

Review

Exploring the attitudes and practices of adult service users and providers towards vaccination in non-primary care settings: A mixed methods scoping review

Eleftheria Lentakis^a, Holly Seale^{a,*}, Rajeka Lazarus^b, Sandra Mounier-Jack^c

^a School of Population Health, Faculty of Medicine and Health, University of New South Wales, Sydney, New South Wales (NSW), Australia

^b Severn Pathology, UK Health Security Agency, Bristol, UK

^c London School of Hygiene and Tropical Medicine, London, United Kingdom



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ABSTRACT

Background: There are several identified service user and provider barriers which lead to missed vaccination opportunities for adults within primary care. Programs delivering vaccination in non-primary care settings, such as in emergency departments, hospitals, specialist clinic and non-medical settings may assist in filling these gaps, especially among under-served populations. While expanding the locations in which vaccines are provided may improve uptake, there is a need to explore service user and provider attitudes towards delivery.

Objectives: This scoping review aims to explore perceptions and attitudes of adult service users and providers towards receiving and delivering vaccination in non-primary care settings and identify how attitudes relate to determinants of vaccine compliance.

Methods: This scoping review was conducted in accordance with Joanna Briggs Institute (JBI) guidance for scoping reviews and the Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR). Studies that focused on attitudes and perceptions of adult service users and providers towards the delivery of influenza, COVID-19, pneumococcal, and herpes zoster vaccines in non-primary care settings were included. Primary, peer-reviewed studies published in English from 01/01/2010 to 31/12/2023 were sought. Studies that focused on vaccination in primary care settings, the operational delivery of vaccination programs and interventions, children or adolescents less than 18 years, pregnant women, and healthcare workers receiving vaccination for occupational purposes were excluded.

Results: 30 studies were included for final analysis in this study. 22 were cross-sectional studies, and 19 were published in the United States. 15 studies were conducted in non-medical settings and 11 in the emergency department. Findings showed that service users were receptive towards vaccination in non-primary care settings and were especially motivated by the convenience of non-medical settings such as workplaces, mobile clinics, drive through clinics, and faith-based organisations. A number of service user barriers were reported to vaccine acceptance, including low confidence in vaccines, fear of adverse effects, and low risk perception of infection. Findings of the included studies highlight a number of provider attitudinal barriers to the delivery of vaccinations outside of primary care, such as considering the process too time-consuming, costly, and detracting from the purpose of their work, although the number of studies assessing provider attitudes were limited.

Conclusion: Overall, there is a limited amount of evidence available regarding the attitudes to vaccination in non-primary care settings, especially among providers. There is a need for more study in this area to strengthen understanding of attitudes towards vaccination delivery in these settings. Mapping of available studies suggests there is a high acceptance level among service users towards vaccination in non-primary care settings, especially those in non-medical settings who lack routine access to the healthcare system. Further exploration of this and expansion of programs may serve to improve vaccine access and assist in overcoming inequity.

* Corresponding author.

E-mail address: h.seale@unsw.edu.au (H. Seale).

1. Introduction

Frequent causes of missed adult vaccination opportunities often encompass insufficient screening of eligible service users, misconceptions about vaccine contraindications among providers and service users alike, shortages in vaccine supply, ineffective clinical workflows hindering vaccine provision, and a deficiency in service user readiness for vaccination [1–3]. While a recommendation from a trusted health provider, such as a general practitioner, is shown to be a predictor of timely immunisation, the existence of these provider and service user barriers may prevent reliable immunisation for some within primary care [4]. Programs offering immunisations in non-primary care settings, such as in hospitals and workplaces, are increasing and may assist in filling gaps, especially among populations that lack access to routine primary care [2,4]. Emergency departments have been shown to function as a safety net for under-served populations and may represent their only point of contact with the health care system [5,6].

Trends in place of influenza vaccination during the 2018–2019 influenza seasons highlighted the importance of non-medical settings in vaccine provision, with 47 % to 51 % of US adults receiving their vaccines outside of healthcare settings [7]. Workplaces are shown to be the most frequent non-medical vaccination setting for adults, with studies reporting that up to 18 % receive their vaccines at work [8]. Predictors for adult vaccination in non-medical settings include lack of recent engagement with the health care system, lack of regular primary care physician, and lack of recommendation for vaccination from a provider [7,8].

While improving expanded access to vaccinations in non-primary care settings may enhance equitable uptake [2], the willingness of service users to receive a vaccine in these locations, and attitudes of providers towards these programs needs to be explored. A rapid mapping of available evidence in this growing area can be achieved by a scoping review.

The objectives of this scoping review are to:

1. Identify the attitudes and perceptions of adult service users and providers towards getting vaccinated in non-primary care settings, and.
2. Explore how these perceptions relate to the determinants of vaccine compliance.

2. Methods

The Joanna Briggs Institute (JBI) guidance for scoping reviews framework [9], and the Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) checklist (Supplemental Table 1) [10] were followed in conducting this review. A protocol for the review was established (Supplement 2) but not pre-registered.

2.1. Eligibility

Supplemental Table 3 outlines the eligibility criteria for this scoping review.

