

Fit for purpose? Assessing the accessibility, theory of action, and accountability of digital technology interventions for sexual and gender-based violence prevention and response

Abstract: This paper presents the results of a scoping review of Information and Communications Technologies for Development (ICT4D) interventions designed to address sexual and gender-based violence (SGBV). Our analysis considers the extent to which these ICT4D interventions align with established strategies for preventing and responding to SGBV from gender equality and global health practitioner communities. Using a feminist lens, we propose three parameters against which design features of digitally-based SGBV interventions should be assessed: (1) accessibility, (2) theory of action, and (3) accountability. Reading the intervention landscape through these parameters, our results indicate that ICT interventions to address SGBV deploy creative use of various technologies, from mapping software to social networks and document storage. That said, we also find significant scope for improving the accessibility of existing interventions through use of features that remove literacy barriers. Our findings p around the accountability of interventions highlight the need for far greater engagement with emerging conceptualizations of data rights. Finally, we show that existing theories of action are only partially aligned with “offline” best practices.

Key Words: sexual violence, gender-based violence, ICT4D, digital technology, accountability

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Introduction

In recent years, developers, non-governmental organizations, and donors have taken increasing interest in leveraging digital technologies (Information and Communications Technologies for Development, ICT4D) to prevent and respond to sexual and gender-based violence (SGBV) in various high, middle, and low-income contexts, as well during humanitarian crises. In this article we propose that there are good reasons to consider the extent to which existing digital interventions align with best practices related to SGBV prevention and response established in practitioner communities (Jewkes & Dartnall, 2019; Eisenhut et al., 2020), as well as some guiding feminist principles of development. This line of inquiry is motivated by prior research demonstrating that even seemingly straightforward, measurable development interventions can have unintended consequences and hidden costs for intended beneficiaries, and these can be obscured in routine program evaluations insensitive to gender dynamics (Cookson, 2018). Moreover, the sensitive nature of SGBV and the specific vulnerabilities of the intended beneficiaries of digital interventions in this space makes this analysis particularly important. This is especially true given a history of ICT4D programming that over-promises and under-delivers in ways that are even more pronounced than the lifecourse of other ‘magic bullet’ development strategies (Heeks, 2010, pp. 629).

This paper contributes to addressing this knowledge gap by presenting the results of a scoping review of 61 digital interventions designed to prevent and respond to SGBV. Rather than focusing on in-depth evaluations of each intervention, we engage in a landscape scan and typology exercise to generate a picture of the state of the ICT4D for SGBV ‘field of practice’ in relation to pre-existing strategies for SGBV prevention and response. In doing so, our analysis

seeks to answer the following question: *to what extent is the ICT for SGBV field of practice aligned with established feminist thought regarding SGBV prevention and response, particularly in development contexts?*

Our analytical framework draws upon a central body of feminist scholarship and development practice: namely, the established strategies for preventing and responding to SGBV generated by gender equality and global health practitioner communities (e.g., WHO, 2012; WHO, 2019), which we outline below. While we locate our study as relevant to the theory and practice of development, we include digital interventions across low, middle, and high-income countries because the perpetration of SGBV exists in all countries. Drawing on the established prevention and response strategies, we establish three overarching parameters against which the *design features* of digitally-based SGBV interventions should be assessed: (1) accessibility (what are the digital and literacy requirements of ICT4D interventions?); (2) theory of action (which SGBV prevention or response strategies do the interventions pursue?); and (3) accountability (do the interventions address basic tenets of digital privacy and feminist data governance, and specifically, seek consent for data use?).

