



victorian refugee
health network

A needs analysis of catch-up immunisation in refugee-background and asylum seeker communities in Victoria

“Vaccination is very important. We have to always to maintain vaccination for every whatever. Vaccination is coming - we have not to miss it and follow the doctor’s appointment.” South Sudanese focus group, 2007



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List of Acronyms

ACIR	Australian Childhood Immunisation Register
AEFI	Adverse Events Following Immunisation
AMES	Adult Multicultural Education Service
AMLA	Australian Medicare Local Alliance
ASID	Australasian Society for Infectious Diseases
BCG	Bacillus Calmette-Guerin
BELS	Blackburn English Language School
BVE	Bridging Visa E
CALD	Culturally and Linguistically Diverse
CAS	Community Assistance Support
CGD	City of Greater Dandenong
DEECD	Department of Education and Early Childhood Development
DIBP	Department of Immigration and Border Protection
DHC	Departure Health Check
DTP	Diphtheria, tetanus and pertussis
EACH	Eastern Access Community Health
ELC	English Language Centre
ELS	English Language School
GP	General Practitioner
HAV	Hepatitis A Virus
HBV	Hepatitis B Virus
Hib	Haemophilus Influenzae Type B
HPV	Human Papillomavirus
IHMS	International Health and Medical Services
IM	intramuscular
ImPS	Immunisation Program System
INWMML	Inner North West Melbourne Medicare Local
LGA	Local Government Area
LOTE	Language other than English
MAV	Municipal Association of Victoria
MBS	Medicare Benefit Schedule
MCH	Maternal and Child Health
MEA	Multicultural Education Aide
MIA	Maternity Immunisation Allowance

MMR	Measles, Mumps, Rubella
MRNWMML	Macedon Ranges and North Western Melbourne Medicare Local
NIP	National Immunisation Program
NHV	Networking Health Victoria
NPAEV	National Partnership Agreement on Essential Vaccines
NSW	New South Wales
OPV	Oral Polio Vaccine
PCEHR	Personally Controlled Electronic Health Record
PNIP	Practice Nurse Incentive Program
RCH	Royal Children's Hospital
RHA	Refugee Health Assessment
RHP	Refugee Health Program
RHN	Refugee Health Nurses
RN	Registered Nurses
SEMML	South Eastern Melbourne Medicare Local
SES	Socio-economic Status
SWMML	South Western Melbourne Medicare Local
TST	Tuberculin Skin Test
VFR	Visiting Friends and Relatives
VFST	Victorian Foundation for Survivors of Torture (Foundation House)
VPD	Vaccine Preventable Disease
VV	Varicella Vaccine
WELS	Western English Language School
WHO	World Health Organization

Definitions

A refugee is defined in the United Nations (UN) 1951 Convention on the Status of Refugees as someone who has left his or her country and cannot return to it owing to a well-founded fear of being persecuted for reasons of race, religion, nationality, membership of a particular group or political opinion.

An asylum seeker is someone who has applied for refugee status and who is awaiting a decision on this application.

For the purposes of this report the term **refugee background** is used to describe:

- People who have been found to be refugees under the UN convention and hold an Australian humanitarian program visa
- People seeking asylum
- People from a refugee-like background who have entered Australia under other streams of the permanent migration program, including the family and skilled streams.

Executive Summary

This report examines catch-up immunisation for people of refugee background in Victoria, and explores effective models of service delivery to complete catch-up vaccinations. This analysis is based on a premise of equity – that refugee background Victorians should be immunised equivalent to an Australian-born person of the same age.

Each year, around 4,000 people of refugee background settle in Victoria, arriving from countries including Afghanistan, Burma, Iraq, and Iran. In addition to this intake, there are currently around 11,000 people in Victoria who are seeking asylum, due to high numbers of people arriving by boat in 2012 – 2013. The majority of this group are from the same source countries.

People of refugee background are at significant risk of being unimmunised or under-immunised on arrival in Australia, due to the circumstances inherent in the refugee and asylum experience. Country-of-origin immunisation schedules are different to the Australian National Immunisation Program (NIP) schedule – meaning no one will arrive fully vaccinated by the NIP. Humanitarian crises are associated with disruption of health services and immunisation programs, leading to issues with vaccine access and quality. Although people of refugee background may have received vaccinations overseas, most do not have written documentation, and in this situation, Australian guidelines recommend full catch-up vaccination.

Unfortunately, there are multiple reasons why people of refugee background are at significant risk of remaining unimmunised or under-immunised in Australia. Catch-up schedules are complex, and change with time. Delivering catch-up vaccinations is complicated, and both time and resource intensive, typically requiring multiple vaccines for numerous family members outside the NIP schedule points. While catch-up vaccines are based on the NIP, the strict age criteria for NIP vaccine delivery mean access is an issue.

There are key gaps in vaccine funding, notably for hepatitis B (HBV), varicella, meningococcal and human papillomavirus (HPV) vaccines. This causes a direct barrier due to cost (around \$725 for non-funded vaccines for an adolescent), and an indirect barrier due to confusion in service providers.

There are challenges with fragmented service delivery across primary care, local government areas (LGAs) and, for children, within school. Information management is also fragmented and inefficient, and the lack of a whole-of-life register or central information repository creates challenges sharing information across providers.

People of refugee background may have difficulty accessing and navigating health and immunisation services, and usually require interpreter assistance for healthcare episodes. Difficulties accessing language services, and/or language appropriate immunisation information, are compounding barriers to immunisation service delivery. Finally, evidence suggests missed opportunities by service providers, including perceptions that catch-up vaccination for people of refugee background is 'too difficult' and notification payments are inconsistent for this group. Support for service providers could be improved through funding, professional development, improved guidelines and records, staffing (including practice nurses), and catch-up immunisation incentives.

Overall, Australian and Victorian early childhood immunisation coverage is generally above the national target rates of 90 per cent. There is limited information on immunisation coverage for other age groups, although lower coverage is reported for adolescent HPV immunisation. In contrast, available evidence suggests almost all people of refugee background have incomplete immunisation, and require catch-up vaccination. In 2013, 94 per cent of refugee background students who attended public immunisation sessions or school-based sessions in the City of Greater Dandenong in Victoria required catch-up immunisation. During the same

period in Victoria, around half the asylum seekers released from detention still required catch-up vaccination. Several Australian studies in refugee cohorts have found 50 – 98 per cent of children and adults require catch-up immunisation, and studies of serological immunity support these findings.

There is increasing recognition that equity in immunisation is critical and that clusters of low immunisation coverage in community sub-groups threaten the overall success of the NIP. Refugee background communities are likely to be at higher risk for ongoing transmission of vaccine preventable diseases (VPD) due to the combination of under-immunisation and increased susceptibility through household, community and travel related contact, as VPD may be endemic and/or epidemic in their countries of origin.

Hepatitis B is of particular concern, with many Australian refugee cohorts having a prevalence of HBV infection in the high endemic range (8 per cent or more), and a significant proportion remaining susceptible to HBV transmission. Despite these prevalence figures, and the 2010 National Hepatitis B Strategy identifying culturally and linguistically diverse (CALD) communities as a priority population; people of refugee background are not currently identified as an 'at risk' group for funded HBV vaccine in Victoria.

Migration is generally not well considered in immunisation policy, which crosses three levels of government. There is sufficient evidence to consider refugee background communities as 'at-risk' populations in the National Immunisation Strategy, the Victorian Immunisation Strategy, the Victorian Guidelines for immunisation practice in Local Governments, and the Victorian guidelines HBV immunisation eligibility. Further, relevant State and Commonwealth policy should address catch-up immunisation for all ages, and not only for children under seven years.

Secure funding for catch-up immunisation across the lifespan is essential, and funding gaps in catch-up vaccines for children aged over nine years, adolescents and adults should be addressed as a matter of urgency. Given current arrangements under the National Partnership Agreement on Essential Vaccines (NPAEV); including refugee and asylum seeker numbers in population forecasts for NIP vaccine procurement would be a positive step toward improving access to catch-up immunisation.

This analysis has highlighted the complexity of immunisation service delivery in Victoria and the multiple barriers to completing catch-up vaccinations at different ages, within different service systems. Immunisations are provided by LGAs, primary care and, less frequently, by other providers, including specialist, or maternal and child health (MCH) services. There is a complex system of State and Commonwealth immunisation notification payments, and an equally complex system of administration for these payments. Overall, LGAs receive higher notification payments (through State government) compared to primary care providers, where Medicare is used for service provision. The differences in notification payments may be a factor in notification rates, with implications for immunisation coverage data. Project informants suggested there is an argument for equitable notification payments across service providers, and that this would allow improved measurement of service provision. Existing systems for notification payments probably do not capture catch-up immunisation adequately, which may be an additional barrier to providing catch-up schedules and a source of administrative inefficiency.

In Victoria, early childhood immunisations are provided by both LGAs, through council immunisation nurses, and in general practice, with around 50 per cent of services delivered in each setting. In contrast, in nearly all the LGAs of high refugee settlement, general practitioners (GPs) provide the majority of early childhood immunisations.

There are strengths and limitations within existing models of immunisation service provision. Primary care can deliver immunisations across the lifespan; all people of refugee background are linked with this service system; and GPs provide the majority of immunisation in LGAs of high settlement. At the same time, GPs identify a range of barriers to providing catch-up

immunisation, and the proposed GP co-payments are likely to be a significant additional constraint, with effects on immunisation service provision and population immunisation coverage.

LGAs are mandated to provide childhood immunisation under the Victorian *Public Health and Wellbeing Act, 2008* (Victorian Government 2008). LGAs provide a high proportion of early childhood immunisation, most adolescent NIP schedule vaccines (through the secondary school program) and there are examples of LGA school-based outreach catch-up programs. However, LGAs do not provide immunisation services to adults, and catch-up immunisation for families cannot be provided through the existing council immunisation sessions. LGAs have identified similar challenges to general practices in delivering catch-up vaccinations, and language service access is problematic in existing LGA service models. Given the numbers of people of refugee background in Victoria, and current challenges in service delivery, there is a need to consider strengthening both types of service delivery in the medium-term.

Providers require additional support to deliver catch-up immunisation. Specifically, project stakeholders identified the need for a centralised catch-up immunisation guideline, a whole-of-life immunisation calculator, and potential to use a single patient-held record across Victoria. They identified gaps in professional and organisational development, with a need for specific information on catch-up vaccination, extension of existing immunisation education to include issues for refugee background communities, and development of service/practice guidelines for LGAs and general practice. Refugee health nurses and refugee health fellows, funded by the Victorian Government, could support these professional development needs, and assist providers to develop catch-up schedules.

Providers identified gaps in accessible patient immunisation information, including gaps in content (principles of catch-up immunisation, how and where to access immunisation in Victoria, immunisation consent forms), translations (inconsistent information across languages, and no information in Dinka, Nuer, Chin or Chin-Hakka), and formats (the need for audio/spoken information in addition to print based information). Sharing resources was viewed as essential, and the current update of the Health Translations Directory is an opportunity to ensure consistent language resources and explore new formats for delivering patient information.

The issue of immunisation data is critical. There are separate registers for early childhood vaccines (the Australian Childhood Immunisation Register - ACIR), the HPV vaccine, and immunisation delivery in LGAs (Immunisation Program System - linked with Immunisation Central). None of these registers identify refugee status, and consequently there are no estimates of population coverage or service delivery for this group. Immunisation data for refugee background communities is required to monitor coverage, policy implementation, and to inform service development.

A whole-of-life immunisation register that includes identification of refugee/asylum seeker status is central to address current administrative inefficiencies, evaluate policy and programs, reduce costs associated with vaccine duplication, and to provide surveillance data. Refugee identifying data include country of birth, year of arrival, language spoken, interpreter requirement and refugee/asylum seeker status on entry to Australia. Inclusion of these parameters would benefit immunisation surveillance for refugee background communities, and also allow improved understanding of immunisation in other migrant groups. Opportunities to improve data collection should be explored, including extending the ACIR beyond seven years, expanding ImPS and Immunisation Central to function as a Victorian registry, and using patient-controlled electronic health records to record immunisation status, including for pre-arrival vaccines.

Finally, there is a gap in refugee background communities' views on immunisation. However, despite barriers to accessing and completing catch-up immunisation, providers consistently report these communities are strongly supportive of immunisation, and recognise the individual and public health benefits.

Background

Immigration to Australia

Australia's permanent migration program consists of two streams – the migration program for skilled and family migrants, and the humanitarian program for refugees and people of refugee-like background. Permanent humanitarian visas can be granted under either the 'offshore' program – for people overseas who apply for Australia's protection, or the 'onshore' program – for people who arrived in Australia and have successfully claimed asylum. In some circumstances, people seeking asylum who are found to be in need of protection are provided with a temporary, rather than permanent, protection visa. People seeking asylum may be in held detention, in the community under a residence determination (community detention), or on bridging visas in the community while their claim is assessed.

People of refugee background in Victoria

Australia currently accepts 13,750 people under the Humanitarian program each year, with around 30 – 40 per cent of this intake settling in Victoria.

In addition to this intake, there are currently significant extra numbers of people of refugee background and people seeking asylum in the Victorian community. This situation has occurred due to:

- An increase in the humanitarian program intake between August 2012 and September 2013 (to 20,000 people annually).
- Additional family stream places allocated for people on permanent humanitarian visas to sponsor overseas family members.
- Increased numbers of people arriving by boat over 2012 – 2013, with large numbers of people being released into the community on bridging visas – type E (BVE)
- Victoria taking the majority of people in community detention.
- Secondary migration from other jurisdictions to established refugee background communities.

At the peak of refugee/asylum seeker arrivals to Victoria over January – August 2013, there were around 1800 people arriving each month, including both offshore refugee arrivals and people seeking asylum released from detention onto BVEs into the community.

In 2013 - 2014 there will be around 4500 Humanitarian program arrivals to Victoria. There are an estimated 11,000 people seeking asylum in Victoria, including those on a BVE (approx. 9683 people) and people who arrived by plane with a valid visa (no Victorian data available). Table 1 provides an overview of available Victorian and Australian figures as of March 2014.

Table 1: Overview - people of refugee background, March 2014

Type of visa/entry	Number of people	
	Victoria	National
BVE holders ^{1,2}	Approx. 9683 ²	24,208
Held detention ¹	370	4484 - including 1538 on Christmas Island
Community Detention ¹	1299	3101
2012-13 people seeking asylum who arrived by plane with a valid visa and lodged an asylum application ³	Unknown	8308
Family visas (tied to subclass 866) 2012-13 ⁴ July-Oct 2013	Unknown	1066 Estimated 1200
Permanent protection visas, 1 year ⁵	4520	12,855
Permanent protection visas, 5 years ⁵	23,315	72,857

¹ Department of Immigration and Border Protection (DIBP), Immigration Detention & Community Statistics Summary, 31 March 2014, retrieved 11th April 2014 from https://www.immi.gov.au/managing-australias-borders/detention/_pdf/immigration-detention-statistics-march2014.pdf

² This figure is estimated from previous trends that demonstrate approximately 40% of Australian BVE holders live in Victoria, as breakdown by States and Territories is not provided in DIBP reports.

³ Asylum Trends Australia 2012-13 – Annual Publication, Department of Border Protection, retrieved 13 January 2014 from <http://www.immi.gov.au/media/publications/statistics/immigration-update/asylum-trends-aus-2012-13.pdf>

⁴ Department of Immigration and Citizenship Annual Report, 2013, retrieved 13th January 2014 from <http://www.immi.gov.au/about/reports/annual/2012-13/pdf/2012-13-diac-annual-report.pdf>

⁵ Department of Immigration and Border Protection Settlement Reporting Facility retrieved 11 April 2014 from <http://www.immi.gov.au/settlement/>, using date of arrival, for the time period 2008-09 and 2012-13 financial years.

Settlement by local government area

There is limited information on the patterns of asylum seeker settlement by LGA across Victoria, although data are available for people with permanent protection visas under the Humanitarian program, see Table 2 (Department of Immigration and Border Protection 2014). Fifteen per cent of new arrival humanitarian entrants settled in rural and regional Victoria in 2012-13 (Department of Immigration and Border Protection 2014).

Table 2: New permanent protection visa holders, 2012-13 financial year by LGA

LGA of residence	Number of people
Greater Dandenong	769
Hume	756
Brimbank	406
Maroondah	400
Casey	298
Greater Geelong	289
Wyndham	254
Maribyrnong	204
Whittlesea	153
Greater Shepparton	118
Total other/unknown	873
Total	4520

Department of Immigration and Border Protection Settlement Reporting Facility, retrieved 11 April 2014 from <http://www.immi.gov.au/settlement/> for the 2012-13 financial year.

Age distribution

The refugee background population has a younger age demographic compared to the Victorian population overall. Over 2012-13, 33 per cent of people granted permanent protection were aged 0 – 17 years, 48 per cent were aged 0-24 years, and only 2 per cent were aged 65 years and older (Department of Immigration and Border Protection 2014). By comparison, in 2011, 32.1 per cent of the Victorian population were aged 0-24 years, and 14.2 per cent were aged 65 years and older (Australian Bureau of Statistics 2011).

There are no population data available for people seeking asylum, although large numbers of families and single adult males were released in 2013, and information from asylum seeker triage sessions in north west Melbourne in 2012-13 showed 46 per cent of people were aged 0-25 years and only 0.3 per cent were aged over 65 years (Victorian Refugee Health Network 2013).

Countries of origin

The ten most frequent countries of origin for people granted permanent protection in Victoria over 2012-13 are shown in Table 3. People seeking asylum on BVE are most frequently from Iraq, Iran, Afghanistan and Sri Lanka, although definitive data are difficult to access.

**Table 3: Countries of origin of permanent protection visa grants
Victoria 2012-13**

in

Country of origin	Number of people
Afghanistan	931
Burma	930
Iraq	869
Iran	583
Pakistan	297
Malaysia	127
Thailand	101
Sri Lanka	93
Egypt	81
Ethiopia	77
Total other/unknown	431
Total	4520

Department of Immigration and Border Protection, Settlement Reporting Facility, retrieved 11 April 2014 from <http://www.immi.gov.au/settlement/>, for the 2012-13 financial year.

Access to health care

There are differences in access to Medicare and health services for people of refugee background and people seeking asylum depending on their visa type and detention status.

All permanent residents, including humanitarian permanent visa holders, have Medicare access and are able to access a full range of Victorian health services. Settlement support for humanitarian entrants is provided through AMES for a period of 6-12 months after arrival in Australia.

People holding a BVE are entitled to Medicare, although this is granted on a temporary basis and tied to the BVE being valid. In late 2013 and early 2014, up to 50 per cent of BVE holders had lapsed visas and lost Medicare access, presenting challenges for health service access. In addition, financial constraints for this group mean that private or fee-based healthcare is rarely an option. Casework support is provided through either AMES or the Red Cross for a six-week period following release from detention; after this time-limited support is available through the Asylum Seeker Assistance Service program or the Community Assistance Support ongoing program for people who are particularly vulnerable.

People in community detention do not have visas or Medicare access. Their healthcare is provided through a network of specified health providers approved by the detention health provider – International Health and Medical Services (IHMS). However, this group also access Victorian health services, for example through specialist referrals, or for acute care episodes. Casework support is provided through either AMES or the Red Cross.

Refugee health teams, funded as part of the refugee health program by the Victorian government, see people from all three groups, although the breakdown varies between regions, reflecting settlement patterns.

Immunisation before arrival in Victoria

Humanitarian entrants arriving in Australia under the offshore program may undergo a Departure Health Check (DHC), which includes Measles-Mumps-Rubella (MMR) vaccination

for those aged 9 months to 54 years, and yellow fever vaccine where relevant. As of May 2014, polio vaccination has also been introduced to the offshore program in response to a World Health Organization (WHO) emergency order. Details are:

- All people departing from Pakistan, Cameroon and Syria will need to have a full course of polio vaccinations certified before they can leave their country of residence.
- Refugee and humanitarian applicants will have one dose of oral polio vaccine (OPV) at the DHC (and any new applicants referred for initial visa medical examination will also have a dose of OPV) in ten identified countries - Afghanistan, Cameroon, Equatorial Guinea, Ethiopia, Iraq, Israel, Kenya, Nigeria, Pakistan, Somalia and Syria.

People in immigration detention are immunised according to the Australian National Immunisation Program (NIP) schedule, with additional vaccinations for hepatitis A virus (HAV) and typhoid.

Refugee background community views on immunisation

There is a gap in knowledge about refugee background communities' views on immunisation. However, despite barriers to accessing and completing catch-up immunisation, providers consistently report these communities are strongly supportive of immunisation and recognise the individual and public health benefits.

Project objectives and methodology

Purpose

To examine catch-up immunisation for people of refugee background in Victoria, and explore effective models of service delivery to complete catch-up vaccinations.

This needs analysis is based on a premise of equity – that refugee background Victorians should be immunised equivalent to an Australian-born person of the same age.

