

Who Is Reached Through Community Pharmacy Preventive Care? A Scoping Review of Health Promotion Services, Referral Arrangements, and Equity in Population Coverage

Peter Novak^{1*}, Grace Okafor², Kenji Sato³

¹Department of Pharmacy Education and Clinical Reasoning, Charles University, Prague, Czech Republic.

²Department of Pharmacy Practice and Patient Safety Education, University of Ibadan, Ibadan, Nigeria.

³Department of Clinical Pharmacy and Risk Communication, Keio University, Tokyo, Japan.

*E-mail ✉ peter.novak@cuni.cz

Abstract

To map preventive and health-promotion services delivered through community pharmacies, identify the populations demonstrably reached, examine how referral and subsequent linkage to care are reported, and assess the extent to which equity in population coverage is explicitly measured. A scoping-review approach was structured around JBI methodological guidance and PRISMA-ScR reporting principles. PubMed-indexed literature and publisher records were searched using combinations of community pharmacy terms with prevention, health promotion, screening, vaccination, referral, follow-up, population reach, deprivation, underserved populations, and equity concepts. Primary quantitative, qualitative, mixed-methods, implementation, and service-evaluation evidence was eligible when it addressed preventive care delivered through community pharmacies or directly examined reach, referral, follow-through, or equity. The executed discovery route produced 89 record manifestations; removal of two visible duplicate manifestations left 87 unique records for relevance assessment. Twenty-six empirical reports had sufficiently verified design, setting, service, population, and outcome information for detailed evidence charting. Because the accessible search route did not provide a complete bibliographic database export, additional stage-specific PRISMA counts were not reconstructed. The charted literature covered vaccination, diabetes and cardiovascular-risk screening, blood-pressure assessment, hepatitis C screening, smoking cessation, colorectal-cancer screening, sexual-health prevention, and social-needs navigation. Evidence of service availability was considerably more common than evidence establishing population-level coverage. Some studies demonstrated reach into rural, deprived, low-income, or culturally defined populations, but accessibility and geographic proximity did not consistently predict service use. Referral processes ranged from simple advice to seek care to structured communication with another provider. Direct measurement of completed linkage was uncommon. Equity variables were inconsistently reported and differed by service. Community pharmacies provide a broad preventive-care platform, but the literature offers a more complete account of what pharmacies can deliver than of who is reached, whether referrals result in care, or whether population coverage is equitable. Future evaluations should measure service reach, referral completion, and equity variables as distinct outcomes rather than infer them from service availability.

Keywords: Community pharmacy, Preventive care, Health promotion, Population reach, Referral, Health equity

Introduction

Community pharmacies occupy an unusual position in preventive health care: they are numerous, frequently visited, and situated outside the appointment structures

that govern much of primary care. Reviews of pharmacy-delivered public-health interventions have documented activity across smoking cessation, vaccination, screening, weight management, and other preventive services, while also identifying limited evidence on whether such activity reduces health inequalities [1]. Preventive-service evaluations likewise report clinical, utilization, and economic outcomes, but those endpoints do not by themselves show which parts of a population were reached [2]. Controlled and quasi-experimental health-promotion evidence supports a substantive preventive role for community pharmacy while retaining

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uncertainty across intervention types and outcome measures [3].

This distinction matters because service availability, encounter volume, population coverage, and equity describe different properties of a preventive-care system. A pharmacy may offer a service but reach a narrow subset of eligible people. A service may operate in a deprived neighborhood without being used proportionately by residents facing the greatest barriers. Conversely, pharmacies can also provide a point of contact for people whose health or social needs are incompletely addressed elsewhere. Practice models addressing social determinants of health illustrate the breadth of this opportunity, including identification of social needs and navigation to other resources [4].

Physical accessibility provides an important but incomplete foundation. National geographic analyses show that community-pharmacy access can be quantified and that pharmacy distribution varies across rural and urban environments [5]. Geographic proximity, however, is a structural condition; it does not establish that preventive services are available at a particular pharmacy, that eligible residents use them, or that those referred elsewhere complete the next step in care.

The same problem appears in descriptions of referral. Screening can produce a recommendation to contact a physician, a documented referral, an electronic or interpersonal handoff, or a completed consultation. These events should not be collapsed into a single outcome. The difference is especially important when preventive services identify previously unrecognized risk: the public-health value of detection depends partly on whether subsequent assessment or treatment occurs.

This review therefore examines community-pharmacy preventive care through four linked but analytically separate questions: what preventive services are delivered; which populations are observably reached; how referral and follow-through are organized and measured; and how explicitly equity in population coverage is reported. A scoping design was chosen because the relevant literature spans heterogeneous interventions, study designs, service systems, populations, and outcomes. The purpose is evidence mapping rather than pooled estimation of a common treatment effect.

