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FRAMEWORKS FOR DATA-DRIVEN EVALUATION OF COMMUNITY-BASED CHRONIC DISEASE INTERVENTIONS: A NARRATIVE REVIEW AND PROPOSED ANALYTICAL ROADMAP

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ABSTRACT

Community-based chronic disease prevention programs operate in complex, multi-component environments where robust evaluation is critical yet, their integration into a coherent, data-driven, equity-centered analytical approach remains underdeveloped, particularly in United States community and safety-net settings. This narrative review synthesizes the published literature on evaluation frameworks and data-driven methodologies applied to community-based chronic disease intervention programs. Drawing on peer-reviewed literature, grey literature from public health agencies, and implementation science frameworks published between 2020 and 2026, sources were identified through searches of PubMed, Scopus, and Google Scholar using terms spanning chronic disease evaluation, community-based intervention frameworks, implementation science, data-driven evaluation, and health equity. Five major framework categories were identified: logic model and theory-of-change approaches; health service quality models including the Donabedian structure-process-outcome framework; chronic disease management frameworks led by the Chronic Care Model; implementation science frameworks centered on RE-AIM; and equity-centered participatory evaluation models designed for vulnerable and indigenous populations. Across frameworks, common evaluation elements included inputs and context, process fidelity, outputs and reach, and short- and long-term outcomes. Persistent gaps included inconsistent use of standardized indicators, limited economic evaluation, underinvestment in sustainment and scale-up assessment, and inadequate representation of equity dimensions in analytical design. No single existing framework fully addresses the analytical needs of data-driven community chronic disease prevention evaluation in diverse United States settings. An integrated roadmap combining theory-based frameworks, mixed-methods designs, equity-centered indicators, and explicit sustainment assessment is needed, and is proposed here to strengthen the evidence base for community chronic disease prevention and inform national policy decisions.

Keywords: Community-Based Intervention, Chronic Disease Prevention, Evaluation Frameworks, Implementation Science, Health Equity

1 INTRODUCTION

Chronic diseases, including cardiovascular disease (CVD), type 2 diabetes, hypertension, cancer, and chronic respiratory conditions, account for the majority of deaths, disability-adjusted life years, and healthcare expenditures in the United States. Despite decades of investment in prevention science, the translation of evidence-based chronic disease

interventions into sustained, equitable community-level impact remains inconsistent and methodologically under examined. Community-based chronic disease prevention programs occupy a uniquely important position in the public health landscape: they operate closest to the populations bearing the greatest burden of preventable illness, they are most accessible to individuals whose structural circumstances limit engagement with conventional healthcare, and they represent the primary delivery channel for preventive services in underserved racial and ethnic minority and low-income communities.

Yet these programs are also among the most difficult to evaluate rigorously. Community-based interventions are complex, multi-component, and implemented across diverse organizational, cultural, and geographic settings that resist the standardization on which traditional experimental evaluation designs depend. Their outcomes unfold over extended time horizons, are shaped by contextual factors that vary across communities, and are influenced by interactions among program components that cannot easily be attributed to single active ingredients. The result is an evaluation literature that is fragmented, methodologically heterogeneous, often short-term in focus, and insufficiently attentive to equity dimensions, leaving program administrators, funders, and policymakers without the analytical tools they need to determine which community chronic disease prevention programs work, for whom, under what conditions, and at what cost (Marvi et al., 2025; Riley-Gibson et al., 2025).

The gap between the sophistication of available evaluation frameworks and the actual analytical practices of community chronic disease programs is well documented. A scoping review of evaluation frameworks applied to noncommunicable disease (NCD) programs in primary healthcare found that while structured frameworks; including logic models, the Chronic Care Model, and RE-AIM are widely referenced in the literature, their application in practice is inconsistent, their indicators are rarely standardized across programs, and their attention to long-term sustainment and equity outcomes remains sparse (Marvi et al., 2025). Digital health interventions for chronic diseases face a similar challenge: while conceptual and results frameworks are commonly used to map program logic, the actual evaluation designs employed are frequently limited to observational or pre-post designs without control conditions, constraining causal inference and limiting generalizability (Bashi et al., 2020; Almohammadi, 2026).

