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**Community health workers to strengthen HIV care continuum and
PrEP delivery in the US/HICs: A Scoping Review**

By Vanessa Nunez

Class of 2024

Primary Advisor: Dr. Sheela Sheno, MD, MPH

Secondary Advisor: Dr. Gerald Friedland, MD

A thesis submitted in partial fulfillment of the requirements for the degree of
Master of Public Health in the Department of Epidemiology of Microbial Diseases

Yale School of Public Health

Abstract

Introduction: With the ongoing global HIV/AIDS burden, community-based service delivery models are increasingly recognized, with community health workers (CHWs) at the forefront. In high-income countries (HICs) like the United States, CHWs have long served marginalized communities, gaining recent legislative attention. Despite this, there's still a need for comprehensive evidence on CHW integration in healthcare delivery.

Methodology: We conducted a scoping review to gather available evidence on community health workers (CHWs) and their impact on HIV outcomes in HICs, and to identify evidence gaps in the use of community-based HIV/PrEP services in HICs. Using the American Public Health Association's definition of a "community health worker" and following PRISMA guidelines, we searched peer-reviewed literature published through February 2024.

Results: Of 1631 abstracts screened, 34 articles were selected. Approximately half of the studies (n=19) focused solely on interventions directly related to HIV care and outcomes. The remaining studies integrated HIV care interventions with STIs (n=8), hepatitis (n=5), substance abuse (n=5), LGBTQ+ health (n=1), and general women's health (n=1). Furthermore, technology played a significant role in 4 studies. The roles and responsibilities of CHWs encompassed cultural mediation, health education, care coordination, social and emotional support, advocacy, capacity building, direct service provision, outreach, and participation in research efforts. The majority of studies concerned Black and Latino populations (n=19). Quantitative findings across the HIV care continuum encompassed various aspects: HIV testing/diagnosis (n=22), ART initiation (n=2), adherence (n=6), and retention (n=2), as well as viral suppression (n=8), and PrEP initiation (n=3), adherence (n=1), and retention (n=1).

Conclusions: Overall, CHWs' interventions employ diverse strategies, including community-based, culturally tailored, and technology-driven approaches, to enhance HIV care outcomes. Leveraging CHWs enables policymakers and practitioners to bridge healthcare gaps and tackle disparities, ultimately fostering health equity and enhancing overall health outcomes in HICs.

Keywords: Community health worker; HIV; AIDS; outreach; testing; PrEP; ART; initiation; adherence; retention; high income; scoping review

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Acronyms

ACA: Affordable Care Act
APHA: American Public Health Association
ART: Antiretroviral Therapy
ASOs: AIDS Service Organizations
C3: Community Health Worker Core Consensus
CARES: Coronavirus Aid, Relief, and Economic Security Act
CDC: Centers for Disease Control and Prevention
CHW: Community Health Worker
CBOs: Community-Based Organizations
CI: Confidence Interval
CMS: Centers for Medicare & Medicaid Services
EHR: Electronic Health Records
EMR: Electronic Medical Records
FQHC: Federally Qualified Health Centers
HBHRT: Home-Based HIV Rapid Testing
HCV: Hepatitis C Virus
HICs: High-Income Countries
HIV: Human Immunodeficiency Virus
HRSA: Health Resources and Services Administration
IDUs: Injection Drug Users
LGBTQ+: Lesbian, Gay, Bisexual, Transgender and Queer
LMICs: Low- and Middle-Income Countries
MI: Motivational Interviewing
MCO: Managed Care Organization
MIK: Mobile Intervention Kit
MSM: Men who have Sex with Men
NACHW: National Association of Community Health Workers
NGOs: Non-Governmental Organizations
PVL: Plasma Viral Load
PIH-US: Partners in Health - United States
PLWH: People Living with HIV
PrEP: Pre-exposure Prophylaxis
RCT: Randomized Control Trial
RWHAP: Ryan White HIV/AIDS Program
SOC: Standard of Care
SOPV: Male Sex On-Premise Venues
SPNS: Special Projects of National Significance
STI: Sexually Transmitted Infections
TB: Tuberculosis
UNAIDS: The Joint United Nations Programme on HIV/AIDS
VL: Viral Load
WHO: World Health Organization

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Introduction

HIV/AIDS remains a significant global health challenge, with an estimated 39 million people currently living with HIV¹. In 2022 alone, there were 1.3 million new infections, and approximately 630,000 AIDS-related deaths occurred¹. In the United States alone, approximately 1.2 million people live with HIV, with around 13% unaware of their status². Over the last 30 years, HIV has contributed to the deaths of 40 million people, disproportionately impacting key populations such as women and girls, sex workers, men who have sex with men (MSM), and transgender people³. Addressing these challenges requires concerted efforts at both the global and local levels to ensure equitable access to HIV services and reach the 2030 target of ending AIDS as a public health threat⁴.

Ongoing HIV transmission is driven by gaps in the HIV care continuum, a crucial framework that outlines the stages people living with HIV (PLWH) undertake from diagnosis to achieving and maintaining an undetectable viral load (i.e., viral suppression) through antiretroviral therapy (ART)^{5,6}. It encompasses five essential stages, starting with the diagnosis of HIV infection through testing and the subsequent linkage to HIV medical care, which the Centers for Disease Control and Prevention (CDC) defines as visiting an HIV healthcare provider within 1 month (30 days) of a positive diagnosis^{5,6}. From there, individuals receive ongoing medical attention and initiate ART, a daily treatment regime for HIV that requires consistent and correct intake as prescribed by a healthcare provider (i.e. ART adherence)^{7,8}. Additionally, retention in care or the ability to remain engaged in and adherent to their prescribed ART regimen over time is necessary for viral suppression⁹. Viral suppression, defined by the CDC as a viral load test result of <200 copies/mL at the most recent viral load test, is pivotal for both individual health and preventing transmission to others^{6,8}. In addition to the HIV care continuum, pre-exposure prophylaxis (PrEP) delivery is crucial for prevention. PrEP initiation involves starting antiviral medications before HIV exposure, retention in PrEP care ensures ongoing access, and adherence to PrEP involves consistent medication use, all contributing to effective prevention strategies alongside HIV treatment efforts¹⁰⁻¹². These components, interwoven within the continuum, are essential for achieving improved health outcomes and reducing HIV transmission rates on a broader scale. By identifying gaps in the continuum, policymakers, healthcare providers, and community organizations can develop targeted strategies to support individuals with HIV in navigating the continuum effectively.

To address gaps in the HIV care continuum, international organizations have identified the need for scaling up efforts to promote the recruitment and retention of competent, skilled, and motivated community health workers (CHWs) to deliver HIV services¹³. In December 2020, UNAIDS released a new set of fast-track targets advocating: 95% of all people living with HIV to know their HIV status, 95% of those with a diagnosed HIV infection to receive sustained antiretroviral therapy (ART), and 95% of all people ART to achieve viral (VL) suppression by 2025¹⁴. In a 2021 Declaration, United Nations (UN) members pledged to ensure that, by 2025, local communities would be responsible for delivering 30% of all HIV testing and treatment services, 80% of HIV prevention services tailored for high-risk populations, and 60% of programs designed to foster societal support systems¹³. This commitment to bolstering community-based HIV care models builds upon the 2008 World Health Organization (WHO) endorsement of task shifting as a strategy to address the shortage of trained health workers and enhance the delivery of HIV care¹⁵. Task shifting, which involves redistributing specific healthcare tasks to workers with less clinical training, has been hailed as a pragmatic approach to addressing workforce shortages and enhancing the delivery of HIV care¹⁵. By leveraging the skills and dedication of CHWs, task shifting contributes to the accessibility and overall quality of HIV services, aligning with the evolving landscape of healthcare delivery and the imperative of patient-centered care.

In the effort to enhance HIV service delivery by recruiting and retaining competent CHWs, it's crucial to acknowledge the lack of consensus regarding the definition of a CHW in global literature. Due to the absence of a widely accepted definition, it is challenging to quantitatively assess the comparative benefits of CHWs within HIV service delivery. For this thesis, I employed the definition of a community health worker provided by the American Public Health Association (APHA), which has been extensively embraced in the United States:

“A community health worker is a frontline public health worker who is a trusted member of and/or has an unusually close understanding of the community served. This trusting relationship enables the worker to serve as a liaison/link/intermediary between health/social services and the community to facilitate access to services and improve the quality and cultural competence of service delivery.”¹⁶

The key defining features of selecting a CHW include community membership; familiarity with community culture and languages; personality traits; fostering trust and respect;

prior healthcare experience; and educational qualifications¹⁷. The Community Health Worker Core Consensus (C3) Project sought to establish a unified set of CHW roles and fundamental competencies applicable across all CHW work environments¹⁸. Through the C3 Project, input was gathered from CHWs across the United States, and 10 core CHW roles were identified: cultural mediation; culturally tailored health education; care coordination; coaching and social support; advocacy; building individual and community capacity; direct service provision; assessment; outreach; and facilitating evaluation and research efforts¹⁸. CHWs can act as liaisons between marginalized populations and healthcare resources, contributing to improved health outcomes and reductions in health disparities^{16,17}. There is a diversity of CHW roles and responsibilities, representing the adaptability of CHWs in differing community health initiatives.

CHWs have emerged as vital contributors to the global response to the HIV/AIDS pandemic. At first, CHW home-based care programs in LMICs aimed to support primary caregivers of individuals living with HIV/AIDS, offering community education, counseling, and general assistance¹⁹. Over time, CHW services have progressed to include more comprehensive clinical care such as ART delivery, PrEP implementation, HIV testing, treatment preparation, community mobilization, health promotion, etc.^{20,21}. In Sub-Saharan Africa, CHWs have taken on a variety of roles in HIV care such as delivering HIV-specific services (e.g., HIV testing and screening for opportunistic infections and acute illnesses), distributing medications, locating individuals who had dropped out of care, and offering assistance in the form of treatment support, referrals, home-based care, and psychosocial support²². CHWs are especially helpful in rural or remote settings that tend to have limited access to healthcare facilities and services^{23–26}.

Community-based approaches have demonstrated improved engagement in HIV testing and have also shown promise in improving outcomes including VL suppression and PrEP initiation^{11,26–32}. In addition, CHW systems are cost-effective and rapidly scalable units of the healthcare system^{33,34}. A systematic review of 14 randomized controlled trials (RCTs) has demonstrated similar positive CHW-associated outcomes across various health conditions (such as TB management, and prenatal care) and diverse settings (including urban and rural areas, Africa, South America, and Southeast Asia³⁵). The bulk of the evidence supporting the effectiveness and feasibility of healthcare models with CHWs originates from low and middle-income countries. Inspired by these successes, there has been a growing interest in extending the role of CHWs to high-income countries in recent years^{36,37}. Recognizing the versatility and

effectiveness of CHW-led interventions, health systems in high-income countries are increasingly exploring ways to incorporate CHWs into their healthcare frameworks^{36,37}.

Despite the appeal, there are criticisms of integrating CHWs into healthcare systems. Concerns include the paucity of data about the impact of CHWs on patient outcomes, quality of care, appropriateness in different contexts, remuneration, sustainability, cost-effectiveness, competencies, training, and quality assurance³⁸. CHW programs often face issues with insufficient funding, fragmented programming due to diverse external donors with specific disease focuses, inadequate supervision, and a lack of continuous performance assessments and improvements³⁹. There are critiques that task shifting to CHWs is not helpful due to the lack of formal linkages to the healthcare systems³⁸. In the realm of HIV services, these doubts and the lack of recognition of CHWs reduce their ability to support national ART programs, for instance³⁸. Lack of support for the expansion of CHW programs has hindered their ability to carry out public health programming. However, there has been progress in some US states on operationalizing insurance reimbursement for CHW services⁴⁰.

Although the contributions and effects of CHWs in HIV care within low- and middle-income countries (LMICs) have been thoroughly studied and analyzed, there is still a need for a comprehensive evaluation of CHWs in the United States and other high-income countries (HICs). In high-income countries, most CHWs cater to communities that have faced structural oppression and are marginalized by conventional healthcare systems⁴¹. For instance, in the United States, these include Black, Latinx, American Indian/Alaska Native, and Asian/Pacific Islander communities, as well as LGBTQ+, rural, and low-income populations⁴¹. Historically, CHW-led programs have focused on non-communicable diseases such as cancers, cardiovascular diseases, chronic respiratory diseases, and diabetes services¹⁷. As a result, CHW integration in HIV care settings across the United States has a long history but has been limited to select sub-populations.

CHWs have operated in various settings in the United States for over 70 years⁴¹. CHWs were initially included on an ad-hoc basis, incorporating indigenous outreach workers and educators in the 1950s, CHWs in anti-poverty programs in the 1960s, and the establishment of the Community Health Representative program in 1968 by the Indian Health Service to address the particular health-related needs of the indigenous community^{42,43}. This expanded to more disease-specific programming in the 1970s and 1980s through short-term grants⁴². Legislation

and support for the integration of CHWs stalled throughout the 1990s and early 2000s until the passing of the 2010 Patient Protection and Affordable Care Act (ACA) allowed for CHWs to be incorporated into programs authorized under the Medicaid health homes state plan option^{41,44}. This created a policy environment conducive to integrating CHWs into primary care settings as healthcare increasingly became concerned with the social determinants of health and ways to reduce preventable utilization as they bore more of the total costs of care as a result of capitated payments⁴⁴.

Individual states have implemented a range of strategies to incorporate CHW services into their Medicaid programs, influenced by factors like existing healthcare infrastructure, payment models, and state policy objectives⁴⁰. As of July 2021, CHW services are reimbursed through Medicaid programs in 29 states⁴⁰. In states where Medicaid covers CHW services, these are typically available to all Medicaid members or specific target populations, with a focus on various conditions such as pregnancy, behavioral health, chronic homelessness, oral health, and HIV⁴⁵. States have been authorized by the Centers for Medicaid and Medicare (CMS) to include CHW services in their Medicaid programs through either a state plan amendment (SPA) or as part of their state's Section 1115 demonstration waiver which allows states to use federal Medicaid funds in ways that federal rules do not otherwise allow^{40,45}. Some states also permitted reimbursement for CHW services through managed care organization (MCO) contracts, even if not explicitly stated in their Section 1115 demonstration waivers^{40,45}. Also, in response to the increased demands for culturally competent healthcare workers during the COVID-19 pandemic, the CARES Act of 2020 and the American Rescue Plan of 2021 allocated \$225 million to the CDC to train over 13,000 CHWs for public health services and seamless integration with state and local public health departments⁴⁶. This investment is part of a historic allocation of over \$1.1 billion for community health, outreach, and health education workers, aiming to deploy over 40,000 individuals in these roles in the coming years⁴⁶.

As of May 2023, it is estimated that there are 58,550 CHWs actively working in the United States, and this number is anticipated to rise due to significant investments in the field.⁴⁷ These CHWs largely practice in four overarching integration models in the United States: community-clinical linkages (i.e., partnerships between community-based organizations and local healthcare institutions), CHWs embedded in healthcare institutions, employment by payers, and employment through public health departments⁴¹. Against this policy backdrop, CHWs are

increasingly recognized as vital members of community service and primary healthcare delivery teams, opening an opportunity for increased scale-up for HIV services.

NGOs and professional organizations have also advocated for the expansion of CHWs in the United States. Initially, CHW leaders laid the groundwork for a national organization through volunteer-based initiatives, including the establishment of a CHW section within the American Public Health Association (APHA)¹⁶, the formation of the American Association of CHWs (2007-2009), and collaborative networking and planning through the national Unity Conference⁴⁸. Through successful policy advocacy, they championed the advancement of CHW workforce development, with notable achievements such as the adoption of a nationally accepted CHW definition by the APHA¹⁶ and the creation of a standard occupational classification for CHWs by the U.S. Department of Labor in 2010⁴⁹. In 2019, the National Association of Community Health Workers (NACHW) was established as a 501(c)(3) organization⁵⁰. Since its inception, NACHW has emerged as a significant national force through engagement with federal agencies, health policy organizations, healthcare providers, and major corporations. With over 3,000 members nationwide, a growing full-time staff, and a budget exceeding \$4 million, NACHW continues to amplify the voices of CHWs and strengthen the profession's capacity to foster healthy communities⁵¹.

In recent developments, the Community Health Worker Access Act, introduced by U.S. Senator Bob Casey in March 2024, aims to enhance Medicare coverage for CHW services and incentivize Medicaid programs to include these services^{52,53}. This legislation, backed by numerous CHW networks and public health organizations, seeks to expand access to CHW services by improving payment eligibility and providing additional federal resources^{52,53}. Specifically, the bill expands coverage for preventive healthcare and addressing social needs as well as mandates states to broaden access and allocate extra federal resources for Medicaid to encompass these services^{52,53}. Partnerships between organizations like Partners in Health (PIH-US) and NACHW have been instrumental in providing input on the bill, mobilizing grassroots support, and advocating for its passage, demonstrating a collaborative effort to bolster the role of CHWs in promoting community health and addressing social needs^{52,54}.

The push to increase CHW utilization in the US has led to greater use of CHWs in managing chronic conditions, including HIV/AIDS, particularly among marginalized populations. CHWs have been used in a variety of communities in the United States such as

“promotores” for underserved Latinos in the Southwestern United States or “accompagnateurs” to those in inner-city Boston who face substance abuse, severe mental illness, homelessness, or domestic violence^{55,56}. “Promotores” interventions were found to reduce HIV/AIDS stigma and increase HIV-related knowledge, perception of risk, and willingness to discuss sexual risk with partners⁵⁵. CHWs in the US have been found to improve ART adherence, reduce HIV viral loads, and increase CD4 cell counts⁵⁷. From 2016 to 2019, The Health Resources and Services Administration (HRSA) HIV/AIDS Bureau funded 10 project sites across the country to integrate CHWs into Ryan White HIV/AIDS Program (RWHAP) care settings⁵⁸. For example, CHWs in the East Baton Rouge Parish, Louisiana site had multiple functions such as HIV testing, PrEP navigation, sterile injection supplies, referrals to syringe services programs, and linking patients to social services (e.g., transportation, job readiness, insurance enrollment, and housing assistance)⁵⁹. Through establishing connections with marginalized populations, CHWs play a vital role in bridging the gap in healthcare resources. Through their earned trust and respect, CHWs can alleviate the stigma and apprehension surrounding HIV, as they often belong to the same prioritized groups, thereby promoting greater acceptance of HIV prevention and treatment measures across the care continuum.

Given the eagerness and political momentum for the expansion of CHWs, there is a need for an evidence base to describe best practices and what is currently being done in the United States and other similar economies (HICs). One review of CHWs in the United States identified two main challenges with the available evidence⁴¹. Firstly, there are often lower-quality study designs, often relying on pre-post assessments; and secondly, there is wide variability in CHW programs regarding disease focus, design, and supervision, complicating result comparisons⁴¹. Concentrating on evidence derived from CHW initiatives addressing HIV/AIDS could enhance the comparability of studies, providing valuable insights for guiding future research and policy development related to chronic conditions. Therefore, we aimed to conduct a scoping review of the literature on CHWs in the United States and other HICs to determine the feasibility of community-centered HIV service delivery and to identify gaps in existing evidence.

Methods

Research Questions

The purpose of this scoping review of the existing literature surrounding CHWs in the United States and HICs is to identify the viability of community-centered HIV service delivery for HIV testing/screening, ART delivery, VL suppression, and the adoption of PrEP in high-income countries.

