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Global eHealth, Social Business and Citizen Engagement: A Natural Convergence?

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Abstract

This paper draws on the vision, mission and experience with the WHO Collaborating Centre on eHealth (WHOCC-eHealth) and Yunus Social Business Health Hub (YSBHH) based at UNSW Australia, and the Asia electronic Health Information Network (AeHIN). Global eHealth aims to provide equitable access to ICT and health care, particularly to the poor, vulnerable and disadvantaged. Social business aims to solve social and economic problem. Its best known product is microcredit financial services for the poor which are small loans that enable them to "produce something, sell something, earn something to develop self-reliance and a life of dignity". Citizen engagement and community participation is integral to both constructs within the context of global partnerships for Integrated People-Centred Health Services (IPCHS) and Sustainable Development Goals (SDGs). The eHealth dimension is consumer heath informatics, social media, mHealth and the Internet of Things. The convergence is multidimensional, mutually beneficial and requires good governance and leadership.

Keywords:

Commerce; Community Participation; Goals

Introduction

The World Health Organization Collaborating Centre (WHOCC) in eHealth was established in The University of New South Wales (UNSW) Medicine in 2013, with its designated activities being evidence-based evaluation, assessment of eHealth and scoping eHealth solutions[1], including the Internet of Things (IoT) [2]. The Asia eHealth Information Network (AeHIN), a group of eHealth advocates in the Asia-Pacific region with an intent on using the peer learning approach to solve their eHealth challenges, is a longstanding collaborator (http://aehin.org/Home.aspx). The UNSW Yunus Social Business Health Hub (YSBHH) was established in 2015 to establish, conceive, and promote social business eHealth initiatives.

The scope includes implementation and evaluation of integrated information systems and data, mobile health (mHealth) and working towards an IoT for health. The WHO and the International Telecommuication Union (ITU) sponsored National eHealth Strategy Toolkit is a guiding document that promotes seven strategies for successful implementation of eHealth programs [3]. The vision is global partnerships for Integrated People-Centred Health Services (IPCHS) [4], United Nations Millennium Development Goals (MDGs) [5, 6], Sustainable Development Goals (SDGs) [7] and health and eHealth workforce [8].

With more than 400 million people globally lacking access to essential health care, the SDGs remain aspirational, like the MDGs. To achieve universal health coverage and equitable access to timely health services, the IPCHS Framework proposes five critical shifts that need to happen (Figure 1): *Coordinating services within and across sectors; Re-orienting the model of care; Strengthening governance and accountability; Empowering and engaging people; and Creating an enabling environment.*

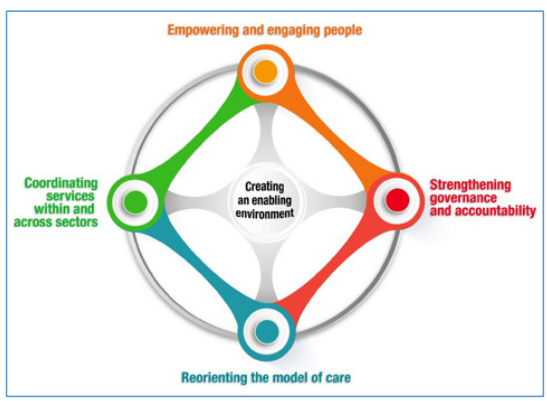

Figure 1 – Five critical shifts required to achieve timely Integrated People Centred Health Services (©WHO 2016)

Developing more integrated people-centred care systems has the potential to generate significant benefits for the health and health care of all people. There is no perfect combination nor a "one size fits all" solution. The right solution will depend on a country's unique context and needs, as well as local considerations [4].

The MDGs aim to eradicate extreme poverty and hunger, achieve universal primary education, promote gender equality and empower women, reduce child mortality, improve maternal health, combat HIV/AIDS, malaria, and other diseases, ensure environmental sustainability and develop a global partnership for development. The 17 SDGs replaced the MDGs in 2016, with goals relevant to health and well-being:

- SDG#3: Ensure healthy lives and promote well-being for all, at all ages;

- SDG#8: Decent, full and productive work and economic growth;
- SDG#9: Sustainable industry, innovation and infrastructure;
- SDG#10: Income equality within and among countries;
- SDG#11: Sustainable cities and communities, inclusive, safe, resilient and sustainable;
- SDG#12: Responsible and sustainable consumption and production patterns

Social business aims to alleviate social and economic problems caused by poverty, poor health, unhealthy food, smoking, alcohol, gambling, risky behavior, unemployment, poor literacy and other social determinants of health. Social business is not a charity [9]. It is a non-dividend, non-profit business entity [10], but like for-profit businesses, it has to be sustainable. Costs must be recovered, but with the profit-maximization principle replaced by the social-benefit principle. Social business and SDGs complement each other, the SDG identifies a socioeconomic area for development while the social business model of cost-effective execution works to improve that area sustainably [11].

