

# People Centred Healthcare Service Delivery - By People for People

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## Abstract

Primary healthcare is the one of the most efficient and cost-effective way to organize health systems. However, delivery of primary healthcare is a challenge for a number of countries as they have low resource setup and high population count. To address this challenge, various health policies & programs, including IT solutions have been devised and deployed. Ways to empower and mobilize Community Health Workers (CHWs) have proven to be beneficial as they address issues specific to the community that leads to effective implementation of care plans. However, as research suggests, numerous programs have failed in the past because of unrealistic expectations, poor planning and an underestimation of the effort and inputs required to make it work. This paper analyses user centric methods of catalysing CHWs in primary care delivery and reflects on a framework that constitutes higher retribution & enablement of the community health worker.

**KEYWORDS:** community health worker, primary care, healthcare delivery, triaging, health continuum, care network, IT, service delivery

## Introduction

Primary healthcare in emerging markets is being constantly deployed and tested for its efficacy and policy makers are working on new strategies to provide healthcare access to people, utilizing effectively limited resources. Community Health Workers (CHW) aid these strategies by extending care services outside the premises of a primary healthcare centre and increase the reach of healthcare. Many examples exist across different countries where CHWs have been trained and used for healthcare delivery, screening and referrals, educating communities on hygiene, mother and child care, family planning, disease management and population data gathering. Yet these programs have either not yielded desired results or has been abruptly concluded due to lack of visible benefits. This paper discusses in details the challenges faced

by primary healthcare in emerging markets and analyses how service innovation in Information and Communication Technology (ICT) can equip and increase the probability of success of a CHW program. The result of which will help to create and propagate 'one network of care'.

## Methodology

Donald A. Norman in his book 'The Hidden Computer', has aptly stated that "the computer industry thinks it is still in its rebellious teenage years, exulting in technical complexity. Customers want change." The best way to probe into this matter would be to start the process all over again. This time with a bottoms-up approach, beginning with the users' perspective and then weaving in technology for a complete design fabric. This would help develop creative solutions in integrated product and service solutions directed towards improvement in quality of life; by addressing inherent problems within healthcare, environment, learning and information dissemination, communication and connectivity, and personal security. All these dealt under the joint umbrella of business, technology and design. Service design will be the key enabler as an approach to make this happen.

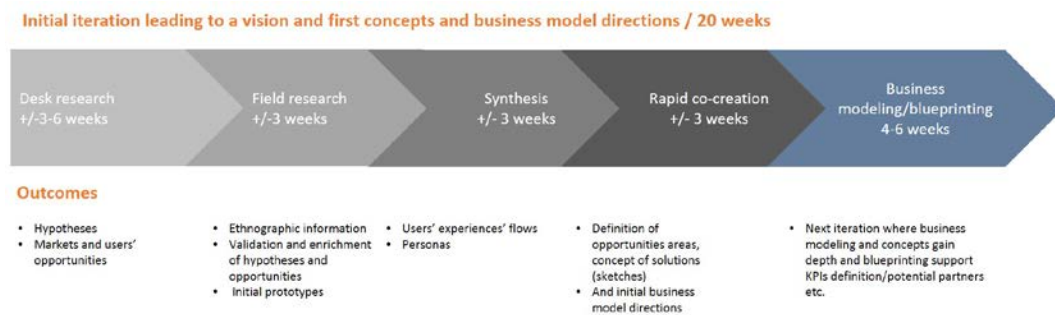
For our study, an intensive desk research was conducted to familiarize with the domain of healthcare and its existence in emerging markets. Post preliminary desk research, visits were made to various health centres in cities of India (Delhi, Bangalore, Kolkata, and Ghaziabad), Brazil (Sao Paulo) Kenya (Nairobi). During these visits, several interactions with stakeholders helped us to understand their perspective and also observe beyond the dialogue. Different levels of care settings were visited which includes - standalone clinics operated by private practitioners, government run primary care clinics and district level hospitals offering secondary care.

The approach to the research was two-folded. The research in India was a top-down approach to understand key stakeholder needs through confrontation of envisioned scenarios. Here they were also interviewed on their vision for primary care and the current challenges faced. However in Kenya and Brazil, we had a bottom-up approach, where we applied qualitative research techniques of shadowing along with interviews. These helped us gather relevant insights for us to construct a detailed 'current workflow', understand personas and identify their tasks, pain points, needs (latent and tacit) and motivations.

The insights from the studies were then synthesized through a number of contextualization and co-creation sessions, where workflows and experience were mapped on a time line representing the patient flow (patient registration, consultation, reports, follow up etc.). After this map was detailed, pain points and hurdles of each of the phases were mapped onto the flow, along with the needs, opportunities and challenges. These were later checked for consistency, relevance and applicability across the primary care workflow.