The research questions motivating this scoping review are:

1. “What is the available evidence on community health workers and their impact on the HIV care continuum and PrEP uptake in the United States and HICs?”
2. “What key concepts can be used to immediately inform policy, practice, and research moving forward?”

Primarily, I aimed to summarize existing data demonstrating the feasibility of community-based HIV services for eight HIV outcomes of interest: HIV diagnostic testing, ART initiation, adherence, retention, and VL suppression as well as PrEP initiation, adherence, and retention. My second aim is to demonstrate evidence gaps in the use of community-based HIV/PrEP services in high-income countries.

Rationale of Scoping Review Research Design

To accomplish these aims a scoping review design was chosen due to its ability to provide a comprehensive overview and mapping of available evidence within a given field and time⁶⁰. By identifying and synthesizing existing evidence, we can determine patterns, trends, and gaps in the literature⁶¹. Given the wide variety of roles, functions, and names a community health worker can undertake, a scoping review can assist in clarifying key concepts and definitions relating to CHWs in HIV care. Additionally, scoping reviews can delve into the methodologies and approaches employed in research and help elucidate the differing ways researchers answer their key questions^{60,61}. Notably, scoping reviews can help guide future research endeavors and contribute to evidence-based decision-making⁶⁰. This allows us to present information that may inform future policy, practice, and research relating to CHWs in HICs. Scoping reviews are not intended to produce a synthesized result or recommendation to a specific question and do not involve a formal evaluation of the methodological rigor of the included studies⁶¹.

This scoping review was conducted and reported in accordance with Levac et al's recommendations for scoping review methodology and the JBI Manual for Evidence Synthesis, Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020 and the PRISMA Extension for Scoping Reviews ([Appendix A](#))⁶²⁻⁶⁵. This review considered evidence from quantitative and mixed-method studies, following the reporting requirements of the PRISMA guidelines⁶⁵ and using an aggregative narrative synthesis approach to summarize the quantitative results⁶⁶.

Information Sources, Search Strategy, Data Extraction and Management

A public health librarian (AAG), skilled in medical and public health database navigation, guided in constructing an electronic literature search. Access was granted to nine electronic databases via the Harvey Cushing/John Hay Whitney Medical Library to find relevant articles published from the inception of each database to February 7, 2024. These include AMED, Cochrane Library, CINAHL, Global Health, Google Scholar, Ovid Embase, Ovid Medline, Scopus, and Web of Science Core Collection databases. The search included a combination of keywords and controlled vocabulary for community health workers, HIV, and high-income countries. The search was peer-reviewed by a second medical librarian using the Peer Review of Electronic Search Strategies (PRESS)⁶⁷. The search was not limited by language, publication type, or year ([full search strategies available in Appendix B](#)).

Citations from all databases were imported into an Endnote 21 library and duplicates were removed using the Yale Reference Deduplicator Tool⁶⁸. The deduplicated results were then entered into Covidence, a web-based systematic review software for screening and data extraction. Initially, all search results underwent screening based on their title and abstract by myself and another investigator (AT) to confirm studies that meet the inclusion criteria. The full text of selected articles was retrieved and sequentially reviewed in duplicate as well. Any disagreements were resolved through review by the primary thesis advisor (SS). The final included articles were then uploaded to Zotero for citation management.

A standardized table generated in Qualtrics⁶⁹ was used to extract data items independently and was ultimately exported to an Excel document for analysis. The following relevant information was extracted from every included study, report, or paper: title, author(s), year, city/state/region/country of focus, rurality, study type, data type, data collection methods, population under study, gender distribution, sample size, name(s) and role(s) of CHW,

intervention setting and scope, and HIV outcomes of interest: HIV diagnostic testing/screening, linkage to care, ART initiation, adherence, retention, and VL suppression, PrEP initiation, adherence, and retention.. Quantitative data associated with the HIV outcomes of interest were abstracted. Additional items of interest were also documented. Qualitative data was not abstracted.

Inclusion / Exclusion Criteria

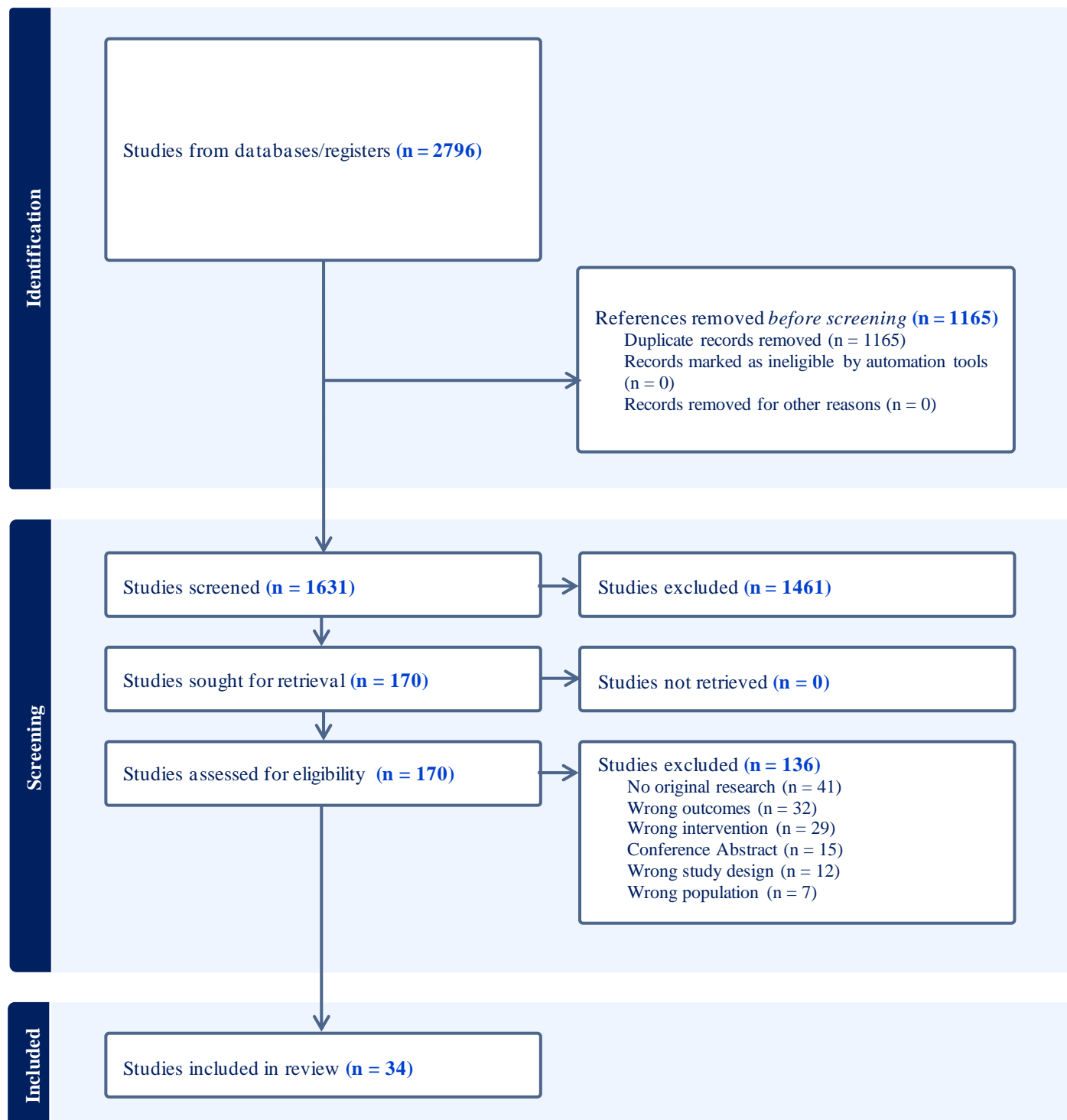
Data from quantitative and mixed method studies to appropriately capture relevant HIV care outcomes in interventions that involve CHWs or other related job titles such as lay health advisors, outreach workers, health educators, health coaches, peer educators, etc. Included articles covered responsibilities undertaken by CHWs in HIV care, such as providing education and health promotion, offering HIV-specific services like testing and screening for opportunistic infections, delivering medications such as PrEP, locating individuals who have defaulted from care, and providing support through treatment support, referrals, home-based care, and psychosocial support. Studies needed to provide our outcomes of interest relating to the HIV care continuum in conjunction with the use of CHWs (according to the APHA definition) to be included. This includes HIV diagnostic testing, ART initiation, adherence, retention, and VL suppression as well as PrEP initiation, adherence, and retention.

We excluded studies that:

- (i) Included only qualitative data
- (ii) Did not take place in the US or other high-income nations
- (iii) Focused solely on the behavioral and interpersonal aspects of CHW delivery such as stigma reduction, trust building, cultural competency, awareness etc.
- (iv) Exclusively talked about the programmatic aspects of CHW delivery (e.g., human resources, training, logistics, health department integration).
- (v) Discussed community-based approaches to HIV care (e.g., mobile clinics, support groups) but didn't make explicit mention of CHWs,
- (vi) Concerned the use of CHWs with other conditions (e.g. TB, hypertension) or primary care but not HIV
- (vii) Use data collected by CHWs or outreach workers but they themselves are not involved in HIV interventions.
- (viii) Had no original research (such as a protocol or review)
- (ix) Did not have a full text in English available

There was no restriction placed on the publication date or study population.

Figure 1. PRISMA 2020 diagram for new systematic reviews which included searches of databases and registers only



Results

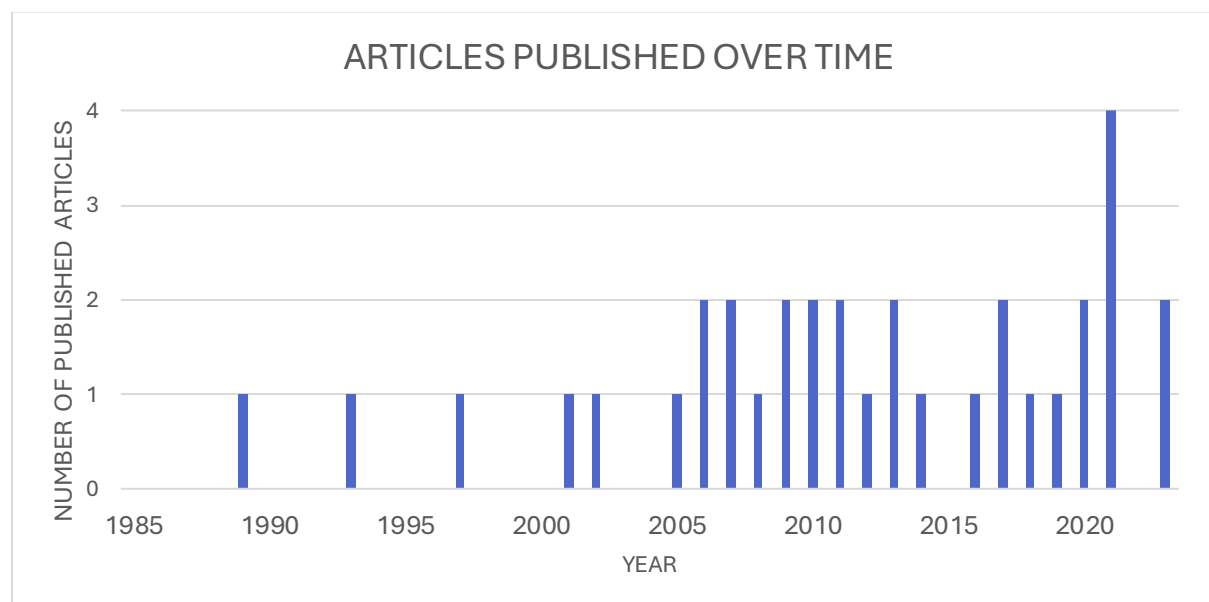
Search and selection of articles

Database searches resulted in 2,796 citations (Figure 1). After removing duplicates, 1,631 citations underwent title and abstract screening. This led to the exclusion of 1461 papers. Ultimately, full texts for 170 articles were retrieved and assessed against the eligibility criteria. Further scrutiny during the review of the full-text articles and data extraction resulted in the exclusion of 136 articles due to no original research, wrong outcomes, wrong interventions, conference abstracts, wrong study design, and wrong population (Table of excluded studies can be found in [Appendix C](#)). Thus, a total of 34 articles were incorporated into this scoping review.

Description of Included Studies

A total of 34 articles were identified that included CHW interventions with our HIV outcomes of interest. Articles were published between 1985 and 2024 with over half (62%, n=21) being published after 2010 (Figure 2). The table of included studies in [Appendix D](#) has more detailed information on study characteristics and findings.

Figure 2. Number of Included Published Articles Over Time



The vast majority of the included studies were from the United States (n=29) with only five studies coming from other nations including Canada⁷⁰, France⁷¹, Lithuania⁷¹, and Australia^{72,73}. Within the United States, the thirty-four included studies concerned eighteen states (and Puerto Rico⁷⁴) from all four U.S. census regions⁷⁵ with seven states (n=10 studies) from the South^{59,74,76–84}, five states (n=11) from the North^{76,79,82,85–92}, three states (n=10) from the West^{74,76,79,82,93–97}, and three states (n=8) from the Midwest^{76,82,98–102}. The most well-represented locations were California^{26,74,76,82,93,96,97} (n=7), Texas^{74,76,78,79} (n=4), Florida^{79–81,83} (n=4), Maryland^{79,87–89} (n=4), and Michigan^{76,82,98,99} (n=4).

A variety of study types were utilized to evaluate the feasibility, acceptability, implementation, and impact of interventions with CHWs on HIV care in differing populations. The most common study type was the pilot study (n=10)^{59,77,78,80,82,84,85,89,90,97} a small-scale preliminary investigation conducted before a main study to assess feasibility, methodology, and potential effectiveness¹⁰³. The second most common study type was process/implementation evaluations (n=8)^{26,70,79,83,88,94,100,104} which assess the extent to which program activities have been carried out according to plan and have yielded specific outputs¹⁰⁵. Another frequently utilized study design was the randomized control trial or RCT (n=7)^{81,82,86,92,98,99,102} to evaluate the effectiveness of specific interventions and outline the cause-effect relationships between interventions and outcomes through randomization of intervention and control groups¹⁰⁶. Other study designs included cross-section designs (n=3)^{72,93,96}, quasi-experimental designs (n=2)^{87,91}, pre/post-test studies (n=1)⁷⁴, outcome/effectiveness evaluations (n=1)⁷⁶, descriptive studies (n=1)¹⁰¹, and observational studies (n=1)⁷³.

Quantitative data was collected through a variety of means such as a survey or questionnaire (n=32)^{71,76,82,85,86,96,102,104,107–130}, pre and post-testing knowledge/attitude tests (n=3)^{74,85,125}, electronic health or medical records (EHR/EMR) (n=9)^{73,77,79,81,90,92,98–101}, observation (n=4)^{71,74,78,104}, or program documentation (e.g., outreach logs, administrative data, referral forms, claims data, etc.) (n=7)^{76,79,94,100,100,112,115}. Only 2 studies did not involve some form of a survey or questionnaire and instead relied on EHR data^{73,101}.

Terminology

The studies included in the scoping review used a wide variety of names for the community health worker, reflecting their diversity of roles and characteristics. The most commonly identified job title was some variation on outreach worker (n=13) such as peer

outreach worker^{98,99}, street outreach worker⁸⁵, indigenous outreach worker⁷⁴, community health outreach worker⁹³, health outreach worker⁹⁴, or outreach worker alone^{76–78,86,87,95,96}. The second most common job title was community health worker^{59,71,72,74,79–83,88,89,104} (n=12) with one article mentioning a peer CHW⁸⁸. Eight articles mention “peer” in the job title with names such as peer advocate or specialist^{76,95}, peer health educator^{93,97}, peer outreach worker^{98,99}, peer health coach⁹⁰, and peer CHW⁸⁸. Six articles had variations on health educators such as lay health educators¹⁰⁰, peer health educators^{93,97}, sexual health educators⁷³, community health educators⁹¹, and health educators themselves¹⁰¹. Four articles mention “lay” with job titles included lay counselor⁹², lay health educator¹⁰⁰, lay health worker¹⁰², and lay health advisor⁸⁴. Other titles include health coach^{90,102}, Navegante¹⁰⁰, facilitator⁹¹, patient navigator⁹⁵, service linkage worker⁷⁶, and fieldworker⁷². Some articles used more than one term to refer to the CHW^{72,76,91,93,95,100,102}.

Settings of CHW interventions

The integration of community health workers (CHWs) into various settings is a pivotal aspect of healthcare delivery, particularly in addressing public health challenges like HIV/AIDS. In this context, understanding the diverse venues where CHW interventions are implemented provides valuable insights into their reach and effectiveness.

Clinic-Based Settings

CHW interventions were performed in various clinical settings (n=15), including hospitals, primary care clinics, outpatient specialty clinics, and community-based health centers^{71,76,82,86,101,107,108,111,116,118,121,122,126,128,129}. Three articles had CHWs either practicing or conducting outreach and education in hospital settings⁹⁰ such as emergency departments^{76,108}. Four articles described interventions that were integrated into primary care settings or had participants specifically recruited from primary care clinics^{77,79,86,91}. Outpatient specialty clinics such as HIV clinics^{111,128,129}, STD clinics^{76,101}, immunology clinics⁸¹, adolescent clinics^{82,98}, and infectious disease clinics⁷⁷, were mentioned in 11 articles⁹¹. Community health centers, nonprofit healthcare facilities that provide primary healthcare services in underserved areas¹³¹, were mentioned in 4 articles^{71,90} with 2 of them being specifically called Federally Qualified Health Centers (FQHCs)^{58,97}. One study reported on 10 sites representing different types of organizations such as Federally Qualified Health Centers (FQHCs), AIDS service organizations (ASOs), city public health departments, and HIV clinics in academic medical centers⁷⁹. Evidence

of CHWs within traditional clinical settings was readily apparent, highlighting their integration into established healthcare systems.

Community Settings

The majority of studies took place in non-clinical settings (n=22)^{73,74,76,82,85,88,91,96,104,113–115,117,119,120,122–127,130}. About half of the studies (n=18) took place in community centers such as churches, cultural centers, LGTBT centers, fairs, libraries, soccer fields, restaurants, college campuses, CBOs, and youth centers^{32,59,73,74,76,80,82,84,87,88,93–97,99,100,107}. Additionally, CHWs visited participants at their place of residence with 7 studies mentioning interventions being delivered at client homes^{79,80,82,83,90,91,94} and 3 at homeless encampments^{94,95,104}. Mobile vans equipped with HIV testing and linkage services were also utilized in three studies, demonstrating a mobile approach to healthcare delivery that brings services directly to communities in need^{72,76,83}. Furthermore, CHWs strategically targeted venues associated with potential high-risk sexual activity, including massage parlors⁷⁰, brothels⁷³, and bars/clubs^{73,76,88,94,96}. Other places of note were streets/bus stops^{87,93,94,96} (n=4) and safe syringe sites^{59,72,85,95} (n=4) for injection drug users (IDUs) and youth.

The diverse range of venues where CHW interventions are implemented reflects their integral role in community-based healthcare delivery. From traditional clinical settings to unconventional environments, CHWs aim to underserved populations and provide targeted interventions to address HIV/AIDS and related public health challenges.

