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Mind the gap: A qualitative assessment of limitations in school-age immunisation programme delivery for Orthodox Jewish children in northeast London

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ABSTRACT

Introduction: School-based vaccine programme delivery offers convenience to parents, and reduces the burden on primary care capacity. Vaccine coverage among school-age children is lower in Hackney (northeast London), and post-pandemic coverage recovery has been limited in Hackney compared to London and England. Hackney is home to the largest Orthodox Jewish (OJ) population in Europe where most children attend independent faith schools. This study aimed to assess (i): vaccine programme delivery gaps via independent OJ schools in Hackney; and (ii) the primary care catch-up and commissioning strategies undertaken to help close gaps.

Methods: Qualitative evaluations of national incident responses for poliovirus and measles tailored to underserved communities in northeast London (2022–24). Data consisted of in-depth semi-structured interviews ($n = 53$) with public health professionals, healthcare practitioners, community partners, and OJ parents. Vaccine clinic visits ($n = 11$) were conducted in northeast London, affording additional ($n = 43$) focused and opportunistic interviews with OJ parents attending for catch-up.

Results: Evaluating the delivery of routine and outbreak vaccination campaigns to school-age children demonstrates that independent OJ schools in Hackney are a key programme delivery gap, directly impacting access to catch-up and routine adolescent programmes. OJ parents reported that they did not receive relevant vaccine programme information and invitations for school-age children via independent faith schools. Primary care-led outreach clinics were hosted to offer school-age immunisations to OJ adolescents, but did not offer HPV vaccines. Sub-commissioning community organisations to liaise with independent schools may be a strategy to help resolve this delivery gap, but would require responsibilities within school-age immunisation partnerships to be clearly assigned.

Conclusion: Limitations in vaccine programme delivery via independent faith schools in northeast London may play a role in suboptimal vaccination coverage. Programme gaps must be addressed to help ensure that every eligible child is invited for, and can access, routine vaccination via accessible pathways.

1. Introduction

Routine childhood immunisations in England are delivered through a combination of primary care services for children under five, and School-Age Immunisation Service (SAIS) providers for children aged 5–16 (Table 1). Delivering vaccines to older children via schools is supported by most parents and is efficient, reducing the need for individual primary care appointments [1,2]. However, the Covid-19 pandemic temporarily disrupted vaccine delivery via schools, leading to declines in adolescent vaccine coverage across programmes and regions (Table 2) [3]. Catch-up activities have helped to improve vaccine coverage, but a return to pre-pandemic levels has not yet been attained

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Table 1
Primary offer of routine school-age vaccinations by age and year. SAIS offer further opportunities for catch-up in Year 10 for HPV, Men ACWY and Td/IPV, and the focus then moves to primary care.

SAIS commissioned to offer vaccines to cohort	Vaccine
Reception (age 4–5 years) to Year 11 (age 15–16)	Measles, Mumps and Rubella (MMR) • check vaccination status of pupils and offer the opportunity to catch up if required
Reception (age 4–5 years) to Year 11 (age 15–16)	Influenza
Year 8 (age 12–13 years)	Human papillomavirus (HPV)
Year 9 (age 13–14 years)	Meningitis ACWY (Men ACWY)
Year 9 (age 13–14 years)	Tetanus, diphtheria and poliovirus (Td/IPV)

Table 2
Year 9 tetanus, diphtheria and polio booster (Td/IPV) and Year 9 Meningococcal groups ACWY coverage for years 2021–22 and 2018–19 (pre-pandemic) for Hackney, London and England [4,7] [5].