These identified needs and opportunities are addressed and ideated upon to generate new service blueprints. Giving way to innovative business models and new models of service delivery. Further, these are broken down into set of detailed Information Technology (IT) solution requirements to create a minimum viable product (MVP) for these care contexts. These are shared with development teams as user stories and scenarios for further development and pilot tests that are currently in progress.

To outline our methodological approach, the following are a few examples and artifacts from each stage that are particular to the research objective:



**Figure 1: Overview of methodological approach**

## 1. Desk Research

As a first step, we used materials that were available with us to plan how we want to define the scope of our study such that we achieve our goals effectively.

### A. Framing the assignment

It was important to frame our project within the perspective of the health care system in place. Usually the business units decide the business potential of a region, therefore we proceed to underpin information to frame our project such as the health care system in place. Questions to be answered were - How active and effective are the public and private health care systems? What are its main ambitions and bottlenecks of either sector? What are the main health problems facing the population? What are the main differences between private and public health care or rural, urban and peri-urban ones? What are new private or public initiatives happening and what is the network of care delivery?

## 2. Field Research

We then were ready to visit the fields and capture the necessary information as below.

### A. Define users, locations main experience pathways and known bottlenecks

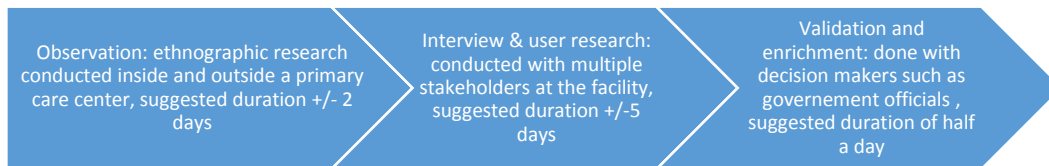
Since we were learning about primary care, it was important to define the main users involved in the care experience, such as clinical providers, care givers, community health workers etc. Also include our ultimate customer (who will buy our solution) with the goal to understand the sector or organization's strategy and challenges. Last but not least, include the locations of the experience such as home and primary care unit, lab and/or pharmacy among others.



**Figure 2: Sample stakeholder mapping for Primary Care in rural setup**

## B. Define (suggestive) methods, duration and locations

### Seek



**Figure 3: Sample structure of timeline and locations**

## 3. In-field hands on research

After the framework for research was set, we were ready to immerse in the context.

### A. Develop ethnographic understanding of the context



**Figure 4: Photos of primary care setups in India and Kenya (left to right)**

### B. Identify, recruit your population and plan the activities

Once we had arrived at the primary care unit, we shared with the facility manager our plan. They usually have good suggestions on how to approach the personnel and who are the best suited people for our conversation.

### C. Deploy research activities

Usually activities planned in emerging economies require some flexibility. It is important to be flexible and to have a plan B and C. When things are not happening the way you expected and you are not provided with options, it is best to talk to a manager of the unit or government official to find alternative options. People in emerging markets tend to be highly servicing and adapting



**Figure 5: Research activities: co-create session and observational study (left to right)**

D. Use probes or any material to get insights

We used shadowing, interviewing, validating concepts and ideas and probed with initial prototypes, examples from other regions. The purpose was to collect richness and good insights in a short time.



**Figure 6: Probes used during the study with participants**

**4. Synthesis of data collected**

After research all the data was processed into insights and further synthesized into formats that would support further discussion and present the users in their context.

A. Creating customer journey/experience flow per context: uncover gaps and opportunities



**Figure 7: Care journey and subsequent challenges across phases: symptoms to treatment**

B. Creating Personas: needs and aspirations of representative stakeholder groups





**Figure 8: Sample personas for key regions; touching upon their values, motivations and challenges**

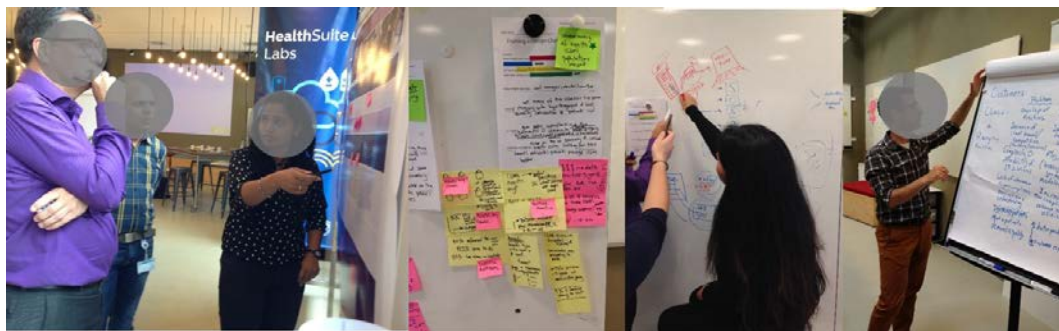
## 5. Co-creation workshop

We used 3 days in a co-create workshop to further synthesize, assimilate data from various regions, along with participants to devise a business model that was meaningful.