Methodology

A variety of data sources were used to develop this needs analysis, including:

- Review of Australian literature on refugees and immunisation using the Medline database, primary source materials and relevant workshop proceedings.
- Review of Commonwealth and State government information and policy documents, including the National Immunisation Strategy (Australian Government Department of Health 2014c; Australian Government Department of Health 2013).
- The Australian Childhood Immunisation Register (ACIR) was used to assess immunisation coverage and immunisation provider type for children in three age cohorts (12-14 months, 24-26 months and 60-62 months).
- Review of unpublished Victorian Government Department of Health data on adolescent immunisation program coverage.
- Qualitative phone and face-to-face stakeholder interviews were conducted with 45 people representing 34 agencies, across nine LGAs (Appendices 1 and 2). Key stakeholders in areas of significant settlement were from:
 - Community health services - Barwon Health, Monash Health, Primary Care Connect Shepparton, Eastern Access Community Health, Western Region Health Centre.
 - Local government - Hume, City of Greater Dandenong (CGD), Maroondah, Moreland, Maribyrnong, Yarra, Kingston, Wyndham, Glen Eira.

- English language schools (ELS) - Blackburn ELS (BELS), Collingwood ELS, Noble Park ELS, Western ELS (WELS).
- Medicare Locals - South Eastern Melbourne Medicare Local (SEMML), South Western Melbourne Medicare Local (SWMML), Inner North West Melbourne Medicare Local (INWMML), Macedon Ranges and North Western Melbourne Medicare Local (MRNWMML).
- Private general practice - Hill Medical Centre, Dandenong Super Clinic, Eastern Medical Centre.
- Specialist refugee health services - Asylum Seeker Resource Centre, Royal Children's Hospital (RCH), Monash Health (MH).
- Peak bodies - Municipal Association of Victoria and Networking Health Victoria (NHV).
- A survey of 42 refugee health nurses – assessing their role in catch-up immunisation and further focus group discussion assessing local program responses, service locations, vaccine availability, data collection and issues arising in delivery and completion of catch-up vaccinations (See Appendix 3).

The needs analysis did not include direct consultation with communities or community advisors of refugee backgrounds.

A Project Advisory Group (Appendix 4) was convened to explore preliminary findings, with representatives from the Department of Health (Health Protection and Diversity, Policy and Projects Branches); RCH, local government (CGD, Hume, Maribyrnong and Maroondah), primary health care (refugee health nurse and general practice) and Medicare Locals (SEMML and SWMML).

Policy and legislative context

This section provides an overview of Commonwealth, State and Local government legislation and policy related to immunisation funding, procurement, administration and data collection.

Commonwealth policy

National Partnership Agreement on Essential Vaccines

Immunisation as an Australian public health initiative commenced in the 1930's, with the States and Territories assuming primary responsibility. By the 1980s, there were a range of disparities in vaccine funding and access across the jurisdictions, and only 53 per cent of Australian children were adequately immunised (Australian Bureau of Statistics 2001). Increasing recognition that a national response was required led to the first National Immunisation Strategy, launched in 1993 (National Health and Medical Research Council 1993). The Australian Childhood Immunisation Register (ACIR) was piloted in 1994 and established in 1996 (Hull et al. 2013), and the NIP was introduced in 1997 (Australian Government Department of Health 2014b), supported through the National Partnership Agreement on Essential Vaccines since 2009 (Council of Australian Governments 2009).

The **National Partnership Agreement on Essential Vaccines** (NPAEV) commits to:

- Address issues of social inclusion, including responding to Indigenous disadvantage.
- Maintaining and, where possible, improving immunisation coverage rates through immunisation initiatives to reduce the incidence of vaccine preventable diseases in the Australian population.

- Maintain and where possible increase immunisation coverage rates for vulnerable groups...*resulting in the output of...*high immunisation coverage rates for all eligible children, adolescents and adults, including indigenous, disadvantaged and high risk groups.

Under the NPAEV, the Commonwealth government is responsible for:

- The purchase of NIP vaccines for delivery by the States and Territories through the NIP.
- Maintaining the ACIR and the National HPV Vaccination Program Register.
- Providing incentive payments to promote effective service delivery by the States and Territories.
- Facilitating projects by the States and Territories aimed at maintaining or increasing coverage in agreed areas of low immunisation coverage, decreasing leakage, and maintaining or increasing coverage for four year olds.

Commonwealth incentive payments are also available for the collection and analysis of data and other information related to the provision of vaccines.

Under the NPAEV, key responsibilities for the states and territories include:

- Assisting the Commonwealth with the procurement of vaccines
- Providing forecasts of essential vaccines to assist the Commonwealth...and amending as required
- Managing the effective delivery of the NIP, including delivering vaccines to immunisation service providers, and monitoring and minimising vaccine wastage and program leakage
- Promoting administration of vaccines in accordance with the current edition of the Australian Immunisation Handbook (Australian Government Department of Health 2013).

The Victorian government also provides notification payments to match and/or top up Commonwealth payments (see Notification payments pp. 43).

The Commonwealth and State governments are jointly responsible for increasing community understanding and support for the public health benefits of immunisation.

Currently the States and Territories provide forecasts to the Commonwealth on the required quantity of NIP vaccines, based on demographic information for specific NIP schedule age cohorts (e.g. children aged 0-4 years, adolescents, adults 65 years and older). Although the NPAEV includes the provision that states can amend vaccine forecasts 'as required', new migrants, including people of refugee background and people seeking asylum are currently not included in forecasts for NIP vaccine requirements.

National Immunisation Program and Strategy

The **National Immunisation Program (NIP)** schedule is the national standard of recommended vaccines funded by the Commonwealth government and available free of charge to all Australians in specified age cohorts. The NIP covers sixteen diseases, including hepatitis B virus (HBV), diphtheria, tetanus, pertussis (whooping cough), *Haemophilus influenzae* type b (Hib), poliomyelitis, pneumococcal, rotavirus, measles, mumps, rubella, meningococcus C, varicella (chickenpox), HAV, HPV and influenza. There are ongoing changes to the NIP schedule, as additional vaccines are added and cohorts are expanded. The age cohorts covered by current NIP schedule are:

- Infants
- Adolescents
- Indigenous adults 50 years and older, non-Indigenous adults 65 years and older.

There are no scheduled vaccinations for primary school aged children.

Technical guidance on the NIP schedule and delivery of vaccinations is provided by the **Australian Immunisation Handbook** (currently 10th edition, Australian Government Department of Health 2013), developed by the Australian Technical Advisory Group on Immunisation.

The **National Immunisation Strategy for Australia, 2013-18** (Australian Government Department of Health 2014c) aims to prevent disease and severe outcomes by maximising immunisation coverage in people of all ages, and consists of eight strategic priority areas:

1. Improve immunisation coverage.
2. Ensure effective governance of the National Immunisation Program.
3. Ensure secure vaccine supply and efficient use of vaccines for the National Immunisation Program.
4. Continue to enhance vaccine safety monitoring systems.
5. Maintain and ensure community confidence in the National Immunisation Program through effective communication strategies.
6. Strengthen monitoring and evaluation of the National Immunisation Program through assessment and analysis of immunisation register data and VPD surveillance.
7. Ensure an adequately skilled immunisation workforce through promoting effective training for immunisation providers.
8. Maintain Australia's strong contribution to the region.

Key actions to address the first priority: 'Improve immunisation coverage' are to:

- Identify geographic areas or cohorts of low coverage and implement strategies to improve immunisation coverage in these areas.
- Ensure equity of access to immunisation services for all Australians without financial or geographical barriers.
- Through disease surveillance, identify the risks posed by unvaccinated cohorts in the population.
- Develop an agreed position on the provision of free catch-up immunisation schedules.

The strategy identifies targeting immunisation to 'at-risk' population groups as a key challenge, identifying 'at risk' groups as Aboriginal and Torres Strait Islander people, pregnant women and specific age cohorts. People of refugee background are *not* included as an at-risk population.

The Immunisation Handbook (Australian Government Department of Health 2013) provides the following information on catch-up vaccination: 'Every opportunity should be taken to review a person's vaccination history and to administer the appropriate vaccines for immunisation catch-up. If a person has not had documented receipt of vaccines scheduled in the NIP appropriate for their age, a catch-up schedule should be planned.'

The National Immunisation Strategy notes: 'Catch-up schedules are available in most states and territories for children up to seven years of age', without providing information on catch-up for older children, adolescents or adults.

Victorian legislation and policy

Victorian Public Health and Wellbeing Act, 2008

The **Victorian Public Health and Wellbeing Act 2008, Division 3** (Victorian Government 2008) mandates that LGA 'seek to protect, improve and promote public health and wellbeing within the municipal district by co-ordinating and providing immunisation services to children living or being educated within the municipal district.' A child is defined in the Act as a person less than 18 years of age.

Victorian Immunisation Strategy, 2009-2012

The **Victorian Immunisation Strategy 2009-2012** (Victorian Government Department of Human Services, 2008) aims to:

- Achieve the lowest possible incidence of vaccine-preventable disease by attaining and maintaining the highest possible levels of effective immunisation coverage across the whole population.
- Achieve and maintain the greatest improvements in effective immunisation coverage among those groups at highest risk of VPD.

People of refugee background are included in the list of high-risk or special-needs groups, however, they are not included as a one of the high-risk groups in relation to improving data and immunisation coverage.

Guidelines for immunisation in Local governments, 2009

The **Guidelines for Immunisation practice in Local governments, 2009** (Victorian Government Department of Health 2009) identify refugee/humanitarian entrants, children of relative carers, and families living in difficult circumstances as population groups that may have incomplete immunisation, and include a recommendation for immunisation providers to:

- Develop a policy for the provision of opportunistic immunisation targeting those clients who are difficult to access in the region, (*and*) ...use all clinical encounters to assess immunisation status and where indicated vaccinate.

These guidelines do not mention catch-up immunisation specifically, or include information for the development of catch-up vaccination schedules. The guidelines also stipulate that local government immunisation providers should ensure all staff are aware of the availability of interpreter services in their region for non-English speaking clients.

Information for secondary and specialist schools, 2011

Victorian government Department of Education and Early Childhood Development (DEECD) guidelines: **Supporting the Victorian Immunisation Strategy - information for secondary and specialist schools, 2011** (Victorian Government Department of Education and Early Childhood Development, 2011), outlines the role of secondary schools in immunisation. These guidelines suggests that schools:

- Appoint a school immunisation co-ordinator to manage the school's vaccination program
- Ensure the school immunisation co-ordinator liaises with the local council immunisation officer in their municipality
- Support the distribution and collection of all immunisation consent cards and obtain completed cards from parents and guardians
- Make use of immunisation resources available from the local council to assist with communication to students, parents, teachers, and the wider school community about school aged immunisations; and
- Ensure appropriate resources and environments are available for the program to run smoothly.

Immunisation program support in Victoria

Immunisation program support in Victoria is provided through several networks and peak bodies (listed below).

Immunisation Section, Health Protection Branch, Victorian Government, Department of Health provides (publicly accessible) information and resources for immunisation providers. The Immunisation Section provides advice through a telephone helpline, and participates in

all Victorian regional immunisation networks. Resources include fact sheets for vaccines provided in Victoria (also available in other languages); various guidelines, including the pre-immunisation checklist and the process to be followed after vaccination; guidelines for local government; immunisation consent forms (in English); immunisation record cards; information for parents and nurse immunisers; and information about cold chain management and adverse event reporting. The Section also provides vaccine order forms, information about vaccine deliveries/stock; and produces a regular newsletter for providers on immunisation-related issues.

Australian Medicare Local Alliance (AMLA) – has been a key agency in the Immunise Australia Program, which aims to support and encourage the provision of safe, effective and timely vaccinations across Australia by general practice, community health or other providers, and to engage actively with providers to achieve a high level of immunisation coverage. Medicare Locals provide information and education to the community and healthcare professionals to improve immunisation coverage in their regions. AMLA hold twice yearly meetings; attendees include Medicare Local immunisation staff, and representatives from the Victorian Department of Health and LGAs.

Local Government Immunisation Reference Group, convened by the Department of Health, which includes LGA representatives from each region, an LGA Environmental Health Officer, a MCH representative from DEECD, and NHV.

Regional Immunisation Networks – these groups provide a local focus on co-ordination of immunisation services. Active groups operate in the following areas (convenor in brackets) – SEMML Immunisation Task Force (SEMML); Northern Immunisation Network (Whittlesea Council); Eastern Ranges Immunisation Committee (ERIC – Eastern Ranges Medicare Local); Western Group (LGA focus); Barwon (Barwon Medicare Local); Greater South Coast (Warrnambool); Grampians (Grampians Medicare Local); Gippsland (Department of Health); Hume Regional Immunisation Network (Department of Health). Regional Immunisation Networks Melbourne have played a key role in the Commonwealth funded Department of Health Regional Immunisation Initiative to increase immunisation coverage for vulnerable adolescents.

SAEFVIC (Surveillance for Adverse Events Following Vaccination in the Community) is the central reporting service in Victoria for adverse events following immunisation (AEFI). The service is based at RCH, and provides expert immunisation safety advice and clinical services to children and adults who have experienced AEFI.

Immunisation registers

Australian Childhood Immunisation Register

The ACIR was piloted in 1994, then established in 1996 by incorporating demographic data from Medicare on children less than seven years of age (Anderson et al. 2012, Hull et al, 1999). As 99 per cent of children are enrolled in Medicare and participation is 'opt out', the ACIR is nearly a complete population register. Immunisations given overseas can be recorded on the ACIR (since 2001) and details for children without Medicare access can be added through use of a supplementary immunisation number (Hull et al. 2013).

Immunisation records cannot be entered after the seventh birthday, and there is no information collected on country of birth, year of arrival, language spoken, interpreter requirement, or refugee/asylum seeker status. Recording early childhood vaccinations on the ACIR triggers \$6 Commonwealth notification payments for immunisation providers. This system has been in place since the ACIR commenced. ACIR immunisation status has been linked to eligibility for Centrelink childcare payments since the 1998 Childcare Legislation Amendment Act (Australian Government 1998) and to additional family assistance payments since 2012.

There have been multiple previous recommendations to extend the ACIR across the lifespan (Murray and Skull 2003, EACH 2011, Heywood et al 2014, and National Health and Medical Research Council 2014). Further exploration of the feasibility/barriers to this extension is beyond the scope of this report.

Other registers

The **National HPV Vaccination Program Register** is operated by the Victorian Cytology Service, and records HPV vaccinations across Australia. The HPV Register records similar demographic information to ACIR; including name, address, date of birth, gender, Medicare number, information about the vaccination (date administered, dose number, vaccine brand) and information about the practitioner, including provider number. The HPV Register does not include country of birth, year of arrival, language spoken, interpreter requirement or refugee/asylum seeker status.

Immunisation Program Support (ImPS) is used in most LGAs in Victoria. ImPS records NIP schedule vaccines, including those for infants, adolescents and adults. As of 2014, ImPS links to **Immunisation Central**, a Victorian Government Department of Health data collection system that is used to make additional (State) payments to LGAs. ImPS does not include country of birth, year of arrival, language spoken, interpreter requirement or refugee/asylum seeker status.

Other payments related to immunisation service delivery, including those that have been discontinued, are detailed in Notification payments (pp. 43) and Previous incentive payments (pp. 45).

Cost-benefits of immunisation

Available costing information is provided in Appendix 5.

Immunisation coverage

This section outlines the rates of immunisation in Australia and available evidence on immunisation coverage for people of refugee background.

Australia’s NIP is recognised globally as a leading publicly funded immunisation program.

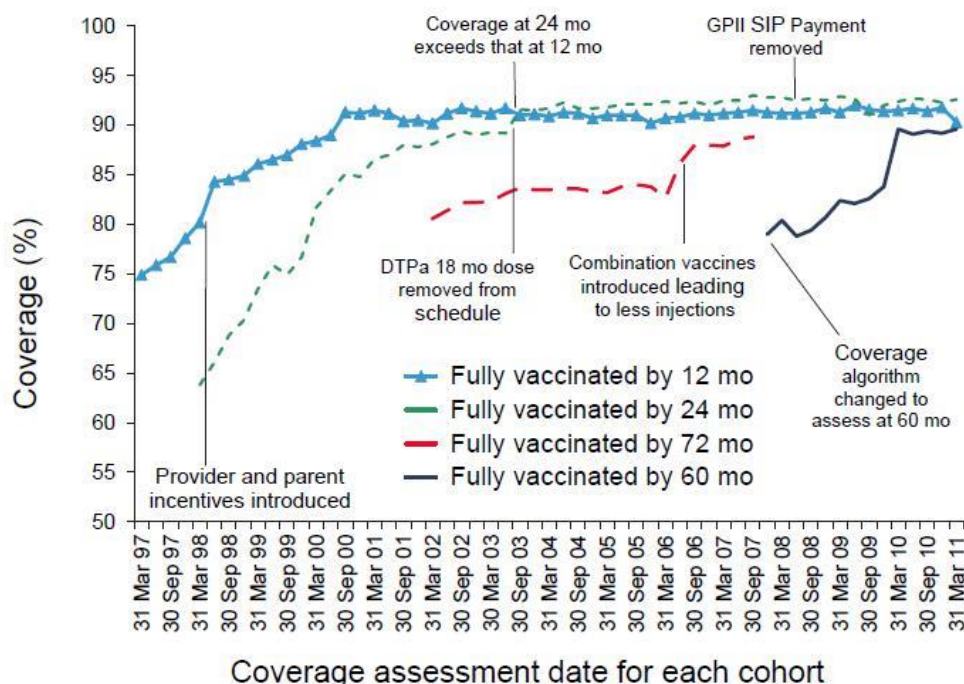
High immunisation coverage protects the population from VPD by reducing the spread of infection through decreasing the risk of contact between susceptible individuals (Ehreth 2003). The term ‘herd immunity’ is used to describe the situation where a high level of immunity in a population provides a measure of (indirect) protection for individuals who remain susceptible to disease transmission, through reduced exposure to disease. The 1993 Immunise Australia Program set targets of 90 per cent vaccine coverage (National Health and Medical Research Council 1993).

There is increasing recognition that equity in immunisation is critical. Clusters of low immunisation coverage in community sub-groups threaten the overall success of the National Immunisation Program (Heywood et al. 2014). Recent measles outbreaks in Victoria and New South Wales (NSW) have reinforced the need for equity in coverage (Najjar et al. 2014; Victorian Government Department of Health 2013); and the outbreak in NSW was linked to an under-immunised migrant community, despite no indication of this community having low coverage on the ACIR (Heywood et al. 2014; see Appendix 6).

Immunisation coverage – Australia

Since 1990, the rates of completed immunisation in Australian children aged 0-5 years have increased, and rates in children aged 0-2 years have been sustained above the national target of 90 per cent, even with changes to the immunisation schedule (See Figure 1; (Hull et al. 2013). The proportions of Australian children ‘fully vaccinated’ at 12, 24 and 60 months in 2010 were 91.6 per cent, 92.1 per cent and 89.1 per cent, although there are disparities between Indigenous and non-Indigenous children (Hull et al. 2013).

Figure 1: Trends in fully immunised vaccination coverage, Australia, 1997 – 2010, by birth cohort (Hull et al. 2013)



There are no comprehensive Australian data for adolescent immunisation, however HPV vaccinations are recorded on the National HPV Vaccination Program Register. In 2010, national HPV vaccine coverage was 70.8 per cent for girls aged 15 years (Hull et al. 2013).

Immunisation coverage - Victoria

Data for immunisation coverage in Victoria are shown in Table 4.

Table 4: Immunisation coverage Victoria, 2014.

2014	12 - <15m*	24 - <27m**	60 - <63m***
	Fully immunised	Fully immunised	Fully immunised
All children	89.5%	92.4%	92.6%
Indigenous children	85.0%	88.7%	92.7%

*Fully immunised = 3 doses of a diphtheria (D), tetanus (T) and pertussis (P)-containing vaccine, 3 doses of polio vaccine, 2 or 3 doses of PRP-OMP-containing Hib vaccine or 3 doses of any other Hib vaccine, and 2 or 3 doses of Comvax HBV vaccine or 3 doses of other HBV vaccines.

**Fully immunised = 3 or 4 doses of a DTPa-containing vaccine, 3 doses of polio vaccine, 3 or 4 doses of PRP-OMP-containing Hib vaccine or 4 doses of any other Hib vaccine, 3 or 4 doses of Comvax HBV vaccine or 4 doses of all other HBV vaccines, and 1 dose of a MMR vaccine.

***Fully immunised = 4 or 5 doses of a DTPa-containing vaccine, 4 doses of polio vaccine, and 2 doses of an MMR-containing vaccine.

The most recent State of Victoria's Children Report (Victorian Government Department of Education and Early Childhood Development 2013) found the proportion of children fully immunised was 92.7 per cent at 24 months and 92.5 per cent at five years in the first quarter of 2013¹. Based on 2011 data from the Australian Institute of Health and Welfare, this report found there were slightly higher rates of immunisation in outer regional areas compared to major city areas, and in areas of lower socioeconomic status (SES) compared to areas with higher SES.

Adolescent NIP schedule vaccines are varicella (chicken pox), HPV and DTP; these are given as part of high school immunisation programs. National HPV Vaccination Program Register data from 2009 show 76.1 per cent of Victorian girls aged 15 years had completed HPV vaccination, and unpublished Victorian Department of Health data suggest coverage for completed immunisation for secondary school students is substantially lower than coverage for children aged 0-5 years.

Immunisation coverage – refugee background populations

There are no population data available for immunisation coverage in refugee background Victorians, as these groups are not captured in available health data sets or population reporting mechanisms (see Immunisation surveillance and data collection pp. 57). In the absence of population data, information is available from service delivery reporting and studies of serological immunity in refugee cohorts in Australia.

