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Translating Ethnographic Evidence into Digital Health Communication Tools to Improve Preventive Healthcare Engagement Among Marginalised Communities

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ABSTRACT

Preventive healthcare engagement depends on whether people can access, understand and act on information within their everyday circumstances. Marginalised communities may face barriers involving language, institutional trust, service navigation and unequal digital access. This proposed study will examine how ethnographic evidence can inform digital communication tools that support participation in preventive care. Observation, interviews and communication mapping will explore experiences of screening, vaccination and other preventive services within a defined community setting. Residents, community organisations and healthcare practitioners will jointly interpret findings and prioritise communication needs. Co-design will translate these insights into accessible prototypes, such as mobile appointment guides, audiovisual explanations and interactive service information. Usability and comprehension testing will guide refinement before pilot implementation. Evaluation will assess reach, understanding, navigation and completion of preventive healthcare actions, with comparisons across relevant access groups. Qualitative feedback will examine trust, acceptability and unintended exclusion. The study will distinguish communication-related improvements from changes requiring service redesign. Its contribution will be a documented pathway linking lived experience to digital tool development and evaluation, with evidence to guide equitable adaptation and further testing in comparable settings.

Keywords: Ethnographic evidence, digital health communication, preventive healthcare, marginalised communities, participatory co-design, health equity.

1. INTRODUCTION

1.1 Preventive Healthcare Engagement and Unequal Opportunities

Preventive healthcare includes screening and vaccination, but opportunities to participate depend on more than receiving an invitation. This article focuses on the cervical screening pathway, from recognising relevance and considering participation to arranging an appointment and attending. Screening information should support informed choice rather than equate attendance with the only acceptable decision [1]. Practical barriers include transport, childcare, lost earnings, unclear eligibility, language needs and limited appointment availability [2]. Previous disrespectful care, discomfort or discrimination can further influence engagement [3]. Although NHS screening is free, indirect costs can still restrict participation. Marginalisation is therefore understood through social and institutional circumstances that constrain access, rather than as an inherent characteristic of particular communities. Experiences also vary within language, ethnic and neighbourhood groups. Distinguishing informed decisions to decline from unsuccessful attempts to obtain care is essential when evaluating engagement [4]. Communication must consequently address both understanding and the practical pathway into services.

1.2 Digital Communication Opportunities and Exclusion Risks

Digital communication tools, including mobile appointment guides, audiovisual explanations and interactive service information, can provide timely support before a screening decision or visit [5]. They can explain unfamiliar procedures, clarify booking steps and identify available assistance. However, digital delivery introduces requirements that are unevenly distributed. Suitable devices, affordable data, reliable connectivity, accessible interfaces and practical digital skills cannot be assumed [6]. Shared phones create additional privacy concerns, particularly when notifications disclose sensitive information. Unfamiliar platforms may also reduce confidence or require help that users cannot readily obtain.

Tool development therefore needs evidence about everyday technology use, preferred languages, trusted information sources and situations in which digital contact feels safe. Ethnographic observation can reveal differences between assumed access and actual use [7]. Digital communication connects with staff assistance, telephone booking and printed alternatives, rather than becoming a compulsory gateway. Maintaining these routes supports choice and reduces the risk that an intervention intended to improve navigation creates another barrier to preventive care.

1.3 Aim, Research Questions and Contribution

The article develops an approach for designing and evaluating a digital communication tool informed by ethnographic evidence. It asks how people experience cervical screening, how observed difficulties become design requirements and whether the resulting tool supports informed engagement. Intended users include eligible people encountering communication or navigation barriers, while implementation partners include primary care teams, screening services and community organisations. The contribution is a traceable process connecting field evidence, collaborative interpretation, design choices and equity-focused evaluation [8]. Assessment distinguishes reach, comprehension, navigation and attendance, recognising that these outcomes are not interchangeable. Benefits remain anticipated until supported by completed evaluation. Neither a usable prototype nor increased platform activity independently demonstrates reduced disparities. The next section therefore defines relationships between communication, digital access and preventive engagement before methods and tool development are selected, and establishes the assumptions that the evaluation must examine.

2. CONCEPTUAL FOUNDATIONS AND INTERVENTION BOUNDARIES

2.1 Preventive Engagement as a Decision and Access Pathway

Cervical screening engagement comprises recognising relevance, understanding the offer, considering participation, arranging access and attending an appointment. These stages are connected but do not constitute an inevitable progression. Understanding describes comprehension; intention reflects a stated decision; booking records an arrangement; attendance confirms a completed encounter. None substitutes for another. Trust and perceived relevance can influence consideration, while appointment availability, transport, childcare and indirect costs shape whether an intended action becomes feasible [9]. Communication can clarify eligibility, explain procedures, support questions and identify booking routes. It cannot create appointments, provide transport or remove unaffordable indirect costs. Digital interventions therefore complement functioning services rather than replace them [5].