An application of social business methodology to financial services is the Grameen Bank or "*village bank for the poor*", which makes "microcredit" or tiny loans to poor people. It is based on trust, with no collateral required or legal documents involved! Grameen Bank currently has nine million borrowers, who are "owners" of the bank and lends out over one and a half billion US dollars each year. Almost all (97%) of borrowers are women, who usually use the loan start a business to earn a livelihood. As Prof Yunus describes it, "*by producing something, selling something, earning something, she starts to develop self-reliance and a life of dignity*" [12].

Successful social businesses in health included selling vegetable seeds at affordable prices to make vegetable growing easy for the citizenry. This business has become the largest seed retailer in Bangladesh and more importantly, is associated with a marked reduction of night blindness, a common disease among the poor children in rural Bangladesh. Malnutrition is being addressed by a joint venture in 2005 with a for-profit global company, Danone, to establish a social business to manufacture an affordable fortified yogurt for poor families. This successful social business continues as Danone's growing corporate social responsibility activities.

A link to eHealth began with the Grameen Village Phone Program. Started in 1997, this provided a good income-earning opportunity to more than 210,000, mostly women, Village Phone operators living in rural Bangladesh through facilitating universal access to telecommunication services by the poor in remote, rural areas. The phone was used mainly for financial discussions and social calls with family and relatives living and working in urban areas, resulting in real savings through avoidance of and reduction in trips to the city [13].

Current social business technologies evolved from adoption of emerging information and communication technologies to affect innovations in social business and the social sector. In 2006, Grameenphone initiated *HealthLine 789* for its ten million subscribers, who are charged thirty-eight cents US dollars per call for five minutes. A range of medical information facilities, (e.g., SMS-based laboratory reports), emergency and ambulance services, and real-time medical consultations are provided via mobile phones. A panel of skilled health professionals is available 24/7 through the physician's interface and support is provided by a back office and network manager [14, 15, 16].

Increasing smartphone penetration [17], strong users and patient demand for mobile phone apps are strong drivers for mHealth [18]. Health professionals may resist this potential power shift to patients and the community. Regulations of the mHealth industry do not appear to be a barrier but, uncertainty exists around the lack of data security and standards. A general barrier is "*discoverability*", where it is difficult to discover the required app from among the 100 thousand plus mHealth apps available online.

Community readiness for eHealth is important globally, as well as in rural Bangladesh[19,20], Community members, leaders and healthcare providers would use mHealth tools and services. However, awareness of existing services is low, especially among the poor and less educated. While face-to-face consultations are preferred, the community is attracted by the timely access to qualified healthcare providers, time savings and lower costs associated with mHealth. Low literacy, lack of English language proficiency, lack of trust and technological incapability are barriers to mHealth use [21]. However, a sense of ownership, evidence of utility, a positive attitude and intention to use mHealth were drivers of adoption of mHealth services. Implementation strategies must emphasize gaining the trust, training and support of users. This requires citizen engagement to inform and empower consumers and ensure transparency and accountability.

The key construct in citizen engagement is public participation. Unlike public communication to inform the public, public participation is characterized by a two-way flow of communication in an iterative fashion. It involves the public in collaborative ways and emphasises empowerment. However, barriers exist including poverty and a decreased sense of worth, especially among those with disabilities and disadvantages such as extremes of age, female gender and belonging to minority groups [22].

Our key assertion is that global eHealth implementation and evaluation requires social business strategies, targeted at both clinical and population issues, underpinned by citizen engagement if they are to succeed in improving global health through the IPCHS Framework (Figure 1) and National eHealth Strategy Toolkit.

Methods

A literature search, using "social business", "eHealth", "electronic health", and "health" with MEDLINE (1966-2016), EMBASE (1974-2016) and SCOPUS (1960-2016), found only one paper that met all criteria [23] and 44 papers matched on outcome criteria. Only relevant papers were used to guide the critical analysis of the WHOCC-eHealth and YSBHH activities and critical reflection to focus key principles into a conceptual framework for a convergent research and development program on eHealth and social business.

Findings

The dimensions of the sociotechnical framework to converge eHealth [3] and social business [10] concepts and strategies include: 1. integrated infrastructure and building blocks; 2. collaborative eHealth activities with a citizen focus; 3. citizen engagement and collaboration; 4. measurement and evaluation of citizen-centred process and impacts across the relevant SDGs for the individual, family, community at facility, district, regional and national levels.

Transparent governance, management and leadership across the four dimensions is essential to manage the change needed

to achieve the Triple Aim of better health, better care and cost-effectiveness [24].

1. Convergent building blocks and infrastructure

These include standards and benchmarks for data, information systems, software applications, standard operating procedures, clinical and managerial protocols, change management and governance structures to support learning health organizations and networks to achieve the SDGs for the country. Convergent activities with potential benefit include:

- Establishing the infrastructure and tools to support an user-centered Internet of Things [25].
- Collaborative projects with the Australian Collaborative Research Centre on Spatial Information (CRC-SI) to geocode digital data repositories collected in integrated health neighborhoods [26].
- Building a robust and trusted eHealth infrastructure [27, 28] to support the implementation and monitoring of programs to achieve the SDGs and, previously, the MDGs.
- Building the eHealth workforce capacity through professional exchanges, education and training [29, 30].

