

Bridging the Gap Between Research and Community Engagement in Health: A Perspective on Designing Research-Based Community Service Programs Aligned with Research Roadmaps

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ABSTRACT

The gap between research outputs and their implementation in real-world health settings remains a persistent challenge within academic and health systems. While research productivity in health sciences continues to grow, its tangible impact on population health outcomes is not always evident. At the same time, community service and public health outreach programs are often conducted without a strong research foundation and lack integration with research roadmaps, resulting in short-term and unsustainable health outcomes. This article presents a conceptual perspective on the importance of integrating research and community service within the context of health systems through a research roadmap-based approach. Using a reflective narrative method, this paper explores existing gaps between health research and community-based health interventions, proposes an integrative framework, and elaborates key principles and systematic steps for designing research-based community service programs in health settings. Furthermore, it highlights the strategic role of the penta helix collaboration model in ensuring sustainability and strengthening health system responsiveness. This perspective argues that ideal community service in the health sector represents the downstream implementation of research, oriented toward sustainable community health empowerment and improved health behaviors. Strengthening the integration between research and community service is expected to enhance the social and clinical relevance of health education institutions and maximize the real-world impact of scientific knowledge on population health.

Keywords: community service, research roadmap, community health, health empowerment, research translation, penta helix

INTRODUCTION

In contemporary academia, particularly within the health sciences, research is widely regarded as the core function of higher education institutions [1]. Universities and health training institutions are increasingly positioned as knowledge-producing entities, expected to generate scientific advancements that contribute not only to global intellectual discourse but also to improvements in public health and clinical practice. Scholarly publications, particularly those indexed in reputable databases, serve as key performance indicators, shaping institutional rankings, academic reputation, and professional advancement [2].

However, alongside this emphasis on research productivity, an increasingly critical question emerges: to what extent does this knowledge translate into improved health outcomes, enhanced healthcare practices, and strengthened community health systems? This question challenges conventional academic metrics and calls for a broader reflection on the social and ethical responsibilities of health research. Knowledge in health sciences is not only meant to be produced and disseminated within academic circles but must ultimately contribute to disease prevention, health promotion, and the improvement of quality of life [3].

It is evident that many health research outputs remain confined within academic environments—archived in journals, conference proceedings, or institutional reports—without being translated into clinical practice or community-based health interventions. This phenomenon reflects a fundamental disconnect between knowledge production and its utilization in real-world health contexts. Even when research findings are methodologically robust and clinically relevant, they often fail to reach the communities and health systems that could benefit from them [4].

Several factors contribute to this gap. Academic incentives frequently prioritize publication over implementation, encouraging researchers to focus on theoretical or experimental contributions rather than translational impact. Additionally, there is often a lack of structured mechanisms that facilitate the integration of research findings into public health programs, primary healthcare services, or community-level interventions. Communication barriers, socio-cultural differences, and limited stakeholder engagement further widen the divide between academic research and community health realities [5].

Conversely, community service and public health outreach programs are frequently implemented as institutional obligations rather than as integral components of the research ecosystem. In many cases, these activities are designed to fulfill accreditation standards or administrative requirements rather than to produce measurable and sustained improvements in health outcomes. Programs are often short-term, event-based, and dominated by one-way knowledge dissemination, such as health education sessions or brief training activities. While such initiatives may increase awareness, they rarely result in sustained behavioral change or improved health practices.

Moreover, many community-based health programs are not grounded in rigorous research evidence [6]. Without a strong empirical foundation, interventions may lack effectiveness, contextual relevance, and scalability. Communities are often positioned as passive recipients of health information rather than as active partners in improving their own health status. This limits both the impact and sustainability of interventions.

The separation between research and community service thus creates a paradox within health academia. On one hand, there is an abundance of scientific knowledge that is not fully utilized to improve health outcomes; on the other hand, there are numerous community health initiatives that lack evidence-based grounding. This fragmentation weakens the overall contribution of health institutions to public health development. In this context, a more integrative perspective is needed—one that redefines the relationship between research and community service within health systems. Rather than viewing them as separate domains, they should be understood as interconnected components of a unified mission aimed at improving population health.

This article argues that community service in the health sector should be positioned as a continuation of research. Research generates evidence, while community service functions as the mechanism through which that evidence is translated into practice, evaluated in real-world

settings, and refined based on contextual realities. Such integration enhances both the relevance of research and the effectiveness of community health interventions.