2.2. Population

Studies focused on the attitudes and perceptions of vaccination providers and adult service users over 18 years were included, while those primarily focused on children and adolescents under 18 years were excluded. Studies on the perceptions of pregnant women and healthcare workers receiving immunisation for occupational risk were excluded due to the additional immunisation requirements of these populations. Additionally, studies which focused on the operational delivery, barriers and facilitators of vaccination programs and interventions outside of primary care were excluded and were the focus of a separate scoping review by the same authors.

2.3. Context

The classification of primary care settings (general practice clinics, community health centres, community pharmacies), secondary care settings (specialist clinics, outpatient clinics, nursing homes, long-term care facilities), and tertiary care settings (hospitals, emergency departments) as defined by the current Australian healthcare system model were used in this review [11]. Studies focused on vaccine delivery in primary care settings were excluded from the review, while those in secondary and tertiary care settings, and non-medical settings were included. Immunisation programs for humanitarian purposes were outside of the study scope.

2.4. Concept

This scoping review investigated three concepts:

1. The specific attitudes and perceptions of adult service users towards receiving vaccination in non-primary care settings, beyond just accepting or not accepting a vaccine. Studies of vaccines recommended as part of most routine adult immunisation programs were included. The included vaccines were influenza, COVID-19, pneumococcal and herpes zoster.
2. The attitudes and perceptions of medical providers towards delivering adult vaccination in non-primary care settings. No provider types were excluded.
3. The determinants of vaccine compliance in adult service users in non-primary care settings. Vaccine readiness measures was defined according the 7C framework by Geiger et al [12]. The core components include vaccine confidence, trust in the healthcare system and providers recommending vaccines; vaccine complacency, due to a lack of perceived risk of infection; constraints in receiving vaccination, including access, psychosocial, and cost barriers; vaccine calculation, the individual weighing of cost versus benefit of vaccination, collective responsibility, whether the individual embodies a willingness to protect others; compliance with vaccination schedules and mandates; and belief in vaccine conspiracy [12]. Although the 7C framework utilises a scoring system, this review used the determinants more broadly to identify barriers and drivers to vaccine readiness.

2.5. Study characteristics

Primary, peer-reviewed studies published in English from 1/1/2010 to 31/12/2023 were included. Non-full text articles, review articles and grey literature were excluded.

2.6. Information sources and search strategy

Systematic searches of PubMed (MEDLINE), Embase (Ovid), CINAHL (EBSCO), ProQuest, Web of Science (Scopus), and Cochrane Central Register of Controlled Trials (CENTRAL) were conducted during March 2024. EL completed the primary search, with oversight by HS. The search was supplemented by hand searching and scanning the reference list of included articles. Supplemental Table 4 lists the keyword and subject strategy headings used in this review, with the full search strategy for each database given in Supplemental Table 5.

2.7. Selection of sources of evidence

EL was responsible for screening article titles and abstracts of studies retrieved through the database search, with clarification provided by HS. Rayyan web-based software [13] was used to screen articles and remove duplicates. EL assessed the full text of articles, and reasons for further exclusion are documented in Fig. 1.

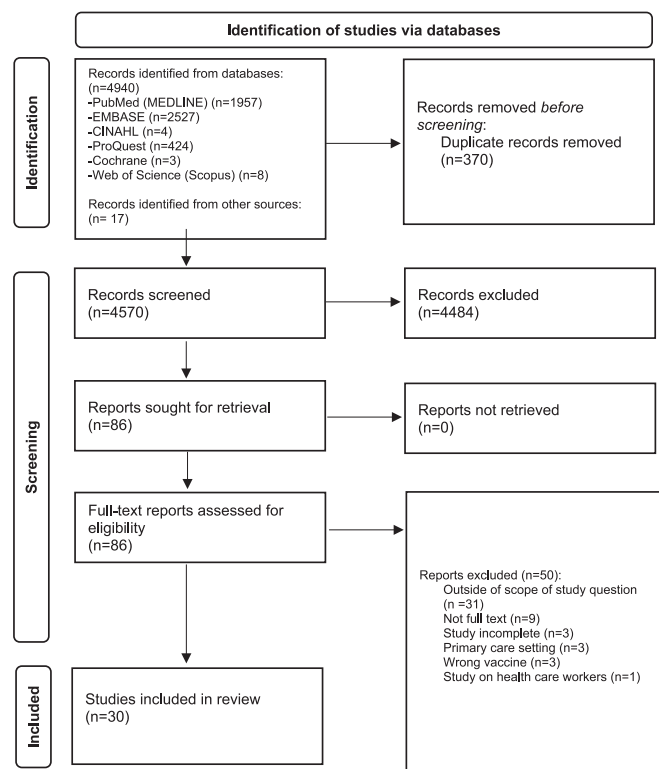


Fig. 1. Flowchart of study identification, screening, and inclusion (PRISMA 2020 V1).

2.8. Data extraction and charting

EL created the data chart and extracted data of included articles accordingly. The chart, which is given as Supplemental Table 6, extracted data including study characteristics population data, setting, vaccination type, and determinants of vaccine compliance.

2.9. Data synthesis

Synthesis of data was an iterative process, updated as necessary throughout the study. Data was sorted according to vaccine type, setting, and provider or service user attitudes classified according to the 7Cs of vaccine readiness (confidence, complacency, constraints, calculation, collective responsibility, compliance, and conspiracy). Access was added as a classification.