Materials and Methods

Review framework and reporting

The review was organized according to scoping-review principles and reported with reference to the PRISMA Extension for Scoping Reviews [6]. Methodological decisions followed updated JBI guidance emphasizing explicit review questions, transparent eligibility criteria, systematic evidence identification, charting, and descriptive or conceptual mapping appropriate to heterogeneous evidence [7].

The unit of substantive interest was the community-pharmacy preventive-service encounter or programme and its relationship to population reach, referral, follow-through, or equity reporting. The review did not treat journal prestige as an eligibility criterion. Study design was also not used as a hierarchy for excluding otherwise relevant evidence because the questions concern service configuration, observed reach, and reporting practice as well as clinical outcomes.

Formal risk-of-bias exclusion was not imposed. Instead, design characteristics and evident methodological limitations were charted to constrain interpretation. Randomized trials, observational studies, surveys, qualitative investigations, mixed-methods studies, programme evaluations, and implementation studies can each answer different parts of the review question. Claims were therefore matched to what each design could establish.

Review questions

The primary question was: What preventive and health-promotion services are delivered through community pharmacies, which populations are reached, how are referral and follow-through arrangements reported, and how adequately does the literature capture equity in population coverage?

Four operational questions guided charting:

1. Which preventive, screening, vaccination, health-promotion, and risk-identification services have been delivered through community pharmacies?
2. Which participant or population characteristics are reported among people actually receiving or being offered those services?
3. When pharmacy activity identifies risk or need for additional care, what referral destination, handoff mechanism, communication process, and follow-through measure are reported?
4. Which socioeconomic, geographic, demographic, cultural, or other equity-relevant variables are measured, and where does their absence constrain interpretation of population coverage?

Eligibility criteria

Evidence was eligible when the service was delivered in a community or retail pharmacy, or when the study directly evaluated community-pharmacy participation in a preventive-care pathway. Eligible concepts included vaccination, disease-risk screening, preventive testing, smoking cessation, infectious-disease prevention, cancer screening, cardiometabolic risk identification, preventive counselling, social-needs screening when linked to health navigation, and referral generated by preventive assessment.

Primary quantitative, qualitative, mixed-methods, implementation, service-evaluation, and programme-evaluation reports were eligible for the substantive map. Reviews were used for background, methodological orientation, contradiction checking, and identification of relevant primary evidence but were kept analytically distinct from empirical evidence units.

Studies confined to inpatient, hospital-ward, or non-community pharmacy practice were excluded unless the community-pharmacy component could be separated. Medication-management interventions without a preventive, screening, referral, population-reach, or health-promotion component were outside scope. Studies reporting only professional attitudes without an identifiable preventive-service implication were not used as substantive evidence units.

No journal-quartile criterion was applied to evidence eligibility, and the date requirements governing the manuscript reference list were not applied as a screening restriction.

Information sources/search

Evidence identification used PubMed-indexed records and publisher bibliographic pages accessible during the review execution. Search activity was completed on 13 September 2026.

The principal search bundles combined "community pharmacy" with the following concept groups:

- preventive OR prevention OR "health promotion" OR screening OR referral OR equity OR "population reach"
- vaccination OR screening OR diabetes OR cardiovascular OR hepatitis OR "smoking cessation" OR referral
- "population reach" OR equity OR inequalities OR deprivation OR underserved
- referral OR follow-up OR linkage OR screening OR "preventive services"

- "cancer screening" OR HIV OR PrEP OR hepatitis OR vaccination OR "preventive services"

Targeted searches were supplemented by exact-title, DOI, citation-chaining, and publisher-record verification for studies identified as relevant. Methodological searches separately located PRISMA-ScR and JBI scoping-review guidance.

The executed discovery process generated 89 record manifestations. Two visibly duplicated manifestations across the targeted searches were removed, leaving 87 unique records for relevance assessment. The accessible search interface did not provide a complete database-export file from which later screening stages could be independently reconstructed; consequently, no unverified numerical values were assigned to those stages.

Selection

Records were assessed against the population–concept–context criteria above. Screening prioritized evidence in which community pharmacies were an actual service-delivery setting or an identifiable component of a preventive pathway. Abstracts and available full records were examined for the preventive service delivered, participant population, evidence of service use, referral arrangements, or equity-related information.

Reports retained for detailed charting had to provide verifiable information on at least the service and setting and one further review-relevant dimension: population reached, referral process, follow-through, implementation, or equity reporting. Twenty-six empirical reports met that verification threshold and formed the detailed charting reservoir used for the evidence map. This charted set is reported separately from the manuscript's methodological and background literature.

