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Veröffentlichungsversion / Published Version

Zeitschriftenartikel / journal article

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Empfohlene Zitierung / Suggested Citation:

Hanrieder, T., & Montt Maray, E. (2021). Digitalizing Community Health Work: A Struggle over the Values of Global Health Policy. *Historical Social Research*, 46(1), 136-159. <https://doi.org/10.12759/hsr.46.2021.1.136-159>

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Digitalizing Community Health Work: A Struggle over the Values of Global Health Policy

Tine Hanrieder & Eloisa Montt Maray*

Abstract: »Die Digitalisierung der community health worker: ein Streit über die Werte der Weltgesundheitspolitik«. The introduction of digital technology has sparked new debates about the value of community health workers in low- and middle-income countries. This debate offers important insights into the conventions that are relevant in global public health. Community health workers, a workforce that was already celebrated during the 1970s Primary Health Care movement, are having a remarkable revival in recent years, and myriad actors seek to boost their impact through mobile devices. Our content analysis of the public health literature evaluating this impact reveals the centrality of attempts at reconciling equity and cost effectiveness concerns, and thus considerable normative tensions. Additionally, we find that discussions about “domestic” values such as privacy and gender roles come with a paternalistic undertone, calling for feminist and postcolonial engagement with the digitalization of community health work.

Keywords: Global health, primary health care, community health worker, digitalization, feminism, orders of worth, economics of convention, mobile health.

1. Introduction

Community health workers (CHWs) – simply trained health staff providing outreach services such as health education and home visits, and occasionally simple medical interventions – are back on top of the global health agenda. CHWs used to be identified with the short revolutionary period of the 1970s’ Primary Health Care movement in global health, when they served as the iconic figure of the health development agenda (Medcalf and Nunes 2018). During the neoliberal 1980s and 1990s, CHW models lost support and faded into the background (Perry et al. 2014). Yet today, a broad coalition of states,

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non-governmental and philanthropic organizations, and multilateral organizations promote the CHW model as a means to close health care gaps, especially in poor countries. High profile initiatives such as the One Million Community Health Workers Campaign (launched at the 2013 World Economic Forum) and renewed guidelines and support by the World Health Organization (WHO; 2018) contribute to the endeavor to increase health coverage and improve health outcomes with the help of non-professional health workers. This trend is accompanied by ever more academic investment in testing and evaluating different CHW interventions in areas including malaria prevention, breastfeeding promotion, or essential newborn care (Gilmore and McAuliffe 2013), and experimentation with mobile technology and digital devices, which shall both support CHW activities and feed directly into their evaluation (Cheney 2018).

This revival calls into question standard narratives of global health as the continuous spread of curative “biomedicine” (Packard 2016). Quite the contrary, the CHW “boom” (Kangovi and Asch 2018) illustrates the plurality of values and aspirations attached to global health policies (Hanrieder 2016; Lakoff 2010). CHWs are heralded as promoters of health equity, guarantors of health security, and as cost effective interventions in resource poor settings all at the same time. Thus, their global health worth is established through values which range from equity and social justice to economic development and efficient planning.

In this contribution, we tackle this pluralism and analyze the construction of CHWs from an economics of convention (EC) approach. We explore how actors in the field, through their evaluation of CHW programs in various parts of the globe, try out diverse conventions, i.e., logics of coordination and evaluation as “hypotheses” (Diaz-Bone and Salais 2011) about the worth and relevance of CHWs, and thus about the purpose of global health more generally. Our analysis centers on evaluations of mobile technologies in the CHW field, since the novelty of these technologies has set free intensive debates and justificatory efforts, and can thus serve as a “reality test” (Boltanski and Thévenot 1999) that explicates the moral grammar of the CHW field.

An EC approach to global health can account for the complex and contested nature of the field (McInnes et al. 2014). It furthermore answers the call to bring insights from cultural and relational sociology to bear on the sociology of health and medicine (Beckfield et al. 2013). Reconstructing evaluations of CHWs through the lens of EC helps us understand the confluence and constant renegotiation of different “orders of worth” (Boltanski and Thévenot 2006) in global health (Hanrieder 2016; see Alenda-Demoutiez and Boidin 2019), and thereby serves as a counterpoint to grand narratives of “medicalization” or “securitization” (Elbe 2010), or the triumph of “economism” (Lee 2009, 111) in global health.

In order to reconstruct competing orders of worth within the field of CHW, as well as typical connections between them, we present the results of a content analysis of 20 evaluations of mobile technologies in CHW work in developing countries. Twelve are intervention studies and eight are reviews. Two-thirds of the intervention studies are sourced from Africa and the remaining third from Asia. We use a mix of deduction and induction for the content analysis. Starting from the four orders of worth in global health as conceptualized by Hanrieder in 2016,¹ we find the prevalence of three forms of legitimization of CHWs: as a means to enhance health security, as a means to increase fairness and access to good health services, and as a cost-saving efficiency tool. Each of these modes of evaluation ascribes a different role and agency to CHWs, regarding them as devices of epidemiological surveillance, agents of health justice, or cost-effective interventions, respectively. Furthermore, the analysis reveals a strong correlation between cost and fairness interpretations of CHWs. This points to a discursive formation that merges social justice and economic efficiency concerns into a vision of “good health at low cost.”