3. Results

Fig. 1 shows the database search results. From the primary search, 4940 studies were retrieved. 17 studies were identified from supplementary searching (reference list scanning and hand search) and 370 duplicates were removed before screening. For the remaining 4570 studies, the title and abstract were reviewed and a further 4484 studies were excluded in accordance with the pre-defined eligibility criteria. The full text of 86 articles were sought and reviewed for inclusion, and a further 50 studies were excluded. Exclusion reasons are listed in Fig. 1, and include the study focus being outside of the scope of the research question (n = 31), not full text paper (conference poster or abstract, n = 9), studies still in progress (n = 3), studies in primary care settings (n = 3), incorrect vaccine of focus (n = 3), and a study of health care workers receiving vaccination for occupational risk (n = 1). 30 studies were included for final review. Supplemental Table 7 lists the study characteristics, relevance to review, and findings of the articles included after full text assessment.

3.1. Study characteristics

Of the 30 included studies, 22 were cross-sectional studies [5,14–34], three were retrospective cohort studies [7,8,35], two were longitudinal studies [36,37], and there was one of each mixed-methods study [38], prospective observational study [39], and quality improvement project [40]. 19 of the studies were conducted in the United States [5,7,8,14,16,18–20,22,25,26,30–32,35,36,39,40], three studies were published in Canada [15,27,28], two in both Australia [24,29] and Germany [33,37], and one study published in each France [17], Ireland [23], the Netherlands [38], and South Korea [21]. The attitudes and perceptions of service users towards vaccination in non-primary care settings was the primary focus of 23 studies [5,7,8,14–16,18–21,24–26,28–32,34,35,37,39,40], six studies assessed the attitudes and perceptions of providers [17,22,23,36,38], and one study assessed the attitudes of both service users and providers [33]. 16 studies assessed attitudes on the delivery of influenza vaccines [7,8,15,16,19–22,25,27–29,31,35,37,39], seven studies on COVID-19 vaccines [5,18,26,32–34,40], three assessed attitudes to vaccination generally [14,23,38], two on COVID-19 and influenza vaccination [17,30], and two on influenza and pneumococcal vaccination [24,36]. Settings for vaccine delivery and included population groups are summarised by frequency in Table 1.

Table 1 Non-primary care vaccine delivery settings and population groups, summarised by frequency.

Setting	n (%)
Tertiary care setting	
Emergency department	11 (36.67) [5,16–18,27,28,31,34,36,39,40]
Hospital	3 (10.0) [24,35,38]
Total	14 (46.67)
Secondary care setting	
Outpatient/specialist clinic	1 (3.33) [23]
Total	1 (3.33)
Other settings	
Workplace	6 (20.0) [21,22,26,29,33,37]
Immunisation clinic	3 (10.0) [15,20,25]
Mobile clinic	2 (6.67) [19,30]
Non-medical settings (grouped generally)	2 (6.67) [7,8]
Drive-through clinic	1 (3.33) [14]
Faith-based organisation	1 (3.33) [32]
Total	15 (50.0)
Population group	n (%)
Service users	
Service users attending emergency departments	7 (23.3) [5,16,18,28,34,39,40]
Service users living in the US (general population)	4 (13.33) [7,8,14,19]
Company employees	3 (10.0) [21,33,37]
Service users living in Australia (general population)	2 (6.67) [24,29]
Minority groups	2 (6.67) [26,32]
Under-served groups (low socioeconomic status, rural)	2 (6.67) [20,25]
Service users living in Canada (general population)	1 (3.33) [15]
Hospitalised adults	1 (3.33) [35]
Adults with mental illness	1 (3.33) [30]
Total	23 (76.67)
Providers	
Emergency department staff (heads, physicians, nurses)	4 (13.33) [17,27,31,36]
Medical specialists	2 (6.67) [23,38]
Occupational physicians	1 (3.33) [22]
Total	7 (23.33)

3.2. Service user perceptions and attitudes

Table 2 lists service user attitudinal drivers and barriers towards vaccination in non-primary care settings and are classified according to study setting and interpreted determinant. Overall, there were more drivers than barriers identified in the included studies. Drivers towards vaccination acceptance were more common in non-medical settings, such as workplaces, drive through clinics, faith-based organisation, and mobile clinics. Barriers to vaccination were more common in medical settings, such as emergency departments and in-patient wards. There were no studies assessing service user attitudes towards vaccination in secondary care settings, such as specialist offices and outpatient clinics.

3.2.1. Drivers

1. Emergency departments

Common drivers of vaccine acceptance in the emergency department were reflective of service user health behaviours including prevention of illness [5,28], wanting to avoid transmitting disease [28,34], and habitual yearly vaccination [5,28]. The study by Waxman showed that service users trusted the vaccine providers in this setting, were willing to prevent transmission of disease, felt they were able to discuss their concerns about vaccination, and appreciated being given the choice to opt-in or out of vaccination [34], leading to an overall increased vaccine acceptance. In the study by Rodriguez [5], which sought to vaccinate under-served patients presenting to 15 US safety-net emergency departments, those who lacked a primary care physician were highly receptive to vaccination in this setting. Confidence in vaccination providers was the strongest determinant to vaccine acceptance in this setting.

