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Acute Respiratory Infection Hub process evaluation

Evaluation report

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Context

Acute respiratory infections (ARIs), and respiratory problems more broadly, put pressures on primary- and secondary-care NHS services, especially during winter months. ARIs are one of the most common reasons for an Emergency Department (ED) attendance during the winter (NHS England 2023). In response to several concurrent respiratory infection outbreaks, including COVID-19, influenza and, particularly among children, respiratory syncytial virus and Group A streptococcus, during winter 2022/2023 (UK Health Security Agency 2026), NHS England provided one-off funding to Integrated Care Boards (ICBs) to commission ARI Hubs. The ARI Hub model is based on service delivery provided during the COVID-19 pandemic through assessment hubs (Boniface et al. 2022). The model is intended to build resilience into local healthcare systems to manage ARIs, to reduce pressures on EDs and General Practitioner (GP) surgeries, and to provide more timely and appropriate care to adults and children with ARIs (Jawad et al. 2023). Despite widespread implementation of ARI Hubs across England in winter 2022/2023, limited information is available on how these hubs were set up and delivered care (both of which potentially vary across hubs). Further, there is limited information on if and how the hubs continue to operate. The Cambridge and RAND Europe National Evaluation Team (CARE-NET) conducted a process evaluation to fill these evidence gaps.[1]

Goals of the evaluation

The primary goals of this process evaluation were to generate an in-depth understanding of the implementation of ARI Hubs across England, to assess how hubs are expected to bring about desired impacts, and to assess the feasibility and inform the design and implementation of a robust outcomes and economic evaluation. To this end, we sought to address the following questions:

1. How are ARI Hubs arranged and delivered in England, and what operating requirements and other factors affect their delivery?
2. What outcomes and impacts do stakeholders expect ARI Hubs in England to achieve, and what kind of information is collected to assess their effectiveness and costs?
3. What is the feasibility of an outcomes and economic evaluation of ARI Hubs, and what design could be appropriate?

1 The UK's Health Research Authority provided governance review and approval of this evaluation (IRAS Project ID: 357921). The RAND Europe Research Ethics Committee reviewed and provided a favourable opinion on the ethical conduct of this evaluation (RECFO: 24285.003).

Methods

This was a mixed-methods evaluation, conducted between May 2025 and June 2026, employing quantitative and qualitative approaches to address the evaluation questions. Data-collection activities included:



Desk research, primarily composed of grey literature searches for local ARI Hub evaluations.



A survey of representatives from ARI Hubs, covering 35 of the 42 ICBs in England.



Twenty-three interviews with a total of 38 national, regional and local NHS stakeholders.



Three focus groups with a total of 28 public participants.



A workshop with c. 20 NHS stakeholders and three public representatives.

Detailed methods can be found in the Technical Annex (Annex A; separate document).

Findings



Evaluation Question 1: **How are ARI Hubs arranged and delivered in England, and what operating requirements and other factors affect delivery?**



Overall, implementation and service delivery of ARI Hubs differed within and across areas of England

Implementation: ARI Hubs were initially implemented in winter 2022/2023 with one-off funding from NHS England in response to higher-than-expected demand on Urgent and Emergency Care (UEC) services for ARIs. A total of 41 of 42 ICBs implemented hubs during that winter. However, as of winter 2025/2026, only 12 ICBs continued to run ARI Hub services. This evaluation identified several key characteristics and features of ARI Hub implementation and service delivery, which are described below.

Funding: Lack of centralised funding from NHS England after winter 2022/2023 was a primary driver for the reduction in the number of ICBs that commissioned ARI Hub services. In the absence

of centralised funding, ICBs that wished to continue to deliver ARI Hubs were required to use their own funding, either from primary-care or UEC budgets or money earmarked for the management of winter pressures. According to professional stakeholders, how ICB leads determined the total funding amount allocated for ARI Hubs each winter was often not transparent.

Organisation and delivery model: ARI Hubs were typically organised at the Sub-ICB Location (SICBL) level, providing additional appointments in primary care. Among the 12 ICBs that commissioned ARI Hubs in winter 2025/2026, 74 ARI Hub systems were in operation across 27 SICBLs. ARI Hubs operated in winter, except for one system that operated all year, albeit at a reduced capacity during the non-winter months. ARI Hubs had three types of delivery model: at-scale, distributed and co-located. The at-scale model was the most common and involved the provision of services through one site or a small number of sites (either community health clinics or GP surgeries). The distributed model involved the provision of services from all or most GP surgeries within a given locality, defined as an SICBL, GP Federation or Primary Care Network. Lastly, the co-located model involved the provision of services from a single site near an ED or Urgent Treatment Centre (UTC), often at an NHS hospital trust.