This narrative review was undertaken to address this gap directly. Rather than simply describing what evaluation frameworks exist, this paper synthesizes what the literature reveals about how these frameworks are actually applied, where their analytical strengths and limitations lie, and what a practical, integrated, data-driven analytical roadmap for community-based chronic disease prevention evaluation would need to include to be both scientifically rigorous and operationally adoptable in the United States context. The review is organized around five framework categories identified through the synthesis, followed by a cross-cutting analysis of methodological gaps and a proposed integrated analytical roadmap that draws on the best elements of each framework tradition.

2 METHODS

A narrative review methodology was selected as the most appropriate design for this paper's objectives. Because the goal was to synthesize a heterogeneous body of literature spanning evaluation theory, implementation science, and community health program practice, rather than to estimate the pooled effect size of a specific intervention, narrative synthesis allows for the integration of diverse study designs, conceptual frameworks, and theoretical contributions that would be excluded from a systematic or meta-analytic review.

Literature was identified through searches of PubMed, Scopus, Google Scholar, and grey literature repositories including the Centers for Disease Control and Prevention (CDC), the Agency for Healthcare Research and Quality (AHRQ), and the National Institutes of Health (NIH) implementation science portals. Search terms were organized across three conceptual domains: evaluation frameworks and methods (including "evaluation framework," "logic model," "RE-AIM," "Chronic Care Model," "theory of change," "process evaluation," "program evaluation"); chronic disease prevention programs (including "chronic disease prevention," "community-based intervention," "noncommunicable disease program," "cardiovascular disease prevention," "diabetes prevention"); and data-driven methods and equity (including "data-driven evaluation," "implementation science," "health equity," "social determinants of health," "underserved populations," "mixed methods"). Publications were prioritized from 2020 onward, with foundational framework literature from earlier periods included where its theoretical contribution was essential to the synthesis.

Sources were reviewed for relevance to at least two of the three conceptual domains. Included sources reported on the design, application, or evaluation of frameworks for chronic disease program assessment in community, primary care, or safety-net settings. Sources focused exclusively on clinical trial evaluation, pharmaceutical interventions, or single-disease specialty care without a community prevention component were excluded. The synthesis was organized thematically around the five framework categories identified through iterative reading of the included literature.

3 RESULTS

3.1 Overview of Evaluation Framework Categories

The reviewed literature revealed five major categories of evaluation framework applied to community-based chronic disease prevention programs in the United States and comparable high-income country contexts. These categories are not mutually exclusive; many programs draw on elements of multiple frameworks simultaneously, but they represent analytically distinct traditions with different theoretical foundations, methodological strengths, and practical limitations. Table 1 summarizes the core elements common across frameworks identified in the reviewed literature.

Table 1: Core Components Common across Community Chronic Disease Evaluation Frameworks

Framework Element	Typical Focus	Representative Citations
Inputs / Context	Resources, workforce, information systems, organizational setting, community context	Marvi et al. (2025); Bashi et al. (2020); Gbigbi-Jackson et al. (2024)
Process / Fidelity	Implementation quality, participation rates, dose delivered, adaptation tracking	Pullyblank et al. (2022); Najjemba et al. (2026); Campbell et al. (2025)
Outputs / Reach	Population coverage, service changes, dose received, program completions	Oestman et al. (2024); Parkinson et al. (2022); Walker et al. (2024)
Short-Term Outcomes	Behavioral change, risk factor modification, knowledge and self-efficacy	Korenhof et al. (2023); Gbigbi-Jackson et al. (2024); Berari et al. (2025)
Long-Term Outcomes	Quality of life, healthcare utilization, costs, mortality, equity impact	Tsui et al. (2025); Gong & Guo (2026); Baid et al. (2021)
Sustainment / Scale	Program continuation, spread to new sites, institutionalization	Riley-Gibson et al. (2024,2025)

3.2 Logic Models and Theory-of-Change Frameworks

Logic models and theory-of-change frameworks represent the most widely used class of evaluation tools in community chronic disease prevention, providing a structured visual map of how program inputs and activities are expected to produce outputs and outcomes through specified mechanisms. Their appeal lies in their accessibility: logic models do not require advanced statistical expertise to construct, can be co-designed with community partners, and communicate program theory in a format that is interpretable by both researchers and practitioners.