2. Workplaces

Drivers to vaccine acceptance in workplaces were commonly reported and centred most on factors of perceived convenience. The studies by Moore [26], Trent [29], and Wagner [33] spanning across workplaces in the US, Australia, and Germany noted convenience as a significant factor towards acceptance in this setting. Free or subsidised vaccines offered in the workplace were noted as drivers in the study of an airline cabin crew by Kim [21], and in Australian workplaces by Trent [29]. Other drivers towards vaccine receptivity in the workplace included trusting occupational health providers with whom employees already had a relationship [33], health-related behaviours such as not wanting to get ill [21], not having a regular primary care physician [29], and time efficiency [33]. The study by Moore [26], which focused on Hispanic employees in a US workplace noted having the choice to opt-in for vaccination, and being provided vaccination information in the service user's own languages were drivers to vaccine acceptance in this population.

3. Other settings

The study by Aghaei [14] regarding service user perception of vaccination in US drive-through urgent care centres, reported perceived convenience, time efficiency, and perception of reduced risk of infection transmission in the clinic as drivers to acceptance in this setting. This study was of particular interest as 15.7 % of participants were mobility impaired and relied on assistive devices, with increased accessibility a positive determinant [14]. Three studies in immunisation clinics, including a flu outreach clinic for under-served adults in South Los Angeles [25], noted convenience [20,25], trust in vaccine providers [15,25], avoidance of illness [20,25], and time efficiency [25] as facilitators to vaccine acceptance. A study of perceptions of a student pharmacist-run mobile clinic by Hannings [19] showed that service users found the clinic convenient, and had past positive experiences

Table 2

Perceived attitudinal drivers and barriers of service users towards vaccination in non-primary care settings*

Drivers (<i>interpreted determinant</i>)	No. of studies	Setting		
		Tertiary	Secondary	Other
More convenient to be vaccinated in this location (<i>calculation, constraints</i>)	7			1 (DrTh) [14] 1 (mob) [19] 2 (IC) [20,25] 3 WP [26,29,33]
Trusting vaccination providers or finding them helpful (<i>confidence</i>)	5	1 (ED) [34]		2 (IC) [15,25] 1 (WP) [33] 1 FBO [32]
Not wanting to get ill (<i>calculation</i>)	5	2 (ED) [5,28]		2 (IC) [20,25] 1 (WP) [21]
Not having a primary care physician (<i>constraints</i>)	4	1 (ED) [5]		2 (NMS) [7,8] 1 (WP) [29]
More time efficient being vaccinated in this location (<i>calculation, constraints</i>)	3			1 (IC) [25] 1 (WP) [33] 1 (DrTh) [14]
Wanting to prevent the spread of disease (<i>collective responsibility</i>)	3	2 (ED) [28,34]		1 (FBO) [32]
Free, subsidised, or less expensive vaccination offered (<i>calculation, constraints</i>)	3			2 (WP) [21,29] 1 (mob) [19]
Setting is more accessible (<i>access</i>)	2			1 (DrTh) [14,30]
Getting vaccinated every year (<i>complacency – not complacent</i>)	2	2 (ED) [5,28]		
Being in good health (<i>calculation</i>)	2			1 (WP) [29] 1 (NMS) [8]
Being given a choice to accept the vaccine (<i>calculation</i>)	2	1 (ED) [34]		1 (WP) [26]
Less risk of catching an infection in this setting (<i>calculation</i>)	1			1 (DrTh) [14]
Having a positive past experience in this setting (<i>confidence</i>)	1			1 (mob) [19]
Trust in community leaders in this setting (<i>confidence</i>)	1			1 (FBO) [32]
Willing to adhere to mandates (<i>compliance</i>)	1			1 (FBO) [32]
At risk of infection in the workplace (<i>calculation</i>)	1			1 (WP) [21]
Having the opportunity to discuss concerns about being vaccinated (<i>calculation</i>)	1	1 (ED) [34]		1 (NMS) [8]
Willing to pay for the vaccination (<i>calculation, constraints</i>)	1			1 (NMS) [7]
Usual provider didn't offer the vaccine (<i>constraints</i>)	1			1 (NMS) [8]
Vaccination information provided in own language (<i>constraints</i>)	1			1 (WP) [26]
Total	47	10	0	37

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Table 2 (continued)

Drivers (interpreted determinant)		Setting		
	No. of studies	Tertiary	Secondary	Other
Barriers				
	No. of studies	Tertiary	Secondary	Other
Not at risk of illness or infection (complacency)	5	3 (ED) [16,28,40] 1 (IP) [35]		1 (WP) [21]
Afraid of getting ill from the vaccine (calculation, confidence)	5	4 (ED) [5,16,39,40] 1 (IP) [35]		
Prefer to receive the vaccine from primary care physician (calculation, confidence)	4	2 (ED) [16,39] 1 (IP) [24]		1 (mob) [19]
Want further advice before receiving the vaccination (calculation, confidence)	2	1 (ED) [5] 1 (IP) [35]		
Concerned about what the media and peers say about the vaccine (conspiracy)	2	1 (ED) [5]		1 (FBO) [32]
Afraid of needles (confidence)	2	2 (ED) [16,28]		
Vaccines don't work (confidence, complacency)	1	1 (ED) [28]		
Don't have time to be vaccinated (calculation, constraints)	1	1 (ED) [28]		
Not interested in being vaccinated (complacency)	1	1 (ED) [16]		
Being vaccinated detracts from the service (calculation)	1	1 (ED) [39]		
Missed the opportunity to be vaccinated (constraints)	1			1 (WP) [21]
Too expensive to get vaccinated (calculation, constraints)	1	1 (ED) [40]		
Total	32	28	0	4

