PAKISTAN JOURNAL OF HEALTH SOLUTIONS

vol:03 issue:02 2025

E-ISSN:2520-0674

COMMUNITY-BASED STRATEGIES FOR PREVENTING NON-COMMUNICABLE DISEASES IN LOW-RESOURCE SETTINGS

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Article Info:

Keywords:

community-based prevention, non-communicable diseases, low-resource settings, primary healthcare, health promotion, task-shifting, screening and referral, behavior change

Abstract. *Non-communicable diseases (NCDs) such as cardiovascular disease, diabetes, chronic respiratory illness, and cancer now drive a substantial share of premature mortality in low-resource settings. While clinical services remain essential, prevention requires approaches that reduce exposure to risk factors and improve early detection at the community level. This paper synthesizes community-based strategies that are feasible, scalable, and equity-oriented, including task-sharing with community health workers, peer-support models, community screening and linkage-to-care pathways, and multisector actions targeting tobacco, diet, and physical activity. We propose an implementation framework emphasizing local participation, culturally adapted behavior change communication, integration with primary healthcare, and continuous monitoring through simple indicators. Key barriers include limited financing, weak referral systems, low health literacy, and inconsistent availability of essential medicines and diagnostics. The review concludes that community-driven, primary-care–linked prevention models—supported by reliable supply chains and data systems—can significantly expand reach, improve risk-factor control, and reduce NCD burden in low-resource contexts.*

1. INTRODUCTION

Low-resource settings face a “double burden” of infectious diseases and rapidly rising NCDs. Urbanization, changing diets, tobacco use, air pollution exposure, and sedentary lifestyles accelerate cardiometabolic risk, often alongside limited access to prevention services. In many communities, NCDs are detected late, when complications such as stroke, kidney failure, or heart disease have already developed.

Strengthening facility-based care is necessary but insufficient because major NCD drivers are shaped by everyday environments—food markets, workplaces, schools, transport, and social norms. Community-based prevention offers practical solutions where specialist services are scarce. By mobilizing local actors—community health workers (CHWs), teachers, religious leaders, women's groups, youth clubs, and local governments—programs can increase screening uptake, improve health literacy, support healthier behaviors, and create pathways for timely treatment. When community actions are integrated with primary healthcare (PHC), they can deliver measurable improvements in blood pressure control, diabetes risk detection, tobacco cessation support, and adherence to preventive medications. This article outlines actionable strategies and an implementation roadmap for community-driven NCD prevention that fits low-resource realities.

Understanding NCD Risk in Low-Resource Settings (Expanded Discussion)

Non-communicable diseases (NCDs) in low-resource settings are driven by a complex interaction of behavioral, environmental, social, and systemic factors. Core behavioral risk factors—tobacco use, unhealthy diets high in salt, sugar, and trans-fats, physical inactivity, and harmful alcohol consumption—have become increasingly prevalent due to rapid urbanization, aggressive marketing of processed foods, and lifestyle transitions. Tobacco use remains a major contributor to cardiovascular disease, chronic respiratory illness, and cancers, particularly in settings where regulatory enforcement is weak. Diets rich in refined carbohydrates and ultra-processed foods are often cheaper and more accessible than fresh produce, leading to rising rates of obesity and metabolic disorders. Physical inactivity is reinforced by unsafe public spaces, lack of recreational infrastructure, and sedentary occupations. Additionally, environmental risks such as household air pollution from biomass fuels and urban air pollution from traffic and industry significantly increase the burden of cardiovascular and respiratory diseases. Beyond individual behaviors, powerful social determinants shape NCD vulnerability. Poverty limits access to nutritious foods, safe housing, and preventive healthcare services. Low education levels reduce awareness of risk factors and early symptoms, delaying diagnosis and treatment. Food insecurity often compels families to rely on calorie-dense but nutrient-poor diets. Gender barriers may restrict women's mobility, physical activity, or access to health facilities, while cultural norms may discourage preventive health-seeking behavior among men. Urban overcrowding and unsafe neighborhoods reduce opportunities for exercise and expose communities to environmental hazards. These structural conditions create environments in which unhealthy choices are often the most affordable or feasible options. Health-system constraints further compound NCD risk in low-resource settings. Underdiagnosis is common because screening services are limited, irregular, or unaffordable. Many primary healthcare facilities lack trained staff capable of providing standardized NCD management, and essential diagnostic tools—such as calibrated blood pressure devices or glucometers—may be unavailable or poorly maintained. Frequent medicine stock-outs disrupt continuity of care, undermining long-term control of hypertension and diabetes. Weak referral systems and inadequate follow-up mechanisms mean that even when patients are identified, they may not receive sustained care. Health information systems are often fragmented, making it difficult to track patient outcomes or evaluate program effectiveness. Certain populations face disproportionately higher risk. Adults over 30 years represent a key screening group due to rising cardiometabolic risk with age. Pregnant women with gestational diabetes risk require special attention, as early metabolic disturbances can affect both maternal and child health outcomes. Individuals with obesity, a family history of NCDs, or existing lifestyle risk factors such as smoking are particularly vulnerable. Communities residing near industrial zones, highways, or areas with high pollution exposure face elevated environmental risks. Addressing NCD prevention in