REFRAMING THE RESEARCH–COMMUNITY SERVICE NEXUS

The relationship between research and community service has long been characterized by a persistent disconnect that is not merely technical in nature, but fundamentally paradigmatic [7]. Within conventional academic structures, these two domains have often been positioned as separate and independent functions. Research is primarily associated with the production of knowledge, driven by theoretical inquiry and methodological rigor, while community service is viewed as a form of practical engagement aimed at addressing societal needs. This separation, while administratively convenient, has created a fragmented academic ecosystem in which knowledge production and knowledge application evolve along parallel but rarely intersecting trajectories.

In practice, this disconnect becomes evident in the way community service programs are designed and implemented [8]. Many initiatives continue to rely on one-way approaches, such as short-term educational sessions, public lectures, or basic socialization activities. While these efforts may contribute to raising awareness, they often lack depth, continuity, and meaningful engagement. More critically, such programs are frequently not grounded in research findings, nor are they aligned with broader research roadmaps or strategic institutional priorities. As a result, the interventions tend to be generic rather than context-specific, and their relevance to actual community needs remains limited.

Another key issue lies in how communities are positioned within these programs. In many cases, they are treated as passive recipients of knowledge rather than active participants in the process of change. This top-down approach not only limits the effectiveness of interventions but also undermines the potential for genuine empowerment. Without active involvement, communities may not fully internalize the knowledge being transferred, nor develop the capacity to sustain or adapt the interventions independently [9]. The consequences of this approach are particularly evident in terms of sustainability. Once a program concludes, there are often no mechanisms in place to ensure its continuation. Knowledge that has been delivered may not translate into lasting behavioral change, and skills that have been introduced are not always integrated into everyday practice. In the absence of follow-up, mentorship, or institutional support, many initiatives fade without leaving a durable impact [10].

This situation highlights a critical paradox within academia. On one hand, there is a wealth of research outputs that are methodologically sound and theoretically rich but remain underutilized. On the other hand, there are numerous community service activities that are well-intentioned but lack a strong scientific foundation. Without meaningful integration, both domains risk losing their relevance—research becomes increasingly detached from real-world challenges, while community service operates without the benefit of evidence-based guidance. In response to this challenge, it becomes necessary to rethink the relationship between research and community service in a more integrative and dynamic manner. One promising approach is to conceptualize community service as an integral component of the research translation process. Rather than viewing research as an activity that culminates in publication, this perspective extends the research lifecycle to include implementation, adaptation, and validation within real-world contexts [11].

Within this framework, research is understood as a continuum. It begins with basic research that generates new knowledge, progresses to applied research that seeks to address specific problems, and leads to the development of models, technologies, or innovations. These outputs are then translated into actionable interventions through community service, where they are implemented, tested, and refined in collaboration with the community. This process not only enhances the practical relevance of research but also allows for iterative learning, where insights from the field inform subsequent research activities [12]. By adopting this perspective, community service is no longer seen as a peripheral or supplementary function, but as a critical stage in the research ecosystem. It becomes a space where theory encounters practice, where abstract concepts are transformed into tangible actions, and where knowledge is continuously shaped by real-world experiences. Importantly, this approach also repositions communities—not as passive beneficiaries, but as co-creators of knowledge who actively contribute to the development and contextualization of solutions.

Furthermore, framing community service as research translation opens up new possibilities for impact. It encourages the design of programs that are evidence-based, context-sensitive, and oriented toward long-term empowerment. It also promotes stronger alignment between institutional research agendas and societal needs, thereby enhancing the overall relevance and accountability of higher education institutions. Ultimately, bridging the gap between research and community service requires more than procedural adjustments; it demands a fundamental shift in how these activities are understood and practiced. By moving from a model of separation to one of integration, and from dissemination to translation, academia can better fulfill its dual mission of advancing knowledge and contributing meaningfully to society.

THE STRATEGIC ROLE OF RESEARCH ROADMAPS

To ensure a meaningful and systematic integration between research and community service, research roadmaps play a crucial and often underutilized role. A research roadmap serves not merely as a planning document, but as a strategic framework that articulates the long-term direction of research activities. It typically outlines thematic priorities, sequential stages of research development, expected outputs at each phase, and potential pathways for implementation and impact. In this sense, a roadmap functions as both a guide and a bridge—linking knowledge production with its eventual application in society [13].

