

Walk the Talk: A Program Model of Community-Oriented Primary Health Care

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ABSTRACT

While there is a dearth of value-based primary care services in low- and middle-income countries, primary care has been demonstrated to be associated with enhanced access to health services and better health outcomes. The demonstrated barriers to high-quality primary care are under-resourcing, inadequate payment models, lack of community linkages, limited scope and comprehensiveness, limited integration with other components of the health system, and unexciting/unattractive conditions for physicians.

Based on global data, we propose a transformative community-oriented primary care program model with a network of ambulatory, virtual, and comprehensive community services. Community-oriented primary care is medical practice that undertakes responsibility for the health of a defined population. Key components of this medical service program are 1. Community health workers (CHWs) responsible for specific populations, with expanded portfolios to provide communicable and noncommunicable disease home health care, health education, and disease registry maintenance; 2. A 24/7 virtual care service to back up and supplement CHW activities; 3. A primary care ambulatory service facility with major paraprofessional-specialist conduct of routine processes and record-keeping utilizing algorithmic guidelines; 4. Multiple point-of-care diagnostic capacities and immediate tele-consults for both ambulatory facility and CHW services; 5. A customized interoperable electronic medical record system, focused on patient care functionalities such as charting and decision-support; 6. Wireless broadband connections for all program workers; and 7. Sustainable economics with revenue from locally determined subscription systems, sliding scale fees for services from ambulatory care facilities, limited CHW service fees, core per capita government support, research projects, and philanthropy.

Keywords

Primary care, Community-oriented care, Virtual care, Health paraprofessionals, Clinical practice guidelines.

Introduction

“Imagination at scale is our only recourse [1].”

“The right measure for successful health care isn’t about the maximum possible for a few, but the average for everyone...and the minimum opportunities available to even those with the fewest resources and privileges [2].”

There is a dearth of value-based primary care services in low- and middle-income countries providing accessible and adequate quality of care to improve health outcomes. Even in the United States, primary health care is dying; 20-40% of Americans do not have a primary care provider [3-8]. Primary health care, defined as essential ambulatory or first-level personal health care, has been demonstrated to be associated with enhanced access to health services, better health outcomes, and decreases in hospitalizations and use of emergency services [3,9-12]. Significantly, the 2021 American National Academy of Medicine Consensus Report notes that primary care is the *only* health system component or function that has been shown to produce better population health and health equity [3]. The WHO goal of reducing mortality from

noncommunicable diseases in low- and middle-income countries by one- third by 2030 is dependent on increasing accessibility to high-quality primary care [13].

In the United States, the response to the Covid pandemic has demonstrated and highlighted several primary care issues beyond inadequate investment [7]:

- Widespread lack of access to medical care
- Overdependence on doctors
- Overdependence on clinics and hospitals
- Inadequate systems for chronic care and prevention
- Lack of attention to mental health
- Massive disparities in healthcare

In summary, globally there is a critical need for the development of community-oriented primary health care service models with greater interaction between clinical medicine activities and those of public health to provide significantly higher-quality care. The creation of successful models anywhere would be a win-win for patients and for *economies* internationally [14-20]. We propose here a sustainable, accessible and patient-outcome oriented model that walks the talk, that is, that specifies a total package grounded in what experts have been saying and reports have recommended (notably the just published American National Academy of Medicine Consensus Report) and which addresses dysfunctionality exposed by the Covid response as well as the information technology developer-user disconnect [3,7,14,17,20-27].

Barriers To and Facilitators of Quality Primary Care

Barriers to high-quality primary care have been clearly described [3,28,29]:

- Lack of community networks, integration, and linkages.
- Limited scope and comprehensiveness of primary care
- Inadequate business and payment models in the face of demonstrated value and under-resourcing generally.
- Unexciting/unattractive conditions for physicians.

Similarly, facilitators of high-quality primary care are well recognized [3,18,19,24,27-31]:

- User-friendly digital information technology systems
- Quality assessment of diagnostic pathways and treatment guidelines using metrics for efficacy, safety, efficiency, timeliness, patient-centeredness, and equity.
- Accountability and quality evaluation of staff

The broad characteristics of in-place health systems and their primary care components compared to those of a more evidence-driven model have also been highlighted (Table 1) [32].

Table 1: Primary health care models compared [Modified from 32].