In digital health and NCD program evaluations, logic models and conceptual frameworks are commonly used to map inputs through activities to outputs and outcomes, clarifying indicators, data sources, and analysis plans prior to implementation (Bashi et al., 2020). Wang et al., (2025) demonstrated how logic model thinking, integrated with big data approaches, can support the design of chronic disease health management programs that connect preventive and medical care, illustrating the potential for data-driven elaboration of traditional logic model structures. Wu et al. (2021) similarly used a pilot pre-post design, guided by an implicit program logic, to evaluate a community-based e-health program for older adults with chronic diseases, illustrating how logic-model thinking extends to digital delivery formats even absent a formally articulated model. Alhuwayfi et al., (2024) applied logic model principles in their systematic review of community-based NCD prevention interventions, using program inputs-outputs-outcomes mapping to organize evidence across diverse program types and population contexts.

The primary limitation of logic models as evaluation tools is their explanatory shallowness: a logic model describes what a program intends to do and achieve, but it does not explain why or under what conditions its mechanisms operate. Theory-of-change frameworks address this limitation partially by requiring programs to articulate the causal assumptions linking activities to outcomes, but in practice, these assumptions are rarely tested empirically. Campbell et al., (2025) illustrated this challenge in their application of an implementation research logic model to the evaluation of arthritis evidence-based interventions, finding that the framework provided useful structure for dissemination evaluation but required significant adaptation to capture the contextual variability that determines why interventions work in some communities and not others.

3.3 Health Service Quality Models

A second major tradition in community chronic disease evaluation draws on health service quality frameworks, most prominently the Donabedian structure-process-outcome model. Originally developed for clinical quality assessment, the Donabedian framework has been adapted for community program evaluation by distinguishing between the structural resources and organizational characteristics that enable program delivery (structure), the activities and interactions through which care is delivered (process), and the health status changes attributable to those activities (outcome). Its strength lies in its comprehensiveness; unlike logic models, it explicitly attends to the conditions under which processes occur, and its familiarity to health system researchers and administrators.

Gbigbi-Jackson et al., (2024) applied a Donabedian-informed analytical lens in their comprehensive literature review of chronic disease management programs, organizing evidence around the structural features of effective programs (community setting, workforce composition, data systems), the process dimensions that distinguished high-performing programs (implementation fidelity, patient engagement, care coordination), and the outcome dimensions most consistently improved (blood pressure, glycemic control, self-management behaviors). Meagher et al., (2024) described the application of a clinical data registry to complex chronic disease program evaluation, demonstrating how structure-process-outcome thinking can be operationalized through routine data systems that track program inputs and outputs longitudinally alongside health outcomes.

Extensions of the Donabedian model relevant to community chronic disease evaluation include effective coverage frameworks, which add population reach and equitable access as structural evaluation dimensions, and patient experience models that incorporate responsiveness, trust, and cultural congruence as process dimensions that the original model does not capture. These extensions are particularly important for evaluating programs in low-income and minority communities where structural barriers to program access and patient-provider trust represent major determinants of program effectiveness that standard structure-process-outcome analyses overlook.

3.4 Chronic Care Model and Disease-Specific Evaluation Frameworks

The Chronic Care Model, a systems-level framework for organizing the resources and relationships that enable high-quality chronic disease management, comprises six core components spanning the individual, practice, and community levels (Al-Qahtani, 2024). Its application in evaluation contexts typically involves assessing the degree to which each component is present and functional, and correlating component strength with clinical and process outcomes.

A systematic review of chronic disease management interventions in primary care, drawing on Chronic Care Model principles, found that programs addressing multiple model components simultaneously; including self-management support, care coordination, clinical information systems, and community resources produced stronger and more sustained health outcomes than single-component approaches (Gbigbi-Jackson et al., 2024). This multi-component finding has direct implications for the design of evaluation frameworks: programs built on the Chronic Care Model must be evaluated across all their active components rather than measured solely through discrete clinical outcomes. Najjemba and Solomon (2026a) reinforced this principle in their systematic review of multidisciplinary care-coordination models for adults with co-occurring disorders, finding that evaluation frameworks that captured coordination quality across disciplines and settings, rather than isolating individual provider contributions produced far more actionable program improvement data than single-discipline outcome tracking alone. Mistry et al., (2021) demonstrated how community health worker (CHW) interventions for chronic disease management map onto Chronic Care Model components, particularly self-management support and community resources, and how evaluation of these interventions must account for the model's systems-level dimensions rather than focusing narrowly on individual patient outcomes.