2. Convergent citizen-centered eHealth tools & things

These include software applications to contribute to the IoT. Legally, "things" should be seen as an "inextricable mixture of hardware, software, data and service" [25]. Examples of "things" may be wireless devices for detecting and/or monitoring of activities and physiological functions, environment quality, food safety, pathogen activity or functioning of smart homes. This IoT framework applies to eHealth activities such as:

- Cloud-based mHealth systems for disaster management in Indonesia [31];
- mHealth for the primary care of cancer patients in Sydney Australia [32];
- Use of tablets for health checks of independent-living elders, within the Silvercare model where a young, retired person supported up to ten elderly people in their neighborhood with the Indian Aboriginal health agencies [33].

3. Citizen engagement, collaboration and convergence

A digital citizen uses information and communication technology (ICT) to engage in society, politics, and government participation. The key concept here is that it is most efficient and effective at the local community and facility levels. However, the governance and accountability needs to link upwards to meso- and macro-organizations at regional, jurisdictional and national levels. Citizen engagement is an evolving dimension of the WHOCC-eHealth and YSBHH. Activities include:

- Assessing community readiness for mHealth with developing countries [19, 20, 34].
- Assessing market adoption, cost, maturity and user acceptance of robotic mHealth services for vulnerable groups with European Union partners [35].
- Eduation and training of students from high schools, univerisities and communities [36].
- Collaborative activities with relevant communities and stakeholders organizations,

4. Convergence and integrated health services & information in local neighborhoods

Digital data from electronic health records (EHRs) of health services in local neighborhoods form the core of any eHealth and health services research and development program. The local neighborhood with its local hospital, general practice and primary care services is the most relevant and logical unit of analysis (denominator) for health services and population health research. Data collected as part of routine clinical practice in EHRs and health information systems (HISs) will form the core longitudinal data source, supplemented by more specific quantitative and qualitative data collection methods at specific time points.

We have defined an Integrated Health Neighborhood (IHN) as a referral network of health services across primary and secondary care, supported by an informatics infrastructure and record linkage across clinical and population health information systems, traditional research data sets, social media and personalized appliances [26]. We have developed and validated tools to assess and manage the quality of data collected and stored in HISs during routine clinical or managerial practices [37-40]. We have also conducted research into natural language processing to improve quality of routinely collected health and social data [41-44].

This evaluation methodology, built around networks of IHNs, is the most logical patient and local community centered approach to collecting data to monitor the implementation, progress and impacts of health care interventions. The IHN approach also enables comparative effectiveness research across IHNs and communities to understand variations in quality of data and care, cost-effectiveness of eHealth in improving self-management, equity and access to health care and social capital in local communities.

We have consulted widely and developed models of data quality management and governance needed to ensure ethical and innovative use of the data collected through this informatics infrastructure [39-41,45-48].

This is an invaluable asset to enable ongoing monitoring of safety and quality of care and achieve the Triple Aim [24] of eHealth and health services, i.e., achieving optimal care, cost and health.

Discussion

Global eHealth research and development, with a social business and citizen engagement approach to achieve integrated people centered health services, is logical and sustainable. It gives meaning to eHealth as mechanisms to achieve access, equity, safety, quality and continuity and comprehensiveness of care of both communicable and non-communicable diseases. Individual and community readiness to adopt and use eHealth tools must be assessed within a comprehensive sociotechnical framework and the context in which they work to achieve healthy behavior and patient outcomes. Finally, open and transparent governance, management and leadership is essential. A range of governance structures exist, but the aim is to extend conventional thinking from simply a government-led program to citizen-led and government-enabled eHealth systems.

Citizen engagement is not easy! However, this is exactly where the social business methodology and approach come into its own. Like the Village Phone project, the community can have a stake in the eHealth program as employees or investors through microcredit for eHealth implementation, training and support projects within the local community. The social business paradigm has shown that it can work.

Integrated people centered health care requires integrated data and information systems (interoperability) to support it and integrated health professionals and services [49, 50] to deliver it to individuals, families and communities. The same data collected during the provision of care should be used to monitor the process and impact on the SDGs [51]. This requires the integration of data from facilities and micro-organizations in health neighborhoods to networks of those managed and governed by meso-orgranizations at regional levels and macro-organizations further up the hierarchy in the health system.

Most national health systems have this health neighborhood based hierarchical organizational structure. However, the collection, management and stewardship of the data and information is not organized, managed or governed to maximize the benefits of this organizational structure. This need to collect and use meaningful information to monitor progress in the achievement of the SDGs may be a catalyst for developing countries to lead the way for a cost-effective means to organize national HISs to use routinely collected digital data to support health care planning, delivery, evaluation and clinical re-design to iteratively improve the process and impacts of integrated people centered health services.

Finally, mechanisms for countries to share and compare experiences and lessons from the field can trigger and facilitate international learning, which will shorten the transformations in capacity and infrastructure necessary for successful citizen-led relevant social businesses and useful eHealth systems.

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