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Review Article

The role of social innovation in combating infectious diseases: A narrative review

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Abstract

Infectious diseases continue to impose a considerable health burden globally, with low and middle-income countries bearing an unequal share. While traditional biomedical interventions remain critical, their effectiveness is often limited without the integration of broader social strategies. Social innovation in health has been fostering community-driven, inclusive and sustainable models for the prevention and management of infectious diseases. This review examines the evolving concept of social innovation in health, the mechanisms through which it operates, existing challenges, and future prospects. Recent initiatives in India, such as the Social Innovation in Health Initiative India Hub at the Indian Council of Medical Research (ICMR), have highlighted innovative models like community-led dengue surveillance systems and mobile health platforms for tuberculosis (TB) adherence that have significantly improved health outcomes in resource-limited settings. Furthermore, pilot projects integrating social entrepreneurship with public health goals, especially during the COVID-19 pandemic, demonstrated the potential of grassroots innovation in strengthening health system resilience. Integrating social innovation with traditional biomedical approaches offers a powerful framework for constructing responsive, and equitable health systems to more effectively combat infectious diseases in India and beyond.

Keywords: Infectious diseases, Social innovation, Public health

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1. Introduction

Infectious diseases such as malaria, tuberculosis, HIV/AIDS, and more recently, emerging pathogens like SARS-CoV-2 continue to exert substantial pressure on global health systems, revealing critical systemic fragilities, particularly in low- and middle-income countries. These health challenges underscore the limitations of conventional biomedical responses including vaccines, pharmacological treatments, and diagnostics when implemented in isolation from broader social determinants of health. While such biomedical interventions remain indispensable, their efficacy is frequently constrained by contextual barriers, including inequitable access, infrastructural deficits, and socio-cultural mismatches between solutions and lived realities.

In response to these enduring challenges, the concept of social innovation in health has emerged as a multidimensional, community-engaged paradigm for addressing health disparities. Social innovation in health refers to inclusive, contextually embedded solutions that are developed through participatory, multi-stakeholder engagement to meet the specific needs of communities. Unlike top-down interventions, these innovations reimagine health delivery through novel processes, services, and organizational models that align with the socio-cultural ecosystem in which they are implemented. As such, social innovation has garnered increasing recognition as a complementary strategy to biomedical science in combatting infectious diseases, particularly in settings where conventional public health infrastructure is overburdened or fragmented.[1-6]

However, while the "what" of social innovation has become better defined over recent years, the "how" that is, the mechanisms by which these innovations are implemented, scaled, and institutionalized often remains superficial. Many projects continue to treat community participation as a procedural formality rather than an intrinsic, transformative process. As a result, the deeply empowering potential of social innovation is sometimes diluted by bureaucratic or donor-driven imperatives that

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prioritize short-term outputs over long-term community ownership. A reframing is needed one that centre communities not merely as beneficiaries, but as co-creators of sustainable health solutions.

This narrative review critically examines the role of social innovation in enhancing the prevention, control, and resilience-building dimensions of infectious disease management. Particular attention is given to community-driven approaches, cross-sectoral collaborations, and the dynamic interface between grassroots ingenuity and formal health systems. India provides a compelling case study, with initiatives such as the Social Innovation in Health Initiative (SIHI) India Hub and various COVID-era technological responses demonstrating significant strides in leveraging localized knowledge and digital platforms to close persistent health delivery gaps.[7]

Additionally, this review interrogates the structural and institutional challenges that constrain the scalability and sustainability of social innovation in public health. Issues such as policy fragmentation, limited evidence frameworks, and inconsistent funding models are explored in depth. Finally, the review outlines a forward-looking agenda that advocates for integrating social innovation more deliberately within existing health systems, harnessing its potential to foster equity, adaptability, and systemic responsiveness in the face of current and future infectious disease threats.[8]

2. Materials and Methods

The narrative review on social innovation in health utilized a comprehensive methodology to analyze case studies and reports from 2020 to 2024, focusing on interventions in low- and middle-income countries (LMICs).[9-13] The review employed a systematic approach to select relevant literature, including peer-reviewed articles, WHO reports, and global health initiatives, ensuring a robust foundation for the analysis.