Day 1 -**Discover** insights & **frame** opportunity areas.

Day 2 - **Ideate**/Sketch/**build** & Select

Day 3 - Business modelling, blueprinting, next steps



**Figure 9: Workshop in progress**

## 6. Post workshop

One of the most important thing is to understand what is presented to the user and what is not (visibility line and backstage). The visibility line are the touch point that are seen by the user(s), and the backstage is what is not presented to the user(s) but are actions required.

Blueprinting allows to analysis the benefits per touch point and to define improvements. For instance, we know that there is a lot of waiting time for patients once they are at the primary care unit prior to be seen by the doctor. If we design a solution that reduces waiting time this is an improvement that can be captured in potential new KPIs, which ultimately help us to build our business case. Therefore, by touch-point we can define improvements (potential KPIs) and partners (backstage) among others.

| User scenario     |  |  |  |   |   |   |   |
|-------------------|--|--|--|---|---|---|---|
| Description       | Easy, early and accurate diagnosis at home Of blood pressure (BP) measurement of "at risk population" conducted by the community agent | Pro-active and early diagnosis done by Philips' coach who identifies high BP cases to bring forward to the weekly meeting. | Identification of cases and planning at the weekly meeting, as a team. The G.P. orders an appointment for the high BP cases, which is done by community agent. | Easy scheduling from home A SMS alert will remind her 36 hours prior to the appointment.                        | Targeted plan for successful management via the Philips coach and program Maria will get a plan to gradually make changes according to her preferences. | Learning and managing the condition at the kiosk, where she can also get a refill of her prescription and get a new patch + phone support from the coach and her peers. | Effective and continuous management Maria reached her initial milestones, and feels proud of herself. |
| Components        |  |  |  |   |   |   |   |
| Visibility line   | Visible to the end-user and comm. Health worker  | not visible  | Visible to the community UBS users   | Visible to the community health worker  | Visible to clinical, comm. health w. and end-user   | Visible to end-user and coach   | Visible to all users  |
| Value proposition | Proactive, easy and efficient diagnosis of hypertension for accurate sizing of cases.  |  |  | Optimum allocation and deployment of resources via targeted and personalized plans to ensure treatment outcomes |   |   |   |
| Potential KPIs    | Effectively and efficiently BP measurement of "at risk population" (+50%). Decrease in queues and waiting time (-60%)                  | Higher accuracy in measurements: from 6% of incidence to 100% representative sampling                                      | Early identification of cases (+50%)   | From hypertension spontaneous demand (-50%) to planned and confirmed diagnosis appointments (+70%)              | Increase (+50%) effectiveness in consultation.  | Increase in effectiveness of treatment (+50%)   | Increase in effectiveness of treatment (+50%)   |
| Partners          | Municipalities   | Municipalities   | Municipalities   | Municipalities  | Municipalities  | Municipalities  | Municipalities  |

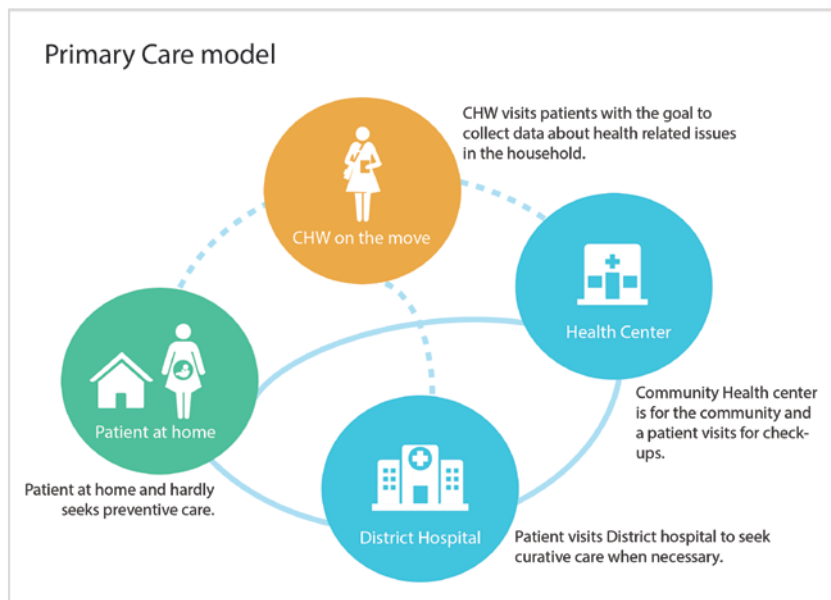
Figure 10: Service Blue-printing a user scenario