While these three legitimizations of CHWs – as security, efficiency, and equity enhancers – debate them as tools of public policy, a final and more ambivalent set of evaluative categories refers to their interactions with privacy, personhood, and domestic life. Debating in particular the role of digitalization for local gender relationships and conceptions of privacy, a range of critical assessments highlight that gendered power relationships might undermine the value of digital CHW tools and infringe upon privacy. We discuss these evaluations as enactments of a mix of inspired and domestic values, which are invoked as forms of resistance against medicalization.

Our analysis thus contributes to a better understanding of how global health actors strive to reconcile several forms of worth – such as equity or efficient allocation, but also values from the traditional “domestic” sphere (see Boltanski and Thévenot 2006) such as gender roles and understandings of privacy – into a coherent and justifiable rationale; in spite of considerable tensions that can arise between these values. At the same time, especially the reference to those domestic values also bears paternalistic traits, which manifests in the effort to sensitize target populations’ privacy “from the top.” We therefore conclude our contribution with some reflections on how the EC approach can be more explicitly combined with postcolonial and feminist ideas (see section 3).

The remainder of the article is divided into four main parts. The following section (2) establishes the EC perspective on global health. The third section introduces the normative grammar of global health and its four main conventions/orders of worth referring to different common goods, namely survival, fairness, production, and spirit. The fourth section establishes how in the

¹ These are the order of survival, the order of fairness, the order of production, and the order of spirit (Hanrieder 2016; cf. below, section 3).

CHW field, the orders of survival, fairness, and production are used and combined to justify digitalized interventions. Section 5 discusses how “domestic” and “inspired” values of privacy and gender roles are invoked: as limiting conditions that the targets of intervention have to be made aware of. The conclusion summarizes the results and outlines avenues for combining postcolonial and EC approaches to the global health discourse.

2. Global Health Through the EC Lens

The rise of global health as a field of practice is increasingly scrutinized from a sociology of knowledge perspective. While in the early 2000s, debates were still marked by the question of how globalization affects health (Lee 2003) and which governance arrangements are most effective in addressing global threats to health (Zacher and Keefe 2008), meanwhile, the growth and consolidation of the field has also sparked intensive debates about its epistemic foundations. Leading agencies such as the WHO, the World Bank, or the Bill and Melinda Gates Foundation (to name just a few, see also Cohen 2006) invest heavily in knowledge production through research sponsoring, expert bodies, policy guidelines, and public communication. These activities have made it plain that the meaning and purpose of global health are far from self-evident. Is health a means to achieve development and best addressed through economic models (World Bank 1993; WHO Commission on Macroeconomics and Health 2001)? Is it a human right, as stated in the WHO constitution and expressed in the quest for universal health coverage in the United Nations Sustainable Development Goals (SDGs; WHO 1946; WHO Regional Office for Africa 2017)? Or is global health mostly part of a new (human) security agenda that seeks to keep pandemics emerging in the developing world off the shores of industrialized countries (Weir and Mykhalovskiy 2010)?

To account for the politicized – and politically consequential – social construction of global health, social science scholars have offered a variety of interpretations. Some emphasize the importance of secular historical trends such as the dominance of biomedicine and “medicalization” (Elbe 2010) and its variants of “pharmaceuticalization” (Roemer-Mahler and Elbe 2016) or “biomedicalization” (Clarke et al. 2003). These accounts stress the strong reliance of global health actors on medical knowledge and technology, often with a critical twist that considers medicine as a (violent) intrusion into people’s lives (Howell 2014), especially in the Global South (Biehl and Petryna 2013; Packard 2016). Another, partly related, trend highlighted in the literature is the “securitization” of global health: the political focus on infectious diseases as threats to human and national security, and the political strategy of governing health through disease containment and short-term crisis interventions (McInnes and Rushton 2013). Finally, with the rise of the World Bank as

a major player in global health, debates about “economism” (Lee 2009, 111) and the role of economic thought and models for global health policy (Chorev 2013; Reubi 2016) have attracted scholarly attention. The contrast between economic and rights-based justifications for public health interventions and the differential policy choices that each perspective can suggest has become a topic of intensive debate (Anand and Hanson 1998; Boidin 2015).

However, this discussion already indicates that no single master trend – neither securitization, nor medicalization, nor economic thought – shapes the global health field in isolation. For example, historically minded scholars have highlighted that global health has long been marked by intricate tensions, such as more biomedical and curative approaches on the one hand, and primary, preventative approaches on the other (Lee 2009). Likewise, the emphasis on health security and securitization as a secular trend (while certainly important as an explanation of the growing high politics and foreign security concern with health) does not yet explain whose security is addressed and how, or how priorities in working toward health security prevail (McInnes and Rushton 2013). Additional normative criteria such as human rights or the quest for research-based interventions are equally invoked in global health debates and further complicate its normative grammar (McInnes et al. 2014; see also Lakoff 2010).

To account for this complexity and moral contingency, a fine-grained sociological approach which takes into consideration the *epistemic openness and indeterminacy* regarding global health policies and interventions, and which explicates and specifies the *creative judgments* through which global health actors establish moral meaning, hierarchy, and worth, is needed. This is precisely the importance of an EC approach to global health. An EC perspective enables identifying a plurality of critical repertoires which are historically and socially institutionalized but do not pre-determine modes of coordination and action (Diaz-Bone and Salais 2011, 29; Diaz-Bone 2018). They provide distinct evaluative devices for action-oriented judgments (Boltanski and Thévenot 2006; Hanrieder 2016), which actors do not employ as blind rule followers, but creatively interpret and combine in concrete situations and contexts.