2.1. Criteria for inclusion

Articles were chosen based on their relevance to social innovation and infectious disease control, emphasizing interventions that address health inequities. The review incorporated a variety of sources, including empirical studies and theoretical frameworks, to provide a well-rounded perspective on social innovation in health.

2.2. Methodological framework

1. ***Case study approach:*** The review analyzed specific case studies from regions like South Africa, the Philippines, Malawi, and Colombia, focusing on community-driven health initiatives (Mdleleni & Velapi, 2022)(Niekerk et al., 2023).

2. ***Qualitative analysis:*** Data collection involved qualitative methods, including interviews and focus groups, to capture the experiences and perspectives of community members involved in health programs (Dako-Gyeke et al., 2020)(Greenall-Ota et al., 2024).

2.3. Analytical techniques

Cross-Case Analysis: A cross-case analysis was conducted using a conceptual framework on social innovation, which helped identify key dimensions such as community engagement and institutional support (Niekerk et al., 2023).

Empowerment Focus: The review highlighted how social innovations empower communities to take active roles in health initiatives, thereby enhancing the effectiveness of interventions (Halpaap & Reeder, 2019).

While the review emphasizes the positive impact of social innovation in health, it is essential to consider potential challenges, such as resource limitations and varying levels of community engagement, which can affect the sustainability of these initiatives.

2.4. Data extraction and synthesis

A literature search was conducted using peer-reviewed articles and organisational reports published between 2020 and 2024.

Relevant information was manually extracted from selected studies including type of social innovation, target populations, disease focus, implementation strategies, outcomes and challenges reported.

Data synthesis involved a thematic analysis, summarising findings across different studies to identify common patterns, effective practices and challenges.

2.5. Inclusion criteria

Literature focused on social innovation in health related to prevention and control of infectious diseases published between 2020 and 2024.

Both peer-reviewed journal articles and grey literature (WHO reports)

2.6. Exclusion criteria

Articles focusing solely on clinical or biomedical innovation without reference to social components.

3. Results

Social innovation has emerged as a vital force in addressing structural gaps within public health systems, particularly in low- and middle-income countries. In India, a range of pioneering interventions illustrate the transformative potential of community-led approaches, cross-sector collaboration, technology integration, and sanitation-driven health promotion. This review presents a critical synthesis of such initiatives, emphasizing their measurable impact and contextual relevance.

Community empowerment lies at the heart of sustainable health interventions. The Sonagachi Project in Kolkata is frequently cited as a global model of success in reducing HIV transmission through community mobilization. Here, peer educators sex workers themselves were trained to provide education and services related to HIV/AIDS prevention. According to UNAIDS (2023), HIV prevalence among this community dropped to below 5%, a dramatic contrast to the 13% baseline observed in comparable districts. This outcome underlines the principle that involving beneficiaries in both design and delivery enhances program ownership, uptake, and impact.

Equally pivotal is cross-sector collaboration, which has emerged as a cornerstone of resilient health systems. The STOP India program exemplifies this through its integration of government infrastructure, non-governmental organizations, private healthcare providers, and technology platforms. By leveraging eNikshay, a digital patient management system, the initiative increased TB case notifications by 19% compared to pre-implementation levels (MoHFW, 2024). This multisectoral framework allowed for better diagnostics, treatment adherence, and data transparency while fostering community trust and participation an essential combination for controlling communicable diseases such as tuberculosis.[14-17]

Technology-enabled health innovations have further accelerated India's march toward universal health coverage. The eSanjeevani telemedicine platform has revolutionized healthcare access by facilitating over 180 million consultations as of 2025. This is particularly significant in rural areas, where traditional barriers such as distance, cost, and workforce shortages often inhibit timely care. Similarly, the Kilkari program, which disseminates weekly audio messages to pregnant and postpartum women, has reached over 25 million users nationwide. Evaluation studies have linked these digital nudges to improved antenatal attendance and increased institutional deliveries (MoHFW, 2024). In Sub-Saharan contexts, analogous mobile interventions such as SMS reminders for TB treatment in Kenya and South Africa have yielded a 20–25% increase in treatment adherence (WHO Regional Reports, 2023), suggesting a promising model for adaptation and scalability.

