SMS/technologies to improve immunisation rates & safety

Prepared by HNE Immunisation Unit

Reviewed Oct 2014
SMS/technologies

- Aboriginal infant immunisation timeliness
- Vaxtracker – Vaccine safety
Covered in Victorian Glory
The above photograph of Winmar has been described as one of the most significant in Australian sporting history.
A country of Gaps
Closing the Gap in Indigenous Disadvantage

In 2008, COAG agreed to six ambitious targets to address the disadvantage faced by Indigenous Australians in life expectancy, child mortality, education and employment.

They are to:
- close the gap in life expectancy within a generation (by 2031);
- halve the gap in mortality rates for Indigenous children under five by 2018;
- ensure access to early childhood education for all Indigenous four year olds in remote communities by 2013;
- halve the gap in reading, writing and numeracy achievements for children by 2018;
- halve the gap for Indigenous students in Year 12 (or equivalent) attainment rates by 2020; and
- halve the gap in employment outcomes between Indigenous and other Australians by 2018.

The targets are set out in the National Indigenous Reform Agreement which commits the Commonwealth, States and Territories to unprecedented levels of investment to close the gap in Indigenous disadvantage.
Fixing the Gap
• Estimated resident population at 30 June 2010

<table>
<thead>
<tr>
<th>Hunter New England</th>
<th>Persons</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aboriginal</td>
<td>34,521</td>
</tr>
<tr>
<td>Non-Aboriginal</td>
<td>840,123</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>874,644</strong></td>
</tr>
</tbody>
</table>

• HNE has 12.3% of the NSW population but 21.3% of the NSW Aboriginal & Torres Strait Islander population.
Aboriginal People of Hunter New England Local Health District

Hunter New England Area Health Service
Aboriginal Nations Map

- Kamiloroi
  - Boggabilla
  - Tooromeelah
- Ngarabal
  - Moree
  - Warialda
  - Inverell
  - Wee Waa
  - Narrabri
- Bundjalung
  - Glen Innes
  - Tenterfield
- Gumbainggir
  - Armidale
  - Gunnedah
- Dainggatti
  - Guyra
- Nganyaywana
  - Walcha
  - Barraba
- Geawegal
  - Boggabri
  - Manilla
- Biripi
  - Wee Waa
  - Narrabri
- Wonnaru
  - Barraba
  - Armidale
  - Glen Innes
  - Tenterfield
- Worimi
  - Moree
  - Warialda
- Darkinung
  - Walcha
  - Barraba
  - Armidale
- Awabakal
  - Glen Innes
  - Tenterfield
- Newcastle
  - Glen Innes
  - Tenterfield

NSW Population Health
Health Government NSW
### Hunter New England by Cluster  Four quarters to 31 March 2010
**Children 12 <15m - Not Immunised**

<table>
<thead>
<tr>
<th>Cluster</th>
<th>Non-Aboriginal children</th>
<th>Aboriginal children</th>
</tr>
</thead>
<tbody>
<tr>
<td>AUS</td>
<td>8.0%</td>
<td>15.5%</td>
</tr>
<tr>
<td>NSW</td>
<td>7.8%</td>
<td>13.2%</td>
</tr>
<tr>
<td>Upper Hunter</td>
<td>7.2%</td>
<td>13.8%</td>
</tr>
<tr>
<td>Tablelands</td>
<td>5.9%</td>
<td>20.0%</td>
</tr>
<tr>
<td>Peel</td>
<td>4.5%</td>
<td>12.1%</td>
</tr>
<tr>
<td>Mehi</td>
<td>4.5%</td>
<td>15.6%</td>
</tr>
<tr>
<td>McIntyre</td>
<td>4.8%</td>
<td>20.0%</td>
</tr>
<tr>
<td>Lower Hunter</td>
<td>5.1%</td>
<td>10.2%</td>
</tr>
<tr>
<td>Lower MN Coast</td>
<td>7.9%</td>
<td>15.5%</td>
</tr>
<tr>
<td>Greater Newcastle</td>
<td>6.1%</td>
<td>9.1%</td>
</tr>
</tbody>
</table>
Provide cultural and general information regarding baby’s upcoming immunisation.
Data Base
Structure of project

Program set up to contact mothers **before immunisations are due** not wait until overdue.