## Primary care

*A primary health care approach is the most efficient and cost-effective way to organize a health system. International evidence overwhelmingly demonstrates that health systems oriented towards primary health care produce better outcomes, at lower costs, and with higher user satisfaction. - Dr. Margaret Chan, Director-General of the World Health Organisation (WHO).*

Primary care is healthcare provided by physicians specifically trained for and skilled in comprehensive first contact and continued care for persons with undiagnosed signs, symptoms, or health concerns not limited by problem origin (biological, behavioural, or social), organ system, or diagnosis. Primary care includes health promotion, disease prevention, health maintenance, counselling, patient education, diagnosis and treatment of acute and chronic illnesses in a variety of health care settings (e.g., office, inpatient, critical care, long-term care, home care, day care, etc. Primary care provides patient advocacy in the health care system to accomplish cost-effective care by coordination of health care services (American Academy of Family Physicians (AAFP), 2015).

In many countries, primary care is facilitated by CHWs who act as the first point of contact. The following diagram outlines the current primary care delivery model:



**Figure 11: General primary care roles & delivery**

WHO's vision for primary care is "better health for all". The organisation has identified five key drivers to make this vision a reality, they are:

- reducing exclusion and social disparities in health (universal coverage reforms);
- organizing health services around people's needs and expectations (service delivery reforms);
- integrating health into all sectors (public policy reforms);
- pursuing collaborative models of policy dialogue (leadership reforms); and
- increasing stakeholder participation.

Clearly, the basis of the goal is people centred. It is focused on healthcare needs of individuals within a community. WHO is supporting countries in implementing people-centred and integrated health services by way of developing policy options, reform strategies, evidence-based guidelines and best practices that can be tailored to various country settings. The United Nations (UN) body also recognizes that integrated health services encompasses the management and delivery of quality and safe health services so that people receive end-to-end a complete continuum of health (World Health Organisation (WHO), 2008).

## Current Challenges in Primary Care Delivery

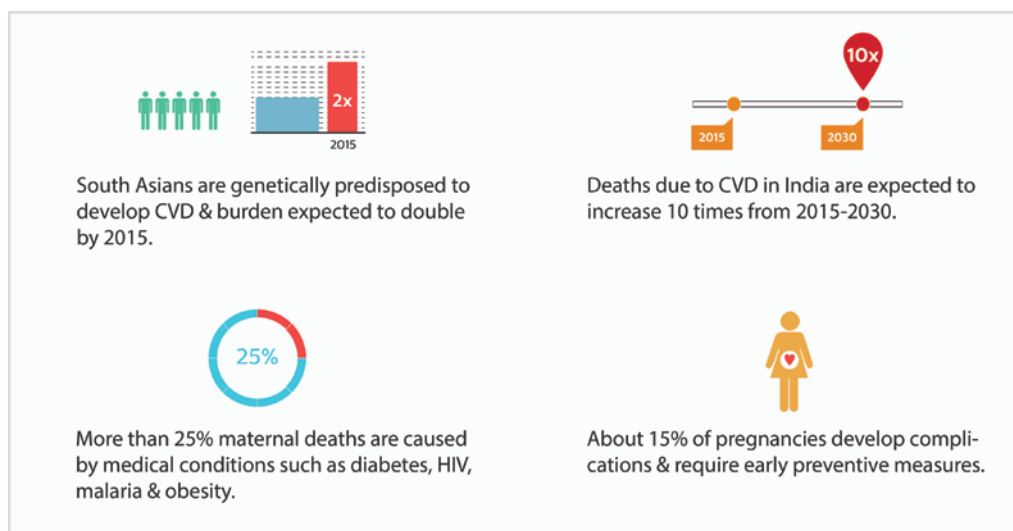
Most emerging markets have similar primary care gaps. In developed countries, the patient's opinion is important i.e. "no decision about me without me". This leads to increased service integration and care closer to patient's home. However, for developing countries, the reality is quite different. Some of these challenges are listed as follows and illustrated in:

- Low GDP expenditure for healthcare
- Healthcare services remain unaffordable for a large section of the population
- Healthcare services are skewed towards urban regions
- Shortage of doctors exists at various levels in the healthcare system
- Insurance coverage is low
- Inaccessibility of healthcare services