Informed choice remains central: a person who understands the offer may reasonably decline or defer. Evaluation consequently distinguishes an informed decision from confusion, administrative failure or inability to obtain care. Successful engagement includes opportunities to deliberate without pressure. Service records and participant accounts are considered together, because nonattendance alone cannot reveal its cause. The intervention targets communication and navigation while documenting structural barriers that require action from accountable service partners rather than additional messages.

2.2 Ethnographic Evidence and Digital Communication Design

Ethnographic observation examines how people encounter screening information, use devices and negotiate practical decisions in everyday settings [7]. Interviews explore meanings and specific encounters, including confusing invitations, unsuccessful calls or concerns about disclosure. Communication mapping identifies who explains messages, which channels are trusted and where information is lost. These sources can challenge assumptions that an invitation is understood, a phone is privately available or a booking link is usable.

Participatory interpretation enables residents and service partners to question emerging explanations and translate supported findings into design requirements [10]. Preferences remain important, but a requested feature differs from a requirement justified by observed difficulty. Disagreements and variation are documented rather than reduced to a uniform community perspective. Prototype assessment also separates perceived usability from demonstrated task completion. A participant may describe a tool positively yet fail to locate booking assistance or explain a screening message. Observing realistic tasks provides complementary evidence [11]. Accessibility requirements inform design throughout, rather than appearing only as corrections after development [12]. Evidence and decisions remain traceable.

2.3 Proposed Theory of Change and Equity Assumptions

The proposed theory links contextual understanding with design requirements, accessible tool use, comprehension, navigation and an informed preventive decision. Progress along this pathway depends on explicit assumptions about devices, connectivity, privacy, service responsiveness and appointment availability [8]. Assisted use through trained staff or community partners can support participation, provided assistance respects consent and does not expose sensitive information [13]. Alternative channels remain available when digital interaction is unsuitable.

Reach measures who encounters the tool; equitable reach examines whether people facing substantial barriers are included. Overall use can increase while inequalities persist or widen. Evaluation therefore examines exclusion, assistance needs and differences in benefit, alongside unintended burdens. A pilot can reasonably assess feasibility, accessibility, comprehension, task completion and documented navigation outcomes. Attendance requires suitable follow-up and interpretation within service conditions. Claims about reduced disparities or improved population health require stronger evidence. Process evaluation tests these assumptions and informs subsequent refinement [14].

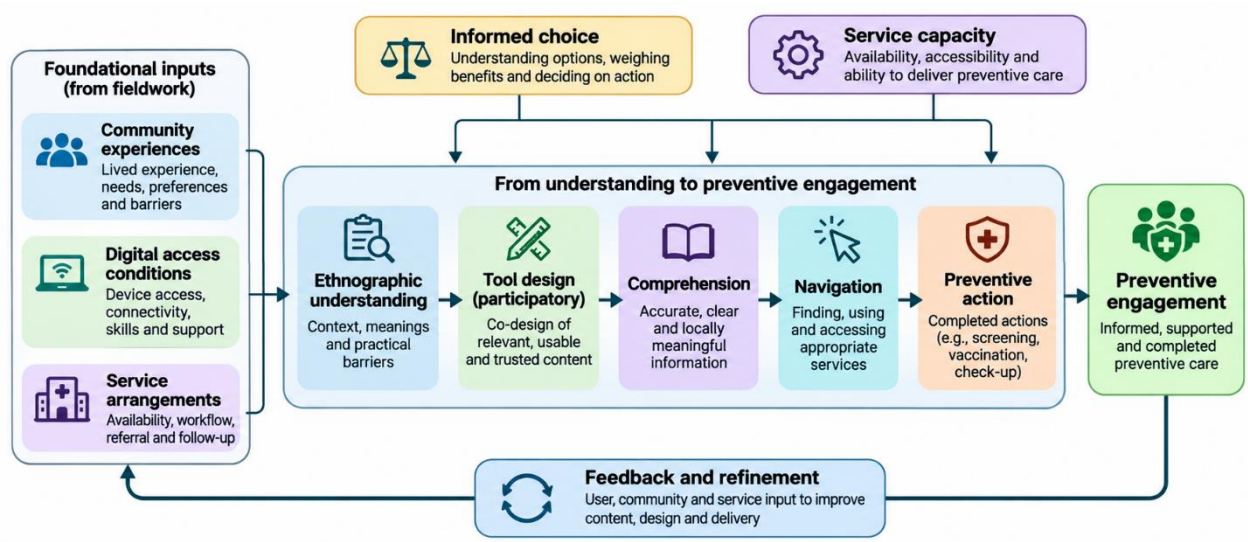


Figure 1. Conceptual pathway from ethnographic understanding to preventive engagement. Community experiences, digital access conditions and service arrangements inform tool design, comprehension, navigation and preventive action. Informed choice and service capacity shape the pathway, with feedback supporting refinement.