Our analysis of the existing ICT interventions to address SGBV indicates a creative use of various technologies, from mapping software to social networks and document storage. In theory, this should facilitate a variety of actions to prevent and respond to violence, which suggests at least some amount of coherence with consensus in “offline” SGBV prevention and response that preventing and responding to SGBV requires a range of complementary and overlapping strategies (WHO 2019). At the same time, we find that greater attention is warranted

to the accessibility and accountability design features of digitally-enabled SGBV interventions. Existing design shortfalls are not insurmountable; we suggest that participatory design approaches (see Holeman and Kane 2020) may provide a practical pathway to improving accessibility and accountability features. While not prescriptive of the entire field, we also see potential for greater alignment with established good practice strategies for SGBV prevention and response, particularly with a view to avoiding the reinforcement of gender *unequal* dynamics, such as resting responsibility for violence prevention on the shoulders of individual women. We end by outlining our recommendations for existing and future developers and funders of technologies to address SGBV, and pointing to directions for future research.

Addressing SGBV with Digital Technology: engaging with SGBV best practice and feminist ICT4D critique

The problem

Sexual and gender-based violence (SGBV) refers to any act of sexual, physical, emotional, or psychological violence or coercion, the perpetration of which is grounded in gender and related inequalities and relations of power (UNGA, 1993). An accurate understanding of the global scope of SGBV is made difficult by the sensitivity of the subject matter, which results in underreporting. Moreover, data collection on SGBV is limited by methodological, political, and financing gaps (Fuentes and Cookson, 2019). Despite these limitations, it is widely recognized that partner/family- and non-partner/family-related SGBV occurs in every country in the world, and that millions of women and girls are affected (UN Women, 2019). The World Health

Organization estimates that over the course of their lives, approximately 30 per cent of women globally who have ever been in a relationship have experienced some form of SGBV perpetrated by an intimate partner (WHO, 2013).

Best practices for addressing the problem “offline”

There is no magic bullet approach to preventing or responding to SGBV. Articulating a generalized set of effective standards that work irrespective of context can prove difficult (Bott et al., 2005), because generalized ‘transnational’ strategies to address SGBV are ultimately reshaped by priorities, actors, and resources at the local level in ways that impact on intended outcomes (Wies & Haldane, 2011). Still, there is high-level agreement among practitioners (WHO, 2012; WHO, 2019) that preventing and responding to SGBV requires a range of complementary and overlapping strategies that at their core seek to prioritize the immediate safety and well-being of survivors and those at risk of (re)victimization, and, in the longer-term, to address the root causes of SGBV that undercut women and girls’ rights to enjoy lives free from violence.

In recent years, international organizations have leveraged evidence produced by SGBV researchers, practitioners, and networks and consortiums operating in vastly different country and regional contexts to aggregate a set of frameworks for action in effective SGBV prevention and response (see SVRI, 2022). The *Framework to Underpin Action to Prevention Violence Against Women* (2015, produced by UN Women in partnership with the WHO, ILO, and UNDP, among others) and the Respect Framework that builds upon it (UN Women et al., 2020) are two

such examples of efforts to aggregate contemporary knowledge and practice. These frameworks emphasize that siloed, “once off” approaches are less effective than multi-sector, holistic approaches that seek to generate a network of potential support for victims/survivors that includes a range of services and resources, not all of which are explicitly related to SGBV. The emphasis on complementary and overlapping strategies is also present in the *What Works* framework for violence prevention and response, which also draws on a cross-regional evidence base. In this framework, Jewkes et al (2020) contend that the most effective interventions are “[b]ased on theories of gender and social empowerment that *view behavior change as a collective rather than solely individual process*” (2020, p. 4, emphasis added). This means that in practice, we should expect SGBV prevention and response strategies to spread the responsibility for addressing SGBV across various actors, rather than locating it on the shoulders of individual women.

Addressing SGBV through digital technologies

The above frameworks and the strategies and principles they encompass were largely developed in light of “offline” policy, advocacy, and service provision. In recent years, efforts to leverage digital technology to respond to violence against women have become more common. Emerging studies of such digital interventions, however, call into question the extent to which ICT-based tools can deliver on preventing and responding to SGBV. Eisenhut et al (2020) conducted a systematic review of ‘anti-Violence Against Women’ apps in existence between the years 2010-2018, categorizing these in terms of functionality (i.e. what do they do—educate, send alerts in an emergency, etc). They found that most apps seek to provide ‘once-off’ support in an emergency