Target Populations

The vast majority of the interventions involved serving specific populations, aligning with the core mission and function of CHWs. By focusing on specific populations, CHWs can deliver culturally sensitive and tailored interventions that effectively address the barriers to HIV prevention, testing, and care within these communities.

Around two-thirds of studies (n=22) aimed or served specific ethnic or racial groups. Thirteen studies centered around the Black or African American community. Within these, interventions addressed young adolescents^{76,90,98,99,129}, MSM^{76,99,112,115}, transgender people^{112,115}, PLWH^{76,77,81,90,98,99}, IDUs^{77,115}, and unhoused people⁸³. Five studies had CHWs themselves be from the Black community^{76,77,99,112,115}. Other CHW identities that aligned with the target population were being from the same location^{77,83,98,112,117,117}, part of the LGBTQ+ community^{59,76,99,112}, a woman^{59,77}, PLWH^{76,90}, an IDU⁵⁹, a young person, or an

adolescent^{98,99,112}. One study had CHWs who were able to speak fluently with participants in their language of preference such as Haitian Kreyol in Little Haiti in Miami, Florida⁸³.

Eight studies served Hispanic/Latino populations within the United States^{74,76,79,90,91,94,119,126}. Within these, interventions addressed Hispanic/Latino women^{91,94,126}, men⁷⁹, transgender people¹²⁶, IDUs^{74,94}, MSM^{81,94,94}, young adolescents⁹⁰, and PLWH^{76,90}. HIV materials and educational sessions were adapted to be delivered in Spanish^{74,91,100}. Additionally, several articles noted CHWs being matched on Hispanic/Latino ethnicity^{74,76,79,91,126}. Oftentimes these were in conjunction with other identities such as being a man¹⁰⁰, a previous IDU⁷⁴, or a transgender woman¹²⁶.

Only one study focused on delivering an HIV intervention to the Asian community, specifically conducting HIV testing for Chinese sex workers in Canada in this case⁷⁰. The CHW outreach teams consisted of women with sex work experience and shared language or Asian ancestry⁷⁰. Similarly, one study focused on indigenous populations⁷². A screening program by non-indigenous CHWs was established in the aftermath of an HIV outbreak among PWID of Aboriginal origin in Melbourne, Australia⁷².

Thirteen studies involved people with substance abuse (e.g. injection drug use, cocaine, heroin, alcohol, etc.)^{59,72,74,77,82,85–87,92,93,96,114}. As a result, CHWs targeted sites by IDUs such as safe syringe sites^{59,72,85,114}, bars/clubs^{94,96}, soup kitchens¹¹⁴, homeless and domestic violence shelters¹¹⁴, streets/bus stops^{87,93,94,96}, drug treatment centers,¹¹⁴ and clinics^{77,82,86,92}. Interventions used outreach workers with a history of substance abuse^{87,94} or current and/or former street youths⁹⁶ for HIV testing and linkage to care.

Eight studies focus on the LGBTQ+ population with seven studies specifically focused on MSM,^{59,73,76,88,94,99,114} five of them being focused on MSM of color,^{59,76,88,94,99} and three studies focused on transgender people of color^{59,88,97}. CHWs often had a shared LGBTQ+ and/or racial/ethnic identity^{59,76,88,97,99} with one study specifically employing four peer health educators who were transgender women of color to lead community mobilization efforts and delivery of trans-specific PrEP navigation, education, and assistance⁹⁷. Pride events^{76,88}, male sex on-premise venues (SOPV)⁷³, and LGBTQ+ centers⁹⁷ were visited for outreach purposes. Of note, four out of the five studies targeted bars/clubs frequented by MSM^{73,76,88,94}.

Seven studies^{59,70,78,91,94,97,104} had interventions that targeted women while only two studies targeted non-MSM men^{84,100}. Other populations of interest were young people /

adolescents^{73,76,82,89,90,93,96,98,99,114} (n=10), unhoused individuals^{83,93,96,104,114} (n=5), sex workers(n=5)^{70,73,87,93,96}, people with mental illness(n=1)¹¹⁴, and those who participated in the street economy (e.g., prostitution, drug sales, theft, panhandling, pornography, or selling stolen property)(n=2)^{93,96}.

Only one study did not mention a specific population of interest and instead aimed to assess the feasibility and acceptability of HIV self-testing with CHWs acting as supervisors⁷¹. While not targeting a specific population, this intervention provided valuable insights into the potential role of CHWs in supporting innovative HIV testing strategies and expanding access to testing services⁷¹.

Scope of Interventions

The interventions carried out by CHWs exhibited a diverse range of scopes and purposes, reflecting the multifaceted approach to addressing HIV and related health outcomes. About half of the studies (n=19) studies focused solely on interventions directly related to HIV care and outcomes including HIV testing/diagnosis, ART initiation/adherence/retention, VL suppression, and PrEP initiation/adherence/retention. In contrast, the remaining studies integrated HIV care interventions with efforts targeting other diseases or general health concerns. In 8 studies, HIV was combined with other STI (e.g. chlamydia, gonorrhea, syphilis) interventions involving education or direct delivery of STI screening in combination with HIV testing^{59,70,72,73,84,92,100,104}. In 5 studies, HIV was combined with hepatitis C for testing and screening events^{59,72,73,85,104}. Another five studies merged HIV care with substance abuse interventions for high-risk behaviors of IDUs especially^{74,85,87,93,96}. One study was a larger Spanish-based intervention concerning general women's health, covering topics such as HIV and STD transmission and prevention, sexual and reproductive health, substance use, partner violence, body image, and the role of social determinants of health (e.g., economics and oppression)¹⁰⁷. The only study that incorporated HIV care into LGBTQ+ healthcare was the TRIUMPH (Trans Research–Informed Communities United in Mobilization for the Prevention of HIV) project in California which delivered educational modules, community mobilization, and direct service delivery concerned trans-specific health issues (i.e. accessing hormones), safer sex act, alcohol and substance use, and PrEP services¹²⁶. These different strategies recognized the need for tailored approaches that address the specific needs and contexts of diverse populations and communities.

Technology-Based Interventions

In four studies, technology was a key component of the delivery of the primary intervention^{79,85,88,90}. For instance, in a 2017 study, outreach workers collaborated with study staff to develop the Mobile Intervention Kit (MIK), a tablet-based intervention with three separate educational modules relating to HIV, HCV, and overdose prevention⁹¹. A 2020 program evaluation of 10 Ryan White HIV/AIDS Program (RWHAP) sites showed CHWs utilized various digital platforms such as phones, texts, social media, and email to conduct the majority of their interactions with clients, ranging from emotional support to healthcare appointment reminders⁷⁹. Similarly, a 2021 study had peer CHWs assisting participants across the PrEP cascade of care using virtual, participant-initiated activities including a website, a text-capable PrEP telephone warm-line, and the PrEPme smartphone app⁸⁸. The Adherence Connection for Counseling, Education, and Support (ACCESS) 2023 study evaluated the feasibility and acceptability of a peer-led mHealth cognitive behavioral intervention (CBI) via remote video conferencing on study-provided smartphones⁹⁰. These studies reflect the increasing interest in recent years in leveraging technology to deliver patient-centered HIV care.

Roles of the CHW

Throughout the examination of 34 studies, the roles and responsibilities assumed by CHWs in HIV interventions exhibited significant diversity. These roles were classified based on the insights from the Community Health Worker Core Consensus (C3) project, which established a standardized framework of 10 CHW roles and competencies to promote cohesion with the CHW field¹⁸. The Boston University Center for Innovation in Social Work and Health amended these roles to suit the HIV continuum care within a fact sheet¹³². Each study illustrated distinct ways in which CHWs contributed to HIV prevention, treatment, and care, demonstrating a wide array of approaches embraced by these frontline healthcare providers.

Role 1: Cultural Mediation Among Individuals, Communities, and Service Systems

CHWs served as cultural mediators within various communities and social service contexts, facilitating access to healthcare, education, and support services. In 15 studies, CHWs educated individuals and communities about how to use health and social service systems in a culturally sensitive, but not necessarily structured, way^{76,78,80,81,83,87-91,93,96,97,100,102}. In the Special Projects of National Significance (SPNS) Young MSM of Color Initiative, CHWs serve as

ongoing linkage agents, assisting clients in navigating the healthcare system and accessing necessary services⁷⁶. CHWs bridged the information gap between marginalized communities and healthcare resources, empowering individuals to overcome barriers to care.

Role 2: Providing Culturally Appropriate Health Education and Information

Across 16 studies, CHWs delivered health promotion and disease prevention education tailored to the linguistic and cultural requirements of participants or the local community^{59,70,74,76,81–85,90,91,94,97,99,100,104}. This often took the form of structured educational sessions or workshops on HIV transmission, risk behaviors, PrEP, testing, ART, etc. in group settings^{76,79,81,85,91,97,100,104}. CHWs also conducted one-on-one educational sessions with participants, offering personalized guidance and support tailored to their unique needs and circumstances^{59,70,74,81–84,90,94,99,100}. Educational materials were tailored to specific ethnic groups^{76,84,91,100}, gender identities^{70,84,91,97,100,104}, sexualities⁹⁴, and street/drug culture^{59,74,85,93,94}. CHWs delivered culturally competent HIV education within diverse populations.

Role 3: Care Coordination, Case Management, and System Navigation

CHWs actively participated in care coordination and case management in 27 studies, collaborating with various healthcare providers and social service agencies to ensure that individuals receive comprehensive and coordinated support tailored to their specific needs^{76,82,85,96,102,104,107–123,125,126,129,130,133}. In a women's health intervention, attendees turned to community health educators for assistance with personal challenges like substance abuse, domestic violence, and mental health concerns, as well as for access to social services including housing, legal aid, and immigration support⁹¹. Through this comprehensive approach to health, CHWs not only addressed immediate health needs but also championed long-term empowerment and resilience within communities.

Role 4: Providing Coaching and Social/Emotional Support

CHWs provided social and emotional support to study participants in 15 studies^{59,70,76,78,79,82,84,91–93,97–99,104}. Four studies utilized motivational interviewing to empower participants to make a behavior change^{82,92,98,99}. Motivational interviewing (MI) is an interviewing style involving expressing empathy, exploring ambivalence, and building motivation for change in a client-centered and goal-oriented manner⁹⁹. The studies reported different HIV outcomes such as increased HIV testing^{92,99}, linkage to care⁹², improved ART retention⁹⁸ and adherence⁸², and declines in viral load⁸². By providing a supportive environment

conducive to behavior change, CHWs contributed to the well-being of study participants and their ability to effectively manage HIV/AIDS.

Role 5: Advocating for Individuals and Communities

CHWs served as advocates and educators in 2 studies, sharing information about community strengths and challenges, advocating for resources, and increasing awareness about social factors affecting health^{84,97}. In *Hombres Manteniendo Bienestar y Relaciones Saludables (HoMBReS)*, a program targeting sexually active heterosexual Latino men, soccer teams elected one lay health advisor or "Navegante" to be trained as a health advisor, opinion leader, and community advocate⁸⁴. In *TRIUMPH*, peer health educators spearheaded community mobilization efforts and acted as advocates for fellow transgender individuals in their communities⁹⁷. Through their grassroots efforts, CHWs empower communities to address health disparities and work towards achieving health equity for all.

Role 6: Building Individual and Community Capacity

CHWs collaborated with medical, behavioral health, and social services providers in 13 studies^{72,76,79–81,85,88,92,94,97,100,101,104}. This generally took the form of CHW providing referrals to key services such as clinics^{76,79,80,85,88,92,94,97,101,104}, mental health support⁹⁷, transportation assistance^{79,97}, hormone therapy⁹⁷, legal services⁹⁷, translation services¹⁰⁰, and appointment scheduling^{72,76,79,81,88,92,101}. CHWs play an integral role in linking individuals to essential resources and promoting holistic health care delivery.

Role 7: Providing Direct Service

CHWs delivered direct HIV care through a diverse array of methods and interventions. CHWs were trained to conduct HIV testing and counseling themselves in 13 out of the 23 studies that reported outcomes on HIV diagnostic testing/screening^{71,72,76,85,94,101,104,108,110,115,117,123,130}. Other direct service activities included acting as a patient navigator^{76,79,81,104,110,115,130} and dispensing ART medications through direct observed therapy as a way to improve ART adherence and reduce viral loads^{77,78,86}. This comprehensive approach underscored the versatility and effectiveness of CHWs in combating HIV/AIDS by addressing both diagnostic and treatment aspects while offering vital support throughout the care continuum.

Role 8: Implementing Individual and Community Assessments

CHWs supported linkage to and retention in care by working with case managers to assess clients' needs and develop care/action/change plans in 6 studies^{76,79,82,98,116,130}. Based on these assessments, they collaboratively formulated personalized care plans, action steps, and strategies for implementing necessary changes. This approach allowed for individualized interventions that addressed the specific challenges and goals of each participant, ultimately enhancing their access to essential care and support services.

Role 9: Conducting Outreach Advocating for Individuals and Communities

CHWs played a crucial role in implementing diverse outreach initiatives aimed at promoting HIV prevention, testing, and linkage to care within their communities. CHWs conduct outreach focusing on case-finding/recruitment of participants^{76,87,89,93,96,97,101,104,110,115,117,123,124,130} and re-engaging clients for follow-up^{79,95,101,127}. In a 2021 study, peer CHWs supported and monitored members of the LGBTQ+ community through the PrEP linkage to care process via two primary outreach methods: (1) community and venue-based events and (2) virtual, participant-initiated activities facilitated through various platforms such as websites, phone lines, and a smartphone app⁸⁸. CHWs have conducted street outreach to connect with IDUs⁸⁷ and youth,^{93,96} adapting their outreach strategies to effectively engage with these diverse communities.

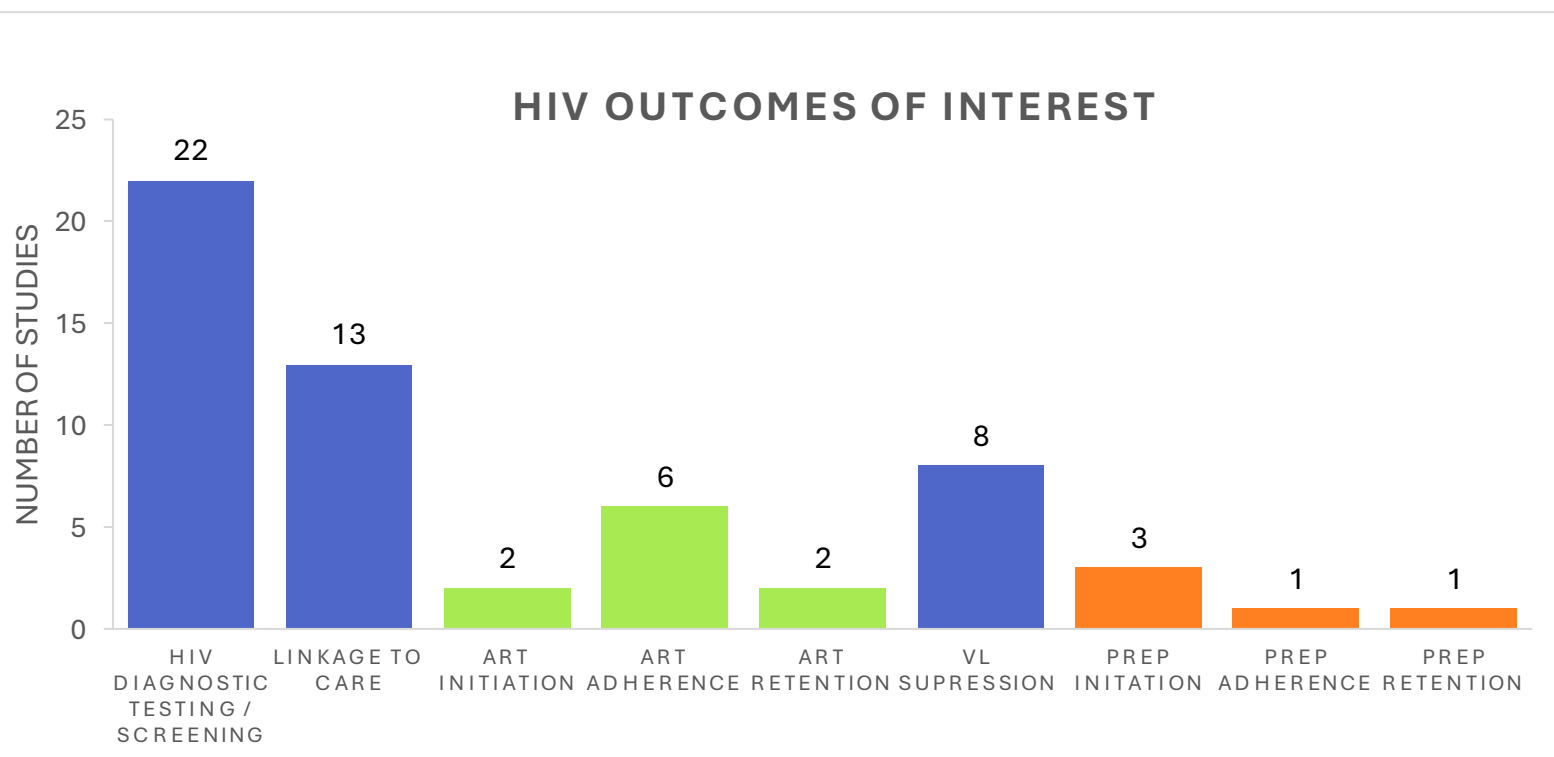
Role 10: Participating in Evaluation and Research

In 15 studies, CHWs contributed to evaluation and research efforts across various stages of the research process, showcasing their versatile skill set and commitment to improving community health outcomes. CHWs helped develop culturally appropriate and targeted intervention materials⁸⁵, delivered data collection surveys to participants^{74,81,89,124}, documented client encounters through program logs and questionnaires^{56,71,78,100,115,127}, analyzed and coded focus group data, updated medical records, and provided¹⁰⁴ and collected feedback⁹⁰ surrounding the intervention. The contributions of CHWs in the research process not only strengthened the evidence base for interventions but also highlighted the perspective they bring to interventions.

HIV Care Outcomes

CHW-led interventions have demonstrated significant impacts on various HIV outcomes, including HIV diagnostic testing and screening (n=22), linkage to care (n=13), antiretroviral therapy (ART) initiation (n=2), adherence (n=6), viral suppression (n=8), and pre-exposure prophylaxis (PrEP) intake (n=3), adherence (n=1), and retention (n=1) (Figure 3). Their multifaceted interventions target key stages of the HIV care continuum. Specific quantitative details of all findings across the 34 included can be found in [Appendix D](#).

Figure 3. Number of Studies per HIV Outcome of Interest



HIV diagnostic testing and screening

CHW-led interventions have emerged as key contributors to HIV diagnostic testing and screening initiatives, facilitating broader access to testing services and promoting linkage to care. Around two-thirds of studies (n=22) reported quantitative outcomes from HIV diagnostic testing/screening results^{71,72,76,85,94,96,101,104,108–110,112,115,117,119,120,123,125,126,129,130,133}. Of these, CHWs conducted HIV testing and counseling themselves in 13 of the studies.