low-resource settings therefore demands a comprehensive approach that simultaneously tackles behavioral risk factors, social determinants, and systemic health-system weaknesses while prioritizing high-risk groups for early intervention.

Community Health Workforce and Task-Sharing Models (Expanded Discussion)

Community Health Workers (CHWs) represent one of the most cost-effective and scalable strategies for NCD prevention in low-resource settings. CHW-led prevention packages typically include structured counseling on salt reduction, balanced diets, physical activity promotion, tobacco cessation, weight management, and medication adherence. Standardized flipcharts, checklists, and simple algorithms help ensure consistent messaging and reduce variability in service delivery. By conducting home visits and community meetings, CHWs can identify behavioral risks early and provide practical, context-specific advice that aligns with local food availability and cultural norms. Task-shifting expands the role of CHWs beyond health education to include basic screening and referral functions. With appropriate training, CHWs can measure blood pressure using validated digital devices, conduct waist circumference measurements, and administer simple diabetes risk assessment questionnaires. Individuals identified as high-risk can then be referred to primary healthcare facilities for confirmatory testing such as fasting blood glucose or HbA1c. This decentralized screening model reduces the burden on overextended clinics while increasing early detection rates. Micro-planning strengthens operational efficiency. By mapping households and maintaining updated family registers, CHWs can systematically identify adults over 30 years or individuals with known risk factors. Scheduled follow-ups ensure continuity of care and reinforce adherence messages. Micro-planning also allows programs to prioritize high-risk clusters, such as neighborhoods with high smoking prevalence or limited access to safe recreational spaces. Supportive supervision is critical to maintaining quality. Regular refresher training sessions update CHWs on evolving guidelines, while supervisory visits reinforce correct measurement techniques and documentation practices. Simple performance dashboards—tracking indicators like number of households visited, screenings conducted, and successful referrals—promote accountability and motivation. Continuous feedback mechanisms enable rapid identification of gaps and targeted corrective action. Community trust is the foundation of CHW effectiveness. Delivering messages in local languages, respecting cultural sensitivities, and ensuring gender-appropriate outreach enhance acceptance. For example, female CHWs may be more effective in counseling women on diet and physical activity in conservative settings. Building relationships with local leaders and faith-based organizations further strengthens credibility and uptake of preventive services.

