



Challenges in immunisation service delivery for refugees in Australia: A health system perspective



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ABSTRACT

Background: Refugees are at risk of being under-immunised in their countries of origin, in transit and post-resettlement in Australia. Whilst studies have focused on identifying barriers to accessibility of health services among refugees, few focus on providers' perspectives on immunisation service delivery to this group. Health service providers are well placed to provide insights into the pragmatic challenges associated with refugee health service delivery, which can be useful in identifying strategies aimed at improving immunisation coverage among this group.

Methods: A qualitative study involving 30 semi-structured interviews was undertaken with key stakeholders in immunisation service delivery across all States and Territories in Australia between December 2014 and December 2015. Thematic analysis was undertaken.

Results: Variability in accessing program funding and vaccines, lack of a national policy for catch-up vaccination, unclear roles and responsibilities for catch-up, a lack of a central immunisation register and insufficient training among general practitioners were seen as the main challenges impacting on immunisation service delivery for refugees.

Conclusions: This study provides insight into the challenges that impact on effective immunisation service delivery for refugees. Deliberate strategies such as national funding for relevant vaccines, improved data collection nationally and increased guidance for general practitioners on catch-up immunisation for refugees would help to ensure equitable access across all age groups.

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1. Background

Australia resettles around 14,000 people of refugee background each year, and this is on the increase [1–4]. Refugees often originate from countries with limited or disrupted access to health services and may present with a multitude of complex health issues upon resettlement [5,6]. They face several barriers that impede their accessibility to primary health care in Australia including language, cultural, financial and logistical barriers as well as a lack of familiarity with the health care system [7–10].

Australia has a very comprehensive National Immunisation Program (NIP); however its strength is compromised by fragmented immunisation coverage, particularly among adolescents and adults [11]. Refugees are at high risk of being under-immunised, and to date there has been no national strategy aimed at improving

immunisation uptake among this group. Whilst data on immunisation coverage for refugees in Australia is not known [12], small cohort studies of newly arrived refugees have indicated that the majority are under-immunised [13–16]. A complete assessment of an individual refugee's immunisation needs and implementation of an appropriate catch-up schedule is recommended as part of a comprehensive health assessment within the first six months' post-resettlement [17]. However, there is variability in how these assessments are undertaken and how complete they are both within and between States/Territories [18,19].

Currently, the models of care for refugee health services vary across the States and Territories. In most jurisdictions, initial refugee health assessments are mainly conducted by refugee-specific services offering a range of professional (chronic disease management e.g. diabetes or community nutrition services, sexual health and sexual assault and violence related services) and organisational development services (education and support to GPs and other health care staff) via community-based services and paediatric/family screening clinics [20–22]. Ongoing care on the other hand is mainly provided by mainstream services via General

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Practitioners (GPs) in private practice [22]. It has been argued that specialised services are better positioned in offering initial health care to refugees due to having the necessary infrastructure (including a range of health/non-health services) and organisational capacity (multidisciplinary) to cater for their needs [22,23]. However, existing literature shows gaps in service delivery including poor uptake of comprehensive health screening services and follow-up including catch-up immunisation [19]. GPs are likely to be the first point of contact for initial health care including immunisation for refugee populations resettled in rural and regional areas [24] and those geographically dispersed in larger states like New South Wales (NSW) and Victoria [19,25].

Previous studies have identified a number of barriers that impede the delivery of immunisation services to refugees from the perspective of the GP, including difficulties in implementing complex catch-up plans, inexperience in providing catch-up [26,27] and provision of catch-up immunisation for school children enrolling in school after their designated age-appropriate catch-up point [28]. Other factors limiting service provision to this group are not clearly understood. Missed opportunities for immunisation may result in pockets of under-immunised populations thereby risking outbreaks of vaccine-preventable diseases within the communities. Furthermore, pockets of under-immunised populations within the community pose a threat to the success of the National Immunisation Program (NIP) [11].

Although many studies have identified barriers to accessibility of health services in general, including from the refugees' perspective, few studies have focused on the perspective of providers and coordinators of immunisation services for people of refugee background. Health service providers are well placed to provide insights into the pragmatic challenges associated with refugee health service delivery [23]. This study aimed to explore the challenges in the provision of immunisation services to newly arrived refugees among key stakeholders to inform effective strategies to improve vaccine coverage among this group.