	Current Model	Community-Oriented Model
Health care posture	Reactive	Proactive
Activities design	Fixed	Flexible, responsive

Activity centers	Clinics, hospitals	Home, community, clinic, hospital
Focus of care	Communicable disease, maternal and child care	Public health, communicable and noncommunicable disease, care over the lifespan
Accountability	Limited, top-down, efficiency- and cost-oriented	Community, value-care oriented with staff ownership consequent to continuing participation in model and plans
Governance	Dysfunctional organization and incentivization with inadequate training and equipping	Guidelines defining routine processes, ongoing major training, complete point-of-care equipping, explicit values education, strong leadership
Community Action	Limited input	Attention to community issues central to successful care

An Evidence Based Transformative Model

The foregoing literature summary and the lessons from the pandemic elucidate the three pillars of a model integrated, patient-centered, community-oriented primary care program. First and most critically, population-covering community health workers (CHWs) with major portfolios; second, virtual acute and facilitating services; and third, ambulatory care facility services with major paraprofessional-specialist conduct of routine guideline-defined processes. Additionally, two information technology capacities are essential for program workers: an electronic medical record (EMR), and wireless broadband access. Finally, multi-source financing is crucial for sustainability.

Pillar one: Community health workers

Better health begins in people's homes, which is where the major emphasis in care needs to be placed (Table 1) [3,7,20,32]. This process can be implemented by CHWs who we specifically recommend are individually:

- Given responsibility for approximately 250 households
- Trained, certified and given ongoing medical education to provide: 1. Care for acute communicable diseases and common noncommunicable diseases following diagnosis and treatment guidelines; 2. Health education; 3. Registration of residents into community health system registries of hypertensive, diabetic, asthmatic and palliative care patients.
- Equipped with a cell phone, tablet computer, scale, tape measure, blood pressure monitor, contact-free thermometer, oximeter, respiratory peak-flow meter, stethoscope, glucometer, oral rehydration salts, and albuterol inhaler.
- Provided linkages to community resources addressing poverty, undernutrition, compromised home facilities for hygiene and shelter, and insufficient financial income [33].
- Linked to a network of virtual and ambulatory care services.
- Able to access and provide input into a community health system EMR through wireless broadband connections.

It is notable that an ambulatory care facility, and not the home or community, is the usual starting and major component of primary care provision discussions, where it has long been expected that qualified health professionals can deliver effective and safe interventions. Well-trained, equipped, and connected CHWs shift

the location of care, a shift crucial to the provision of high-quality care.

Some clarity about quality-of-care metrics is appropriate [27]. The common emphasis on efficacy and intervention safety should not be ignored, but other critical metrics are less discussed and from population health perspectives, are worthy of attention: efficiency, patient-centeredness, timeliness, and equity. Centering primary care on the patient's home, making it the most important site for primary care, significantly increases the opportunities to better address all of these metrics, as well as the first two more common ones. Consider the problem of hypertension.

Hypertension now affects one-third of global adults; 1 billion of those affected are residents in low- and middle-income countries (LMICs) [34]. Hypertension is the leading cause of premature death and disability worldwide, and it is well-documented that blood pressure control can result in major levels of reduction of cardiovascular disease events [35,36]. Globally, most patients needing medical-behavioral care for hypertension lack access to comprehensively trained clinicians, be they physician or paraprofessional. Scalable health-system and public health-grounded approaches are limited; notably, a key part of recently reported interventions has been CHWs [37,38].

Pillar two: Virtual care

In high-income countries the Covid pandemic has revealed that quality virtual care for many health problems is feasible to a degree greater than had previously been believed [7]. Across low- and middle-income countries, majorities of residents do not have personal computers, so the richer levels of tele-health care increasingly being offered in high-income countries are not immediately practicable. Cell phone availability is, however, stunningly widespread. Thus, in low-and middle-income countries providing cell phone users limited health services on an unscheduled basis is highly feasible. More substantive care through CHWs backed up by ambulatory care facility health professionals is also practical and possible [25,39].