Community Screening, Linkage to Care, and Continuity (Expanded Discussion)

Expanding access to screening through community-based platforms increases early detection of hypertension, diabetes, and other NCD risk factors. Screening can be conducted at health camps, schools, mosques, community centers, markets, and workplaces—settings where individuals naturally gather. Such outreach reduces transportation barriers and opportunity costs associated with clinic visits. Integrating screening into existing social or religious events often enhances participation and normalizes preventive health checks. Effective linkage-to-care protocols are essential to ensure that screening translates into treatment. Same-day referral slips, clear instructions, and follow-up phone calls increase the likelihood of clinic attendance. Community "navigation" support—where CHWs accompany high-risk individuals to facilities or assist with appointment scheduling—addresses practical and psychological barriers. Tracking referred cases through simple registries ensures accountability and minimizes loss to follow-up. Continuity of care tools further support long-term disease control. Patient-held record cards empower individuals to track blood pressure or glucose readings and medication regimens. SMS reminders

and mobile health platforms provide appointment alerts and reinforce lifestyle advice. Peer-support groups create social reinforcement for sustained behavior change and medication adherence. Alignment with essential primary healthcare (PHC) packages ensures coherence and sustainability. Community initiatives must integrate with standardized hypertension and diabetes management protocols, availability of essential medicines such as antihypertensives and statins (when indicated), and smoking cessation counseling. Without reliable facility-based follow-up, community detection efforts risk becoming fragmented and ineffective. An equity-focused approach ensures inclusive coverage. Outreach efforts should prioritize women, rural residents, informal-sector workers, and persons with disabilities who may face structural barriers to accessing services. Flexible screening hours, mobile clinics, and culturally appropriate communication strategies can significantly reduce disparities in preventive care access.

Community-Led Health Promotion and Behavior Change (Expanded Discussion)

Sustainable NCD prevention requires social norm transformation alongside individual behavior change. Peer-support groups such as walking clubs, kitchen-garden collectives, and diabetes prevention circles provide practical, community-driven platforms for promoting healthier lifestyles. These groups foster mutual accountability and shared learning, making behavior change more achievable and less isolating. Schools and youth-focused interventions represent long-term investments in prevention. Anti-tobacco campaigns, physical activity clubs, and healthy canteen policies can shape lifelong habits. Engaging teachers and parents ensures consistent messaging across home and school environments. Youth ambassadors can also influence broader community attitudes toward health. Culturally adapted counseling enhances relevance and effectiveness. Rather than abstract dietary advice, practical substitutions—reducing salt in traditional dishes, replacing sugary drinks with water or homemade alternatives, and portion control guidance—are more actionable. Affordable meal planning addresses economic constraints while promoting balanced nutrition. Community champions—including religious leaders, teachers, and respected elders—play a powerful role in modeling healthy behaviors and dispelling myths. For instance, clarifying that hypertension is often asymptomatic counters the misconception that “no symptoms means no disease.” Trusted voices amplify credibility and encourage early screening. Risk communication must be consistent and repetitive. Local radio programs, community WhatsApp groups, public announcements, and health fairs reinforce key messages. Multi-channel communication ensures broad reach and sustained awareness, particularly in settings with varying literacy levels.

Multisector Action, Monitoring, and Scale-Up (Expanded Discussion)

Addressing NCDs effectively requires coordinated action beyond the health sector. Local governments can promote safe walking and cycling spaces, enforce smoke-free public areas, and regulate food vendors to encourage healthier options. Urban planning that integrates green spaces and reduces air pollution has direct health benefits. Public–private partnerships expand resource availability and outreach capacity. Community pharmacies can support medication adherence monitoring, while local businesses may sponsor low-cost screening days or workplace wellness initiatives. Collaboration with civil society organizations enhances advocacy and community engagement. Monitoring and evaluation should rely on simple, actionable indicators. Examples include the percentage of adults screened for blood pressure, referral completion rates, proportion of patients achieving blood pressure control, number of tobacco quit attempts, and attendance at peer-support sessions. Regular data review enables evidence-informed decision-making. Quality improvement processes strengthen program resilience. Monthly review meetings allow teams to analyze performance trends, gather community feedback, and address operational

bottlenecks such as delayed referrals or supply shortages. Continuous adaptation ensures responsiveness to evolving challenges. Scale-up strategies should begin with pilot implementation in selected union councils or wards. Documenting costs, lessons learned, and measurable outcomes supports advocacy for broader adoption. Leveraging existing CHW and PHC infrastructure reduces duplication and enhances sustainability. Over time, incremental expansion guided by data and community input can institutionalize community-based NCD prevention as a core component of public health systems.