Td/IPV coverage (Year 9)				
Area	**2018–19 (pre-pandemic)**	**2021–22**	**2022–23**	**2023–24**
England	87.6 %	69 %	68.3 %	71.7 %
London	87.7 %	67.8 %	60.4 %	64 %
Hackney & City of London	81.4 %	65.9 %	64.3 %	57.3 %
Men ACWY (Year 9)				
Area	**2018–19 (pre-pandemic)**	**2021–22**	**2022–23**	**2023–24**
England	88 %	69.2 %	68.6 %	72.1 %
London	87.8 %	67.8 %	60.4 %	64.1 %
Hackney & City of London	82.2 %	65.9 %	64 %	56.3 %

at national or regional levels [3,4]. Critically assessing programme delivery gaps may generate solutions to the pandemic-related vaccine coverage decline observed in school-age cohorts in England and internationally [5,6].

SAIS providers are organisations commissioned by National Health Service England (NHSE) to deliver routine vaccine programmes to all eligible cohorts and to support public health incident responses upon request [8]. Adolescent immunisation programmes are primarily delivered through secondary schools, with outreach pathways for those home-schooled or attending independent schools. The UK Health Security Agency (UKHSA) has produced guidance to encourage close collaboration between schools and SAIS providers, but schools are not required to facilitate vaccine delivery [8]. Enablers to school-age vaccine programme delivery involve appointing a school contact to liaise with SAIS providers [9]. Barriers vary by programme and area but often include communication with parents and consent procedures [9–13]. Some schools are reluctant to share pupil data, despite legal permissions, limiting SAIS providers' ability to identify eligible children, obtain consent, and issue invitations [11,12]. When unable to contact parents directly, providers may assess adolescents for Gillick competence to self-consent [10,12,13]. However, SAIS providers feel deterred from vaccinating adolescents without parental consent due to concerns about complaints or litigation [13]. Evidence indicates lower vaccine uptake among children attending independent secondary schools (ages 11–16) [2], which do not receive state or local authority funding in England and are not required to follow the national curriculum. There is limited qualitative research contextualising relationships with SAIS providers and barriers to supporting vaccine programme delivery.

Adolescent vaccine coverage in Hackney did not follow the patterns of increase observed at London and national levels in 2023–24 (Table 2) [7,14,15], indicating school-age immunisation programme gaps in Northeast London (NEL) boroughs. Hackney is home to the largest Orthodox Jewish (Haredi) population in Europe. Approximately one in four children in Hackney are Haredi – most of whom attend independent faith schools [16]. Haredi children and adolescents have experienced persistent outbreaks of preventable disease due to low and delayed uptake of routine vaccinations [17,18].

Declining childhood vaccination coverage in London has left children under and over 5 years of age vulnerable to the spread of poliovirus (2022) and measles (2023–24), requiring successive region-wide vaccination campaigns as part of public health incident responses (Table 3) [18–23]. Outreach activities prioritised communities with historically low vaccine uptake, including Haredi families in NEL, who were at elevated risk due to connections to linked-outbreaks abroad [18]. A rise in reported measles cases occurred in 2023, requiring a new MMR catch-up campaign in November 2023 incorporating both local and national call-recall approaches and school-based catch-up activities delivered with SAIS support [23]. Transmission continued and there were close to 3000 confirmed measles cases in England in 2024, the highest number of annual cases reported since 2012. Many outbreaks were linked to schools and nurseries, particularly in London and Birmingham [23]. Hackney reported the highest number of confirmed measles cases in July 2025, which raises questions about the effectiveness of outbreak catch-up pathways in primary schools and routinely commissioned catch-up pathways in secondary schools in this area.

This study integrates data from evaluations of public health incident response campaigns to prevent the spread of measles and polio in NEL (Table 3). These incident responses were implemented under UKHSA protocols for managing health security threats requiring resource mobilisation and strategic oversight [24]. The evaluations focused on parental engagement with school-based vaccine information and invitation systems for children aged 1–11. We evaluated enablers and barriers to vaccine uptake among Haredi Jewish families in NEL, but the scope of study extended to vaccines offered to all school-age children up to age 16 for several reasons (Supplementary File 1). Firstly, Haredi families are larger and are more likely to have infants and adolescents eligible for routine vaccination. Secondly, schools were used to disseminate information about the catch-up campaigns and the routine programmes. Hence, the study setting offered an opportunity to examine the effectiveness of school-based delivery pathways for children and

Table 3
characteristics and delivery pathways of polio and measles incident responses.