Service delivery data

Available information from 2013 suggests around half the people seeking asylum released from detention required catch-up immunisation at the time they arrived in Victoria on BVE.

- The North and West Metropolitan Region Health Orientation and Triage for Asylum Seekers program evaluated triage sessions run for people released from detention

¹ Immunisation data from June 2013 are included in the 2012 reporting.

over the period December 2012 – September 2013. This evaluation found 44 per cent of adults (aged 19-35 years) and 46 per cent of children (aged 0-18 years) required catch-up immunisation (Victorian Refugee Health Network 2013).

- In asylum seeker triage sessions in South East Melbourne over September – December, 2012, 53 per cent of people (75 per cent aged 22-44 years) required immunisation (South Eastern Melbourne Medical Local 2012).

Incomplete immunisation on release from detention may be partly explained by two factors – over 2013 there were large flows of people through detention, placing pressure on detention health services, and many people were only in held detention for short periods. However, providers indicate that prior to September 2013, immunisation was generally incomplete for people seeking asylum, even for those who had spent several months (or longer) in detention (i.e. where catch-up immunisation should have been completed). Refugee Health Nurses involved in asylum seeker triage sessions in 2014 reported improved immunisation coverage at this time, although they noted some people had still not completed immunisation at the time of release from held detention.

There are no data on immunisation coverage in people seeking asylum who arrived in Victoria by plane. This group may not have Medicare access and there are no formal pathways for health assessment. This combination, and consequent challenges for healthcare access; suggest this group is at high risk of being un/under immunised.

Practice-based data also indicates poor immunisation coverage for refugee background children and adolescents in the Victorian community.

- A CGD report from immunisation program delivery over May – June 2013 (public and adolescent school-based programs) found only 6 per cent (16/278) of people from a refugee background aged 5-18 years were fully immunised (personal communication CGD staff, May 2014).

Other studies suggest similar issues:

- A study of Asian and African refugee arrivals attending for screening in Darwin in 2009-10 found 98 per cent had incomplete immunisation (Johnston et al. 2011).
- A study of 259 African refugee arrivals attending primary care in Melbourne in 2005 found over 90 per cent of children and 50 per cent of adolescents and adults had incomplete immunisation and required vaccinations (Tiong et al. 2006).
- A study of 70 newly arrived refugee students at Western ELS in 2006 found 75 per cent of children had completed a post arrival health check and 91 per cent had a family doctor. However, only 33 per cent had received immunisations in primary care. None of the students in Australia less than six months had received immunisations in primary care, even though 89.5 per cent had completed a post arrival health check at a GP (Kennedy 2007).
- A study of East African refugee children attending an immigrant health clinic in 2001-02 found 98 per cent had incomplete/unknown immunisation status (Paxton et al. 2011b).

Interstate studies suggest similar challenges (Parsons et al. 2007; Thomas et al. 2007).

Serological immunity

Multiple Australian studies, mainly from Melbourne, have found that serological immunity to VPD is low in refugee cohorts. Serological immunity is not a perfect surrogate for immunisation coverage, it may reflect either immunisation or natural disease, and there are limited data on waning serology responses with time. However a full course of vaccination is expected to induce serological protection in over 90 per cent of recipients (Australian Government Department of Health 2013).

Available data suggest the following rates of serological immunity for children:

- Measles 56-90%.
- Mumps 60-93%.
- Rubella 74-85%.
- Tetanus 52-88%.
- Diphtheria 45-69%.
- HBV 26-66%.

Available data suggest the following rates of serological immunity for adults:

- Measles 87-95%.
- Mumps 84-96%.
- Rubella 62-96%.
- Tetanus 33-47%.
- Diphtheria 66%.
- HBV 49-60%.

Detailed information is provided in Table 5. There are limited data on serological immunity to multiple VPD, which is important to consider given the use of combination vaccines. Four Australian studies provide information:

- A study of 164 offshore program refugee children in Illawarra, NSW examined the effects of pre-departure MMR immunisation. The study found that while 87.7 per cent were immune to measles and 84.8 per cent were immune to rubella, only 73 per cent were immune to both diseases. In children with written documentation of pre-departure MMR vaccine, 80 per cent were immune to both diseases (Joshua et al. 2013).
- A community-based study of Karen refugee arrivals (children and adults) in Melbourne found that of 367 people tested for serological immunity to measles, mumps and rubella, only 56.9 per cent had protective antibody titres to all three components of MMR (Paxton et al. 2012).
- A study of 136 East African children in Melbourne found only 15 per cent had serological immunity to all five of measles, rubella, tetanus and HBV (Paxton et al. 2011b).
- A study of 126 East African adults in Melbourne found only 19 per cent had serological immunity to all four of measles, tetanus, diphtheria and HBV (Skull et al. 2008).

No data are available on serological coverage for pertussis, polio, varicella, Hib, meningococcus or pneumococcus.

Table 5: Serological immunity for vaccine preventable diseases in refugee cohorts – Australian studies

Study	Adequate immunity – based on serology (%)						
	Measles	Mumps	Rubella	Tetanus	Diphtheria	HBV	
136 East African children (0-18 years) attending an immigrant health clinic, Melbourne, 2001-02 (Paxton et al. 2011b).	90	-	77	61	45	33	CHILDREN
156 East African children (0-18 years) attending an immigrant health clinic, Melbourne, 2002 (Jamsen et al. unpublished, 2003)	88	-	74	62	69	66	
193 East African children (0-18 years) attending an immigrant health clinic, Melbourne 2005 (Buttery and Chionh, unpublished, 2005)	80	-	82	88	69	66	
129 African refugee children (<15 years) attending general practice, Melbourne, 2005 (Tiong et al. 2006)	56	60	78	52	-	26	
331 predominantly African refugee children (<14 years) seen at refugee health clinics, Sydney, 2005 (Raman et al. 2009)	81	-	81	-	-	31	
504 Karen refugee children (0-17 years) attending primary care, Melbourne, 2006-09 (Paxton et al. 2012)	87	93	85 (12-17 y)	-	-	50	
164 African and Asian refugee (offshore program) children (1-18 years) attending refugee screening, Illawarra region NSW, 2007-09 (Joshua et al. 2013)	88	-	85	-	-	-	
510 predominantly African female refugees (>15 years) attending Migrant Health Unit, Perth, 2003-04 (Martin & Mak 2006)	-	-	87%	-	-	-	ADULTS
129 African refugee adolescents and adults (15 years and older) attending general practice, Melbourne, 2005 (Tiong et al. 2006)	95	84	96	47	-	60	
126 East African adults attending primary care, Melbourne, 2005-06 (Skull et al. 2008)	97	-	-	33	66	59	
632 Karen refugee adults (18 years and older) attending primary care, Melbourne, 2006-09 (Paxton et al. 2012)	87	96	62	-	-	49	

Under immunisation in refugee groups

This section provides a summary of specific risk in refugee background communities and the reasons for under immunisation in these groups in Victoria (and Australia).

Refugee communities – why they are at risk

Vaccine preventable diseases are endemic and/or epidemic in many of the countries of origin and transit of new refugee and asylum seeker arrivals (Foundation House 2012). People of refugee background are an at-risk population for inadequate immunisation due to pre and post arrival factors. These include:

Country of origin factors

- Differences in country of origin schedules.
- Disruption of health and immunisation services in countries of origin, and poor access to healthcare due to forced migration.
- Probable issues with vaccine quality, including maintenance of the cold chain.

Challenges with delivering and completing catch-up vaccinations in Australia

- Complexity of catch-up schedules.
- Provider expertise/experience in providing catch-up vaccinations.
- Difficulty assessing previous and required vaccination due to a lack of written records, and inefficient information management.
- Complexity of service delivery - additional time required to develop catch-up schedules, competing priorities in healthcare, and challenges delivering multiple catch-up vaccines to multiple family members simultaneously, with vaccinations outside NIP schedule ages.
- Gaps in vaccine funding – resulting in cost being a barrier to NIP schedule delivery.
- Missed opportunities by service providers.
- Difficulty accessing and/or navigating the health system - also for a proportion of people seeking asylum, lack of Medicare severely restricts access to healthcare.
- Challenges accessing language services, and language appropriate, accessible immunisation information, leading to issues with consent.

These issues are discussed in more detail in the following sections.

At the same time, refugee background communities are likely to be at higher risk for ongoing transmission of VPDs, due to the combination of increased susceptibility and opportunities for exposure through household, community and travel related contact (Reekie et al. 2013; Sathandan et al. 2005). Appendix 6 examines the 2012 measles outbreak in Sydney in relation to this concept, and HBV is an issue of particular concern (see Hepatitis B infection pp. 29).

Crowded living conditions increase the risk of transmission of most communicable diseases, especially those spread through oral-faecal, respiratory droplet or blood/body fluids. Household compositions are often fluid in the early post-arrival period, and up to half of newly arrived families stay with another family in the first months after arriving in Australia (Paxton et al. 2011a). Most people seeking asylum on BVEs do not have work rights, and receive limited financial support; providers report crowded housing and functional homelessness are extremely common in this group.

In the years after settlement, people of refugee background frequently travel to visit friends and relatives (VFR), often for extended periods, and typically to developing countries, where VPDs remain prevalent. VFR travellers are at higher risk of VPDs and are less likely to seek pre-travel health advice (Heywood et al. 2014).

Alongside the issues of inadequate immunisation and VPD transmission risk, immunisation providers consistently report refugee communities are strongly supportive of immunisation, and recognise the individual and public health benefits. Providers were not aware of any refugee background families conscientiously objecting to vaccinations.

Hepatitis B infection

Australia's first national strategy for HBV was adopted in 2010 (Australian Government Department of Health and Ageing 2010). The National Hepatitis B strategy states "*the involvement of communities most affected by hepatitis B is essential to all levels of the national response*" and "*vaccination is the most effective means of preventing the transmission of hepatitis B*", identifying three priority populations for the prevention of HBV:

- People from CALD backgrounds.
- Aboriginal and Torres Strait Islander peoples.
- Children born to mothers with chronic HBV.

The strategy also identifies four main populations of interest, including people travelling to and from high prevalence countries, particularly those visiting families and friends in their country of origin. People from CALD backgrounds are also named as a priority population to monitor, detect and treat chronic HBV.

The priority actions in the National Hepatitis B Strategy for the prevention of HBV infection include:

- Promote national consistency in groups and communities eligible for funded vaccination, giving priority to communities at greatest risk of HBV infection
- Increase the uptake of HBV vaccination among priority populations.

The prevalence of chronic HBV in Australia is approximately 0.8 per cent (The Kirby Institute 2011; Gidding et al. 2007). Recent Australian studies in refugee cohorts suggest the prevalence of HBV infection is:

- 2-21 per cent in people from Africa (Tiong et al. 2006; Martin and Mak 2006; Davis and Webber 2006; Cooley et al. 2004; Johnston et al. 2011; Buttery and Chionh 2005; Mahmoud et al. 1994; Sheikh et al. 2009; Johnson 2007, Lucas et al. 2010), with six cohorts finding a prevalence of 8 per cent or more (high endemic range).
- 3.5-9.7 per cent in people from South East Asia (Martin and Mak 2006; Caruana et al. 2005; Paxton et al. 2012).
- 0-2.5 per cent in people from Afghanistan and Iraq (King & Vodicka 2001; Martin and Mak 2006).

These prevalence figures reflect the prevalence of HBV in current humanitarian source countries (Appendix 7). Melbourne data suggest the seroprevalence of HBV by postcode increases with the proportion of residents born overseas (Cowie et al. 2010).

At the same time, a high proportion of people of refugee background remain susceptible to HBV transmission. Australian studies in refugee cohorts suggest the proportion that are non-immune to HBV, and remain susceptible to disease transmission is:

- 34-74 per cent of African refugee children (Tiong et al. 2006; Buttery and Chionh 2005; Raman et al. 2009; Jansen et al. 2003; Paxton et al. 2012)
- 40 per cent of African refugee adults (Tiong et al. 2006; Skull et al. 2008)
- 50 per cent of Karen refugee children and adults (Paxton et al. 2012).

Despite these prevalence and susceptibility figures, the revised 2014 HBV 'at-risk' groups entitled to free HBV immunisation in Victoria do not include refugees and asylum seekers

(Victorian Government Department of Health 2014a).² There is a strong argument to consider this group as likely household contacts of people with HBV, and to include them as a named 'at-risk' group in Victorian policy given i) the high prevalence of infection, ii) proportion of communities remaining susceptible, and iii) the priority actions of the National Hepatitis B Strategy.

Pre-arrival factors

Country of origin schedules

People from refugee background will not have had immunisation consistent with the Australian NIP schedule due to differences in country of origin schedules. These differences include both the vaccine(s) administered and the ages at which they are recommended. Table 6 lists the differences between the NIP and schedules in the ten most frequent Humanitarian source countries for people of refugee background in Australia, highlighting that even if people are fully immunised in their country of origin, they will require catch-up vaccination in Australia.

² The current 'at risk' groups are: household contacts and sexual partners of people living with HBV, people who inject drugs or are on opioid substitution therapy, people living with Hepatitis C, men who have sex with men, people living with HIV, people no longer in a custodial setting who commenced but did not complete a free vaccine course while in custody.

Table 6: Comparison of vaccination schedules: Australia and humanitarian source countries (WHO 2014)

Vaccinations shown are the national schedules for the ten most frequent Humanitarian source countries – specific vaccines for risk groups are not included. The orange squares represent a gap compared to the Australian NIP schedule.

Vaccine	Australia	Iraq	Afghanistan	Burma	Iran	Bhutan	Pakistan	Sri Lanka	Thailand	Congo	Nepal
Diphtheria	DTPa	DTwP	DTwP	DTwP	DTwP/DT	DTwP/DT	DTwP	DTwP/DT	DTwP/DT	DTwP	DTwP
Tetanus											
Pertussis											
Polio	IPV	OPV/IPV	OPV	OPV	OPV	OPV	OPV	OPV	OPV	OPV	OPV
Hib	Hib	Hib	Hib	Hib		Hib	Hib	Hib		Hib	Hib
Hep B	HepB	HepB	HepB	HepB	HepB	HepB	HepB	HepB	HepB	HepB	HepB
Rotavirus	Rota	Rota							Varies		
Pneumococcal	Pn conj	Pn conj	Pn conj 8/13				Pn conj			Pn conj	
Meningococcal	MenC										
Measles	MMR	Measles/ MMR	Measles	Measles	MMR	MR	Measles	MMR	MMR	Measles	MR
Mumps											
Rubella							MR				
Varicella	Varicella										
HPV	HPV					HPV					

Missing compared to Australian schedule	MenC Varicella HPV	Rotavirus MenC Mumps Rubella Varicella HPV	Rotavirus Pn conj. MenC Mumps Rubella Varicella HPV	Hib Rotavirus Pn conj. MenC Varicella HPV	Rotavirus Pn conj. MenC Mumps Varicella	Rotavirus MenC Mumps Rubella Varicella HPV	Rotavirus Pn conj. MenC Varicella HPV	Hib Rotavirus Pn conj. MenC Varicella HPV	Rotavirus MenC Mumps Rubella Varicella HPV	Rotavirus Pn conj. MenC Mumps Varicella HPV
Additional compared to Australian schedule	BCG	BCG	BCG	BCG	BCG	BCG	BCG JE	BCG JE	BCG	BCG JE

Access to healthcare

Forced migration and situations of conflict are associated with disruption of health services, which may cause issues with access to healthcare and immunisation programs. Even if the country of origin schedule is similar to the Australian NIP schedule, people may not have been able to access vaccinations, and if they have been vaccinated, they often do not have written records (Paxton et al. 2011b). Further, even where coverage is adequate, issues with vaccine quality and cold chain may reduce vaccine effectiveness (Heywood et al. 2014).

Post arrival factors

Complexity of catch-up schedules

Catch-up immunisation is complex, and requires additional planning and time compared to providing vaccines for a defined NIP schedule point. Calculating a catch-up schedule requires the provider to:

- Assess overseas immunisation history and whether a written record is available (which may need to be translated) and whether it is complete.
- Assess any vaccinations given as part of offshore or detention health screening and whether a written record is available and whether it is complete.
- Assess for a natural history of varicella.
- Consider if screening serology has been completed, and whether this will modify the catch-up schedule (e.g. if someone has HBV).
- Consider the timing of vaccine dosing and vaccine type (e.g. recent live viral vaccines).
- Assess vaccines delivered by other providers post-arrival, and whether a written record exists (e.g. the ACIR, the National HPV Vaccination Program Register, school-based card, (MCH) record book, informal paper record, other) and, if so, if this record is available (with the patient at the time).
- Consider minimal dosing intervals, combination vaccines and which vaccines will require the greatest number of doses, in order to minimise visit numbers and maximise client/family convenience.
- Clarify which vaccines are not funded, and thus not accessible.
- Consider additional relevant factors:
 - Recent or pending schedule changes.
 - Which vaccines should be deferred until the child reaches the NIP schedule age.
 - How this episode of immunisation service will interact with other vaccination episodes (e.g. year 7 child who is due to receive school-based NIP vaccination)
 - The impact of age (e.g. nine year old child who will turn ten years before completing catch-up – thus changing vaccine formulations)
 - If an immunisation calculator could be used – noting this is only relevant for children less than seven years.

The Australian Immunisation Handbook (Australian Government Department of Health 2013) is the key national resource for immunisation providers. The handbook provides guidelines on immunisation catch-up, which is detailed across six separate tables over 27 pages, which is a barrier to using this resource in clinical practice. The Handbook provides recommendations on vaccines required for catch-up, but does not address funding of the catch-up schedule at a state or national level.

Refugee guidelines (Australian Society for Infectious Diseases (ASID) guidelines (2009), Victorian Foundation for Survivors of Torture (VFST or Foundation House) handbook (Foundation House 2012), RCH Immigrant health catch-up immunisation website) use a single table that applies across all ages (although this refers back to handbook tables for Hib and

pneumococcal vaccination in young children) – this is maintained on the RCH website, and a ‘whole-of-life’ single resource was identified as useful by providers.

Consultations for this needs analysis emphasised the additional time required to review vaccine history, develop a catch-up schedule, and work with an interpreter. GPs reported difficulties keeping ‘up-to-date’ with NIP schedule changes; this was felt to be an increasing challenge as practices reduce their immunisation load. They reported a need for additional clinical decision-making tools to support developing catch-up schedules, and a wide range of project informants noted there are no adequate immunisation calculators available. The South Australian-based national online immunisation calculator (Government of South Australia 2014) is only relevant for children aged less than seven years, and various LGA stakeholders had concerns about the accuracy of this resource. Primary care providers reported the Victorian Department of Health catch-up immunisation quick guide has not been in use since 2011.

Primary Care stakeholders agreed that the development of ‘whole-of-practice’ guidelines for catch-up immunisation would be helpful and an effective online immunisation calculator was identified as a key resource - see Professional development and support (pp. 61).

Complexity of service delivery

Delivering catch-up vaccination is complicated, and both time and resource intensive; typically requiring a minimum of three visits over at least four months for completion. Children aged four to nine years require a fourth dose of vaccinations six months later, although recent changes to combination meningococcal vaccination may add a further visit for children less than ten years.

Whereas catch-up for an Australian-born child usually involves providing a defined (missed) schedule point; catch-up for refugee background patients typically requires multiple vaccines, for multiple family members, across the NIP schedule, outside NIP age points, while dealing with health screening and settlement issues and working with an interpreter. See Table 7 for an example of the vaccinations required in an unimmunised family of six people (two adults, two children less than ten years, and two adolescents).

Consultations identified difficulties developing catch-up schedules and providing catch-up vaccinations within busy clinical services, also noting competing priorities in healthcare in the early settlement period. Stakeholders suggested solo GPs (without a practice nurse) generally do not have the resources or capacity to provide catch-up immunisations, and that for some providers, catch-up is regarded as “too difficult” and may be a low clinical priority. GPs reported possible financial disincentives to engaging in immunisation, in that practice nurses attract more secure MBS income through specific items for chronic disease management, thus focussing their activity on immunisation reduced practice income.

LGA also reported difficulties planning and delivering catch-up vaccinations within routine LGA immunisation sessions.