Which conventions thus shape the global health discourse and how? How do actors draw on repertoires from the worlds of social policy and redistribution (Batifoulier et al. 2019; Carpenter 2012), economic efficiency, or international security, to set priorities and fix the meaning of health policy? In a previous analysis of the normative texts and policy tools of major international health organizations, Hanrieder (2016) suggests that four major conventions (or orders of worth) constitute the moral grammar of global health: the order of survival, which interprets health as the collective defense against infectious threats; the order of fairness, which interprets global health as an endeavor to eliminate unfair discrimination and inequity in access to health services; the order of production, which interprets global health as an

investment in the maximum possible amount of health per dollar; and an order of spirit, which interprets health as the integrity of the individual in the face of medical or economic intrusion. Each of these orders comes with specific devices for measuring and providing health, which are only partially commensurable. Therefore, the practical meaning and enactment – or reinterpretation – of these orders depends on actors and their creative endeavors in concrete historical contexts. The following section discusses these conventions in more depth.

3. Four Conventions in the World of Global Health Survival, Fairness, Production, and Spirit

To justify policies, allocate resources, and assign different roles in the field of global health, the participating actors and institutions refer to a plural yet limited set of conventions. Their specific characteristics echo elements of the conventions that Boltanski and Thévenot (2006) identified in their studies of western culture, even if they are not identical with them. Elements from the spheres of international security, development, and medical discourses have given rise to distinct conventions in the world of global health. Yet, their basic structure as conventions, or “orders of worth,” follows the logic laid out by Boltanski and Thévenot (2006): Each of them refers to different conceptions of the common good, as well as distinct institutions and devices for assigning moral worth. We distinguish four major orders of worth that global health actors regularly invoke in the global health field: the orders of survival, of fairness, of production, and a domestic, spiritual order.²

First, the order of survival considers global health as a live-or-die scenario, where humankind is united by its vulnerability to dangerous infections – and thus the looming threat of being decimated or even eradicated by deadly pathogens (Fidler 2005). It is the fear and vulnerability of humans to infectious diseases that constitute this order. Where in a globalized society, “germs globalization is permanent while the borders are the transitory phenomena” (Fidler 2005, 13-4), being a frequent mantra for this order is that disease knows no border (Fidler 2004). In this order, the political community is based in humans’ shared vulnerability to contagious diseases irrespective of their socio-economic predispositions (Hanrieder 2016) and the dystopian scenario to fear is “Mother Nature” (Fidler 2004, 3). The order’s virtuous behavior is to control and respond to microbial threats by sacrificing economic interests and other pleasures for the higher value of survival (Hanrieder 2016).

Second, the order of fairness is grounded in the language of human rights, which is increasingly invoked in global health conflicts (Inoue and Drori

² For a more extensive deduction of the four conventions, see Hanrieder (2016).

2006). From the fairness point of view, the problem of health is not one of biological vulnerability to nature, but a problem of distributional (in)justice and thus of health equity and non-discrimination. The underlying notion of community is that we are rights-bearers who owe each other an equal share of the social and medical goods potentially available. The focus here is on those afflictions which could be prevented, alleviated, or cured “in an age of great affluence” (Farmer 2005, 6), but which are rampant due to social injustice. Health is above all compromised by social inequalities and the forces that produce them. Thus, behaviors that might be criticized as “self-centered” and illegitimate from a survival point of view – for example, when states or social groups delay cooperation in pandemic preparedness to negotiate a fairer access to the benefits of such cooperation – can be defended as legitimate and even necessary from the fairness point of view. Social justice and a “preference for the poor” become major evaluative standards and moral imperatives for global health policies.

Third, the order of production where health is viewed through the lens of natural and economic scarcity in which human beings are driven to maximize utility and economic gain (Kenny 2015). New measurements of health, counted as the number of healthy years we live, here also became a means to optimize our economic productivity (Hanrieder 2016). This order is related to Boltanski and Thévenot’s (2006, 118-23) “industrial” convention, where social organisms should be arranged and managed in a way that makes them as productive as possible. The political community values economic growth, stressing the need for prior investment in health to enable economic development, especially where disease negatively affects economically productive adults, where health services are lacking, or where disease imposes an intolerable economic burden (World Bank 1993). The order’s moral imperative is to make “smart choices,” for seeking to maximize healthy life years. Also, the individuals should be concerned with optimizing their own health by becoming a self-investing entrepreneur (Kenny 2015).

Fourth and finally, the global health discourse also harbors more radical positions, which are fundamentally skeptical of medical intrusions into communities and bodies. Classic critiques of medicalization (Illich 1976; Elbe 2009) emphasize the intrusive and power-laden nature of biopolitics. More recently, these are joined by critiques of digital surveillance and the resistance against violations of privacy through new technological devices. In her reconstruction of canonical global health texts, Hanrieder (2016) depicted these critiques as the “spiritual order,” an order which seeks to defend the integrity of the soul and its inspired autonomy against technological intrusion (see also Boltanski and Thévenot 2006 on the worth of inspiration). Yet, as our analysis below shows, the defense of privacy in global health also extends to notions of a protection-worthy, autonomous zone of the household and family relations – what Boltanski and Thévenot (2006) named the “domestic”

order. We combine these notions of spirituality and domesticity into a convention of “spirit,” which credits family solidarity, patriarchal traditions, and personal integrity as institutions that must be shielded from medical dominance and overly instrumental, biopolitical calculation in their own right. The debates about this private sphere in the case of CHW digitalization reveal the tensions of this order, particularly in postcolonial settings.