^{71,72,76,85,94,101,104,108,110,115,117,123,130}. HIV testing methods varied by specimen collection (including

blood draw/venipuncture^{72,101}, finger prick⁷⁰, oral swab^{108,115,117,119,123,127}), and the speed at which results are obtained (either through conventional^{72,73,89,92,94,99,101} or rapid testing^{59,70,71,74,80,83,85,97,100,101,104}). Two studies used home-based self-tests^{59,80}.

A common HIV testing approach consisted of some variation of an outreach event(s), followed by pre-test counseling, the HIV test itself or the collection of samples, then post-test counseling, and linkage to care/confirmatory testing^{59,76,92,101,117,119,124,127,129,130}. In some cases, the CHW accompanied the participant to confirmatory testing and follow-up care^{59,70,76,83,97}. A third of the studies^{71,85,96,104,107,109,110,120,123,125,126,133} that focused on HIV testing did not report linkage to care outcomes. Of these, no HIV cases were detected in 3 studies^{104,110,133}, and the number of positive tests and linkages were not provided by the authors in other studies⁸⁵. Testing was often done alongside other infectious diseases such as STIs^{59,70,72,73,84,92,100,104} like chlamydia, gonorrhea, syphilis, as well as hepatitis C^{59,72,73,85,104}. The integration of HIV testing into CHW-led interventions demonstrates the feasibility of a multifaceted approach to addressing HIV prevention and care.

While many studies emphasized the process of testing, counseling, and linkage to care, some focused on behavior change surrounding HIV testing. In 4 studies, the provision of the HIV test itself was not included and instead, the emphasis was on the number of people recently tested for HIV as a result of education, coaching, and other forms of outreach emphasizing testing^{96,107,120,125}. Participants in CHW interventions were more likely to report a recent HIV test than those who didn't have contact with a CHW in 3 studies^{96,120,125}.

By conducting testing themselves and offering comprehensive support, CHWs can identify HIV-positive people and potentially connect them to care services. Furthermore, the emphasis on behavior change surrounding HIV testing underscores the effectiveness of CHW interventions in promoting testing uptake and fostering a culture of proactive healthcare engagement within communities.

Linkage to care

Thirteen studies^{59,72,76,80,83,88,89,92-95,100,101} reported linking HIV-positive individuals to care, ten of which occurred after HIV testing provided by the intervention^{59,72,76,79,83,89,92,94,101}. In the United States, linkage to care is defined as the completion of a visit with an HIV medical provider within 1 month (30 days) of HIV diagnosis,¹³⁴ but this was not applied consistently across studies. Linkage to care was provided after motivational interviewing interventions⁹²,

street-based outreach^{59,93}, HIV mobile van testing events^{72,76,85}, supervised Home-Based HIV Rapid Testing (HBHRT)⁸⁰, index tracing or social network interviewing⁸⁹, and other approaches involving CHWs. Two studies reported the time to successful linkage to care; one study reported an average of 56 days⁹⁵ while another found that 72% were linked to care within 30 days of diagnosis, 81% within 60 days, and 87% within 90 days⁷⁶, respectively.

Among studies that didn't provide testing, a cross-sectional street outreach project found that the intervention (i.e., engaging youth on the streets and referring them to a youth center) was associated with 3.2 higher odds (95% CI: 0.74, 13.2) of attending an HIV-related referral received in last 6 months⁹³. A separate study involved outreach workers directing individuals to HIV care and related services, confirming attendance at scheduled appointments, and reintegrating those who missed appointments within the Bay Area Network for Positive Health (BANPH) network⁹⁵. Additionally, the definition of linkage to care was modified to apply to PrEP where peer CHWs gave LGBTQ+ members a referral for PrEP and verified completion of that appointment⁸⁸.

These studies collectively demonstrate successful approaches to linking individuals to HIV care, treatment, and prevention.

Antiretroviral therapy (ART)

Community health workers play a crucial role in promoting ART by providing personalized support, education, and counseling to individuals living with HIV/AIDS. Nine studies examined ART uptake, adherence, and retention^{82,86,101,102,111,118,121,122,128}.

ART Initiation

Two studies demonstrated the positive impact of CHW-led interventions on ART uptake^{79,101}. Participants within 10 Ryan White HIV/AIDS Program (RWHAP) locations had statistically significant improvements in having an ART prescription from about two-thirds (66.9%) to over 90% in the 6 months post-enrollment ($p < .000$)⁷⁹. Another study showed that two-thirds of people (67%, $n=20$) who tested HIV positive via rapid test met the current recommendations for ART and were subsequently prescribed medication¹⁰¹. The findings from these studies underscore the role of CHWs in facilitating ART initiation, as evidenced by significant improvements in ART uptake rates.

ART Adherence

CHWs were found to promote adherence to ART, which involves the consistent and correct intake of antiretroviral medications as prescribed by a healthcare provider⁷. Adherence to ART regimens results in viral suppression, reducing the risk of HIV transmission to other persons⁷. Six studies examined ART adherence outcomes, all reporting viral load changes or viral suppression results^{77,82,86,119,122,128}.

CHWs provided directly observed therapy of ART to improve adherence in 3 studies published from 2006 to 2008^{77,78,86}. One study implemented Modified Directly Observed Therapy (MDOT), involving outreach worker involvement for three months, with daily observation of medication intake and support with refills⁷⁷. Initially non-adherent to their ART, participants achieved 75% adherence by consuming at least 80% of prescribed doses within a 4-day span after 3 months and maintained 67% adherence at 6 months⁷⁷. All participants reported that MDOT visits facilitated their intake, resulting in a reduction of viral loads from 39% below 400 copies/mL at baseline to 67% at 6 months⁷⁷. Another study comparing MDOT with the standard of care (SOC) for 12 months found that MDOT participants were more likely to achieve virologic suppression (OR=2.16; 95% CI:1.0, 4.7)⁸⁶. Also, Directly Delivered Therapy (DDT), where an outreach worker delivered all ART doses in a bubble pack for six months, showed slightly higher adherence levels, measured by empty medication packets, than a health care team intervention⁷⁸. Additionally, the DDT intervention demonstrated significantly higher sustained virologic suppression rates in both short-term (4-8 months) and longer-term (10-14 months) periods compared to the healthcare team intervention and standard of care⁷⁸.

CHWs also utilized a personalized approach to increasing ART adherence, focusing on one-on-one sessions. The CHW-delivered Healthy Choices intervention used motivational interviewing skills in client homes to encourage adherence, leading to declines in viral load post-intervention⁸². Similarly, another study found that CHWs providing one-on-one support over the phone significantly improved adherence to ART medication compared to controls (OR=1.83) and increased the likelihood of viral suppression among intervention participants (OR = 2.01; 95% CI: 1.18, 3.43; p = 0.01)¹⁰². Additionally, technology was leveraged in a peer-led mHealth cognitive behavioral intervention (CBI) via remote video conferencing using smartphones, resulting in a 32% increase in self-reported ART adherence over the course of 5 weeks (95% CI:11.2, 53.3)⁹⁰.

These studies underscore the effectiveness of CHW-led interventions in enhancing ART adherence through both direct observation and personalized, one-on-one sessions.

ART Retention

Only 2 studies^{79,98} reported ART retention or the ability of individuals living with HIV/AIDS to remain engaged in and adherent to their prescribed ART regimen over time⁹. CHWs significantly contributed to ART retention within Ryan White HIV/AIDS Program (RWHAP) locations by providing a range of support activities, including coaching, emotional support, appointment referrals, consistent communication through virtual means, and assistance with obtaining resources⁷⁹. Participants in the CHW program showed significant improvements in appointment attendance with the proportion of participants attending a provider visit in the last 6 months rising from 49.9% at baseline to 84.7% at 6 months ($p < .000$)⁷⁹. Another intervention utilized motivational interviewing (MI) to improve youth retention in HIV primary care and compare outcomes among peer outreach workers (POW) and master's level staff (MLS). The study created a proxy measure for adherence that transformed appointment data into a four-point gap score, where zero indicated no gaps (at least one HIV care appointment per quarter), and four indicated no appointments in 12 months. Both groups showed fewer than two gaps, ensuring at least one appointment every six months, and demonstrated significant pre- to post-intervention improvements, with large effect sizes (Cohen $d = 1.73$ for POW, 0.94 for MLS). In both cases, interventions with CHWs encouraged appointment attendance and ultimately greater retention via the reduction of barriers that may have hindered a participant's ability to remain in care such as stigma, lack of information or transportation, and others.

Viral (VL) suppression

Eight studies reported outcomes related to viral suppression or changes in viral loads^{77-79,81,82,86,90,100}. Studies reported different thresholds for viral suppression or sustained virological response such as ≤ 400 copies of HIV RNA/ml^{77,78}, < 50 copies/mL^{86,102}, or a greater than two log₁₀-unit reduction in plasma viral load (PVL)⁸⁶. Six studies reported on whether participants achieved viral suppression^{79,82,86,118,119,128} and two focused on changes in viral load^{81,90}. Time to viral suppression ranged from 1 month to 12 months^{79,82,86,118,119,128}. One study documented changes in viral load from baseline to 9 and 12 months, while another study documented outcomes at 2, 4, and 6 months⁹⁰. In 10 Ryan White HIV/AIDS Program (RWHAP) locations, CHW-led interventions resulted in the proportion of participants who were virally suppressed

doubling from 22.4% to 43.7% after 6 months of follow-up ($p < .000$)⁷⁹. In another study, HIV viral load data was extracted from participants' medical records at baseline/pre-intervention, immediately following intervention completion, and 8, 16, and 24 weeks post-intervention⁹⁰. An annualized average reduction of 47.5% (0.28 log₁₀) in HIV viral load was noted, indicating a small effect size (Cohen $d = 0.3$), although this reduction was not statistically significant ($t = -1.40$, $p > 0.05$)⁹⁰. The studies covered a wide range of reporting methods related to VL suppression and the impact of CHWs on improving viral suppression rates.

Pre-exposure prophylaxis (PrEP)

Pre-exposure prophylaxis (PrEP) is a scientifically supported biomedical approach to preventing HIV^{10–12}. It entails taking antiretroviral drugs on a regular basis to lower the likelihood of acquiring HIV if exposed^{10–12}. Three studies concerned the uptake, adherence, and retention of people on PrEP by CHWs^{97,112,115}. It is noteworthy that all three studies were published in 2021 and specifically targeted the initiation of PrEP among LGBTQ+ communities, with a particular focus on those belonging to minority ethnic groups^{97,112,115}. In Maryland, peer CHWs monitored individuals across the PrEP linkage to care cascade, providing education, counseling, linkage to PrEP and/or HIV care services, transportation/co-pay assistance, and appointment scheduling⁸⁸. Out of 496 individuals who had one-on-one sessions with a peer CHW, 31.8% were referred for PrEP, with 87.9% scheduling their intake appointment and 65.4% completing it⁸⁸. PrEP referrals and application assistance were also given by CHWs in a CDC initiative based in East Baton Rouge Parish, Louisiana⁵⁹. CHWs inquired about basic needs assistance during outreach and provided extended support, resulting in 320 people undergoing HIV testing, linking 10 people with HIV to medical care, and referring 19 at-risk individuals to medical visits for PrEP initiation⁵⁹. In the TRIUMPH project in Oakland and Sacramento, California, peer health educators facilitated trans-specific PrEP navigation alongside support services, leading to 87% PrEP initiation rates. PrEP retention was 76% in Oakland and 62% in Sacramento, while PrEP adherence was 50% in Oakland and 56% in Sacramento over 12 months⁹⁷. By offering tailored support, addressing barriers to access, and offering comprehensive assistance, CHWs play a vital role in ensuring equitable access to and utilization of PrEP, thereby contributing to the prevention of HIV among LGBTQ+ communities and minority ethnic groups.

Discussion

This scoping review has synthesized a comprehensive body of literature focusing on CHW interventions with HIV outcomes, spanning nearly four decades and encompassing diverse study designs and geographic locations. There was a notable increase in publications that met our eligibility criteria after 2010, potentially reflecting a growing interest and recognition of CHWs in delivering HIV-related services. Furthermore, the diversity of study types utilized in evaluating CHW interventions— with pilot studies^{59,77,78,80,83–85,89,90,97,98}, process/implementation evaluations^{70,79,83,88,94,95,100,104}, and randomized controlled trials (RCTs)^{80–83,86,92,98,99,102} being the most commonly featured —highlights the multifaceted approach taken to assess these interventions. Most studies were conducted in the United States with only five studies originating from other HICs^{71,72,104,110,133}. A review conducted in 2014 similarly also showed that the bulk of published studies on health interventions involving CHWs in HICs predominantly originated from the United States, with Canada following closely behind³⁶.

This review showed that CHWs generally had a positive impact on HIV outcomes in HICs. Across a substantial proportion of the included studies, CHWs were actively involved in conducting HIV testing and counseling in point-of-care settings^{71,72,76,85,94,101,104,108,110,115,117,123,130}. While some studies did not report linkage to care outcomes comprehensively^{71,85,96,104,107,109,110,120,123,125,126,133}, those that did showed promising results, with a significant proportion of HIV-positive individuals successfully linked to HIV care within a relatively short timeframe^{59,72,76,80,83,88,89,92–95,100,101}. Moreover, CHW interventions not only facilitated HIV testing but also promoted behavior change conducive to testing uptake, as evidenced by increased rates of recent HIV testing among participants in CHW-led interventions that didn't offer screening^{96,107,120,125}. In a similar fashion, ART uptake and adherence were also facilitated by CHW interventions that elicited behavior changes such as personalized, one-on-one sessions with the CHW or directly observed therapy, resulting in decreases in viral load and ultimately VL suppression^{77,79,82,86,101,119,122,128}. CHWs were also shown to have contributed to ART retention by providing a range of support activities, such as coaching, emotional support, appointment referrals, and consistent communication, resulting in improvements in appointment attendance and retention rates^{79,98}. Three studies delved into the role of CHWs in ensuring equitable access to and utilization of PrEP for PrEP services among the LGBTQ+ community^{97,112,115}. However, expansion of PrEP services to other high-risk communities such as

substance abusers could present a potential opportunity for additional impact. Additionally, the results found through this scoping review highlighted significant variability in the definition of each outcome. Therefore, establishing standardized definitions and benchmarks for each stage of the HIV care continuum in research could enhance the generalizability of findings.

Another key consideration for future evaluations of CHW interventions is the sustainability and scalability of these interventions. For instance, it is unknown whether a one-time intervention focusing on HIV testing and linkage to care has a greater potential for immediate and durable impact compared to a single intervention related to ART or PrEP uptake, adherence, and retention. A singular HIV testing intervention can generate short-term results through the identification of HIV-positive individuals early in the course of their infection, facilitating prompt initiation of treatment and care, and decreasing the risk of HIV transmission within the community¹³⁵. In contrast, the impact of a single ART or PrEP intervention may take longer to manifest, as adherence to treatment or preventive medication requires ongoing commitment and follow-up^{136,137}. Consequently, studies relating to medication adherence and retention would benefit from a longer follow-up period to understand whether the positive outcomes observed in the short term persist over extended periods of time. None of the studies that tracked viral load outcomes reported long-term outcomes (over 24 months), demonstrating an opportunity for more studies to conduct longer follow-up periods. Additionally, given the small sample size of studies that reported PrEP outcomes (n=3)^{97,112,115}, more information is similarly needed surrounding the sustainability of CHW interventions in promoting PrEP services. Furthermore, the extent to which CHW interventions contribute to reducing HIV incidence via increased PrEP adherence and retention, potentially even through mathematical modeling, remains unexplored. The long-term impact of CHW interventions in promoting HIV testing, ART adherence, and PrEP uptake and retention warrants further investigation to optimize their effectiveness in reducing HIV transmission and improving public health outcomes.

One approach to enhance sustainability and scalability could involve integrating HIV services with non-HIV services, as advocated in various other studies^{138,139}. While the majority of studies in this review exclusively focused on HIV care, several studies (n=15) integrated HIV care interventions with other diseases or general health concerns such as other STIs, hepatitis C, substance abuse, women's health issues, and LGBTQ+ healthcare^{72-74,84,85,87,91,93,97,100,104,108,110,115}. A previous meta-analysis has shown that integrated services resulted in higher averages of HIV

testing and counseling, ART initiation, retention in HIV care, and viral suppression¹³⁹. They found that the success of integration strategies is most likely context-specific (e.g., geography and population)¹³⁹, thus the bolstering of CHWs could provide an opportunity for integration to exist beyond the traditional clinic setting and reach particularly resource-strained or hard-to-reach populations within HICs¹³⁸. CHWs within integrated care models could serve as an effective and practical approach to enhance the long-term viability of the HIV response.

Furthermore, technology can play a greater role in supporting the delivery of CHW-led interventions in HICs as demonstrated in this review. This shift towards mobile technology-enabled interventions (i.e. mHealth) reflects a growing trend in healthcare delivery, especially in HICs, and is driven by the need for innovative solutions to overcome barriers to access and engagement¹⁴⁰. The widespread availability and affordability of smartphones, coupled with advances in digital health care, have facilitated the integration of mHealth tools into the healthcare landscape, including HIV care^{141–143}. In this review, several studies incorporated technology as a key component of the intervention, leveraging platforms such as tablets, smartphones, social media, and remote video conferencing to facilitate outreach, education, counseling, and support^{79,85,88,90}. mHealth technologies can facilitate real-time communication and data exchange between CHWs and HIV-positive individuals, promoting care coordination and support^{142,143}. Through secure messaging platforms and telehealth applications, CHWs can remotely provide education, counseling, and emotional support, which is particularly beneficial for patients facing stigma or geographic barriers to traditional healthcare¹⁴². The identification of best practices for utilizing technology to support CHW-led initiatives should be further investigated.

This review also underscored the diverse roles and functions of CHWs, reflecting their capacity to act as intermediaries between medical and social services. This ability stems from their trusted status within the community or their deep understanding of it¹⁶. This diversity is reflected by the wide range of job titles, including key terms such as “outreach”, “community health”, “peer”, and “lay”, emphasizing the breadth and depth of their personal experience and their contributions to healthcare delivery while the lack of a universal definition or function of a CHW in the literature.

In almost all included studies, CHWs served marginalized populations, reflecting the high-income countries' efforts to tackle disparities in healthcare access and outcomes across

diverse population groups¹³⁹. The increasing focus on CHWs in high-income countries is in part driven by concerns about shortages in the healthcare workforce¹⁴⁴ and the escalating burden of chronic and complex diseases¹⁴⁵, which result in heightened demand and costs in numerous developed nations. Investment in CHWs thus presents a valuable opportunity for HICs to ameliorate this shortage and deliver in-demand HIV services in homes and communities.

Notably, interventions targeting Black or African American and Hispanic/Latino communities (n=19) constituted a significant portion of the studies^{74,76,91,101,111,112,115,117–119,121–123,125–127,129,130}. Cultural and linguistic adaptations were frequently employed to ensure the relevance and effectiveness of interventions within these communities^{59,70,74,76,81–85,90,91,94,97,99,100,104}. Additionally, interventions targeting marginalized populations like those with substance abuse, LGBTQ+ individuals, women, and young people highlighted the importance of addressing intersecting vulnerabilities and social determinants of health. CHWs from within these communities often played key roles in intervention delivery, leveraging their shared experiences and cultural competency to establish trust and rapport with participants. The importance of concordance between CHWs and their target communities is acknowledged but remains insufficiently studied. An evaluation is needed to determine how factors such as sexual orientation, racial/ethnic identity, and cultural competency influence the effectiveness of CHW interventions in HIV care. Additionally, this review identified a gap in interventions tailored to Asian and indigenous populations. Only one study specifically focused on delivering HIV interventions to the Asian community in Canada⁷⁰, while indigenous populations were addressed in a single study conducted in Australia⁷². Also, there was no attention to the health needs of pregnant and lactating women and girls, as well as individuals in prison, despite their classification as at-risk populations for HIV by the WHO¹⁴⁶. The development of more interventions targeting these at-risk groups within HICs is needed.