Geographic distribution: ARI Hub systems operating in winter 2025/2026 tended to be clustered in the North of England (73 per cent of all hub systems) and, at the time of this evaluation, were disproportionately located in areas with higher population density, greater respiratory disease burden and greater socioeconomic deprivation.

Location within SICBLs: ARI Hubs' site locations varied within each SICBL. Some hubs were intentionally situated in urban, densely populated areas to accommodate a larger population who would potentially benefit from these services. The ARI Hub model appeared to influence where sites were located, but in some instances preferred locations influenced the type of delivery model that was implemented.

Staffing: ARI Hubs were staffed by primary-care professionals, typically GPs; however, in some cases Advanced Nurse Practitioners (ANPs) were used to deliver appointments. At lower unit costs, more appointments could be delivered by ANPs within a fixed budget. Staff were often locum clinicians who delivered ARI Hub appointments in addition to their regular employment.

Estates and infrastructure: Most ARI Hubs used funding for the provision of appointments rather than spending on estates and infrastructure.

Eligibility criteria and populations treated: Patients with ARI-related symptoms requiring face-to-face clinical assessment were generally eligible for an appointment. Most ARI Hubs treated people of all ages; however, some hubs prioritised children and young people (CYP). Even in hubs that treated all ages, many appointments were used predominantly for young children (0–5 years).

Operating days and times: ARI Hub systems and individual hub sites generally had flexibility in determining the days and times during which appointments were delivered. This included provision during normal business hours, evenings and/or weekends.

Appointment distribution: ARI Hub systems distributed appointments to individual hub sites in different ways. Some systems distributed appointments proportional to the relative size of each site, such that larger sites received more appointments. Other systems held appointments centrally and allowed connected providers to book them on a first-come, first-served basis.

Despite variation in ARI Hub characteristics and features, several common factors were identified as impacting implementation and service delivery.

The timing of funding and commissioning: Funding decisions were usually made late, requiring provider organisations to set up hubs at pace.

Existing relationships: Short timescales for setting up hubs meant that commissioners looked to providers from prior years to deliver hubs, pre-empting formal procurement processes.

IT integration: Registration with the Directory of Services (DoS)[2] facilitated NHS 111 referrals and data linkages helped with monitoring and evaluation.

Regional leadership support: Regional stakeholders helped to advocate for ICB funding.

The wider health system context: ARI Hub provision was considered in the context of the 'left shift' to community-based care, influencing decision making around implementation and delivery.

Several activities are associated with achieving potential impacts of ARI Hubs. The achievement of these impacts is predicated on if and how these activities are conducted.

Appropriate referrals, triage and booking: Referrals into ARI Hubs were most frequently through primary care and often through a patient's own GP surgery (self-referral was not permitted). Co-located ARI Hub models often took referrals from nearby UEC services; this was, in part, due to patients self-referring to an ED or UTC. Referral through NHS 111 was less common because ARI Hubs were often not registered with the DoS. This was due to the type of ARI Hub model (i.e. it was difficult to register multiple Organisation Data Service codes for a single ARI Hub system) or late funding decisions, which did not allow for time to register with the DoS. Referrals to ARI Hubs were influenced by primary-care staff knowledge and awareness, clinical triage processes, the proximity of UEC services and IT integration, which facilitated direct booking by other providers.

> So, patients will ring for an appointment, and they'll get through to the receptionist, it's very clear that they need to be seen, i.e. they've got a bad chest. If there's an ARI Hub [appointment] there, they will refer the patient and book an appointment.
>
> (NHS England Stakeholder, Interview 19)

2 The Directory of Services is a real-time database that catalogues available health and care services across England.

Separating potentially infectious patients from other patients: Despite an explicit, core goal of ARI Hubs, as set out by NHS England, most ARI Hub systems were not separating potentially infectious patients from other patients in healthcare facilities, as ARI Hubs were delivered in existing facilities, without separate entrances or waiting areas. Public participants, however, noted the importance of infection control, and raised issues related to potentially infectious patients travelling by public transport to an appointment.

> We generally don't separate them, because it's the same appointments [...].
>
> (ARI Hub Operational Leader, Interview 22)

Point of Care Testing (PoCT): PoCT[3] was not commonly performed at ARI Hubs because additional funds were required to purchase equipment and supplies, as well as a lack of space, appropriate facilities or the time to run the tests during short appointments. Only one ARI Hub system was identified as using PoCT, which was financially supported by a manufacturer-sponsored pilot programme.

