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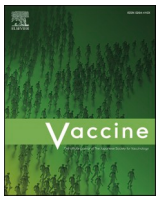

Influenza vaccine delivery models in secondary care (hospital) settings: What approaches are used to enhance access for clinical risk groups in England?

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A B S T R A C T

Background: Influenza vaccine uptake rates in England remain suboptimal among adults with clinical conditions that predispose to severe influenza. Influenza vaccines are predominantly delivered in primary care settings, but complementary delivery via a broader range of secondary care settings is recommended to enhance access. This qualitative study aimed to document current influenza vaccine delivery models in hospital-based settings and to compare the opportunities and limitations associated with those delivery models.

Methods: Semi-structured interviews ($n = 28$) were conducted with healthcare professionals based in secondary care, and with National Health Service commissioners to understand current vaccine delivery practices within hospital settings in two regions of England.

Results: Most hospitals who offered patient vaccination had invested in dedicated staff and processes to support influenza vaccine delivery. A variety of interventions were used to navigate the steps in the vaccination pathway. Challenges included engagement of medical staff, access to vaccination records and managing vaccine stocks.

Conclusion: Secondary care vaccination is possible with the appropriate investment in staff and processes. Focusing on staff engagement, addressing logistic challenges and providing adequate invesment would support the sustainability of vaccination in secondary care.

1. Introduction

Influenza is an important public health concern as it causes 15,000 deaths and 43,000 hospital admissions each year in the UK [1]. The annual influenza vaccine programme aims to protect cohorts at risk of severe influenza, which includes adults aged under 65 with underlying medical conditions designated as clinical risk groups. Clinical risk groups include those with chronic medical problems and are listed in national guidance documents [2]. However, just 49.3 % of people in clinical risk groups in England received the influenza vaccine in 2022–23 [3]. Influenza vaccination is predominantly offered within community settings, which includes general practice (GP) and pharmacies. Interventions such as payments associated with the Investment and Impact Fund for GPs, extending GP practice opening hours, and the introduction of call and recall systems have helped increase influenza vaccination rates in clinical risk groups over the past two decades [4]. Yet, influenza vaccine uptake rates among clinical risk groups continue to fall short of the 75 % target set by England's Chief Medical Officer in 2012 [5].

The National Institute for Clinical Excellence (NICE) and National Health Service, England (NHSE), recommend opportunistically offering influenza vaccines in a broad range of healthcare settings, including secondary care hospitals, to broaden access to vaccines further and thereby increase uptake [6,7]. In 2020, NHSE instructed all Hospital Trusts to offer vaccinations to eligible patients [8]. Models used to deliver hospital-based influenza vaccine in the UK have not previously been described. In contrast, models and interventions to support hospital-based vaccination in the US, Australia and Canada, are well described [9]. Here, we report models for hospital-based vaccination as part of a study examining and contrasting models for delivering influenza vaccination outside of primary care settings in two major English cities with different rates of vaccine uptake.

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2. Methods

This study draws on a subset of data collected as part of a broader qualitative assessment of the feasibility and acceptability of integrating the influenza vaccine programme within non-primary care settings [10]. The subset of data focuses on the experiences of healthcare professionals (HCP) in secondary care, and vaccine commissioners, in delivering influenza vaccine within hospital settings.

The interviews were conducted in two English cities, London and Bristol. London NHS region has a lower than average vaccine uptake rate compared to the England average. Bristol is situated within the South West NHS region where vaccine uptake rates are higher than the England NHS region average (Table 1). The use secondary care (hospital) sites ino these two cities allows examination of vaccine delivery pathways in the context of low and above average vaccine uptake settings. Secondary care within the United Kingdom (UK) refers to clinical services provided outside of primary care. Many of these services are delivered within hospitals which include different settings such as inpatient wards, outpatient clinics, dialysis services and pharmacy dispensing services. In this study hospital-based vaccination refers to all settings that are typically found within hospitals within the UK.

Secondary care HCPs were based in hospital services for respiratory disease, liver disease, diabetes, infectious diseases, renal medicine, pharmacy or operational management. The specialties included those with the highest (diabetes) and lowest (liver disease) rates of influenza uptake and the largest number of registered patients within a given risk group. HCPs were based at two hospitals in Bristol (South West) and five in the London region. All hospitals were teaching hospitals who provided both secondary and tertiary care. Participants outside secondary care included commissioners responsible for the South West region that includes Bristol and London region who worked for NHSE either regionally or in an Integrated Care Board (see Table 2).