Table 7: Example of catch-up vaccinations in a family

Age, gender	2 year girl	7 year girl	11 year boy	16 year girl	35 year female	42 year male
Diphtheria Tetanus Pertussis (Hib)	Hexavalent x 3, 4 th dose 6 months after primary course then 5 th dose at 4 years	Hexavalent x 3, then 4 th dose 6m later	dTpa x 1 then dT x 2 Could use dTpa-IPV for one dose	dTpa x 1 then dT x 2 Could use dTpa-IPV for one dose	dTpa x 1 then dT x 2 Could use dTpa-IPV for one dose	dTpa x 1 then dT x 2 Could use dTpa-IPV for one dose
Polio	IPV in hexavalent vaccine		IPV x 3	IPV x 3	IPV x 3	IPV x 3
Hepatitis B	HBV in hexavalent vaccine		HBV (adult) x 2 adolescent schedule	HBV (paediatric dose) x 3	HBV (adult dose) x 3 not funded	HBV (adult dose) x 3 not funded
Measles, mumps, rubella, varicella	MMR x 1, then MMR-V x 1 (MMR has to be primary dose at this age)	MMR-V then MMR (MMR-V can be used as primary dose at this age)	MMR-V x 1 then MMR	MMR x 2 VV x 2 – not funded, check serology first	MMR x 2 VV not funded	MMR x 2 VV not funded
Other	MenC/Hib* x 1, not same time as hexavalent 13vPCV x 1	MenC/Hib* x 1 but not same time as hexavalent	Not funded or licensed for MenC/Hib, no MenC available at time of writing Will get HPV at high school	HPV x 3 – not funded Not funded or licensed for MenC/Hib, no MenC available at time of writing	HPV x 3 - not funded	
Visits	3 or 4, plus 1 six months later and 1 at age 4 years	3 or 4, plus 1 six months after primary course	3 then high school	3 (or 4 depending on HPV schedule)	3	3

*Could use (and order could change):

- Infanrixhexa®, Infanrixhexa®, Menitorix®, Infanrixhexa® (4 visits)
- Infanrixhexa®, Infanrixhexa®, Menitorix® and DTPa-IPV and HBV as an alternative (3 visits, avoids one extra dose Hib, additional needles)
- Infanrixhexa®, Infanrixhexa®, Menitorix® and Infanrixpenta® as an alternative (3 visits, avoids one extra dose Hib)
- Infanrixhexa®, Infanrixhexa®, Menitorix® and Infanrixhexa® (3 visits, gives double dose Hib, less preferable option based on current Department of Health advice, May 2014)

NOTE: Infanrixhexa® is DTPa-IPV-Hib-HBV and Infanrixpenta® is DTPa-IPV-HBV

Information management

Consultations for this project identified inefficient and fragmented information management as a key barrier to completing catch-up vaccinations. See: Immunisation registers (pp. 68); Coordination of immunisation records (pp. 56); Immunisation surveillance and data collection (pp. 57); and Patient health information (pp. 62).

Gaps in vaccine funding

The Commonwealth government currently provides vaccines for NIP schedule vaccinations for infants and adolescents. The Victorian Government also provides:

- Catch-up vaccinations for children less than ten years.

- DTPa, dTpa, MMR, and IPV vaccines for Indigenous and refugee background Victorians (including for people seeking asylum).
- HBV vaccine for 'eligible people at risk' defined as: household contacts and sexual partners of people living with HBV, people who inject drugs or are on opioid substitution therapy, people living with Hepatitis C, men who have sex with men, people living with HIV, and people who have been in a custodial setting who commenced, but did not complete, a free HBV vaccine course while in custody.

Table 8 outlines catch-up immunisation for all ages as per the current NIP schedule, and highlights gaps in vaccine funding (orange shading, and red text). These gaps are:

- **HBV vaccine for those ten years and older** – unless they are household contacts or sexual partners of someone with HBV, or fall within another risk group as above. In comparison, Victorians born 1989 onwards have had access (i.e. people up to 25 years of age in 2014). It is not clear whether the Engerix-B® provided for at-risk groups includes both paediatric and adult formulations.
- **Meningococcal vaccine for those ten years and older** - in comparison Victorians born 1987 onwards have had access (i.e. people up to 27 years of age in 2014).
- **Varicella vaccine (VV) for those fourteen years and older** - in comparison, Victorians born 1993 onwards have had access (i.e. people up to 19 years of age in 2014).
- **HPV vaccine for females aged fourteen years and older and males sixteen years and older** - in comparison, Victorian females born 1981 onwards have had access (i.e. females up to thirty-three years of age in 2014).

Cost of unfunded vaccines

If families were to pay for the unfunded vaccines, the cost of fully immunising an adolescent child according to the NIP is around \$725. This includes:

- HBV x 2 doses at \$20 = \$40
- HPV x 3 doses at \$150 = \$450
- VV x 2 doses at \$65 = \$130
- MenC vaccine x 1 dose at \$106 = \$106

Unfunded NIP vaccines are an enormous barrier to completing catch-up immunisation, and are likely to prevent refugee background communities from ever being fully vaccinated by the NIP. Refugee background Victorians are typically reliant on welfare payments in the early years after settlement; and available information suggests 50 per cent of refugee children live in relative poverty (Paxton et al. 2011a). People seeking asylum receive lower income support payments compared to refugee arrivals, equivalent to 60-89 per cent³ of Centrelink, payments depending on their visa status.

Asylum seeker case-workers, particularly those based in CGD, have reported multiple instances where children and adolescents had not been able to access HBV vaccination due to cost, and thus had not completed catch-up immunisation⁴

“We hear regularly from local practices that patients turn up wanting the hepatitis B vaccine but cannot afford it and that GPs feel their hands are tied because of the current Victorian Health Department hepatitis B criteria.” Senior Project Officer, Medicare Local

³ Adults who arrived before 13 August 2012 receive payments equivalent to 70% of Centrelink Special Benefit; adults who arrived after 13 August 2012 receive payments equivalent to 60% of Centrelink Special Benefit; and unaccompanied minors receive payments equivalent to 89% of youth allowance.

⁴ Sessions run by RCH medical staff with 135 case workers from AMES over March-April 2014.

Differences in vaccine funding also have an unintended secondary effect – they make calculating catch-up schedules more complicated, and are a source of confusion for providers, sometimes resulting in catch-up vaccination being deferred, or referred on to other providers. This may lead to gaps, service duplications and/or inefficiencies; thus unfunded vaccines are both direct and indirect barriers to completing catch-up immunisation.

Gaps in vaccine ordering

Table 8 outlines the vaccines listed by Department of Health as being funded for catch-up and the vaccines listed on the order form for people of refugee background. Table 9 outlines current gaps in vaccine funding. Providers identified these discrepancies as a source of confusion, and a likely barrier to immunisation services accessing a full range of catch-up vaccines for refugee background populations.

Table 8: Comparison of listed free vaccines and order form for free vaccines.

Indigenous/refugee/ asylum seeker catch-up vaccine order form	Free vaccine Victoria – listed vaccines for refugee and asylum seeker groups or listed by age
ADT booster® Boostrix® Priorix® IPOL®	ADT booster® Boostrix® Priorix® IPOL® H-B-Vax II Paediatric® (catch-up <10 years) Infanrix ^{hexa} ® (catch-up <10 years) Infanrix IPV® (catch-up single dose 4y 1m to <10 years) Menitorix® (catch-up 13m to <10 years) Prevenar 13® (catch-up <5 years) Priorix®-Tetra (catch-up single dose 19 months to <10 years) Varilrix®/ Varivax® (catch-up single dose <10 years)

Free vaccine Victoria – criteria for eligibility: A person must reside in Australia and meet at least one of the following criteria to be eligible for free Victorian Government supplied vaccine.

- Hold a Medicare card, or be eligible to hold a Medicare card, and all asylum seekers (if a person attends without their Medicare card vaccines can still be administered).
- Hold Australian citizenship.
- Hold a permanent visa or have applied for a permanent visa.

Gaps and changes in vaccine availability

Table 9 outlines current gaps in vaccine funding. Related issues are emerging gaps in vaccine availability, and additional vaccine doses required due to schedule changes and licensing restrictions. There are three main vaccines to consider:

- **Meningococcal vaccine** – has recently changed to Menitorix® (combination meningococcal vaccine and Hib vaccine) – for children less than ten years of age in Victoria. This means there will be no option for meningococcal vaccination in those aged ten years and older. Menveo® (introduced in 2010, covering MenACYW135) would be an alternative meningococcal C vaccine – and would have the added advantage of also covering travel-related meningococcal illness. Currently Menveo® is unfunded for the NIP schedule, but is used for people with asplenia⁵.

⁵ The cost of Menveo® is \$105, a single dose regimen is used, except in asplenic patients where two doses are given.

- **HBV vaccine** – included in Infanrix *hexa*® for children less than ten years of age. Additional supplies of Engerix-B® are provided for at-risk groups, although it is not clear whether this includes both the adult and paediatric formulations. Refugee background populations are not included as an at-risk group, despite high disease prevalence (see Hepatitis B infection pp. 29, discussion on the number of catch-up visits below).
- **Additional doses of Hib vaccine** – children receiving catch-up immunisation will now receive multiple additional doses of Hib, through three doses of Infanrix*hexa*® and a single dose Menitorix®. Current Department of Health guidelines suggest the preferred option for catch-up is to give these doses over **four** visits (i.e. Infanrix*hexa*®, Infanrix*hexa*®, Menitorix®, Infanrix*hexa*® - as well as other vaccines required). DH guidelines suggest the least preferable option is to give Infanrix*hexa*® and Menitorix® together.

A further consideration is the need for an extra visit to complete catch-up immunisation in children four to nine years due to issue 3. Currently children aged four to nine years can complete catch-up immunisation over three visits with a fourth visit six months after the primary course. The Department of Health recommended option of giving Menitorix® separately to Infanrix*hexa*® extends this to four visits with a fifth visit six months later. This could be avoided by using alternative combinations (e.g. Infanrix*hexa*®/ Infanrix*hexa*®/Menitorix® and DTPa-IPV and HBV; or Infanrix*hexa*®/Infanrix*hexa*®/ Menitorix® and Infanrix*penta*®), however it is unclear if paediatric HBV vaccine or Infanrix*penta*® could be accessed for this purpose.

Table 9: Recommended catch-up immunisations and funding in Victoria

Vaccine type	Age, number of doses	Funding eligibility	Year introduced Victoria, relevant retrospective catch-up
Diphtheria Tetanus Pertussis (DTP)	<10 years (4 doses)	Infanrix <i>hexa</i> ® funded for catch-up <10 years Infanrix IPV® funded for catch-up single dose from 4 years and 1 month to <10 years	1953
	10 years and older (3 doses)	dTpa (Boostrix®) funded for 10 years and over for an Indigenous/refugee/asylum seeker person as a single dose as part of the 3-dose dT primary course.	
Measles, Mumps, Rubella (MMR)	<10 years (2 doses)	MMR®/Priorix® funded for catch-up from 13 months to <10 years, Priorix-Tetra® (MMR-V) funded for catch-up single dose from 19 months to <10 years, not used as 1 st dose <4 years	1969 Measles 1971 Rubella 1981 Mumps 1989 MMR
	10 years and older (2 doses)	MMR®/Priorix® funded for Indigenous/refugee/asylum seeker person if born after 1966	
Inactivated Poliomyelitis Vaccine (IPV)	Any (3 doses)	IPOL® funded for Indigenous/refugee/asylum seeker person from 10 years of age for a primary course Infanrix-IPV® funded for catch-up single dose from 4 years and 1 month to <10 years	1956
Hepatitis B (HBV)	<11 years (3 doses)	Infanrix- <i>hexa</i> ® funded for catch-up <10 years HB-VaxII-Paed® funded for catch-up <10 years	2000 - infant immunisation 2001-13 - Year 7 immunisation. Victorians born 1989 onwards have had access
	11-15 years (2 or 3 doses varies with schedule)	EngerixB® funded for household contacts or sexual partners of people living with HBV infection (not specified if both paediatric and adult formulation) HBV not funded for children 10 years and older	
	16 years and older (3 doses)		
Meningococcal C (MenC)	<10 years (1 dose)	Menitorix® funded for catch-up single dose from 13 months to <10 years	2003 – immunisation at 12 months, 2003-06 catch-up 1-19 years. Victorians born 1987 onwards have had access
	10 years and older (1 dose)	MenC vaccine not funded for children 10 years and older Menitorix® not licensed for use in older children	
Haemophilus influenzae type b (Hib)	2-11 months (2 or 3 doses varies with vaccine type)	Infanrix <i>hexa</i> ® funded for catch-up <10 years Menitorix® funded for catch-up single dose from 13 months to <10 years	1992
	12-59 months (1 dose + booster)		
13-valent Pneumococcal conjugate vaccine (13vPCV)	<7 months (3 doses)	Prevenar13® funded for catch-up <5 years of age	2005 – infant immunisation, catch-up program at the time for children born 2003-04
	7-11 months (2 doses)		
	12-59 months (1 dose)		
Varicella vaccine (VV)	18 months-13 years (1 dose)	Varilrix®/Varivax® funded for catch-up single dose <10 years Given in Year 7 at secondary school, or at 12-13 years outside of school	2005 – immunisation at 18 months and catch-up in year 7 Victorians born 1993 onwards have had access
	14 years and older (2 doses)	Varicella not funded for children 14 years and older	
Human Papillomavirus (HPV)	9-18 years (3 doses)	Gardasil® funded for Year 7 in the secondary school program or 12-13 years outside of school Gardasil® funded for Year 9 boys in the secondary school program or 14-15 years outside of school, time-limited 2013-14 HPV not funded for females >13 years or males >15 years	2007 – immunisation for females 13-26 years Victorian females born 1981 onwards and males born 1999 onwards have had access
Rotavirus	<6 months (3 doses)	RotaTeq® funded for primary course - strict timing prohibits most catch-up	2007
Bacillus Calmette Guerin (BCG)	Not part of NIPS (1 dose)		School based BCG ceased 1984/5

Changes in primary care availability – future issues

The recent Commonwealth government budget papers include plans to charge co-payments for GP visits (Australian Government 2014). Any co-payment for GP care is likely to be a significant additional barrier to catch-up vaccinations for refugee background communities, and may have wide ranging effects on immunisation service delivery, and immunisation coverage at population level.

In a two parent family with four children, a \$7 co-payment would represent a cost of \$42 for each visit for catch-up vaccinations, or a total of \$126 over three visits. This cost, in addition to the cost of unfunded vaccines, is likely to be an insurmountable barrier to completing catch-up vaccinations for many people, not only those of refugee background

Missed opportunities in service delivery

There are no comprehensive data collection on catch-up vaccination service provision (see Immunisation surveillance and data collection pp. 57). Consultations for this project suggested that missed opportunities in immunisation service delivery are an ongoing issue, and there is a gap between refugee health assessments (RHAs) and completing catch-up vaccinations.

Despite an active refugee health program within the SEMML and Monash Health, CGD immunisation providers found only 6 per cent (16/278) of refugee background/asylum seeker children aged five to eighteen years attending public or school-based immunisation sessions in May to June 2013 were fully vaccinated. While 18 per cent of this cohort had been in Dandenong for less than 2 months, 68 per cent had been in Dandenong for two to seven months, and 14 per cent for seven to twelve months⁶, suggesting that catch-up vaccinations were not being provided consistently as part of the comprehensive post-arrival health assessment. However, project informants noted recall of patients to primary care is challenging, not all refugee background patients respond to reminder letters or recall prompts, and low English proficiency reduces patient understanding of such messaging. In addition, refugee background patients are frequently mobile in the early settlement period and move between GPs. This further complicates completing catch-up vaccinations, especially if written records are not available.

A 2012 evaluation of specialist refugee health services found wide variation in opportunistic immunisation practice. At the RCH, immunisation status was known (and documented) for 98 per cent of refugee/asylum seeker patients, 75 per cent were up to date for age, 23 per cent were in the process of completing catch-up and 2 per cent were unknown, however, providers reported they were frequently giving vaccination at the hospital, as immunisation had not been completed in primary care. Conversely, at Royal Melbourne Hospital, immunisation status was known and documented for only 15 per cent of patients, and was unclear in the remaining 85 per cent (Clinical Audit Research Electronic Health Record (CAREHR) evaluation 2014).

The structure of catch-up vaccination programs can also result in missed opportunities by providers. Catch-up programs at ELS and English language centres (ELC) are delivered once a term, however students typically attend ELS/C for only two terms. Hence, despite the cost and logistics of the program (see page XXXX), students do not complete catch-up vaccination and there is additional work created in trying to ensure students follow-up at other providers for the final set of vaccines.

Older studies from Melbourne suggest this is a long-standing issue.

⁶ CGD Refugee/Asylum Seeker Immunisation in City of Greater Dandenong report provided to the Department of Health, tabled at SE Immunisation Taskforce 20th September 2013.

- A 2007 study of 70 recently arrived refugee children at ELS found around 90 per cent had a GP and had completed a RHA. However, only 33.4 per cent had completed catch-up immunisation (at a GP in 28.6 per cent and at a community health centre in 4.8 per cent), and, of children who had arrived in the previous 6 months, none had had immunisation in primary care (Kennedy 2007).
- A 2011 study of 136 East African children in 2000-02 found 97 per cent had incomplete/unknown immunisation and only 32 per cent reported any vaccinations in Australia, despite a mean of 16 months (range 2 weeks to 4 years) in Australia, and a total of 395 previous visits to vaccine providers (Paxton et al. 2011b).
- A 2008 study of 126 East African adults found only 19 per cent had adequate serological immunity to VPDs despite a median of seven visits to vaccine providers since arrival in Australia (Skull et al. 2008).

Duplications in service delivery

Duplications in vaccine delivery result in extra costs, including the cost of vaccines and administrative time, and unnecessary discomfort and inconvenience to individuals. They can compromise vaccine efficacy if immunisation is given before minimum dosing intervals.

Project informants reported that under-immunisation is a far greater issue than over-immunisation.

Language service access and support

Victoria has a high proportion of residents who speak a language other than English (LOTE) at home (23.1 per cent) and a higher proportion of LOTE speakers with low English proficiency compared to other jurisdictions (Australian Bureau of Statistics 2011).

Low English proficiency is a significant barrier to accessing healthcare, including immunisation, and effective communication between health providers and patients is fundamental to ensure safety and quality in health care (Foundation House 2013; Murray and Skull 2002; Sheikh-Mohammed et al. 2006; Alexander et al. 2004; Edberg et al. 2011; Thomas et al. 2007; Drummond et al. 2011; Henderson et al. 2011; Milledge et al. 2003).

Current evidence suggests interpreters may not be engaged during healthcare episodes when required, including in general practice. (Foundation House, 2013; Phillips and Travaglia, 2011). Local government key informants⁷ consistently identified major challenges with language service access, despite Department of Health Guidelines (Victorian Government, Department of Health 2009) that state:

- 'Local government immunisation providers should ensure that all staff are aware of the availability of interpreter services in the region.'

There are multiple risks arising when vaccination is provided without interpreting support, including issues with obtaining adequate health and immunisation history or informed consent, and providing pre- and post-vaccination advice.

Local government providers reported that interpreting services are generally utilised when families have an organised appointment to develop catch-up schedules, but arrangements during busy public sessions are problematic, primarily due to time and cost constraints. Providers reported that telephone interpreting was the most common method for accessing language services during immunisation sessions, although they identified a number of barriers to optimal use of any language services, including:

⁷ See Appendix 1

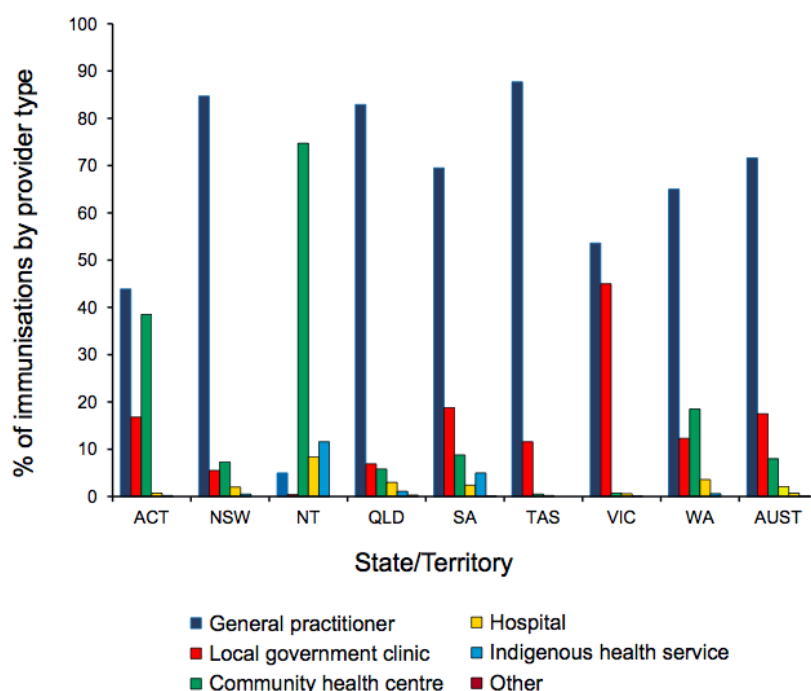
- Lack of adequate speaker-phones (nurse immunisers are often reliant on personal mobile phones).
- Lack of clear policy and procedure (some LGAs reported relying on family and friends of the client to interpret).
- Difficulty accessing particular languages, particularly after hours.
- Inadequate information to plan ahead (e.g. booking face-to-face or telephone interpreting for high frequency languages, or booking telephone interpreters in advance).

Current service delivery

This section outlines administrative arrangements and service delivery models for immunisation in Victoria.

In Victoria, most childhood immunisations are provided by LGA or in general practice; either in private practice, or in community health. Figure 2 shows 2010 ACIR data on provider types by State and Territory (Hull et al. 2013). Victoria has a far higher proportion of childhood immunisations delivered by local government compared to the other jurisdictions.

Figure 2: Proportion of immunisations on the ACIR given by various provider types, by State or Territory, 2010



Source: (Hull et al. 2013)

Adolescent NIP schedule vaccinations are generally provided in the school setting (through LGAs). Most immunisations for adults 65 years and older are provided in general practice.

Local government has a primary focus on immunising children, as defined in the Victorian Health and Wellbeing Act 2008 (Victorian Government 2008). LGAs typically run immunisation sessions for children up to four years for NIP schedule vaccines. They may run outreach services to secondary schools or English Language Schools (ELS) in year 7, 9 (in 2014) and 10, and a small number of LGAs offer sessions for older adults/seniors. Nurse immunisers⁸ administer vaccinations.