We suggest that virtual care system goals and operations should be:

- CHW staffing 24/7.
- CHW interviewing and record-keeping guided by EMR templates
- A Virtual CHW consulting medical assistant consulting medical officer/physician case management sequence
- CHW call assistance for emergency/urgent care using evidence-based guidelines

Pillar three: Ambulatory care facility services

A core pillar of a transformative primary health care system model is a re-organized ambulatory service system. Cardinal features of such facilities have been well-described and thus we suggest:

- High (estimate 7:1) paraprofessional to physician staff ratio, with all staff salaried. Routinized medical processes and record-keeping achieved by breaking medical interactions and services into component tasks undertaken by paraprofessional specialists leading to major improvements in efficiency [19,22,25]. The goal is guidelines for paraprofessional routine care with exception management by physicians/medical officers. Such systems mirror the successful program developed in the department of Family Medicine at the University of Colorado: health record technicians and medical assistants gather and record visit data in a structured process that is followed by medical officer/physician review, the review itself recorded by a medical assistant [39,40,41]. Key to the success of this model system is intense and ongoing training.

- Increased use of point-of-care diagnostic tools: Oximetry, spirometry, EKG, ultrasound for breast, gynecologic, and abdominal organ imaging; on-site blood tests for complete blood count, basic biochemistry studies, and urinalysis; and radiologic imaging of chest X-ray, and bone views [19,42-45].
- Maximal use of diagnostic pathway and treatment guidelines [19,21,25,39,42,46].
- Immediate specialty tele-consults.

Networking the Pillars: A Customized Refined EMR

Electronic medical record (EMR) use is clearly associated with improved quality of care, better health outcomes, and increased efficiency of care, reduced errors, and decreased utilization of health services [47]. We cannot seriously talk about sustainable high-quality primary health care without electronic medical records. Well-functioning EMR systems are the critical glue for integration and comprehensiveness of medical care. Commercially available EMRs come with significant direct and indirect financial burdens associated with their implementation [48]. Additionally, the majority of commercially available EMR systems are significantly complicated, difficult to use, and impractical. They are also often user-unfriendly, un navigable, and inflexible. EMRs are rarely interoperable across institutions, not structured for clinically useful record searches, and overloaded with add-on features of limited value. Finally, most EMR systems are grounded in billing and compliance functionalities, e.g., coding and insurance data, as well as scheduling [41,48]. There is a clear need for more refined EMRs centered on patient care information and focused on clinical outcomes (Table 2) [3,19,41].

A major source of the discontent and limited success in EMR use has been a user-developer disconnect. Bridging this requires: 1. Careful exploration of diverse users' need with repeated exercises of hypothetical user activities, rather than outsider-developer defined functionalities and systems. 2. Multidisciplinary team activity in system creation; 3. Care process redesign in parallel with EMR construction; and 4. Experimentation in the creation process [24]. These issues need to direct EMR refinement/customized tools in each particular setting (Table 2).

Table 2: Dominant functionality areas for a patient-care- information-centered-interoperable EMR.

Major diagnoses and health problems; patient goals; functional status; and social determinants including poverty, remote homesite, and compromised sources of food, shelter, hygiene and regular family income.
Visit records using specific history and physical examination templates. Examples are available for hypertension, asthma, diabetes, COPD, heart disease, breast problems, breathing problems, gynecological problems, diarrhea, abdominal pain, acute fever/chills, headache/pain, BMI<18, BMI>25, stroke, tobacco smoking, betel-nut chewing, palliative care, general unspecified problem, trauma emergency management(49).
Alerts and links for clinical finding or problem and diagnosis decision-support
Intra-record facilitated test ordering
Laboratory testing and image reports
Extra-systemic health records

As discussed above, the key to successful EMR implementation is having paraprofessionals record the preponderance of EMR information, along with intense and ongoing training [19,40,41].

Wireless Broadband Capacity

Meeting metrics of efficiency, timeliness, patient centered care, and equity requires rapid, reliable, and universal staff access to the EMR, to diagnostic guidelines and pathways, and to the internet, which is to say access to wireless broadband. Notably, the primary component of a community-oriented primary care program—the services of CHWs—absolutely requires such wireless access.

Revenue and Payment

Revenues from both formal, open costs and informal, but required, fees for primary care can never by themselves be adequate to cover service expenses, yet this is the dominant current model globally. These circumstances explain why the primary care component of health services is struggling and often of poor quality. Insurance programs in many LMICs are limited and, when present, often with limiting caps that do not protect patients and families from the expenses associated with major illness [20]. The common mechanism for keeping primary care services afloat financially is cross-subsidization from overpriced diagnostic testing and associated hospitalization and surgical services. As Christensen has suggested, significant business model disruption is needed. We propose that systems seek to expand their revenue-generating sources, seeking income in the following ways [22].