3. ETHNOGRAPHIC INQUIRY INTO PREVENTIVE HEALTHCARE ENGAGEMENT

3.1 Setting, Preventive Service and Community Boundaries

The proposed setting is a primary care catchment in England, with the locality and participating organisations confirmed before recruitment. The study examines cervical screening among eligible adults who encounter communication, navigation or digital access barriers. This pathway provides identifiable encounters involving invitations, decisions, booking and appointment preparation. The communication problem concerns whether existing information fits everyday circumstances, rather than assuming that nonattendance reflects inadequate knowledge. Participating organisations include general practices, screening teams and community partners offering language, disability or digital support. Community boundaries follow shared service use and relevant relationships, not a single ethnic or neighbourhood label. A twelve-week fieldwork period provides the planning window, with dates and access agreements documented before observation. Eligibility includes people considering screening, previous attenders and those who delayed, declined or could not obtain care. Contextual descriptions identify service arrangements and recruitment boundaries so readers can assess transferability without treating local accounts as population estimates.

3.2 Recruitment and Inclusive Participation

Purposive recruitment seeks varied experiences rather than statistical representation [15]. Invitations circulate through practices, community venues, outreach contacts and routes independent of established service-user groups. Sampling considers language, disability, digital access, previous screening and confidence in services. People who delayed, declined or unsuccessfully sought appointments remain eligible, avoiding an account dominated by attendees. Interpretation, accessible information and flexible interview arrangements support participation, while reimbursement addresses involvement costs. Partners distribute invitations without selecting only cooperative residents or disclosing private records without authority. Individuals contact the research team voluntarily, and participation does not affect care. Recruitment records document channels, refusals where voluntarily explained and perspectives still missing. Accessibility is considered throughout recruitment, not merely during prototype testing [12]. Repeated review identifies whether language, scheduling or organisational gatekeeping restricts whose experiences shape the evidence and subsequent decisions about the proposed digital communication tool.

3.3 Observation, Interviews and Digital Practice Mapping

Authorised observation examines outreach, booking assistance and community discussions relevant to screening, with consent arrangements appropriate to each encounter. Researchers avoid intimate examinations and unnecessary access to clinical information. Interviews with residents, community workers and service staff explore specific events: receiving an invitation, interpreting eligibility, requesting an appointment or preparing for attendance. Questions seek practical sequences and consequences rather than satisfaction alone.

Digital practice mapping examines device access, shared phones, connectivity, information searches and assistance from trusted others. Participants can describe or demonstrate navigation using approved examples without exposing personal accounts. Observation distinguishes independent completion from tasks requiring prompts, supporting later usability assessment [11]. Fieldnotes record setting, interruptions, language choices and researcher reflections.

Existing websites, messages, letters and leaflets provide documentary evidence. Communication maps identify information sources, trusted intermediaries and points where instructions become unclear [16]. Comparisons examine discrepancies between published procedures and actual encounters, including failed calls, inaccessible links or unavailable appointments. Such discrepancies inform interpretation without assuming either account is complete.

Practical problems beyond communication, including transport or service capacity, enter a separate action record. Their presence is retained when interpreting engagement, consistent with evaluating intervention delivery within its service context [14]. Findings remain provisional during ongoing fieldwork.

3.4 Analysis, Reflexivity and Interpretation with Participants

Analysis iteratively compares fieldnotes, interview accounts and reviewed materials, using coding appropriate to the research questions [17]. Codes distinguish engagement stages, communication encounters, assistance and structural constraints. Interpretations develop through comparisons within and across accounts, including cases that contradict emerging patterns. Frequency alone does not determine importance: an infrequent disclosure risk can warrant substantial design attention.

A reflexive record examines how professional identity, language and relationships influence access, questions and interpretation [18]. Team discussion makes alternative explanations explicit. Participants review accessible summaries or anonymised scenarios and can challenge interpretations without being required to endorse consensus. Disagreement and uncertainty remain documented. Problem statements specify the circumstance, affected engagement stage, supporting evidence and consequence. This creates a traceable bridge to design decisions rather than turning every preference into a universal requirement [16].

3.5 Ethics, Confidentiality and Sensitive Digital Contexts

Ethics review and organisational permissions precede recruitment. Consent remains ongoing, with separate agreement for recording or observing digital activity [19]. Researchers avoid collecting passwords, unrelated messages or unnecessary identifiers. Demonstrations use mock accounts where possible, and participants control what becomes visible. Encrypted storage, restricted access and agreed retention protect records. Procedures address distress, disclosures and safeguarding concerns. Reporting removes identifying combinations of contextual details, especially for small groups. Participants receive information about confidentiality limits, withdrawal and how findings are shared.