Multiple publications were not assumed to represent independent evidence units when they appeared to describe the same programme or population. Where a study described a referral protocol without observing an eligible referral event, protocol availability and completed linkage were coded separately.

Data charting

A structured charting form recorded study design; country or region; community-pharmacy setting; participant or service-user population; sample size where reported; preventive service or programme; comparator where applicable; relevant delivery features; reported

outcome or construct; measurement method; follow-up period; principal finding; reported direction or magnitude; referral, implementation, or equity dimension; contradictory or null findings; stated limitations; applicability boundaries; and the precise claim supported by the evidence.

Missing information was coded as not reported rather than inferred. Numerical values were retained only where they were reported by the source and were necessary to understand service reach, referral, or study design.

Population and equity variables

Population reach was defined as evidence concerning people who were actually approached, screened, vaccinated, counselled, enrolled, referred, or otherwise documented as users of the service. General statements about pharmacy accessibility or eligibility were not treated as evidence that a population received care.

Equity charting included socioeconomic deprivation, income-related context, insurance, geography, rurality, race or ethnicity, culturally defined population, age, sex or gender where reported, and other characteristics relevant to differential service coverage. The review also recorded studies in which discriminatory experiences, cultural acceptability, or service-location patterns provided information relevant to equitable access.

Absence of an equity variable was classified as a reporting gap. It was not interpreted as evidence that inequity was absent or present.

Service/referral classification

Preventive services were classified according to the activity actually performed: vaccination; screening or risk assessment; infectious-disease testing; smoking-cessation intervention; cancer-screening participation; sexual-health prevention; or preventive/social-needs navigation.

Referral was charted separately using four components: trigger, the finding that prompted referral; destination, such as a physician, specialist, programme, or social resource; handoff, the communication or transfer

method; and follow-through, any evidence that the patient reached or engaged with the destination.

A recommendation to seek care was coded as referral advice. It was not coded as completed linkage unless subsequent attendance, communication, diagnostic confirmation, enrolment, or another explicit follow-through measure was reported.

Evidence mapping

Evidence was mapped across four dimensions: preventive-service category, population actually reached, referral/follow-through reporting, and equity-variable reporting. This structure allowed a study to contribute to several dimensions without implying that evidence in one domain established another.

The approach also preserved discordant findings. Greater pharmacy density or longer opening hours, for example, represented structural access, while consultation volume represented observed use. These measures were not treated as equivalent indicators of population coverage.

Results and Discussion

Study selection

The executed evidence-identification searches yielded 89 record manifestations. Removal of two visibly duplicated manifestations left 87 unique records for relevance assessment. Twenty-six empirical reports contained sufficiently verified information for detailed charting of community-pharmacy preventive services, population reach, referral or follow-through, or equity-related dimensions.

The search environment did not provide a complete export permitting defensible reconstruction of distinct title/abstract exclusion, report-retrieval, and full-text-exclusion counts. Those intermediate values are therefore not reported. The resulting selection representation distinguishes observed counts from stages for which arithmetic was not recoverable.

The evidence flow and its reporting boundary are summarized in **Figure 1**.

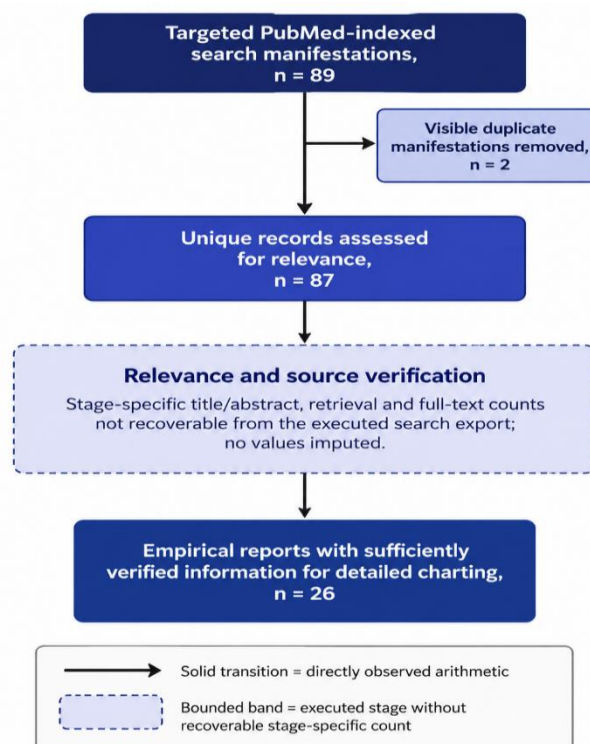


Figure 1. Executed evidence-identification and charting flow for the community-pharmacy preventive-care scoping review

Characteristics

The charted empirical evidence covered community-pharmacy preventive activity across North America, Europe, Australia, New Zealand, and the Middle East. Screening programmes frequently relied on opportunistic contact with pharmacy users, while vaccination and organized screening programmes more often used explicit service workflows. Mixed-methods evaluation of screening implementation showed that interprofessional coordination could become part of preventive-service delivery rather than a downstream administrative detail [8].