General practices provide immunisations for all ages; typically nurse immunisers or practice nurses administer vaccinations. Practice nurses may be Registered Nurses (RN) or Enrolled Nurses (EN). All RN can administer medications, including vaccinations, on the orders of a doctor. Registered nurses who are Nurse Immunisers can develop a catch-up schedule and administer vaccines within their designated scope of practice. Some practice nurses are EN who may not have the necessary training to administer medications.

⁸ **Nurse immunisers** - are registered nurses, with a post-graduate qualification that is formally recognised by the Victorian Government Chief Health Officer (Victorian Government Department of Health 2014a).

It is important to note that even with the high proportion of children in refugee background communities, if full catch-up immunisation is completed at all ages, the bulk of service provision will fall to general practice, unless LGAs extend their immunisation services to the adult age group.

Administrative arrangements

Core funding and incentive notification payments for immunisation service provision vary with the location of service delivery (Table 10). There is a complex system of incentive payments, and an equally complex system of administration for these payments.

Core funding for immunisation is from:

- LGAs – council rates.
- General practice - Medical Benefits Schedule (MBS) for doctors and practice nurses.
- Community health centres - MBS if associated GPs, limited Victorian Department of Health integrated care funding available.

Notification payments

The Commonwealth and Victorian governments provide the following payments⁹ with notification of vaccine administration (also shown in Table 10):

- **Infant schedule point provided before age 7 years** (i.e. 2-month, 4-month, 6-month, 12-month, 18-month, and 4-year) - schedule point completed and data entered in ACIR before age 7 years - \$6 (Commonwealth) paid to any immunisation provider (GP, LGA, other) and \$8.60 (Victorian) paid to LGA providers if ACIR payments received (see detail on following page).
- **Adolescents receiving VV vaccine** (Year 7) – \$5 (Commonwealth) and \$3.60 (Victorian) to LGA providers.
- **Adolescents receiving HPV vaccine** (Years 7 and 9) – \$8 (Commonwealth) and \$0.60 (Victorian) to LGA providers. Payments are made against the number of immunisations recorded on the National HPV Vaccination Program Register.
- **Adolescents receiving Boostrix® vaccine** (Year 10 in 2014, but will include years 7, 8, 9 and 10 in 2015) – \$8.60 (Victorian) to LGA providers.

⁹ Payments add up to \$8.60, i.e. State payments generally 'top-up' the Commonwealth payments to this total.

Table 10: Core funding and incentive payments for immunisation service provision

Funding/payments	LGA	General practice	Community health
Core funding source	Council rates	MBS for doctors and practice nurses Practice Nurse Incentive Program (PNIP)	MBS if associated GPs, limited Victorian Department of Health integrated care funding available.
Commonwealth payments	Entry of vaccines into ACIR if complete NIP schedule given for age (i.e. full set of vaccines equivalent to 2-month, 4-month, 6-month, 12-month, 18-month, and 4-years NIP schedule) up to age 7 years (\$6)		
	Catch-up schedule – payments made when an age schedule point is completed, and only up to age 7 years. Complexity with payments (see below).		
State-administered Commonwealth payments	Adolescents receiving VV (\$5)		
	Adolescents receiving HPV vaccine (year 7 or year 9 school) (\$8)		
State payments	Vaccines at NIP schedule points if ACIR payment received (up to age 7 years) (\$8.60)		
	Additional - Adolescents receiving VV (\$3.60)		
	Additional - Adolescents receiving HPV vaccine (year 7 or year 9 school) (\$0.60)		
	Additional - Adolescents receiving Boostrix® vaccine (year 10 in 2014, years 7 – 10 school in 2015) (\$8.60)		
Model – total	\$70.40	\$36	\$36

ACIR notification payments are made for catch-up immunisations in children; however immunisation service representatives from Dandenong, Hume, Maribyrnong and Maroondah LGAs all stated there were ongoing problems with payments for catch-up vaccination that had not been approved by ACIR. There was also widespread confusion about whether payment was made for all NIP schedule points, or just at 12m, 24m and 4 years.

Clarification with ACIR revealed the following complexity with ACIR notification payments:

- Payment for MMR at 12 months is only made if the third dose of HBV vaccination (i.e. normally given at six months) has already been completed. This means that if MMR is given as part of the first dose of catch-up immunisations, the payment for the 12-month immunisation point will only be made after the third dose of HBV vaccine is given. Payment for MMR at four years also requires the fourth dose of DTPa-IPV to complete the NIP schedule point.

- Children who are not given HBV vaccination¹⁰ would miss catch-up payments for the 2-month, 4-month, 6-month (incomplete coverage) and 12-month NIP immunisation points (related to MMR payment as above) unless a medical exemption form is completed.
- Payments for different schedule points may be made at the same time (e.g. as the third dose of catch-up vaccination is given, the provider could receive simultaneous payment for the 6-month and 12-month NIP schedule points). Payments are not contingent on previous payments.
- Calculation of notification payments takes the child's age and NIP vaccine schedule into account (e.g. a child entering Australia age 6 years with no previous vaccinations will not be given *Haemophilus influenzae* vaccine because of their age, and this vaccine would not be required to receive catch-up payments for the 2-month, 4-month and 6-month NIP schedule points).
- Completed schedule requirements for notification payments change with time in relation to NIP schedule changes. MMR-V is required to complete the 18-month schedule point for children born after 1 January 2012, meningococcal C and pneumococcal vaccine have been added to the 4-year schedule point requirement for children born after 1 July 2013.

There are no incentive payments for (non-adolescent schedule) catch-up immunisation to those aged over seven years.

The Practice Nurse Incentive Program (PNIP) provides general practice incentive payments to support an expanded role for nurses, including in the provision of immunisation services. The PNIP simplifies funding arrangements under the previous Practice Incentives Program, Practice Nurse Incentive and six of the MBS practice nurse item numbers.

Administration of notification payments

The administration of immunisation incentive payments is also complex (also see Table 10):

- Commonwealth ACIR notification payments are made directly to GP clinics and LGAs by ACIR.
- The Victorian Government uses the ACIR payment record to make additional payments to LGAs.
- The Victorian Government uses Immunisation Central (2013), which collects immunisation data from LGAs (most LGAs use Immunisation Program System – ImPS) to provide payments to LGAs for delivery of Varicella and Boostrix® vaccines.
- The Victorian Government administers HPV vaccine payments, including both the State and Commonwealth payments.

Previous incentive payments (now ceased)

Previous incentive payments that have now ceased include:

- **General Practice Immunisation Incentive Scheme** outcomes payments (Commonwealth funded, \$3.50 per Whole Patient Equivalent) for practices achieving 90 per cent or greater completed immunisation – ceased May 2013
- **Practice nurse item for immunisation** (MBS 10993, \$11.80) – ceased December 2011, although these activities were rolled into the broader PNIP.

¹⁰ All refugee and asylum seeker should have screening for HBV as part of post arrival assessment – a proportion of children would not need HBV immunisation due to HBV infection or HBV immunity (i.e. due to past infection or immunisation). DTPa-IPV could be used instead of Infanrixhexa®.

- **General practice HPV notification incentive** payment (Commonwealth funded, \$8.00¹¹) – ceased June 2010.
- **Service Incentive Payments** – to GPs reporting vaccinations completing 6-month, 12-month, 18-month or 60-months schedule points (Commonwealth funded, \$18.50) – ceased in 2008.
- **Maternity Immunisation Allowance** (MIA) was a payment to families (Commonwealth funded, \$236.70) for completing immunisation by 18 months (1997 – 2009). This was later split into payments at 18 months and four years (split payment, 2009 - 2012)¹² – the MIA then ceased in June 2012. Subsequently immunisation requirements have been linked to Family Tax Benefit part A supplement (Australian Government Department of Health 2014a).

LGA immunisation providers and coverage, Victoria, 2013

2013 ACIR data on Victorian children less than seven years show 42.3 per cent of vaccinations were provided by LGAs and 53.6 per cent of vaccinations were provided in general practice (provided by DH immunisation section, May 2014). There was considerable variation across the top ten LGAs for humanitarian settlement in Victoria (Table 11):

- The proportion of vaccines provided by GPs ranged from 29.1 per cent in Maribyrnong to 74.2 per cent in Greater Dandenong.
- The proportion of vaccines provided by LGAs ranged from 21.3 per cent in Casey to 67.6 per cent in Maribyrnong.

¹¹ In the first year of administration the payment was \$15.00, in the second year the payment was \$12.00, thereafter the payment was \$8.00.

¹² The MIA was also paid to families who had registered as conscientious objectors, and had not immunised their child.

Table 11: Comparison of vaccine provider type and ACIR coverage in the top 10 LGAs for humanitarian settlement, Victoria, 2013

LGA	Number of children by age groups			Total number humanitarian entrants 2012 -13* (All ages)	Proportion service delivery by provider type, 2013		2013 ACIR immunisation coverage by age (%)**		
	12 - <15 m	24- <27 m	60- <63 m		General practice	LGA	12 to <15 m	24 to <27 m	60 to <63 m
Greater Dandenong	610	534	464	771	74.2	23.1	89.7	90.8	90.5
Hume	776	744	689	754	54.7	42.7	90.3	92.5	93.2
Brimbank	786	703	687	403	67.0	30.2	89.9	91.5	92.7
Maroondah	361	381	389	400	54.9	41.7	89.3	92.1	91.6
Casey	1157	1221	1184	296	76.2	21.3	91.2	93.4	93.3
Wyndham	1137	1001	892	251	55.8	40.2	89.2	92.1	93.5
Greater Geelong	660	700	722	291	56.5	41.7	92.4	94.6	94.0
Maribyrnong	345	268	262	207	29.0	67.6	89.8	91.8	91.7
Whittlesea	741	691	640	153	50.2	43.6	92.3	94.3	94.3
Greater Shepparton	214	242	227	117	52.1	43.0	91.0	92.5	93.0
Victoria	19,535	18,566	18,839	4,503	42.3	52.6	91.0	92.8	92.6

*LGA settlement data for the 2012-13 financial year extracted from Department of Immigration and Border Protection, Settlement Reporting Facility, retrieved 11 April 2014 from <http://www.immi.gov.au/settlement/>

**ACIR data for the 2013 calendar year (provided by DH immunisation section, May 2014).

Current service delivery – catch-up

This section outlines service delivery models for catch-up immunisation in Victoria.

Local government

LGAs have a variety of arrangements in place for catch-up vaccination in newly arrived children and adolescents. LGAs generally do *not* offer immunisation to adults; except for a small number of LGAs that provide immunisation to seniors. There are no easily accessible LGA data on catch-up service delivery or coverage. LGAs can use ImPS to generate reports, but reports on catch-up immunisation have to be cross-checked against individual records. There are no coverage data for LGAs, as Councils do not know the numbers of new arrivals into their area or how many refugee families are receiving vaccinations within general practice/primary care.

In many cases, the LGA approach to catch-up immunisation is not well publicised, and approaches vary across LGAs. The most common approaches are:

- Nurse immunisers assess previous immunisation schedules and administer vaccines
- Catch-up schedules are developed and administered in public immunisation sessions, depending on demand and complexity of catch-up required.
- Specific catch-up sessions may be run in areas with large new arrival populations.
- Families attend council for schedule to be developed and administered there, or subsequently attend public sessions for immunisations.
- Outreach immunisation catch-up at English Language schools and centres.
- For large families, nurse immunisers may attend home visit with enhanced MCH service.
- Several LGAs (Maribyrnong, Ballarat, Melbourne) are co-locating nurse immunisers with MCH services, although LGAs noted MCH no longer provide immunisation service delivery.

Public immunisation sessions

LGAs organise immunisation sessions to deliver the NIP schedule to children aged 0-4 years in various locations, at different times across their municipality, to facilitate community access; usually with (at least) monthly sessions.

If a family with several children presents for catch-up vaccination at one of these sessions, Nurse Immunisers may provide catch-up vaccines at the time, depending on demand and whether the immunisation history is available. The more common approach is to provide the family with an appointment to attend council in order to clarify the immunisation history and plan a catch-up schedule, then refer the family back to the next public immunisation session for vaccine administration (also see Complexity of catch-up schedules pp. 32).

Additional time is required for people with low English proficiency to develop a catch-up schedule (particularly when the clients do not have previous vaccination records), provide information, and obtain consent. CGD immunisation staff estimate that developing a catch-up plan and administering vaccines takes around 45 minutes for adolescents and around 20 minutes for infants (City of Greater Dandenong, 2013).

As an indication of the scale of service delivery (also see Table 13 on pp. 52):

- Over January – October 2013, CGD provided catch-up immunisation to around 400 children less than four years of age (predominantly refugee background) through public immunisation sessions, and a specific session for people born overseas (City of Greater Dandenong, 2013).

- Maroondah Council Immunisation Department estimates that approximately 5 per cent of the children at public immunisation sessions receive catch-up vaccinations.

English Language Schools and Centres

In Victoria, newly arrived students who do not speak English may be supported through English Language Schools (ELS) or English Language Centres (ELC) or 'intensive outpost' programs run from the ELS/C in surrounding schools. Data on refugee students from 2004 – 2008 showed around 40 per cent of primary and 75 per cent of secondary age students attended ELS/C (Paxton et al, 2011a) - there are no more recent figures. Currently most students spend 6 months in language school before transitioning to a mainstream school environment.

There are four ELS, with a total of eleven campuses (base ELS and campus locations) and an additional four ELC (Victorian Department of Education and Early Childhood Development 2014). Six LGAs provide outreach immunisation sessions to seven of the fifteen ELS/C in metropolitan Melbourne. The needs analysis did not extend to outpost locations, since many are co-located at primary schools and do not have vaccination programs. There are no data on the number of refugee students who access vaccination at ELS/C, or whether they complete catch-up immunisation.

Factors influencing LGAs decisions on providing outreach immunisation programs to ELS/C include resources allocated for catch-up programs, the distance between schools and existing LGA immunisation sessions, and student numbers.

Table 12 shows the current (April 2014) arrangements for immunisation catch-up at ELS/C. Box 1 provides further detail on immunisation services at ELS/C provided by CGD, City of Hume, City of Maribyrnong and City of Maroondah.

Table 12: ELS/C outreach immunisation arrangements

ELS/C	Location	Primary or secondary	Catch-up NIP schedule	Adolescent NIP schedule
Blackburn ELS	Croydon North (Maroondah)	Both	Y	Y
	Burwood East (Whitehorse)	Both	Y	Y
Collingwood ELS	Broadmeadows (Hume)	Both	Y (only 7,9,10)	Y
	Collingwood (Yarra)	Both	Y	Y
Noble Park ELS	Noble Park (CGD)	Both	Y	Y
	Springvale (CGD)	Primary	Y	N/A
	Hampton Park (City of Casey)	Both	N	N
	Stonnington (Glen Eira)	Primary	N	N/A
Western ELS	Braybrook (Maribyrnong)	Both	Y	Y
	Footscray (Maribyrnong) – LGA drop-in nearby	Primary	N	N/A
	Wyndham	Secondary	N	Y
Hume Central ELC	Hume Central Secondary College	Secondary	N	Y
Brunswick ELC	Brunswick Secondary College	Secondary	N	Y
Glen Eira ELC	Glen Eira College	Secondary	N	Y
Westall ELC	Westall Secondary College	Secondary	N	Y

Box 1: Local Government immunisation services at language schools and centres

CGD at Noble Park ELS (Noble Park, Springvale):

The immunisation program was established in the 1980s. CGD covers 24 schools within the LGA, with more than 4000 students who require vaccinations. This includes both the standard adolescent NIP schedule and provision of catch-up vaccination.

In 2013, CGD originally planned for catch-up immunisation provision to 100 students at the ELS, however there has been difficulty meeting demand. Over the ten months from January to October 2013, CGD provided catch-up immunisations to more than 800 children/adolescents at the ELS. Details include (also see detailed process map, Appendix 8):

- Information about immunisation sessions and consent cards are included in ELS enrolment
- Follow-up information sessions are conducted for parents to obtain consent.
- Based on enrolment information, CGD nurse immunisers develop catch-up schedules and try to co-ordinate with other providers.
- Students are provided with a vaccine record (card) at immunisation sessions, including dates and information for follow-up doses.
- The LGA tracks students who transition to mainstream school within the LGA, but not outside the municipality.

City of Hume at Collingwood ELS (Broadmeadows) and Hume Central ELC:

The program was established at Hume Central ELC when it was opened in 2007, and will commence at Collingwood ELS - Broadmeadows (which opened in 2012) in May 2013. The LGA provides catch-up vaccinations at the time of adolescent NIP program delivery (currently years 7, 9 and 10) as part of this program to students in these years. Details include:

- Students are provided with a vaccine record (card) at immunisation sessions, including dates and information for follow up doses.
- Hume Council provides students with information about council sessions to finalise vaccinations when they transition to mainstream school in their catchment, and also sends a letter to parents.

City of Maribyrnong at WELS Braybrook:

This program was established as a partnership between Western Region Health Centre, City of Maribyrnong and WELS in 2006-07, and has continued as a partnership between City of Maribyrnong and WELS. Details include:

- WELS requests past immunisation history as part of enrolment, then circulates information about the vaccination session and consent forms closer to the time of the session
- WELS employs a sessional nurse immuniser who works out the catch-up schedule (estimated \$6,500/year), contacts family by phone (with an interpreter) to explain what vaccines are needed and to gain consent. The nurse also coordinates with families' GPs.
- Students are provided with a vaccine record (card) at immunisation sessions.

City of Maroondah at BELS:

This program was established in 2009 when the school opened. Details include:

- Past immunisation history is requested at enrolment.
- Council circulates consent forms with information about the immunisation session two weeks prior. BELS supports families to return consent forms. The consent forms come back within days and the council starts follow-up coordination with GPs a week before the session to identify students receiving vaccinations elsewhere. Council takes responsibility for the consent process, developing the catch-up schedules, administering vaccines and monitoring students after vaccine administration. The council quality management process for the immunisation program is ISO accredited.
- Students are provided with a vaccine record (card) at immunisation sessions, including which set of vaccines this is within the planned catch-up schedule.

Stakeholders¹³ identified the following strengths in ELS/C based immunisation catch-up programs:

- ELS/C have Multicultural Education Aides (MEA) who are able to assist with providing information about immunisation services to parents and students at enrolment
- There is potential to gain consent for immunisation at enrolment or information sessions, where an interpreter is present and an MEA can support the provision of health information to parents – e.g. translating written materials
- There are large numbers of students requiring catch-up in one location.

Stakeholders identified the following challenges with ELS/C based immunisation catch-up programs:

- They only address immunisation for school-aged children, which may increase the risk that parents will not seek catch-up immunisation.
- There is potential for over-immunisation if students do not report previous vaccines.
- There is potential for under-immunisation – nurse immunisers at the ELS ask on the day of the vaccinations whether students have received any vaccinations elsewhere. If the student says yes, they are not given any vaccinations at the school and are advised to complete the course with their current immunisation provider.
- ELS/C receive information about students GPs, but are not able to pass this information on to LGAs. Stakeholders reported that if schools could release family GP contact details (with family permission) to LGA immunisation programs, co-ordination could be improved.
- Most students do not complete catch-up vaccination during their time at ELS/C - catch-up typically requires three episodes of vaccine administration, students usually attend ELS/C for two terms and most councils are only able to conduct one session a term.
- The adolescent catch-up program is not provided at every campus/outpost, further reducing accessibility.

¹³ See Appendix 1

Summary of LGA immunisation activity

LGA stakeholders agreed that guidelines that included promoting existing good practice in working with people from refugee backgrounds across LGA service delivery types would be helpful.

Table 13 shows a summary of immunisation service provision by selected LGAs. It should be noted that the numbers receiving catch-up immunisation are not exclusively people of refugee background and people seeking asylum and also include migrants who have not been vaccinated in accordance with the NIP schedule. These numbers are estimates, since the data collection and records are not able to generate reports for catch-up. In addition, the numbers of infant episodes will include the same infant receiving vaccinations at two, four and six months of age.

Table 13: Summary of LGA immunisation activity, 2013 calendar year.

LGA		CGD	Hume	Maribyrnong	Maroondah
Immunisation sessions at council	Sessions/year	132	180	58 drop-in 146 by appointment	94
	Infant episodes	~2408	6284	1479	~3500
	Catch-up (individuals)	~480	No estimate available	~70	~60
	Seniors	730	0	0	~50
School-based outreach programs	Number schools	23	23	9	13
	Sessions/year	100	72	28	40
	Adolescent NIP schedule	4741 students	10,000 vaccinations to 3247 students	1502 students	6706 vaccinations to 2700 students
	ELS/C catch-up (individuals)	800+ students	103 children for MMR catch-up	~70	~120

Primary care

Private general practice and community health

In Victoria, GPs have a key role in providing post-arrival RHA and care to people of refugee background across the lifespan, and are therefore well placed to deliver catch-up vaccinations. Some practices have experienced staff able to deliver catch-up vaccinations to children and adults; some also specialise in refugee health.