Beyond its technical function, a research roadmap also reflects an institution's vision of how knowledge should evolve and contribute to broader societal goals. It provides coherence across individual research projects, ensuring that they are not isolated efforts but part of a cumulative and purposeful trajectory. Without such a framework, research activities risk becoming fragmented, reactive, and disconnected from real-world needs [14]. Within this perspective, community service should be intentionally embedded within the research roadmap rather than positioned as an external or parallel activity. This integration implies that community engagement is anticipated from the early stages of research design, not only as a site for dissemination but as a space for application, validation, and refinement. Research findings that have reached a sufficient level of maturity—whether in the form of models, methods, or technological innovations—should be translated into intervention strategies that can be implemented through structured community service programs.

Such alignment ensures that community service activities are not incidental or ad hoc, but strategically positioned within a broader research agenda [15]. Programs become more focused, as they are derived from clearly defined research outputs, and more relevant, as they are informed by evidence. At the same time, this approach enhances accountability, as each stage of the roadmap is associated with specific deliverables and expected impacts, both academic and societal. Importantly, embedding community service within a research roadmap also transforms the nature of engagement with communities. Rather than being the final recipients of knowledge, communities can be involved at multiple stages—ranging

from problem identification and contextual analysis to implementation and feedback. This creates a more iterative and responsive system, where insights from the field inform subsequent research directions, thereby strengthening the overall quality and applicability of knowledge.

Moreover, a roadmap-based approach inherently supports continuity and sustainability [16]. Unlike one-off initiatives, programs that are linked to a long-term research trajectory can evolve over time. Initial pilot interventions can be refined based on evaluation findings, expanded in scale, and adapted to different socio-cultural contexts. This scalability allows successful models to be replicated across regions, thereby amplifying their impact. In addition, continuity is reinforced through institutional memory and resource alignment. When community service is embedded within a roadmap, it becomes easier to secure sustained funding, build long-term partnerships, and develop human resource capacity. Academic staff, students, and community stakeholders can engage in ongoing cycles of learning and collaboration, rather than isolated activities.

Ultimately, the strategic use of research roadmaps enables a shift from fragmented efforts to coordinated action. It aligns research, implementation, and impact within a single coherent framework, ensuring that knowledge generated within academic institutions does not remain static, but continues to evolve through its application in real-world settings. In doing so, research roadmaps become a key instrument for enhancing both the relevance and the transformative potential of higher education.

DESIGNING RESEARCH-BASED COMMUNITY SERVICE

Designing effective community service programs that are genuinely grounded in research requires more than good intentions; it demands a coherent integration of guiding principles and a structured methodological approach [17]. Too often, community service initiatives fail not because of a lack of commitment, but because they are not anchored in a clear conceptual framework or are implemented without a systematic process. Bringing together principled thinking and practical steps is therefore essential to ensure that community service becomes both meaningful and impactful.

At the foundation of this process are several key principles that define what constitutes research-based community service. First, programs must be rooted in validated research findings. This ensures that the interventions are not based on assumptions or anecdotal knowledge, but on evidence that has undergone scientific scrutiny. Second, programs should address real and clearly identified community needs. This principle emphasizes relevance—interventions must respond to actual problems experienced by the community rather than abstract or externally imposed agendas. Third, community members must be actively involved throughout the entire process. Participation is not merely a procedural requirement, but a central element of empowerment. When communities are engaged as active contributors, rather than passive recipients, they are more likely to develop ownership of the program and sustain its outcomes. Fourth, the solutions offered must be practical and context-sensitive. Even the most sophisticated research findings will have limited impact if they cannot be adapted to the local socio-cultural, economic, and environmental context. Finally, all efforts must be oriented toward sustainable empowerment, meaning that the ultimate goal is not short-term change, but the development of long-term capacity within the community [18].

These principles collectively require a fundamental shift in mindset within academia. Researchers are no longer positioned as the sole producers and transmitters of knowledge, but as facilitators and partners in a shared learning process. Engagement becomes dialogical rather than directive, emphasizing mutual exchange, co-creation, and continuous reflection. This transformation is essential for bridging the gap between theory and practice. While principles provide direction, they must be translated into concrete actions through a systematic approach. The design of research-based community service programs can be understood as a sequence of interrelated steps, each building upon the previous one.