Vaccination represented one of the more established service classes. Longitudinal evaluation of community-pharmacy influenza vaccination demonstrated that

preventive services can be delivered at substantial operational scale [9]. Scale, however, described service volume and did not establish whether use was proportionate to population need.

The evidence base also differed markedly in what it measured. Some studies focused on patient uptake, others on implementation, professional experience, geographic accessibility, screening yield, or referral. This heterogeneity makes a single effectiveness summary inappropriate but is well suited to mapping where population reach and follow-through are directly observed.

Table 1 shows the empirical evidence units and the review-relevant service characteristics extracted from the verified charting reservoir.

Table 1. Community-pharmacy preventive-care evidence units by setting, design, service, population, and delivery context

Evidence unit	Country/region	Design	Preventive-service focus	Population/participants	Delivery context
E01	United States	GIS cross-sectional analysis	Geographic pharmacy access	National population	Community-pharmacy distribution

E02	Australia	Mixed methods	Screening and primary-care coordination	Screening stakeholders	Community pharmacy–primary care interface
E03	Wales/UK	Longitudinal service evaluation	Influenza vaccination	Vaccination service users	Community-pharmacy vaccination
E04	Canada	Qualitative study	COVID-19 vaccination	Vaccinating pharmacists	Community pharmacy
E05	Rural United States	Survey	COVID-19 boosters	Rural pharmacists	Rural community pharmacies
E06	United States	Qualitative analysis	COVID-19 immunization	Pharmacy personnel	Community-pharmacy operations
E07	United States	Site visits/interviews	COVID-19 vaccination	Independent pharmacists/pharmacies	Independent community pharmacy
E08	Italy	Policy/service analysis	SARS-CoV-2 vaccination	Pharmacy programme	National pharmacist-vaccinator context
E09	United States	Service pilot	Hepatitis C screening	Pharmacy customers	Health-system-affiliated community pharmacy
E10	Switzerland	Pilot feasibility study	Hepatitis C screening	Screening participants	Community pharmacy
E11	Australia	Cluster randomized trial	Type 2 diabetes screening	Adults screened	339 community pharmacies
E12	United Arab Emirates	Feasibility study	Diabetes/CVD risk screening	Adults aged ≥40 years	12 community pharmacies
E13	Germany	Implementation evaluation	Blood-pressure screening	Pharmacy users	17 community pharmacies
E14	Italy	Screening evaluation	Hypertension/CV risk	Adults screened	Community pharmacy
E15	United Kingdom	Cluster randomized trial	Smoking cessation	Community pharmacies	Pharmacy cessation service
E16	Switzerland	Customer survey	COVID-19 vaccination	Vaccination customers	Community pharmacy
E17	Norway	Screening study	Diabetes risk/HbA1c	Pharmacy customers	Community pharmacy
E18	Wales/UK	Service/deprivation evaluation	Public-health pharmacy services	Service users/pharmacies	Deprivation-stratified pharmacy system
E19	Wales/UK	Observational service-use analysis	Common ailments service	Pharmacy consultations	Population pharmacy service
E20	United States	Accessibility analysis	Adult immunization access	Low-income communities	Pharmacy versus physician-office access
E21	New Zealand	Mixed methods	Minor-ailment care	Māori community participants	Community pharmacy
E22	United States	National cross-sectional survey	Pharmacy experience/discrimination	Adults	Community pharmacy
E23	Spain/Catalonia	Population programme evaluation	Colorectal-cancer screening	Screening invitees/users	Pharmacy-supported FIT programme
E24	San Francisco Bay Area, USA	Pharmacy survey	PrEP/PEP furnishing	Community pharmacies	Sexual-health prevention
E25	United States	Qualitative study	Colorectal-cancer screening	Primary-care providers	Pharmacy–primary-care interface

E26	United States	Implementation study	Social-needs screening/navigation	Pharmacy users	Pharmacy-integrated navigation
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Preventive services

Vaccination evidence illustrated both expansion and heterogeneity. Pharmacists described distinct forms of COVID-19 vaccine hesitancy rather than a single barrier to uptake [10]. Rural pharmacies demonstrated substantial booster availability, although service availability did not reveal which eligible rural residents remained unreached [11]. Operational studies similarly showed variation in staffing, workflow, and delivery arrangements [12]. Independent pharmacies adapted rapidly during pandemic vaccination campaigns [13], while national policy change in Italy expanded pharmacist vaccination roles [14].

