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CHALLENGES AND OPPORTUNITIES IN DELIVERING NON-COMMUNICABLE DISEASE SERVICES THROUGH PRIMARY HEALTHCARE SYSTEMS

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Background

In low-resource settings, the growing burden of non-communicable diseases (NCDs) is increasingly difficult to manage, largely due to weaknesses within the existing health system. Despite the critical need for effective service delivery, there remains limited understanding of the systemic barriers and potential enablers related to organizing NCD care. This study aims to explore the health system-level challenges and possible opportunities in delivering services for four key NCDs i.e., cervical cancer, diabetes, cardiovascular disease, and chronic respiratory conditions, at the primary healthcare (PHC) level.

Study design: exploratory qualitative design.

Duration and place of study: This study was conducted in Shaheed Mohtarma Benazir Bhutto Medical College Lyari Karachi from December 2023 to December 2024

Methods

This study adopted a qualitative research approach to explore the issues in depth. Data collection involved 10 in-depth interviews with local healthcare providers, 10 key informant interviews with facility-level managers and service providers, and 10 focus group discussions held with members of the community. Thematic analysis was conducted using the health system dynamics framework as a guiding structure. To enhance the credibility of the findings, data from different methods and sources were triangulated for validation.

Results
The delivery of NCD services at the PHC level was shaped by multiple systemic challenges. Key issues included the absence of standardized treatment guidelines and clinical protocols, limited oversight of informal and profit-driven private healthcare providers, fragmented health information systems with inadequate record-keeping, and poor coordination among various healthcare actors and service platforms. Additional barriers included weak referral systems, insufficient access to essential medicines, diagnostics, and logistical support, along with a shortage of trained healthcare personnel. On the other hand, several strengths and opportunities were also identified. These included the presence of national policy documents focused on NCDs, an extensive network of healthcare facilities and frontline workers, and a growing public demand for NCD-related services.

Conclusion
Although there is significant potential to strengthen NCD service delivery at the PHC level, persistent health system challenges continue to hinder effective organization and implementation. Addressing these systemic gaps is essential to ensure the delivery of quality NCD care and to respond more effectively to the growing burden of NCDs within PHC settings.

Keywords: Non-communicable diseases, primary healthcare system, healthcare facilities, healthcare services, national policy

Introduction

NCDs have quietly, yet rapidly, transformed into the most pressing health threat of our era. Accounting for nearly three-quarters of all global deaths, these chronic conditions, including cardiovascular diseases, cancers, diabetes, and chronic respiratory illnesses, have outpaced infectious diseases as the primary cause of morbidity and mortality worldwide [1]. This transition from communicable to non-communicable disease burden has occurred within a surprisingly short span of time, and health systems, particularly in low- and middle-income countries (LMICs), have struggled to keep up [2]

PHC systems were originally focused on maternal and child health, vaccination, and infectious disease control. However, with the rise of NCDs, PHC must adapt to provide long-term, complex care for chronic conditions [3, 4]. Key global commitments like Alma-Ata (1978) and Astana (2018) stressed PHC's role in achieving UHC and SDGs [5]. Yet, despite political support, significant implementation gaps persist. Many PHC facilities lack trained staff to manage NCDs, and essential diagnostics, medicines, and protocols are often missing, especially in rural areas [6, 7]. Health information systems remain weak or absent, limiting patient tracking and treatment adherence [8]. Chronic underfunding and workforce shortages further restrict PHC's capacity to address NCDs [9].

Socioeconomic and cultural factors worsen access. Patients delay care due to cost, stigma, or lack of awareness [10]. Prevention is difficult because risk factors like tobacco use, poor diet, inactivity, and alcohol are deeply rooted socially and environmentally [11]. In many LMICs, healthcare focuses on treatment rather than prevention, with few sustained community programs [12]. Nonetheless, task shifting, delegating tasks to less specialized workers, has proven effective in expanding NCD care [13]. Training community health workers for blood pressure checks or diabetes counseling is one example. Digital health tools like telemedicine and mHealth apps are also improving access in remote areas [14]. These innovations enhance health literacy, self-management, and continuity of care.

The COVID-19 pandemic disrupted health systems but highlighted the need for resilient PHC that can maintain essential services during crises [15]. Lessons learned, such as improved surveillance and decentralized care, are now strengthening NCD services. Delivering NCD care through PHC involves complex institutional, political, social, and economic factors. Instead of copying high-income country models, solutions must be tailored to local contexts. This study explores the challenges and opportunities in PHC-based NCD care to support a practical, context-sensitive response to chronic illness today.

Methodology

To explore the challenges and opportunities in delivering NCD services through PHC systems, this study adopted a qualitative research design. Given the complexity of the healthcare landscape and the exploratory nature of the inquiry, a qualitative approach was deemed most appropriate. The research was conducted in a region experiencing a rapidly rising NCD burden alongside relatively under-resourced PHC infrastructure. This setting was deliberately selected for its demographic and geographic diversity, aiming to capture systemic issues within a rich contextual backdrop.