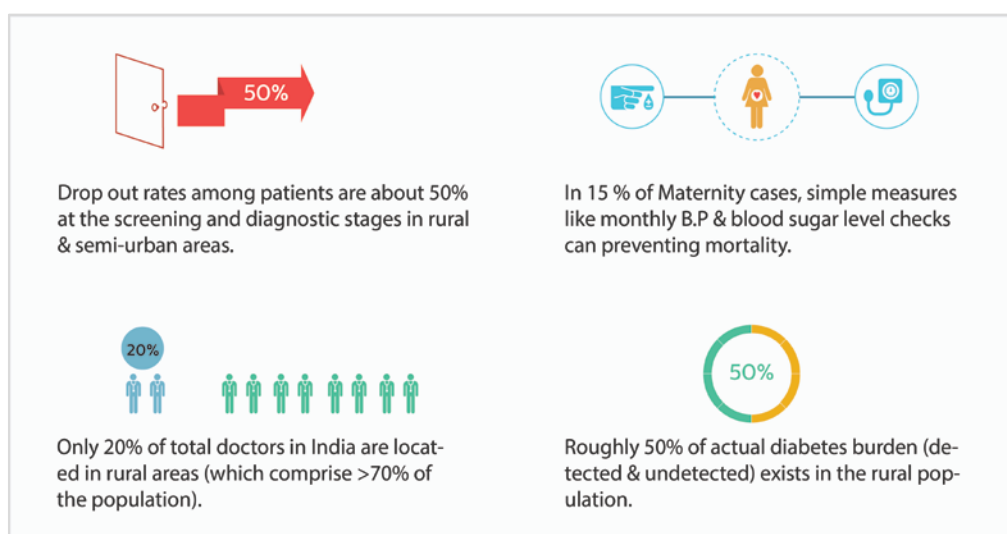


- Primary reasons for shifting preferences towards private sector setups include:
- Low health-seeking behaviour in patients. Focus on Curative health care.
- Lack of adequate healthcare infrastructure & workers.
- Fragmented healthcare delivery.

As illustrated in Figure 2, in emerging markets there is a high occurrence of cardio vascular diseases (CVD) and maternity complications. Similarly, Figure 3, highlights some life-threatening realities about access to care and deficiency in early screening of potential health risks.



**Figure 12: Increasing disease burden in India**



**Figure 13: Current health scenario in India**

## Role of the Community Health Worker

Community Health Workers (CHW), sometimes called Community Health Volunteers (CHV), can be seen as effective extensions of the healthcare systems especially in case of human resource shortages (Strachan, et al., 2015) and inaccessible care in low-income countries and

difficult geographical terrains. CHWs are frontline public health workers who have a close understanding of the community they serve. This trusting relationship enables them to serve as a liaison/link/intermediary between health/social services and the community to facilitate access to services and improve the quality and cultural competence of service delivery.

CHWs function along a continuum ranging from individual and community development to service delivery and promoting community empowerment and social justice. They often help link people to needed health care information and services.

In Kenya and Brazil, CHWs provide additional hands and ears for the physicians and nurses. They are mostly responsible for collecting relevant population data, such as the health and socio-economic status of the community, around the primary care facility and in some cases they refer people to the primary care unit or make an appointment for them.

Successful CHWs know the community well and tend to belong to that particular community. In Brazil, CHWs are paid by the government. In Kenya they can be paid by NGOs or not paid at all. Their personal motivation and dedication towards their community is often reflected in their approach towards fulfilment of their role. As stated by Strachan, et al. (2015) CHWs value feedback and feeling connected to the health system and their community, are motivated by status and community standing, and want to be provided with the necessary tools to perform. (Lehmann, et al, 2007)

The Affordable Care Act (ACA) defines community health worker as “an individual who promotes health or nutrition within the community in which the individual resides.” As per the Act, a CHW promotes health in the following ways:

- By serving as a liaison between communities and healthcare agencies
- By providing guidance and social assistance to community residents
- By enhancing community residents’ ability to communicate effectively with healthcare providers
- By providing culturally and linguistically appropriate health or nutrition education
- By advocating for individual and community health
- By providing referral and follow-up services or otherwise coordinating care
- By proactively identifying and enrolling eligible individuals in federal, state, local, private, or non-profit health and human services programs

## Current implemented programs & their efficacy

The CHW role is not new in the United States or around the world (Andrews, Felton, Wewers, & Heath, 2004; Heath, 1967; Swider, 2002). In the U.S., the use of lay health workers in the community to expand access to healthcare for the poor and ethnic minorities began in the early 1960s (Heath, 1967). Today, community health workers can be found in a wide spectrum of settings, such as community organizations, health departments, churches, schools, clinics, and hospitals. Globally, there is evidence of the successful use of CHWs in developed and developing countries for a variety of chronic conditions, including asthma, diabetes, HIV/AIDS, and hypertension (Cherrington et al., 2008b; Patel & Nowalk, 2010; Postma, Karr, & Kieckhefer, 2009; Rich et al., 2012). Similarly, in the U.S., reports indicate that CHWs were successful in uni-modal roles for a variety of chronic conditions, such as asthma, congestive heart failure, and diabetes, as well as mother-child health and sexually transmitted diseases (Andrews et al., 2004).