Screening studies covered infectious disease as well as chronic-disease risk. A pharmacist-initiated hepatitis C programme established a screening, education, and hepatology-referral protocol, although no participant tested positive and the linkage pathway was consequently not exercised [15]. A Swiss pilot demonstrated feasibility of pharmacy HCV screening among populations targeted for testing [16].

Diabetes screening supplied stronger evidence of large-scale operational reach. A national cluster randomized trial conducted through Australian pharmacies screened 14,093 adults and generated identifiable referral pathways for people meeting risk criteria [17]. Diabetes and cardiovascular-risk screening was also feasible in a developing primary-care system, where screening generated recommendations for physician follow-up [18]. Blood-pressure programmes used explicit referral thresholds to connect abnormal findings with medical evaluation [19], and nonphysician cardiovascular screening identified otherwise unrecognized risk in pharmacy users [20].

The intervention literature was not uniformly positive. In a cluster randomized smoking-cessation study, a structured pharmacy training intervention did not improve every prespecified endpoint [21]. The broader smoking-cessation evidence supports a possible pharmacy role while retaining limitations in certainty and intervention consistency [22]. Similarly, pharmacy distribution of pre-exposure prophylaxis has shown feasibility, but evidence of effectiveness and sustained uptake is less developed [23].

Other services broadened the preventive-care map without resolving the coverage question. Surveys of

pharmacy vaccination users described satisfaction and motivations among people who had already entered the service [24]. Diabetes risk assessment and HbA1c measurement identified people requiring further assessment [25]. Across these service classes, the dominant evidence concerns what pharmacies delivered and what occurred among participants who engaged. Fewer studies identified the eligible population denominator or quantified who was not reached.

Populations reached

Population reach was most informative where service data were linked to geography or deprivation. In Wales, community pharmacies and publicly commissioned services were frequently located in deprived areas, yet greater geographic presence did not automatically produce proportionately greater consultation rates for every service [26]. Analysis of the Common Ailments Service showed a different pattern, with substantially greater use in more deprived communities [27]. These findings demonstrate why pharmacy location, service availability, and actual utilization require separate measurement.

Structural accessibility can nevertheless alter opportunity to obtain preventive care. In low-income US communities, pharmacies offered more adult-immunization locations and substantially more operating hours than physician offices [28]. This represents an access advantage, but it remains a measure of opportunity rather than vaccination completion.

Population experience also changes the meaning of nominal availability. Research with Māori communities showed that cultural safety, trust, and service design shaped how pharmacy-based minor-ailment care was perceived [29]. A US national survey identified reported racial discrimination within community pharmacies and an association between discriminatory experience and delayed prescription pickup [30]. Although that study concerned pharmacy access more broadly, it shows why population membership and experience cannot be reduced to geographical proximity.

Organized screening programmes offer a different model of reach. Community-pharmacy participation in colorectal-cancer screening has supported distribution and return of screening materials within a defined population programme [31]. Such designs make the link

between invitation, service contact, and completion more observable than opportunistic preventive encounters, although their findings remain specific to the programme and service studied.

The cross-service population patterns are summarized in **Table 2**.

Table 2. Observed population reach and equity dimensions across community-pharmacy preventive-service configurations

Service configuration	Population actually observed	Reach indicator	Equity variable explicitly represented	What remains unmeasured or uncertain
Pharmacy vaccination	People presenting for influenza/COVID-19 vaccination	Service use/vaccination encounter	Age, rurality or local context in selected studies	Eligible nonusers and reasons for nonattendance
Rural booster services	Rural pharmacy users	Pharmacy service availability	Rural location	Population-level uptake
Hepatitis C screening	Pharmacy customers accepting screening	Screening participation	Vulnerability/risk targeting in selected programmes	Reach among eligible people who did not present
Diabetes screening	Adults participating in pharmacy screening	Screening completion and referral eligibility	Age and setting; selected demographic measures	Population denominator and nonparticipant profile
BP/CV-risk screening	Pharmacy users accepting screening	Risk detection/referral	Limited and inconsistent	Coverage among high-risk nonusers
Smoking cessation	Service users/pharmacies	Treatment engagement/outcomes	Inconsistently reported	Whether disadvantaged smokers were proportionately reached
Pharmacy immunization access	Residents of low-income communities	Locations and opening hours	Low-income community	Actual immunization uptake
Public-health services in deprived areas	Pharmacy/service users	Consultation volume	Area deprivation	Individual-level need and unmet demand
Common ailments service	Recorded pharmacy consultations	Utilization	Area deprivation	Direct applicability to preventive-service categories
Māori minor-ailment care	Māori community participants	Experience/acceptability	Ethnicity/cultural context	Population-wide uptake
Community-pharmacy experience	Adult pharmacy users	Reported discrimination and access behavior	Race/ethnicity	Preventive-service-specific utilization
CRC screening programme	Invited or participating screening population	Kit distribution/return	Programme population	Transfer to other preventive services