2. Methods

2.1. Study design

In-depth interviews were undertaken with stakeholders with key roles in immunisation service delivery across all the States and Territories in Australia. Ethics approval was obtained from the Human Research Ethics Advisory (HREA) Panel at the University of New South Wales (Ref: 2014-7-63) and the South Western Sydney Local Health District (SWSLHD) Research and Ethics Office (HREC Ref: LNR/14/LPOOL/542).

2.2. Recruitment and study participants

Stakeholders representing a range of service delivery levels including policy development, co-ordination and delivery of programs including State-funded refugee health services, community-based health services offering services to refugee clients, including GPs and representatives from State and Territory government health departments were purposefully recruited into the study. The following inclusion criteria were used: had at least one-year experience of involvement in immunisation service delivery for refugees either directly or indirectly, or government administrators with at least one year's experience in planning, coordination or management of immunisation services for refugees.

Recruitment involved the following three approaches. Firstly, refugee health network websites were searched to identify potential participants and an invitation letter was sent via email. Secondly, flyers and advertisements were broadcast through the

NSW Refugee Health Service electronic network and via the Refugee Health Network of Australia (RHeaNA) to identify potential participants who were interested in participating in the study. Lastly, a snowball technique was used in which participants were asked to directly recommend any colleagues who they thought would fit the selection criteria and letters of invitation were sent via email. Potential participants were followed up three times within three months before being excluded from the study.

2.3. Data collection

Semi-structured telephone interviews were undertaken between December 2014 to December 2015 with key stakeholders representing all Australian States and Territories. The interviews averaged 40 min in length (range 20–60 min). Due to the largest proportion (32%) [1,29–31] of refugees being resettled in New South Wales, at least one representative from among the four specialised refugee services (NSW Refugee Health Service, Coffs Harbour Refugee Health Clinic, Illawarra Shoalhaven Local Health District Refugee Health Services and New England Refugee Health Clinic) was included to obtain a broader perspective on the pertinent issues impacting service delivery within this state.

An interview guide was developed based on available literature to ensure all issues were explored and that a rich description of context specific immunisation service delivery was obtained. The interview guide included the topics of: current models of care for refugee health services; awareness of immunisation policies or guidelines; current barriers and facilitators in the provision of immunisation; and existing and potential strategies to improve vaccination uptake among refugees. Prompts were included to ensure that all of the relevant aspects pertaining to the research questions were exhausted. AM conducted all the interviews via telephone and debriefed the other researchers on the important issues arising from the interviews throughout the process. All participants voluntarily participated in the interviews and individual written informed consent was sought prior to conducting the interviews. All interviews were digitally recorded and transcribed verbatim. To protect the identity of the certain participants, information regarding their location was omitted from the quotes. For confidentiality purposes, the categories of work for general practitioners, paediatricians, clinical nurse consultants and refugee health nurses were classified as 'clinical practice'; immunisation managers/coordinators and policy advisors as 'policy and planning' and health managers as 'management of health services'.

2.4. Data analysis

Data were analysed using a six step process of inductive thematic analysis [32]. AM read and re-read the first quarter of the transcripts during the transcription process and documented emerging ideas. AM and HS then independently coded the data and collated them to potential themes using the interview guide. After an independent analysis of the first quarter of the transcripts, the two researchers then jointly developed a list of themes using an agreed framework. The framework was then applied to another subsample of transcripts and modified further to suit the specifics of each identified theme. Using this final framework, all of the transcripts were analysed and coded. Text was organised within the identified themes of the developed framework with the use of NVIVO 10 software.

3. Results

Forty-nine stakeholders were initially invited to participate in the study. Of these, thirteen did not respond to the invitations,

Table 1
Demographics of study participants.

State/Territory	Categories of work	Number of participants
Australian Capital Territory (ACT)	Clinical practice	2
	Policy and planning	1
New South Wales (NSW)	Clinical practice	7
	Policy and planning	1
Northern Territory	Clinical practice	1
	Policy and planning	1
Queensland	Clinical practice	4
South Australia	Clinical practice	2
	Policy and planning	1
Tasmania	Clinical practice	2
	Management of health services	1
Victoria	Clinical practice	1
	Policy and planning	2
Western Australia	Clinical practice	2
	Management of health services	1
	Policy and planning	1

three consented but did not indicate their availability and three declined citing either a change in job description or workload as reasons for refusal. Thirty stakeholders (61%) consented to participate and were interviewed including general practitioners, paediatricians, clinical nurse consultants, refugee health nurses, policy advisors, health service managers and immunisation managers/co-ordinators from all the States and Territories in Australia (see Table 1 below). Of those interviewed, eight participants had less than 5 years' experience working with refugee health; another eight had between 5 to 10 years' experience in refugee health while the remaining 14 participants had over 10 years' experience in refugee health services.