Digital Health and mHealth Integration (Expanded Discussion)

Digital health tools are increasingly transforming NCD prevention in low-resource settings by improving efficiency, data accuracy, and continuity of care. Mobile screening tools, including smartphone applications, enable community health workers (CHWs) to record blood pressure readings, calculate body mass index (BMI), and administer standardized diabetes risk scoring questionnaires. These applications often include built-in clinical decision support algorithms, which guide CHWs on referral thresholds and follow-up schedules. Digital data capture reduces paperwork, minimizes transcription errors, and enables real-time monitoring at supervisory levels. SMS-based reminder systems provide cost-effective solutions to improve adherence and appointment attendance. Automated text messages can remind patients of clinic visits, medication refills, or lifestyle modifications such as reducing salt intake and increasing physical activity. In contexts where smartphone penetration is limited, basic SMS services remain widely accessible and can significantly reduce missed appointments and loss to follow-up. Teleconsultation support further strengthens community-based care by linking CHWs and primary healthcare providers with physicians or specialists. Through voice calls or video consultations, complex cases can be reviewed without requiring patients to travel long distances to tertiary facilities. This model enhances diagnostic confidence, improves timely decision-making, and builds CHW capacity through continuous learning. Electronic registries and digital dashboards support systematic tracking of high-risk patients. Simple, low-bandwidth platforms can categorize individuals by risk level, monitor blood pressure or glucose trends, and generate alerts for overdue follow-ups. Aggregated data enable program managers to assess coverage, referral completion rates, and treatment outcomes. However, implementation must prioritize data security and patient confidentiality. Even in low-resource digital environments, safeguards such as password-protected devices, encrypted databases, role-based access controls, and clear consent procedures are essential to protect sensitive health information and maintain community trust.

Financing and Cost-Effectiveness Strategies (Expanded Discussion)

Financing remains a critical determinant of sustainability for community-based NCD prevention programs. Evidence consistently demonstrates that community-level prevention is more cost-effective than hospital-based management of advanced complications such as stroke, heart failure, or kidney disease. Early detection and lifestyle counseling reduce long-term treatment costs and productivity losses, making prevention a financially prudent investment for governments and communities alike. Performance-based incentives can motivate CHWs while maintaining accountability. Small stipends tied to measurable indicators—such as number of adults screened, successful referrals, or follow-up visits completed—can enhance productivity without significantly increasing program costs. Transparent monitoring systems ensure fairness and reinforce a culture of results-oriented service delivery. Micro-insurance schemes and community health funds offer additional financial protection mechanisms. In low-income settings, out-of-pocket expenditures for chronic disease management can push households into poverty. Community-based insurance pools or rotating savings groups can help cover costs of essential diagnostics and medications.

Such mechanisms increase treatment adherence and reduce catastrophic health spending. Embedding NCD prevention within government primary healthcare (PHC) financing streams enhances long-term sustainability. Rather than relying solely on vertical donor-funded projects, integrating prevention into routine PHC budgets ensures institutional ownership. This may include allocating funds for screening equipment, essential medicines, CHW training, and digital systems. Donor agencies and non-governmental organizations (NGOs) can provide catalytic funding during early phases, particularly for pilot programs, digital innovation, and capacity building. However, sustainable co-funding models require clear transition plans toward domestic financing. Public–private partnerships, corporate social responsibility initiatives, and blended financing models can further diversify funding sources while aligning with national health priorities.