For CVD specifically, Singh et al., (2022) evaluated community-based culturally tailored education programs for Black communities with CVD, diabetes, hypertension, and stroke, finding meaningful improvements in risk factor outcomes when programs were explicitly aligned with community context and culture, dimensions that disease-specific evaluation frameworks must incorporate alongside clinical outcome measurement to fully capture program impact. Walker et al., (2024) demonstrated through the Project Extension for Community Healthcare Outcomes (ECHO) diabetes trial that structured program evaluation frameworks applied to medically underserved populations could document clinically significant outcome improvements, reinforcing the value of framework-guided evaluation in community health equity contexts.

3.5 Implementation Science Frameworks: RE-AIM and Related Approaches

Implementation science frameworks; particularly RE-AIM (Reach, Effectiveness, Adoption, Implementation, Maintenance) represent the most analytically sophisticated approach to community chronic disease program evaluation and the most directly applicable to the data-driven evaluation challenges that motivate this review. RE-AIM was developed specifically to address the gap between efficacy research, which optimizes interventions under

controlled conditions, and effectiveness of research, which examines whether interventions work in real-world practice. Its five dimensions capture not only whether a program produces health outcomes (Effectiveness) but whether it reaches its intended population (Reach), whether practitioners and organizations adopt it (Adoption), whether it is implemented as intended (Implementation), and whether it continues to produce effects over time (Maintenance).

Pullyblank et al., (2022) applied RE-AIM to evaluate the implementation of evidence-based disease self-management programs in a rural region of the United States, demonstrating how the framework's multi-dimensional structure exposed implementation gaps; particularly in reach among the highest-risk population segments and in maintenance beyond the initial grant funding period that outcome-only evaluation would have obscured. Parkinson et al., (2022) applied a multi-component evaluation framework aligned with RE-AIM principles to a state-wide preventive health program in Australia, finding that process-level implementation data were essential to interpreting outcome variation across program sites and population subgroups. Oestman et al., (2024) evaluated a collective community approach to sustainable health programming using a framework that integrated RE-AIM dimensions with community engagement assessment, documenting how collective impact models can sustain evidence-based chronic disease prevention when implementation fidelity and community ownership are systematically monitored.

Riley-Gibson et al. (2025) conducted a systematic review specifically examining strategies for sustaining chronic disease prevention interventions in clinical and community settings, screening 7,293 records and identifying only three randomized trials worldwide, too few to determine which sustainment strategies are effective. Their findings reinforce the argument that evaluation frameworks for community chronic disease programs must attend to the full RE-AIM spectrum, and particularly to Maintenance, rather than concluding evaluation at initial outcome measurement. Their findings reinforce the argument that evaluation frameworks for community chronic disease programs must attend to the full RE-AIM spectrum, and particularly to Maintenance, rather than concluding evaluation at initial outcome measurement. Najjemba (2026b) demonstrated through a review of implementation science strategies for scaling behavioral health interventions in US community organizations that programs guided by explicit implementation frameworks achieved significantly higher fidelity, broader reach, and more sustainable adoption than those without structured implementation guidance; a finding with direct transferability to community chronic disease program evaluation. Derrick (2025) synthesized chronic disease prevention strategy evidence through a narrative review lens, finding that programs guided by structured implementation frameworks demonstrated stronger fidelity, more consistent outcomes, and greater potential for scale-up than programs that operated without explicit framework guidance.

3.6 Equity-Centered and Participatory Evaluation Approaches

A fifth and critically important tradition in community chronic disease evaluation centers on equity, culture, and community participation as foundational design principles rather than supplementary considerations. This tradition recognizes that evaluation frameworks developed in majority-population clinical research contexts, including the Donabedian model, RE-AIM, and standard logic models embed assumptions about program delivery, participant engagement, and outcome measurement that may not hold in Indigenous, racial and ethnic minority, or low-income community settings. Musa and Botwe (2025) illustrated this challenge directly in their scoping review of barriers and facilitators to implementing harm reduction programs in rural and underserved US communities, finding that standard program evaluation frameworks consistently failed to capture the structural barriers, including transportation, stigma, provider distrust, and limited digital access, that determined program reach and uptake in these settings. Their findings reinforce the argument that equity-centered evaluation must be built into framework design from the outset rather than appended as a reporting afterthought. Mends and Solomon (2025) similarly demonstrated through a qualitative systematic review of patient and provider experiences with mobile health applications for diabetes self-management that the contextual factors shaping program effectiveness in underserved communities, including health literacy, device access, and provider communication style were systematically underrepresented in quantitative outcome evaluations, creating a misleading picture of what digital chronic disease programs actually deliver for vulnerable populations.