3.1. Challenges impacting on service delivery

Five key themes pertinent to immunisation service delivery for refugees emerged: (1) Variability in accessing program funding and funded vaccines for older children and adults outside the NIP; (2) Lack of a national policy for catch-up immunisation for refugees; (3) Unclear roles and responsibilities for catch-up; (4) Lack of a central immunisation register for older children and adults; and (5) Insufficient training among GPs.

3.2. Variability in accessing program funding and vaccines

Due to the absence of a national funding model for vaccines for refugees, participants spoke about the wide variation in the funding approaches for refugee vaccines across the jurisdictions in Australia. Participants reflected on the differences in eligibility criteria for funded vaccines for refugees that existed across the jurisdictions:

"...ongoing funding for these essential vaccines is a huge issue too. And that's very patchy around Australia as well ... you know some States are better than others at providing the actual vials to immunise people; so you know Victoria do have policy where they do provide for example catch-up Hepatitis B vaccines for new arrivals" (General practitioner, Tasmania).

"Every [State/Territory] government has got different vaccines available, so we're very lucky in Queensland, we actually have funded vaccines that other people don't have." (General practitioner, Queensland).

"Now we have guidelines in place so we don't just give everyone hepatitis B, we don't give everyone MMR[mumps-measles-rubella] it's all age related" (Immunisation manager 1).

Respondents considered the lack of discreet funding for refugees as a significant impediment to the delivery of catch-up immunisations for this group.

"I think the biggest challenges are in relation to the lack of comprehensive free vaccines, difficulties that we have is with the Commonwealth Government in not funding vaccines for this population for catch-up purposes" (Immunisation manager 2).

"I think funding is a barrier issue because obviously that is going to impact on your success to driving an immunisation regime" (Paediatrician, Western Australia)

Due to the lack of funding for vaccines for refugees, respondents from some jurisdictions reported leakage of vaccines from the National Immunisation Program (NIP) as a solution to ensure refugees were adequately immunised.

"...what happens is that we provide vaccines through the GPs to vaccinate people according to the NIP schedule but we know that vaccines are leaking to refugees and humanitarian people and family reunion and everything else, and we, I guess just turn a blind eye. So the crux of our problem is we've raised it very much it's just that there is no discreet funding" (Immunisation manager 1).

Interestingly, participants from other jurisdictions were appreciative of the fact that funding for most of the vaccines for refugees was available:

"We have, good funding for our vaccines. We, have funding to immunise everybody against hepatitis B. All the newly arrived refugees are immunised against hepatitis B cause there's a high prevalence in that community, and I don't think any other state has that" (General practitioner, South Australia).

"All these things are dependent on the context so in a place like ours that has an established and a quite well funded service or relatively, we are well resourced in terms of vaccines" (General practitioner, ACT).

However, even in jurisdictions with available funds, there were concerns on the fragility of existing funding mechanisms and its impact on the stability of immunisation programs for refugees with regards to the continuity of services:

"So I guess the problem comes in, you know, with the gaps in funding everywhere in government, one is not sure of where we're going in the future and will funding continue or will there be restrictions?" (Immunisation manager 3).

3.3. Lack of a national policy for catch-up for refugees

A lack of direction from the Federal Government in terms of available policies and guidelines was conveyed as a contributory factor for the existing gaps in immunisation service delivery to refugees. Some respondents expressed their sense of frustration in the absence of guidance that they deemed imperative to effective delivery of immunisation services to newly arrived refugees:

"We find that we are one of the only councils that provide a catch-up service for refugees and asylum seekers so we don't, something I forgot, when we talk about what's lacking in this area, that there are policies that are lacking in and we are very involved in lobbying to the state and the federal government for a clearer pathway for these families to access immunisation services not only at councils but also at GPs and refugee health services as well" (Immunisation manager 3).