> We've not [implemented Point of Care Testing], mainly because we can't get anyone to pay for it. It's not cheap. We would love to do it. [...] Unfortunately, we can't persuade anyone to pay for it for us, and we're not a charity, so we're not doing it for free.
>
> (ARI Hub Operational Leader, Interview 22)

Monitoring and evaluation: ARI Hub systems monitored key activity and outcomes metrics and reported these to their ICB, as the commissioning body. These metrics included appointment utilisation rates, did-not-attend (DNA) rates, patient experience/satisfaction and whether patients required follow-up or escalation to UEC services after an ARI Hub appointment.

3 Point-of-Care Testing involves the use of medical diagnostic tests performed during a healthcare visit, providing a rapid results to inform diagnosis and treatment.

> We collect two bits of data, we ask clinicians to ask every single patient they see what they would have done differently if this appointment was not available, and if they would have attended A&E, […] But then we also ask patients the exact same question, and the scores we get from both the patients and the clinicians, pretty much marry up [...].
>
> (ARI Hub Operational Leader, Interview 5, Respondent 1)[4]

Integrated care working and staff training to help with development and retention: There was limited, and only indirect, evidence that ARI Hubs were providing integrated care working and opportunities for staff training to support development and retention. While some hubs were using ANPs, rather than GPs, and existing non-clinical primary-care staff, like receptionists, this was largely motivated by cost-saving measures, rather than to promote staff development. Formal staff training did not appear to be offered, likely because of limited funding. Instead, hubs prioritised using experienced clinical staff to deliver appointments. Despite a lack of formal training, staff may have benefited from opportunities to work in areas that they enjoyed and where they could hone clinical skills.



Evaluation Question 2: **What outcomes and impacts do stakeholders expect ARI Hubs to achieve, and what kind of information is collected to assess their effectiveness and costs?**



Through the abovementioned activities, there are several impacts that potentially can be achieved.

ARI Hub utilisation: Local evaluations showed that ARI Hubs generally had high utilisation rates and low DNA rates, and that relatively few patients required subsequent UEC services after an ARI Hub appointment, suggesting that patients were appropriately referred and triaged.

UEC pressures: There was limited direct evidence that ARI Hubs helped to reduce UEC pressures. Largely, this evidence was derived from local evaluations of patient surveys after an ARI Hub visit and one quantitative national-level analysis; however, the national-level analysis did not account for other factors that could explain reductions in UEC pressures. Professional stakeholders

4 Some interviews were conducted with more than one individual.

expressed mixed views about whether ARI Hubs had impacts on UEC pressures, but many acknowledged the lack of robust evidence and the difficulty of generating this evidence.

> I think it's one of those winter-pressure schemes that tries its best to implement and relieve some of the pressures, but it's primary-care pressures. It's not making differences, I wouldn't have thought, around A&E attendances or even UTC to a degree.
>
> (SICBL Stakeholder Interview 18)

Primary-care capacity: While there was also limited evidence from local evaluations that ARI Hubs supported the enhancement of primary-care capacity, most stakeholders agreed that this was a likely impact of ARI Hubs, by virtue of increasing the number of appointments available in primary care for patients with ARI-related symptoms and, consequently, freeing up regular appointments for other patients. Nevertheless, stakeholders questioned whether enhanced capacity could actually be discerned, given such high demand for both primary- and acute-care services during the winter period. Moreover, questions remained about how to operationalise and measure 'capacity'.

> I've worked on primary-care access for the last 15 years. And there's only one sure thing: you put more capacity in, it will get filled. It doesn't matter how much capacity you have.
>
> (SICBL Stakeholder, Interview 23, Respondent 4)

Patient experience: Patient experience was a commonly reported outcome in local evaluations, with most reporting high levels of satisfaction with ARI Hub services. This was likely due to flexibility of hub appointments and the fact that patients were able to be seen by a clinician in a timely manner. Nevertheless, stakeholders believed that patients who needed to travel to a site that was not their GP surgery may have considered this an inconvenience.

> Patients are pleased that they get seen. Often, we hear, "oh, I didn't think I'd get an appointment".
>
> (ARI Hub Clinical Leader, Interview 1)

Cost savings: Healthcare cost savings were typically calculated in local evaluations by extrapolating from patient-reported feedback, based on whether they would have attended the ED if the ARI Hub appointment was not available, counting this as an 'avoided' ED attendance. However, there are limitations to this type of extrapolation. Stakeholders had mixed views on whether ARI Hubs achieved value for money or even if value for money (or cost savings) should be an intended goal of the ARI Hub model.