Participants were recruited via professional networks, by direct invitation, snowball sampling methods, and clinical networks and associations (British Association for the Study of the Liver; the National Institute for Clinical Excellence [NICE], local Clinical Research Networks).

2.1. Data collection and analysis

The interviews were conducted in-person and virtually between February–November 2023. Participants provided informed consent (written or oral) to take part in the study. Interviews lasted between 30 and 40 min and were recorded, and notes made with permission. Interviews were transcribed using an online transcription service (Otter.ai) and anonymised. Participants were coded according to health service location and role (Table 3).

Topic guides were informed by existing literature and used to explore experiences surrounding influenza vaccines, perceived acceptability of integrating vaccine delivery in non-primary care settings, and lessons learnt from COVID-19 vaccine programme delivery. Key analytical themes were drawn directly from the data through a grounded theory approach [11]. The end of sampling was determined by the research team based on achieving data saturation (i.e. no new concepts emerged). Emergent coding themes were reviewed and discussed extensively between the research team and refined as the results of these discussions. Data were coded and analysed using software (Nvivo and Excel) [12].

Table 1
Seasonal influenza vaccine uptake among people aged 16 to under 65 with one or more clinical risk factors (excluding healthy pregnant women and carers) in the NHS London region and NHS England regions including the SouthWest, 2022–23. UKHSA.

Patient group aged 16–65	London NHS region	South West NHS region including Bristol	England NHS region
Diabetes	54.8 %	65.8 %	60.3 %
Chronic kidney disease	47.6 %	65.6 %	58.5 %
Immunosuppression	45.9 %	63.1 %	56.6 %
Chronic neurological disease	44.1 %	58.8 %	54.9 %
Chronic respiratory disease	44.7 %	56.2 %	52.4 %
Chronic heart disease	42.1 %	54.8 %	49.8 %
Chronic liver disease	38.2 %	49.1 %	44.6 %
Asplenia	38.9 %	57.4 %	51.0 %

Table 2
Breakdown of interviewees by role.

Role	London (London region)	Bristol (Southwest region)	Total
Clinician (diabetes)	0	1	1
Clinicians (liver disease)	3	2	5
Clinicians (respiratory/ infectious diseases/renal)	2	1	3
Diabetes specialist nurses	1	2	3
Liver specialist nurses	0	2	2
Specialist nurses (other)	0	2	2
Hospital pharmacists	3	1	4
Secondary operational leads	1	1	
Commissioners	4	2	8
Total	14	14	28

Table 3
Participant code key.

Participant setting/number	Participant role	Condition/speciality
Secondary Care healthcare worker (SC)	Nurse Consultant Pharmacist Pharmacy technician	Respiratory disease Diabetes Liver disease Renal disease Infectious Diseases
Secondary Care (SCM)	Operations lead	
Commissioner (CM)	NHS England (NHSE)	Regional Integrated Care Board (ICB)

2.2. Ethical approval

Ethical approval to conduct this study was provided by the London School of Hygiene & Tropical Medicine, and permission was obtained from the NHS Health Research Authority in January 2023 to interview NHS employees (Reference: 23/HRA/0194).

3. Results

The delivery of influenza vaccine varied between hospitals represented in this sample from the use of established processes, ad hoc offers of vaccination or no offer at all.

Some hospitals had offered COVID-19 vaccination but this had not continued to the same extent for influenza vaccine:

> '*….during COVID we managed to give COVID vaccines in hospital but in general, we don't, hospitals aren't places where vaccination takes place in general.*' (SC14_Consultant_Infectious Diseases).

In hospitals where influenza vaccines were offered three key topics emerged from our thematic analysis: dedicated vaccine teams versus integration into routine care; the interventions used and the role of funding and commissioning.

3.1. Dedicated vaccine teams versus integration of vaccination delivery into routine care

There were two models of vaccine delivery described. In one hospital

vaccine delivery was incorporated into routine activity on one hospital ward. In most hospitals however, staff were dedicated to delivering vaccine in different locations around the hospital (see appendix 1).

3.1.1. Integrated vaccine delivery

In one London teaching hospital ward, the delivery of influenza vaccine was incorporated into the routine workflow of a respiratory ward. This integrated delivery was supported by the use of electronic prescribing and driven by strong clinical leadership:

> '*I think one of the key things I would say of the learning…is you have to have the clinical leads…saying this* [influenza vaccination] *matters.*' (SC15_Consultant_Respiratory Disease).