- 28day
- 6 wks
- 4mths
- 6months
- 12 months
Text messages

- Text message wording put together by Aboriginal Health Worker’s ensuring cultural appropriateness.

- 160 characters

- “Have u made appt for bubs immunisation? Make appt now to see your Dr or clinic. Need help? Call HNEHealth 67648037 or 49246479. Pls do not reply to this text.”

- Hi this is the link for the free save the date immunisation app. [http://www.immunisation.health.nsw.gov.au](http://www.immunisation.health.nsw.gov.au)
Hunter New England LHD clusters: four quarters to 30 June 2014
Children 12<15 mths - Not Immunised

- Australia: 13.7%
- NSW: 12.2%
- HNE LHD: 9.5%
- Tablelands Cluster: 8.2%
- Peel Cluster: 9.2%
- Mehi Cluster: 14.0%
- Lower Mid North Coast Cluster: 9.5%
- Hunter Valley Cluster: 7.9%
- Greater Newcastle Cluster: 9.9%
Immunisation Close the Gap

HNE vs NSW (without HNE)
Aboriginal vs Non Aboriginal Percentages
12-15 months
Solution – employ Aboriginal People
FluTracking is an online health surveillance system to detect epidemics of influenza. We are looking for people who live in Australia and have easy access to email on a weekly basis. It doesn't matter if you are vaccinated or unvaccinated.

It takes only 10 - 15 seconds each week. We ask if you have had fever or cough in the last week. This will help us find ways to detect both seasonal influenza and hopefully pandemic influenza and other diseases so we can better protect the community from epidemics.

You will receive weekly information on influenza-like activity in the region based on our analysis of the data. Participation is voluntary and your information will be kept confidential. See our Weekly Influenza Map and Last Week's Report.
Vaxtracker

Vaxtracker Project
vaxtracker.net/ - Cached

Vaxtracker Project. Vaxtracker is a pilot program to test notifications of adverse events from influenza vaccine in children by their parents. It is a project of Hunter...

Vaxtracker Clinic Login
Vaxtracker Clinic Login. Thank you for
More results from vaxtracker.net »

Vaxtracker Admin
Vaxtracker Admin Vaxtracker Admin

VaxTracking Introduction
www.slideboom.com/presentations/...VaxTrackingIntroduction - Cached

Introduction to Video Analytics Analysis of video, of specific data Object behavior or attitude Video analytics is much more than Motion detection Example video...
What is Vaxtracker?

Vaxtracker is a program that allows the parents/carers of children to report vaccine reactions following enrolment of their child at the time of routine vaccination.

It is a project that began in the Hunter New England Local Health District of New South Wales and has expanded in 2014 to cover four areas within NSW (South East Sydney, Western Sydney and Sydney Children’s Hospital Network in addition to HNE) and also multiple sites in Victoria.

Vaxtracker provides information to the AusVaxSafety network. AusVaxSafety is led by the NCIRS and funded by the Australian Government Department of Health (Health). Information collected via Vaxtracker and another active system call Follow up and Active Surveillance of Trivalent influenza vaccine (FAST) in WA is combined and analysed on a weekly basis and reported to the Health and the Therapeutic Goods Administration (TGA).

This information helps parents and all health professionals involved in immunisation, know that the vaccines being used are safe. For more information about AusVaxSafety please visit the NCIRS website under “Surveillance”.

At the time of vaccination, participating clinics register the email address or mobile number of the child’s parent/carer who then receives invitations to complete a short survey(s) at predefined time(s) after the vaccination. These surveys check on any reactions the child may have experienced. There may also be a reminder to parents if the child needs a second vaccine.

Participation is entirely voluntary and all individual information will remain confidential.

If you have any questions about Vaxtracker please call 02 4924 6477 and ask to speak to Vaxtracker staff, or the project leader Patrick Cashman or email vaxtracker@hnehealth.nsw.gov.au.