"...we are aiming to deliver good immunisation ... what worries me is that it's ... we have access to the vaccines but it's not really a, it's

not a policy, it's not set in concrete. And, you know, we need to be able to give them" (Refugee health nurse, Tasmania).

In the absence of national policies for catch-up for refugees, some respondents highlighted initiatives taken at a state level to address the policy gaps in service delivery. One respondent highlighted State-based policy changes aimed at ensuring comprehensive and equitable access of vaccines to marginalised populations including refugees. Such changes included the implementation of new policies whereby all humanitarian entrants would be granted access to free vaccines regardless of their Medicare eligibility and the development of catch-up guidelines.

"And the other thing that we have recently done to try and overcome some of the barriers in relation to access to funded vaccines, is we've implemented a new criteria within the state where we now say that all asylum seekers regardless of access to Medicare are eligible to free vaccines, so any person who has no Medicare card or any asylum seeker regardless of Medicare status; if that person is considered a vulnerable citizen they have access to free vaccines regardless of their age" (Immunisation manager 2).

Another respondent reported of establishment of organisational catch-up guidelines specifically aimed at facilitating immunisation service delivery for refugees among immunisation providers:

"So we have specifically developed them [guidelines]; we also have developed a catch-up tool that we use in-house, that we sometimes use" (Immunisation manager 3).

3.4. Unclear roles and responsibilities for catch-up

A lack of clarity regarding who is responsible for ensuring completion of catch-up immunisation for newly arrived refugees was a clear systems barrier to refugee immunisation and impacted many respondents on a daily basis. Inadequate referral pathways for refugees to health services upon resettlement were reported to further compound the confusion on whose responsibility it is to provide catch-up vaccines.

"And I also don't think that we have a systematic approach as to who should actually be responsible for providing the catch-up vaccines and so in some parts of the state in some regions there's an attempt to try and build that capacity within GPs, in other areas some of the local councils try to deliver it for children through English Language Schools, in other areas refugee health nurses may take it on but I think all of those different areas are fraught with their own issues and barriers. I think we need to have a more systematic approach as to who's immunising and there are different people accessing immunisation, it's a bit of a mess right now." (Immunisation manager 2).

"And then the actual refugee health clinic does more the comprehensive health assessments and all of the vaccination catch-up and all the ongoing management for, for different health issues. It operates a little bit different in the north and the south of the state but yeah. It's a little bit clunky and sometimes I think there's a little bit of duplication. It's just lack of clarity around roles sometimes" (Senior nurse, Tasmania).

This lack of defined roles and responsibilities was reported to particularly impact immunisation service delivery to older adolescents who may miss out on school-based immunisation programs. Additionally, not all refugees attend English language schools, an important setting for catch-up vaccination, and therefore would be slipping through the gaps. A few participants questioned who was responsible for ensuring this group was captured, considering

the fact they would be out in the communities and may either miss out on routine school-based immunisation programs and may not readily access primary care services.

"Yes, the ones who don't go to schools, they'll be covered under our program but we are saying in future, you know, once they have finished our program and they are not going to school, they are out there you know, who is taking that responsibility?" (Refugee health nurse, Northern Territory).

"There's that big gap who probably haven't had catch-up regimes in education so still exposed, but not necessarily to GPs, will lose the child health advocacy and they are reliant on health services So there is a big gap in that you know early adolescence young adult cohort they're denied obviously apparent catch-ups" (Paediatrician, Western Australia).

It was suggested that some primary care providers were unaware of the specific role played by specialised refugee services in providing initial immunisation services to newly arriving refugees:

"..we only see half of the newly arrived refugees; the other half don't come to us initially, they go to the local GPs in the community initially, and we don't necessarily know whether they all get to a proper NARI [New Arrival Refugee Immunisation Program] clinic" (General practitioner, South Australia).

"For the families that go the Humanitarian Entrant Health Service, they will refer the children that they think need specialist paediatric follow-up, but there are a lot of children that we do not get referrals for. So they go straight to the community nurse and we do not see those families at all. So we see a small . . . you know, a small to medium percentage of refugee families in Perth. There are a lot of families that we don't actually have access to" (Registered nurse, Western Australia).

There were varying attitudes about whether the immunisation services should be predominantly delivered through specialised services or mainstreamed to primary care. To ensure continuity of care, one participant reiterated the need for communication between providers particularly when refugees transition from refugee health services to primary care mid catch-up.