Another crucial domain of health-related social innovation is sanitation. India's Swachh Bharat Abhiyan, launched in 2014, has catalysed one of the largest behaviour change initiatives globally. Over 110 million toilets were constructed nationwide, raising rural sanitation coverage from 39% in 2014 to over 99% by 2020. UNICEF and WHO evaluations have linked this infrastructural push to a marked reduction in diarrhoea-related morbidity and mortality, especially among children under five. Beyond infrastructure, the campaign’s success hinged on mobilizing local communities, incentivizing behavioural change, and aligning hygiene promotion with national policy goals.

Collectively, these initiatives showcase how context-specific innovation, when anchored in participation, partnerships, and purpose-driven technology, can significantly enhance public health outcomes. However, sustained impact depends on iterative evaluation, inter-sectoral governance, and the integration of such innovations into formal health systems. As nations grapple with post-pandemic recovery and resilience-building, India’s mosaic of socially driven health programs offers a robust blueprint for global emulation.

Table 1: Presenting the results, highlighting key social innovation initiatives in Indian public health, their approaches, and measurable impacts.

Initiative	Focus	Key Approach	Measurable Impact	Contextual Relevance
Sonagachi Project	HIV prevention, Community Empowerment	Peer-led education, community mobilization, microfinance, rights-based framing, and anti-trafficking	HIV prevalence among sex workers dropped to below 5% (from 13% in comparable districts); increased condom use and STD/HIV knowledge	Demonstrates the effectiveness of involving beneficiaries in program design and delivery for ownership and sustainability
STOP India Program	Tuberculosis control, Cross-sector collaboration	Integration of government, NGOs, private sector, and technology (eNikshay digital system)	19% increase in TB case notifications post-implementation; improved diagnostics and treatment adherence	Showcases the value of multisectoral frameworks for communicable disease control and building community trust
eSanjeevani Platform	Telemedicine, Technology Integration	Nationwide digital consultations, remote access to healthcare	Over 180 million consultations facilitated, especially benefiting rural areas with limited healthcare access	Reduces barriers of distance, cost, and workforce shortages in rural healthcare delivery
Kilkari Program	Maternal & Child Health, Digital Health	Weekly audio messages to pregnant/postpartum women	Reached over 25 million users; linked to improved antenatal attendance and	Illustrates the role of digital nudges in improving maternal and child health behaviors

			increased institutional deliveries	
Swachh Bharat Abhiyan	Sanitation-driven Health Promotion	Nationwide toilet construction, community mobilization, behavior change incentives	Rural sanitation coverage rose from 39% (2014) to over 99% (2020); reduction in diarrhoea-related morbidity and mortality among children under five	Emphasizes the health impact of large-scale, community-driven sanitation and hygiene promotion

3.1. Key insights

Community empowerment (e.g., Sonagachi) leads to sustained behavior change and improved health outcomes Cross-sector collaboration (e.g., STOP India) strengthens health system resilience and disease control. Technology integration (e.g., eSanjeevani, Kilkari) expands the reach and effectiveness of health services, especially in underserved areas. Sanitation initiatives (e.g., Swachh Bharat Abhiyan) have direct, measurable impacts on public health, particularly for vulnerable groups.