Data collection involved 30 activities across three participant groups. These included 10 in-depth interviews (IDIs) with frontline healthcare providers—such as general practitioners, nurses, and community health workers. These participants were selected based on their direct involvement in NCD care delivery. 10 key informant interviews (KIIs) were conducted with facility-level health managers, policymakers, and senior service providers responsible for overseeing PHC operations and NCD program implementation. Participants were recruited through purposive and snowball sampling techniques to ensure depth and breadth of expertise. 10 focus group discussions (FGDs) were organized with community members, including patients with chronic conditions, caregivers, and local opinion leaders. Each FGD comprised 6–8 participants and was designed to capture collective insights on access, acceptability, and perceived quality of NCD services at the community level.

Participants were approached through local health facilities, NGOs, and community networks. Written informed consent was obtained from all participants.

All interviews and focus group discussions were conducted using semi-structured guides, developed in alignment with the study objectives and pilot-tested for contextual appropriateness. Topics explored included awareness and perceptions of NCD services, systemic barriers to access, service quality, workforce capacity, and the role of community engagement. Data collection took place over a period of three months, and all sessions were conducted in the local language by trained facilitators with experience in qualitative research.

Each interview and FGD was audio-recorded with participant consent and transcribed verbatim. Where necessary, transcripts were translated into English for analysis. Field notes and memos were also maintained to capture non-verbal cues, contextual factors, and immediate reflections post-interview.

A thematic analysis was undertaken to identify, analyze, and interpret recurring patterns and meanings within the data. The analysis was guided by the Health System Dynamics Framework, which provided a structured lens to explore the interconnected components of the health system, including governance, financing, human resources, service delivery, and community interface.

Transcripts were coded using a combination of deductive categories derived from the framework and inductive themes that emerged from the data. Coding was conducted manually and with the aid of qualitative data analysis software (e.g., NVivo), allowing for systematic organization and comparison of data across participant groups.

Results

The study was conducted at a single site where NCD burden and health system limitations were particularly evident. Data were gathered through 30 qualitative sessions, including 10 in-depth interviews (IDIs) with healthcare providers, 10 key informant interviews (KIIs) with health managers and senior staff, and 10 focus group discussions (FGDs) with community members, patients, and caregivers.

Participants represented a wide range of perspectives across the local PHC ecosystem, enabling a rich and layered understanding of the factors affecting the delivery of NCD services in this context.

Table 1. Data Collection Activities

Method	**Sessions Conducted**	**Participant Type**
In-depth Interviews (IDIs)	10	Community and facility healthcare providers
Key Informant Interviews	10	Health managers, NGO workers, senior staff
Focus Group Discussions	10	Patients, caregivers, and community members
Total Sessions	**30**	—

Focus group participants (n = 82) included a mix of genders, ages, educational levels, and NCD conditions. A considerable number reported living with multiple chronic conditions, and many shared insights based on years of interacting with the local health system.

Table 2. Demographic Characteristics of FGD Participants (n = 82)

Characteristic	**n**	**% / Mean ± SD**
Age (years, mean ± SD)	—	50 ± 9
Male	38	46%
Female	44	54%
No formal education	28	34%
Completed primary (grades 1–5)	24	29%
Completed secondary (6–10)	25	31%
Married	59	72%
Living with multiple NCDs	48	59%

Participants consistently highlighted structural weaknesses and operational gaps in NCD care at the PHC level. The use of standardized treatment guidelines was rare. Providers often relied on personal experience or outdated protocols, especially in the management of conditions like cardiovascular disease and asthma. Unlicensed practitioners and unregulated private clinics were heavily involved in care provision, often operating without adherence to any guidelines. Health records were maintained manually, and patients frequently misplaced them. This disrupted follow-up and compromised long-term management. Basic diagnostic tools such as glucometers and ECGs were missing from most facilities. Stock-outs of essential NCD drugs were frequently reported. There was no functional system for referring patients from PHC to secondary or tertiary care. Patients often self-referred, with no communication between providers. Facilities operated with fewer staff than required. Most had not received specific training in NCD prevention, counseling, or lifestyle management.

Table 3. Professional Background of IDI and KII Participants

Role	**Count (n = 20)**
Community Healthcare Providers	6
Health Assistants	3
Facility Medical Officers	4
Program Managers/NGO Workers	5
Traditional/Informal Providers	2

Although significant gaps exist, several positive elements were also identified. National-level guidelines and policy documents focusing on NCD management were available and recognized by some facility leaders. The health center network and outreach staff—though stretched—represented a base from which to expand services. Demand for chronic disease services had grown. Community members were more proactive in seeking care than in previous years, especially for diabetes and hypertension.

The findings were organized using the Health System Dynamics Framework. The table below summarizes the core issues raised across thematic domains.