* Abbreviations are listed in supplementary data S9.

which facilitated their return. An interesting study by Vincenzo assessed factors associated with vaccine acceptance among Marshallese and Hispanic adults in community vaccine events at faith-based organisations [32]. The authors noted trust in vaccination providers, a willingness to prevent transmission to family and friends, and trust in participating community leaders as drivers of vaccine acceptance in this setting [32]. Confidence in authorities was a strong determinant in this setting. Two studies by Lu assessed trends and drivers of place of vaccination among US adults [7,8]. They noted that service users selecting non-medical settings for vaccination reported a lack of primary care physician or vaccine recommendation from a medical provider, felt they were in good health, appreciated the opportunity to discuss their concerns about vaccination, and were willing to pay for the vaccination [7,8].

3.2.2. Barriers

1. Emergency departments and in-patient settings

There were several attitudinal barriers to vaccine acceptance reported in studies within emergency departments, the most common of which was service users fear of vaccine side effects [5,16,39,40]. Service users refusing vaccination in the emergency department also perceived themselves as not at risk of contracting transmissible diseases [16,28,40], or were needle-phobic [16,28]. Service users in the study by Cohen [16] of a pharmacy-led emergency department immunisation program, and in the study by Hilger [39] in a military medical centre, preferred to receive their vaccine from a primary physician. Other barriers reported in emergency department studies included service users wanting further advice before receiving vaccination [5], negative influence of the media and peers [5], a belief that vaccines don't work [28], not believing they have the time to be vaccinated [28], finding vaccination too expensive [5], and feeling that vaccination detracted from the reason for their visit [39]. The study by Masnick [35] regarding patient refusal of vaccination in a large tertiary hospital reported patients believing they are not at risk of illness, being afraid of vaccine side effects, preferring to receive their vaccination from a primary care physician, and wanting further advice before vaccination.

2. Workplaces and other settings

There were few barriers reported to service user receptivity to vaccination in workplaces and non-medical settings. Two barriers were reported in the study of South Korean airline cabin crew workplace vaccination, including employees believing they are not at risk of illness, and some simply missing the vaccination drive [21]. In the study by Hannings of a student pharmacist-run mobile influenza clinic, a small proportion of service users preferred to receive their vaccination from a primary care physician [19]. Lastly, in the faith-based organisation study by Vincenzo [32] service users who refused the vaccination reported influence of media and peer opinion on their choice.

Fig. 2 shows the frequency of determinants of vaccine readiness among service users being vaccinated in non-primary care settings, as interpreted in Table 2. Convenience and the availability of free or subsidised vaccination in non-primary care settings led to a lowering of perceived barriers (defined as constraints in this framework) and high self-benefit calculation as the strongest determinants of vaccine readiness. A lack of confidence in vaccines and providers, perception of vaccine risks, and complacency were the most common determinants of low vaccine readiness.

3.3. Provider perceptions and attitudes

Table 3 lists attitudinal drivers and barriers of providers towards offering vaccination in non-primary care settings. There were more perceived barriers than drivers among providers reported in the included studies, although the number of studies assessing provider attitudes was limited.

3.3.1. Drivers

Only two studies reported on attitudinal drivers of providers towards offering vaccination in non-primary care settings. The study by Doornekamp assessed the opinion of medical specialists from a Dutch tertiary care centre treating immunocompromised service users, among which a small proportion viewed it their responsibility to vaccinate service users [38]. In the study by Ghazali investigating the adherence of heads of French emergency departments to vaccination of service users in ED, existence of a previous vaccination campaign and clinical infrastructure was positively associated with adherence to future programs [17].

There were no studies reporting drivers of providers in secondary care or non-medical settings towards vaccination.