This review found that CHWs were able to serve these communities in both clinical and community settings. The integration of CHWs into clinic-based settings, such as primary care and outpatient specialty clinics, demonstrated their importance in multidisciplinary healthcare teams, particularly for patients with chronic conditions. CHWs were also able to conduct outreach and point-of-care services by venturing out into community settings such as churches, street corners, cultural centers, and LGBTQ+ centers, emphasizing the importance of meeting individuals where they are to improve accessibility and engagement in healthcare. Targeted

outreach efforts to venues like massage parlors and safe syringe sites demonstrate a proactive approach to addressing health disparities among vulnerable populations, reflecting CHWs' role in tackling social determinants of health. By harnessing the strengths of both clinical and community settings, CHWs can play a pivotal role in improving access to care, promoting health equity, and addressing the diverse needs of populations affected by HIV and related health disparities. Additional research can delve into how the effectiveness of CHW interventions differ across different settings and populations as well as how these CHW can be integrated into existing community and clinic-based structures.

Ultimately, the adaptability of CHWs allows them to adopt different functions in the healthcare space both inside and outside of the clinic. However, there is much progress to be made in the development, implementation, evaluation, and subsequent promotion of future CHW-led interventions in the HIV field.

Limitations

Despite searching through nine databases, the exclusion of several others and the lack of review of grey literature limited the scope of the search. Additionally, the absence of citation, snowball, and web searching further restricted the discovery of potentially valuable sources. Because of these limitations, pertinent sources were likely overlooked, thus restricting the comprehensiveness of the review. This most likely manifested itself in the surprising lack of studies concerning CHWs encouraging PrEP, potentially due to the lack of inclusion of key job titles to describe CHWs in the initial search. Of note, the words outreach, navigator, champion, and coach were not included in the search potentially not capturing the full breadth of CHW roles.

Also, there is limited generalizability of the findings of this review to all HICs due to the dominance of studies originating from the United States. This lack of representation from other nations was surprising and could reflect a flaw in the overall search strategy (e.g. not including the terms for another country's version of a CHW) or simply an overrepresentation of the United States in the literature. A review conducted in 2014 also showed that the bulk of published studies on health interventions involving CHWs in HICs predominantly originated from the United States, with Canada following closely behind³⁶. The search primarily yielded studies published in English and might have excluded studies published in other journals not captured by the web search.

Ultimately, scoping reviews do not include a rating of the quality of evidence included and thus cannot make firm recommendations for practice and policy moving forward. To mitigate this limitation and enhance the reliability of findings, our review employed reputable databases renowned for their comprehensive coverage of scholarly literature. By drawing from these authoritative sources, we aimed to ensure that our review encompassed a wide range of relevant studies, thereby enhancing the robustness and credibility of our findings. While scoping reviews may not offer conclusive recommendations, they serve as valuable resources for identifying gaps in knowledge, informing future research directions, and guiding decision-making processes in clinical practice and policy development.

Conclusion

This scoping review has provided a comprehensive overview of CHW interventions targeting HIV outcomes in HICs. The findings indicate that CHWs play a vital role in improving HIV-related outcomes, including testing, linkage to care, ART initiation/adherence/retention, viral suppression, and PrEP initiation/adherence/retention, particularly among marginalized communities. Moreover, CHWs demonstrate flexibility in their roles, serving as cultural mediators, health educators, care coordinators, advocates, and direct service providers. However, there are opportunities for further research to optimize the sustainability, scalability, and effectiveness of CHW interventions in HICs.

Future policy and practice in expanding CHWs in HICs can be informed by several key considerations highlighted in this review. First, there is a need for standardized definitions and benchmarks across the HIV continuum care to enhance comparability and generalizability of findings. Additionally, longer follow-up periods in studies evaluating CHW interventions can provide insights into their long-term impact on HIV outcomes. Furthermore, integrating HIV services with non-HIV services and leveraging technology-enabled interventions can enhance sustainability and scalability. Increasing investment and passing favorable legislation related to CHWs can provide HICs with a valuable resource to mitigate healthcare workforce shortages and provide essential HIV services directly to households and communities. CHWs' ability to operate in both clinical and community settings allows for integration into multidisciplinary healthcare teams and community-based structures to improve access to care and address health disparities. By tapping into the unique skills and accessibility of CHWs, HICs can close healthcare gaps, particularly in underserved regions and among marginalized groups. This investment not only strengthens healthcare systems' abilities to combat the HIV epidemic but also advances broader public health objectives by ensuring fair access to high-quality care.

By addressing these considerations, policymakers and practitioners can maximize the potential of CHWs to contribute to HIV prevention, care, and treatment efforts in HICs, ultimately advancing health equity and improving public health outcomes.

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Appendix

Appendix A. Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) Checklist

SECTION	ITEM	PRISMA-ScR CHECKLIST ITEM	REPORTED ON PAGE #
TITLE			
Title	1	Identify the report as a scoping review.	1
STRUCTURED SUMMARY			
Structured summary	2	Provide a structured summary that includes (as applicable): background, objectives, eligibility criteria, sources of evidence, charting methods, results, and conclusions that relate to the review questions and objectives.	2
RATIONALE			
Rationale	3	Describe the rationale for the review in the context of what is already known. Explain why the review questions/objectives lend themselves to a scoping review approach.	6-14
OBJECTIVES			
Objectives	4	Provide an explicit statement of the questions and objectives being addressed with reference to their key elements (e.g., population or participants, concepts, and context) or other relevant key elements used to conceptualize the review questions and/or objectives.	13
PROTOCOL AND REGISTRATION			
Protocol and registration	5	Indicate whether a review protocol exists; state if and where it can be accessed (e.g., a Web address); and if available, provide registration information, including the registration number.	
ELIGIBILITY CRITERIA			
Eligibility criteria	6	Specify characteristics of the sources of evidence used as eligibility criteria (e.g., years considered, language, and publication status), and provide a rationale.	14-15
INFORMATION SOURCES			
Information sources*	7	Describe all information sources in the search (e.g., databases with dates of coverage and contact with authors to identify additional sources), as well as the date the most recent search was executed.	14,55
SEARCH			
Search	8	Present the full electronic search strategy for at least 1 database, including any limits used, such that it could be repeated.	55
SELECTION OF SOURCES OF EVIDENCE			
Selection of sources of evidence†	9	State the process for selecting sources of evidence (i.e., screening and eligibility) included in the scoping review.	14-15
DATA CHARTING			
Data charting process‡	10	Describe the methods of charting data from the included sources of evidence (e.g., calibrated forms or forms that have been tested by the team before their use, and whether data charting was done independently or in duplicate) and any processes for obtaining and confirming data from investigators.	14-15
DATA ITEMS			
Data items	11	List and define all variables for which data were sought and any assumptions and simplifications made.	15
CRITICAL APPRAISAL OF INDIVIDUAL SOURCES OF EVIDENCE			
Critical appraisal of individual sources of evidence§	12	If done, provide a rationale for conducting a critical appraisal of included sources of evidence; describe the methods used and how this information was used in any data synthesis (if appropriate).	
SYNTHESIS OF RESULTS			
Synthesis of results	13	Describe the methods of handling and summarizing the data that were charted.	14-15
RESULTS			
Selection of sources of evidence	14	Give numbers of sources of evidence screened, assessed for eligibility, and included in the review, with reasons for exclusions at each stage, ideally using a flow diagram.	16
Characteristics of sources of evidence	15	For each source of evidence, present characteristics for which data were charted and provide the citations.	61-71

SECTION	ITEM	PRISMA-ScR CHECKLIST ITEM	REPORTED ON PAGE #
Critical appraisal within sources of evidence	16	If done, present data on critical appraisal of included sources of evidence (see item 12).	
Results of individual sources of evidence	17	For each included source of evidence, present the relevant data that were charted that relate to the review questions and objectives.	17-32, 61-71
Synthesis of results	18	Summarize and/or present the charting results as they relate to the review questions and objectives.	33-37
Summary of evidence	19	Summarize the main results (including an overview of concepts, themes, and types of evidence available), link to the review questions and objectives, and consider the relevance to key groups.	17-37
Limitations	20	Discuss the limitations of the scoping review process.	38
Conclusions	21	Provide a general interpretation of the results with respect to the review questions and objectives, as well as potential implications and/or next steps.	39
Funding	22	Describe sources of funding for the included sources of evidence, as well as sources of funding for the scoping review. Describe the role of the funders of the scoping review.	3

JBI = Joanna Briggs Institute; PRISMA-ScR = Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews.

From: Tricco AC, Lillie E, Zarin W, O'Brien KK, Colquhoun H, Levac D, et al. PRISMA Extension for Scoping Reviews (PRISMA ScR): Checklist and Explanation. *Ann Intern Med.* 2018;169:467–473. [doi: 10.7326/M18-0850](https://doi.org/10.7326/M18-0850)

Appendix B. Search Strategy

Search Terms

1 health auxiliary/ 9966

2 ((community or village or auxiliary or lay) adj3 health adj3 (worker* or activist* or officer* or aide* or practitioner* or helper* or educator* or promoter* or representative* or advocate* or advisor* or volunteer* or personnel* or helper*)).tw,kf. 13557

3 (natural helper* or barefoot doctor* or accredited social health activist* or medical auxiliary or family planning personnel* or peer health promoter* or peer health educator* or outreach worker* or natural helper*).tw,kf. 1511

4 (CHW or CHWs or ASHA).ti,ab. 4580

5 or/1-4 19188

Databases Utilized

Ovid Embase

Ovid MEDLINE(R) ALL

PubMed

Cochrane Library

The Cochrane Library database includes:

1. Cochrane Database of Systematic Reviews
2. Cochrane Central Register of Controlled Trials
3. Cochrane Clinical Answers

Google Scholar (Via Harzig's Publish or Perlish)

Scopus

Web of Science Core Collection

The Core Collection included in this review is:

1. Science Citation Index Expanded (1900 - Date Searched)
2. Social Sciences Citation Index (1900 - Date Searched)
3. Art & Humanities - (1975 - Date Searched)
4. Conference Proceedings Citation Index - Science (1991 - Date Searched)
5. Conference Proceedings Citation Index - Social Sciences and Humanities (1991 - Date Searched)
6. Book Citation Index - Science (2005 - Date Searched)
7. Book Citation Index - Social Sciences and Humanities (2005 - Date Searched)
8. Emerging Source Citation Index - (2018 - Date Searched)
9. Current Chemical Reactions (1985 - Date Searched)
10. Index Chemicus (1993 - Date Searched)

Appendix C. Table of Excluded Studies

Studies Excluded from the Search				
First Authors Last Name	Year	Title	Journal	Reason for Exclusion
Aladin	2023	The YGetIt? Program: a Mobile Application, PEEP, and Digital Comic Intervention to Improve HIV Care Outcomes for Young Adults	Health promotion practice	Wrong intervention
Ambia	2016	A systematic review of interventions to improve prevention of mother-to-child HIV transmission service delivery and promote retention	J Int AIDS Soc	No original research
Anderson	2014	Positively UK's peer support service-an HCP perspective	HIV Medicine	Wrong outcomes
Anjali	2022	"I...tell her not to take medicines": understanding engagement in the prevention of mother to child transmission (PMTCT) care continuum through the socio-ecological model	International Journal of Environmental Research and Public Health	Wrong population
Anonymous	1999	Program increases HAART adherence in HIV patients	Aids Alert	No original research
Arant	2022	Barriers and Facilitators to the HIV (PrEP) Care Continuum: Perspectives of Key Stakeholders and Formerly Incarcerated Individuals	Open Forum Infectious Diseases	Conference Abstract
Arco	2013	HIV testing and counselling for migrant populations living in high-income countries: a systematic review	European Journal of Public Health	No original research
Baim-Lance	2023	Integrating a Resilience Framework to Assess Implementation of a Novel HIV Care Re-Engagement Model in NYC	J Acquir Immune Defic Syndr	Wrong study design
Bates	2007	The RARE model of rapid HIV risk assessment	J Health Care Poor Underserved	No original research
Bazzi	2023	Patient and Provider Perspectives on a Novel, Low-Threshold HIV PrEP Program for People Who Inject Drugs Experiencing Homelessness	J Gen Intern Med	Wrong study design
Behforouz	2004	From directly observed therapy to accompagnateurs: enhancing AIDS treatment outcomes in Haiti and in Boston. (Directly observed therapy and other community based efforts to improve adherence to HAART)	Clinical Infectious Diseases	No original research
Bowser	2012	Preventing AIDS: Community-science collaborations	Preventing AIDS: Community-Science Collaborations	No original research
Bradford	2007	The promise of outreach for engaging and retaining out-of-care persons in HIV medical care	AIDS Patient Care STDS	Wrong outcomes
Brennan	2023	"It's a win for the clinic, it's a win for the frontline, but, most importantly, it's a win for the client": Task Shifting HIV Prevention Services from Clinicians to Community Health Workers in Ontario, Canada	Sex Res Social Policy	Wrong outcomes
Brennan	2019	Examining interactions with online outreach workers for gay, bisexual and other men who have sex with men	Sexually Transmitted Infections	Conference Abstract
Broadhead	1995	DRUG-USERS VERSUS OUTREACH WORKERS IN COMBATING AIDS - PRELIMINARY-RESULTS OF A PEER-DRIVEN INTERVENTION	J. Drug Issues	Wrong intervention
Broeckaert	2011	Barriers and facilitators to HIV prevention in rural and remote communities in Canada	Canadian Journal of Infectious Diseases and Medical Microbiology	No original research
Buchanan	2003	Neighborhood differences in patterns of syringe access, use, and discard among injection drug users: Implications for HIV outreach and prevention education	J. Urban Health	Wrong outcomes
Budhwani	2022	Adapting a Motivational Interviewing Intervention to Improve HIV Prevention Among Young, Black, Sexual Minority Men in Alabama: Protocol for the Development of the Kings Digital Health Intervention	JMIR Res Protoc	No original research
Carnochan	2011	Positive connections - A case study of nine circles outreach and social support programming and the effectiveness of retaining phas with clinical care	Canadian Journal of Infectious Diseases and Medical Microbiology	Conference Abstract
Carrasquillo	2020	Increasing uptake of evidence-based screening services through a community health worker-delivered multimodality program: study protocol for a randomized pragmatic trial	Trials	No original research
Carrire	2008	Linking women to health and wellness: Street Outreach takes a population health approach	Int. J. Drug Policy	Wrong intervention
CementsKmten	1996	Can street outreach effectively reach a mobile population of homeless youth?	Pediatr. AIDS HIV Infect.	Wrong intervention
Chaisson	1987	HIV, bleach, and needle sharing	Lancet	Wrong study design
Chiampas	2016	Description of collaboration between an interdisciplinary human immunodeficiency virus (HIV) clinic	Pharmacotherapy	Conference Abstract
Chutuape	2016	Adding to the HIV prevention portfolio: the achievement of structural changes by coalitions targeting to reduce HIV risk in adolescents and young adults through community mobilization in urban areas across the US and Puerto Rico	Journal of Adolescent Health	Wrong intervention

Conserve	2023	Adapting a community-based intervention to address social determinants of health influencing pre-exposure prophylaxis services for Black adults in Washington, District of Columbia: A study protocol	PLoS ONE	No original research
Cowan	2023	CLUSTER RANDOMISED TRIAL OF RISK-DIFFERENTIATED CARE FOR FEMALE SEX WORKERS: AMETHIST	Topics in antiviral medicine	Wrong population
Crown	1993	Making HIV prevention work in the north	Can J Public Health	Wrong outcomes
Darrow	2004	Eliminating disparities in HIV disease: Community mobilization to prevent HIV transmission among black and hispanic young adults in Broward County, Florida	Ethni. Dis.	Wrong intervention
Davoust	2021	"He Gave Me Spirit and Hope": Client Experiences with the Implementation of Community Health Worker Programs in HIV Care	AIDS Patient Care STDS	Wrong study design
Dunkley	2021	Factors influencing accessibility of a novel, remote supported STI and HIV (NRS-STI/ HIV) testing service among east London residents at risk of HIV	HIV Medicine	Conference Abstract
Elford	2002	Peer-led HIV prevention among gay men in London: process evaluation	AIDS Care	Wrong outcomes
Flickinger	2018	Patient and provider perspectives on an innovative mobile health intervention for people living with hiv	Journal of General Internal Medicine	Conference Abstract
Goldhammer	2021	HIV care continuum interventions for Black men who have sex with men in the USA	Lancet HIV	No original research
GomezPrat	2023	Implementation of a Community-Based Public Model for the Prevention and Control of Communicable Diseases in Migrant Communities in Catalonia	Tropical Medicine and Infectious Disease	Wrong intervention
Harrison	2011	Community HIV testing: the feasibility and acceptability of assertive outreach and community testing to reduce the late diagnosis of HIV M Brady1	HIV Medicine	Conference Abstract
Heerden	2017	Perceived mHealth barriers and benefits for home-based HIV testing and counseling and other care: qualitative findings from health officials, community health workers, and persons living with HIV in South Africa	Social Science & Medicine	Wrong intervention
Hoff	1997	Looking for men in all the wrong places: HIV prevention small-group programs do not reach high risk gay men	Aids	Wrong intervention
Iniesta	2021	Implementation of pre-exposure prophylaxis programme in Spain. Feasibility of four different delivery models	PLoS ONE	Wrong intervention
Jack	2023	Applying a mutual capacity building model to inform peer provider programs in South Africa and the United States: A combined qualitative analysis	Int J Drug Policy	Wrong population
Jadwin-Cakmak	2019	HIV prevention and HIV care among transgender and gender diverse youth: design and implementation of a multisite mixed-methods study protocol in the U.S	BMC Public Health	No original research
James	2018	Hiv testing in a large community health center serving a multi-cultural population: A qualitative study of providers	Open Forum Infectious Diseases	Wrong outcomes
James	2019	HIV testing in a large community health center serving a multi-cultural patient population: A qualitative study of providers	AIDS Care	Wrong intervention
Javanparast	2018	Community health worker programs to improve healthcare access and equity: are they only relevant to low- and middle-income countries?	journal of health policy	No original research
Kawasaki	2024	Sentinel surveillance to assess HIV/HCV coinfection prevalence across Southern Texas	Sexually Transmitted Diseases	Wrong intervention
Kelly	2014	Evaluation of a partnership between primary and secondary care providing an accessible Level 1 sexual health service in the community	Int J STD AIDS	Wrong intervention
Kempf	2018	Universal Screening for HIV and Hepatitis C Infection: A Community-Based Pilot Project	Am J Prev Med	Wrong intervention
Kennedy	2012	Safe Works Access Project (SWAP) in rural areas-contributing to lower HIV rates by providing safe injection equipment and supplies, as well as related education	Canadian Journal of Infectious Diseases and Medical Microbiology	Conference Abstract
Kenya	2014	Feasibility of home-based HIV rapid testing (HRT) among African Americans	Clinical and Translational Science	Conference Abstract
Kenya	2015	Strategies to Improve HIV Testing in African Americans	J Assoc Nurses AIDS Care	Wrong intervention
Kenya	2011	Can community health workers improve adherence to highly active antiretroviral therapy in the USA? A review of the literature	HIV Med	No original research
Khan	2022	Barriers to and facilitators of accessing HIV services for street-involved youth in Canada and Kenya	BMC Public Health	Wrong study design
Khanna	2016	Preexposure prophylaxis awareness and use in a population-based sample of young black men who have sex with men	JAMA Internal Medicine	Wrong outcomes
Knishkowsy	1996	HIV care for Ethiopian immigrants in an Israeli family practice	Family Systems Medicine	Wrong intervention
Kredo	2014	Task shifting from doctors to non-doctors for initiation and maintenance of antiretroviral therapy	Cochrane Database of Systematic Reviews	No original research
Kyles	2012	Community health advisors: A model in community outreach and health education	Cancer Research.	No original research
LaFosse	2004	Community outreach to patients with AIDS at the end of life in the inner city: reflections from the trenches	Palliat Support Care	No original research
Lefevre	2014	[Community health workers in HIV/AIDS care]	Sante Publique	No original research