Incident response phase	Target cohort	Campaign delivery	Delivery pathway
Phase 1 Polio response in London: IPV booster and catch-up campaign	All children aged 1–9	August–December 2022	Primary care, vaccine centres, hospital hubs, outreach
Phase 2: Polio response in London + MMR catch-up	All children aged 1–11 not vaccinated to schedule	May 2023 – April 2024	Primary care, schools, community/ outreach clinics
National MMR catch-up campaign 2023–2024	All children aged 1 to 11 years not vaccinated to schedule. In London, Greater Manchester, and the West Midlands the catch-up was extended to individuals aged 12 to 25 years	Nov 2023 – April 2024	Primary care, schools

adolescents who are typically educated in the independent sector.

This study aimed to explore (i): access barriers to school-age immunisations in independent faith schools; and (ii) the role of primary care and public health services in responding to these gaps and supporting catch-up vaccination efforts. By analysing local incident response efforts and their engagement with schools and families, this study provides insights into the challenges and opportunities for improving vaccine uptake among children in underserved communities and ensuring equitable opportunities for catch-up when required.

2. Methods

This study drew on qualitative evaluations of the Phase 1 and Phase 2 incident responses (Table 3) [18]. The study employed in-depth semi-structured interviews (n = 53), complemented by clinic observations and rapid interviews with parents (n = 43) conducted during 11 site visits to catch-up vaccine delivery points.

2.1. Sampling and participants

In-depth interview participants included public health professionals, health care practitioners, community partners and parents from Haredi families with school-age children in Hackney. Topic guides were tailored to each participant cluster and were informed by characteristics of the real-time incident response (e.g. perceptions of vaccine delivery strategies, site accessibility, information quality) (see Supplementary Files). Parental interview topic guides were informed by previous research and public health evaluations of barriers to access, including the World Health Organization Tailoring Immunisation Programme study conducted in north London's Haredi community in 2014–16 [17]. Insights from clinic observations and rapid interviews further informed subsequent lines of questioning and participant selection, as each stage of the qualitative methodology shaped and refined the next. This iterative design [25,26] supported real-time evaluation of the public health incident responses and strengthened the depth of analysis concerning the broader role of schools in supporting delivery of routine and catch-up vaccine programmes.

Participants were accessed through ongoing research collaborations between UKHSA, the London School of Hygiene & Tropical Medicine, and London health partners and recruited using snowball sampling (Table 4). The particulars of participants' backgrounds and affiliations have been removed for anonymity. Interviews lasted between 30 and 90 mins and were recorded with participant consent.

Haredi Jewish mothers were interviewed as they were the parents attending vaccination clinics and, consistent with previous research, are primary decision-makers for child health and vaccination [17,18].

Table 4
Total in-depth interviews conducted across Phase 1 and 2 evaluations.

Research participant clusters	Phase 1 Evaluation	Phase 2 Evaluation
Public health professionals (PHP), including consultants, commissioners and programme managers based in UKHSA, ICB and local authorities	10	3
Healthcare practitioners (HCP) based in NHS vaccine centres, primary care centres, and managers	12	5
Linked professionals (LP) including professionals involved in providing healthcare services to Haredi populations	4	0
Community partners and organisations (CPO) involved in supporting campaign delivery	3	2
Haredi Jewish mothers **(Parent)**	7	7
Sub-total	36	17
Total	53	