4. Contesting the Worth of CHWs: Digitalization as a Critical Test

Community health workers (CHWs), as a category of health personnel, entered the global health stage in the 1970s. They served as the icon of the Primary Health Care movement, whose ideological center was the WHO (Medcalf and Nunes 2018). The category of CHW is relatively broad. It is used to refer to a broad array of activities performed by non-professional health workers, including home visits and health education, and simple medical interventions, for example, vaccinations (Lehmann and Sanders 2007). The CHW category has consolidated as an occupational profile through the attempts to roll out Primary Health Care policies in developing countries since the late 1970s (Källander et al. 2013; Perry and Zulliger 2012).

Most of these national attempts to establish CHW programs have faced considerable difficulties in attracting sufficient funding or establishing sustainable intervention schemes, so that by the turn of the century, CHWs appeared out of fashion (Lehmann and Sanders 2007). In recent years however, and especially with the transition from the Millennium Development Goals to the SDGs, CHWs have reemerged as a global health policy priority (Kangovi et al. 2015). Today, bilateral development organizations such as the United States Agency for International Development (Crigler et al. 2013), public-private partnerships such as the One Million Community Health Workers Initiative,³ and international organizations such as the WHO (WHO 2016; 2018) promote CHWs as a means to achieve universal health coverage and provide sustainable health services.

CHW interventions are thus at the forefront of contemporary global health policies, and considered as a vital tool for going the “last mile” in health provision.⁴ They are laden with high normative expectations of equity, efficiency, and cost effectiveness all at the same time which makes them an instructive case for exploring the normative landscape of contemporary global public health. The ways in which global health actors establish the worth and

³ See <http://1millionhealthworkers.org/> (last accessed July 17, 2019).

⁴ This metaphor is used, for example, by the organization Last Mile Health, which supports CHW programs in Liberia; see <https://lastmilehealth.org/> (last accessed July 17, 2019).

purpose of CHWs can therefore provide critical insight into the ways in which competing conventions are reconciled in global health.

To focalize the analysis of the CHW debate and make it empirically coherent, we zoom in on a crucial bone of contention in the CHW world, but also in global health more generally. This is the attempt to introduce and valorize digital technologies in global health. Digitalization has been a historical juncture. As any technological transformation, it sparks debates about the worth and impact of technological change across the entire field of global health, and compels actors to explicate and re-articulate latent conventions for a given context. It is thus a focal point for a diverse set of “reality tests” (Boltanski and Thévenot 1999; Hanrieder 2016, 414-5) and thereby also the renegotiation of critical conventions in global health.

In the CHW field, one major element of digitalization is the development of mobile phone applications for CHWs, and thus a variety of mobile health (mHealth) tools as a support for CHW activities. Mobile devices are considered as a means to enhance CHWs’ reach, rationalize their activities and enhance their effectiveness, and evaluate them through data collection (Agarwal et al. 2015; Cheney 2018). This promise has created an exponential proliferation of pilot initiatives using these tools for CHWs in the Global South (Braun et al. 2013). At the same time, the concomitant research on and evaluation of these interventions has also spurred an ongoing renegotiation of critical conventions in global health. The following section presents a content analysis of 20 such evaluations and reconstructs the specific way in which cost and efficiency considerations and health equity considerations jointly shape the public health discourse in this domain.

4.1 Legitimizing CHWs between Security, Cost, and Equity Concerns

In order to gather the articles, which evaluate and reconstruct the global health discourse about CHW digitalization, we used two of the major search engines in medicine and global health, OVID-Medline and OVID-Embase.⁵ The initial keyword search yielded 775 hits and we added a grey literature search in the key internet-based database *m.healthevidence.org*, gathering 73 hits. The search was completed from October 2 to October 4, 2018. From these, we selected articles that explicitly mentioned effects of mHealth tools used by CHWs in the Global South. Moreover, we focus on initiatives in low- and middle-income countries, since these are still considered to be the main locus of global health policy (Packard 2016; but see also Hanrieder 2019).