Lorente	2021	The Role of Community Health Workers Within the Continuum of Services for HIV, Viral Hepatitis, and Other STIs Amongst Men Who Have Sex with Men in Europe	J Community Health	Wrong outcomes
MacDonell	2022	Barriers and facilitators to scaling up <i>Healthy Choices</i> , a motivational interviewing intervention for youth living with HIV	BMC Health Serv. Res.	Wrong study design
Martijn	2004	The effects of AIDS prevention programs by lay health advisors for migrants in The Netherlands	Patient Educ. Couns.	Wrong outcomes
Martinez	2021	"Part of getting to where we are is because we have been open to change" integrating community health workers on care teams at ten Ryan White HIV/AIDS program recipient sites	BMC Public Health	Wrong outcomes
Massengale	2016	Community health advocate-identified enablers of HIV testing for Latina immigrant women	AIDS Education and Prevention	No original research
Mathur	2018	Characteristics for PrEP uptake, retention, and discontinuation: Data from the ANCHOR study	Open Forum Infectious Diseases	Conference Abstract
Mayer	2016	HIV and Hepatitis C Virus Screening Practices in a Geographically Diverse Sample of American Community Health Centers	AIDS Patient Care STDs	Wrong intervention
McBrien	2018	Patient navigators for people with chronic disease: A systematic review	PLoS ONE	No original research
McDaid	2010	Contact with HIV prevention services highest in gay and bisexual men at greatest risk: cross-sectional survey in Scotland	BMC Public Health	Wrong intervention
McDaid	2013	Sexually transmitted infection testing and self-reported diagnoses among a community sample of men who have sex with men, in Scotland	Sex. Transm. Infect.	Wrong outcomes
McQuiston	2003	"If they don't ask about condoms, I just tell them": a descriptive case study of Latino lay health advisers' helping activities	Health Educ Behav	Wrong study design
McQuiston	2001	Latino recruitment and retention strategies: community-based HIV prevention	J immigr health	Wrong intervention
Mgabo	2020	Community Health Workers Engagement in Prevention of Mother-to-Child Transmission of HIV (PMTCT): A Cross-Sectional Study from Selected Fishing Communities in Tanzania	Journal of Family Medicine and Health Care	Wrong population
Mimiaga	2011	Barriers to Routine HIV Testing Among Massachusetts Community Health Center Personnel	Public Health Rep.	Wrong population
Minick	2018	Participants' perspectives on improving retention in HIV care after hospitalization: a post-study qualitative investigation of the MAPPs study	PLoS one	Wrong outcomes
Mosnier	2023	Effectiveness of a Community Empowerment Intervention to Improve Access to Pre-exposure Prophylaxis in Migrant Women Sex Workers: Protocol for a Mixed Methods Implementation Study	JMIR Res Protoc	No original research
Nemoto	2005	Promoting health for transgender women: Transgender resources and neighborhood space (TRANS) program in San Francisco	Am. J. Public Health	Wrong outcomes
Ness	2017	Using an Innovative Telehealth Model to Support Community Providers Who Deliver Perinatal HIV Care	AIDS Educ Prev	Wrong intervention
Ochom	2018	Integrating home hiv counselling and testing into household tb contact investigation: A mixed-methods study	Public Health Action	Wrong population
Parsons	2019	Clinic-Based Delivery of the Young Men's Health Project (YMHP) Targeting HIV Risk Reduction and Substance Use Among Young Men Who Have Sex with Men: Protocol for a Type 2, Hybrid Implementation-Effectiveness Trial	JMIR Res Protoc	No original research
Philbin	2012	Linkage to care and engagement in care for newly diagnosed HIV-positive youth within fifteen adolescent medicine clinics in the United States	Journal of Adolescent Health	Conference Abstract
Philbin	2014	Linking HIV-positive adolescents to care in 15 different clinics across the United States: creating solutions to address structural barriers for linkage to care	AIDS Care	Wrong intervention
Platt	2011	Risk of sexually transmitted infections and violence among indoor-working female sex workers in London: the effect of migration from Eastern Europe	Sex Transm Infect	Wrong intervention
Puppo	2019	Community-Based Care in the ANRS-IPERGAY Trial: The Challenges of Combination Prevention	AIDS Educ Prev	Wrong study design
Rahimian	1999	Stories of AIDS outreach and case management: Context and activities	Subst. Use Misuse	Wrong outcomes
Rajabiun	2021	Ending the HIV Epidemic: One Southern Community Speaks	Soc	Wrong intervention
Ramos	2006	Promovision: designing a capacity-building program to strengthen and expand the role of promotores in HIV prevention	Health Promot Pract	Wrong outcomes
Ramos	2006	A Transcultural Case Management model for HIV/AIDS care and prevention. (Outreach and care approaches to HIV/AIDS along the US-Mexico border.)	Journal of HIV/AIDS & Social Services	Wrong outcomes
Ramos	2010	<i>Pasa la Voz</i> (Spread the Word): Using Women's Social Networks for HIV Education and Testing	Public Health Rep.	Wrong population
Rhodes	2016	The HoMBReS and HoMBReS Por un Cambio Interventions to Reduce HIV Disparities Among Immigrant Hispanic/Latino Men	MMWR (Suppl)	No original research
Rhodes	2012	Using community-based participatory research (CBPR) to develop a community-level HIV prevention intervention for Latinas: a local response to a global challenge	Womens Health Issues	Wrong intervention

Rhodes	2012	A snapshot of how latino heterosexual men promote sexual health within their social networks: process evaluation findings from an efficacious community-level intervention	AIDS Educ Prev	Wrong outcomes
Rios-Ellis	2015	Evaluation of a Community Health Worker Intervention to Reduce HIV/AIDS Stigma and Increase HIV Testing Among Underserved Latinos in the Southwestern US	Public Health Rep.	Wrong intervention
Rodríguez	2016	Integrating routine HIV screening in the New York City community health center collaborative	Public Health Rep.	Wrong intervention
Saber-Tehrani	2012	Rationale, study design and sample characteristics of a randomized controlled trial of directly administered antiretroviral therapy for HIV-infected prisoners transitioning to the community - a potential conduit to improved HIV treatment outcomes	Contemp Clin Trials	Wrong study design
Sanchez	2022	Stakeholder Perspectives on MAPS	J Acquir Immune Defic Syndr	Wrong study design
Santelli	1995	Interim outcomes for a community-based program to prevent perinatal HIV transmission	AIDS Educ Prev	Wrong outcomes
Santiago	2010	Identifying practices and strategies to increase HIV testing among Haitian migrant communities	Retrovirology	Conference Abstract
Schlaflf	1991	Boston's Codman Square Community Partnership for Health Promotion	Public Health Rep	Wrong outcomes
Selwyn	2003	Palliative care for AIDS at a large urban teaching hospital: program description and preliminary outcomes	Journal of Palliative Medicine	Wrong outcomes
Senter	2019	The southern initiative: Implementing a community health worker model to improve HIV care and prevention services among minority populations in four southern states	Implement. Sci.	Conference Abstract
Shah	2019	Solo se vive una vez (you only live once): A campaign to improve HIV testing among latinx in baltimore	Journal of General Internal Medicine	Wrong intervention
Silva-Santisteban	2016	HIV prevention among transgender women in Latin America: implementation, gaps and challenges	J Int AIDS Soc	Conference Abstract
Springer	2022	Study protocol of a randomized controlled trial comparing two linkage models for HIV prevention and treatment in justice-involved persons	BMC Infectious Diseases	No original research
Sudha	2017	"Beneficioso y Una Prioridad": Latina Women's Perceptions about HIV Testing	Am. J. Health Behav.	Wrong outcomes
Sun	2015	Latino sexual and gender identity minorities promoting sexual health within their social networks: process evaluation findings from a lay health advisor intervention	Health Promot Pract	Wrong outcomes
Sun	2015	ONCE A NAVEGANTE, ALWAYS A NAVEGANTE: LATINO MEN SUSTAIN THEIR ROLES AS LAY HEALTH ADVISORS TO PROMOTE GENERAL AND SEXUAL HEALTH TO THEIR SOCIAL NETWORK	Aids Educ. Prev.	Wrong outcomes
Tobi	2013	Investigating the HIV knowledge-personal risk awareness gap among black africans in London, UK	Sexually Transmitted Infections.	Conference Abstract
Tobin	2004	Correlates of HIV antibody testing among a sample of injection drug users: The role of social and contextual factors	AIDS behav.	Wrong intervention
Trotter	1996	The efficacy of network-based HIV/AIDS risk reduction programs in midsized towns in the United States	J. Drug Issues	Wrong outcomes
VanPelt	2023	Increasing antiretroviral therapy adherence and retention in care among adults living with HIV in Philadelphia: a study protocol for a stepped-wedge cluster-randomised type 2 hybrid effectiveness-implementation trial of managed problem-solving plus (MAPS+	BMJ Open	No original research
Vaughn	2019	Barriers to PrEP uptake: Perspectives of community health workers in the Mid-South region of the United States	J. HIV-AIDS Soc. Serv.	Wrong study design
Vorobjov	2013	Socio-demographic factors, health risks and harms associated with early initiation of injection among people who inject drugs in Tallinn, Estonia: evidence from cross-sectional surveys	Int J Drug Policy	Wrong intervention
Ward	2010	Guarding against an HIV epidemic within an Aboriginal community and cultural framework; lessons from NSW	N S W Public Health Bull	No original research
Ward	2014	SO FAR, SO GOOD: MAINTENANCE OF PREVENTION IS REQUIRED TO STEM HIV INCIDENCE IN ABORIGINAL AND TORRES STRAIT ISLANDER COMMUNITIES IN AUSTRALIA	Aids Educ. Prev.	No original research
Watters	1990	AIDS prevention for intravenous drug users in the community: street-based education and risk behavior	Am J Community Psychol	Wrong outcomes
Welch-Lazoritz	2017	Differential access to syringe exchange and other prevention activities among people who inject drugs in rural and urban areas of Puerto Rico	Int J Drug Policy	Wrong outcomes
Wendell	2003	Street outreach for HIV prevention: effectiveness of a state-wide programme	Int. J. STD AIDS	Wrong outcomes
Williams	1986	AIDS Risk Reduction: A Community Health Education Intervention for Minority High Risk Group Members	Health Educ. Behav.	Wrong outcomes
Wolfe	2021	Client Satisfaction with Community Health Workers in HIV Care Teams	J Community Health	Wrong outcomes
Wood	2023	A community health worker and mobile health app intervention to improve adherence to HIV medication among persons with HIV: the CHAMPS study protocol	BMC Public Health	No original research
Worth	2003	HIV/AIDS and the African Refugee Education Program in New Zealand	AIDS Educ. Prev.	Wrong outcomes
Yamanis	2020	"Hay que seguir en la lucha": An FQHC's Community Health Action Approach to Promoting Latinx Immigrants' Individual and Community Resilience	Behav. Med.	Wrong outcomes
Zamudio-Haas	2023	"Entre Nosotras:" a qualitative study of a peer-led PrEP project for transgender latinax	BMC Health Serv Res	Wrong study design
Nct	2020	Community Health Worker And MHealth to Improve Viral Suppression	https://clinicaltrials.gov/show/NCT04562649	No original research

Nct	2023	Community Health Worker And MHealth to ImProve Viral Suppression (CHAMPS Pilot)	https://clinicaltrials.gov/ct2/show/NCT05938413	No original research
Nct	2018	Retention in HIV Care for Hispanic Immigrants	https://clinicaltrials.gov/show/NCT03484117	No original research
Nct	2019	Linking High-Risk Jail Detainees to HIV Pre-Exposure Prophylaxis: prEP-LINK	https://clinicaltrials.gov/show/NCT04064567	No original research
Nct	2022	Addressing Risk Through Community Treatment for Infectious Disease and Opioid Use Disorder Now (ACTION) Among Justice-involved Populations	https://clinicaltrials.gov/show/NCT05286879	No original research
Nct	2013	Healthy Beginning Initiative	https://clinicaltrials.gov/show/NCT01795261	No original research
Nct	2019	Using CBPR to Engage Hazardous Drinking Women in the HIV Prevention and Care Continuum	https://clinicaltrials.gov/show/NCT04090723	No original research
Nct	2005	Community Intervention Trial for Youth (CITY) Study	https://clinicaltrials.gov/show/NCT00164580	No original research
Nct	2017	Using CBPR to Reduce HIV Risk Among Immigrant Latino MSM	https://clinicaltrials.gov/show/NCT03276338	No original research
Nct	2015	WebTelOAKTREE: text Messaging to Support Patients With HIV/AIDS in British Columbia	https://clinicaltrials.gov/show/NCT02603536	No original research
Nct	2018	Technology Based Community Health Nursing to Improve Combination Anti-Retroviral Therapy (cART) Adherence and Virologic Suppression in Youth Living With HIV	https://clinicaltrials.gov/show/NCT03600103	No original research
Nct	2017	Couples Health Project: couples-based Intervention to Reduce Drug Use and HIV Transmission Risk	https://clinicaltrials.gov/show/NCT03386110	No original research
Nct	2018	Testing an Intervention to Increase HIV Self-Testing Among Young, Black MSM	https://clinicaltrials.gov/show/NCT04210271	No original research

Appendix D. Table of Included Studies

Reference	Title of Study	Study Design/ Methods	Location	Sample Size	Population(s) of Interest	Name(s) of CHW	Scope of Intervention	Role(s) of CHW	Outcome(s) of Interest	Did CHWs test for HIV?	Quantitative Findings
Amaro et al., 2002	Implementation and long-term outcomes of two HIV intervention programs for Latinas	Quasi-experimental study	United States (MA)	170	Women, Hispanic/Latino	Community health educator, facilitator	Part of general women's health	Two interventions, the HIV-Intensive Prevention (HIV-IP) program and the Women's Health Program (WHP), were compared to a wait-list control group that received HIV prevention literature and referrals. Led by two trained bilingual community health educators, both programs were conducted in Spanish. Primary facilitators led educational sessions, while secondary facilitators handled logistics like childcare and transportation. Participants sought support or referrals from facilitators for various personal issues (e.g., substance use, domestic violence, mental health) and social services (e.g., housing, legal assistance, immigration).	HIV diagnostic testing / screening	No	A set of logistic regression analyses was undertaken to examine the interaction effects between groups on significant HIV-risk behavior outcomes. The effect of the intervention on HIV testing in past 3 months was found to be non-significant. At baseline (t=0 months), the proportion of participants who underwent HIV testing recently were 22.5% HIV-IP group, 20.37% in WHP group, and 30.30% in control group. At 15 months follow up, the proportion of participants who underwent HIV testing recently were 30.00% HIV-IP group, 16.67% in WHP group, and 31.91% in control group.
Aronson et al., 2017	Mobile Technology to Increase HIV/HCV Testing and Overdose Prevention/Response among People Who Inject Drugs	Pilot Study	United States (Bronx, NY)	31	Drug Users / Alcohol Abusers, Only HIV-Individuals	Street outreach worker	Combined with hepatitis C and substance abuse interventions	Street Outreach workers collaborated with study staff to develop the Mobile Intervention Kit (MIK), a tablet-based intervention with three separate educational modules relating to HIV, HCV, and overdose prevention. OWS recruited a convenience sample of syringe exchange programs (SEP) clients. Participants who consented to HIV or HCV testing underwent private testing in a van at the outreach site and received their results before departing. Those who tested positive were referred to care.	HIV diagnostic testing / screening	Yes	91% of recruited participants (10/11) accepted HIV test post-intervention with the MIK. All participants who tested HIV or HCV positive were referred to care by SEP staff.
Bernstein et al., 2012	The impact of a brief motivational intervention on unprotected sex and sex while high among drug-positive emergency department patients who receive STI/HIV VC/T and drug treatment referral as standard of care	Randomized Control Trial (RCT)	United States (Boston, MA)	1030	Drug Users / Alcohol Abusers	Lay counselor	Combined with other STI interventions	Lay counselors delivered B-MI, a safe sex motivational interviewing technique. Appointments were made for positive test results and results of study screening sent to the treatment provider chosen by the patient. Some lay counselors became certified in voluntary counseling/testing (VC/T) as well.	HIV diagnostic testing / screening; Linkage to care	Yes (some)	At enrollment, 91(8.8%) people tested positive on the Orasure ELISA test pre-randomization. The study compared a brief motivational intervention (B-MI) delivered by an outreach worker (intervention) with voluntary counseling/testing (VC/T) and drug treatment referral to VC/T and referral only (control). Incident HIV cases at 0, 6, 12 months follow-up were 3, 1, and 2 for intervention group and 4, 1, 2 for control group, respectively (non-significant). Out of 7 incident HIV cases in intervention group, 6 were successfully transferred to infectious Disease Clinic.