3.3.2. Barriers

1. Emergency departments and in-patient settings

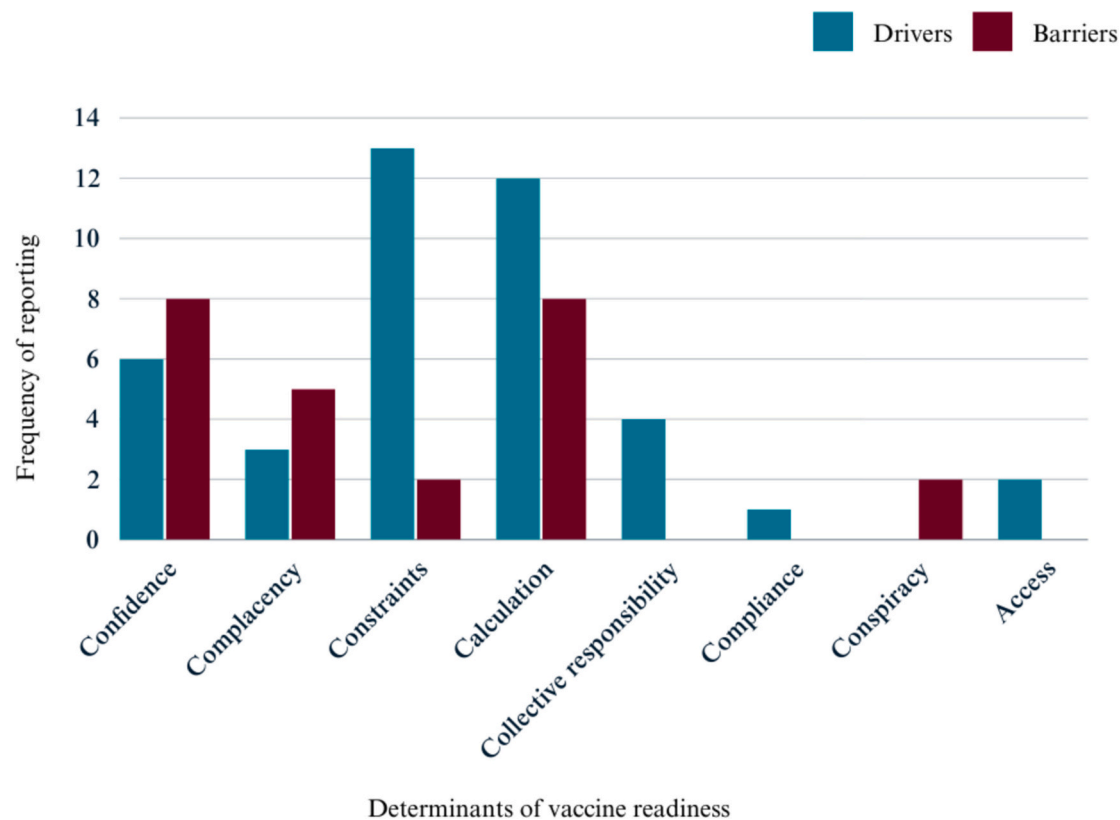


Fig. 2. Frequency of determinants of vaccine readiness among service users being vaccinated in non-primary care settings. Blue bars reflect determinants as drivers towards vaccine readiness and red bars as barriers. (For interpretation of the references to colour in this figure legend, the reader is referred to the web version of this article.)

There were a number of attitudinal barriers among providers to delivering vaccination in non-primary medical settings, the most common being that it is too time-consuming [17,31,36]. Providers in the studies by Ghazali of French ED heads of staff [17] and by Delgado of US ED directors [36] perceived service user vaccination as wasting resources, unnecessarily increasing patient length-of-stay, and inappropriate due to inability to follow up. Providers in the Delgado study also felt vaccinating service users was too costly, and a proportion believed that preventative services should not be offered in the ED, although further reasoning was not provided [36]. The study by Doornekamp of tertiary hospital specialists, reported time-constraints, difficult logistics and insufficient guidelines as perceived barriers to service user vaccination in this setting [38].

2. Specialist clinics

One study by McCarthy assessed the willingness of Irish rheumatologists to vaccinate their service users [23]. An overwhelming majority of physicians interviewed were opposed to vaccination in the specialist setting, citing time constraints, a preference to prioritise acute care, insufficient guidelines, and feeling it was the primary care physicians responsibility to vaccinate service users [23].

3. Workplaces

Two studies assessed the attitudes of company occupational and environmental health physicians towards vaccinating employees [22,33]. In the study by Kirupakaran regarding the practices and attitudes of US-based occupational physicians perceived barriers were logistics, cost, low public awareness, and a preference to prioritise other acute issues [17]. In Wagner's study in Southern Germany occupational physicians felt vaccinations increased their workloads [33].

4. Discussion

This scoping review is the first to map the available evidence regarding the specific attitudes and perceptions of service users and providers towards vaccination in non-primary care settings, including exploring determinants of vaccine readiness. The evidence suggests that service users are highly receptive to vaccination in non-medical settings, such as workplaces [7,8,21,26,29,33], drive through clinics [14], mobile clinics [19], and faith-based organisations [32]. While more attitudinal barriers were reported to receipt of vaccine in medical settings, such as hospitals, many of these were associated with vaccine uptake in all settings, such as a lack of belief in vaccine effectiveness and concern of side effects, and therefore may not be reflective of attitudes specific to the setting. The strongest determinants of vaccination readiness among service users were ease of access and potential benefit, particularly towards the convenience and lower associated costs of accessing vaccination in non-medical settings [7,8,14,19,21,26,29,32,33]. The most frequent determinants of low vaccine readiness were a lack of confidence in vaccines, and a perception of being at low risk for infection [5,16,24,28,35,39,40]. Among the included studies, providers commonly perceived the process of delivering vaccinations outside of primary care as too costly [22,36,38] or time-consuming [17,23,31,36,38], preferring to prioritise acute care [22,23].