If you have any questions about AusVaxSafety, please call the NCIRS on 1800 750 566 and ask to speak to the project leader A/Prof Kristine Macartney or email ncirs.schn@health.nsw.gov.au.
Background

• Vaxtracker
  – online
  – near real time
  – AEFI surveillance system.

• Vaxtracker is able to provide
  – timely post marketing surveillance of new vaccines
  – early signal detection of any adverse events.
Ethics

• Surveillance of AEFI’s is conducted under the NSW Public Health Act therefore ethical review was not required for this enhancement to existing surveillance
Background

Good AEFI surveillance is essential to integrity of immunisation program
Using automated text messages to monitor adverse events following immunisation in general practice

Abstract

Objective: To assess the performance of SmartVax, a prototypic active monitoring system for adverse events following immunisation (AEFI) using short message service (SMS) text messages and clinical data extracted from commercially available medical practice management software.

Design, setting and participants: Between 11 November 2011 and 10 June 2013, adult patients and parents of paediatric patients receiving routine vaccinations in general practice were sent an SMS by SmartVax enquiring if they had experienced any AEFI and requesting a reply by SMS. Attempts were made to telephone patients who did not reply by SMS.

Main outcome measures: The proportion of patients sent an SMS who replied by SMS, and the proportion of respondents indicating possible AEFI.

Results: Of 3281 vaccinated patients, 3226 (98.3%) had a mobile telephone number on record and were sent an SMS. Of 2342 patients (72.5%; 95% CI, 70.0–75.1%) who responded by SMS, 266 (11.3%; 95% CI, 9.0–13.7%)
Western Australian Children’s Follow up and Active Surveillance of Trivalent influenza vaccine (FAST) Study

A/Prof. Peter Richmond, A/Prof. Christopher Blyth, Dr Tracy Markus
A first world approach to vaccine safety?

• Dr Mo Ibrahim – Celtel
Vaccines safety; effect of supervision or SMS on reporting rates of adverse events following immunization (AEFI) with meningitis vaccine (MenAfriVac™): A randomized controlled trial

Jerome Ateudjieu a, b, c,*, Beat Stoll d, Georges Nguefack-Tsague e, Christoph Tchangou f, Blaise Genton b, g

a Department of Biomedical Sciences, Faculty of Sciences, University of Dschang, Cameroon
b Department of Epidemiology and Public Health, Swiss Tropical and Public Health Institute, Basel, Switzerland
c Clinical Research Unit, Division of Health Operations Research, Ministry of Public Health, Cameroon
d Institute of Social and Preventive Medicine, Faculty of Medicine, University of Geneva, Switzerland
e Biostatistics Unit, Department of Public Health, Faculty of Medicine & Biomedical Sciences, University of Yaounde I, Cameroon
f Department of Pharmacology Drugs and Laboratory, Ministry of Public Health, Cameroon
g Department of Ambulatory Care and Community Medicine, Infectious Disease Service, University Hospital, Lausanne, Switzerland

ARTICLE INFO

Article history:

ABSTRACT

Background: To ensure vaccines safety, given the weaknesses of the national pharmacovigilance system
Vaxtracker participants: 2011-14

Year and Vaxtracker program

<table>
<thead>
<tr>
<th>Year</th>
<th>Program</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011</td>
<td>Influenza</td>
</tr>
<tr>
<td>2012</td>
<td>Influenza</td>
</tr>
<tr>
<td>2013</td>
<td>Influenza</td>
</tr>
<tr>
<td>2013/14</td>
<td>MMRV</td>
</tr>
<tr>
<td>2014</td>
<td>Influenza</td>
</tr>
<tr>
<td>Vaxtracker Program</td>
<td>Scope</td>
</tr>
<tr>
<td>--------------------------------------------</td>
<td>------------------------------------------------</td>
</tr>
<tr>
<td>Influenza Vaxtracker – 2011*</td>
<td>Newcastle &amp; Tamworth GPs</td>
</tr>
<tr>
<td>Influenza Vaxtracker – 2012*</td>
<td>HNE GPs &amp; Westmead Children’s Hospital</td>
</tr>
<tr>
<td>Influenza Vaxtracker- 2013*</td>
<td>HNE GPs</td>
</tr>
<tr>
<td>MMRV Vaxtracker – 2013/14**</td>
<td>HNE GPs &amp; HNE Community Health</td>
</tr>
<tr>
<td>Influenza Vaxtracker 2014***</td>
<td>HNE GPs, Sydney Children Hospitals, SES and WS local health districts, SAEFVIC.</td>
</tr>
</tbody>
</table>