In addition to offering influenza vaccine to eligible ward patients, the lead consultant routinely incorporated vaccine recommendations into all patient encounters such as outpatient appointments using standardised proformas:

> *'I lead a home oxygen team where within the pro forma… it's got flu, COVID, Pneumovax. I did a drug clinic…..we did exactly the same thing there. We picked up a massive group of people who had never had flu vaccination…'* (SC15_Consultant_Respiratory Disease).

3.1.2. Dedicated vaccine delivery teams

Dedicated vaccine delivery teams mostly consisted of nursing and/or pharmacy staff. Some teams employed a roving model whereby they went to specific patient areas to offer vaccination that included inpatients, discharge lounges and dialysis units:

> *'So we find that our kidney and our dialysis units, those sorts of places, they're very welcoming for us to go. So we might go to the dialysis unit for a couple of days in a week, and we'll [vaccinate] quite a few'* (SCM4_Operations Manager)

There were examples of individuals who were funded to deliver vaccine in specific teams but these did not include influenza vaccine. Nurses have been funded to deliver hepatitis B vaccines within renal units and pertussis vaccines within maternity to ensure timely vaccination:

> *'it is much easier for us to control our patients getting their timely hepatitis B vaccination, particularly because for example, in a patient who's going to have a transplant, if you do it* [vaccinate] *pre transplant, you're much more likely to get a good response from it. Whereas if you do a post-transplant, after all the immunosuppression, you won't get as good a response. So we have better control over that.'* (SC11_Consultant_Renal)

In one pharmacy-led service, a space to vaccinate was created within the pharmacy. Patients were then referred to the pharmacy department with a prescription for the vaccine to be dispensed and administered by a pharmacist before they left the hospital:

> '*So it means that the patient who had [had] a discussion with a consultant in the outpatient clinic could come down to the pharmacy, they would then have a prescription ready for us [pharmacy], and they can see that it's been prescribed by a doctor. And then they [pharmacists] can then give the vaccine in the outpatient pharmacy, which has a little room for vaccination.*' (SC9_Pharmacist).

3.2. Interventions used to offer influenza vaccine within hospital settings

Vaccine delivery within hospital settings is a multi-step pathway. Different types of interventions were used to navigate each step (Table 4). Many of the interventions reported were interchangeably delivered by different staff groups, including pharmacists, nurses and

Table 4
Influenza vaccine delivery pathway and associated interventions and challenges.

Vaccination pathway	Interventions	Challenges
Identifying patients eligible for vaccination	Review of vaccine history by clinical staff as part of routine care	Referral of patients by medically qualified ward staff to dedicated vaccine teams using electronic referral forms was limited
	Electronic referrals made to dedicated vaccination teams by clinical staff caring for eligible patients	Access to primary care records to confirm vaccination status varies between different hospitals
	Review of vaccine status by ward pharmacists during routine medicines review. Vaccine status confirmed by cross reference to either primary care records or the National Immunisation and Vaccination System	Access to the National Immunisation and Vaccination System was limited to a small number of individuals within the hospital
	Pharmacy generated lists of individuals not vaccinated for 3-months using routinely collected data	Actively reviewing the 'ready for discharge' list was time consuming and did not always result in successful vaccination
	Review of National and Immunisation System of patients waiting for discharge	
Offering vaccination: providing necessary information and answering questions about vaccination	Opportunistically during outpatient consultant led appointments. This includes signposting to vaccination services in primary care	Differences in levels of confidence and knowledge of healthcare workers in providing information and answering questions about vaccines
	Opportunistically during routine ward-based care by medically qualified clinicians	
	Undertaken by dedicated vaccination teams, typically made up of nursing or pharmacy staff	
Receiving consent	Requesting medically qualified ward staff to receive consent from either patient or next of kin to facilitate vaccination by dedicated vaccine delivery team	Relying on medically qualified staff was inconsistent
		Receiving consent from next of kin was especially time consuming
	Enabling vaccination team to receive consent	
Vaccine prescription	Electronic prescriptions Pharmacy led prescribing	Delays if medically qualified prescribers need to sign prescription
Age-specific vaccine stock needs to be maintained on site and be made available in a timely manner	Pharmacy led management	Difficult to predict demand as vaccine stocks are ordered many months in advance
Vaccine administration	Utilisation of standard nursing/medical skills for ward-based patients	Nurses working outside of ward areas may not routinely administer intramuscular injections therefore additional training may be required
	Pharmacist trained to provide vaccination	
	Ensuring patient is considered fit for vaccination whilst they are a hospital inpatient	Reviewing medical notes or finding medical staff to confirm patient was fit for vaccination was time consuming
Documenting vaccination status in primary and	Recording vaccination on patient discharge documentation for primary	Limited access to National Immunisation and Vaccination System