4.1. Limitation of evidence

The findings of this scoping review demonstrate a general lack of studies regarding specific attitudes and perceptions towards vaccination in non-primary care settings, particularly among providers. This may limit the generalisability of the expressed sentiments among the wider population. The majority of included studies were cross-sectional in design, involving surveys or interviews of convenience samples

Table 3
Perceived drivers and barriers of providers towards offering vaccination in non-primary care settings*

Drivers	No. of studies	Setting		
		Tertiary	Secondary	Other
Specialists have a responsibility to vaccinate their patients	1	1 (IP) [38]		
Having pre-existing vaccination service infrastructure	1	1 (ED) [17]		
Total	2	2	0	0
Barriers	No. of studies	Tertiary	Secondary	Other
Too time-consuming to vaccinate patients	5	3 (ED) [17,31,36] 1 (IP) [38]	1 (OP) [23]	
Logistics are difficult	3	1 (ED) [27] 1 (IP) [38]		1 (WP) [22]
It would cost too much to vaccinate service users in this setting	3	1 (ED) [36] 1 (IP) [38]		1 (WP) [22]
Increases patient length-of-stay	2	2 (ED) [17,36]		
Wastes resources	2	2 (ED) [17,36]		
Unable to follow-up patients	2	2 (ED) [17,36]		
Insufficient guidelines available	2	1 (IP) [38]	1 (OP) [23]	
Prefer to prioritise acute care	2		1 (OP) [23]	1 (WP) [22]
Primary care responsibility	1		1 (OP) [23]	
Low public awareness makes vaccinating service users difficult	1			1 (WP) [22]
Inappropriate in setting (no further reasoning given)	1	1 (ED) [31]		
Increases workload	1			1 (WP) [33]
Preventative services should not be offered in this setting (no further reasoning given)	1	1 (ED) [36]		
Total	26	17	4	5

* Abbreviations are listed in supplementary data S9.

[5,14–34]. While most of these studies employed mixed methods data, statistical significance of extracted findings was rarely reported, weakening the overall strength of evidence. Although cross-sectional studies are often used to explore determinants of health behaviour, they are susceptible to nonresponse and recall biases and lack the ability to explore temporal relationships between variables [41]. Furthermore, a large proportion of the studies were conducted in the US [5,7,8,14,16,18–20,22,25,26,30–32,35,36,39,40], and their findings may not be generalisable to other populations.

4.2. Meeting people where they are – drivers of adult vaccination readiness

The findings of this study indicate an overall willingness of service users to be vaccinated in locations they deemed more convenient and accessible such as workplaces [7,8,21,26,29,33], drive through clinics [14], mobile clinics [19], outreach clinics [25] and faith-based organisations [32].

Availability of vaccines in the workplace has shown to be a positive predictor of uptake [7,8,29,42]. The study by Wagner [33] assessing the attitudes of employees at five German companies found that 93.8 % were willing to be vaccinated in the workplace. The study by Kim [21] of

South Korean airline employees reported a 70.7 % workplace vaccination rate. Drivers of vaccine intention in these studies included personal convenience, not having to pay for vaccination, and trust in company occupational physicians [21,33].

Along with convenience and reduced cost, the study by Trent [29] showed that lack of a primary care physician was a determinant to vaccine acceptance in the workplace among Australian adults. Lack of primary care physician was also a driver of vaccine uptake in the studies by Lu on trends in US vaccination location [7,8], and the study by Rodriguez of under-served adult patients in emergency departments [5]. In the study by Rodriguez, 18 % of service users lacked a regular source of medical care and 54 % of these were willing to be vaccinated in the ED [5]. Furthermore, in the study by Lu [8], 56 % of adults who received a vaccination in non-medical settings lacked a recommendation from their usual primary care provider.

Vaccinating adults where they commonly spend their time and in settings which they demonstrate greater vaccine readiness, such as in the workplace, may assist in filling access gaps.

Accessibility is of particular importance in reaching under-served adult populations. The study by Van Alphen [30] regarding the attitudes of adults with serious mental illness reported that 81 % preferred a mobile vaccination service, citing accessibility as the major determinant. A recent systematic review by Suffel et al. [43] showed that mental health issues were significantly associated with lower vaccine uptake, especially among adults with substance use disorder. Making vaccines more accessible, such as through a mobile service, may assist in improving vaccine equity in this cohort.

The study of drive-through clinics offering vaccination by Aghaei [14] included a cohort of service users with mobility impairment. Although only 29 % of all participants were willing to receive vaccination in this setting, attitudes towards the service were positive and included a perceived reduction in risk of infection transmission, convenience, time efficiency, and accessibility. A study by Rotenberg [44] focused on COVID-19 vaccination accessibility for people with disabilities, suggested the need for more physically accessible locations outside of primary care clinics and pharmacies. A drive-through model wherein physical accessibility is mitigated may serve as a viable option, although transportation must be considered.

The findings of this review suggest that meeting adult service users where they are may improve vaccine readiness and assist in filling access and equity gaps.

4.3. Who or what to trust? – attitudinal barriers to adult vaccination readiness

The most frequent determinants of vaccine hesitancy found in this review were a lack of confidence in vaccines and fear of adverse events [5,16,24,28,35,39,40]. In the study by Cohen [16] assessing patient attitudes to being vaccinated in the emergency department, 20 % of those who declined vaccination feared adverse events. In the study by Rodriguez, 65 % of patients who declined ED vaccination held this same fear. A recent study by Khouri explored the feelings of adults of being at risk of vaccine adverse effects [45]. Their findings showed that 15 % of respondents felt to be more at risk than others of adverse events, with majority of reasons cited not found to be genuine risk factors [45]. However, these attitudes are unlikely to be specific to location and may not reflect perceptions regarding receiving vaccines in a specific setting. Nevertheless, service user fear of vaccine adverse effects needs to be considered by providers of immunisations outside of primary care.