Birkel et al., 1993	Findings from the Horizontes Acquired Immune-Deficiency Syndrome Education Project- The Impact of Indigenous Outreach Workers as Change Agents for Injection Drug Users	Pre/Post Test study- one group	United States (Laredo, TX; San Diego, CA; San Juan, PR)	1616	Drug Users / Alcohol Abusers, Hispanic/Latino	Indigenous outreach worker	Part of substance abuse interventions	IOW recruited IDUs and gave an AIDS initial assessment (AIA) to gather demographic/ risk behavior details. They then delivered a standard educational intervention on HIV/AIDS, HIV antibody tests, virus spread, risks to unborn children, recognizing personal risk, needle cleaning, and safe sex practices. Referrals to drug treatment, medical, social service providers, and HIV test centers were provided as well as was transportation in some instances. A post test (AFA) was conducted by IOW.	HIV diagnostic testing / screening	Unknown	A total of 1159 injection drug users (IDUs) participated in voluntary HIV antibody testing, with 373 (70%) in Laredo, TX, 535 (72%) in San Diego, CA, and 251 (76%) in San Juan, PR. The rates of HIV-positive results varied significantly by site, with Laredo, San Diego, and San Juan having seropositive rates of 0.8%, 1.5%, and 56%, respectively.
Bungay et al., 2013	Community-based HIV and STI prevention in women working in indoor sex markets	Process / implementation evaluation	Canada	129	Women, Sex Workers, Asian	Community health worker	Combined with other STI interventions	As a part of "Outreach and Research in Community Health Initiatives and Development Project" (ORCHID), CHWs visited 32 indoor sex venues and provided information, emotional support, and referrals to assist women in obtaining care. CHWs or community-based researchers (CBRs) also offered appointment accompaniment services, translation services, STI testing, and a point-of-care (POC) HIV screening test. A CHW assisted in the thematic analysis of focus groups data.	HIV diagnostic testing / screening	Yes	112 Chinese sex workers (CSWs) were screened for HIV and 0 tested positive.
Drainoni et al., 2020	Integrating community health workers into HIV care teams: Impact on HIV care outcomes	Process / implementation evaluation	United States (LA, AL, NC, MD, NJ, FL, NV, TX)	397	Black/African American	Community health worker	Focused only on HIV	Within ten Ryan White HIV/AIDS Program (RWHAP) locations, CHWs documented their daily encounters with clients. CHWs conducted eight activity types: coaching, provision of emotional support, making appointment referrals, accompanying clients to appointments, assisting with concrete services as phones or bus passes, health care appointment reminders, arranging health care transportation, and updating care plans and medical records. Encounters between CHW and client interactions occurred mostly through virtual means (phone, texts, social media, email).	ART initiation; ART retention; Viral (VL) suppression	No	Participants who enrolled in a CHW program had statistically significant improvements in appointment attendance, being prescribed ART, and viral suppression from baseline to 6 months follow-up. The proportion of CHW program participants that had attended a provider visit in the past 6 months rose 49.9% to 84.7% (p<.000). Initially, about two-thirds of participants had an active prescription for ART (66.9%) and grew to over 90% in the 6 months post-enrollment (p<.000). The proportion of participants who were virally suppressed almost doubled from 22.4 to 43.7% (p<.000). Controlling for baseline characteristics, the number of encounter days between the CHW and participant was not significant associated with any outcome.
Farley et al., 2021	Community engagement and linkage to care efforts by peer community-health workers to increase PrEP uptake among sexual minority men	Process / implementation evaluation	United States (Baltimore, MD)	2465	Men who have Sex with Men (MSM), Trans Persons, LGBTQ+ persons, Black/African American	Peer community health worker	Focused only on HIV	Peer CHWs assisted and tracked LGBTQ+ community members across the PrEP linkage to care cascade across two main types of outreaches: community and venue-based events and virtual, participant-initiated activities (i.e., a website, a text-capable PrEP telephone warm-line, and the PrEPme smartphone app). Education, counseling, risk assessment, linkage to PrEP and/or HIV care services, transportation/co-pay assistance, and appointment scheduling / verification was conducted by the peer CHW.	Linkage to care; PrEP initiation	N/A	Across all forms of outreach (i.e., community-based and virtual), our team had contact with 2,465 participants in Baltimore. After 496 people had a private session with a peer CHW, interested individuals (31.8%) were given a PrEP referral. Out of 107 referred for an intake appointment, 94 had scheduled their appointment (87.9%) and 70 (65.4%) had completed their appointment.

Gleghom et al., 1997	The Impact of Intensive Outreach on HIV Prevention Activities of Homeless, Runaway, and Street Youth in San Francisco: The AIDS Evaluation of Street Outreach Project (AESOP)	Cross-sectional study	United States (San Francisco, CA)	1146	Unhoused individuals, Drug Users / Alcohol Abusers, Sex Workers, Young People / Adolescents, Participated in street economy	Community health outreach worker, Peer health educator	Part of substance abuse interventions	As part of a larger, multisite intervention study, the AIDS Evaluation of Street Outreach Project (AESOP). Outreach workers engaged with youth on the streets, introducing them to the newly created youth center's services and offering items like condoms. The center provided opportunities for deeper discussions on HIV prevention and other with support services like free meals and showers. Intervention materials were tailored to local youth subculture difference (punk vs. squatter identity).	Linkage to care	N/A	The median number of HIV-related referrals (e.g., HIV testing and counseling, drug treatment, or diagnosis or treatment of a sexually transmitted disease) from an OW in past 6 months increased significantly from 0 to 3 people over the span of the intervention ($p \leq .05$). The proportion of participants in the intervention group increased from 16% to 30% (8 out of 49 to 44 out of 149), while in the control group, it decreased from 48% to 33% (11 out of 23 to 9 out of 27) over the course of approximately 2 years, from baseline to follow-up. Adjusting for covariates, the intervention was associated with 3.2 higher odds (95% CI: 0.74, 13.2) of attending an HIV-related referral received in last 6 months.
Gomez et al., 2017	What Will It Take to End the HIV/AIDS Epidemic? Linking the Most Disenfranchised Into Care Through Outreach	Process / implementation evaluation	United States (San Francisco, CA; Oakland, CA; Richmond, CA)	546	Men who have Sex with Men (MSM), Drug Users / Alcohol Abusers, Prisoners/Ex-Prisoners, LGBTQ+ People, Young People/Adolescents, Low-income individuals, Only HIV+ Individuals, People with mental illness	Outreach worker, Peer advocate, Patient navigator	Focused only on HIV	Within the Bay Area Network for Positive Health (BANPH), outreach workers aimed to reduce the total number of PLWHA out of care. OWs referred people to HIV care and/or ancillary services, verified if referred individuals attended HIV care appointments, and reengaged those who didn't. For those referred to ancillary services, workers assessed service receipt and readiness for HIV care.	Linkage to care	No	Out of 546 PLWHA who had completed their intake surveys, 440 individuals (80.6%) were successfully connected to care: 61 in the initial year, 193 in the second year, and 186 in the third year. Average time to linkage of care was 56 days. OW made an average of 10 attempts to contact clients for care linkage.
Hammack et al., 2021	A Community Health Worker Approach for Ending the HIV Epidemic	Pilot study	United States (East Baton Rouge Parish, LA)	980	Women, Men who have Sex with Men (MSM), Drug Users / Alcohol Abusers, Trans Persons, LGBTQ+ People, Black/African American	Community health worker	Combined with hepatitis C and other STI interventions	During outreach, CHWs first inquired about basic needs assistance, (e.g. applying for SNAP, Medicaid, etc.). If accepted, they provided extended support, including referrals, HIV care reengagement, syringe distribution, PrEP referrals, or HIV testing by the CHW. They also attended appointments, navigated, and assisted with online applications. CHWs documented these client encounters.	HIV diagnostic testing / screening; Linkage to care; PrEP initiation	Yes	320 people were screened during street-based outreach using OraQuick, in-home HIV test kits, or the client would make an appointment to get tested with a standard rapid test at the CHW's office. 10 people with HIV were successfully linked to HIV medical care. 19 people at risk of HIV infection were linked to a medical visit for PrEP initiation.

Hidalgo et al., 2011	Roles and challenges of outreach workers in HIV clinical and support programs serving young racial/ethnic minority men who have sex with men. (Special Issue: Special Projects of National Significance (SPNS) Young Men of Color Who Have Sex with Men (YCMSM))	Outcome/effectiveness evaluation	United States (Bronx, NY; Chapel Hill, NC; Chicago, IL; Detroit, MI; Houston, TX; Los Angeles, CA; Oakland, CA; Rochester, NY)	8 sites-25,376 contacts	Men who have Sex with Men (MSM), LGBTQ+ People, Young People / Adolescents, Only HIV+ Individuals, Hispanic/Latino	Outreach worker, Connection to care specialist, Peer youth advocate / specialist, Service linkage worker	Focused only on HIV	Across eight demonstration sites in the federal Special Projects of National Significance (SPNS) Young MSM of Color Initiative, outreach workers provided a variety of ongoing linkage activities. They frequently escorted clients to medical appointments, assisted them in navigating the healthcare system, collaborated with case managers to coordinate services, facilitated support groups, arranged social and educational gatherings, conducted outreach and HIV testing, and provided peer support to initiate HIV medication.	HIV diagnostic testing / screening; Linkage to care	Yes	Outreach and testing with HIV mobile testing vans was conducted by 2 sites. 37% of HIV testing events (n=3) targeting young racial/ethnic minority MSM led to the identification of 439 HIV-positive cases. Out of these, 197 cases were from SPNS outreach, group, or center contacts, 215 from SPNS partners or designated referral sources, and 27 from other referral sources. Of 334 patients analyzed for linkage analysis, 72% were linked to care within 30 days of diagnosis, 81% within 60 days, and 87% within 90 days. Retention rates at 12 months were high, with 83% remaining in care after entering or re-engaging in care.
Kendrick et al., 2005	Outcomes of offering rapid point-of-care HIV testing in a sexually transmitted disease clinic	Descriptive study	United States (Chicago, IL)	1977	Only HIV-Individuals, Black/African American	Health Educator	Focused only on HIV	Three health educators, equipped with laboratory and HIV counseling expertise, administered pretest and posttest counseling, collected blood samples, and conducted an HIV rapid test (Single Use Diagnostic System for HIV-1 (SUDS)). Positive participants, confirmed by Western blot, were promptly scheduled for a medical evaluation at the HIV primary care clinic within two weeks. Outreach was conducted for those who missed appointments.	HIV diagnostic testing / screening; Linkage to care; ART initiation; Viral (VL) suppression	Yes	Of the 1,977 eligible patients for the study, 1,581 (80%) consented to HIV testing, with 1,372 (87%) opting for rapid HIV testing and 209 (13%) choosing conventional HIV testing. Those with negative results were informed during a brief session and advised to return in 2 weeks to receive their standard test results. 99% of participants received their results. Out of the 37 people (2.7%) found to be HIV positive via rapid testing, 36 entered into care, 30 (83%) remained in care (2+ visits) after 6 months, and 20 (67%) met the current recommendations for antiretroviral therapy and were prescribed medication. The median viral load at first visit was 53,259 (50-500,000) copies/mL
Kenya et al., 2016	Using community health workers to improve clinical outcomes among people living with HIV: a randomized controlled trial	Pilot Randomized Control Trial (RCT)	United States (Miami, FL)	62	Only HIV-Individuals, Black/African American	Community health worker	Focused only on HIV	Participants in the experimental condition were aided by CHWs to undertake Home-Based HIV Rapid Testing (HBHRT), while those in the control group were instructed to complete the HBHRT independently. If eligible participants had the time to undergo the OraQuick HIV test, CHWs promptly conducted a survey and provided pretest counseling at the screening site. Test completion was confirmed via results and return of mouth swab. HIV positive individuals were given education and linked to care by CHWs to South Florida AIDS Network (SFAN). CHWs helped in recruitment.	HIV diagnostic testing / screening; Linkage to care	Yes	All 30 participants in the experimental group (OraQuick HIV test with CHW assistance) successfully completed the HIV test. However, three out of the 30 participants in the control group (no CHW assistance) did not complete the test. This difference was statistically significant ($\chi^2(1, n=60) = 5.46, p \leq .02$). Among those who completed the test, two participants from the experimental group and three from the control group were found to be HIV positive. 100% of those in intervention group were linked to care which entailed attending an initial appointment at SFAN and a follow-up with an HIV provider within six weeks of diagnosis. None of the control group was linked to care.

Kenya et al., 2013	Can Home-Based HIV Rapid Testing Reduce HIV Disparities Among African Americans in Miami?	Randomized Control Trial (RCT)	United States (Miami, FL)	91	Only HIV+ Individuals, Black/African American	Community health worker	Focused only on HIV	During initial contact, CHWs assessed participants' healthcare barriers and collaborated with supervisors to create individualized action plans. For three months, CHWs provided weekly in-person visits focusing on HIV education and support, transitioning to phone support afterward. CHWs accompanied participants to medical appointments, ensured understanding of treatment recommendations, facilitated access to social services, and connected them to HIV support groups.	Viral (VL) suppression	N/A	In both pre and post-analysis, both groups experienced reductions in viral load. However, at 9 and 12 months, participants in the CHW intervention arm had significantly lower viral loads compared to the control group. Although VLs began to rise after 9 months in both groups, significant differences persisted at the 12-month mark. Specifically, at post-study, the intervention group had a mean VL 0.9 log copies/ μ L lower than the control group ($t = 2.76$, $df = 67$, $p \leq .01$).
Ma et al., 2008	The feasibility of modified directly observed therapy for HIV-seropositive African American substance users	Pilot Study	United States (Southern)	31	Drug Users / Alcohol Abusers, Only HIV+ Individuals, Black/African American	Outreach worker	Focused only on HIV	The Modified Directly Observed Therapy (MDOT) intervention began with a 3-month intensive phase where participants met with an outreach worker five days a week. OWs observed the morning HIV medication dose, noted any side effects, and recorded adherence to self-administered doses daily. The outreach worker also liaised with medical clinics, facilitated medication refills, and provided referrals. In the 3-month transition phase, outreach visits gradually decreased from five days to one day per week.	ART adherence; Viral (VL) suppression	N/A	Initially, none of the participants were considered adherent to their HAART regimen. Participants who consumed less than 80% of their prescribed doses within a 4-day span were classified as non-adherent to their medication regimen. By the 3-month assessment, 75% achieved this criterion, and by 6 months, 67% maintained it. All participants reported that the directly observed medication (MDOT) visits facilitated their medication intake. Reduction in viral loads occurred with 39% of participants (11 out of 29) having viral loads below 400 copies/mL at baseline. This percentage rose to 55% at 3 months (11 out of 20) and further to 67% at 6 months (8 out of 12).
Macalino et al., 2007	A randomized clinical trial of community-based directly observed therapy as an adherence intervention for HAART among substance users	Randomized Control Trial (RCT)	United States (RI; MA)	87	Drug Users / Alcohol Abusers	Outreach worker	Focused only on HIV	Eligible participants were randomly assigned to either modified directly observed therapy (MDOT) or standard of care (SOC). MDOT participants obtained their own prescriptions, which were then packed by a study nurse. An OW delivered the medications to the participants' chosen location and supervised their intake. MDOT participants were equipped with a one-week medication supply for self-administration if an outreach visit was missed. Outreach visits were attempted daily for the first 3 months and gradually reduced over subsequent months, up to 12 months.	ART adherence; Viral (VL) suppression	N/A	A total of 87 participants were enrolled (43 in SOC, 44 in MDOT). At 1 month follow up, 38% of MDOT and 27% of SOC had achieved VL suppression. At 3 months, the proportion rose to 38% in MDOT group and 41% in SOC group. Using repeated measures logistic regression, MDOT participants were more likely to achieve virologic suppression by 3 months follow-up (OR= 2.16; 95% CI: 1.0,4.7), driven primarily by those HAART experienced (OR= 2.88; 95% CI: 1.2,7.0). Virologic suppression was defined as either undetectable virus (less than 50 copies/ml) or a greater than two log ₁₀ -unit reduction in plasma viral load (PVL) from baseline.

Martinez et al., 2014	Adaptation and implementation of HoMBReS: a community-level, evidence-based HIV behavioral intervention for heterosexual Latino men in the midwestern United States	Process / implementation evaluation	United States (Indianapolis, IN)	270	Men, Hispanic/Latino	Navegant e, Lay health educator	Combined with other STI interventions	Navegantes recruited Latino men from soccer leagues for HIV and sexual health education sessions and one-on-one discussions. Free on-site HIV and STI testing and counseling (gonorrhea, chlamydia, syphilis, hepatitis C) was provided, with HIV-positive individuals were referred for confirmatory tests, HIV Case Management services, and Casa Mateo/Latino Action League, Inc. for wraparound care, including non-medical case management and translation services. Navegantes completed monthly activity logs as part of the evaluation process	HIV diagnostic testing / screening; Linkage to care	Unknown	146 (54%) participants were tested for HIV using the OraQuick ADVANCE® Rapid HIV-1/2 Antibody Test on site. 3 people (2% of those tested, 0.5% prevalence) tested positive and were referred to HIV cases management services and were given confirmatory testing. All remained in care coordination at 12 months.
McAuliffe et al., 1989	An evaluation of using exaddict outreach workers to educate intravenous drug users about AIDS	Quasi-experimental study	United States (Baltimore, MD)	308	Drug Users / Alcohol Abusers, Sex Workers, Non-White	Outreach worker	Part of substance abuse interventions	In the Street Outreach AIDS Prevention (SOAP) program, outreach workers interviewed IDUs before educating them on AIDS prevention. They remained in the area conducting outreach and interviews until reaching every willing IDU. Control areas underwent similar interviews but received no AIDS education. Additionally, referral to drug treatment and care services was provided.	HIV diagnostic testing / screening	No	The intervention has positive, but not-significant, changes in IDU behavior of recently being tested for HIV. In the experimental and control group, 23% and 24% of IDUs had been recently tested.
Naar et al., 2020	Motivational interviewing by peer outreach workers: a pilot randomized clinical trial to retain adolescents and young adults in HIV care	Randomized Control Trial (RCT)	United States (Chicago, IL; Detroit, MI; Memphis, TN; Los Angeles, CA; Philadelphia, PA)	183	Drug Users / Alcohol Abusers, Young People Adolescents, Only HIV+ Individuals, Black/African American	Community health worker	Focused only on HIV	Participants recruited from adolescent HIV clinics were randomized to receive the Healthy Choices intervention in either a home or clinic setting. A CHW delivers four session using motivational interviewing strategies to encourage (1) medication adherence and modify (2) drinking behavior. The CHW created an individualized change plan with the participant and modified it as necessary.	ART adherence; Viral (VL) suppression	N/A	Using growth-curve analysis, both groups exhibited declines in viral load post-intervention. Among participants with available viral load data, in the home group, 12 participants (21%) achieved an undetectable viral load at 16 weeks, 12 (22%) at 28 weeks, and 10 (20%) at 52 weeks. In contrast, in the clinic group, 16 participants (24%) achieved an undetectable viral load at 16 weeks, 20 (39%) at 28 weeks, and 18 (35%) at 52 weeks. On average, individuals who received the intervention at the clinic experienced approximately 355 fewer viral copies/mL compared to those who received home delivery. While the clinic group maintained their gains, those counseled at home showed a significantly different and increasing trajectory during follow-up (unstandardized $\beta = -0.07$; 95% CI: $-0.14, -0.01$; $p = .02$).