Table 1. Ethnographic findings and their implications for digital design.

Engagement stage	Observed barrier or practice to investigate	Supporting evidence required	Affected users or circumstances	Potential design requirement	Service-level issue
Recognising relevance	Invitation wording leaves screening purpose or eligibility unclear	Anonymised accounts, material review and comprehension observations	People encountering unfamiliar terminology or language barriers	Plain-language explanations with accessible language options	Accurate eligibility information and staff clarification
Considering participation	Information does not address concerns about discomfort, privacy or previous experiences	Interviews, observed discussions and contradictory accounts	People with anxiety, previous negative encounters or disclosure concerns	Balanced explanations, questions to ask and clear choices	Sensitive clinical support and appropriate adjustments
Accessing information	Phones are shared or notifications are visible to others	Consented descriptions or safe demonstrations of device use	People without private devices or accounts	Discreet content, user-controlled contact preferences and alternatives	Confidential communication arrangements
Booking	Users cannot identify the correct route or complete navigation	Observed tasks, booking instructions and staff accounts	People with limited digital confidence or inaccessible interfaces	Clear steps, accessible controls and visible assistance routes	Available appointments and responsive booking support
Preparing to attend	Practical instructions omit adjustments or available support	Appointment materials, participant accounts and staff confirmation	People requiring interpretation, disability adjustments or additional time	Preparation checklist and verified support information	Staffing, interpretation and adjustment availability

Engagement stage	Observed barrier or practice to investigate	Supporting evidence required	Affected users or circumstances	Potential design requirement	Service-level issue
Deciding not to attend	Records do not distinguish informed refusal from access failure	Voluntary participant explanations and authorised service information	People who decline, defer or cannot obtain care	Noncoercive information and options to revisit decisions	Respectful recording and appropriate follow-up

4. EVIDENCE TRANSLATION AND DIGITAL TOOL DEVELOPMENT

4.1 Prioritising Problems and Establishing Design Requirements

Analysed field evidence becomes a set of problem statements describing what people need to understand or accomplish during cervical screening engagement. Each statement identifies the affected circumstance, pathway stage and consequence, while retaining links to observations, accounts and reviewed materials [17]. For example, uncertainty about booking assistance becomes a requirement to locate a contact route, rather than an assumption that another reminder is needed. Requirements are prioritised through consequence, community importance, likely reach and implementation feasibility [20]. Essential functions cover informed understanding, navigation and access to help; optional features require a separate justification.

Problems involving appointment shortages, transport or inaccessible clinical arrangements enter a service-action register. Communication cannot resolve them by changing interface content. The decision record documents evidence strength, alternatives, selected priorities and deferred items. Reflexive discussion considers whether institutional preferences displace participant concerns [18]. Unresolved disagreement returns to shared interpretation, with further inquiry where necessary. Decisions distinguish acceptable local variation from clinical inaccuracies or exclusion risks that require correction before the prototype advances to testing with intended users.

4.2 Participatory Co-Design and Decision Responsibilities

A design group brings together residents, community partners, screening practitioners, researchers and developers. Its terms define which decisions are shared, which involve technical constraints and which require clinical approval. Shared authority concerns priorities, language, presentation and support arrangements; clinical reviewers retain responsibility for the accuracy of health information [21]. Developers explain feasibility without treating technical convenience as the default priority.

Activities include paper sketches, narrated scenarios and individual sessions, allowing participation without advanced literacy or digital skills. People preferring assistance or non-digital information contribute directly to decisions about alternative routes. Interpretation, accessible venues, flexible scheduling and reimbursement reduce practical participation barriers. Facilitators monitor dominant voices and provide confidential opportunities to disagree. Consent to involvement does not imply agreement with every design choice [19]. A change log identifies participant contributions, resulting revisions and reasons for decisions that differ from suggestions. Accessible summaries report these decisions back, including unresolved questions and actions assigned to service partners for follow-up at design review meetings.

4.3 Content, Interaction and Accessibility Design

Content explains cervical screening in plain language, covering relevance, eligibility, the appointment, preparation and opportunities to ask questions. Information presents participation as a choice and avoids implying that every recipient should attend regardless of circumstances. Clinical review checks accuracy against current programme information and local procedures [22]. Language adaptation involves competent translation and intended users, with attention to unfamiliar administrative terms. Examples reflect documented experiences without assigning one preference to an entire cultural group.

Format selection follows observed needs. Short audio, captioned video, illustrated instructions and guided navigation offer alternatives rather than compulsory steps. Essential information remains available in text, with meaningful headings, descriptive controls and accessible alternatives for visual content. Screen-reader compatibility, keyboard operation, contrast and resizing are assessed against relevant accessibility criteria. Low-bandwidth delivery avoids downloads, while testing includes older devices and intermittent connections.