* Age range 6 months - < 10 years
** Age range 12 month – <11 years
*** 6 months - <5 years
If they do respond, they will jump to a web form that offers a four-way choice of pathways to follow:

1. **Have Already Had Extra Vax** – In which case the vaccination date is requested and they proceed to Phase D if the extra vax was less than 7 days ago, or **Phase E** if not.
2. **Not Yet Had Extra Vax** – in which case they remain at **Phase C** and will receive another reminder.
3. **Not Going To Have Extra Vax** – in which case they proceed to **Phase F**.
4. **Want To Unsubscribe** – in which case they proceed to **Phase G**.

```
Vaxtracker System

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```
Vaxtracker – what does it do?

Vaccination → Vaxtracker

Clinic Invite (web) → Web Survey

Vaxtracker Admin → Review Reactions

→ Manage Data

→ AusVox Safety
Video of clinic and participant web pages


- http://www.vaxtracker.net/Content/VaxtrackerOct2014.mp4
What is going on? – run a report
Reactions: Flu 2015 (HNE)

<table>
<thead>
<tr>
<th>Submitted</th>
<th>Participant</th>
<th>Survey</th>
<th>Reaction</th>
<th>Followed</th>
<th>Admin</th>
<th>Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>24/10/14</td>
<td>John Clarke</td>
<td>First</td>
<td>Seizures</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14/10/14</td>
<td>Paddy1 cashman</td>
<td>First</td>
<td>Fever, Reaction at Injection Site, Seizures, Rash, Chills and Shakes, Vomiting, Headaches or Irritability, Other Symptoms</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10/10/14</td>
<td>Stephen</td>
<td>First</td>
<td>Reactions at Injection Site, Seizures, Headaches or Irritability, Other Symptoms</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Follow-up Details

Date: 26/10/14
Admin: Patrick Cashman

Spoke With: Patrick's mum
Comments: Please nod approvingly so others in the room think the presentation is going well

Assessment

Serious AEFI: No
AEFI Notified: No
NCIMS Case Ref: 
Further Action: Referral to AEFI Clinic
Current Status: Follow-Up Completed

Update
Vaxtracker outcomes

• Influenza Vaxtracker 2012
  – Commencement of online survey component
  – Reaction at injection site (21.2%), low fever rate (2%), nil seizures

• Influenza Vaxtracker 2013
  – Reaction rates higher for Vaxigrip, when compared to other inactivated influenza vaccines (p = 0.02)
  – Reported to Commonwealth DOH and TGA for investigation

• MMRV Vaxtracker 2013/14
  – Data supports recommendation that MMRV can be safely given as the second dose of measles containing vaccine.
  – Supports vaccine company’s prelicensure trial data.

• Influenza Vaxtracker 2014
  – AusVaxSafety: Vaxtracker and Western Australia data
  – Demonstrated that influenza vaccines registered and used for children are safe
2013 Results

• 477 participants
  – (20 lost due to incorrect contact details, and 20 aged >10 years)
• 61% (n=290) of parents completed first online survey at day 3
• Of these 47% (n= 136) completed the final survey at day 42
## Results

<table>
<thead>
<tr>
<th>Event</th>
<th>Count (Percentage)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Participants 1st survey</strong></td>
<td>290</td>
</tr>
<tr>
<td>Any adverse event 1st dose</td>
<td>52 (18%)</td>
</tr>
<tr>
<td>Serious adverse event</td>
<td>0</td>
</tr>
<tr>
<td>Sought medical attention</td>
<td>4</td>
</tr>
<tr>
<td>Reaction at Injection Site</td>
<td>23 (8%)</td>
</tr>
<tr>
<td>Fever</td>
<td>8 (3%)</td>
</tr>
<tr>
<td>Headaches</td>
<td>9</td>
</tr>