Hackney's Haredi population is heterogenous, varying in ethnicity, customs, and levels of religious stringency, and independent schools align to particular movements. While diverse, Haredi Jews are characterised by stringent interpretations of Jewish law (*halachah*), close-knit communal living, and efforts to limit exposure to information considered "secular" (or non-Haredi sources) and digital technologies. Jewish law does not explicitly require or oppose vaccination, but rabbinic authorities have historically endorsed vaccination as a safe means of protecting child health [27]. Haredi parents do not necessarily rely on *halachah* or consult rabbinic authorities in vaccine decision-making [18,28,29]. Past research has identified key drivers of low and delayed routine vaccination uptake among children under five, including: (i) access barriers associated with larger family sizes and constrained clinic appointments and flexibility [17]; (ii) heightened concerns about vaccine safety relative to disease risk, which is reinforced through tight-knit networks [18]; and (iii) targeted misinformation, 'compounded by a lack of skills to critically appraise such information' [29] due to ethos of independent faith schools that prioritise religious instruction.

2.2. Vaccine clinic site visits

Site visits to vaccine delivery points were conducted (Table 5), offering opportunistic and rapid interviews with parents attending for vaccination in primary care clinics to understand enablers and barriers to immunisation.

The SAIS provider in NEL stated in personal correspondence that 32 schools out of 450 in this area did not allow access to vaccination teams in 2023. Information on the cohort of eligible children was not shared with the SAIS provider in at least 15 of these schools hindering the ability to offer vaccinations to 100 % of eligible children. The 32 schools included primary and secondary schools. A Primary Care Network serving Haredi families in NEL held a school-age vaccination clinic for Haredi adolescents in May 2024, which we attended as part of this evaluation. The SAIS provider has also hosted community outreach clinics to serve eligible adolescents as part of the national MMR catch-up campaign in response to the incident.

Interviews were conducted, transcribed and analysed by BK-D and TC, with emergent themes iteratively reviewed and refined through in-depth discussions, ensuring consistency in interpretation and strengthening the rigour of approach. Analysis of the interview data involved a combination of deductive and inductive approaches. This approach allowed data collection to be guided by a structure that examined key incident response processes, while allowing thematic and theoretical insights to emerge from prolonged engagement with the data rather than being pre-conceived [30]. Inductive approaches were crucial for drawing out and synthesising themes around adolescent vaccinations which are the focus of this paper.

2.3. Ethical approval

Approval to conduct this study was provided by the UKHSA Research Ethics and Governance of Public Health Practice Group (NR0348; NR0385).

Table 5
Total vaccine clinic site visits and opportunistic interviews across the different phases of response and incident evaluations in NEL.

	Phase 1 London	Phase 2 London and National MMR catch-up	Total
Vaccine clinic visits conducted	5	6	11
Opportunistic and focused interviews conducted with parents during clinic visits	26	17	43

2.4. Patient and public involvement

This evaluation was responsive to public health incident responses led by UKHSA. The London Jewish Health Partnership, bringing together health partners and Jewish community representatives, was consulted on the evaluations and preliminary results shared with members during network meetings to inform their activities in NEL.

3. Results

Parents attending vaccine clinics in primary care settings stated that information and invitations were not received via the independent schools that their children attended. Outreach clinics arranged by primary care teams were hosted but did not offer adolescents HPV vaccination, and parents were not informed of the full schedule that their adolescent children were eligible for. PHP proposed sub-commissioning Haredi Jewish community organisations to coordinate vaccine delivery to independent schools in partnership with the SAIS providers as a strategy to build relationships to enable and sustain programme delivery.

3.1. Limited delivery of catch-up vaccine information via independent schools: incident response

A NEL public health professional asserted that every eligible child must be offered routine vaccinations to ensure that uptake is as high as possible, as outlined in service commissioning expectations:

> 'We want uptake to be as high as possible, but within that, its ensuring there's 100% offer' (Phase 2_PHP1).