The first step involves identifying research outputs that have the potential for real-world implementation. This requires critical reflection on the nature of the research findings: Do they offer practical solutions? Can they be translated into models, tools, or interventions that are usable in community settings? Not all research outputs are immediately applicable, and this stage helps to determine which findings are ready for translation into action. The second step focuses on understanding the realities of the community. This goes beyond relying on secondary data or generalized assumptions. It requires direct engagement with community members through methods such as interviews, focus group discussions, and participatory observation. At this stage, building trust is crucial. Researchers must listen carefully, respect local knowledge, and develop a nuanced understanding of the community's needs, challenges, and strengths. The third step involves formulating solutions that effectively bridge research findings and community needs. This is a critical point of integration, where scientific knowledge is adapted into context-appropriate interventions. Solutions must remain flexible, allowing for modification based on feedback and changing conditions. This adaptability ensures that programs remain relevant and responsive. The fourth step is the design of empowerment-oriented programs. Here, the focus shifts from activities to actors—from what is being done to who is being strengthened. Strategies may include forming or strengthening community groups, building the capacity of local facilitators or volunteers, and providing continuous mentoring. The goal is to create structures and capabilities that enable the community to sustain and further develop the program independently [19].

Importantly, these steps should not be seen as strictly linear, but rather as iterative and dynamic. Feedback from implementation can inform earlier stages, leading to continuous refinement of both the program and the underlying research. This cyclical process reinforces the integration between knowledge production and practical application. By combining clear principles with a systematic approach, research-based community service can move beyond fragmented and short-term interventions toward more coherent, impactful, and sustainable practices. Such an approach not only enhances the effectiveness of community engagement but also strengthens the role of research as a driver of meaningful social change.

IMPLEMENTATION, OUTCOMES, AND SUSTAINABILITY

The effectiveness of community service programs is not determined solely by what is done, but by how it is done, what it produces, and how long its impact endures [20]. In this regard, implementation methods, expected outcomes, and sustainability considerations are deeply interconnected and should be understood as part of a single, coherent framework rather than as separate components. At the level of implementation, the choice of methods is not merely a technical matter but reflects underlying assumptions about how change occurs. Traditional approaches, such as lectures or one-way information delivery, may be effective in increasing knowledge, but they are often insufficient to foster meaningful behavioral change. Knowledge alone does not automatically translate into practice, particularly when it is not contextualized or reinforced through experience.

For this reason, participatory and experiential approaches have gained increasing recognition as more effective strategies in community service [21]. Methods such as hands-on training, interactive workshops, collaborative problem-solving sessions, and sustained mentoring create opportunities for active engagement and deeper learning. These approaches enable participants not only to understand new concepts but also to apply them, reflect on their experiences, and adapt them to their own contexts. In doing so, learning becomes a transformative process rather than a passive transfer of information.

Equally important is the continuity of engagement. Short-term interventions, even when well-designed, rarely lead to lasting impact if they are not followed by consistent support. Sustained mentoring and iterative interaction allow for gradual capacity development, reinforcement of new behaviors, and adaptation to emerging challenges. This highlights the importance of viewing implementation as a process rather than a one-time event [22]. The outcomes of community service programs must also be conceptualized in a holistic manner. While increases in knowledge are often the most immediate and measurable results, they represent only one dimension of impact. More meaningful outcomes include changes in attitudes and behaviors, the development of practical skills, the strengthening of local institutions or community groups, and the emergence of community-driven initiatives.

In addition, community service programs may generate academic outputs, such as scientific publications, policy briefs, or educational modules. While these outputs are valuable, they should not be seen as the primary indicators of success. Instead, they function as complementary products that document and disseminate the learning generated through engagement with communities.

Assessing the success of community service programs therefore requires a broader and more nuanced set of indicators. Success should not be defined simply by the completion of planned activities, but by the depth, quality, and durability of the changes achieved. Indicators may include increased individual capacity, evidenced by improved knowledge and skills; collective behavioral change within the community; the emergence of local leadership; and the degree of community independence in sustaining program activities [23]. Among these, sustainability stands out as a defining characteristic of truly effective programs. A successful initiative is one that continues to function and evolve even after external support has ended. This does not imply the complete absence of external involvement, but rather the presence of sufficient internal capacity within the community to maintain and adapt the program over time. Achieving sustainability requires deliberate effort from the outset. It involves fostering strong community ownership, ensuring that local stakeholders are actively involved in decision-making processes, and building capacities that are transferable and enduring. It also requires the establishment of supportive structures, such as local organizations, networks, or partnerships, that can provide continuity beyond the duration of the initial intervention.