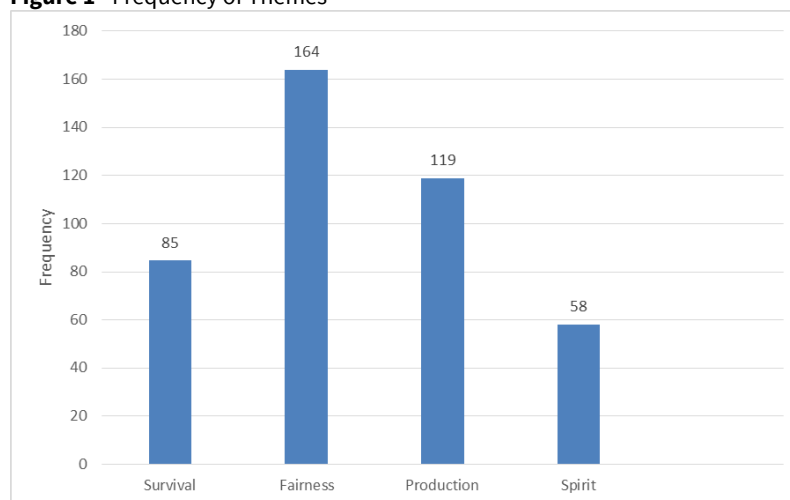
A total of 20 articles were included in this study, of which twelve were intervention studies (60%) and eight were reviews (40%). Out of all the

⁵ The search strategy, sampling criteria, data collection, and data analysis are specified in Appendix 1.

intervention studies, 66.6% (8 of 12) were conducted in Africa and 33.3% (4 of 12) in Asia. The dataset had more interventions in rural than in urban areas, with 50% (6 of 12) explicitly identified as based in rural settings. Point-of-care apps⁶ made up 66.6% (8 of 12), which were used as job aid for CHWs. From those, 75% (6 of 8) were aimed at assisting CHW in maternal, newborn, and child health (MNCH). The remaining 25% (2 of 8) of the point-of-care apps were specific disease interventions (pneumonia and cardiovascular evaluation). Only 16% (2 of 12) of interventions were explicitly for data gathering, however, all of the articles mentioned the use of the data gathered by the mHealth tools. Finally, all articles retrieved were published in the present decade, indicating both a considerable intensification of the debate in recent years and how current mHealth tools focused for CHWs are incorporated in the medical and global health narrative.

All articles reported benefits of mHealth tools for CHWs and used a wide variety of methodologies ranging from randomized controlled trials (RCT) to qualitative studies. Thus, many of the articles included in this study have methodological limitations in terms of causal inference. Despite these restrictions, the evaluative categories used by the articles displayed trends regarding views on global health policy, helping us understand what discourse is used as legitimizing narrative.

Figure 1 Frequency of Themes



Each column represents the amount of times each order or theme was coded in the data set.

⁶ Point-of-care apps are applications in a mobile phone that support CHWs when they are delivering care to their patients (Agarwal et al. 2016).

To reconstruct these trends, we used a mix of deduction and induction. Sensitized by the orders explicated in section 3, we developed codes that aligned with, but to some extent also re-specified, the survival, fairness, production, and spiritual perspective on global health. In the following, we will first focus on the first three themes, since they were invoked in as legitimizations of CHW digitalization. After that, we will discuss in a separate section how references to privacy and gender norms were invoked to criticize CHW digitalization.

Considering quantitative results of the analysis, figure 1 shows the frequency of themes. The order of fairness was most frequently used by the academic narrative. Nevertheless, we will first discuss the security perspective of the order of survival since the two subsequent orders are frequently connected within the discourse.

4.2 Spearheads of Surveillance

From the viewpoint of the order of survival, global health is a matter of fighting and containing infectious disease, and linked to a language of emergency and methods of surveillance and containment (Hanrieder 2016). From this viewpoint, CHWs are valuable insofar as they improve the control of infectious diseases by collecting data from places that historically have been unexplored. In the articles analyzed, this value is explicated as CHWs' omnipresence and access to hard-to-reach communities, combined with the benefit of mHealth tools for constant monitoring. CHWs, equipped with mHealth devices, can enhance epidemiological surveillance and outbreak alert, allowing faster tracking of outbreaks and hotspots of communicable diseases. Thus, a particular focus of many studies was the ability of the tools to help CHWs in data gathering and real-time monitoring, with the ultimate goal of preventing and/or limiting outbreaks. Some articles mentioned the use of Global Positioning System (GPS) technology in mHealth:

Communicable disease incidence can also be explored on an aggregate level across locations. For example, if the CHWs were collecting sickness data at a household level with GPS, it would be possible to map the incidence of sickness to look for hot spots. Even if GPS is not used, the data could still be mapped by CHW catchment area. (Derenzi et al. 2011, 415)

Another important benefit mentioned was the ability to improve data precision by the ability of the tool to reduce errors and time spent during data collection, allowing a real-time monitoring of people:

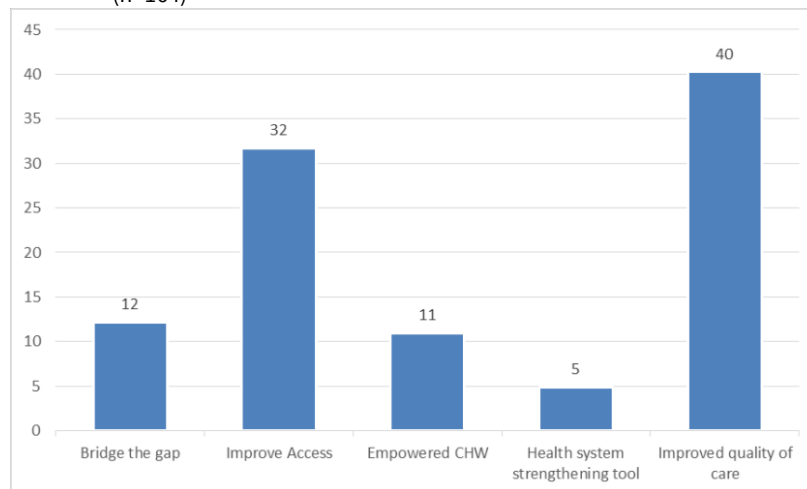
Capturing data immediately from the field avoids the delay of using paper records that are later entered by a data-entry clerk. This enables data to be aggregated in real time, allowing organizations to make informed decisions and respond more promptly to needs in the field. (Derenzi et al. 2011, 415)

These quotes illustrate that digitalization is used to enhance the role of CHWs as frontline agents in the fight against infectious disease. They connect peripheral zones with transnational data hubs and thus become important sources of health security intelligence.