However, CHW programs can readily fail without proper design and implementation. Without appropriate structure and support, CHWs can face numerous barriers to the successful execution of their duties. For example, in a study conducted in rural KwaZulu-Natal, South Africa, CHWs reported feeling overwhelmed due to the large number of households for which they were responsible, the lack of needed supplies (including pens, bandages, gloves, etc.), and the lack of support from community health facilitators. Moreover, they were dissatisfied with their low stipends and the lack of support from supervisors while they experienced emotional strain, whether as a result of caring for the sick and dying or from helping the poor. The lack of supplies reflects the financial strains on the health system at large and also illustrates the need for health system strengthening. A variety of issues must be considered for quality program implementation.

Based on an analysis of the literature concerning CHW program evaluations, Hermann et al. (2009) delineated conditions that a CHW program must fulfil in order to be successful in terms of its quality, sustainability, and scalability. The authors note that a program must meet all conditions or risk failure. The first five considerations are basic necessities, and the final three pertain to the program's scalability. The following list is adapted from Hermann et al. (2009).

1. Selection and motivation: CHWs must be members of the community with which they work and must be motivated to help their community.
2. Initial training: Training should include practical knowledge on local diseases and on communication and counselling skills.
3. Simple guidelines and standardized protocols: In order to ensure a baseline of quality in all care provided by CHWs, standardized protocols and tools should be used.
4. Supervision, support, and relationship with the formal health services: In order to ensure quality practices, CHWs need to have adequate supervision and supplies from non-governmental organizations (NGOs) or public health organizations and need to participate in refresher training sessions.
5. Motivation: The lack of recognition by other health care professionals can have a detrimental effect on the morale of CHWs and their level of work satisfaction, which can lead to higher turnover or a breakdown in collaboration between CHWs and the formal health care sector.
6. Alignment with broader health system strengthening: CHWs cannot serve as Band-Aid solutions to weak health systems, but instead should supplement health systems which are able to provide adequate clinical care, supply of materials, training, evaluation, etc.

Clearly, just deploying CHW and programs specific to them are not enough. However, assessing the effectiveness of health programs on the health of populations in general is a challenging methodological task, since it is not necessarily the case that any improvements in the health of a population can be attributed to one or more health program activities. Many factors contribute to the health of populations, including non-health program factors such as the standard of living, level of education etc. It is imperative to bridge the gap between a robust primary care vision and the everyday reality such that it provides:

- Increased access to care and improved quality of patient's experience and satisfaction
- Effective utilization of healthcare experts
- More proactive education, management and prevention of health of individuals, families and the community
- Higher integration across secondary and tertiary care
- More efficient ways with the support of a social support system

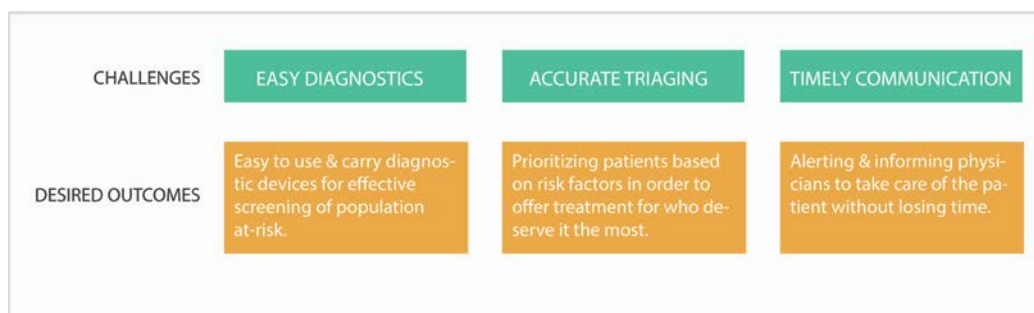
## Key challenges & opportunity areas

Before we analyse how a CHW's role extrapolates into our context of study within the developing countries offering primary care and how we identify the principles of people-centred healthcare delivery, it is important to note that in our study the prominent findings gave us insights into the key challenges & possible opportunity areas. The needs and opportunities identified are presented in table below (Table 1).

|   | Needs/Bottlenecks   | Opportunities/Directions   |
|---|---|--|
| 1 | Data collection bottlenecks across stages of screening & treatment (Registration/triage/consultation. etc.)   | New distribution model of data collection pre-consultations, during visit and post consultation                            |
| 2 | Limited time with the patient and too much data collection that it is hardly used by clinical users           | Simplified, limited and effective data collection in the consultation that follows the practice logic and time constraints |
| 3 | Inaccurate triage that creates queuing issues and long waits  | Pre assessment and triage prior to arrival to the unit to ensure more timely and effective visit                           |
| 4 | Lack of presence and guidance after the consultation resulting in low compliance and poor referral completion | Extended care and communication after consultation to ensure successful referral and higher compliance                     |
| 5 | Lack of understanding about the health issues of the community  | Ongoing, pro-active and thorough data collection via community health workers and patients with apps and devices           |

**Table 1: Needs and Directions of primary care in emerging economies**

We analysed how these needs and opportunities translate into the role of CHWs and how they can be performed by the CHWs who are closer to a community. Figure 4 summarizes the challenges of identifying, treating and offering post treatment care, as currently faced by the CHWs and lists the desired outcome for each of those challenges.