Ultimately, implementation, outcomes, and sustainability should be understood as a continuous and interdependent cycle. The methods used influence the type of outcomes achieved, and these outcomes, in turn, determine the sustainability of the program. By aligning these elements within a coherent framework, community service programs can move beyond short-term achievements toward lasting and meaningful impact.

REFLECTIONS FROM PRACTICE

Practical experiences across various contexts consistently demonstrate that well-integrated research and community service can generate not only significant but also lasting impact. When research findings are thoughtfully translated into community-based interventions, and when these interventions are implemented through participatory and sustained engagement, the outcomes tend to extend far beyond initial expectations. In such settings, community service becomes more than a program—it evolves into a process of shared learning and transformation.

A key factor that distinguishes impactful initiatives from short-lived ones is the degree of community involvement. When communities are actively engaged—not merely as participants, but as co-creators of the program—they develop a sense of ownership that is critical for long-term success. Capacity-building efforts, such as training, skills development, and leadership strengthening, further reinforce this ownership by equipping individuals and groups with the tools they need to take initiative and sustain progress.

Equally important is the presence of continuous mentoring and accompaniment. Transformation rarely occurs instantaneously; it is a gradual process that requires time, reinforcement, and adaptation. Ongoing support allows communities to internalize new knowledge, experiment with new practices, and navigate challenges as they arise. It also creates a space for reflection, where both researchers and community members can learn from experience and refine their approaches. In this sense, mentoring is not simply a support mechanism, but a critical component of the learning ecosystem.

Field experiences also reveal that context matters deeply. Interventions that are successful in one setting cannot always be replicated directly in another without adaptation. Cultural norms, local power dynamics, resource availability, and historical experiences all shape how communities respond to external initiatives. Therefore, flexibility and responsiveness are essential. Programs that are designed with sensitivity to local context—and that allow room for modification based on feedback—are more likely to achieve meaningful and sustainable outcomes.

Another important insight from practice is that impact often unfolds in layers. Initial changes, such as increased knowledge or improved skills, may be visible in the short term. However, deeper transformations—such as shifts in collective behavior, strengthened social cohesion, or the emergence of local leadership—tend to develop over time. These less visible outcomes are often more significant, as they indicate a fundamental change in how communities organize, make decisions, and respond to challenges.

Furthermore, successful programs frequently create ripple effects that extend beyond their original scope. Trust built through initial engagement becomes a form of social capital that facilitates future initiatives and collaborations. Communities that have experienced positive and respectful engagement are more open to subsequent interventions, and they may even initiate their own programs based on the knowledge and confidence they have gained. Similarly, partnerships established between academic institutions and local stakeholders can evolve into long-term collaborations, enabling more complex and ambitious projects.

These experiences also highlight the importance of reciprocity in community engagement. While communities benefit from access to knowledge and resources, researchers also gain valuable insights that enrich their understanding and inform future research. The field becomes a site of mutual exchange, where theory is continuously tested and refined through practice. This dynamic not only enhances the quality of research but also ensures that it remains grounded in real-world relevance.

Ultimately, reflections from practice underscore the importance of integration, participation, and continuity. They suggest that the success of research-based community service lies not only in what is delivered, but in how relationships are built, how learning is facilitated, and how change is sustained over time. By embracing these lessons, academic institutions can move toward more meaningful and impactful forms of engagement—where knowledge is not only produced, but lived, shared, and continuously transformed within the communities it is meant to serve.

CONCLUSION

This article argues that ideal community service—particularly within the health sector—should not be detached from research but integrated as a core component of the research ecosystem. A roadmap-based approach ensures alignment, relevance, and sustained impact on population health. Such integration requires a paradigm shift—from fulfilling institutional obligations to fostering collaborative, evidence-based health ecosystems with communities. In this process, penta helix collaboration becomes essential for ensuring sustainability, particularly in addressing complex health challenges that require multi-sectoral engagement. Ultimately, the success of health education institutions should not be measured

solely by academic outputs, but by the extent to which knowledge contributes to meaningful improvements in health outcomes and community well-being.

Ethical consideration, competing interest and source of funding

-As this article is an perspective and does not involve human or animal, ethical approval was not required.

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