(*continued on next page*)

Table 4 (*continued*)

Vaccination pathway	Interventions	Challenges
secondary care records	care Direct update of vaccination status on the National and Immunisation System which communicates with primary care record	Documentation in multiple locations in secondary care notes required, reported as time consuming and inefficient

doctors. The main challenges for vaccine delivery were limited engagement of medical staff, management of vaccine stocks, and management of vaccination records.

National Immunisation and Vaccination System (NIVS).

3.2.1. Variable engagement of doctors in vaccine delivery pathway

Vaccine teams who tried to get doctors to refer patients for vaccination reported that this was not a reliable method to identify eligible patients:

> *'…we realized that the barrier was essentially, the doctors aren't thinking about flu…'* (SC9_Pharmacist)

When roving vaccine teams visited wards to identify or vaccinate eligible patients, they found that it often took time to get the information they needed from ward staff which increased the time it took to deliver a vaccine:

'……. *when you go to the ward, it's the mental capacity, trying to find the notes, trying to find the drug charts. If you have any concerns, try and find a doctor to ask advice. And the time of day that you go, the nurses are always busy. We don't know if the patients are having any type of therapy or treatments but eventually we get there.*…' (SC16_Nurse_vaccine team).

Whereas the process was reported to run more efficiently when many of the steps were delivered by a single team on a ward, utilising existing clinical skill sets:

"*So the doctors prescribe and the ward nurses administer – they have been trained to, and are very used to giving other treatments, including injections, so you don't need a specialist nurse or roving 'vaccinator' to come and do it – it just happens as part of 'treatment' rounds." (*SC15_Consultant_Respiratory Disease).

3.2.2. Management of vaccination records

Access to patient vaccination records was needed to confirm vaccination status, in order to corroborate vaccine history provided by a patient or to proactively identify individuals who were potentially eligible for vaccination. Updating the patient medical record once the vaccine had been given was an administrative burden due to the number of places documentation was required:

> '[We] *put it* [vaccine] *into the noting system as well…the patient's medical records. Three places that we have to do it on.'* (SC9_Pharmacist)

In addition to documentation in the secondary care notes, primary care notes need to be updated to ensure the patient's primary medical record is maintained and this information is available in a timely manner. The National Immunisation and Vaccine System (NIVS) was used by those working in dedicated vaccination roles to access both vaccine history and to update the patient record. This was thought to be a reliable and efficient way of updating the primary care record as the information from NIVS is automatically transferred to the primary care record. The limitation of NIVS, however, was reported to be two-fold, one that it did not communicate and update secondary care records so it could be used efficiently for communication within secondary care and access to NIVS was perceived to be limited:

> *'So recording is really important, in the sense that yes, we do record it into this national database, that gets pulled into GP records. But then if you stand back, what we know as well as that national document database does not get pulled into the hospital record. So there's a chance that a patient goes to another ward, and then they're going to get another dose because there's no way the doctors [know], not everyone has NIV access.*' (SC9_Pharmacist)

It may be the perceived limited access to the NIVS is temporary whilst the system becomes more established. A regional commissioner reported that widespread use of the system was encouraged and there were superusers within all hospitals to facilitate use:

'*….there are certain NIVS superusers in each trust. I don't think there's a certain number of people that can use it. In fact, we encourage lots of people to train to use it.…*'(CM6 NHSE Regional).

3.3. Commissioning and funding for influenza vaccination within secondary care

Hospital-based vaccine delivery was undertaken through service-level agreements which included a service fee for each vaccine delivered. The service-level fee, agreed locally, was approximately £10. This fee was not sufficient to fund dedicated vaccine staff, therefore the decision to allocate staff resource was made at the level of individual hospitals (Trusts):

> *'Each Trust as well as got to make a decision about where the capacity is, and who they can release to be a vaccinator. And, you know, if you're already a nurse down on a ward, you can't necessarily release another one…. I suppose for some of the smaller hospitals, that's more of an acute pressure as well,…I'm just thinking about some of the biggest sort of city-based hospitals that we have across the region, who have much bigger vaccination workforces'*. (SCM6_operations manager)

The service-level fee and payment structures are based on the models used in primary care. In contrast to hospital models, influenza vaccination in primary care is well established and benefits from the financial efficiencies of scale and robust recording systems as well as financial incentives:

'*The payment structure for flu vaccination is not very conducive to using different models of delivery.*'(CM1 NHSE ICB).

