, Peta Kilsby, Kelly Bernard, Angela Wood and Michael Cheung. 14th National Immunisation conference (PHAA), Melbourne, June 2014



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