Gresku et al., (2022) examined collaborative evaluation frameworks for Indigenous-led community health interventions, finding that co-designed, community-controlled evaluation approaches, in which community members participate in defining success indicators, collecting data, and interpreting findings produced more valid, actionable, and trusted results than externally imposed evaluation designs. Their scoping review identified participatory action research, realist evaluation, and most significant change approaches as particularly well suited to Indigenous and culturally diverse community health program evaluation. Yadav et al. (2024) extended this evidence in the context of Aboriginal and Torres Strait Islander chronic disease prevention in Australia, finding that program implementation and evaluation must be grounded in community-level context rather than assuming that findings generalize across population settings.

Korenhof et al., (2023) evaluated a community-based group intervention for chronic disease self-management in a vulnerable population, finding that evaluation frameworks that incorporated social cohesion, peer support quality, and

cultural responsiveness as process dimensions captured program mechanisms that standard clinical outcome measures missed entirely. Mistry et al. (2021), reviewing 29 studies of community health worker navigation, found these interventions effective in increasing cancer screening adherence and primary care use. Shared cultural, linguistic, and experiential background is a defining feature of the model rather than a tested variable, and the review's narrative synthesis cannot separate its effect from other components. That this mechanism remains unmeasured despite being central to the model argues for frameworks capable of treating cultural congruence as a program mechanism rather than a background characteristic. The barriers and facilitators shaping engagement with harm reduction and prevention programs in rural and underserved communities represent a closely related equity challenge: programs that fail to assess structural access barriers as evaluation dimensions systematically overestimate their reach and underestimate their equity impact (Musa & Botwe, 2025). Patient and provider experiences with mobile health applications for chronic disease self-management further illustrate the importance of qualitative equity-centered evaluation, participants from marginalized communities reported distinct patterns of technology engagement, trust, and usability that aggregate outcome metrics failed to capture (Mends & Solomon, 2025).

4 CROSS-CUTTING METHODOLOGICAL GAPS

4.1 Short-Term Orientation and Neglect of Sustainment

Across all five framework categories, the reviewed literature documents a persistent and consequential bias toward short-term outcome measurement at the expense of sustainment evaluation. Most community chronic disease program evaluations assess outcomes at program completion; typically, six to twelve months post-enrollment with limited follow-up beyond the funded program period. This temporal myopia is particularly problematic for chronic disease prevention, where the most important health outcomes; reduced cardiovascular events, delayed diabetes onset, prevented cancer, unfolded over years to decades rather than months. Riley-Gibson et al. (2025) screened 7,293 records across seven databases and identified only three randomized trials worldwide that tested strategies to sustain chronic disease prevention interventions, concluding that the effect of such strategies cannot currently be determined. Earlier evidence points the same way: of 125 studies reviewed by Wiltsey Stirman et al. (2012), most interventions were only partially sustained once initial implementation support was withdrawn. Addressing this gap requires evaluation frameworks that build sustainment indicators into program design from the outset and commit to follow-up data collection beyond initial funding cycles.

4.2 Limited Economic Evaluation

Economic evaluation, including cost-effectiveness analysis, cost-benefit analysis, and return on investment analysis is strikingly absent from the community chronic disease prevention evaluation literature relative to its presence in clinical trial and pharmaceutical evaluation research. Tsui et al., (2025) conducted a critical review of economic evaluation methodologies applied to community-based public health interventions, finding that while the methodological tools for cost-effectiveness analysis in community settings are well developed, their application is limited by the difficulty of capturing full societal costs, attributing cost savings to specific program components, and conducting long-term economic modeling from short-term trial data. Baid et al., (2021) reviewed return on investment evidence for workplace wellness chronic disease prevention programs, finding substantial variation in economic outcomes that reflected both real differences in program effectiveness and methodological inconsistency in how costs and benefits were defined and measured. These limitations reinforce the need for standardized economic evaluation guidance tailored to community chronic disease program contexts.