4. Discussion

The proliferation of social innovation in healthcare reflects a paradigmatic shift from top-down, provider-centric models to inclusive, participatory systems that prioritize contextual responsiveness and community agency. However, the translation of innovative, often grassroots solutions into broad-based public health impact continues to be fraught with multidimensional challenges that merit critical examination.

One of the foremost challenges is scalability. While localized interventions such as the Sonagachi Project or Kilkari exemplify high contextual effectiveness, their replication across divergent socio-cultural landscapes is not straightforward. Factors such as linguistic diversity, administrative heterogeneity, and community receptiveness can significantly modulate intervention outcomes. Scalable innovation thus requires adaptable frameworks rather than rigid models, demanding sensitivity to local governance structures and epidemiological profiles.

Sustainability presents another pressing concern. Many socially innovative programs depend heavily on catalytic funding or the enthusiasm of a few local champions. Without structural embedding and recurrent financial investment, these efforts risk dissipating once initial momentum wanes. Post-intervention stagnation is particularly evident in cases where community ownership is superficial or where interventions are not institutionalized into public health frameworks. Transitioning from pilot to policy demands a more robust strategy for stakeholder alignment, fiscal continuity, and institutional legitimacy.

Moreover, the integration of social innovation with formal health systems remains uneven. Innovations frequently evolve in parallel silos, facilitated by non-governmental actors or private enterprises, often bypassing state health systems altogether. This can lead to fragmentation, redundancy, and policy incoherence. Building interoperability between informal innovations and formal health infrastructure both technologically and procedurally is crucial to ensure sustainability and scalability. Institutional frameworks must evolve to accommodate pluralistic health actors while safeguarding standards, equity, and accountability.

The promise of social innovation also hinges on its capacity to address structural inequities. While designed to promote inclusivity, there is an emerging critique that some interventions inadvertently privilege digitally literate or geographically accessible populations, sidelining those who are socially or economically disenfranchised. Innovation must therefore be deliberately equitable in its conception and deployment, embedding mechanisms to identify and reach vulnerable groups, and accounting for gendered, caste-based, and geographic disparities.

Finally, measuring the impact of social innovation remains inherently complex. Unlike biomedical interventions with quantifiable endpoints, social innovations often operate across behavioural, relational, and systemic domains. Mixed-methods evaluation models are increasingly necessary to capture both quantitative health outcomes and qualitative shifts in empowerment, trust, and community cohesion. Moreover, impact trajectories often unfold over long horizons, challenging conventional funding cycles and assessment metrics.

In sum, while social innovation has indisputably enriched the public health landscape particularly in infectious disease control its long-term efficacy depends on confronting systemic barriers to scaling, sustaining, and integrating these efforts within a just and responsive health ecosystem. Embedding innovation into the governance fabric, backed by context-specific evidence and driven by inclusive design, is imperative if these promising interventions are to become enduring public health solutions. Despite the inherent implementation challenges, social innovation remains a fertile ground for transformative change in the public health sector particularly in infectious disease prevention and control. Its most compelling strength lies in the ability to contextualize interventions by integrating local knowledge, cultural practices, and lived experiences. This enables

tailored solutions that resonate with community values and facilitate higher levels of acceptance, ownership, and behavioural alignment. For instance, co-designed health strategies not only promote relevance but also empower marginalized populations to move from passive recipients to active agents of change.

Furthermore, the proliferation of digital infrastructure and mobile technologies opens expansive opportunities for real-time disease surveillance, patient engagement, and health system responsiveness. Platforms capable of aggregating epidemiological data at the community level when combined with predictive analytics can significantly enhance the timeliness and precision of outbreak detection and response. Integrating such tools with grassroots surveillance networks ensures early warning capabilities are both technologically robust and socially embedded.

Additionally, social innovation catalyses cross-sectoral experimentation, offering a testing ground for novel partnerships between government, civil society, academia, and private enterprise. This pluralism fosters the emergence of hybrid solutions that transcend sectoral boundaries, blending public accountability with entrepreneurial agility. As new actors engage in healthcare innovation, pathways emerge for developing scalable, cost-effective, and context-sensitive interventions.