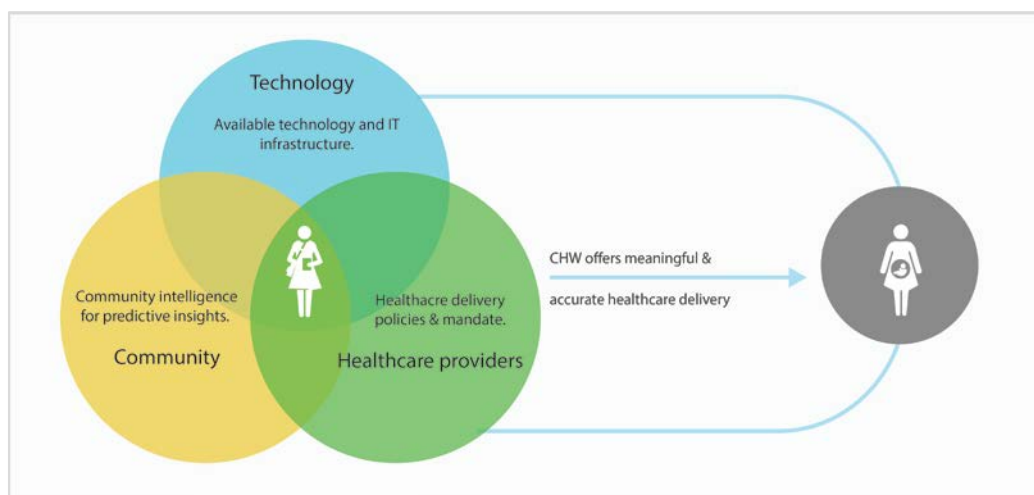
**Figure 14: Challenges and desired outcomes**

Community health workers are most effective when supported by a clinically skilled health workforce, and placed within the context of an appropriately financed primary health care system. Medical device companies are already partnering with private and public practices, but the real opportunity is to deploy low-cost readily usable mobile systems. IT companies are building elaborate solutions for clinical practice management for clinics and hospitals. However these solutions might be too complex for CHWs due to their limited experience with IT and low literacy. Due to these reasons, services and solutions providers need to rethink their offerings. The offered solutions need to match the knowledge and skill level of the CHWs. Additionally, the solutions should address the various scenarios in which the CHWs operate.

With this new perspective in mind, service design thinking can be coupled with a user centred design approach. Wherein each stakeholder within the primary care system is individually identified and analysed for their role, needs and motivations. For example, a CHW is seen as a user of a service that allows him/her to be the link between the clinical staff and the patient. Similarly, the patient is a user of a service where he/she gets access to care at any given moment, and the clinical staff is a user of a service that allows them to better manage patients not only at their location but also remotely. It is now that a system is designed keeping in mind the overlapping needs and influences of each of the users' requirements along with their personal abilities or thresholds. In this particular case, literacy and access to IT are the limitations of a CHW that must be considered.

## Healthcare service delivery framework

Based on the aforesaid considerations, it becomes essential that the community health worker leverages on the community knowledge and interactions, uses technology support to make operations easier and more relevant and contributes to the bigger goal of hospitals and the healthcare provider network. It is about empowering the CHWs with their own resources and additional clinical and IT support to make their contributions visible, actionable and trackable. It also helps to ensure that patients understand and follow their care plan to increase compliance and satisfaction across the healthcare continuum. The following model (Figure 5) outlines the enablers of care for the CHWs.



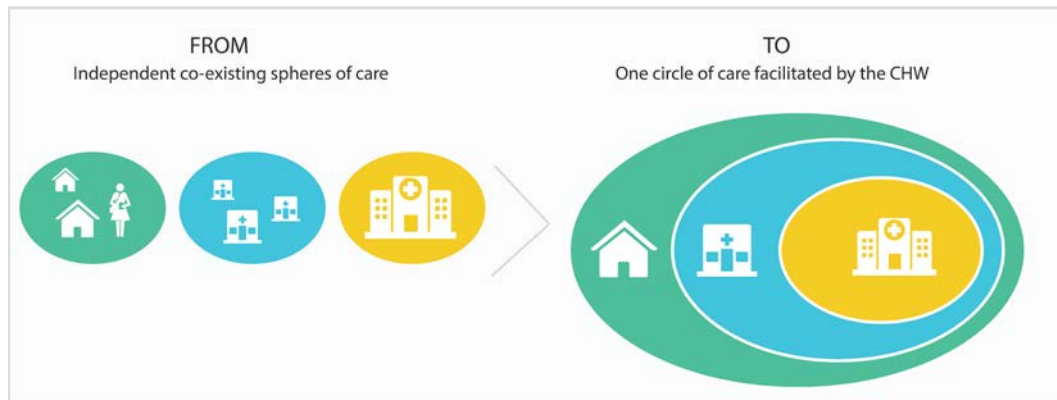
**Figure 15: Way to enable a CHWs**

In the current model, healthcare delivery unifies healthcare providers, patients, services and the community health worker. The care circles exist in a community where the community workers perform their duties and the hospital/clinics offer specific care. However, there isn't