4.3 Inconsistent Indicator Standardization

A fundamental obstacle to synthesizing evidence across community about chronic disease programs is the absence of standardized outcome indicators that would enable cross-program comparison and evidence of accumulation. Programs measure blood pressure with different protocols, at different time points, using different thresholds for success. Self-management outcomes are assessed through incompatible instruments. Process indicators; attendance rates, dose delivered, fidelity scores, are defined and reported inconsistently across programs, limiting the ability to explain why some programs outperform others. Gbigbi-Jackson et al., (2024) identified indicator inconsistency as one of the primary barriers to evidence synthesis in chronic disease management program evaluation. Nur et al., (2023) found similar fragmentation in family-focused chronic disease program evaluations. Kizza and Oware (2025) similarly found that inconsistent approaches to multimorbidity and mortality modeling across US chronic disease studies limit the field's ability to compare program impact across populations with differing comorbidity burdens. Without a core set of standardized, minimally sufficient indicators spanning process, outcome, equity, and economic dimensions, the community chronic disease evaluation literature will continue to produce fragmented findings that cannot be accumulated into actionable policy guidance.

4.4 Underrepresentation of Equity Dimensions

Perhaps the most significant gap in current community with chronic disease evaluation practice is the systematic underrepresentation of equity as an analytical dimension rather than a population descriptor. Most evaluations report aggregate program outcomes without disaggregating by race, ethnicity, income, language, geography, or other social dimensions, making it impossible to determine whether programs are reaching and benefiting the highest-burden populations or primarily serving those already advantaged within the target community. Gresku et al., (2022) documented how evaluation frameworks designed without equity lenses can produce misleading positive findings that mask differential impact across subgroups. Singh et al., (2022) demonstrated that culturally tailored community CVD programs produced meaningfully different outcomes for Black communities compared to standard programs, findings that would be invisible in non-disaggregated evaluation designs. Building equity as a core analytical dimension into community chronic disease evaluation frameworks, specifying equity-relevant indicators, requiring subgroup analyses, and designing data systems that capture social dimensions at enrollment, is essential to generating evaluation evidence that can advance rather than perpetuate health disparities.

5 A PROPOSED INTEGRATED ANALYTICAL ROADMAP FOR COMMUNITY CHRONIC DISEASE PROGRAM EVALUATION

Drawing on the synthesis of framework strengths and the cross-cutting gap analysis presented above, this paper proposes an integrated analytical roadmap for data-driven evaluation of community-based chronic disease prevention programs in the United States context. The roadmap is organized around five sequential phases, each with specific framework inputs, data requirements, analytical methods, and equity checkpoints. It is designed to be practically adoptable by community-based organizations and safety-net healthcare settings that have limited internal analytical capacity, while being sufficiently rigorous to meet the standards required for peer-reviewed publication and policy-level evidence.

5.1 Phase 1: Clarify Theory and Framework before Implementation

Effective evaluation begins with explicit articulation of the program theory; the causal logic linking program activities to intended outcomes before the program launches. This phase involves constructing a logic model that maps inputs (staff, funding, community partnerships, data infrastructure) through activities (educational sessions, CHW home visits, clinical monitoring protocols) to outputs (number of participants reached, sessions delivered, referrals made) and outcomes at short-, medium-, and long-term horizons. The logic model should be overlaid with a RE-AIM lens that specifies how each dimension will be measured, and an equity lens that identifies which population subgroups the program is designed to reach and how differential reach and impact will be monitored. Campbell et al., (2025) demonstrated how pre-implementation framework clarification using an implementation research logic model improved the coherence and interpretability of subsequent dissemination evaluation findings. Bashi et al., (2020) similarly found that programs with explicit pre-implementation evaluation frameworks produced more complete and interpretable evaluation data than those that designed evaluation retrospectively.