All schools – including independent schools – in Hackney were asked to disseminate letters produced by healthcare services to parents/guardians to inform Haredi families about the spread of poliovirus and the polio vaccine booster campaign in 2022. However, there was no reporting system in place to confirm that schools disseminated the letters to households. Parents attending vaccine clinics indicated that they did not receive these letters via schools:

> "I think if the school sent serious letters or even offered immunisations in school, I think it would have been very serious." (Phase 1_Parent4).

Hence, parents may have accepted a school delivery pathway or at least been receptive to information circulated via schools, had this been offered. While the parent did not elaborate on what a 'serious letter' should have involved, we interpret this to mean clear and accurate indication of transmission risk to their community or area of residence due to under-vaccination and why catch-up mattered. Parents attending vaccine catch-up clinics for children aged 1–9 reported being unaware that their older, adolescent children were eligible for NHS recommended vaccines (including IPV-containing vaccines):

> "I didn't know there was another one [IPV-containing vaccine] they were supposed to get. I wasn't aware of it at all. It's interesting because I usually get messages from the surgery, you know, if my child is due for a vaccination. But I never got anything." (Phase 1_Parent 2).

The absence of delivery via independent faith schools means that parents expect to receive vaccine invitations via primary care. Community partners supporting the incident response sought to raise awareness among primary care teams about a gap in provision for adolescents attending Haredi independent schools, and to encourage responsibility to be taken by primary care services:

> "And when I explained to her [general practice manager] what was going on, she said, 'I've learned something today,' she had no idea [about limitations in school-based provision]. Absolutely no idea. And she's a practice manager. Right. So, we need the statutory providers or primary care, everybody, to understand what the issues are." (Phase 1_CPO1).

However, PHPs considered the independent school sector to be less accountable to local authorities, resulting in insufficient leverage over school engagement with SAIS:

> "So, for years there are around 20 Haredi schools in Hackney that they [SAIS providers] have never been allowed access to. They will send emails, letters, calls, to try and make contact with the schools and they hear nothing back or the school say: 'No thank you, we don't want you coming in.' And because they're not state-run schools, the local authority doesn't really have much sway, sort of trying to increase that engagement. So, our hands are slightly tied there." (Phase 2_PHP1).

PHPs considered the absence of relationships between SAIS and independent schools as a key obstacle to progress:

> 'The difficulty is that they [SAIS providers], I don't think they have the relationships with any of the [Haredi] schools. I think part of the issue is that acceptance of the schools to engage with them.' (Phase 2_PHP2).

However, CPOs supporting attempts to deliver campaign information described independent Haredi schools and pre-school settings as uncoordinated, requiring significant engagement to obtain institutional approvals:

> 'We needed to do one-on-one contact with each setting to get that authorisation. That was quite a labour-intensive [...] we had some [schools] that took as many as between seven and nine calls to get all that OK'd [...] if you have a whole school board, you've got layers that you have to clear, and that was less easy.' (Phase 2_CPO1).

A state-aided school serving Haredi children supported delivery of all recommended school-age immunisations except the HPV vaccine, and highlighted the importance of tailoring information letters to emphasise school support for vaccination to parents:

> What makes a difference is we get the [information and consent] packs [from SAIS providers] but we actually put our own letter in from the school, where we say it's important to have these vaccinations and this is an opportunity without going to your doctor's surgery […] I think that the school has really got to advocate for it [vaccination] [but] its getting the school on board. (Phase 2_CPO2).

Schools therefore experience a resource burden when supporting vaccine programme delivery, highlighting the challenges that must be considered when encouraging independent schools to initiate collaborations with SAIS providers and on-site vaccine delivery.

3.2. Primary care outreach to school-age cohorts: routine adolescent vaccine programmes

Following the real-time sharing of data from these evaluations, a NEL primary care network hosted an evening outreach clinic in May 2024 to invite adolescent Haredi children to catch-up on their school-age vaccinations. Opportunistic interviews conducted with parents attending the outreach service indicated that vaccines were previously (and conveniently) offered by their child's school, but that this arrangement had ceased:

> "They would get the vaccines in different places and school and that was good." (Phase 2_Opportunistic1).