or to help women avoid potentially violent situations. The authors of the study further noted the striking paucity of studies on these interventions given their observed eight-fold increase in the number of interventions on the market during their study period (p. 5). They also called for further research investigating the utility of these apps “in the context of already existing traditional intervention strategies,” such as those we discussed above. In an assessment of whether personal safety apps actually “make us safer”, Maxwell et al. (2020) found that while these technologies may reduce fear of crime, they do not necessarily reduce people’s vulnerability to victimization. White and McMillan’s study of anti-rape technologies also comes to the conclusion that these can have negative unintended consequences, that may serve to “privatize and atomize the problem of sexual violence” – that is, rely on a woman’s individual judgement and ability to act or turn on a device when in a potentially dangerous situation – rather than tackle the root causes of SGBV more broadly (2019, pp. 1137). A study among female college students in the United States found that they believed that their mobile phones were weapons of self-defense or protection, a belief that altered perceptions of their social environment vis-à-vis personal safety in a potentially detrimental way (Cumiskey and Brewster 2012, pp. 591).

Why do such gaps exist between what digital tools promise in relation to SGBV prevention and response, and what they actually deliver? The answer to this question may lie in part with the assumptions driving the design of the tools. Scholarly inquiry into the design and uptake of digital interventions has been particularly robust in development contexts, where a prevalent assumption is that ICTs inherently hold the power to unleash social, economic, and political progress, not least for women, and especially in places where the digital divide has yet to be

bridged (O'Donnell & Sweetman 2018, pp. 219; see also Abu-Shanab and Al-Jamal, 2015). ICTs have been deeply important tools in furthering global development goals, including for example the delivery of community-based maternal healthcare in hard to reach places (Philbrick, 2015), enabling more gender-inclusive agriculture (Mittal, 2016), and enhancing women's access to financial resources (e.g. Suri and Jack, 2016). In recent years, however, feminist scholars—among others—have raised important questions about whether we can assume that “mobile access leads to – or even contributes to – empowerment” (Bailur et al., 2018, pp. 95). They note, for example, that quantitative data about women's access to digital devices, or about the number of digital interventions designed to ensure women's safety, tell us very little about whether and how women are able to use them (O'Donnell & Sweetman, 2018, pp. 218). On this basis, feminist scholars push us to interrogate the nexus between gender, technology, and development, including by asking “what ‘empowerment’ through technology means for women and how it might be achieved” (Bailur et al., 2018, pp. 97).

Broadly-speaking, feminist development scholars conceptualize empowerment as a complex process of gaining agency and, in turn, being able to exercise that agency through purposeful decision-making that leads to tangible improvements in women's lives in the short and long-term (Kabeer, 2005). Kabeer's work on empowerment and agency informs Hussain and Amin's (2018) exploration of the relative value of ICTs for improving, or even transforming, women's lives in Afghanistan. Their analysis draws primarily upon Tongia et al's (2005, pp. 29) ‘4As’ framework: awareness, availability, accessibility, and affordability. These interrelated factors shed light on whether people know about a digital intervention, are open to using it, have access to the required hardware and software, their literacy and e-literacy levels, and whether they have

sufficient income to use the intervention (for a case in Uganda, see Abima et al., 2021). Drawing on Kabeer, Hussain and Amin add another “A” to the framework: agency. Sharing the concerns of Bailur et al. (2018) that “a growth in female ICT users does not automatically imply significant changes in women’s lives” (ibid., pp. 253), they investigate whether ICTs enhance women’s agency understood as the ability to control resources in order to make one’s own choices. For Hussain and Amin, ICTs *can* be resources that have the potential to enhance and expand agency. Thus, any feminist assessment of whether ICTs are fit for purpose needs to go beyond questions of access, to also consider whether they are “appropriate for the purposes to which women need to put them” (ibid., pp. 252). It is also important to note that “digital access is not a binary” (Roberts and Hernandez, 2019). Drawing upon research on digital forms of political participation in the Philippines, Roberts and Hernandez (2019) remind us that there are “multiple classes” of digital access, and that it is essential to move beyond merely technical explanatory frameworks (e.g., lack of ownership over a mobile phone, or lack of internet connectivity) to understand (and ultimately, overcome) the barriers to digital inclusion. Their framework also highlights the importance of the abilities (their fifth “A”) of the envisioned end-user; this concepts trains our attention on questions around digital literacy, ie. Who can actually make effective use of this tool?