*'Nailing the best delivery model to capture people is really hard in a Trust, actually. And there's nothing, other than the item of service fee…. There's no other real support from a financial perspectiv*e…' (CM5 NHSE ICB).

Influenza vaccines need to be ordered many months in advance therefore it may be difficult for this planned activity to be balanced against the recommended opportunistic approach to vaccination.

Stock management remains a challenge even for the planned, routine vaccination programme:

'So the problem that we have is that we have limited scope and flexibility to be able to significantly increase the amount of flu vaccines we have. Because if we do that, and we really encourage that, what we are putting our sites at risk of is a financial loss in terms of flu vaccination, because they could be left with X amount of flu stock at the end of the year, that they are not able to use.' (CM5 NHSE ICB).

The delivery of influenza vaccines for frontline HCPs is supported by the Commissioning for Quality and Innovation (CQUIN) framework. The CQUIN sets a minimum target for staff vaccination which is associated with a fixed payment. The lack of inclusion of patient vaccine in the CQUIN meant that most vaccination resources were used to support staff vaccination:

> "*Again, there's no carrot for people to do it. So the focus tends to be on staff vaccination staff, flu vaccination. Why is that? Because there's a CQUIN target. So do we need to have a target for hospitals to vaccinate inpatients?*" (SC9_Pharmacist)

4. Discussion

This study describes how, and to what extent influenza vaccines are being offered to patients within hospital settings in two regions of England (UK) where uptake rates differ considerably. The main challenge was how to align the recommendation for opportunistic vaccination with resources needed to plan, develop and sustain effective delivery pathways, staff training and maintain vaccine stock.

The availability of age-specific vaccine supply is a critical component of the vaccine pathway. Vaccines often need to be ordered many months in advance, a process that does not lend itself to the flexibility in stock needed to support opportunistic (as opposed to planned) vaccination. Vaccines may also be limited in quantity and subject to delays [13]. Limited stock may need to be prioritised for frontline HCPs, the vaccination of whom is supported by a financial incentive. Whether a financial incentive alone, however, would be sufficient to support opportunistic patient vaccination is unknown. Despite financial incentives for frontline HCPs vaccination there remains wide variation between vaccine uptake, with rates as low as 55 % in some centres and differences between the delivery models used within hospitals [14].

The models described in this study demonstrate that an opportunistic offer vaccine demands careful planning of processes and training of staff. The current service item fee does not cover the cost of such delivery therefore most models reported here depended on additional resources to be committed by the Trust which is likely to lead to variation in this offer around the country. The single integrated model described in this study has been highlighted as a case study in the Get It Right First Time Respiratory report [15] and was started in 2017 prior to the NICE and NHSE recommendations [7,8]. The key driver to the success of this model appeared to be medical leadership enacted both locally and nationally through disease specific management guidance [16].

Dedicated vaccine staff were either nurses or pharmacists, who were able to receive consent and administer vaccination but often had to rely on a doctor to identify eligible patients and recommend and prescribe influenza vaccine. Doctors were reported as being too busy to support the pathway or simply not thinking about vaccination as part of patient care. The extent to waiting for prescription to be signed caused delays or challenges depended on the interventions used to support the vaccination pathway. When influenza vaccine was recommended by a consultant in the outpatient setting, a prescription could be issued alongside the recommendation. The use of automated electronic prescriptions facilitated authorisation by making the process more efficient and convenient for doctors. Standing order protocols (SOPs; equivalent to the UK Patient Group Directive), provide a mandate for healthcare workers to administer vaccine to eligible patients without physician supervision or acceptance, and are widely used to support hospital-based vaccination worldwide but were not reported in this study [17–19]. Use of SOPs could help overcome the need for physicians to prescribe the vaccine. Given that non-primary care vaccine delivery has been reinforced in the most recent NHSE vaccination strategy, implementation of the strategy needs to include clarification of roles and responsibilities [20].

Hospital-based vaccine may benefit adults in clinical risk groups due to their higher rates of hospital admission [21]. However, it is not known whether hospital-based vaccination will add value to community-based vaccination by reaching those who do not usually access vaccination services or simply provide a more convenient option for those who would have otherwise gone to their GP.