Similarly, a parent attending the evening outreach clinic described how "they used to do it [deliver vaccines] through the school" (Phase 2_Opportunistic2). In the absence of school delivery, this parent described requiring evening clinic appointments due to the late finishing

time of Haredi independent schools.

The outreach clinics were advertised in Haredi Jewish media in NEL and promoted the offer of Year 9 'school leavers boosters and MMR catch-up' (DTP; Men ACWY) but omitted the HPV vaccine. Clinic observations highlighted that HCP did not offer the HPV vaccines to Haredi adolescents, and interviews elaborated on the reasons for selectively excluding the HPV vaccine:

> "…with other communities I raise it, but with Orthodox Jewish people it's different. They might not think penile or cervical cancer is relevant because they are married to one person for life and that's it." (Phase 2_HCP1).

HCP then offered vaccinations selectively and based on assumptions. While local-level primary care approaches aim to address the SAIS-school communication gap, there is no service commissioning expectation to offer the full school-age immunisation programme. Hence adolescents and their parents are not fully informed about the vaccines their adolescent children are entitled to receive.

3.3. *Sub-commissioning delivery pathways to build relationships with independent schools*

To help address the above challenges PHPs proposed that Haredi community organisations could be sub-commissioned either to administer vaccines or liaise and engage with independent schools to enable access for SAIS providers. A volunteer rapid response service ('*Hatzolah*') [31] that is funded and delivered within Haredi neighbourhoods was viewed as a possible partner to involve in delivering school-age vaccines. As Hatzolah cadres are all male and Haredi, their role was considered particularly suitable to engage with older-age boys as gender separation is normative in Haredi schooling:

> 'For the Year 9, I often get asked by parents, "will there be male vaccinators?" […] I don't think it [gender of vaccinator] matters for the under-5 s. (Phase 2_HCP2).

However, attempts to sub-commission Hatzolah as a co-delivery partner 'sort of stalled' (Phase 2_PHP1). Sub-commissioning a co-ordinating role was then considered a priority to build relationships that were not in place at the time of the evaluation, and would aim:

> '…to liaise with the schools and then coordinate the vaccinators. But they need to contract to deliver that service – *as a service*' (Phase 2_HCP2).

Maximising the potential of existing community groups that work with Haredi schools to deliver national programmes in state-maintained schools, such as the National Child Measurement Programme, was considered a model for a sub-commissioned co-ordinator role:

> '...to work with someone that's already in the schools, who's got that connection with the schoolteachers, to have a conversation with them […] and build that contact before bringing in SAIS.' (Phase 2_PHP2).

Building relationships with independent Haredi schools was considered critical to addressing the absence of service provision and to make use of schools as a key pathway to deliver information, or vaccinations, to large numbers of eligible children.

4. Discussion

This public health incident response evaluation suggests that there are significant barriers to delivering routine and catch-up immunisations to school-age Orthodox Jewish children attending independent faith schools in northeast London. Parents participating in this evaluation were unaware that their school-aged children were eligible for routine vaccinations. Parents reported that school-based vaccination was no longer offered through the schools that their children attended, suggesting that both schools and SAIS providers may not have fully recovered from pandemic-related service disruptions. Collaborations between numerous schools and SAIS providers in northeast London do not appear to be in place, limiting the opportunity for children aged 5–16 to receive vaccinations via a timely and acceptable delivery pathway. This likely contributes to the lower-level school-age vaccination coverage in Hackney relative to London and England, and poorer vaccine coverage recovery in Hackney since the pandemic (Table 3) [7]. Variation in local authority-level coverage may indicate nationwide limitations in the ability of SAIS providers to access independent schools or to invite all eligible individuals for vaccination. Results help to contextualise the historically lower-level vaccine uptake in children attending independent schools in England [4]. Studies have tended to focus on barriers to vaccination in schools that already support programme delivery, particularly consent processes [10,13], but our results highlight the challenges for equitable access when schools do not support on-site delivery.