Drawing on our own experiences as researchers, practitioners, and activists working in the “gender data for development” space, we propose that yet another “A” be added to this useful prior work: accountability. This is certainly not a new area of focus. Feminist scholars in gender and development have been grappling with the concept of accountability for decades now, often honing in on the governance and management of development initiatives (see Goetz, 1995).

Much of this literature directs analytical attention to the question of interests (see Kabeer, 1994): namely, whose interests are being served by a particular development organization, initiative or process? Whose perspectives or interpretations of peoples’ needs are shaping decision-making? Who is answering to who? These lines of interrogation remain highly relevant to the ICT4D space, and certainly for initiatives that envision women– and particularly victim-survivors of SGBV– as their primary beneficiaries. For the purposes of this paper,¹ we conceptualize accountability in terms of being responsible for, or answerable to, the digital privacy of users in the data collection and processing practices of any given ICT4D intervention. This includes data-related activities and processes such as collecting personally identifiable information, data retention and storage, data sharing, obtaining (or not) user consent, among others. Internationally agreed upon frameworks for data privacy and governance are nascent (see ESOMAR, 2017; European Union, 2018). Critiquing the unregulated and often unethical practices of the profitable global market in menstrual apps, Gurumurthy and Chami (2022) make a compelling argument for a “feminist vision of data sovereignty” that “ensure[s] that subjects not only have the right to dignity, privacy, and personal autonomy – corporeal and datafied – and the right to be represented in decisions about their data, but also the right to collectively determine how the social commons of data are preserved and promoted for ‘public value and public benefit’ (Prainsack 2019)” (p. 7). A widely-accepted feminist conceptualization of data privacy and governance is even further from being fully materialized than any international norms, although progress is being made (see D’Ignazio & Klein, 2020). As a burgeoning body of literature on technology and accountability makes clear (see Gigler & Bailur, 2014), however, the questions

¹ In a forthcoming paper, we go beyond data collection and processes practices, examining the accountability pillar as it relates to the design and implementation practices associated with service and information provision in ICT-SGBV initiatives.

around “feedback loops”-- for example, do those with (more) power, e.g., donors, designers and implementers of ICT4D projects, meaningfully listen and iterate in response to the voices and perspectives of those with less, e.g., the women beneficiaries/end-users?— are largely similar to the ones that were being posed by feminists in the field of gender and development decades ago, but they have moved into a new digital terrain. As Bailur & Gigler (2014, pp. 7) highlight, just as ICT’s are a potential tool for empowerment, they have a potential role in fostering greater accountability. Again, the questions that need asking are: whose interests are being served? who is answering to who? When it comes to design features related to data collection and processing practices, are the developers of an ICT-SGBV initiative answering primarily to the perspectives and interests of those funding or implementing the initiative, who might be incentivized to collect more data, or to those who use the tool (and whose data is being collected)?

This paper assesses the ‘state of the field’ regarding ICT interventions to address SGBV. We do so in two ways: 1) we inductively identify patterns in the features of existing interventions and the strategies to address SGBV they deploy (theory of action); and 2) we analyze these patterns in light of the research and practitioner principles discussed above—including both strategies for “offline” work to address SGBV, as well as the conceptual tools and considerations emanating from feminist scholarship on gender, development, and technology. In regards to the latter, we seek to contribute to answering Eisenhut et al’s (2020) call for further research that both addresses data privacy issues, and considers digital interventions in light of existing “offline” SGBV prevention and response strategies. To be clear, we do not evaluate the effectiveness of each existing intervention (see the Methods section below). Rather, our aim in this exercise is to

generate insights into the design choices characterizing this field of practice, and the extent to which these may or may not result in interventions that are ‘fit for purpose.’