Interaction design makes booking assistance visible, provides clear backtracking and explains errors without blaming users. Realistic tasks examine whether people can find requirements, locate help and recover after selecting an incorrect route. Positive reactions to appearance do not substitute for successful navigation [24]. Content and interaction decisions remain documented alongside evidence and outstanding limitations throughout.

4.4 Privacy, Trust and Connection to Services

The tool collects only information necessary for its defined functions, with an information-only version requiring no personal account wherever feasible. Any analytics or service linkage receives a documented purpose, appropriate governance and transparent explanation [23]. Shared-device risks inform notification wording, screen content and choices about saving information. Users receive realistic privacy advice: closing a page does not necessarily erase browsing history, and an exit control cannot guarantee secrecy.

Visible ownership, sources and review dates support scrutiny of health information. Booking links identify the receiving service and any transition to another platform. Staff-assisted routes remain available for clarification. Instructions are checked against actual local booking processes, including what happens when appointments are unavailable [20]. An identified clinical owner approves content, while a service lead coordinates procedural updates. Error reporting and scheduled review support maintenance before inaccurate instructions become embedded in delivery.

4.5 Prototype Testing and Readiness for Pilot Use

Prototype testing uses realistic tasks with intended users, including people with limited digital confidence and those using assistive technology. Tasks assess understanding, navigation and access to support separately from perceived relevance. Moderators avoid leading participants, and record independent completion, prompted completion, errors, abandonment and requests for help [24]. Comprehension checks ask participants to explain information in their own words rather than merely confirm that it is clear.

Findings guide revisions through a versioned decision log. Clinical accuracy is rechecked whenever wording or sequence changes. Pilot readiness requires agreed essential tasks to be achievable, unresolved privacy risks addressed and support routes confirmed. These criteria are specified before judging success. The intervention specification records materials, functions, delivery, assistance, ownership and permitted adaptation, supporting reproducibility [25]. The refined prototype therefore enters evaluation as a defined intervention, not evidence of improved engagement or equity.

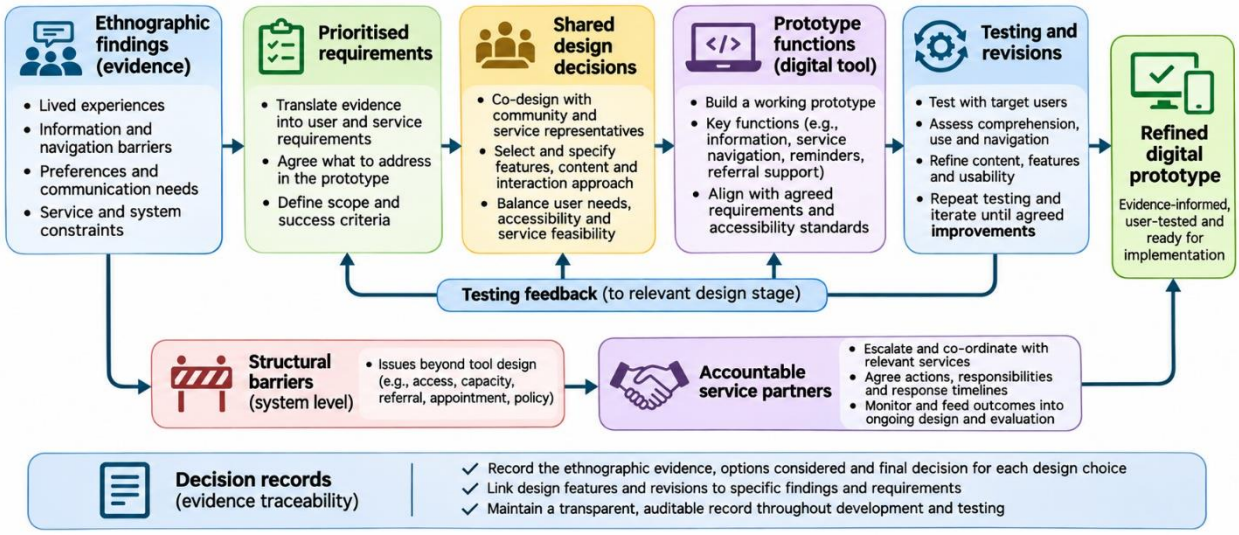


Figure 2. Ethnographic evidence-to-digital prototype development pathway.

5. PILOT IMPLEMENTATION AND EVALUATION

5.1 Delivery Model and Implementation Readiness

The proposed pilot operates through two participating general practices and linked community partners within the selected catchment. An eight-week recruitment period includes screening-eligible adults encountering the communication or navigation barriers identified during fieldwork. Participants encounter the tool through approved invitations, reception contacts or community outreach. Trained staff offer assistance without requiring device ownership. Telephone support, printed information and booking routes remain available.