"I think its fine for mainstream services to finish off the immunisation schedules, like do the third Gardasil or do the third hepatitis B provided they receive really clear communication from the specialised services cause they can't be expected to know these things and the client can most definitely not be expected to tell them so you need really clear paper-based, you know, printed communication and in a prominent place" (General practitioner, Tasmania).

Another respondent questioned the involvement of mainstream services in providing immunisation services to refugees considering the complexities associated with the planning and implementation and completion of catch-up plans for refugees.

"I think the immunisation people who do it should have expertise in catch-up schedules such as these [New Arrival Refugee Immunisation Program], it's also not something that every immunisation provider is going to have experience of; doing the complex immunisation catch-up schedules that you need to do for newly arrived refugees; so I think having a specialised person or a specialised service doing it I think is a good idea which is why the NARI [New Arrival Refugee Immunisation Program] clinics I think are a good idea because these are very highly trained nurses who are very good at this, they are not just the usual immunisation nurses, they are very highly skilled." (General practitioner, South Australia).

3.5. Lack of a central immunisation register

It was evident that many participants doubted refugees were being adequately brought up-to-date with their immunisations. At the time of interview, providers were unable to access a central immunisation register to check the immunisation status of refugees aged above seven years and to record vaccines given. For participants in policy and planning roles, the lack of identifiers of refugee status in the current immunisation register limits the ability to measure coverage rates at practice level or health district level for efficient planning and service delivery:

“And then anyone over seven it’s almost impossible to find out, you might get some information from the GP but it will be very little you know, centralised record of what immunisation that person has had, so you can’t find out” (Paediatrician, NSW).

“..we don’t have a whole of life register so the issues of records and vaccine history when people are transiting and moving to different areas or between services becomes extremely difficult to follow-up. And because of the lack of the register and the lack of data we really don’t have data that we can pull out of a register to say this is the coverage rate for refugees and this is what the explanations are” (Registered nurse, NSW).

Consequently, almost all respondents reiterated that an immunisation register was an integral tool for facilitating immunisation service delivery and crucial for assessing immunisation needs, particularly considering multiple settings within which immunisation services are offered in Australia and the high mobility of refugees both within and between providers and jurisdictions:

“Yeah, well, the whole of life register would be very valuable, so for refugees if they’re new to a practice, and they’ve been here for 6 years, and I want to know if they were vaccinated in NSW when they first arrived and they’ve no idea who they saw in NSW, I would love to be able to just look at the whole of life register and just say oh you’ve already had your vaccinations, your fine. You don’t have to worry about it. Rather than wonder.” (General practitioner, Queensland).

“But really, I think you need to develop some kind of documentation system or something to actually provide evidence or numbers of how many families there are out there that are not vaccinated, because currently, we don’t know the extent of the problem” (Registered nurse, Western Australia).

3.6. Insufficient training among GPs

At least two GPs indicated a lack of necessary training and expertise required in the provision of catch-up immunisation to refugees:

“...there’s no way I’d be able to work out the catch-up schedule...” (General practitioner, South Australia).

“The Handbook says you should be vaccinating them but if you don’t know to do that how will it happen? So we were in a very difficult situation where people had just missed out [on immunisations] for years” (General practitioner, Queensland).

It was evident that this theme also resonated among other key stakeholders involved in refugee health care, including refugee health nurses working in specialised services, and those involved in policy and planning for refugee immunisation services. Participants postulated that GPs (many of who rarely manage patients from refugee backgrounds) lacked experience in managing refugee specific health issues. Others were concerned that the complexities of health conditions that refugees present with may overwhelm

those GPs who haven’t received sufficient training. Consequences of a lack of refugee-specific training by mainstream GPs included incomplete refugee health assessments and deficiencies in the development and implementation of catch-up plans. *“And I think that often, again, you know, when it’s put on to GPs oh well, whoever the provider is, but specifically for GPs, some of the complexities around completing a catch-up schedule and understanding you know how to actually develop clinical guidelines around developing catch-up can be quite overwhelming and quite complex and some providers don’t feel that they have the skill to tackle it so it’s not necessarily done effectively”* (Immunisation manager 2).

“...GPs don’t necessarily want, you know, they don’t feel, you know, expert. They don’t feel their clinical expertise is, is up to it or they don’t have the time sort of to deal with what they might be seeing as a complex patient” (Senior nurse, Tasmania).