When SAIS providers are unable to establish contact with schools, primary care teams are not routinely engaged in closing gaps in school-age vaccination coverage due to system fragmentation. GP surgeries are required to provide vaccines delivered through the school-based offer, from the age of 14 (and up to 25 for HPV and Men ACWY vaccines), on request or opportunistically [32]. This pathway affords an important catch-up opportunity, but adolescents or their parents would need to know about their right to request school-age vaccinations from primary care services. Primary care teams do not routinely record the school that children attend in patient records and are not informed about the schools that do not cooperate with SAIS providers. It is therefore unlikely that primary care teams will be aware of the schools that do not support vaccine-delivery, which is necessary to prioritise adolescent patients for opportunistic vaccination. GP surgeries are not routinely commissioned to invite children for adolescent school-age immunisations and are not incentivised to deliver these under the Quality Outcomes Framework [33]. This means that primary care teams may be less likely to prioritise adolescent school-age immunisations amidst current capacity limitations [34]. Service commissioning expectations may need reform to include referral pathways from SAIS to primary care to help ensure that non-responses are invited for follow-up. Appropriate renumeration would be required to cover the costs of catch-up activities. Clear referral pathways to primary care may benefit minoritised communities in Global North countries, where inequitable HPV vaccine uptake persists, particularly when school-based delivery models lack the resources needed for labour-intensive engagement with families [35].

The real-time sharing of results from this study led a primary care team to offer Haredi adolescents an opportunity to catch-up on school-age immunisations through a dedicated evening outreach clinic. However, HCPs did not offer HPV vaccination to this cohort due to perceived lack of relevance, which was based on assumptions of future sexual relationships. Research conducted after the 2008 roll-out of the HPV programme in England (when only girls were eligible to be vaccinated) demonstrated Jewish parents declined vaccination due to low risk perceptions and expectations that their children would not engage in pre-marital sexual relations [36]. Research conducted in Israel indicates that Haredi young adults (age 18–26) report low intention to vaccinate against HPV, which is unlikely to change by only providing more information [37]. We maintain that parents should always be offered a conversation with trained healthcare professionals about the decision to vaccinate, whether for HPV or any routine programme, rather than withholding an offer from them. HCP may require confidence training to sensitively offer HPV vaccination for diverse communities, and community partnerships can help to ensure sensitivity in language and invitations. Eliminating cervical cancer through population-wide vaccination against HPV is within reach [38], though significant disparities in uptake remain [39] and, in this case, disparities in who is *offered* HPV vaccination.

Integrated Care Boards (ICB) became health commissioning

authorities in England in 2022, and have a mandate to develop place-based plans to meet the needs of populations [40]. Developing sub-commissioning models may offer a place-based opportunity to recruit trained co-ordinators from Haredi communities to deliver programme information to ensure that every eligible child receives their invitation to be vaccinated. Lessons may be drawn from the experience and approach of community organisations that deliver nationally-mandated public health programmes to Jewish schools, such as the National Child Measurement Programme (NCMP) to monitor childhood obesity [41,42]. However, as NCMP is limited to state-maintained schools, the relevance for vaccine delivery approaches in independent schools will require additional consideration. While co-ordinator roles may help to build relationships between SAIS and independent schools, participants of this study were unclear about who is accountable and responsible for ensuring that eligible school-age children receive their offer for vaccination. Hence, sub-commissioning models to improve equity in access must clearly assign responsibility for vaccination programme delivery.