4.3 Promoters of Health Equity

Human rights and equity arguments are omnipresent in the global health discourse, as well as in the discourse about CHW digitalization. We found these principles invoked through portrayals of mHealth tools for CHWs as equity enhancers. Codes related to the theme of fairness were the most frequent in the dataset (figure 1). From the data, five codes emerged as the main references to equity: Bridging the gap, improving access, empowering CHWs, improving quality of care, and health system strengthening. As summarized in figure 2, 40% of the articles stated that the mHealth tool will improve the quality of care provided by CHWs, 32% referred the capacity of the tools to improve access to health, 11 % discussed the ability of mHealth tools to empower CHWs – who, as members of the community, are considered to make the health system more responsive to community members – and finally, 12% discussed the ability of the workers to bridge the gap between the communities and the formal health system and how mHealth could enhance equity as well.

Figure 2 Percentage of the Frequency of the Codes within the Order of Fairness (n=164)



The “mobile” nature of CHWs and mHealth is valued as a means to improve health coverage and thus health equity, particularly in the peripheries:

The use of mobile technology by CHWs to improve healthcare services has intuitive appeal. mHealth tools enable CHWs to provide health services far from the clinical setting, in remote areas, and among hard to reach communities. Under this decentralized approach to service provision, health care can become more accessible to patients due to reduced time and expense of travel [...] and due to the ability to seek out patients who are the targets of stigma and discrimination [...]. (Braun et al. 2013, 2)

In addition, mHealth tools are valued for improving the quality of care through standardization:

mHealth initiatives that incorporate point-of-care decision support tools with automated algorithm- or rule-based instructions help ensure quality of care in these task-shifting scenarios by prompting frontline health workers to follow defined guidelines. (Agarwal et al. 2015, 1003)

The dominance of the fairness concern for equitable and good quality care echoes decades-old moral aspirations of community medicine, aspirations which through the CHW have found a new outlet in the global health discourse. This observation is remarkable given that most sociology-of-knowledge-oriented studies of global health highlight how international institutions spread economism (Elbe 2009; Sridhar 2008). The emphasis on equity is certainly related to the resurgence of human rights language in the public and global health domain (McInnes et al. 2014). Over the last 20 years, there has been an extensive debate over the use of moral values and human rights as guides for health policies and practices, ensuring that they are not discriminatory, coercive, or undemocratic (Farmer 2005). The health-related goals for the 2030 agenda of sustainable development and the premise to “leave no one behind” (UNDP 2018) underline this agenda. The incorporation of universal health coverage (UHC) in the SDGs (target 3.8) necessitated the development of new strategies to improve health care access, especially in the Global South (WHO 2016). As we examined, CHWs and mHealth tools are valorized by public health protagonists for their ability to improve access to health services, especially in remote and underserved areas. Both are formulated as “equity implementers” and as connectors between health systems and communities (Agarwal et al. 2016). Yet, this observation needs to be qualified to some extent when looking at the co-occurrence of equity language with references to economic efficiency.

4.4 Cost-Effective Service Providers

Next to equity, much of the global health debate oscillates around the problem of resource scarcity and the need for cost containment. The CHW debate illustrates how global health protagonists aim to reconcile this concern with the fairness considerations that are so prominent within the CHW debate. The article contained varied references to the value of optimizing economic productivity by achieving the promotion of economic development and the

consideration of economic scarcity when implementing health solutions. Therefore, CHWs and mHealth tools are praised from the viewpoint of the order of production because both enhance economic development in resource-poor communities and are affordable interventions. The CHW digitalization is considered a “smart choice” and an “investment.” Most importantly in this context, many articles stressed the capacity of mHealth tools to improve CHWs’ work performance:

In my view, this phone will help to bring about better understanding between the bosses and workers because it will be like a spy to establish that this employee is working. I think it will improve the working relationship between employer and the employee. (Chang et al. 2013, 877)

Furthermore, the literature is very explicit in mentioning the mHealth benefit of cost saving and emphasizes how important this benefit is within a resource-scarce context such as the Global South. The ability to save time as well as decreasing expenditure is highlighted: “FHWs reported reduction in time and money consumption with their experience with mHealth interventions [...]” (Aamir et al. 2018, 94).⁷

Notably, the two orders of fairness and production were often mentioned jointly in the articles investigated. This indicates an emerging interpretation of CHW digitalization as a top technology for achieving “good health at low cost,” finding that the global health discourse seeks to satisfy several moral concerns and therefore must draw from different elements: “Mobile health interventions can target all three of these factors - access, quality, and experience - leading to improvements in health outcomes [...]” (Kaphle et al. 2015, 2).