Choice in immuniser was also a consideration among some service-users in receiving vaccination. In the Cohen study, a small proportion of service users preferred to receive their vaccination from a primary care physician rather than the ED pharmacist [16]. There were similar findings in studies offering vaccinations in a military clinic [39], hospital ward [24], and mobile clinic [19]. Further reasoning on this issue was not explored in depth in the included studies, and there may be a

need for more studies to address this barrier.

At minimum, there is an opportunity to provide vaccine education to service-users in these settings, particularly those who decline vaccination, which can assist in raising awareness and knowledge of vaccine-preventable diseases [46].

4.4. Attitudes among providers

Studies of provider attitudes included in this review were more limited. The results of those included reported more barriers than drivers regarding vaccination in non-primary care settings [17,22,23,27,31,36,38]. The overall theme identified was that providers felt it was too difficult or time consuming to provide this service [17,23,31,36,38]. Even in a study of occupational physicians 50 % of respondents considered workplace vaccination too costly and 29 % preferred to prioritise other issues [22]. In the study by Delgado of a national sample of US ED directors, only 6 % were interested in offering influenza vaccinations, and 3 % in offering pneumococcal vaccinations [36]. Lack of interest in this study stemmed from the perceived costs of offering vaccine programs, increased patient length of stay in ED, resource shifting, and an inability to follow up patients after vaccination [36]. This finding is unsurprising given competing workflow demands in ED settings, and the prioritisation of acute care [47]. Interestingly, only one study reported the attitude that it was the primary care physician's responsibility to vaccinate service users, with 57 % of surveyed Irish rheumatologists agreeing with this statement [23]. However, this is likely related to the structure of questionnaires and the general lack of studies in this area. In the study of ED nurses' attitudes towards offering vaccination, 59 % felt that it was inappropriate in the setting, which may also reflect a belief that it is the role of primary care. The findings of this review suggest that the workload of providers may be a barrier to vaccination acceptance in this setting, however more studies are required.

Provider-level interventions such as clinical reminders, education, and workflow improvements have been shown to improve immunisation rates in non-primary care settings, and may offer solutions to provider barriers in these settings [48].

4.5. Limitations

There were a number of limitations to this scoping review. Firstly, there is a sparsity of available evidence on the topic, particularly on provider attitudes towards vaccination in non-primary care settings. The overall quality of studies is low, prone to biases, and unlikely to be generalisable. Studies were conducted across different population groups and settings, which impacts the ability to compare results. Lastly, all of the included studies were published in high income countries, with the vast majority conducted in the United States. This is likely to limit replicability across other health care systems.

5. Conclusion

This scoping review maps the available evidence regarding the perceptions of adult service users and providers towards delivery of vaccination in non-primary care settings. Furthermore, it explores the determinants of service user drivers and barriers to vaccine receptivity in these settings. The findings indicate that service users are receptive to vaccination in non-primary care settings, such as workplaces [7,8,21,26,29,33], drive through clinics [14], mobile clinics [19], and faith-based organisations [32]. Service users are shown to be motivated by convenience and reduced costs in these settings [7,8,14,19,21,26,29,32,33]. Non-primary care settings also provide vaccination opportunities for those with limited access to primary care, and contribute to filling inequity gaps [5,7,8,29]. There were some barriers reported to service user acceptance of vaccination outside of primary care settings, including a lack of confidence in vaccines and fear

of adverse events [5,16,24,28,35,39,40]. However, these attitudes are unlikely to be location-specific and more so reflect perception towards vaccination in general. There is a lack of studies regarding provider attitudes towards vaccination in non-primary care settings, and further studies are required in this area.

CRediT authorship contribution statement

Eleftheria Lentakis: Writing – review & editing, Writing – original draft, Validation, Methodology, Investigation, Formal analysis, Data curation. **Holly Seale:** Writing – review & editing, Supervision, Project administration, Methodology, Conceptualization. **Rajeka Lazarus:** Writing – review & editing, Supervision, Conceptualization. **Sandra Mounier-Jack:** Writing – review & editing, Supervision, Conceptualization.

Declaration of competing interest

HS receives institutional funding from Moderna for investigator driven research focused on factors impacting COVID-19 vaccine uptake, payment from Sanofi Pasteur for contributing to a review of vaccine reactogenicity, and support from Moderna for attending a COVID-19 expert meeting. RL receives funding from GSK via an investigator initiated grant to investigate coadministration of the shingles vaccine with influenza and COVID-19 vaccines, funding from the National Institute of Health Research UK for policy grant: National Immunisation Schedule Consortium, payment from Astra Zeneca for conference presentation in non-promotional sessions, support for attending a conference from Astra Zeneca, is part of the Sanofi Pasteur advisory board, and University of Oxford Data Safety Monitoring Board for three phase one vaccine trials (nipah, plague, and non-typhoid salmonella), is vice president of the British Infection Association, and co-founder of the Clinical Vaccine Network UK. SMJ receives funding from the Bill and Melinda Gates Foundation for zero dose strategies in fragile countries, the National Institute of Health Research UK for health protection research in immunisation, and UNITAID for the evaluation of IPTI, consulting fees from The Global Alliance on Vaccines and Immunisation as part of an independent review committee, is part of the GABI independent review committee, and currently seconded at UNICEF.

Data availability

No data was used for the research described in the article.

Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.vaccine.2024.126472>.

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