Across the evidence, population reach was therefore strongest where a study measured an actual service encounter or operated within a defined population programme. Geographic accessibility, eligibility, and professional capacity provided useful context but could not substitute for observed utilization. Equity was most interpretable when demographic, socioeconomic, geographic, or cultural variables were attached to service participation itself.

Referral arrangements

Referral processes varied from informal recommendations to seek further assessment to

structured pathways connecting pharmacy findings with another healthcare professional. The practical distinction was whether the pharmacy encounter merely identified a need for additional care or whether the study documented a mechanism for transferring information, arranging subsequent assessment, or verifying that care occurred.

Pharmacy-based HIV prevention illustrates the gap between authorization and implemented referral-capable service. In a survey of community pharmacies in the San Francisco Bay Area, only a small minority reported actually furnishing pre-exposure or post-exposure prophylaxis despite the relevant scope of practice [32].

The finding indicates that formal permission to provide a preventive service cannot be assumed to translate into practical availability.

Coordination was more explicit in organized screening pathways. Primary-care clinicians interviewed about pharmacy participation in colorectal-cancer screening described communication, responsibility allocation, and follow-up as important features of workable pharmacy–primary-care integration [33]. These accounts identify implementation requirements but do not establish that every referred individual completed screening or subsequent diagnostic assessment.

Navigation models extended referral beyond conventional medical services. Integration of community health workers within a pharmacy demonstrated a feasible route for identifying health-related social needs and linking pharmacy users with external resources [34]. As with clinical referral, documented navigation activity should be distinguished from confirmation that the underlying need was ultimately resolved.

Across the charted studies, four referral components could be separated: the finding that triggered referral, the intended destination, the handoff or communication process, and evidence of follow-through. The final component was reported least consistently.

Table 3. Referral configurations reported across community-pharmacy preventive-care pathways

Preventive-service context	Referral trigger	Intended destination	Handoff or communication approach	Follow-through measurement	Unresolved linkage issue
Hepatitis C screening	Reactive/positive screening result where applicable	Hepatology or medical service	Predefined referral protocol	No positive-screen pathway activated in the pilot	Capacity of the pathway to secure completed care remained untested
Diabetes screening	Elevated diabetes-risk result	General practitioner or diagnostic pathway	Referral recommendation with subsequent diagnostic options	Diagnosis or medical follow-up documented for some participants	Not every referred participant had confirmed subsequent care
Diabetes/CVD risk screening	Elevated calculated risk or abnormal measurement	Physician	Advice/referral following pharmacy screening	Subsequent discussion with a physician reported for a subset	Referral recommendation exceeded verified follow-through
Blood-pressure screening	Measurement meeting referral threshold	Physician	Guideline-based referral recommendation	Subsequent clinical evaluation incompletely captured	Referral threshold did not itself establish diagnosis
Colorectal-cancer screening	Screening eligibility or abnormal screening pathway	Primary care/screening programme	Programme-linked pharmacy–primary-care coordination	Screening completion more observable within organized programme pathways	Diagnostic follow-up after abnormal results remained a separate stage
PrEP/PEP prevention	HIV-prevention need	Pharmacist prescriber or other clinical service	Furnishing or referral depending on pharmacy capability	Actual furnishing measured at pharmacy level	Legal authority was much broader than observed service provision
Social-needs navigation	Identified health-related social need	Community or social resource	Pharmacy-integrated community-health-worker navigation	Navigation activity documented	Resolution of the social need was not equivalent to referral initiation

The referral evidence therefore supports a graded interpretation. Community pharmacies can identify risk and initiate movement toward another service, but the literature is less consistent in demonstrating the completion of that movement. Referral initiation and linkage to care should remain separate outcome categories.

Equity reporting

Equity reporting was uneven across services. Some studies directly incorporated deprivation, rurality, cultural identity, or discrimination; others reported little beyond age and sex or described the pharmacy

population without connecting participant characteristics to a relevant population denominator.