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<td>Fatigue</td>
<td>15</td>
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<tr>
<td>Influenza-Like Illness</td>
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</tr>
<tr>
<td>Lymph Node Swelling</td>
<td>3</td>
</tr>
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<td>Seizures</td>
<td>0</td>
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<td>Muscle Aches</td>
<td>14</td>
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<tr>
<td>Weakness</td>
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</tr>
<tr>
<td>Other Symptoms</td>
<td>9</td>
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</table>

Rates of reactions within expected range.
## Results

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</tr>
</tbody>
</table>

No serious reactions or seizures
### Results cont.

<table>
<thead>
<tr>
<th></th>
<th>Agrippal</th>
<th>Fluarix</th>
<th>Influvac</th>
<th>Vaxigrip</th>
<th>Vaxigrip Jnr</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participants 1st survey</td>
<td>1</td>
<td>43</td>
<td>32</td>
<td>212</td>
<td>2</td>
<td>290</td>
</tr>
<tr>
<td>Any adverse event 1st dose</td>
<td>0</td>
<td>5(12%)</td>
<td>1 (3%)</td>
<td>46(22%)</td>
<td>0</td>
<td>52 (18%)</td>
</tr>
</tbody>
</table>

- Higher rates of any reaction in participants receiving Vaxigrip (22%) compared to other brands (6/78, 8%) (p=0.01)
AusVaxSafety surveillance shows 2014 seasonal influenza vaccine is safe in children under 5 years of age

As of 22 June 2014, AusVaxSafety surveillance has collected information from the parents/carers of 735 children given the 2014 influenza vaccine. The surveillance shows that:

- Fewer than one in five (18.4%) children vaccinated had a mild reaction at the injection site (e.g. pain or redness) or a systemic reaction (e.g. headache or irritability) after vaccination.
- Fewer than one in fifteen (6.5%) children had fever after vaccination.
- Reported reactions were generally mild and resolved within 1 to 2 days. No serious vaccine reactions were reported.
- These findings are well within the expected range and demonstrate that the influenza vaccines registered and recommended for use in children under 5 years of age are safe.

Surveillance also shows that the 2014 influenza vaccine has a good safety profile in adults, including pregnant women as discussed below.*

Overview of AusVaxSafety

AusVaxSafety is an enhanced surveillance system to monitor adverse events following immunisation with influenza vaccine in children under 5 years of age.

AusVaxSafety brings together information collected through two systems: Vaxtracker in New South Wales and Victoria and FAST (Follow up and Active Surveillance of Trivalent influenza vaccine) in Western Australia.

This information helps parents and all health professionals involved in immunisation know that the vaccines being used are safe.

The information is also shared with the Therapeutic Goods Administration (TGA), the Australian Government Department of Health (HEALTH) and the participating state health departments, all of whom have a shared responsibility for monitoring the safe use of vaccines.
MMRV

No. of children

350
300
250
200
150
100
50
0

Nil reaction

340

Any reaction

Fever
Rash
Injection site reaction
Seizures

No. of children

60
50
40
30
20
10
0
Klein et al – Vaccine Safety Datalink

FIGURE 2
Postvaccination outpatient fever visits among 12- to 23-month-olds according to vaccine received: VSD study population, 2000–2008.

Klein et al *Pediatrics*
2010;126
Vaxtracker MMRV