Table 4. Summary of Health System Challenges and Opportunities in Delivering NCD Services at the PHC Level

Domain	Challenges Identified	Opportunities Observed
Clinical Practice	Guidelines not implemented; provider reliance on habit	Existing national guidelines could be adopted with training
Human Resources	Inadequate staffing; limited NCD-specific knowledge	Frontline workers open to training and task-sharing
Supplies & Diagnostics	Frequent stock-outs; lack of equipment	Essential lists available; interest in strengthening procurement
Health Information Systems	Manual records lost or incomplete	Potential to trial low-cost digital tools
Referral Systems	Patients self-refer; no structured follow-up	Policy support exists for integrated referral models
Regulation & Oversight	Private clinics and informal providers operate unregulated	Growing consensus on need for coordination
Community Engagement	Low prevention literacy; treatment delays	Visible increase in awareness and willingness to seek care

This section highlights a dual narrative: one of persistent health system fragility and one of untapped potential. While infrastructural and operational issues are evident across domains, the presence of policy instruments, motivated frontline workers, and a receptive public suggest a meaningful pathway to reform if adequately supported.

Discussion

This study set out to understand how NCD services are organized and delivered at the PHC level within a single urban–rural setting. What emerged was a complex but familiar story, one that resonates with findings from other LMICs, where NCD burdens are rising faster than health systems can adapt.

One of the most consistent themes in this study was the absence of standardized clinical protocols at the facility level. Many providers were found to rely on habit or informal training, especially for managing conditions beyond diabetes and hypertension. This mirrors findings from a study in Uganda, where frontline staff lacked both up-to-date guidelines and confidence in managing NCDs, despite policy-level commitments [16]. Similarly, a qualitative study in Nepal found that primary care physicians often treated NCDs using a mix of anecdotal knowledge and outdated norms, largely due to the unavailability of national treatment protocols at the clinic level [17].

The shortage of trained personnel was another major theme. Participants described stretched staffing, especially in roles that support preventive care, counseling, and health education, elements crucial to long-term NCD control. A study from Kenya noted nearly identical concerns: health workers were overwhelmed with general duties, leaving little time or capacity to focus on NCD management, especially in areas requiring continuity of care and lifestyle guidance [18]. This echoes findings from Ghana, where nurses and mid-level providers expressed willingness to engage in NCD care but lacked training and formal task delegation frameworks [19].

Perhaps more alarmingly, the health information system was almost entirely paper-based, resulting in poor continuity of care. Patients often lost their records, and providers had no systematic way to track follow-up. This scenario is not unique. A study in Sri Lanka reported similar breakdowns in recordkeeping, where lack of electronic medical records led to fragmented care, particularly for chronic diseases that require long-term tracking [20]. In that setting, even low-cost innovations like mobile-based registries had shown promise but had not been scaled.

Another theme that strongly surfaced was the absence of a functional referral system. Patients were left to navigate the system on their own, choosing when and where to seek specialized care, often without any clinical guidance. This is consistent with findings from India, where a study on rural

PHC facilities revealed that referral protocols were rarely followed, and often not understood, by frontline staff [21]. In both contexts, the lack of referral structure led to overcrowding at tertiary hospitals and missed opportunities for early intervention.

Yet, it would be inaccurate to paint only a bleak picture. As in other LMICs, policy frameworks and public demand emerged as bright spots. Several participants acknowledged that national guidelines and action plans for NCDs had been developed, though they remained underutilized. The mere presence of such frameworks is significant; it provides a springboard for targeted training, procurement planning, and performance monitoring. Encouragingly, the increased awareness and demand for NCD care among community members, as found in this study, reflects a broader regional shift. People are now seeking care for high blood pressure, diabetes, and asthma far more proactively than a decade ago. A study from Pakistan similarly observed this trend, with patients beginning to engage with PHC services earlier and more frequently for chronic conditions [22].

What differentiates this study is the depth of grassroots insight gathered from not only healthcare providers and managers but also from the people most affected, patients and caregivers. It makes the case that while structural reforms are essential, implementation hinges on locally grounded solutions. No single strategy will work unless it is informed by those operating in and receiving care from the system.

Ultimately, the findings reinforce a clear message: primary healthcare must evolve to meet the demands of a changing disease landscape. This transformation will not be linear, nor fast. But as our study and others have shown, the building blocks are present, what's needed is the political will, community involvement, and sustained investment to pull them together.

Conclusion

This study sheds light on the everyday realities of delivering non-communicable disease services through primary healthcare in a resource-constrained setting. While the gaps, such as weak clinical protocols, staff shortages, and poor referral systems, are undeniably serious, they are not insurmountable. What stands out just as clearly is the presence of meaningful foundations: policy frameworks, motivated health workers, and a growing public awareness of chronic health conditions. The path forward doesn't require reinventing the system, it requires listening more closely to those working within it and those depending on it. With sustained investment, targeted training, and a stronger link between policy and practice, primary healthcare can truly become the first and strongest line of defense against NCDs.

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Permission

Ethical approval obtained

Conflict of Interest

None

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