The scholarly narrative highlights the trade-offs between the order of fairness and production: “mHealth can be used by health care workers in LMICs to improve affordability of interventions for health promotion, increase health education, and address disease prevention [...]” (Amoakoh-Coleman et al. 2016, 2).

However, the articles do not mention or discuss potential conflicts between both aims, for example when collective efficiency clashes with distributional justice. It thus seems that the CHW discourse complies with assumptions that health budgets cannot be increased but need to be managed efficiently. This leaves space for considerable struggle and conflict in the implementation of specific interventions and bears the potential to mobilize different groups of actors with competing priorities.

⁷ FHWs (Frontline Health Workers): are those who deliver health care and services to communities on the frontlines. FHWs typically work and live within the community and may include CHWs in their definition (Agarwal et al. 2016).

5. Negotiating the Domestic Sphere of Gender and Privacy

From various angles, sociologists of health and medicine have highlighted that medicine provokes critique and resistance, because it is perceived as intruding into intimate spheres of the self and domestic orders of family and companionship. This critique is present both in global health debates (Hanrieder 2016) and in recent discussions about digital devices in medicine (Cappel and Kappler 2019). At the same time, medicine cannot do without engaging with things considered private, be it bodily intimacy, family relationships, or lifestyle. It thus touches on elements of what Boltanski and Thévenot (2006) described as inspired as well as domestic forms of worth (Da Silva 2018; Bati-foulier et al. 2018). This also holds for CHWs, of course, given that their community-base is a core characteristic of this workforce. How then does the discourse of privacy and the debate about the social life of medicine play out in debates about CHW digitalization?

Our analysis yields that references to privacy are usually invoked as critical remarks that seek to set limits to the use of mHealth tools. Notably, we found that these remarks had a paternalistic component. There was a common perception that in rural communities from the global south, privacy ownership was not considered relevant. CHWs and the communities they serve are seen to be unaware of potential problems: “The potential intrusiveness of this technology for both the CHW and the mother or family being supported and monitored is unlikely to be appreciated by either the CHW or the family” (Tomlinson et al. 2013, 10).

This narrative brings to mind the colonial roots of global health and how global health research is enabled by these structural colonial legacies (Brisbois and Plamondon 2018). This legacy is echoed by the way in which researchers from Euro-America impose their priorities and implement technology under their own preconceptions of privacy. Our result illustrates the necessity of a participatory approach by the developers of the technology as well as researchers. As Pinto et al. (2013, 12) noted, “it is precisely because global health [...] has emerged from a history of colonialism and imperialism that we must be mindful of how this legacy influences relationships between communities and organizations.”

Another notable point of debate is the impact of digitalization on gender relationships, given that most CHWs are female (George et al. 2018). Several articles stressed that technology in general, and mHealth specifically, might reinforce culturally-entrenched power roles and gender-based dynamics:

In the social, political and cultural context of the developing countries, there is a need to constantly check the dynamic nature of gender roles and relations within mHealth initiatives [...], especially where gender divide for

ownership and usage of mobile phone is already well established [...].
(Aamir et al. 2018, 96)

Global health policies formulate community based-programs as a way to empower women and to achieve greater gender equity within their communities (WHO 2018). Yet in patriarchal contexts, female CHWs' cellular phone ownership and use can meet with opposition by their partners, who traditionally control household resources (Hackett et al. 2018). This problem appears not to be transferable to male CHWs: "Women's concerns regarding mobile phone ownership and who controls access to its contents did not apply to male CHWs; these perceptions only emerged with reference to females [...]" (Hackett et al. 2018, 195).

Despite the importance and persistence of these topics in the modern narrative, very few studies in the health realm examine the effects of mHealth on gender and power dynamics (Sinha and Schryer-Roy 2018). Recent studies suggest that mHealth tools can influence the interactions between men and women in various ways (Jennings and Gagliardi 2013). The analysis and evidence establish that the tools have potential to shift gender roles by empowering women through improvements in knowledge, decision-making, and economic status (Jennings and Gagliardi 2013; George et al. 2018). Conversely, some mHealth interventions have been shown to exacerbate gender inequalities by reinforcing existing power differentials, hence enabling existing gendered context and possibly creating new ones (Jennings and Gagliardi 2013). Negotiating and navigating these norms and values to ensure that mHealth tools for CHWs initiatives address local systems, processes, and realities is clearly very important.

6. Conclusion

As new digital technologies set out to revolutionize one of the most celebrated pillars of global health – community medicine – the debate about the values and pitfalls of digital tools is just at its beginnings. By reconstructing this intensifying debate, we also get a glance into the contemporary moral economy of global health. Next to the ever-present security discourse about outbreak surveillance and control, the field of community medicine also uncovers ongoing attempts at reconciling equity and economic concerns: in other words, achieving good health at low cost.

Future studies should explore in more depth how this compromise between a fairness- and an efficiency-oriented global health regime is achieved as well as the potential contradictions arising from it. Put differently, the slogan could not only be "good health at low cost," but rather "good health at whose cost?"