The lack of refugee specific training among general practitioners was seen to be more a system issue than an individual issue. There were feelings among respondents that the government was not doing enough to ensure GPs were adequately trained in refugee specific health, including catch-up immunisation. Compounding this were concerns that the currently available resources were inadequate in assisting GPs in providing quality immunisation services for refugees:

“Umm, the lack of education of GPs around refugee health and that’s a government issue I believe. Umm I don’t believe that has been, I mean I’ve been looking after refugees for, you know, since 1977 and we were never given any education in how to look after refugees. You know, they just arrived, and then of course the GPs didn’t know, they don’t know that there is a whole range of different issues with refugees and people were misdiagnosed” (Registered nurse, Queensland).

“I think there’s a lot of barriers with GPs and a lot of misunderstanding in what is required in a catch-up vaccination and actually how to do an assessment for someone who has come from overseas, for catch-up vaccinations, because it is a difficult process and I don’t believe that the immunisation handbook makes that easy at all for practitioners” (Refugee health nurse, Western Australia).

Respondents reported a range of consequences impacting on the health outcomes of refugee clients as a result of insufficiently trained GPs in the system. These consequences could include misdiagnosis of common infectious diseases. Specifically reflecting on immunisation services to refugees, respondents reported the impacts ranging from missed opportunities for vaccination to cases where some were being over-immunised:

“Currently I think people who are going to GPs they often do find out about us and will come back to us cause they don’t maybe use interpreters, they don’t know their follow up, they don’t get case managed or well supported so they end up coming back to our clinic anyway; and then we have to call for their notes and start pretty much all over again. But I do know this when we call for their notes from their private practice that they have had multiple vaccinations” (Public health nurse, NSW).

4. Discussion

The study findings highlight the health system gaps that impact on immunisation service delivery for refugees in Australia. Compared to previous studies which have focused on barriers to access from the refugee viewpoint, our study examined the perspectives of key immunisation stakeholders involved either directly in immunisation service delivery or indirectly through policy making, planning and management of immunisation services for this group.

The lack of national funding for vaccines for refugees compounded by the varying eligibility criteria for program-funded vaccines was reported to be a significant challenge in ensuring equitable access for refugee clients across all jurisdictions in Australia. The high cost of unfunded vaccines inhibits the completion of catch-ups among people of refugee background [27]. This issue has also been raised in other settings including Canada, where complexities around insurance coverage and variability in eligibility rules have similarly been highlighted to be barriers to health care access for refugees [33]. In New Zealand on the other hand, all refugee children under 18 years of age are eligible for free catch-up vaccines regardless of their citizenship or immigration status [34]. To address the gaps in funding in Australia, Victoria and New South Wales have introduced State-based funding mechanisms to ensure equitable access to vaccines for refugees and asylum seekers; however sustainability of such initiatives is unpredictable as it is heavily reliant on the continued availability of State funds. Free catch-up vaccines for newly arrived refugees of all ages was recently announced in the latest Federal budget (2017–18), a measure which is highly commendable [35] but yet to be implemented. Studies conducted in Canada, US, Denmark, New Zealand have indicated refugees to be under-immunised hence the universal need to ensure comprehensive access of vaccines for this group [36–39]. Universal funding for vaccines for refugees would minimise the bureaucracies impeding effective service delivery and promote equitable access [11,40].

Health service delivery for refugees varies across the jurisdictions, and there are ongoing debates regarding the best model of care for this group [22]. Despite the co-existence of specialised refugee services and mainstream services for many years, our findings indicate that service providers were unclear of their responsibilities for providing catch-up immunisation potentially leading to either over-immunisation or missed opportunities for immunisation for refugees in the primary care setting. The need for improved coordination of care between specialised services and mainstream services [22] to ensure refugees are adequately immunised cannot be over-emphasised. A review of the roles and responsibilities of key immunisation service providers at a State/Territory level within the existing models of care may be necessary to ensure refugees are captured and immunised appropriately.