![Bar chart showing reaction onset time](chart.png)
### Table 2. Proportion (%) of infants reporting fever within 7 days after at least 1 of the 3 infant doses of 4CMenB, by vaccine recipient group

<table>
<thead>
<tr>
<th>Axillary temperature</th>
<th>Routine vaccines only</th>
<th>4CMenB only</th>
<th>Concurrent vaccines (routine + 4CMenB)</th>
</tr>
</thead>
<tbody>
<tr>
<td>≥38°C</td>
<td>23–36%</td>
<td>26–41%</td>
<td>51–62%</td>
</tr>
<tr>
<td>≥39°C</td>
<td>3–4%</td>
<td>4–8%</td>
<td>10–15%</td>
</tr>
</tbody>
</table>

### Table 3. Age at commencement of vaccine course, primary immunisation, interval between primary doses, and age for booster dose

<table>
<thead>
<tr>
<th>Age at commencement of vaccine course</th>
<th>Primary immunisation</th>
<th>Interval between primary doses</th>
<th>Age for booster dose</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 months*</td>
<td>3 doses, delivered at ~2*, 4 and 6 months of age; (intervals ~2 months, at least 1 month)</td>
<td>12 months</td>
<td></td>
</tr>
</tbody>
</table>
Next Steps

- Vaccination
  - Clinic Invite (web)
- Vaxtracker
  - Web Survey
  - Vaxtracker Admin
    - Review Reactions
    - Manage Data
  - AusVox Safety
### Expected coincidental deaths following DTP vaccination in selected countries

<table>
<thead>
<tr>
<th>Country</th>
<th>Infant Mortality Rate per 1000 live births (IMR)</th>
<th>Number of births per year (N)</th>
<th>Number of infant death during year in</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Month after immunization</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>= (IMR×N/12)×nv×ppv</td>
</tr>
<tr>
<td>Australia</td>
<td>5</td>
<td>267,000</td>
<td>300</td>
</tr>
<tr>
<td>Cambodia</td>
<td>69</td>
<td>361,000</td>
<td>5,605</td>
</tr>
<tr>
<td>China</td>
<td>18</td>
<td>18,134,000</td>
<td>73,443</td>
</tr>
<tr>
<td>Japan</td>
<td>3</td>
<td>1,034,000</td>
<td>698</td>
</tr>
<tr>
<td>Laos</td>
<td>48</td>
<td>170,000</td>
<td>1,836</td>
</tr>
<tr>
<td>New Zealand</td>
<td>5</td>
<td>58,000</td>
<td>65</td>
</tr>
<tr>
<td>Philippines</td>
<td>26</td>
<td>2,236,000</td>
<td>13,081</td>
</tr>
</tbody>
</table>

Note: Assumes uniform distribution of deaths and that children who are near death will still be immunized.

nv = number of immunization doses: assumed here to be three dose schedule; 3.
ppv= proportion of population vaccinated: assumed here to be 90% for each dose; 0.9.
Contact SAEFVIC

- Immunisation Hotline: 1300 882 924 (choose option 1)
  Staff will be in attendance between 9am and 4pm. An answering machine will take calls at all other times.
- Email: saefvic@mcri.edu.au
- Online: saefvic.org.au
- Fax: (03) 9345 4163 (24 hours)
- Post: SAEFVIC, Murdoch Children's Research Institute c/- Royal Children's Hospital, Flemington Rd, Parkville, Vic 3052

Useful links

- Department of Human Service - Victorian Immunisation Program
- Australian Government - Immunise Australia
- National Centre for Immunisation Research and Surveillance
Thank you

- Survey respondents
- Participating GP practices, Clinics
- Newcastle Kaleidoscope
- Sydney Children’s Hospital Network
- HNE Team Jody Stephenson, Michelle Butler, Sally Munnoch, Chris Staples, Sarah Moberley, Craig Dalton, David Durrheim
- Stephen Clarke – ChordWizard Systems
- A/Prof Kristine Macartney & Dr Gulam Khandaker at NCIRS
- AusVaxSafety
- SAEFVIC - Gowri Selvaraj
- Deborah Thompson SESPHU & Salwa Gabriel WSPHU
- Medicare locals – Lauren Dalton
- Dr Nick Wood, Kath Cannings at NCIRS
- Dr Bronwen Harvey at TGA
- Commonwealth Department of Health