Finally, social innovation serves as an incubator for alternative metrics of success beyond traditional epidemiological indicators by emphasizing empowerment, equity, and system adaptability. This pluralistic lens is particularly relevant in complex, dynamic public health landscapes, where rigid models often falter. By encouraging iterative learning and responsiveness, social innovation has the potential to not only fill system gaps but also reimagine the architecture of public health delivery for the 21st century.

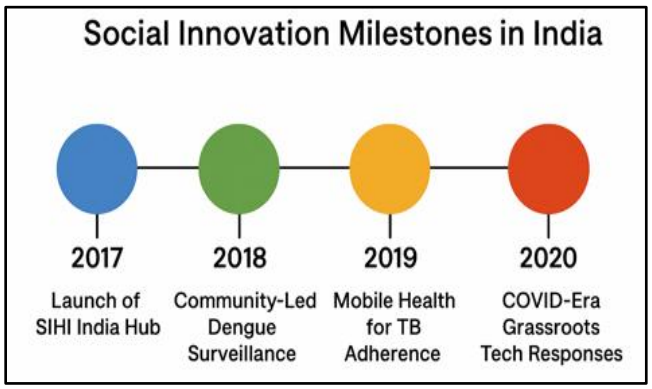

Figure 1: Social Innovation history

Figure 2: Sex workers marching with placards express

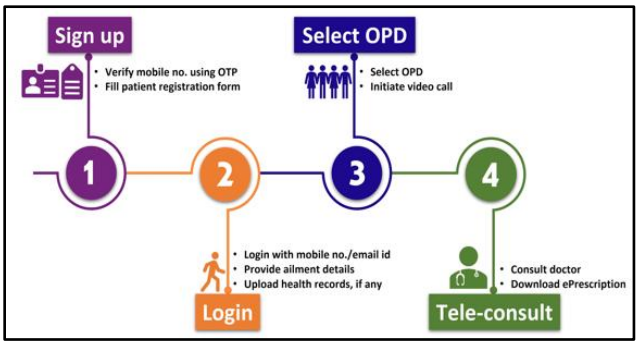

Figure 3: eSanjeevani (Patient to doctor telemedicine)

Government and International Health Organisations must recognise the importance of social innovation and support its integration in national health systems. Policy frameworks that encourage cross sector collaboration community participation and sustainable scaling of successful initiatives are essential for ensuring the long term impact of social innovations.

5. Limitation

This review is subject to several limitations that warrant careful consideration. First, the inherently diverse nature of social innovation initiatives spanning multiple contexts, stakeholder constellations, and implementation modalities limited the feasibility of direct comparison across studies. Variability in intervention scope, population demographics, and evaluation metrics complicates efforts to generalize findings or extrapolate best practices universally. Second, the review relies primarily on published literature and programmatic reports, which may introduce publication bias by disproportionately reflecting successful or high-profile interventions. Grassroots initiatives with limited documentation or those operating outside formal publication channels may thus be underrepresented, skewing the thematic synthesis. Moreover, while thematic analysis allowed for the identification of recurrent patterns and principles, it may have inadvertently obscured context-specific nuances that are critical to the success or failure of individual initiatives. These limitations highlight the need for more systematic,

mixed-methods research and greater inclusivity in evidence sourcing to capture the full spectrum of social innovation in public health.

5.1. Future directions

1. *Strengthening research and evaluation:* Develop metrics to assess the effectiveness, cost-efficiency, and scalability of social innovations.
2. Policy support: Advocate for national policies that foster innovation ecosystems and integrate successful models into health systems.
3. Capacity building: Train communities, local governments, and health workers to lead and sustain innovations.
4. Leveraging technology: Expand the use of artificial intelligence, mobile platforms, and data analytics to enhance surveillance, communication, and intervention delivery.
5. Promoting equity and inclusivity: Prioritise the voices and needs of marginalised and vulnerable populations in innovation design and implementation.