Immunisation coverage among people of refugee background continues to be a significant gap in immunisation surveillance [27]. Although the Australian Childhood Immunisation Register (ACIR) facilitated the tracking of immunisation records for children aged seven years and below, the amount of time required to record immunisation provided in other countries and catch-up records for older children undermined its usefulness particularly for refugees [41]. Compounding this was the lack of identifiers for people of refugee background in the register making it impossible to monitor vaccine coverage for refugees [12]. Reviews of migrant health policies in most European Union nations including Mediterranean countries have similarly indicated gaps in data collection mechanisms and emphasised the need to address this for better health outcomes [42,43]. As the ACIR has now been extended to all age groups to become the Australian Immunisation Register (AIR), it has the potential to address such gaps. Incorporating identifiers for people of refugee background into the AIR has been argued to be a necessary step to enable monitoring of vaccine coverage among this group [12]. Identifiers that have been proposed as a proxy to identifying people of refugee background include the combination of 'country of birth', 'ethnicity', 'language spoken' and 'year of arrival' [12,44]. Such information would be useful in providing an evidence base for future planning and allocation of resources aimed at improving immunisation coverage among this group.

In the absence of a centralised immunisation register with access to an individual's immunisation records by multiple providers, participants expressed concerns of potential over-immunisation among refugees due to doubling up of services. Although paper-based immunisation records are usually given to parents, their use by providers in tracking immunisation status has been debated. Surveys conducted in Canada have indicated a reasonable proportion of parents (30%) have misplaced their children's immunisation records, have forgotten to present the records during an appointment or have presented records that may not necessarily be up to date [45]. Even without the complexities of resettlement and multiple providers, retaining hard copies of immunisation records has been similarly problematic for other population groups [46]. More so, the Australian Immunisation Handbook recommends that service providers start catch-up from scratch in the absence of immunisation records [47]. Although there is minimum risk associated with over-immunisation [48], it is a waste of program resources considering an at-risk population such as adult refugees have been unable to access funded vaccines and illustrates inefficiencies within the health system. The whole of life immunisation register may therefore be crucial in reducing over-immunisation and vaccine wastage that occurs in this group.

General practitioners may be less likely to recommend immunisation if they lack training around specific immunisation needs for refugees [49]. Our findings highlighted inexperience with implementing complex catch-up for refugees as a major barrier in service delivery among GPs, findings which are similar to previously published studies [11]. This highlights the need to provide training opportunities for GPs to improve their awareness of the catch-up needs of refugees across all age groups. Resources such as online immunisation calculators, refugee specific guidelines and e-learning could potentially equip GPs with the relevant skills and knowledge and ultimately make implementation of catch-up vaccines for this group easier. However, the use of these resources needs to be further explored and evaluated.

This study provided insights into the challenges associated with immunisation service delivery for refugees in Australia and practical recommendations in improving vaccine uptake among this group. While a study done in the US reported discrepancies in the provision of preventative services including immunisation among Somali refugees compared to non-Somali residents, little has been done to examine the root causes for such discrepancies [50]. Another study conducted in Denmark similarly highlighted low uptake of immunisation among refugee children and further alluded organisation of immunisation service delivery to be a potential underlying cause calling for further research in this area [36]. Future research focusing on organisational and systemic factors impacting on immunisation service delivery for refugees may help inform strategies to improve uptake of immunisation among refugees in these settings.

4.1. Strengths and limitations

This study was unique in that the viewpoints of stakeholders from a range of agencies were sought, including State government health departments who were integral as they are primarily involved in the planning and coordination of health services for refugees at a local level in Australia. Additionally, it detailed current issues impacting service delivery from the service providers themselves compared to previous studies which have focused primarily on refugees' perspectives on accessibility of health services.

However, this study is not without its limitations. It was based on the opinions and experiences of a limited number of people and can therefore not be generalised to all service providers across Australia. While a range of stakeholders were recruited, GPs that were

outside of the refugee networks were not included so their views were not represented. GPs who participated could have been more motivated to participate due to their satisfaction or dissatisfaction with the current systems in place for immunisation service delivery for refugee populations. Further research targeting GPs outside of the refugee health networks would be useful in providing a more comprehensive overview of the challenges in immunisation service delivery for refugees. It is our view that member checking done during the interviews has been sufficient in ensuring the identified codes and themes accurately represented participants' perspectives.

5. Conclusion

This study provides an insight on the challenges that impact on effective immunisation service delivery for refugees. Deliberate strategies such as national funding for relevant vaccines, improved data collection nationally and increased guidance for GPs on catch-up vaccine delivery for refugees would help to ensure equitable access across all age groups.

Declaration of Conflict of interest

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