Naar-King et al., 2009	Comparative Effectiveness of Community-Based vs Clinic-Based Healthy Choices Motivational Intervention to Improve Health Behaviors Among Youth Living With HIV: A Randomized Clinical Trial	Pilot Randomized Control Trial (RCT)	United States (Detroit, MI)	83	Young People / Adolescents, Only HIV+ Individuals, Black/African American	Peer outreach workers	Focused only on HIV	Motivational Interviewing (MI) was employed to enhance youth retention in HIV primary care, while also assessing the fidelity and outcomes of peer outreach workers (POW) compared to master's level staff (MLS). Using standard MI techniques, the interventionist elicited clients' perspectives, showed empathy, encouraged self-efficacy, and highlighted discrepancies between clients' values and attending HIV care appointments (i.e., care received from a doctor, nurse practitioner, or physician's assistant who could monitor CD4 and viral load and prescribe HIV medications). The session concluded with clients creating a change plan that could be modified at 6 months follow up.	ART retention	N/A	There were no significant differences between conditions in gaps in HIV primary care over 12 months post-enrollment. The study created a proxy measure for adherence that transformed appointment data into a four-point gap score, where zero indicated no gaps (at least one HIV care appointment per quarter), and four indicated no appointments in 12 months. Both groups demonstrated fewer than two gaps, indicating at least one appointment every six months. Both groups also exhibited significant improvements pre- to post-intervention, with large effect sizes: $d = 1.73$ for POW and $d = 0.94$ for MLS. Specifically, mean gap scores decreased from pre- to post-intervention in both groups, with POW showing greater reductions compared to MLS, supported by a medium effect size ($d = 0.43$). Participants in the POW group attended a significantly higher number of intervention sessions compared to those in the MLS group ($F(1, 81) = 5.52, p < 0.05$), with an effect size of 0.44.
Nash et al., 2021	Acceptability and usability of HIV self-tests in two European countries: findings from surveys of clients at non-governmental organisations in Lithuania and Italy	Acceptability / usability study	France, Lithuania	138 (Lithuania); 28 (Italy)	None Specified	Community health worker	Focused only on HIV	In Italy, participants underwent HIV self-testing (Mylan Autotest) under the supervision of a community health worker (CHW). Both the participants and the CHW completed a self-administered survey to assess the participant's experience. The CHW completed the survey while observing the tester to ensure accurate completion of all required test steps. If participants were unable to complete the test the CHW would assist them.	HIV diagnostic testing / screening	Yes	28 people used the HIV self test under supervision of a CHW. Approximately one-third (9 out of 28) of participants encountered challenges during the HIV self-testing process, either failing at least one step or requiring assistance to complete the test. The most common difficulties included difficulties in collecting an adequate blood sample (7 out of 28) and understanding how to activate the test (6 out of 28).
Navarra et al., 2023	Feasibility and Acceptability of the Adherence Connection Counseling, Education, and Support (ACCESS) Proof of Concept: A Peer-Led, Mobile Health (mHealth) Cognitive Behavioral Antiretroviral Therapy (ART) Adherence Intervention for HIV-Infected (HIV plus	Pilot study	United States (New York City, NY)	21	Young People / Adolescents, Only HIV+ Individuals, Hispanic/Latino, Black/African American	Peer health coach	Focused only on HIV	The Adherence Connection for Counseling, Education, and Support (ACCESS) study assesses the feasibility and acceptability of a peer-led mHealth cognitive behavioral intervention (CBI) via remote video conferencing using smartphones. It also aims to estimate ACCESS's impact on various factors, including HIV virologic outcomes, ART adherence, beliefs about ART treatment, adherence self-efficacy, and healthcare utilization (retention in care). Peer health coaches held five weekly, 60-minute sessions in their private offices, while participants used their study-provided smartphones at their chosen location. Participant feedback was collected by PHC to gauge intervention acceptability.	ART adherence; Viral (VL) suppression	N/A	Adherence outcomes, encompassing HIV viral load (considered the primary adherence outcome) and self-reported adherence over a three-day period, were measured. HIV viral load data was extracted from the participant's medical record at the time of baseline/pre-intervention, immediately following intervention completion, and 8, 16 and 24-weeks post-intervention. An annualized average reduction of 47.5% (0.28 log10) in HIV viral load was noted. While this reduction was not statistically significant ($t = -1.40, p > 0.05$), it holds clinical significance, corresponding to a small effect size (Cohen $d = 0.3$). Pre-intervention versus post-intervention (after 5 weeks) self-reported ART adherence showed improvement, with an average increase of 32% in doses taken (95% CI: 11.2-53.3).

Outlaw et al., 2010	Using motivational interviewing in HIV field outreach with young African American men who have sex with men: a randomized clinical trial	Randomized, 2-group, repeated-measures design(RCT)	United States (Detroit, MI)	188	Men who have Sex with Men (MSM), LGBTQ+ People, Young People / Adolescents, Only HIV-Individuals, Black/African American	Peer outreach worker	Focused only on HIV	Peer outreach workers (POW) provided safe sex supplies and standard education to all participants. The motivational interviewing intervention (MI) condition utilized an interviewing style in a field outreach session involving expressing empathy, exploring ambivalence, and building motivation for change in a client-centered and goal-oriented manner. Completion of a change plan was offered. After the intervention, participants were offered HIV counseling and testing, which involved an oral swab of the cheek by the POW. Test results were typically available 7 to 10 days after the counseling and testing session, and posttest counseling sessions were scheduled accordingly.	HIV diagnostic testing / screening	Yes	Nearly half (49%) of the participants in the intervention group underwent HIV counseling and testing post-intervention, compared to only 20% of those in the control group. This discrepancy was statistically significant ($\chi^2 = 17.94$; $p = .000$). Additionally, individuals in the intervention group were more inclined to return for their test results compared to those in the control group (98% versus 72%). This difference was also statistically significant ($\chi^2 = 10.22$; $p = .001$).
Peach et al., 2018	Blood-borne virus transmission in an urban, culturally diverse neighbourhood: results from a cross-sectional bio-behavioural survey using innovative outreach methods in a hard-to-reach population	Cross-sectional	Australia (Melbourne, VIC)	128	Drug Users / Alcohol Abusers, Aboriginal People	Community health worker, Fieldworker	Combined with hepatitis C and other STI interventions	After an HIV outbreak among Aboriginal PWID, CHWs conducted a HIV/HCV/HBV/syphilis screening program from a mobile van alongside a study questionnaire. Results were given to participants from the mobile van at a later time or through an appointment with a general practitioner to encourage linkage to care.	HIV diagnostic testing / screening; Linkage to care	Yes	5 incident cases of HIV were detected through the screening program. All were either already linked to care or linked via participation in the study.
Rhodes et al., 2009	Outcomes from a community-based, participatory lay health adviser HIV/STD prevention intervention for recently arrived immigrant Latino men in rural North Carolina	Pilot study	United States (NC)	222	Men, Hispanic/Latino	Lay health advisor	Combined with other STI interventions	HoMBReS, a program targeting sexually active heterosexual Latino men, aimed to promote condom use, HIV testing, and positive prevention behaviors. 30 soccer teams were recruited, evenly split between 15 intervention teams and 15 control teams. One lay health advisor or "Navegante" was elected from each intervention team by his peer. Navegantes were trained to serve as health advisors, opinion leaders, and community advocates who were equipped to make referrals, increase HIV/STD knowledge, promote testing, enhance condom use skills, challenge negative socio-cultural norms, and advocate for change.	HIV diagnostic testing / screening	No	Effects of intervention were evaluated at 18-month post-Navegante training from a random sample of teammates from the intervention and control teams. Participants in the intervention were more likely to report HIV testing (adjusted OR=2.5; 95% CI: 1.5,4.3; $p=.001$) with 64.4% of the intervention group having tested versus 41.8% of the control group.

Rosa et al., 2001	HIV risk behavior and HIV testing: a comparison of rates and associated factors among homeless and runaway adolescents in two cities	Cross-sectional study	United States (San Diego, CA; Los Angeles, CA)	2259	Unhoused individuals, Drug Users / Alcohol Abusers, Sex Workers, Young People / Adolescents, Participated in street economy	Outreach worker	Part of substance abuse interventions	This research was part of a larger multisite intervention funded by the CDC, conducted in Hollywood, CA, as the intervention community, and San Diego, CA, as the control community. Five components constituted the intervention: enhanced street outreach, peer outreach, condom distribution, a monthly newspaper by street youth, and referral of injection drug-using youth to a needle exchange program. Though not aimed at increasing HIV testing rates, the enhanced outreach provided information and referrals to testing sites for street youth in Hollywood.	HIV diagnostic testing / screening	No	Los Angeles youth were significantly more likely than San Diego youth to report interaction with an outreach worker (62% vs. 17%), $\chi^2(1, n = 2,242) = 487.0, p < .001$. Those who engaged in conversations with outreach workers were 1.75 times more likely to undergo testing compared to those who did not (95% CI: 1.24–2.48, $p < .01$).
Roth et al., 2011	Can lay health workers promote better medical self-management by persons living with HIV? An evaluation of the Positive Choices program	Prospective Randomized Control Trial (RCT)	United States (Marion County, IN)	449	Only HIV+ Individuals	Health coach, Lay health worker	Focused only on HIV	Lay Health Workers (LHWs) provided one-on-one support over the phone and in-person to people living with HIV (PLWH) covered by Indiana's high-risk insurance pool. LHWs in a supplementary Patient Navigation with the Positive Choices (PC) program provided direct health education, behavioral skill development, and emotional support.	ART adherence; Viral (VL) suppression	N/A	Adherence to antiretroviral medications was 1.83 higher among PC participants compared to controls, after adjusting for baseline viral load (VL). Intervention subjects were more likely than controls to receive VL tests during the study (OR = 3.05; 95% CI: 1.05, 8.86; $p = 0.04$). Moreover, the intervention group had a higher likelihood of achieving VL suppression (<50 copies/mL) during the 12-month follow-up period compared to controls (OR = 2.01; 95% CI: 1.18, 3.43; $p = 0.01$). After adjusting for baseline risk factors and missing values, the predicted probability of VL suppression among PC and control patients at follow-up was 51% and 34%, respectively. This absolute difference reflected both an increased likelihood of PC participants who were not initially under control achieving better control and a higher likelihood of PC participants maintaining VL <50 copies/mL if they were already well-controlled at baseline.
Sevelius et al., 2021	Uptake, Retention, and Adherence to Pre-exposure Prophylaxis (PrEP) in TRIUMPH: A Peer-Led PrEP Demonstration Project for Transgender Communities in Oakland and Sacramento, California	Pilot Study with prospective single-arm design	United States (Oakland, CA; Sacramento, CA)	185	Women, Trans Persons, LGBTQ+ People, Only HIV- Individuals, Hispanic/Latino	Peer health educator	Part of larger LGBTQ+ health programming	TRIUMPH (Trans Research-Informed communities United in Mobilization for the Prevention of HIV) project utilized highly trained peer health educators (PHEs) to deliver trans-specific PrEP navigation, education, and assistance. Additionally, PHEs offered peer navigation for legal aid for name changes and asylum processes, mental health support, hormone therapy, and transportation assistance, as needed. PHEs spearheaded community mobilization efforts in community-based venues, events such as PrEP pageants and clinics, social networks, and on social media. These efforts aimed to promote self-referral and referrals to TRIUMPH clinics in Oakland and Sacramento.	HIV diagnostic testing / screening; PrEP initiation; PrEP adherence; PrEP retention	No	Study staff, certified as HIV test counselors, conducted testing at baseline, 1, 3-, 6-, 9-, and 12-months post-enrollment. Zero incident HIV infections were detected. PrEP was dispensed by providers at office visits in Sacramento and from the on-site pharmacy in Oakland. Out of 185 participants, 8 (4%) were already taking PrEP upon enrollment. Among the remaining 177 participants, 162 (87%) began taking PrEP, while 15 (8%) did not initiate PrEP during the study. PrEP retention was assessed at 12 months by proportion of visits completed (76% in Oakland; 62% in Sacramento). PrEP adherence was assessed longitudinally, defined by protective drug levels (tenofovir diphosphate level ≥ 700 fmol per punch by dried blood spot [DBS] analysis) for those on PrEP who completed visits (50% in Oakland; 56% in Sacramento).

<p>Sturrock et al., 2007</p>	<p>Community-based sexual health care works: A review of the ACT outreach program</p>	<p>Retrospective observational study</p>	<p>Australia (ACT)</p>	<p>313</p>	<p>Men who have Sex with Men (MSM), LGBTQ+ People, Sex Workers, Young People / Adolescents</p>	<p>Sexual health educator</p>	<p>Combined with hepatitis C and other STI interventions</p>	<p>In the Partnership Approach to Comprehensive Testing (PACT) program, outreach clinics are conducted to offer sexual healthcare to at risk-groups (MSMs, sex workers, youth, and university students). Health educators negotiate clinic venues and times, as well as providing support during clinic sessions alongside two registered nurses. Testing and referrals for care for chlamydia, gonorrhea, hepatitis A, hepatitis C, and HIV were conducted as needed.</p>	<p>HIV diagnostic testing / screening</p>	<p>No</p>	<p>During 119 clinics (~547 clinician hours), 313 individuals received education and/or STI/BBV testing. Blood specimens were screened for HIV antibodies at outreach clinics. Zero HIV infections were detected. Number of people screened is unknown.</p>
<p>Valverde & Felderman-Taylor, 2006</p>	<p>HIV/AIDS Outreach in Southern New Mexico: from design to implementation. (Outreach and care approaches to HIV/AIDS along the US-Mexico border.)</p>	<p>Process/implementation evaluation</p>	<p>United States (Doña Ana County (DAC), NM along US/MX border)</p>	<p>1021</p>	<p>Women, Men who have Sex with Men (MSM), Drug Users / Alcohol Abusers, LGBTQ+ People, Hispanic/Latino</p>	<p>Health outreach worker</p>	<p>Focused only on HIV</p>	<p>The New Mexico Border Health Initiative (NMBHI) was a five-year Special Project of National Significance (SPNS) focus on enhancing HIV testing and linkage to care for high-risk populations, including MSM, IDU, and at-risk women. The project involved four key program areas: recruitment and training of health outreach workers (HOWs), HIV testing of targeted individuals, raising HIV risk awareness, and linking newly diagnosed individuals to HIV primary care. HOWs were trained in HIV testing and counseling, identification of personal risk behaviors, establishment of goal behaviors, development of a risk reduction action plan, referrals, data collection and follow-up.</p>	<p>HIV diagnostic testing / screening; Linkage to care</p>	<p>Yes</p>	<p>Between March 2001 and December 2004, 1021 individuals (79%) underwent screening, with 5 testing positive and 4 being linked to care. All participants received pre- and post-test counseling on HIV/AIDS transmission and prevention. OraSure test results were typically provided by the state laboratory within two weeks. Newly diagnosed HIV-positive individuals were connected to primary care through a partnership with the NMDOH's early intervention nurse, facilitating their enrollment into services. Confirmatory HIV blood tests for positive OraSure results were administered by the early intervention nurse or designated NMDOH staff member.</p>
<p>Vaugoyeau et al., 2023</p>	<p>Proof of concept of a sexual health outreach program led by community health workers in homeless hostels in the greater Paris region</p>	<p>Process / implementation evaluation</p>	<p>France (Greater Paris region)</p>	<p>572</p>	<p>Unhoused individuals, Women</p>	<p>Community health worker</p>	<p>Combined with other STI interventions</p>	<p>Outreach was conducted in 12 social homeless hostels, where CHWs held tailored sexual health workshops for women over 8 weeks, meeting weekly. CHWs organized 30 rapid diagnostic testing (RDT) sessions for HIV and hepatitis B and C. Collected data were digitally entered into an accredited health data storage tool after CHWs received training. Comments from CHWs during interviews, focus groups, and field observations helped identify program facilitators and barriers. Participants testing positive for any infection were referred to a hospital referral center, with CHWs accompanying if needed. Additionally, with participant consent, their general practitioner was informed about the test results and referral process.</p>	<p>HIV diagnostic testing / screening</p>	<p>Yes</p>	<p>In total, 146 individuals participated in testing for HIV with no HIV infections detected. Over 70% of participants completed all three RDT tests (HIV, hepatitis B, and hepatitis C).</p>

Visnegarwala et al., 2006	Community outreach with weekly delivery of anti-retroviral drugs compared to cognitive-behavioural health care team-based approach to improve adherence among indigent women newly starting HAART	Pilot study	United States (Houston, TX)	54	Women, Only HIV+ Individuals	Outreach worker	Focused only on HIV	Directly Delivered Therapy (DDT) was evaluated over six months among ARV-naive indigent women initiating HAART. The intervention involved an outreach worker delivering all HAART doses in a bubble pack for six months, with weekly visits for the first four months and biweekly visits for the remaining two months. The OW filled out a brief questionnaire on adverse effects and self-reported adherence as well as provided emotional support and education. The study compared DDT with two other approaches: Adherence Coordination Services (ACS), which utilized a health care team, and the Standard of Care (SoC) historical referent group.	ART adherence; Viral (VL) suppression	N/A	Out of 26 enrolled, 24 began HAART alongside the DDT intervention. 307 visits were scheduled with the OW, and 282 (92%) were attended by participants in DDT, higher than both ACS and SoC (75% and 54%). Proportion of empty bubble packets served as a proxy for adherence among the DDT group (85%) and ACS (81%). The proportion of subjects achieving sustained virologic suppression (SVR), defined as ≤ 400 copies of HIV RNA/mL, was assessed. In the short-term (4-8 months), the DDT group had a significantly higher SVR proportion (85%) compared to ACS (54%) and Standard of Care (SoC) (36%). DDT showed superiority over SoC ($p < 0.001$) and ACS ($p < 0.08$), while no significant difference was observed between ACS and SoC ($p = 0.3$). In the post-intervention period (10-14 months), 54% of ACS, 80% of DDT, and 45% of SoC participants achieved SVR. DDT was superior to SoC ($p = 0.03$), while the difference between ACS and SoC was not significant ($p = 0.1$).
Yamazaki et al., 2010	Pilot programme using social network interviews to screen high-risk adolescents and young adults	Pilot Study	United States (Baltimore, MD)	95	Young People / Adolescents, Black/African American	Community health worker	Focused only on HIV	The pilot program, conducted at the Adolescent HIV Clinic, aimed to test social and sexual networks of HIV-infected youth patients. HIV-positive youth at the clinic, serving as index youths, were referred to CHWs for a risk reduction program and Social Network Interview (SNI) where the CHW taught about partner notification and gathered relevant contact information. CHWs sought and met with all referred contacts, urging them to test at partner clinics. Referred contacts received HIV counseling, testing, and referrals (CTR), and if positive, completed the SNI.	HIV diagnostic testing / screening; Linkage to care	No	Referred contacts from index youths were encouraged to schedule confidential testing appointments and voluntarily visited clinics. Of the 32 contacts offered HIV tests (including first- and second-generation contacts), 2 were known to be HIV-positive, and 5 declined testing. Twenty-five contacts (85%) received HIV tests, resulting in three new HIV diagnoses and referrals. When the HIV-positive referred contacts visited and registered at clinic, they were offered CTR and the risk reduction program.
Young et al., 2019	Beyond the Barefoot Doctors: Using Community Health Workers to Translate HIV Research to Service	Process / implementation evaluation built on a previous pilot RCT	United States (Miami-Dade County, FL)	529	Unhoused individuals, Only HIV+ Individuals, Black/African American/Caribbean	Community health worker	Focused only on HIV	In the "CHAMP" initiative, CHWs conducted rapid HIV testing and counseling using the ADVANCE® Rapid HIV-1/2 Antibody Test, providing results within 20 minutes. CHWs collected sexual history, assessed support systems, and adjusted action plans from pretest counseling. After the test, they provided counseling and education, encouraged PrEP and PEP, and scheduled follow-up screenings for recent exposures. Participants received a community resource guide, CHAMP contact details, and contraceptive tools. If a positive result occurred, CHWs schedule and accompany participants to a local HIV care agency for confirmatory testing and follow-up care, assisting with pre-enrollment needs like obtaining identification or health insurance.	HIV diagnostic testing / screening; Linkage to care	yes	Out of 529 people with screened for HIV, 5% (n=26) tested positive, and 92% (n=24) of those were positive through confirmatory testing. Approximately 17% (n=4) of participants were linked to care through CHAMP. Among those not linked, 21% were already in care, while others refused linkage support or were lost to follow-up.