- **Subscription systems for ambulatory facility services** Such systems can both attract patients and provide steady income streams. With service price reductions, including costs of maximized point-of-care testing, such systems can increase quality of care as well as efficiency with features also perceived as consumer friendly. We have been experimenting with our own low-cost family subscriber system and these features have allowed us to attract increased numbers of Amader Gram subscribers.
- **Federal line-item annual support** Often, there is interest from federal governments in having “experiments” in primary care systems that promise to be successful and scalable and that are politically beneficial. A well-described and planned system can attract core federal support, perhaps on a per capita served

basis, support that can potentially grow with demonstrated program stability.

- **Fees for service** Fees can be charged for ambulatory and emergency visits, and for diagnostic testing of nonsubscribers. Basic visit rates should be on sliding income scales and vary depending on point-of-care diagnostic services such as oximetry, spirometry, EKG, and ultrasound tests that can be revenue-generating even at less than community market rates.
- **Fee-for-service CHW visits** CHWs should be salaried employees for at least half of their work incomes, but it is reasonable to try and develop an earnings model for these workers that includes defined and transparent fixed fees for home care.
- **Special consultant and other services** Fees can be generated from contracts with regional businesses; office space leased for consultants; and fees from ambulance and transportation services.
- **Funding for research projects** Transformative primary care systems should be “clinical laboratories” for investigations of the health impacts of climate change and of social determinants of health, as well as comparisons of public health approaches to major common noncommunicable diseases [33].
- **Philanthropy** International supporters are a source of funding in the interest of fostering local economic development, social stability and limiting pressures for migration [14].

Implementation Challenges

The elements of the model proposed here, indeed of any health system, rely on integration for effectiveness and efficiency. CHWs require professional supervision and expert facilities for referrals; the ambulatory care system, indeed the entire system, requires a sustainable reimbursement scheme; and effective care requires an easily accessible and universally implemented EMR. Whereas a region with limited health services currently in place and substantial funding and cooperation and coordination of the controlling political, legal, financial, and health institutions could most easily implement the entire system, such circumstances are rare. In many, perhaps most situations globally, the extent of changes envisioned in the proposed model is overwhelming. Furthermore, international funding often targets a specific problem, such as gender inequity or increasing telehealth use, providing support for just one component of the model suggested here.

So how can such a model be successfully implemented? The answer, we suggest, is to start by trying to implement the individual elements that require the least effort - the low-lying fruit - but allow for interoperability. For example, build on public health community outreach programs that utilize volunteer women. Starting small taps into two more sources of effectiveness and efficiency that benefit from systematic implementation. One is the development of local models reflecting a bottom-up flow of information that is responsive to the medical needs and cultural milieu of a community as well providing the flexibility to address changing health challenges. The other is the encouragement of experimentation to provide demonstrations of success for others to follow.

Implementation and assessment of individual components must also include all stakeholders for practicable programs that address real needs with community acceptance. These stakeholders include patients, providers (including paraprofessional workers), payors (including local subscription services), and policy makers.

Discussion

Globally, we desperately need to “walk the talk”, and transform our primary health care systems. The Covid pandemic experience, and the timely American National Academy of Medicine report provide together excellent summaries of ideas for addressing this critical issue. [3,6,7]. The necessary components of high-quality primary health care systems have been repeatedly defined. These include employment of CHWs and significantly greater use of clinical ambulatory-care paraprofessional workers; use of broadband wireless communication; point-of-care diagnostics in ambulatory care; basic clinical EMRs that focus on critical functionalities; virtual care services including tele-health consultations; and multi-source sustained financing through subscriptions, service fees, government, research, and philanthropic sources.

Implementation of transformation in our local primary care systems does require top-down coordination, especially the mix of financing resources and the development of paraprofessional roles. This can come about through adopting a public health framework with an emphasis on value healthcare. Primary care is more than the initial contact of a patient with a clinician; it is the nexus of the health care system with the community. What is required is the will to marshal local community, government, and institutional resources to take bold reform steps

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