5.2 Phase 2: Co-Design Indicators and Data Systems with Communities

The second phase involves translating the program theory into a specific set of measurable indicators and designing the data systems through which those indicators will be collected. Critically, this phase should involve community members, program participants, and frontline implementation staff as active co-designers; not merely as data sources. Co-designed evaluation systems produce indicators that communities recognize as meaningful, data collection processes that participants find acceptable, and interpretive frameworks that reflect community-defined success alongside researcher-defined outcomes. Gresku et al., (2022) found that co-designed evaluation approaches produced more valid and trusted results in Indigenous community health program contexts. Yadav et al., (2023) demonstrated through realist review methodology how context-specific indicator co-design enabled evaluation of Aboriginal chronic disease prevention programs that externally imposed frameworks had failed to capture.

At minimum, the indicator set should span: process indicators (reach, attendance, fidelity to protocol, dose delivered and received); clinical outcome indicators (blood pressure, glycemic control, lipid profiles, body weight as appropriate to the program's disease focus); behavioral indicators (physical activity, dietary behavior, medication adherence, self-management competency); equity indicators (participation rates by race, ethnicity, income, and geography; differential outcomes across subgroups); and economic indicators (program cost per participant, cost per unit of clinical outcome improvement, return on investment estimates where feasible). Standardizing indicators against established national frameworks, including BRFSS measures, Patient-Reported Outcomes Measurement Information System (PROMIS) instruments, and NIH Common Data Elements maximizes the potential for cross-program comparison and evidence synthesis.

5.3 Phase 3: Apply Mixed Methods and Appropriate Research Designs

The third phase addresses the design of data collection and analysis. The reviewed literature documents a heavy reliance on observational, cross-sectional, and pre-post designs without control conditions, designs that are practical and cost-effective but limit causal inference and confound program effects with secular trends and regression to the mean. Where feasible, evaluation designs should incorporate comparison conditions, ideally randomized, but where randomization is impractical, quasi-experimental designs including interrupted time series, difference-in-differences, and matched comparison group analyses represent methodologically credible alternatives that have been successfully applied in community health program evaluation.

Mixed-methods integration, combining quantitative outcome data with qualitative process and context data is particularly valuable in community chronic disease evaluation because it enables explanation of outcome variation across sites and subgroups that quantitative data alone cannot produce. Realist evaluation approaches, as applied by Yadav et al., (2023) in the context of Aboriginal chronic disease prevention, offer a structured mixed-methods framework for specifying and testing context-mechanism-outcome hypotheses that is well suited to the complexity of community program environments. Susanto et al., (2022) demonstrated how mixed-methods evaluation of community chronic disease management programs in diverse settings could generate both outcome evidence and implementation learning simultaneously; a dual-purpose analytical approach that maximizes the return on evaluation investment for resource-constrained community programs.

5.4 Phase 4: Assess Sustainment and Scale-Up Explicitly

The fourth phase addresses what the literature identifies as the most neglected dimension of community chronic disease evaluation: sustainment. Evaluation protocols should specify how and when Maintenance data will be collected, at minimum at twelve and twenty-four months post-program completion and should assess both whether program effects are sustained at the individual participant level and whether the program itself continues to operate and reach new participants at the organizational level. Riley-Gibson et al. (2025) found the most frequently employed sustainment strategies to be developing and distributing educational materials, identifying and preparing champions, and conducting ongoing training. No included study employed a funding strategy, reported cost outcomes, or addressed health equity. Evaluation frameworks should therefore assess these commonly used strategies alongside the funding and equity dimensions that current trials leave unexamined.

Scale-up evaluation should assess whether programs that demonstrate effectiveness in initial community sites can be replicated with fidelity and impact in new settings, a question that requires both process data from the original implementation and systematic comparison of implementation quality and outcomes across expansion sites. Bader et al., (2023) demonstrated through a scoping review of community health promotion evaluation strategies that scale-up assessment requires evaluation frameworks that explicitly distinguish between program fidelity and program adaptation, recognizing that some degree of contextual adaptation is both necessary and desirable in community health programming, while core components must be maintained for program effects to replicate.