Readiness checks confirm clinical content, contact details, accessibility and arrangements for responding to questions. Staff preparation covers introducing the tool, recording assistance and escalating service problems. Distribution records distinguish invitations, access attempts, assisted use, interruptions and local adaptations [25]. Data collection uses proportionate privacy safeguards [23]. Research consent concerns evaluation activities; declining participation does not remove routine information or care. Implementation records identify whether nonuse reflects preference, delivery failure or an unavailable support route rather than presumed disinterest.

5.2 Evaluation Design and Comparison Strategy

The evaluation uses a randomised feasibility comparison of existing communication alone against existing communication plus the tool and its defined assistance offer. Individual allocation occurs after consent, with concealment maintained until assignment. Four weeks of baseline service records describe appointment capacity and usual activity. Participants complete an assessment two weeks after allocation, with authorised booking and attendance follow-up extending to twelve weeks.

The primary outcome is completion of prespecified essential information and navigation tasks at two weeks, using equivalent tasks across groups. Recruitment, retention and delivery feasibility remain explicit pilot objectives rather than treating a small study as definitive effectiveness evidence [26]. Analysis follows assigned groups, including participants who do not use the tool. Concurrent outreach, appointment changes and exposure to the other group's materials are recorded.

Selection into research can exclude less connected residents despite randomisation. Interviews with users, nonusers and staff investigate mechanisms and context [27]. Estimates include uncertainty and account for practice. The design supports feasibility and preliminary comparative estimates, not established population-level effects or reduced disparities.

5.3 Outcomes Across the Engagement Pathway

Reach is measured as the number offered the intervention among eligible people approached through recorded channels, with unknown eligibility identified separately [28]. Access success uses those attempting access as its denominator, while task completion uses all participants allocated to each group with missing assessments reported explicitly. Receiving a link, opening a page, using content and understanding information remain distinct events.

Comprehension is assessed through structured explanation and questions. Perceived relevance and navigation confidence are recorded separately, avoiding substitution of satisfaction for demonstrated understanding [24]. Booking and attendance use authorised service records, with denominators restricted to the prespecified eligible follow-up population. These outcomes do not automatically indicate informed choice.

Participants can describe informed decisions to decline or defer without being categorised as failures. Nonattendance is explored where consent permits, distinguishing access problems from deliberate choices. Assistance measures include independent versus supported completion, staff minutes and repeated contacts. Workload covers introduction, troubleshooting and maintenance, while participant burden includes time, data use and disclosure concerns. Outcome definitions identify timing, data sources and handling of repeated events before collection, supporting transparent interpretation across groups.

5.4 Equity, Missing Data and Unintended Effects

Equity assessment compares reach, task completion and assistance across prespecified language, disability and digital-access categories. Recruitment records also identify people never contacted, unable to access materials or unwilling to use digital routes. These observations prevent analytics from representing only users. Small-group estimates include denominators and uncertainty, with disclosure controls where identification is possible [23].

Missing observations are described by group, outcome and recorded reason. Follow-up procedures use accessible channels without pressuring participation. Analysis examines whether conclusions change under plausible missing-outcome assumptions, rather than equating missing information with failure or success [29]. Differential loss can undermine comparability even after random allocation.

Interviews examine privacy concerns, confusing content, dependence on helpers and unintended pressure to attend. Overall improvement does not establish reduced inequalities: differences between groups and unequal opportunities to benefit require separate interpretation [28]. Usage counts therefore inform implementation assessment but cannot independently demonstrate improved engagement, informed decisions or equitable outcomes.

Table 2. Digital communication and preventive engagement evaluation matrix.

Outcome domain	Indicator	Denominator or data source	Timing	Equity comparison	Interpretation limitation
Reach	Proportion offered the intervention	Eligible people approached; unknown eligibility reported separately	Throughout recruitment	Language, disability and digital access	Does not represent eligible residents outside recruitment channels
Accessibility	Successful access and barriers encountered	Participants attempting access; observation and support records	First encounter and two-week assessment	Device, connectivity and assistive-technology use	Excludes nonattempts unless investigated separately
Comprehension	Accurate explanation of essential screening information	Structured assessment in both allocated groups	Two weeks	Preferred language and communication needs	Assessment conditions may differ from everyday use
Task completion	Completion of prespecified information and navigation tasks	All allocated participants; missing assessments identified	Two weeks	Digital confidence, disability and assistance needs	Research tasks do not establish completed service access