> You could ask patients where they would have gone if they weren't offered an ARI Hub appointment, but I guess you don't know whether that is actually true and what they would have actually done.
>
> (ARI Hub Operational Leader, Interview 6)

Spread of healthcare-borne infections: Given that most ARI Hubs did not separate potentially infectious patients from other patients, it was unlikely that ARI Hubs helped to reduce the spread of healthcare-borne infection.[5] However, if potentially infectious patients were spending less time in ARI Hub waiting areas and with fewer people compared to an ED waiting area, then it is theoretically possible that the spread of infection could have been reduced. But this also assumes that ARI Hubs were diverting care away from EDs and not inducing demand.

> We would spend quite a long time in urgent care and often we'd be around people who may not necessarily be sick in the same way, and we could potentially be spreading that to people who we are in very close proximity to. [...] I think there's a way to maybe streamline it that would be a bit better, just to make sure that we don't spread it to other people in an urgent care facility.
>
> (Focus Group Participant 1, Group 3)

Antimicrobial stewardship: Given that most ARI Hubs did not use PoCT, there is limited evidence that ARI Hubs helped to promote better antimicrobial stewardship, at scale. However, one ARI Hub system that used PoCT reported a 61% reduction in antibiotic prescribing compared to the prior year.

Monitoring and evaluation: Monitoring and evaluation helped to justify the impact of ARI Hubs and the need for funding from ICBs. Stakeholders viewed IT infrastructure, such as Electronic Health Records (EHRs), and the ability to link data to other sources, as a facilitator for monitoring and evaluation. Monitoring and evaluation were made more challenging in systems where data could not be linked or where there were issues around data governance and data sharing.

> [The decision to reallocate funds for ARI Hub service provision] didn't go through a detailed process to allocate funding because of anything said in the evaluation [of service outcomes], but it was a, "was the service last year sufficient and satisfactory?" The evaluation showed "yes, it was", [...] we had data on [...] how many appointments were offered, how many were taken up, how many booked appointments were unattended, what happened after that appointment, etc.
>
> (ICB Stakeholder, Interview 3)

Staff experience: Evidence from local evaluations and stakeholder interviews suggested high levels of satisfaction among staff in ARI Hubs due to opportunities for working in preferred areas and where they could hone clinical skills.

> [...] 'cause it's satisfying [...]. And particularly the paediatric respiratory, there's loads of teachings to be done there, so people are interested in how they're doing, and they're seeing the impact that they're having.
>
> (NHS England Stakeholder, Interview 19)



Evaluation Question 3: **What is the feasibility of an outcomes and economic evaluation of ARI Hubs, and what design could be appropriate?**

A robust impact evaluation must take into consideration the level of the analysis, variation in intervention delivery, attribution of NHS hospital trust outcomes to specific SICBLs, identification of potential confounders, data availability and quality, and statistical power and expected effect sizes.

Prior analyses: A prior national-level impact analysis of ARI Hubs conducted at the ICB level for winter 2022/2023 by NHS England showed that higher levels of ARI Hub activity were associated with a small, but statistically significant, proportional decrease in ARI-related ED

walk-in attendances between December and March. Through our exploration of these data, we estimated that this corresponded to a 10% lower cumulative rate of ARI-related ED walk-in attendances in ICBs with the highest level of hub activity compared to ICBs with the lowest level of hub activity. We further estimated that for every 34 ARI Hub appointments one ARI-related ED walk-in attendance was avoided, suggesting that during this period ARI Hubs were potentially inducing demand rather than diverting demand away from EDs. However, this estimate could be biased due to the descriptive nature of the analyses. We further estimated that, given their respective costs, ARI Hubs would be good value for money if the ratio of ARI Hub appointments to avoided ARI-related ED walk-in attendances is no more than 6:1.[6] For details of this analysis, see Technical Annex (Annex B; separate document).

Recommendations for future analyses: We recommend a future impact evaluation that examines differences in outcomes between SICBLs with ARI Hubs (intervention group) compared with SICBLs without ARI Hubs (control group) during the six-month period between October 2025 and March 2026. The primary outcome of interest should be rates of ARI-related ED walk-in attendances. Secondary outcomes should include rates of ED and GP waiting times for non-ARI patients, as well as ambulance conveyances. The analysis should measure and control for confounders. Based on the number of SICBLs with ARI Hubs, we expect the analysis will be sufficiently powered to detect a statistically significant difference in the primary outcome, representing a likely tangible impact of the intervention.