5.5 Phase 5: Synthesize, Report, and Translate to Policy

The final phase of the analytical roadmap addresses how evaluation findings are synthesized, reported, and translated into policy and practice decisions. Community chronic disease program evaluations should produce layered reporting products: technical reports for funders and program administrators that document full implementation and outcome data; peer-reviewed publications that contribute evaluation findings and methodological innovations to the scientific literature; and community-accessible summaries that translate findings into actionable guidance for program participants, community organizations, and local policymakers. Oestman et al., (2024) demonstrated how community-engaged evaluation reporting in which communities participate in interpreting and disseminating findings, strengthened the policy impact and community ownership of evaluation evidence from a collective chronic disease prevention initiative. Wijayanti and Datu (2025) similarly found that community and home-based chronic disease care programs improved patient-reported quality of life, reinforcing the value of translating evaluation findings into outcomes that are directly meaningful to program participants, not only to funders and administrators.

Equity reporting deserves particular emphasis in this phase. Evaluation reports should explicitly address whether programs reached their intended populations equitably, whether outcomes differed across demographic and social subgroups, and what the findings imply for program modification or targeted investment to reduce disparities. The absence of disaggregated reporting in much of the current community chronic disease evaluation literature represents not merely a methodological gap but a policy failure: without equity-disaggregated findings, decision-makers cannot determine whether community prevention investments are reducing or perpetuating health disparities.

6 DISCUSSION

This narrative review synthesized five major evaluation framework traditions applied to community-based chronic disease prevention programs and identified four cross-cutting methodological gaps that collectively explain why the evidence base for these programs remains fragmented, inconsistently equity-focused, and insufficiently actionable for national policy decisions. The proposed five-phase integrated analytical roadmap addresses each of these gaps directly: pre-implementation framework clarification addresses the widespread absence of explicit program theory; co-designed indicators address the inconsistency and equity blindness of current measurement practices; mixed-methods and quasi-experimental designs address the methodological modesty that limits causal inference; sustainment evaluation addresses the temporal myopia that truncates evidence at program completion; and policy-oriented equity reporting addresses the translation gap between evaluation findings and equitable program investment decisions.

The proposed roadmap builds on the existing framework traditions reviewed here; it does not replace the Chronic Care Model, RE-AIM, or logic model approaches but integrates their most analytically valuable elements into a coherent, practically adoptable sequence. Its most important innovation is not methodological but architectural: it treats equity as a foundational dimension of evaluation design rather than a post-hoc reporting category, and it treats sustainment as a core evaluation phase rather than an afterthought. These architectural choices reflect the specific needs of the United States community chronic disease prevention context, where the populations most burdened by preventable illness are those for whom equity-blind and short-term evaluation frameworks are least adequate.

Several limitations of this review should be acknowledged. As a narrative rather than systematic review, it does not apply formal quality assessment criteria to included studies and may reflect the authors' interpretive choices in organizing and synthesizing a heterogeneous literature. While this review draws primarily on evidence from the United States, it also incorporates findings from a geographically diverse set of countries, including China, Indonesia, Moldova, Iran, and Egypt, representing a range of health system resource levels. Future work should more systematically map how community chronic disease evaluation practice varies across low- and middle-income country contexts, where resource constraints on evaluation capacity are often most acute. Future work should examine whether the proposed roadmap requires adaptation for specific disease contexts, population groups, or organizational settings, and should subject the roadmap's components to prospective evaluation in real-world community program contexts.

7 CONCLUSION

Community-based chronic disease prevention programs represent one of the most important and underutilized mechanisms for reducing the burden of cardiovascular disease, diabetes, and related conditions in the United States, and for ensuring that the benefits of prevention science reach the populations most in need. Their potential is constrained not by a lack of effective interventions but by the absence of rigorous, equity-centered, data-driven evaluation frameworks that can document what works, for whom, under what conditions, and at what cost.

This review has demonstrated that the major evaluation framework traditions; logic models, health service quality models, the Chronic Care Model, RE-AIM, and equity-centered participatory approaches, each contribute essential analytical elements but none alone provides a sufficient foundation for the complex, multi-dimensional evaluation that community chronic disease programs require. The integrated analytical roadmap proposed here synthesizes the best elements of each tradition into a practical, five-phase framework that is both scientifically rigorous and operationally adoptable in the resource-constrained community and safety-net settings where prevention investments are most urgently needed. Implementing this roadmap consistently and reporting its findings with the equity transparency the populations it serves deserve, represents a critical and achievable step toward a more equitable national chronic disease prevention infrastructure.

STATEMENTS ON COMPLIANCE WITH ETHICAL STANDARDS

Disclosure of conflict of interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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