While UKHSA have produced national guidance to strengthen collaborations between schools and SAIS providers, this may need to be complemented with tailored support when schools are supporting programme delivery for the first time. It is important that all schools are familiar with current legislation that permits data-sharing agreements between them and vaccination teams to facilitate timely invitations [8,11]. Vaccine coverage recovery could be strengthened by requiring all schools (including independent schools) to support SAIS, to nominate a dedicated staff member to liaise with SAIS providers [8] and disseminate vaccine programme information and invitations to parents. Requiring schools to support delivery of national vaccination programmes may help to improve information flows, with school support for vaccine delivery assessed as an issue of 'leadership and management' in standard inspections by the Office for Standards in Education, Children's Services and Skills. There is a precedent for requiring schools to support the immunisation system in England. All state-maintained schools in England have been required to teach Health Education since 2019, which includes an expectation for children to learn about the facts and science pertaining to immunisation [43]. However, evaluation is required to assess whether educators in England feel equipped to confidently discuss immunisation and to link content to school age immunisations to encourage uptake. Such evaluation in England is crucial, as research conducted in Canada indicates that inconsistent integration of vaccine education in school curricula contributes to adolescents' limited knowledge about the vaccines they receive – particularly HPV [44].

Further research is needed to assess whether recent changes to the NHS immunisation schedule and service commissioning requirements have impacted the ability of SAIS providers to attain higher and equitable coverage rates consistent with pre-pandemic years. SAIS providers were tasked with delivering Covid-19 vaccines to eligible school-age cohorts between 2021 and 23, while being limited by school closures (2020) and lower school attendance rates into 2022 due to pandemic control measures and sickness [45]. The HPV programme expanded in 2019 to include boys, and changed to a single dose offer in 2023 [46]. The influenza vaccination programme was expanded to include secondary school-aged children (Years 7–11) in 2023 [47], and SAIS providers were then asked to support the 2024 measles incident response [48].

4.1. Strengths and limitations

A strength of this study was the integration of clinic visit observations and interviews, which enabled in-depth exploration of barriers to accessing school-age immunisations in an underserved setting. A key limitation was the lack of access to school leaders, which restricted insights into organisational barriers to vaccine delivery and adolescents' understandings of school-age vaccination programmes relative to their parents. We were unable to assess whether dissemination of information and invitations for vaccination improved across the phases of the incident response, or whether these changes translated into sustained improvements in adolescent vaccination programmes. Interviews were conducted only with parents attending vaccination clinics, which may introduce selection bias toward those already engaged with services. However, because many parents reported being previously unaware that their children were eligible for school-age immunisations, this bias is likely to be limited. Further research should assess whether these challenges are consistent across the independent school sector to determine appropriate interventions. Identifying the locations of the 32 (out of 450) schools that did not permit vaccine delivery in northeast London in 2023 would clarify the proportion that are Orthodox Jewish, and help estimate the extent of under vaccination among adolescents in this community and help guide catch-up strategies.

5. Conclusion

Limited vaccine delivery via the independent school sector may be contributing to the slower adolescent vaccine coverage recovery in Hackney relative to the gains made in London and England. System strengthening is required to help ensure that every eligible child is invited for routine vaccination. The ability for Integrated Care Boards to develop place-based health delivery strategies may afford innovative opportunities for partner organisations to support school-based vaccine delivery vaccination and help share responsibility for 'community health.'

Authors contribution

BK, TK, VS and TC conceived of the study. BK and TC planned and 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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CRediT authorship contribution statement

Ben Kasstan-Dabush: Writing – review & editing, Writing – original draft, Software, Resources, Project administration, Methodology, Investigation, Funding acquisition, Formal analysis, Data curation, Conceptualization. **Tehseen Khan:** Writing – review & editing, Conceptualization. **Vanessa Saliba:** Writing – review & editing, Conceptualization. **Tracey Chantler:** Writing – review & editing, Writing – original draft, Supervision, Project administration, Funding acquisition, Formal analysis, Conceptualization.

Declaration of competing interest

The authors 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. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.vaccine.2025.128193.

Data availability

The authors do not have permission to share data.

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