All new offshore Humanitarian arrivals are supported by the Department of Immigration and Border Protection (DIBP) funded Humanitarian Support Service (HSS) program, and are referred to a local general practice through casework support. GPs are able to use extended care MBS item numbers for RHA in this group, if the RHA is completed within 12 months of arrival. Many people seeking asylum released from held detention in Victoria (or arriving in Victoria from other jurisdictions) attend a Health Orientation and Triage program, where they

are booked directly to see a GP, or advised to see a GP, either in private practice or a community health service.¹⁴

The Royal Australian College of General Practitioners (RACGP) endorsed RHA template (General Practice Victoria 2012) and the Promoting Refugee Health Handbook (Foundation House 2012) both provide guidelines on health screening and catch-up vaccination. Despite these guidelines, practice varies as to whether a comprehensive RHA and/or catch-up vaccination is completed.

LGA providers¹⁵ reported many GPs refer children and adolescents to LGAs to develop a catch-up schedule, some GPs request children return to primary care for vaccinations, others refer both planning and delivering vaccinations to the LGA. This two-step process may reduce the likelihood that catch-up immunisation is completed.

Table 11 suggests GPs are the major providers of infant NIP schedule vaccines in areas of significant refugee settlement, however there are no data on catch-up immunisation in primary care. The most common model for vaccination delivery in primary care is a practice nurse administering vaccines under GP supervision, rather than Nurse Immuniser led models.

This project identified a number of good practise examples of comprehensive catch-up vaccination for refugee background communities in different forms of primary care. These included:

- **Private practice** - two practices in Geelong see most new arrivals and undertake RHA and catch-up immunisation
- **Super-clinics** - a 'super clinic' in Dandenong that immunises up to 150 people of refugee background a week
- **Community health** – Eastern Access Community Health (EACH) undertake RHA working in partnership with local private GPs.

Conversely, stakeholders identified constraints to delivering catch-up immunisation in general practice; particularly for solo GPs without practice nurse support, and where GPs identify the need for professional development and support. Challenges include maintaining currency with changing schedules and eligibility for free vaccines in a busy practice environment, the time commitment to develop a schedule, and, GPs reported issues with financial viability in the current MBS funding model and the lack of linked incentive/notification payments, other than ACIR payments for children less than seven years.

Refugee health nurses

The statewide Victorian government funded Refugee Health Program (RHP) aims to increase refugee access to primary health services, to improve the response of health services to people of refugee background and to enable individuals, families and refugee communities to improve their health and wellbeing.

Refugee health nurses (RHN) employed under the program are now located in sixteen community health centres across metropolitan Melbourne and regional Victoria, in areas of significant refugee settlement.¹⁶ In a number of areas, RHN are now part of multidisciplinary refugee health teams, including allied health and counselling support. There are at least six

¹⁴ The asylum seeker triage program was introduced in Dandenong in September 2012 and North West Melbourne in December 2012, but due to demand not all asylum seekers will have attended sessions. Coverage of all new arrivals to Victoria was achieved by September 2013 and is continuing in 2014.

¹⁵ See Appendix 1

¹⁶ The RHP started in 2005, there are now 22 EFT and 44 RHN in total across the 16 locations; some positions are part time and some nurses have additional responsibilities outside of refugee health. An additional five EFT is funded direct from community health.

RHN who are accredited nurse immunisers, seven regularly develop catch-up schedules, four administer vaccines directly, and six are trained to provide tuberculin skin testing (TST or Mantoux testing).

The RHP receives referrals from settlement services, asylum seeker services and other sources, including community-based agencies and hospitals. The duration of intensive support provided by the RHN varies across community health centres, and services are often restricted to more complex cases.

The role of the RHN within community health includes ensuring that new arrivals from refugee backgrounds have access to a comprehensive RHA, either in partnership with a local private GP or through the GPs at the community health centre. RHN described their role as facilitating the link between new arrivals and immunisation providers, rather than providing vaccinations directly. RHN usually determine their clients' immunisation status and history, and provide health promotion around immunisation and VPD. The majority of RHNs do not calculate or provide catch-up vaccination schedules.

There are two community health centres – Darebin and Eastern Access Community Health (EACH) – where RHN develop catch-up schedules and administer vaccines; the RHN at Monash Health Refugee Service also provide these services.

Hospitals

Opportunistic immunisation is offered by some hospitals. Of the current specialist refugee health clinics, only RCH and Geelong Hospital (Barwon Health) offer catch-up vaccination within the clinical service. Dandenong Hospital refugee clinic will refer patients to the community-based refugee health clinic for RHN-led immunisation services.

Comparison of service models

Table 14 provides a comparison of the main service delivery models.

Bulk-billing primary care settings provide an ideal opportunity for catch-up vaccinations for people of refugee background within the context of initial health assessment and care, particularly as caseworkers support initial contact with primary care for all new arrivals. However, GPs identify significant barriers to providing catch-up vaccinations, especially in busy clinical practice.

While LGA are significant service providers for early childhood immunisation in Victoria, the main constraints of this model (and associated ELS/C outreach programs) are that they do not vaccinate adults, sessions are not well advertised (affecting access for refugee communities) and language service access is problematic. Outreach to ELS/C provides efficient delivery, however, catch-up vaccination is not completed prior to the student transitioning to mainstream schools due to the number of sessions provided.

Given current demand, there is a need to consider strengthening both models of service delivery in the medium term. Further, the collection of data on catch-up vaccination in refugee background and asylum seeker communities is essential to evaluate current programs and to inform service development over time (see Immunisation surveillance and data collection pp. 57).

Table 14: Advantages and constraints of current service delivery models

Model	Language services	Advantages	Constraints
Council general immunisation sessions	Interpreting services generally available at (non-session) appointments to calculate catch-up, often not available at council immunisation sessions.	Experienced staff who are able to work out catch-up immunisation schedules All children and adolescents in a family can be vaccinated simultaneously Ability to deliver immunisation to large numbers of people	No immunisation for adults Lack of interpreter use – concerns with ability to take history and informed consent Limited advertisement of immunisation sessions (and no mention of catch-up immunisation) means new arrivals need to be actively linked to this service, and providers/public may assume only immunisation for NIP schedule points No or irregular ACIR payments for catch-up immunisation (which is more time consuming and expensive) so services directed to standard NIP, where ACIR payments are more secure Complexity of involving another service system, with multiple providers already involved
ELS – adolescent program	Support provided by Multicultural Education Aides	Convenience and attendance – students are present on-site Providers report high parent acceptability Ability to deliver immunisation to large numbers of people	Immunisation sessions are not offered at all ELS campuses or outpost schools Only available to ELS students - siblings and parents have to see a different provider Students do not complete immunisation before transitioning to mainstream schools No consistent follow-up mechanism for students exiting ELS/C Inconsistent transfer of information between school, GPs and Council immunisers
General practice – private and community health	Utilisation of available services varies in private practice, some GPs bilingual providers, usually available community health	All refugees and asylum seekers referred to GPs under existing systems for on-arrival assessment and care Ability to provide catch-up immunisation to everyone across the lifespan at a single location Can be offered as part of general longitudinal health care	Variable knowledge of catch-up immunisation Confusion about which vaccines are available and/or funded Variable willingness to deliver catch-up immunisations Financial concerns – diversion of practice nurse services to activities perceived as more profitable
Community health services, including refugee health nurses	Available	RHN specialise in support to refugees and provide health promotion on catch-up immunisation, and link people with service providers. Increased investment in follow-up with phone calls and text messages to ensure clients return and complete their course.	Not all new arrivals will be referred to a refugee health nurse, particularly in areas with significant numbers of new arrivals. Whilst practice varies in response to local service configurations, the refugee health nurse role focuses on general assessment and care co-ordination with referral for clinical needs to GP services in community health or private practice. A key role for refugee health nurses is providing health information, including immunisation, to new arrivals, settlement support and asylum seeker case work services.

Coordination of immunisation records

This section explores the challenges of coordinating immunisation records, existing information systems, and whether these systems can be utilised for immunisation surveillance.

Coordination of immunisation records has been an issue for many years. Most people of refugee background do not have written documentation of overseas vaccinations (Australian Government Department of Health 2013; Australasian Society for Infectious Diseases 2009), and Australia does not require completed Expanded Program of Immunisation records prior to departure. Humanitarian entrants completing a Departure Health Check (DHC) do not receive written documentation of this assessment, and many providers are unaware of the (live viral) vaccines given as part of the DHC that affect the timing of post arrival vaccines and tuberculosis screening. Providers reported detention health summaries (which individuals receive when released from held detention) frequently contain limited vaccination history, and multiple discrepancies.

The ACIR is a valuable resource for children up to seven years of age, and the ability to record overseas vaccines on ACIR is a significant benefit. However, there are challenges using ACIR for children without Medicare, especially when there have been changes in their name and birthdate (both are common). The National HPV Vaccination Program Register provides immunisation records for HPV only, and the Department of Health has reported poor data entry by GPs (Victorian Government Department of Health, 2014b). HPV notification payments for GPs ceased in 2010; these were reported to have been administratively complex and more cumbersome than ACIR notifications, which are typically automated through practice software. For older children, adolescents and adults, there is no centralised immunisation record or data repository (see Table 15).

There are various types of patient held records in use:

- Most infants have a MCH health and development record that includes vaccination history – newly arrived infants are referred to MCH through casework support.
- Patient held immunisation records are provided by LGAs, GPs, and by the detention health services provider – although these are all in different formats.

Project informants highlighted difficulties in obtaining past immunisation history, including vaccinations received overseas or in immigration detention, and vaccines from other providers. They noted that even if written records exist, individuals do not necessarily bring them to relevant appointments. Providers were strongly supportive of provision of patient held immunisation cards (preferably using a pro-forma) across services (see Appendix 9 for an example). Use of the same immunisation card across services might also help reduce duplication in service provision (i.e. if patients recognised the record related to the same service). Project informants felt the development of electronic immunisation records for those aged over seven years is long overdue, as noted by other groups (Heywood et al 2014). Options for development are explored in Immunisation surveillance and data collection (pp. 57).

Local issues with coordination of vaccination records included:

- Providers obtaining consent for school-based immunisation at school enrolment then families attending a GP and vaccinations being provided before the school session.
- Students commencing, but not completing, immunisation at ELS/C - this was identified as particularly problematic if students transitioned to a school in another municipality.

- The mobility of families in the early post-arrival period.
- Differences in ACIR reporting - ACIR provides reports to LGAs about children who are overdue for immunisations, however the LGA is not advised of the child's GP (and this information does not go to GPs).

In some areas there are clear protocols in place to enable co-ordination of immunisation information between LGAs and GPs, notably in Eastern Access Community Health (EACH) (see case study below) and the Geelong area – where two general practices see most new arrivals for their health assessments and immunisations. In areas with high demand for catch-up immunisations, such as CGD, the council reported difficulties obtaining information from busy GP services.

Eastern Access Community Health

EACH coordinates with Maroondah and Whitehorse City Councils, which provide immunisation sessions at the Blackburn ELS campuses. EACH sees all new arrival refugee families and refers them to GPs within the area. EACH seeks consent from families for their information to be shared for provision of health services, which enables greater co-ordination between the EACH RHN, treating GPs and the LGA immunisation services. This reduces the risk of over-immunisation, as LGA immunisation services are advised of students who have commenced immunisation in primary care.

Immunisation surveillance and data collection

Immunisation coverage for refugee background communities has been identified as a critical gap in immunisation surveillance; through stakeholder consultations for this project and also in other reports (National Health and Medical Research Council, 2014). Immunisation registers (pp. 68) provides details on the different immunisation registers; Table 15 outlines the availability of surveillance and centralised recording systems in LGAs and primary care.

The key challenges are:

- ACIR only records information up to the seventh birthday, and cannot be used for adolescent NIP schedule vaccines, or for catch-up over age seven years.
- The National HPV Vaccination Program Register is limited to HPV vaccine.
- GPs and LGAs use different mechanisms to enter data into ACIR - GPs via practice software, and LGAs through ImPS.
- There is no linkage between ACIR and the HPV register.
- There is no facility to indicate whether immunisations are part of a specified catch-up plan (and then whether this is completed), the systems capture the proportion of children who are up-to-date for age.
- None of the registers capture migration or refugee/asylum demography, so there is no ability to measure baseline immunisation coverage or the impact of immunisation strategies directed to these groups.

Providers strongly supported extending the ACIR across age groups, or using an alternative 'whole of life' register for immunisation in order to address administrative inefficiencies and provide a central repository for vaccination information. As an initial step, removing the upper age limit for data entry into ACIR would allow ACIR to become a repository for vaccination information for those aged seven years and older, although it is unclear whether this is feasible from a technical perspective.

Other possibilities raised by providers were extending use of the ImPS/Immunisation Central system to primary care, with a view to establishing a centralised Victorian system. Immunisation Central is currently an administrative system recording the numbers of

vaccinations provided, and as such would require further development to serve as a repository for client level immunisation history. Providers suggested that if this system was extended to primary care, notification payments would be required to encourage data entry.

Refugee health sector representatives discussed the need to include migration-related demography to monitor immunisation in refugee background, asylum seeker, and other migrant communities in Victoria, specifically:

- Country of birth.
- Year of arrival.
- Language spoken.
- Need for Interpreter.
- Refugee/asylum seeker on entry to Victoria.

Inclusion of these data items in existing repositories, ACIR, and the National HPV Vaccination Program Register would allow evaluation of: i) program support to migrant groups and vulnerable sub-groups, ii) the time taken to complete immunisation after arriving in Victoria, and iii) an understanding of immunisation status in relation to migration pathway and language proficiency.

Project informants identified the need for any central repository to capture data on delivery of catch-up immunisation, which could then be analysed against DIBP settlement and asylum seeker data. In addition to existing information collected by the ACIR and the HPV registry, information should be collected on:

- All Year 7/adolescent vaccines (HPV¹⁷, dTpa (Boostrix®) and varicella vaccine) across service types.
- Catch-up vaccination provided for 0-18 years.
- Catch-up vaccination provided for adults from refugee backgrounds.

At a service delivery level, the inclusion of these items in ImPS, primary care Client Management systems (billing software) and any Personally Controlled Electronic Health Records (PCEHR) would support efficient service delivery and planning.

The introduction of a PCEHR may provide an opportunity to centralise immunisation records across age cohorts. ACIR data has recently been incorporated into the PCEHR (Australian Department of Health 2014d; National Health and Medical Research Council 2014). Stakeholders felt linking the PCEHR and immunisation registers and using the PCEHR as a repository for immunisation information was a positive initiative, with potential to address a range of existing administrative inefficiencies. Challenges identified were the need to incorporate ImPS and general practice data into the PCEHR including vaccinations provided to older children, adolescents and adults and the interface with different primary care software systems.

Project informants also noted people with low-English proficiency and/or low health literacy are likely to face challenges in accessing the PCEHR. There have been initial steps to facilitate PCEHR registration at Medicare offices/other venues and targeted programs in hospitals, however broader, proactive strategies will be required to optimise use of the PCEHR by all Australians, including those with low English proficiency.

There are a number of challenges in addressing the existing shortfalls and fragmentation in immunisation records and collection of surveillance data, and staged improvement of data collection will be needed (Australian Government Department of Health, 2014d).

¹⁷ HPV has been included as a gap, given current poor data entry by general practice.

Table 15: Surveillance and immunisation records

Vaccines	LGA				General practice			
	Immunisation events	Surveillance	Central record	Refugee information	Immunisation events	Surveillance	Central record	Refugee identifying information
Children <4 years NIP schedule	Entered into ACIR with notification payment via ImPS or other software	Y	Y	N	Entered into ACIR with notification payment via Medical Director/other CMS	Y	Y	N
Children <7 years catch-up	Entered into ACIR as above, notification payment if conditions filled, no ACIR reports on catch-up	N	Y	N	Entered into ACIR No reports on catch-up from ACIR	N	Y	N
Children 7- <10 years catch-up	ImPS* Not entered into ACIR Funded vaccines	N	N	N	Practice software records, not entered into ACIR	N	N	N
Adolescents NIP schedule HPV	Entered into HPV register with notification payment, via ImPS or other software	Y	Y	N	Able to enter date into HPV register, compliance poor without notification payment (est. 50%)	Varies	Varies	N
Adolescent NIP VV and dTpa	Immunisation Central (via ImPS)* VV ceases 2016, dTpa year 7 from 2015	Y, no individual data collected – participation recorded	N	N	General practice unable to enter data into Immunisation Central.	N	N	N
10 years and older catch-up	Not all vaccines funded Not entered into ACIR	N	N	N	Not all vaccines funded	N	N	N
Adult	HBV – only funded for at-risk groups, influenza/23vPSV 65 years and older (earlier ATSI)	N	N	N	HBV – only funded for at-risk groups, influenza/ 23vPSV 65 years and older (earlier ATSI)	N	N	N
Adult catch-up	Not all vaccines funded	N	N	N	Not all vaccines funded	N	N	N

*As of 2014, LGAs enter data into Immunisation Central (via ImPS) on the numbers of vaccinations administered, which triggers ACIR notification payments for children less than seven years. The level of participation (coverage) is currently based on an LGA-determined denominator; this varies across LGAs; work is underway to link to Cases 21 (DEECD data). Immunisation central data are not population data, as this system does not include information on vaccinations given in primary care.

Professional development and support

This section outlines identified need for professional development opportunities about immunisation and catch-up immunisation. The increasing complexity of planning and delivering catch-up vaccination with the evolving NIP suggests a need for improved clinical decision-making tools and professional development opportunities.

Stakeholders emphasised ongoing changes to the NIP schedule and the increased complexity of developing and delivering catch-up vaccination schedules. Many providers reported that GPs struggle to keep up-to-date with NIP schedule changes in busy practice environments, and noted the lack of relevant immunisation catch-up calculators, specifically:

- While the *Australian Immunisation Handbook* (Australian Government Department of Health 2013) is the reference for catch-up immunisation, however the complexity of the (six) tables mean this is not straightforward to use in practice.
- The 2011 Department of Health guide for catch-up immunisation for people without previous vaccination has not been updated due to schedule changes, combination vaccines, and need for clinical decision making.
- The South Australian immunisation calculator only provides guidance for children less than seven years, and cannot be used for older ages reducing utility.

Providers felt an immunisation calculator was likely to be a valuable resource that would support service delivery and professional development (PD). Resources that simplified catch-up regimens were identified as extremely useful, and there was consensus that a streamlined approach to catch-up vaccination, with a centralised guideline, an immunisation calculator and greater consistency in patient-held records across the service systems would enable enhanced delivery of catch-up immunisation and support providers. An interim catch-up record that also supports providers planning a catch-up regimen is feasible (Appendix 9).

Project informants reported a threshold effect, such that providers need to deliver immunisation catch-up on a regular basis, or they tend to stop providing this service. Practice nurses were identified as a critical group requiring ongoing support, as they tend to be the main group delivering vaccines in the primary care setting. Medicare Locals reported nurses were more likely to attend face-to-face immunisation PD than GPs.

PD was identified as important, acknowledging the competing priorities within busy general practice and other PD requirements, and also the need for ongoing support with ongoing changes to immunisation practise.

Current PD opportunities for providers include:

- The post-graduate nursing qualification at Latrobe University for RN to become Nurse Immunisers.
- The Melbourne Vaccine Education Centre (MVEC) - MVEC is a collaboration between the RCH, Monash Health, the Murdoch Children's Research Institute and the University of Melbourne, with web-based resources for health providers a 6-monthly clinical vaccinology update.
- Public Health Association of Australia conferences.

- Immunisation Nurses Special Interest Group (INSIG)¹⁸ is a professional body of the Australian Nursing Federation, established to support nurses working in immunisation practice with a forum that facilitates communication, discussion and PD for immunisation nurses in Victoria
- Sessions run by Medicare Locals, Department of Health, refugee health fellows, refugee health nurses, and others, and content included in health teaching/coursework.

Patient health information

New arrivals usually have low English proficiency, and face challenges in understanding and navigating a complex and unfamiliar health system. This section examines existing patient information on immunisation.

The Department of Health immunisation website includes information in 28 languages¹⁹, with the following breakdown:

- Pre-immunisation information (27 languages).
- Vaccine side effects (27 languages).
- Understanding childhood immunisation (16 languages).
- Starting primary school (school entry information) (25 languages).
- Information about particular vaccines (19 languages).

Key gaps include:

- Inconsistent information across languages.
- No general information about immunisation program delivery (e.g. roles of LGA and GPs).
- No information on catch-up immunisation (e.g. the need for three or four visits to complete catch-up, and need to avoid duplication).
- No translated consent forms.
- No information in Chin, Hakka-Chin, Dinka, or Nuer.
- No audio/spoken information.
- No overall pro-forma immunisation record.

NHV has recently introduced talking books and posters about immunisation in eleven languages to support people with low health literacy. These resources were developed in partnership with Centre for Ethnicity and Health (CEH), and NHV are in the process of translating post-immunisation information. Hume City Council has trialled the talking books, but suggested that this resource has not been used to full potential, although providers also noted the unit cost is high and the resource can only be used on-site. NHV advised that further consideration is being given to other formats, including on-line information.

Stakeholders felt immunisation services are not easy for clients to understand/navigate, particularly for catch-up vaccinations. They noted there is no summary information about immunisation services in Victoria, and suggested this would be useful, and that any such resource should include information on what to expect (e.g. the number of visits for catch-up), and where immunisation is available (e.g. roles of GPs and LGAs). Further, they

¹⁸ <http://www.immunisationnursesvic.org.au/>

¹⁹ <http://www.health.vic.gov.au/immunisation/factsheets/language.htm>

suggested this information was important not only for clients, but also for RHN, caseworkers, and organisations delivering health education to groups of people from refugee backgrounds, such as Water Well²⁰. Stakeholders also identified information gaps as above, including translated consent forms, and information in specific languages, as well as the need for community-informed approaches to information provision.