Area deprivation provided one of the clearest examples of why equity requires more than locating services in disadvantaged neighborhoods. Pharmacy availability and commissioned public-health provision were often substantial in deprived areas, yet consultation patterns did not always increase in parallel [26]. In contrast, use of the Welsh Common Ailments Service was higher in more deprived areas [27]. The two findings are compatible because they concern different services and measures. They demonstrate that the direction of socioeconomic patterning cannot be inferred from pharmacy location alone.

Structural accessibility also differed from realized use. Pharmacies in low-income US communities offered more vaccination locations and substantially greater opening-hour availability than physician offices [28]. That advantage increases opportunity for access, but the study design does not show which residents were vaccinated or whether disparities in vaccination were reduced.

Cultural and interpersonal dimensions were less frequently measured. Māori participants described service characteristics relevant to culturally acceptable pharmacy-based minor-ailment care [29]. A national US survey found reported racial discrimination in community pharmacies and an association between discrimination and delayed prescription collection [30]. Although the latter study did not examine a specific preventive intervention, it illustrates an access process that may influence whether nominally available pharmacy services are experienced as usable.

Taken together, the literature supports explicit coding of equity variables but not a general claim that community-

pharmacy preventive care is either equitable or inequitable. Where deprivation, ethnicity, cultural context, discrimination, rurality, or income-related access were measured, the resulting patterns were service- and setting-dependent. Where they were absent, the appropriate conclusion is limited reporting.

Coverage gaps

The evidence map revealed several recurrent gaps. First, studies frequently documented service activity without defining the population denominator from which users were drawn. Vaccination, screening, or counselling volume can demonstrate delivery while leaving uncertainty about who remained unreached.

Second, the strongest population-reach evidence tended to come from organized programmes, administrative datasets, or studies linking service use to deprivation or geography. Opportunistic pharmacy services more often described the people who presented than the eligible population that did not.

Third, referral reporting commonly stopped at recommendation or initiation. Screening studies could specify thresholds and destinations, but fewer followed the pathway through confirmed clinical assessment, diagnosis, treatment entry, or other completed linkage.

Fourth, equity variables were inconsistently integrated into service evaluation. Socioeconomic deprivation and geographic access received more attention than several other dimensions relevant to population coverage. Cultural acceptability and discrimination were visible in a smaller subset of studies, while intersectional reporting was uncommon.

These gaps form the evidence structure shown in **Figure 2**.

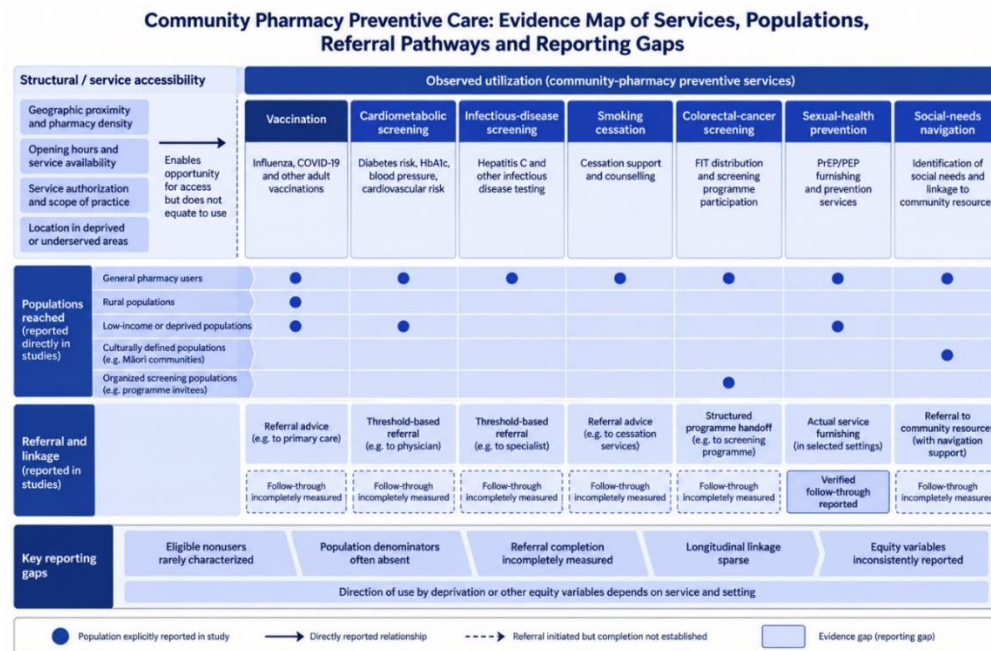


Figure 2. Evidence density and reporting gaps across community-pharmacy preventive services, population reach, referral linkage, and equity measurement

The central finding of this scoping review is that community-pharmacy preventive care is documented more thoroughly as a set of deliverable services than as a population-coverage system. Vaccination, screening, cessation support, infectious-disease prevention, cancer-screening participation, and navigation activities demonstrate substantial preventive capacity. The evidence becomes thinner when the question changes from whether a service can be provided to whether the people with the greatest need are reached and whether subsequent care is completed.