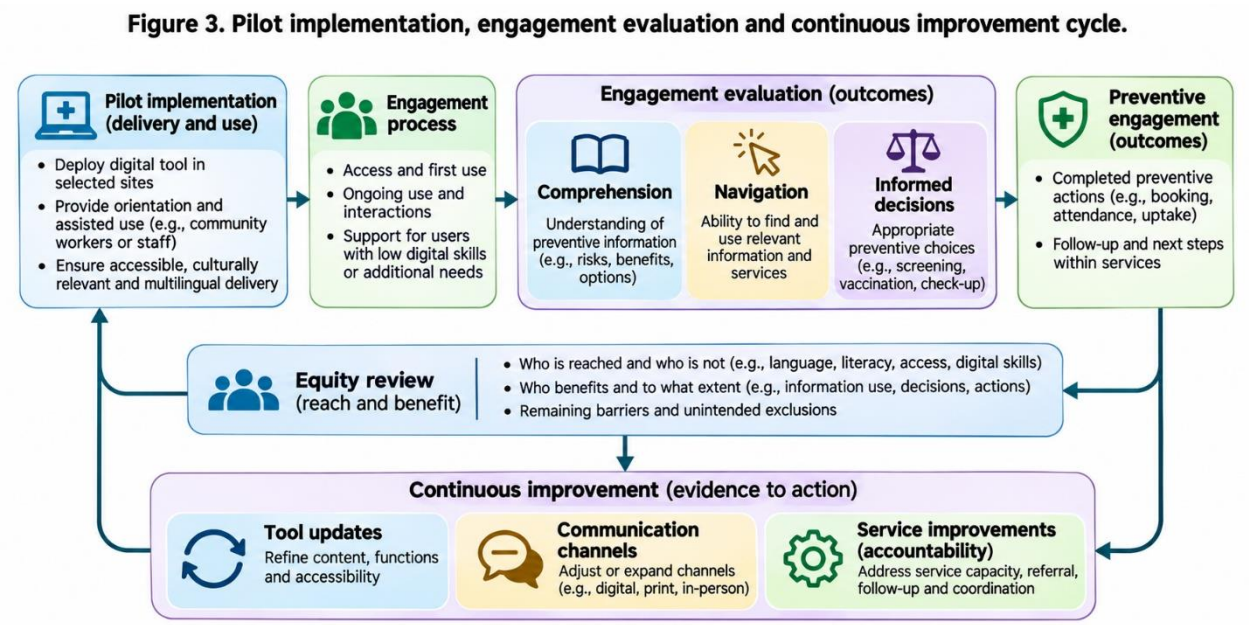
Outcome domain	Indicator	Denominator or data source	Timing	Equity comparison	Interpretation limitation
Preventive action	Booking and attendance	Prespecified eligible follow-up population; authorised service records	Through twelve weeks	Prespecified access-related groups	Attendance alone does not demonstrate informed choice
Assistance	Supported completion, contacts and assistance time	Participants attempting tasks; staff logs	Throughout delivery	Independent versus assisted use	Assistance may enable participation while concealing independent-use barriers
Workload	Staff time for introduction, support and maintenance	Time logs and implementation records	Throughout pilot	Site, channel and support arrangement	Research staffing may exceed routine service capacity
Unintended effects	Privacy concerns, confusion, pressure or distress	Participant feedback, interviews and incident records	During delivery and follow-up	Shared-device use and other relevant circumstances	Nonreporting does not establish absence of harm
Informed decisions	Reasons for declining, deferring or seeking further advice	Voluntary accounts and structured follow-up	Two weeks and subsequent follow-up	Prespecified groups where disclosure is safe	Reported reasons may be incomplete or influenced by the encounter

5.5 Maintenance, Costs and Expansion Decisions

Cost assessment records development, translation, hosting, staff preparation, assistance and updating, distinguishing research expenditure from routine delivery. An organisational owner oversees funding and ongoing technical maintenance, while clinical and service leads approve content and procedural changes. Revised guidance, booking failures, accessibility problems or privacy incidents trigger review.

Continuation depends on prespecified feasibility, acceptability and safety criteria. Expansion additionally requires manageable workload, credible comparative evidence and equitable access, with uncertainty retained in decisions [30]. Language options, contact routes and support arrangements require local adaptation. Wider use therefore follows further validation rather than favourable analytics alone. Findings are interpreted against the ethnographic evidence and the assumptions connecting communication with informed preventive engagement.

Figure 3. Pilot implementation, engagement evaluation and continuous improvement cycle.



6. DISCUSSION, LIMITATIONS AND IMPLICATIONS

6.1 What Ethnographic Translation Added to the Intervention

Ethnographic translation adds value when a documented encounter changes a specific intervention decision, not simply when community accounts accompany development. The decision record therefore connects identified problems with functions such as clearer booking assistance, discreet contact options or alternative formats. Thematic findings and observed use provide complementary evidence, while implementation evaluation examines whether the intended functions actually reach participants [28].