Regarding this connection, we especially recommend further work on post-colonial and feminist approaches to CHW digitalization. Our observation of a paternalistic imposition of privacy norms calls for greater engagement with the actual meaning and operation of the privacy norm in target communities. Likewise, the debates about the ambiguous effects of digitalization on gender relationships invite further investigations of the ways in which digital CHW technologies re-articulate extant power structures in the “domestic sphere.” Finally, further work could involve further understanding of how the data captured by mHealth tools is utilized and whether it meets the needs it has been directed to meet. Thus far, there has been a focus on individuals’ data; yet, there is a need to also look at the collective data gathered (big data) and consider how big data is becoming an influential factor for health policy and forming a new basis of evidence in modern life.

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Appendix: Methodology of Content Analysis of Academic Literature about the Use of mHealth Tools for CHWs in the Global South

In order to explore the values of mHealth tools for CHWs in the Global South, an electronic literature search was applied on the October 4, 2018, in two databases: OVID-Medline and OVID-Embase. Truncations, wildcards, Boolean operators, and Medical Subjects Heading (MeSH) were employed to search through these databases. The grey literature search was done by searching in a key Internet-based database in the October 2, 2018: www.mhealthevidence.org.⁸ The following search strategy, terms, and corresponding MeSH terms were applied for OVID/EBSCOhost databases:

(e?health OR m?health OR Telemedicine OR mobile application OR mobile communication OR Computers, Handheld OR Cell Phone OR Text Messaging OR Smartphone\$ OR Social media) AND (Community Health Worker OR promotora* OR Lay health advisor* OR link worker*).

For the grey literature search: mhealth, mobile communication, mobile technology, smart phone, social media, and community health worker.

Sample Criteria

The sample criteria included literature which explicitly mentions the effects of mHealth tools used by CHWs. First, the definition of CHWs used for the study was in accordance to the WHO's definition:

community health workers should be members of the communities where they work, should be selected by the communities, should be answerable to the communities for their activities, should be supported by the health system but not necessarily a part of its organization, and have shorter training than professional workers. (Lehmann and Sanders 2007, 2)

Second, the sample only included peer-reviewed journals, given that the aim of the research was to analyze scholarly discourse in the medical and global health field.

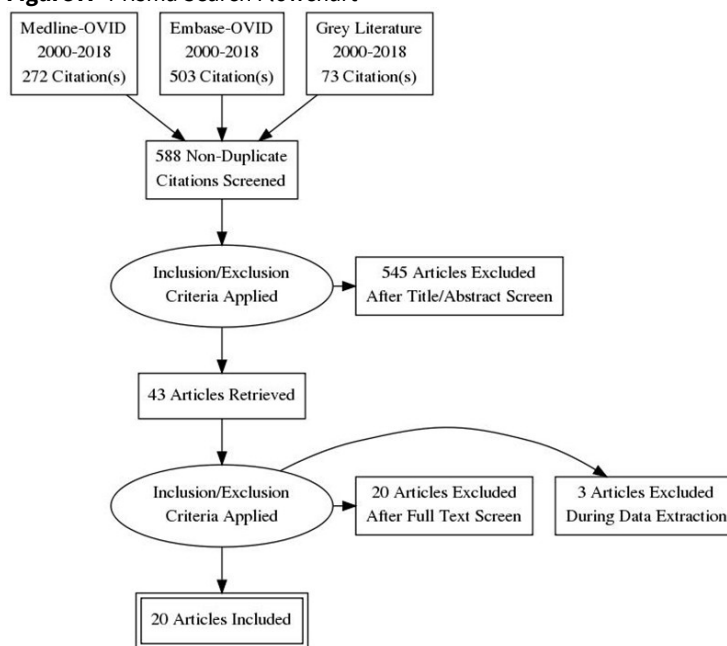
⁸ As of March 2021, this page no longer exists. However, it can be found via web.archive.org at <https://web.archive.org/web/20180602094441/https://www.mhealthevidence.org/> (Accessed March 2, 2021).

The sample excluded studies using interventions based on the use of fixed-line Internet or standard telephone lines, as well as interventions labelled “mobile” that did not involve cell phones, for example mobile clinics. Also excluded were protocols of RCT and protocols of systematic reviews, because they did not contain any results. Finally, studies executed in developed countries were excluded from the database, as the focus of this thesis is on the Global South, emerging from transnational and post-colonial studies and refers to “developing countries” (Parnell and Oldfield 2014).

Data Collection

All results yielded by the electronic search (n=848) were imported into a reference manager (EndNote X8). The title and abstracts of the articles were read by a single reviewer and all duplicates were removed. Following initial screening based on the content according to the inclusion and exclusion criteria, 43 articles were kept. All papers that could be accessed were downloaded for full reading. The final selection included 20 articles. Among the 23 remaining articles, 2 were not included due to language, 14 were inaccessible, and 7 were not relevant to the topic. Figure A shows a PRISMA search flowchart summarizing the selection process (Moher et al. 2015; Liberati et al. 2009).

Figure A Prisma Search Flowchart



Data Analysis

The method of analysis was based on a deductive-inductive approach. The creation of codes emerged from the raw data (Neuendorf 2002) and were based the theoretical framework. The unit of analysis was the entirety of each article and the dataset was coded using MAXQDA2018 (version 18, by VERBI GmbH). One researcher (EM) coded the database and held regular meetings to review codes with the second researcher (TH) and discuss possible discrepancies until consensus was reached. The codebook was created after reading seven papers which represent approximately 30 % of the database due to saturation of the data. The final codebook was applied to the entire dataset by the first participant; the second participant was consulted during the entire process.

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