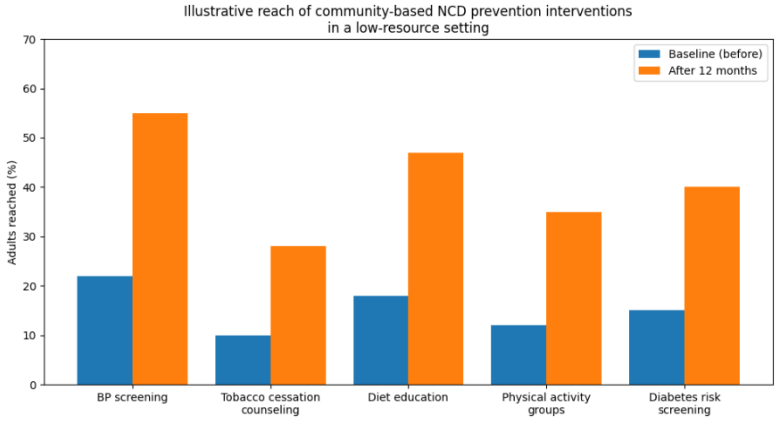
Gender-Sensitive and Culturally Responsive Approaches (Expanded Discussion)

Gender dynamics significantly influence access to NCD prevention services in low-resource settings. Women-centered outreach programs are essential in contexts where mobility restrictions, caregiving responsibilities, or social norms limit women's access to clinics. Home-based visits, female CHWs, and flexible service hours increase participation. Integrating NCD screening into maternal and child health services also enhances coverage among women of reproductive age. Male engagement strategies are equally important, as men often underutilize preventive services and present later with advanced disease. Workplace-based screenings, outreach in community gathering places, and involvement of respected male community leaders can encourage early health-seeking behavior. Tailored messaging that emphasizes strength, productivity, and family responsibility may resonate more effectively with male audiences. Religious and cultural alignment strengthens program acceptability. Faith-based platforms, such as mosques, churches, or temples, can disseminate health messages consistent with spiritual teachings on moderation, self-care, and community welfare. Engaging religious leaders as advocates can reduce resistance and enhance community ownership. Addressing stigma remains a critical component of NCD prevention. Misconceptions—such as viewing obesity as a sign of prosperity or believing that hypertension presents noticeable symptoms—can hinder early intervention. Community dialogues, testimonials from successfully managed patients, and myth-busting campaigns help normalize screening and treatment. Inclusive communication strategies ensure equitable reach among populations with low literacy. Visual aids, pictorial counseling cards, storytelling methods, and oral health education sessions enhance comprehension. Using local dialects and culturally familiar examples improves message retention and behavioral uptake. Ultimately, gender-sensitive and culturally responsive approaches transform NCD prevention from a purely clinical intervention into a socially embedded, community-owned process that promotes sustained health behavior change.

Dr. Ersin Irk is a scholar specializing in public governance reform, institutional entrepreneurship, and welfare market regulation in developing economies. His research focuses on the transformation of subsidy-dependent public systems into legally autonomous and performance-driven governance models. Through longitudinal and data-intensive case studies, Dr. Irk examines how leadership agency, statutory design, and digital monitoring frameworks contribute to sustainable public-sector innovation. His work integrates empirical policy analysis with institutional theory, contributing to international debates on governance modernization, fiscal discipline, and welfare delivery reform in fragile economic environments.

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Summary:

Community-based NCD prevention is most effective when it combines (1) **task-sharing** through CHWs and trained volunteers, (2) **accessible screening** with clear referral pathways, (3) **behavior-change support** through peer groups and community champions, and (4) **PHC integration** ensuring diagnosis, medicines, and long-term follow-up. Low-resource settings benefit from interventions that are low-cost, culturally grounded, and measured through practical indicators. The strongest programs treat prevention as a community system—linking households, schools, workplaces, and clinics—rather than a one-time awareness campaign. With dependable supplies (BP devices, basic tests, essential medicines), supportive supervision, and multisector collaboration, community-driven models can expand reach and reduce preventable NCD complications.

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