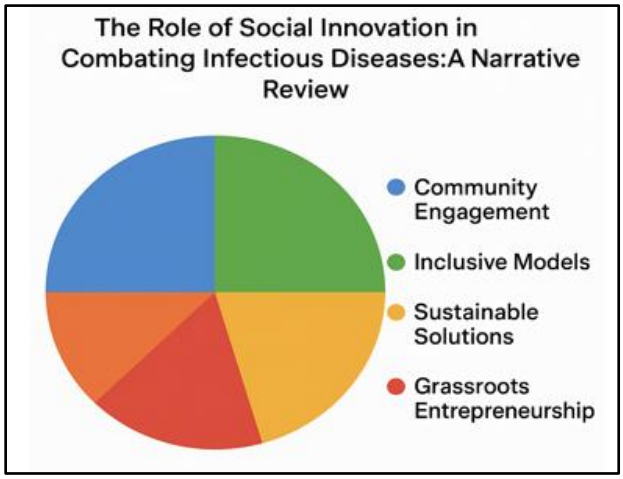

Figure 4: Pie chart showing inclusive modes.

Table summarizing the future directions of social innovation in India, covering public health, education, sustainability, entrepreneurship, and technology integration:

Table 2: This table reflects how India's social innovation landscape is moving toward integrated, technology-enabled, and community-driven approaches with a focus on sustainability, inclusivity, and measurable impact across sectors.

Future Direction	Focus	Key Programs & Examples	Expected Impact
Cross-sector Collaboration	Partnerships between government, NGOs, private sector, and communities to address complex challenges	Aspirational Blocks Programme (ABP), Atal Innovation Mission, Tata Social Enterprise Challenge	Locally tailored solutions, improved governance, and inclusive development
Technology-Driven Inclusivity	Leveraging digital tools, AI, and data for health, education, and financial inclusion	eSanjeevani, Kilkari, NSDC AI-integrated learning, Start-up India, Digital Green	Expanded access to services, reduced disparities, and scalable impact
Sustainable, Community-Centered Models	Empowering grassroots innovators and communities to co-create and sustain solutions	Goonj (clothing & rural development), SELCO (solar energy), Barefoot College (rural women engineers), Community-Led Local Development	Greater ownership, resilience, and sustainability of outcomes
Youth & Women Empowerment	Fostering entrepreneurship and leadership among youth and women	SHEF (education for girls), Myna Mahila Foundation, Feeding India, Educate Girls	Increased social mobility, gender equity, and community leadership
Environmental & Social Sustainability	Integrating clean energy, circular economy, and climate resilience into innovation agendas	SELCO, Aarohan Social Innovation Awards (environmental category), Vyoda Solar Irrigation Pumps	Long-term ecological balance and improved livelihoods
Outcome-Based Monitoring & Evaluation	Data-driven frameworks for tracking progress and scaling best practices	Swachh Survekshan Grameen, ABP indicator tracking, ESF Social Innovation Plus Initiative	Transparent, adaptive, and evidence-based scaling of innovations
Global Collaboration & Knowledge Sharing	Engaging with international networks, research, and funding to scale social innovation	India as a Global Innovation Hub, OECD/ESF+ Communities of Practice, UNCTAD Technology & Innovation Reports	Accelerated learning, funding, and global leadership in social innovation

6. Conclusion

Social innovation plays an important role in prevention and control of infectious diseases particularly in resource-limited settings. By fostering community engagement, promoting cross-sector collaboration and incorporating innovative technologies, these approaches complement traditional biomedical strategies. However, challenges related to scalability, sustainability and integration into health systems

need to be addressed. Future efforts should focus on building supportive policies, evaluating long-term impacts of social innovation on global health outcomes.

7. Source of Funding

None

8. Conflict of Interest

None

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