The CGD has undertaken an initial review with young people and community services that will inform this approach. A community advisory approach, including Foundation House’s Relationships to Enhance Accessible Learning (REAL) projects (school based parent advisory groups) and service literacy project (Afghan families in Dandenong/Casey, Assyrian Chaldean families in Hume), existing CGD consultation groups and other links offer opportunities for community advice to determine key messages and communication approaches.

Stakeholders noted the need to test information before implementation, to ensure utility in clinical environments, and group health education sessions.

Table 16 lists ways immunisation information could be delivered based on existing literature and stakeholder interviews.

Table 16: Immunisation information and means of delivery

Delivery mechanism	Resource
On-arrival settlement support (humanitarian entrants) and asylum seeker case workers	Key messages included in staff orientation (in place, 2014)
Refugee health nurses, Water Well and other group health education	Simple fact sheets on immunisation services Multi-lingual audio-visual resources available on-line
General practice MCH Public immunisation sessions Other immunisation providers, including hospitals	NHV talking posters for waiting room AV available via tablet in waiting room Simple fact sheets about immunisation Translated consent forms Existing translated pre and post immunisation check lists Service information available in an audio-visual format, including on-line and print based via MCH, RHN and caseworkers
On-line- further review use of on-line material by new arrivals- adults, young people	Multi-lingual audio- visual resources — that can be ‘dubbed’ with new languages as needed
School based information	Information for parents (e.g. similar to current information used in Hume, Dandenong) providing overview of school based program Health information sessions provided at AMEP classes to include detail on immunisation and service delivery Health information sessions for parents conducted at ELS/C by RHNs promoted at student enrolment Establish parent advisory groups to discuss immunisation program (e.g. REAL program currently being piloted in Victoria)
Community radio and Channel 31	Review use of radio and TV by language group, may be more relevant for more established communities

²⁰ The Water Well program volunteers include junior doctors, allied health professionals and medical students who deliver health education to refugee background communities.

Conclusions

Access to catch-up immunisation for people of refugee background has been of concern at a practice level for many years. Increased numbers of refugee and asylum seeker arrivals in 2013 highlighted the ongoing need, the challenges of delivering catch-up vaccinations, and the gaps and shortfalls in existing approaches to immunisation service delivery.

Almost all people of refugee background require catch-up vaccination on arrival to Australia, due to differences in country of origin schedules, disrupted health services in their countries of origin, and a lack of written immunisation records. Unfortunately, people of refugee background remain at significant risk of being unimmunised or under-immunised in Australia.

Refugee background communities are likely to be at higher risk for ongoing transmission of VPD due to the combination of under-immunisation and increased susceptibility, and also through increased opportunities for exposure through household, community and travel related contact, as VPD are endemic and/or epidemic in many of their areas of origin. HBV is of particular concern, with many refugee cohorts having a prevalence of HBV infection in the 'high endemic' range (8 per cent or more), with a significant proportion remaining susceptible to transmission of HBV infection.

Catch-up immunisation is challenging for providers due to the complexity of catch-up schedules and ongoing changes to the NIP; the complexity of delivering catch-up vaccines to multiple people of different ages outside the NIP schedule points; gaps in vaccine funding, notably for HBV, varicella, meningococcal and HPV; fragmented service delivery, and inefficient information management.

Catch-up immunisation is challenging for people of refugee background because of difficulty accessing and navigating health and immunisation services, fragmented service delivery, gaps in vaccine funding, a lack of efficiency in information management and missed opportunities by service providers. People of refugee background usually require interpreter assistance for health care episodes in the initial period of settlement, so difficulty understanding recall systems and difficulty accessing language services, and/or language appropriate immunisation information are further barriers to immunisation service delivery.

Immunisation policy sits across three levels of government: Commonwealth, State and Local government. In Victoria, most immunisation services are provided by LGAs or primary care. There is a complex system of immunisation notification payments from both State and Commonwealth governments, and an equally complex system of administration for these payments. Overall, LGAs receive increased notification payments (through State government) compared to primary care, where MBS item numbers can be used for service provision.

There are strengths and limitations with existing models of immunisation service delivery in the provision of catch-up vaccines. Primary care can deliver immunisations across the lifespan - people of refugee background are all linked with this service system, and GPs already provide the majority of immunisation in LGAs of high settlement. However, GPs identify a range of barriers to providing catch-up immunisation, and co-payments for primary care are likely to be an additional and significant barrier in the future.

LGAs are mandated to provide immunisation to children under the Victorian *Public Health and Wellbeing Act, 2008* (Victorian Government 2008). Overall LGAs provide the majority of early childhood vaccination and most adolescent NIP schedule vaccines in Victoria, and there are some exceptional examples of outreach to provide school-based catch-up programs. However, LGAs do not provide immunisation services to adults, catch-up

immunisation for whole families does not fit easily into existing council immunisation sessions, LGAs identify similar challenges to GPs, and language service access is problematic.

Given the numbers of people of refugee background in Victoria, and the current limitations of service delivery, there is a need to consider strengthening both service delivery types in the medium-term.

Strategies to support catch-up immunisation include: ensuring catch-up vaccinations are funded and therefore accessible; providing a clear guidelines and an immunisation calculator to support catch-up vaccination; and considering a uniform patient held record/pro-forma across service types. Gaps in patient information need to be addressed, including gaps in content (e.g. principles of catch-up immunisation, how and where to access immunisation in Victoria, immunisation consent forms), translations (not all current immunisation information is available in all languages), languages (increasing the number of languages - Dinka, Nuer, Chin and others), and formats (the need for audio/spoken information in addition to print-based information). Other strategies include adequate professional development, practice and staff support (including for practice nurses), better utilisation of existing services, including the refugee health nurses and refugee health fellows, and incentives in the form of notification payments.

The issue of data is critical – there are currently separate registers for early childhood vaccines, the adolescent HPV vaccine, and immunisation delivery in LGAs. There is no identification of refugee status in any of the existing immunisation registers, and therefore no estimates of population coverage or service delivery occasions for this group. This means there is no ability to monitor program coverage, or evaluate the impact of any policy or program implementation. A ‘whole of life’ immunisation register that includes migration related demography and a means of identifying people of refugee background is central to address the current administrative inefficiencies and to provide surveillance data.

There is sufficient evidence to consider refugee and asylum seeker communities as ‘at-risk’ populations in the National Immunisation Strategy, the Victorian Immunisation Strategy, the Victorian Guidelines for immunisation practice in Local Governments, and the Victorian guidelines for groups eligible for funded HBV immunisation. Further, State and Commonwealth policy should consider and address catch-up immunisation for all ages, not just for children under seven years.

Finally, there is a gap in knowledge of refugee background communities’ views on immunisation, however, despite barriers to accessing and completing catch-up immunisation, providers consistently report these communities are strongly supportive of immunisation, and recognise the individual and public health benefits.

Recommendations

Victorian advocacy for national policy

1. Include refugee and asylum seeker numbers in Victorian government forecasts for the required quantity of NIP vaccines, thus recognising the delivery of catch-up immunisation that occurs in addition to delivery of the NIP schedule. A reasonable approximation of numbers would be:
 - 4,000 offshore program entrants annually
 - 1,000 plane arrivals annually
 - Include the additional 10,000 people seeking asylum on bridging visas over a 3-year period.
2. Advocate through the Standing Council on Health and the Australian Health Ministers Advisory Council to address the National Immunisation Strategy's eight strategic priority areas, with particular emphasis on priority 1: Improve immunisation coverage, and developing an agreed position on the provision of free catch-up immunisation schedules, including catch-up for those aged over seven years.
3. Support policy and economic analysis of the impact of general practice co-payments on immunisation service delivery in Australia, and consider ways to support accessible immunisation service provision (e.g. through exemption of co-payment for immunisation services or supporting nurse-led service delivery models).
4. Support identification of people of refugee background and people seeking asylum as a named 'at risk' group in the National Immunisation Strategy, in line with the National Centre for Immunisation Research and Surveillance (NCIRS) recommendation.
5. Support development of a whole of life immunisation register as per the NCIRS and the Public Health Association of Australia, with the additional need for refugee/asylum seeker and migration related data (see Immunisation register recommendation below).
6. Support linkage and inclusion of all relevant immunisation data in the PCEHR or equivalent.

Victorian policy

7. Include people of refugee background and people seeking asylum as a named high-risk group in the next iteration of the Victorian Immunisation Strategy, with specific reference to improving data and immunisation coverage.
8. Include people of refugee background and people seeking asylum as a named at-risk group for hepatitis B and ensure they are eligible for funded HBV vaccine in Victoria, in line with the National Hepatitis B Strategy.
9. Extend Department of Health Guidelines for Immunisation Practice in Local Government Areas to include explicit reference to the provision of catch-up immunisation, at both public sessions and as part of school immunisation programs, for all children aged below 18 years.

Vaccine funding

10. Address funding gaps based on a premise of equity – that overseas-born Victorians should be immunised equivalent to a Victorian-born person of the same age. This will require funding strategies across the lifespan.
11. Include refugee and asylum seeker numbers in Victorian Government forecasts²¹ for the required quantity of NIP vaccines for all vaccines including HBV, VV, HPV (acknowledging MenC may not be feasible for catch-up immunisation, with schedule changes and current combinations).

²¹ Immunisation catch-up is provided free to all children up to nine years (inclusive) so permanent migrant numbers should also be included, although this issue was beyond the scope of this report.

12. Ensure the order form for vaccines for refugees and asylum seekers is consistent with the Free Vaccine Victoria guidelines, and that this consistency is maintained.

Vaccine administrative arrangements

13. Consider extending the system of State payments to LGAs to primary care, as a notification payment for data entry into the National HPV Vaccination Program Register and Immunisation Central, with the additional benefit of improving surveillance.
14. Consider introduction of a catch-up notification payment for children, adolescents and adults of refugee background that is available to all immunisation providers, linked to Immunisation Central or other repository.

Service delivery

15. Ensure catch-up immunisation is included in Medicare Local population planning, supported through the Regional Management Forums.
16. Support access to language services consistent with the Department of Health guidelines and Victoria's Multicultural Affairs and Citizenship policy.
17. Support a single catch-up guideline. This could be located on the Department of Health website, and/or the MVEC website, and be developed as a collaboration between Department of Health and Royal Children's Hospital (RCH).
18. Support the development of a catch-up immunisation calculator that could be used for all ages, and across services.
19. Support the development of a single pro forma for catch-up immunisation that could be used in the interim – see example in Appendix 9.
20. Utilise the refugee health fellows and refugee health nurses, who are able to provide education on catch-up immunisation for people of refugee background and people seeking asylum, capitalising on existing state government investment.

Local government

21. Develop service guidelines for LGAs in providing catch-up immunisation services for people of refugee background and people seeking asylum, including approaches to service provision and language services.
22. Consider pilot program funding for LGAs to complete catch-up immunisation schedules for children, adolescents and their parents from a refugee background, with a 'whole family' approach.
23. Ensure English language schools and centres (ELS/C) immunisation programs run more than once a term so students can complete catch-up during their time in ELS/C if they choose this location for immunisation service delivery.

General practice

24. Further develop the role of refugee health nurses, who are located across Victoria, to work with local practices to develop expertise in refugee immunisation catch-up, and develop catch-up schedules where this is an identified barrier. Nurse immuniser qualifications will be added as a desirable attribute in future recruitment of refugee health nurses, and the refugee health fellows will be able to support the nurses with training, and ongoing consultation.
25. Facilitate Medicare Locals, and in the future, Primary Health Networks, to educate and build the capacity of general practice for catch-up immunisation, building on existing relationships. Consider development of whole-of-practice catch-up immunisation guidelines.

Immunisation registers

26. Ensure the ACIR and other immunisation software and registers (HPV, ImPS, Immunisation Central) include data items relevant to refugee and asylum seeker status (country of birth,

- year of arrival, language spoken, interpreter requirement and refugee/asylum seeker on entry to Victoria) allowing measurement and evaluation of immunisation delivery to refugee background (and other new arrival) communities at a local and state level.
27. Ensure ACIR and other immunisation registers and software (HPV, ImPS, Immunisation Central) include a specific indicator for catch-up immunisation, allowing fair application of notification payments, and improving measurement and evaluation of catch-up vaccination delivery to refugee background (and other new arrival) communities.
 28. Explore whether it is feasible to remove the upper age limit for data entry into ACIR, allowing ACIR to become a repository for information on vaccines provided for those aged over seven years.
 29. Explore the use of ImPS/Immunisation Central as a whole of life Victorian register/data repository for use by all of LGAs, general practice and other providers.
 30. Explore the potential for PCEHR to provide a centralised immunisation record across the lifespan.

Professional development and clinical support

31. Extend existing professional development activities on immunisation delivery to cover catch-up immunisation, with specific reference to refugee background communities
32. Ensure there is a catch-up immunisation guideline as above.
33. Professional Development at Foundation House for refugee health nurses to include training on catch-up immunisation.
34. Training on catch-up immunisation for other providers, including Medicare Locals and Community based providers can be supported through the refugee health clinicians and refugee health fellows.

Patient health information and community engagement

35. Ensure all Department of Health immunisation information is available in all the current included languages, i.e. that the same information is available for individual languages.
36. Extend this patient information to additional languages – Dinka, Nuer, Chin and others.
37. Include new translated information sheets and multi-lingual resources outlining immunisation services in Victoria.
38. Include a new translated information sheet and other multi-lingual resources on basic principles of catch-up immunisation.
39. Include immunisation related information in the pending revision of the Health Translations Directory.
40. Extend immunisation information from purely print-based to audio/spoken resources.
41. Seek community views on preferred means of communication for, and critical gaps in, immunisation information as well as views on immunisation services, and use of the PCEHR.
42. Pilot an immunisation catch-up record and a health information folder for people of refugee background and people seeking asylum when they arrive in Victoria through the existing case-work system.

Appendix 1: Key informants

Ambi Kaur	Refugee Health Nurse, Doutta Galla Community Health Service
Andrea Read	Welfare Officer, Collingwood English Language School
Dr Andrew Block	Director of General Medicine & Refugee Health, Monash Health
Angela Dunn	Immunisation Coordinator, Hume City Council
Angela Ouroumis	GP Services, Infiniti Health Solutions
Anne Nunan	Immunisation Program Manager, South Eastern Melbourne Medicare Local
Catherine Fulgoni	Refugee Health Nurse, Monash Health
Chelsea Taylor	Senior Policy Advisor, Immunisation, Victorian Government Department of Health
Chris Scouler	Practice Nurse, Dandenong Super Clinic
Chris Johnson	Refugee Health Nurse, Barwon Health
Christine Heuston	MCH Nurse, City of Greater Dandenong Council
Con Pagonis	MAV Multicultural Policy Adviser & VLGMIN Co-convenor, Municipal Association of Victoria
Crystal Russell	Policy Coordination & Projects, Victorian Government Department of Health
Dr I-Hao Cheng	Refugee Health Program Manager, South Eastern Melbourne Medicare Local/GP, Monash University
Jacinta Bongiorno	Refugee Health Nurse, Monash Health
Jane Foy	Maternal & Child Health Unit Manager, Moreland City Council
Julie Hammett	Project Lead, South Western Melbourne Medicare Local
Jan Stone	Maternal and Child Health and Immunisation Coordinator, Maribyrnong City Council
Jeanette Cameron	Manager, Health Reform Initiatives, Inner North West Melbourne Medicare Local
Jill Kelly	Senior Project Officer, South Eastern Melbourne Medicare Local
Joanne Fittock	Maternal & Child Health Policy Advisor, Municipal Association Victoria
Dr Joanne Gardiner	General Practitioner, Doutta Galla Community Health Service, Refugee Health fellow, Royal Melbourne Hospital
Dr Karen Linton	General Practitioner, GP Liaison, South Western Melbourne Medicare Local, Macedon Ranges & North Western Melbourne Medicare Local
Kate Russo	Program Consultant, Networking Health Victoria
Kay Dufty	GP Services, Infiniti Health Solutions
Lauren Davidson	Project Lead, South Western Melbourne Medicare Local
Linda Marburg	Immunisation Coordinator, Wyndham Council
Lindy Marlow	Statewide Facilitator, Refugee Health Program, Western Regional Health Centre
Lisa Beck	Immunisation Coordinator, City of Greater Dandenong Council
Lisa Sparkes	Immunisation Coordinator, Maroondah City Council
Dr Liz Bannister	Consultant Paediatrician, Gastroenterology Fellow, Department Gastroenterology and Clinical Nutrition, Royal Children's Hospital

Dr Margie Danchin	Consultant Paediatrician, Department of General Medicine, The Royal Children's Hospital, Senior Research Fellow, Vaccine and Immunisation Research Group, Murdoch Childrens Research Institute, Senior Fellow, Department of Paediatrics, The University of Melbourne
Dr Mark Timlin	Refugee Health Fellow, Monash Health
Mary Spyropoulos	Deputy Principal, Western English Language School
Merilyn Spratling	Refugee Health Nurse, Eastern Access Community Health
Natasha Macleod	Immunisation Nurse, Yarra Council
Dr Nigel Crawford	Consultant Paediatrician, Medical Head, Immunisation Services, Department of General Medicine, Royal Children's Hospital, Deputy Director SAEFVIC, Murdoch Childrens Research Institute, Senior Fellow, Department of Paediatrics, University of Melbourne
Robyn Vough	Practice Nurse, Eastern Medical Centre
Sarah Callaghan	Immunisation Nurse, Kingston Council
Sarah Daly	Regional Manager, AMES Settlement
Samara Piskopos	Welfare Officer, Western English Language School
Samantha Smorgan	Manager, Primary Care Engagement & Support, Inner North West Melbourne Medicare Local
Sheenagh McShane	Health Services Co-ordinator, Asylum Seeker Resource Centre
Sheryl Southern	Welfare Officer, Noble Park English Language School
Tessa Speller	Refugee Health Nurse, Primary Care Connect
Vesna Courtot	Health Services Coordinator, International Health and Medical Services
Victoria Butterfield	Welfare Officer, Blackburn English Language School
Yandi Choong	Immunisation Officer, Glen Eira Council

Appendix 2: Stakeholder interviews

These questions were developed at the start of the needs analysis and used as a guide for the stakeholder interviews. They were adapted as the consultation process evolved.

Guiding questions

- Where are you holding immunisation programs?
- Do these include provision of catch-up immunisation?
- How do you advertise immunisation programs? Do you think this information is accessible/likely to reach refugees and asylum seekers?
- Councils – how much funding is available for interpreters to be used during catch-up immunisation? How do you access interpreters? Does local government have access to a credit line for interpreters?
- Councils – are you providing vaccinations for hepatitis B?
- What data are you collecting for the program? Do you collect any data with regard to whether people are asylum seekers/from a refugee-background?
- What record is provided to those receiving vaccinations?
- Do you think the NIP schedule provides sufficient coverage with regard to catch-up?
- What other programs are you aware of that are taking place in the area? How is the division of labour between providers decided/agreed?
- Can you provide an approximate breakdown of the percentage of vaccinations delivered between the Local government and GPs?
- Who provides vaccinations in general – GPs, community health centres, other? How much is targeted and how much opportunistic? How are the costs covered?
- Medicare Locals – how many GP practices are providing catch-up immunisation to refugees in your particular region?
- Who is being missed? For example, if the program takes place in an English Language School, how are those not enrolled reached?

Additional questions for Local Government Areas

- Are you providing catch-up vaccinations (e.g. outside of the specific NIP age cohort) at your public drop-in sessions? If yes, up to approximately what age do you provide catch-up at these sessions?
- Are you providing catch-up vaccinations at your vaccination sessions at English Language Schools?
- Are you providing catch-up vaccinations at your vaccination sessions at mainstream secondary schools?
- If you have answered yes to any of the last three questions, are you able to provide an approximate percentage of the total vaccinations administered that would be considered catch-ups provided at these sessions?
- Approximately how many times in a single drop-in sessions would you use a telephone interpreter?
- What equipment do you have to do this – e.g. do you have a hands-free telephone/speaker-phone and where is it located – e.g. in the same room, or in another part of the building?
- How long do you have to wait for an interpreter?
- Can you get an interpreter in all languages you request?
- What is your process for informing parents/students at English Language Schools about immunisation and getting consent – and when do you do this? What written materials are circulated?
- Do you provide immunisation services at all English Language centres and campuses?
- Who takes the responsibility for coordinating with GPs to see if vaccinations have been given elsewhere?

Appendix 3: Refugee health nurse survey

This survey was circulated to all refugee health nurses.

- Are you an accredited Nurse Immuniser?
- Do you develop catch-up schedules?
- Are you administering vaccines?
- Are you trained for Mantoux testing?
- Is there a catch-up immunisation program operating in your area?
- If yes, who is organising, running and funding this service? How is it advertised?
- Where is it occurring and how often does it take place?
- Who does it target/reach?
- How is the consent for children to be vaccinated organised?
- What vaccinations are provided?
- Who works out the catch-up schedule?
- What data is collected – country of origin, visa status, other information?
- What record is provided to those receiving vaccinations?
- What are the gaps? For example, in those receiving the vaccinations, are there gaps in the vaccinations on offer, in the data being collected or other gaps?
- What barriers/constraints are there to refugees and/or asylum seekers accessing the provision of catch-up immunisation?
- Please provide information on any previous catch-up programs in your area – when it occurred, numbers reached, vaccines provided, delivery model, other details.
- Do general practices in your area offer catch-up immunisation? If they do, who administers the vaccines?