Hospital-based staff may also add value, even if the immediate offer of vaccination is not available, by signposting to appropriate vaccination services as it is well recognised that a recommendation from a HCP increases the likelihood of vaccine uptake [6,22]. Routinely recommending influenza vaccination in outpatient letters or clinical proformas, as reported in this study, may also be beneficial. Adoption of these practices within hospital settings could increase opportunities for patients to discuss vaccination with a disease specialist which would support the need for tailored, disease specific information [10,23].

4.1. Strengths and limitations

This is the first study, to our knowledge, to describe hospital-based influenza vaccine delivery in England. Our study participants included HCPs from different disciplines who were involved in vaccination that provided insight into the different challenges and potential models for vaccine delivery.

Our study was limited to two regions in England, and all staff interviewed were based in large teaching hospitals which generally have more resources than district general hospitals, therefore the challenges and approaches may differ in other regions and hospital types. We interviewed HCPs working in a limited number of clinical specialities therefore the applicability of these results for other clinical risk groups may vary.

5. Conclusion

Influenza vaccination is offered by some but not all hospitals represented in this study. Several different interventions and approaches are being used to deliver vaccination. This study demonstrates that the infrastructure used to support opportunistic vaccination requires financial resource which is not covered by the current fee for service. The reliance on individual hospitals having to decide whether or not to invest in hospital-based vaccination threatens the sustainability of these models as funds may be diverted for other priorities in the future. Finally, further evaluation is needed to establish whether hospital-based vaccination will increase overall vaccine uptake rates or displace community-based vaccination.

Author contribution

*RL and BKD contributed equally to this manuscript.

BK, RL and SM-J conceived of the study and planned the study. BK, IA, and RL conducted the qualitative data collection and led the data analysis. All authors contributed to the design of the study, reviewed the analysis, and contributed to writing the manuscript.

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Ethical approval to conduct this study was provided by the London

School of Hygiene & Tropical Medicine, and permission was obtained from the NHS Health Research Authority in January 2023 to interview NHS employees (Reference: 23/HRA/0194).

CRediT authorship contribution statement

Rajeka Lazarus: Writing – review & editing, Writing – original draft, Investigation, Formal analysis, Conceptualization. **Ben Kasstan-Dabush:** Writing – review & editing, Project administration, Methodology, Investigation, Funding acquisition, Formal analysis, Data curation, Conceptualization. **Ifra Ali:** Investigation, Formal analysis. **Sandra Mounier-Jack:** Writing – review & editing, Methodology, Investigation, Formal analysis, Data curation, Conceptualization, Funding acquisition.

Declaration of competing interest

The authors declare the following financial interests/personal relationships which may be considered as potential competing interests: Rajeka Lazarus reports a relationship with Sanofi Pasteur Inc. that includes: consulting or advisory. Rajeka Lazarus reports a relationship with AstraZeneca Pharmaceuticals LP that includes: speaking and lecture fees and travel reimbursement. No If there are other authors, they declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Appendix A. Potential hospital locations to offer vaccination.

All locations below except the Emergency Department were reported as locations used in this study.

Secondary care location	Facilitators/Advantages	Barriers
Inpatient ward	Vaccine offered to those who are unable to attend primary care for vaccination due to hospitalisation	Vaccination not seen as a priority as it is not addressing an immediate medical need
	Existing skill sets of ward staff can be used to deliver vaccination	Lack of access to vaccination record systems to confirm vaccination status and update records
		Reliance on time poor medical staff to confirm fitness for vaccination
Outpatient	Individuals are usually medically stable	Limited space in close proximity to outpatient clinics
		Limited time
	Assurance can be provided by a specialist in a specific condition	Vaccination may not be within staff routine skill sets
		Increasing tendency for e-consultations since Covid-19 reduces footfall
Discharge areas	Individuals are medically stable or considered able to manage conditions at home	Patients may only spend a few hours in these areas
	Able to offer patients vaccination while waiting for discharge process to be completed	Vaccination not seen as a priority as it is not addressing an immediate medical need
Emergency department	Time available to discuss vaccination during waiting periods	Vaccination not seen as a priority as it is not addressing an immediate medical need
	Increase access to those not registered with GP or do not access primary care	Access to vaccination record systems to confirm vaccination status and update records
		Need medical review to confirm clinical stability to receive vaccinations
Pharmacy	Many hospitals have an on-site pharmacy	Limited space, time and trained vaccinators
	Vaccines can be dispensed individually which may help with stock management	
	Vaccine prescription and administration could be performed by trained pharmacists	

Data availability

Data will be made available on request.

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