Interpretation compares participant accounts with task performance and authorised service outcomes. A favourable interview may coexist with abandoned navigation, while successful booking may depend on extensive staff assistance. Such contradictions identify limits rather than inconvenient exceptions. Acceptance, comprehension, booking and attendance consequently remain separate conclusions.

The randomised pilot compares the complete tool-and-assistance offer with existing communication, but cannot isolate the contribution of each component. Any additional value requires credible differences, appropriate uncertainty and consistency with the original problems. Where outcomes remain inconclusive, the contribution rests on a traceable development process rather than demonstrated improvement. Framework evaluation examines mechanisms and context alongside outcomes [30], without assuming digital delivery is inherently advantageous.

6.2 Equity, Assisted Use and Institutional Responsibility

Equity interpretation asks who benefits, who remains excluded and whether assistance changes those patterns. Overall reach can conceal underrepresentation among people with language barriers, disabilities or unreliable connectivity [28]. Assisted use may enable participation, but its staff time, continuity and privacy requirements form part of the intervention rather than an incidental resource.

Community workers and reception staff require responsibilities, support and routes for unresolved questions. If users must repeatedly seek help to interpret instructions or secure appointments, digital delivery may shift navigation work onto them. Service partners therefore remain responsible for appointment supply, accessible booking and appropriate adjustments.

People preferring telephone, printed or face-to-face communication retain equivalent opportunities to obtain information and care. Assessment compares these routes without treating digital uptake as the desired outcome for everyone. Participation is meaningful when preferences influence decisions, not merely when consultation occurs [35].

6.3 Methodological and Practical Limitations

Recruitment through practices and community partners can favour people already connected to services, leaving less visible experiences underrepresented. Researcher presence may change encounters, and professional identity can influence what participants disclose or how accounts are interpreted [32]. Limited observation cannot capture every setting, language or stage of screening engagement. Translation can alter meaning, requiring attention to conceptual equivalence rather than literal wording alone [31].

Short follow-up limits assessment of sustained engagement. Incomplete service records may misclassify booking or attendance, while differential missingness can undermine comparisons [29]. Concurrent outreach, appointment changes and communication between participants complicate attribution. Random allocation supports comparison of the intervention offer, but does not establish which feature produces any observed difference.

Transferability depends on local services, relationships, devices and assistance arrangements [33]. A usable tool in one catchment may require adaptation elsewhere. Assumptions concerning private access, responsive support and continuing content accuracy remain testable rather than guaranteed. Sustained use additionally depends on resources and organisational ownership, which a short pilot cannot establish beyond its observed implementation period.

6.4 Future Research and Public Health Application

Further research prioritises larger comparisons, longer follow-up and recruitment beyond existing organisational networks. Sampling strategies should examine whether disconnected residents encounter different barriers and require different channels. Evaluation combines communication with service redesign where fieldwork identifies appointment or administrative constraints, rather than repeatedly refining messages alone [30].

Economic assessment includes development, translation, assistance and maintenance, with research resources distinguished from delivery. Sustained operation requires named ownership and evidence about organisational capacity [34]. Community partners remain involved in selecting outcomes and interpreting unequal benefits [35]. Expansion requires acceptable accessibility, privacy, workload and implementation fidelity, alongside credible comparative findings. These requirements frame the conclusion: the contribution is an evidence-to-design approach whose responsible application depends on local fit and continuing evaluation in practice.

7. CONCLUSION

7.1 Integrated Contribution and Principal Findings

The study examines how lived experience shapes access to preventive healthcare information and how digital communication may influence subsequent engagement. Ethnographic inquiry identifies practical barriers, communication preferences and institutional constraints that conventional needs assessments can overlook. Participatory design translates these insights into locally relevant content and interaction choices, while evaluation distinguishes usability and information uptake from informed decisions and completed preventive actions. Together, these approaches provide a framework for assessing whether digital interventions respond to priorities expressed during fieldwork rather than assumed user needs. Claims of improved preventive healthcare engagement, however, depend on observed outcomes and disaggregated evaluation evidence showing whether benefits reached the communities and access groups initially prioritised.

7.2 Conditions for Responsible Application

Responsible application requires clinically accurate, regularly reviewed content, accessible interfaces and genuine community influence over design and revision. Delivery arrangements must include ongoing technical maintenance, assisted access and clear accountability for referrals, appointments and follow-up services. Evaluation should examine who cannot use the intervention, who needs assistance and whether improvements are distributed unequally across language, literacy and connectivity groups. Digital tools should complement, rather than replace, trusted interpersonal communication and non-digital pathways. Under these conditions, locally grounded digital communication, combined with responsive services, can support equitable engagement with preventive healthcare.

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