Appendix 4: Project Advisory Group

Angela Dunn	Immunisation Coordinator, Hume City Council
Angela Ouroumis	General Practice Services, Infiniti Health Solutions
Anne Nunan	Immunisation Program Manager, South Eastern Melbourne Medicare Local
Chelsea Taylor	Senior Policy Advisor, Immunisation, Department of Health Victorian Government
Crystal Russell	Policy Coordination and Projects, Department of Health, Victorian Government
Jan Stone	Immunisation Coordinator, Maribyrnong City Council
Jill Kelly	Senior Project Officer, South Eastern Melbourne Medicare Local
Dr Karen Linton	General Practitioner, General Practice Liaison, South Western Melbourne Medicare Local and Macedon Ranges and North Western Melbourne Medicare Local
Kate Russo	Program Consultant, Networking Health Victoria
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Appendix 5: Cost benefit of immunisation

Incomplete vaccinations place individuals and the community at risk of VPD, and increase the demands and the strain on the public health system. Incomplete vaccination is a missed opportunity for effective preventative health care, which results in significant downstream costs to acute health services, and the resultant burden of disease, including both acute (e.g. measles) and chronic health concerns (e.g. HBV) will fall upon State funded hospitals and services.

There are public and personal health costs if newly arrived migrant populations do not receive adequate immunisation through a coherent catch-up program. Globally, vaccines are one of the most cost-effective of all health interventions, preventing an estimated three million deaths annually and preventing disability in many more (Ehreth 2003).

Assessing the cost-effectiveness of immunisations is notoriously difficult – especially on a vaccine-by-vaccine basis (Ehreth 2003; Drummond et al. 2007). Table 17 provides information on the cost of treatment and monitoring for diseases included on the NIP schedule. These analyses suggest monitoring and treatment of VPDs far exceeds the costs of providing vaccines and administering vaccinations, and that there are substantial returns for investment in immunisation.

Table 17: Costs associated with vaccine preventable disease in Australia.

Disease	Cost Implications
Hib	US data: for every US\$1 spent on Hib vaccine, more than US\$2 is saved (Ehreth, 2003)
Hepatitis B (HBV)	The cost of monitoring a person with chronic HBV is \$1233 per year, while treatment costs average \$1400 per patient (Butler et al., 2004a). The cost of treatment of hepatocellular carcinoma is \$11,753 per year, and the cost of a liver transplant is \$144,392 plus \$23,160 per year for follow-up (Butler et al., 2004a; Robotin et al., 2009). Acute HBV would involve multiple medical practitioner visits, pathology testing, and contact tracing, however there are no cost data available.
Influenza	Overall, influenza costs the Australian healthcare system \$115 million per season (Newall & Scuffham, 2008). The cost of influenza is approximately \$33 per person not requiring hospitalisation, and \$5413-5985 per person requiring hospitalisation (Newall & Scuffham, 2008).
Measles	The cost of measles is estimated at \$2,982 per case, including both acute clinical presentation and treatment and the management of long-term neurological sequelae (Shiell et al, 1998). Centers for Disease Control (CDC) estimates from the United States (US) suggest that for every US\$1 spent of the MMR vaccine, more than US\$21 is saved in direct medical costs (Ehreth, 2003). Costs of measles outbreak control strategies are significantly more than catch-up vaccination, estimated at \$20 per vaccination required (Shiell et al., 1998). Strategies targeting the highest risk contacts cost approximately \$32.90 per case prevented, while broader outbreak control strategies including more distant contacts and family members cost up to \$217.80 per case prevented (Shiell et al., 1998). This is much less than the cost of managing a case of measles, resulting in cost saving that is 2-10 times the cost of immunisation.
Meningococcal disease	The cost of meningococcal disease is approximately \$7549 per case. This includes those who die (\$7410 per case), those who survive with no long-term sequelae (\$7410) and those who survive with long-term sequelae (\$11,306), (Skull et al., 2001).
Diphtheria, Tetanus, Pertussis	CDC data from the US suggests that for every \$1 spent on DTP immunisation there is a cost saving of \$24 (Ehreth, 2003). There are limited cost data from Australia.
Pneumococcal disease	The cost of uncomplicated pneumococcal meningitis is approximately \$8,333 per case, with lifelong costs of \$30,333-37,670 for those with chronic hearing deficit and \$138,973-4,587,000 for those with neurological deficit (Butler et al., 2004b). The cost of pneumococcal bacteraemia, pneumonia and other focal infections is \$113-3,955 per case (depending on severity) (Butler et al., 2004b). The cost of otitis media is \$75-2,292 per case depending on severity and need for tympanostomy (grommets) (Butler 2004b).
Varicella	The cost of hospitalisation for varicella infection is approximately \$1,953 if uncomplicated, and \$5,163-5,895 if involving pneumonia or encephalitis, with annual costs of \$38,902 for those with long-term disability (Scuffham, Lowin, & Burgess, 1999).

Appendix 6: Case example - measles outbreak, Sydney 2012

A recent outbreak of measles in a migrant community in Sydney (Najjar et al. 2014) highlights the risks of under-immunisation for refugee background communities, and also the risk to the wider community.

In April 2012, a 20 year-old male returned to Sydney from overseas with fever, sore throat, cough and coryza – the early signs of measles. By the time his symptoms had progressed and he was diagnosed, at least three other people were already infected. Over the following seven months a measles outbreak spread well beyond this index case's geographical and social domain. In total, 168 people contracted measles. Two-thirds were children, including 36 (21 per cent) infants aged less than one year. Overall, 49 (30 per cent) people required admission to hospital and six (4 per cent) suffered serious complications. Three quarters of cases had received no measles immunisation, including 33 (20 per cent) who were too young for vaccination (i.e. less than 1 year) and 95 (57 per cent) who were conscientious objectors/forgot/reasons not specified. Of the 25 per cent of cases that had received measles vaccine, only three (1.7 per cent) had received the full two-dose course and completed immunisation.

In addition to population susceptibility, this outbreak required opportunities for exposure to infection. The index case was a returned traveller from a region with higher measles prevalence than Australia. Opportunities for contact included schools, health care facilities (21 per cent), religious and cultural centres, and family homes - although a large proportion of contact points were unknown. Despite a prompt public health response, the outbreak was sustained for seven months by serial transmission between susceptible contacts.

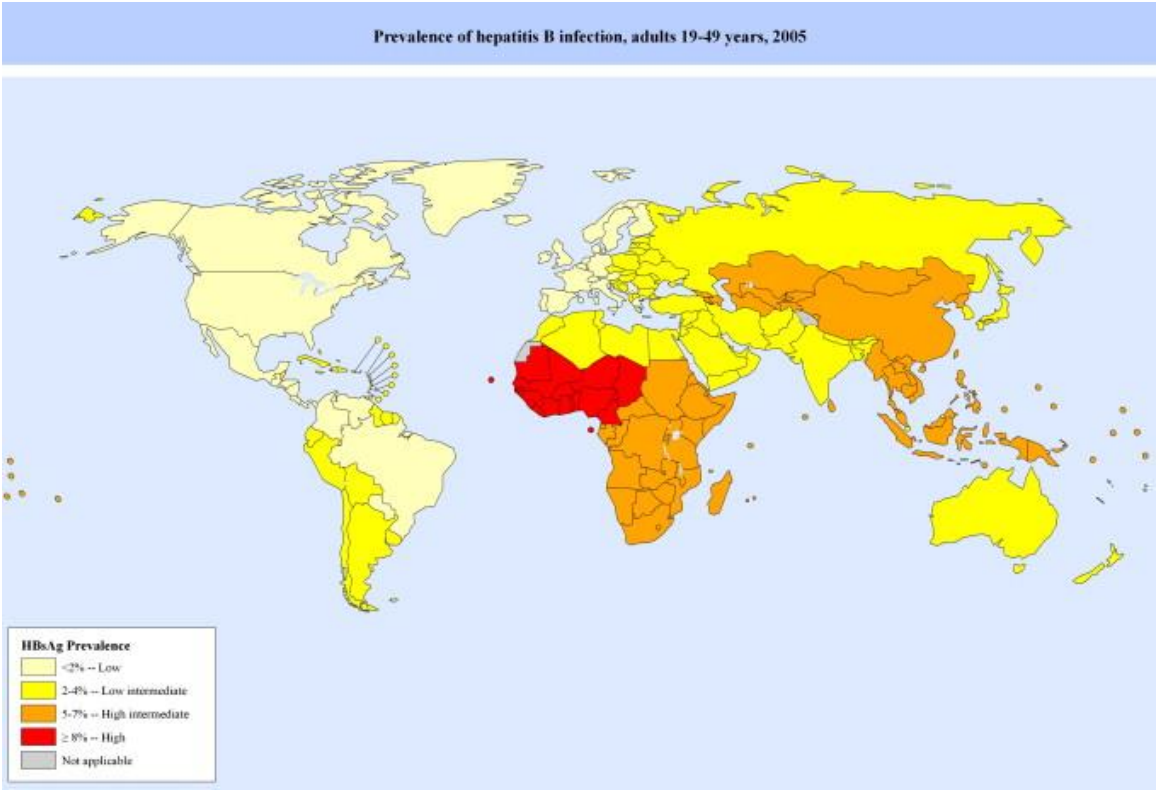
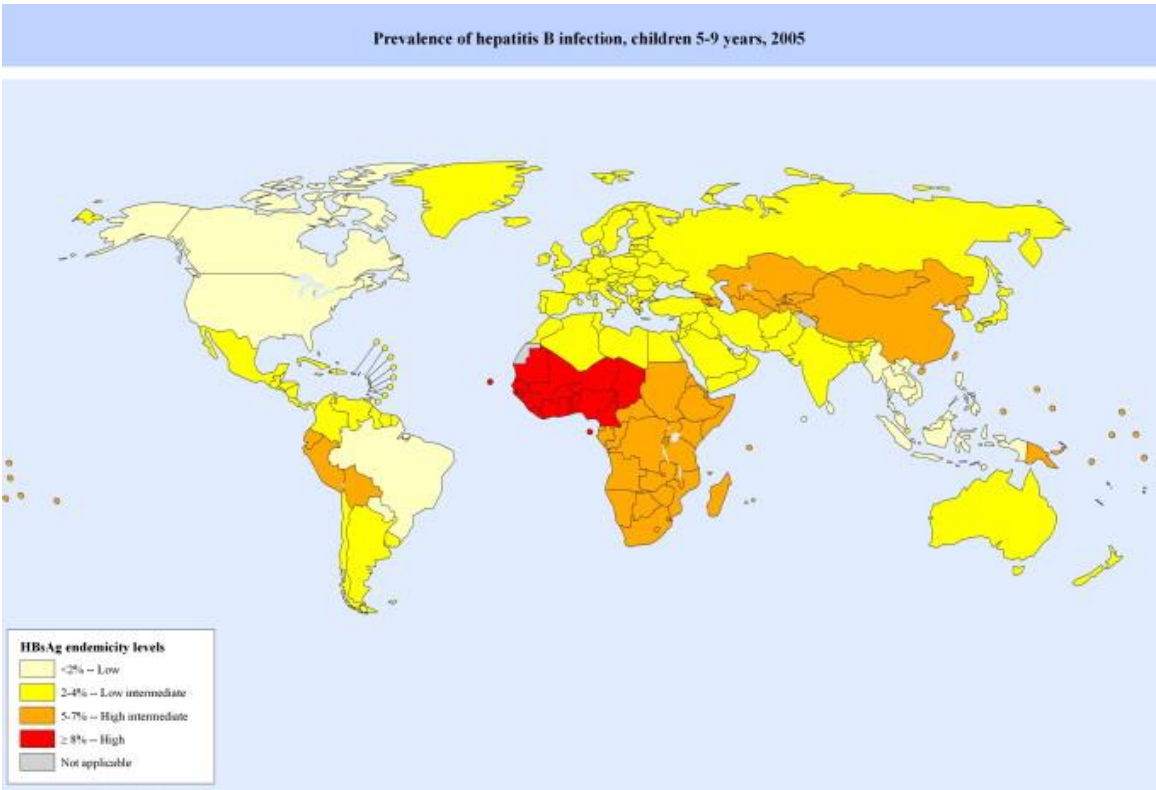
This case highlights the potential for relatively small susceptible populations to sustain a large outbreak despite high population immunity. Clustering was observed by age (18 per cent were 15 – 19 years of age), geography (Campbelltown), and ethnicity (28 per cent of Pacific Island descent). The outbreak occurred despite NSW recording 90 per cent population coverage for measles immunisation at the time. While there was variation between postcodes, coverage in affected areas was not significantly different to the NSW average; this suggests LGA level monitoring may not capture susceptible populations. Accordingly, the public health response to this outbreak involved targeted catch-up immunisations for children of Pacific Island descent.

This outbreak raises multiple issues relevant to refugee and asylum seeker communities.

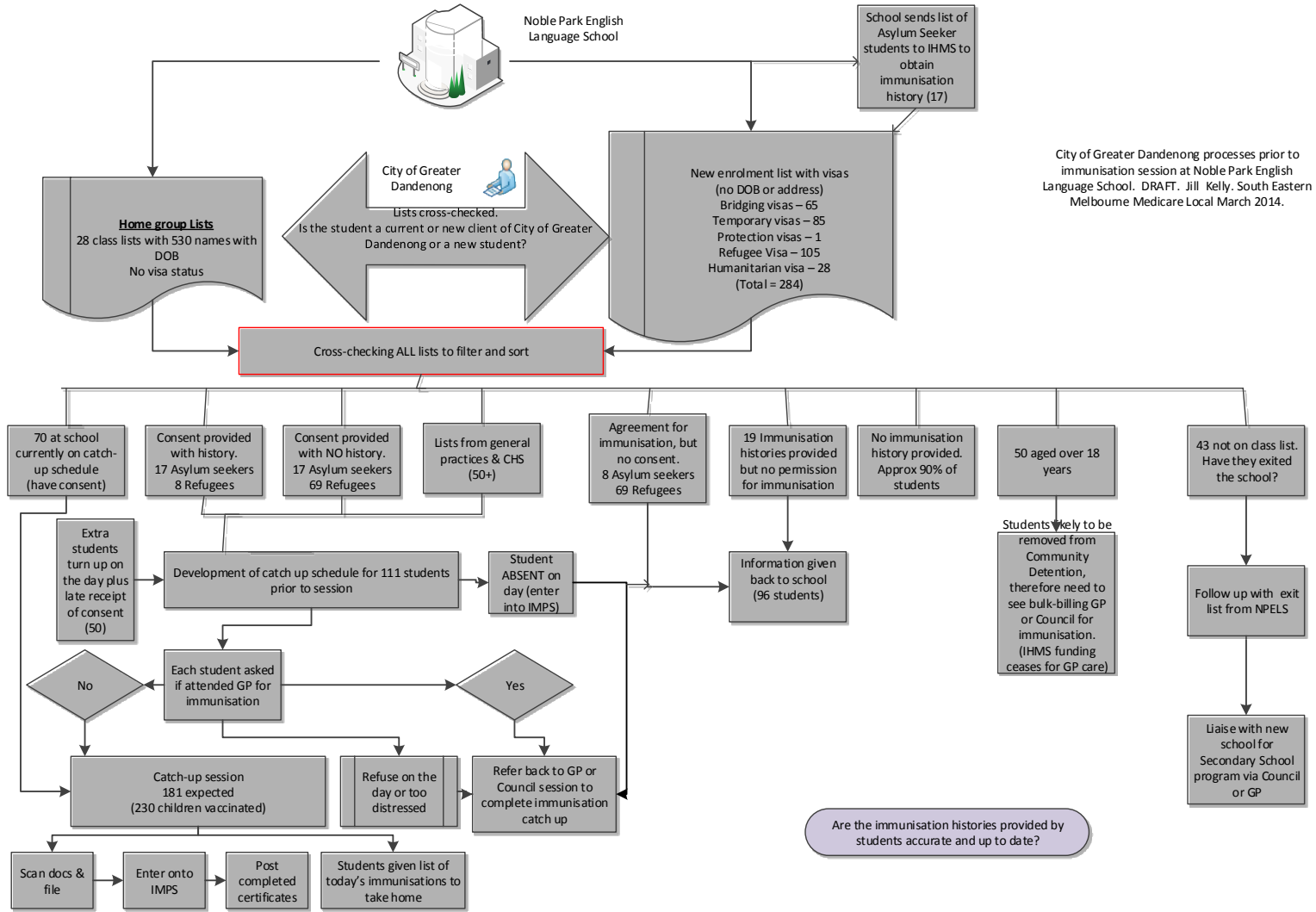
1. **Other refugee and immigrant communities share important features in common with the Pacific Islander community in terms of susceptibility to VPDs and exposure opportunities for transmission of VPDs.** They have low immunisation rates, greater contact with host visitors from high-prevalence destinations, and are part of complex social networks involving family, community groups, social service, and health care facilities and are more likely to live in crowded housing. As such, the possibility of future outbreaks clustering around these populations is real.
2. **The presence of pockets of under-immunised groups in areas with recorded high coverage is likely to be replicated in other LGAs.** This suggests that while achieving childhood immunisation targets is important, targeted strategies directed towards susceptible minority groups are also critical to prevent future outbreaks of VPD.
3. **Older children, adolescents and adults who immigrate to Australia are not included in ACIR, and have frequently missed some or all of the vaccinations on the Australian NIP schedule.** This may explain why a sizeable susceptible group were unrecognised prior to this measles outbreak, and highlights the need for inclusion of these populations in surveillance data and monitoring.

Appendix 7: Hepatitis B seroprevalence

Source: Ott et al. 2012



Appendix 8: Process map ELS immunisation catch-up



Appendix 9: Catch-up plan and record for all ages

Age	Vaccine Most 0.5 ml (Route)	Minimum dosing intervals http://rch.org.au/immigranthealth/clinical/Catchup_immunisation_in_refugees/					
		Initial Time=0	+1 Month	+2 Months	+4 Months	Subsequent doses	Notes
All	DT(P) containing IM			Can be given at 2m instead if hepatitis B not required		See note	Age <4 years – 3 doses then 4 th dose at 18 months or 6 months after primary course and 5 th dose at 4 years. If the 4 th dose is given after the child is 3.5 years the 5 th dose is not required. Usually given as combination vaccine, if using hexavalent vaccine with hepatitis B, dosing interval = 2 months between dose 2 and 3, and 4 months between dose 1 and 3. Age 4-9 years – 3 doses for primary series then 4 th dose 6 months after primary course, usually given as combination vaccine* as above. Age 10 years and older – dTPa then dT, dT, then booster dTpa after 10 years.
	IPV IM or SC			As above			4 th dose required at 4 years if aged <4 years for primary course. SC if given as IPV only, IM in combination vaccines. Hexavalent dosing as above.
	HBV IM						Age 11–15 years can be given as alternate 2-dose schedule (adult dose), with 4-month interval. Paediatric dose 0.5ml (0 – 19 years), adult dose 1ml (20 years and older). 3-dose schedule interval = 2 months between dose 2 and 3, and 4 months between dose 1 and 3.
Born >1966	MMR IM MMR-V SC						Born after 1966 Now available as MMR-V, see below
All	Varicella SC						<14 years -1 dose, now available as MMR-V, see below Age 14 years and older, born after 1992 - 2 doses (check serology first if no history of infection)
Born >1987	MenC IM	If using MenC		If using MenC/Hib			Single dose, age <10 years see below
<5 years	Hib IM						Only <5 years, dosing varies, 2–11 months - 2 or 3 doses then booster, 1–5 years - 1 dose then booster, interval varies. Hexavalent dosing as above. Children <10 years get extra doses due to combination vaccines (see below).
	13vPCV IM						Only <5 years, unless medical risk factors. Dosing varies, <7 months - 3 doses, 7–11 months - 2 doses, 1–5 years -1 dose.
Born >1981F >1999M	HPV IM					+ 4 months after dose 2	Age 12–15 years, born after 1981 (females) and after 1999 (males), complete dosing within 12 months.

Combination vaccines – use where possible

- Hexavalent vaccine = DTP-IPV-Hib-Hep B (IM) – age <10 years
- DTPa-IPV (IM) – age <10 years, also dTpa-IPV (IM) age 10 years and older.
- MMR-V (SC) – age <14 years, not used as first dose MMR age <4 years
- MenC-Hib – if possible not with hexavalent vaccines, OK with DTPa-IPV, HBV instead. MenC instead is likely to be more convenient and reduce catch-up visits.

Legend: white = give, shaded = give depending on age/number doses, orange = not required

Other notes

- Offshore entrants may have MMR and YF – wait 1 month before other vaccines
- Do not give TST within 4 weeks of live viral vaccines (including DHC vaccines)
- Rotavirus not usually catch-up – has to be given before 13-15 weeks of age
- Consider BCG in age <16 years if not given – needs negative TST first
- All 0.5 ml dose except adult HBV vaccine, which is also used for adolescent catch-up

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