6 This is based on the assumption that the provision of an ARI Hub appointment costs on average £40 and an ED walk-in attendance costs on average £250. Thus, every 6 ARI Hub appointments thus would cost £240, which represents a cost savings of £10 compared to an ED walk-in attendance.

Implications and considerations



Regional variation – adaptation or fragmentation?

ARI Hub implementation varied significantly across NHS England's seven regions, with the North of England sustaining the majority of ARI Hub systems (54 of 74 systems) across two regions, reflecting active regional leadership and higher respiratory disease burden. It remains unclear whether variation reflected locally responsive adaptation or fragmentation that undermined equal access.



Commissioning philosophy and opportunity costs

Commissioners faced difficult trade-offs, such that investing in ARI Hubs meant not investing in alternative interventions. Absence of robust evidence on system-wide impact of ARI Hubs made justifying continued investment challenging.



Addressing health inequalities

ARI Hubs tended to be situated in areas of greater deprivation and respiratory disease burden, suggesting alignment with need. However, some high-burden areas lacked provision, representing a potential unmet need. Accessibility barriers persisted, particularly in rural areas. The cultural competence of ARI Hub services and engagement with underserved populations remain unexamined.



Alignment with a national health policy agenda

ARI Hubs in theory can help to support the 'left shift' ambition of moving care from hospitals into communities. Whether hubs represented the optimal use of resources for this shift drew mixed views from stakeholders, with insufficient evidence to draw firm conclusions.



Assumptions underlying expected impacts

The validity of the assumption that additional primary-care capacity provided by ARI Hubs diverts UEC demand remains unclear and induced demand remains a possibility. Primary care's absorptive capacity is constrained by workforce limitations, which raises concerns that ARI Hubs might shift pressures rather than resolve them.



Impacting UEC pressures – varying approaches

Commissioners needed to balance reactive models (intercepting demand via ARI Hubs) with proactive models (upstream prevention reducing demand). Stakeholders favoured integrated, multifaceted community pathways. They desired a more joined-up commissioning strategy that addresses both short-term and long-term drivers of UEC pressures.

Practical recommendations for future commissioning of ARI Hubs



Optimising patient access

Each ARI Hub delivery model (at-scale, distributed and co-located) carries trade-offs regarding capacity, utilisation, location of sites and referral pathways. These should be considered in light of local needs and geography. Further, commissioners should consider that patients value convenience, including the proximity of hubs to their community and extended opening hours (including evenings and weekends). Given high utilisation among CYP, specific accommodations should be considered for this population.



Strengthening referral pathways

Assessment approaches should reflect local workforce availability, with regular review of referral appropriateness. Allowing for direct NHS 111 referrals and booking into hubs should be a priority, but this will require early IT integration planning.



Integrating within the wider ARI clinical pathway

Alignment with the wider ARI clinical pathway should be considered, including Pharmacy First and step-up remote/virtual monitoring for patients with mild-to-moderate symptoms, as well as step-down remote/virtual wards to support continuity of care for patients with more severe symptoms or those with more complex health conditions.



Earlier and more strategic commissioning

Earlier decisions each year around the scope of ARI Hub funding should be considered to allow for more robust procurement processes and strategic commissioning, and to give provider organisations adequate mobilisation time, including for the set-up of supporting IT infrastructure for referrals and bookings, as well as monitoring and evaluation.



Designing for flexibility of provision

ARI Hub implementation should allow for appointment volumes to flex up or down in response to fluctuating winter demand and for combining hubs with broader primary-care hub models to help maintain capacity utilisation throughout the winter.

Conclusions

Implementation and delivery of ARI Hubs varied across England. ARI Hubs appeared to offer additional primary-care capacity during the winter, and they were valued by staff who delivered these services and patients who used them. Evidence of their wider system impacts, however, particularly on reducing UEC pressures, remains unclear. A future impact evaluation will seek to address this gap. Commissioners had to contend with a variety of trade-offs related to hub delivery models, opportunity costs and alignment with a national health policy agenda and alternative approaches to addressing UEC pressures. Future commissioning of ARI Hubs may benefit from optimising patient access, strengthening referral pathways, integrating with the wider ARI clinical pathway, earlier and more strategic commissioning and more flexibility to scale up or scale down service provision to meet demand.

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