a uniform flow of information or a unified approach between the different stakeholders. Care types are broken and medical history is not leveraged, for instance every time a patient is treated as a new patient due to absence of medical history. Even when patient data is captured, the information is most likely outdated or incomplete.

To overcome the previously discussed shortcomings, the following suggestions to improve the delivery framework are proposed. From independent co-existing spheres of care where community, primary care, and secondary and tertiary care are separate entities and operate in silos, to one circle of care that is well networked across different levels of care, is facilitated by all stakeholders alike and enabled by IT. Figure 6 illustrates this vision of the proposed care delivery.



**Figure 16: Proposed health care delivery**

## Possible directions supporting the delivery framework

Clearly, propositions for primary care delivery for low resource settings, had unique quantifiers that can be almost used as a pattern. The following guidelines outline them:

### 0.1. Building upon existing infrastructure, resources & technology

Rather than introducing new technology and infrastructure, it is imperative to take into account any limitations such as resource scarcity and building propositions around it.

#### Description

- Leveraging upon the existing technology and infrastructure of the place. Like SMS and IVRS based services are common in many regions with limited smart phone penetration and literacy and can be seen as a useful channel
- Exploring partners for implementation and management purposes (clinical, operational, economic and infrastructural); communication, data storage, infrastructural enables, electricity, hardware, money transactions, care, staff etc.

#### Benefits

- Reducing costs, 'not reinventing the wheel', faster time to implementation, no or less training will be needed
- Faster and possibly cheaper adoption.



**Figure 17: Building upon existing infrastructure, resources & technology - Patient Requesting Consultation/CHW Visit through SMS and IVRS**

## **02. Providing care even before a patient visits a facility**

Not only progressing from curative to preventative helps, but also to enable care spots outside the facility.

### **Description**

- Reconsider the workflow along with its bottlenecks to redesign the healthcare journey that starts and ends at the patient's home. Such that it not only improves the quality but also the service experience for all actors involved.

### **Benefits**

- Distribution of data collection across the care continuum and enable more proactive outreach to patients in the community
- Reduce clinical service burden
- Better care experience
- Managing throughput

## **03. Triage patients using low cost, trustworthy and mobile devices**

Triaging patients is the most important step to primary care and a lot can be gained if devices are deployed safely and are connected to hospital infrastructure in a secured environment.

### **Description**

- Using digital devices and equipment that can accurately measure and store relevant data outside of a primary care center and before a patient visit
- Bridge the digital and physical divide early in the process to avoid error and data bottlenecks

### **Benefits**

- In addition to efficiency in measurement of temperature and blood pressure the digital devices can offer more value and improve the workflow if they can have added features such as information transfer and communication with an electronic medical record (EMR)



#### 04. Make payments easy and trackable

Leverage on the current payment infrastructure of a country and be flexible around it.

### Description

- Use mobile payment technologies for micro-payments of clinical services facilitated by CHWs

## Benefits

- Reduce handling of cash at the facility and threat of theft
- Effective book-keeping of finances
- Ease for patient



**Figure 19: Make payments easy and trackable - Patient Fees through existing telecom services like mobile payment (mPesa in Kenya)**

## 05. Follow-up of care outside the clinic

Follow up

### Description

- Allow the clinic to extend its reach outside of the premises, using the existing network of CHWs

### Benefits

- Closer and personalized follow-up of chronic patients with reduced burden on clinic's services
- Increase compliance, therefore better outcome
- Prevention of avoidable intervention hence reduce cost or resources utilized



**Figure 20: Follow-up of care outside the clinic - Follow-up by CHWs at home, where the care thread continues**

## Conclusions

Our study so far has been about identifying a methodological approach to opportunity areas using concept sketches, storyboards and prototypes. The most important next step is to see if there is a buy-in from policy makers, technology providers and healthcare product manufacturers. While we lay out a human-centred approach, the implementation plan and roadmap needs to support our claim. Furthermore, assumptions and benefits to user and health system need to be carefully tested and validated. The community worker's tasks are envisioned to be extended outside the currently defined responsibilities, which requires alignment with responsible government bodies.

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*Community Health Workers/Promoters, in Chronic Care: A discussion paper*

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Kathleen Grimm, MD and Jessica Bauer Walker, BA, *Challenges & Opportunities of Community Health Workers in Buffalo, NY*

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