Population reach should therefore be treated as an observed outcome rather than inferred from professional accessibility. The deprivation studies illustrate this clearly: one service can show greater use in deprived communities while another shows no corresponding increase despite strong pharmacy presence [26, 27]. Structural accessibility remains valuable, particularly where pharmacy locations and operating hours exceed those of alternative providers [28], but it measures opportunity rather than completed preventive care.

Referral evidence creates a similar distinction. Screening can detect risk and generate a clinically reasonable next step, yet its preventive value depends partly on what happens after the pharmacy encounter. The charted literature contained examples of referral thresholds, programme coordination, and navigation, but much less

consistent evidence of completed linkage. Legal authority showed the same implementation gap in sexual-health prevention, where actual PrEP/PEP furnishing remained uncommon despite the possibility of pharmacy provision [32].

Equity cannot be inferred from these accessibility advantages. Studies addressing Māori experience, racial discrimination, deprivation, and low-income community access indicate that geography, cultural acceptability, interpersonal experience, and service design can each influence whether a pharmacy service is practically usable [29, 30]. The evidence does not support a single direction of inequality across all preventive services. It supports a stronger methodological conclusion: equity needs to be measured directly.

The resulting synthesis is therefore an evidence map rather than a model of effectiveness. It separates five questions that are commonly compressed: Is the service offered? Who uses it? Who does not? What happens when further care is recommended? Which equity variables are actually measured? Studies answering only the first question cannot carry conclusions about the remaining four.

Evidence gaps and research priorities

Future research should define the eligible or target population wherever feasible, allowing service users to be compared with those who are not reached. Reporting

only encounter counts makes it difficult to distinguish high service volume from broad population coverage. Referral studies should predefine completion outcomes. Useful measures include successful appointment scheduling, confirmed attendance, diagnostic completion, treatment initiation, enrolment in a programme, or documented closure of a social-needs referral. These outcomes should remain distinct from the initial referral recommendation.

Equity analysis also requires more consistent variables at the individual and service-area levels. Socioeconomic status, rurality, race or ethnicity, cultural identity, language, disability, age, sex or gender, insurance or affordability, and digital or transportation constraints should be collected where relevant rather than assumed from pharmacy location.

Longitudinal studies are particularly needed where community-pharmacy screening is intended to initiate a wider preventive pathway. Connecting pharmacy records with primary-care, laboratory, screening-programme, or public-health data would permit assessment of whether identification of risk leads to subsequent care.

Finally, future evaluations should avoid treating accessibility as a surrogate endpoint. Location, opening hours, legal authority, and service availability are important system characteristics, but their population value is best established when they are linked to utilization, completion, and equity outcomes.

Strengths and limitations

This review used a deliberately broad scoping approach that preserved heterogeneous study designs and service models. The separation of service delivery, observed reach, referral, follow-through, and equity reporting reduced the risk of assigning stronger conclusions to accessibility or referral data than those data support. Contradictory and null findings were retained rather than harmonized into a single favorable account of community pharmacy.

Several limitations constrain interpretation. The executed search used PubMed-indexed and publisher-accessible records but did not yield a complete database-export file from which every intermediate screening and retrieval stage could be reconstructed. The review therefore reports only recoverable selection counts and does not invent missing PRISMA arithmetic. The evidence map is also dependent on what individual studies reported; an unmeasured population

characteristic or referral outcome may represent a reporting omission rather than absence in practice.

The included services differ substantially in organization, population denominator, outcome definition, and healthcare context. Consequently, evidence density across one service cannot be used to rank another. The review also did not perform pooled effectiveness estimation, and its findings should not be interpreted as comparative evidence that community pharmacies outperform other preventive-care settings.

Conclusion

Community pharmacies support a broad range of preventive and health-promotion services, but the evidence base is much stronger on service delivery than on equitable population coverage. Actual reach varies by service and setting, and structural accessibility cannot be assumed to represent use. Referral pathways are often described more completely than their outcomes, leaving uncertainty about whether risk identified in the pharmacy leads to completed care. Equity is likewise measured inconsistently, with important socioeconomic, cultural, geographic, and interpersonal dimensions absent from many evaluations.

A more informative preventive-care evidence base would treat service availability, population reach, referral initiation, completed linkage, and equity as separate measurable outcomes. Doing so would allow community pharmacy's preventive role to be judged not only by what services are offered, but by who receives them and what happens afterward.

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