We have a particular interest in understanding whether and how ICTs for SGBV can be fit for purpose. This is due to our positions as academic-practitioners and developers of *Cosas de Mujeres* (see Zulver et al, 2021), which we developed to address SGBV amidst a worsening humanitarian and migration crisis at the Colombia-Venezuela border (see Zulver & Idler, 2020). We include our own intervention as one of the 61 analyzed in this paper.

Methods

In order to generate a landscape picture of existing interventions to address SGBV, we conducted a scoping review. Scoping reviews are used to assess the “extent, range, and nature” of research and literature on a given topic, as well as to identify any existing gaps (Arksey & O’Malley, 2005). We chose this approach because it is amenable to practice-oriented research: scoping reviews generate understanding of “key concepts, theories and sources of evidence as a means of guiding new innovations, empirical research or systematic reviews, and informing policymakers” (Holeman et al., 2016).

Our scoping review included the following steps. First, we undertook a phased keyword search (see Table 1) to identify digital interventions that address SGBV via Google searches, Google Scholar, academic databases (EBSCO, Proquest, and JSTOR), and our own professional knowledge and networks. The keywords we used enabled us to identify a variety of ICTs that address different types of violence. Initially, searches consisted of “violence against women”,

“gender-based violence”, “sexual assault” and “sexual violence”. We found that this language tended to identify ICTs oriented towards street-based violence or violence committed by strangers. In order to ensure that violence experienced in both private and public settings was accounted for in this study, we began an additional phase of searches using the terms “domestic violence/abuse”, “dating violence” and “intimate partner violence”. Our searches yielded 78 results, of which 36 met our inclusion criteria (n=36). Peer-reviewed articles and studies accessed via Google Scholar and academic databases yielded 52, of which 18 met our inclusion criteria (n=18). Personal knowledge of SGBV-related ICT4D interventions yielded four (n=4), and peer recommendations yielded five, of which three met our inclusion criteria (n=3). In total, our scoping review identified 138 digital technologies, 61 of which were included in our study.²

Using the keywords from both Phase 1 and 2, we also conducted an interdisciplinary landscape scan for existing literature related to ICTs and SGBV. In order to develop our analytical framework, we reviewed SGBV digital technologies, foundational literature for developing effective non-technology-based SGBV interventions, and literature regarding ICT4D initiatives, as well as the attendant feminist critiques and frameworks. This approach enabled us to better understand the current dialogue surrounding SGBV and ICT4D, while also contributing to the development of our analytical and conceptual frameworks, as well as our continued search for digital technologies.

² Interestingly, when revising the sample of interventions a year after initial research we found that nine are no longer operational, which we see as suggestive of the impermanence of interventions in this space. Such flux could suggest ‘pilotitis’, which has been identified as a problem in the world of mHealth (see Huang et al., 2017). We posit that there are further research questions to be asked around which interventions have the most longevity and why.

We established three inclusion/exclusion criteria in order to ensure a relevant selection of interventions. First, the intervention had to address some form of SGBV. This could include SGBV that occurs at home, in the so-called “private sphere”, or in public spaces. It could be preventative of future violence, or aim to respond to an act of violence occurring in real-time. Second, the intervention had to contain a digital technology component. This could include an app, a web-based platform, a wearable technology, or use of already existing communication technology (e.g., WhatsApp, SMS, USSD, Telegram). Third, the intervention had to be currently operational. The extent to which an intervention was currently operational was determined based on whether it was available on Google Play or iTunes, had user reviews, had a functioning website, and/or if the intervention was the subject of a recent publication, peer-reviewed or otherwise. For example, an English-language personal safety app on Google Play with reviews most recently from 2014, and for which an internet search revealed no hits, was excluded. But another personal safety app that has an active website and was the subject of recent articles in Forbes and NPR was included. We recognize that these criteria are imperfect, while simultaneously acknowledging the need to flexibly ‘weed out’ the interventions that do not seem to be actively in use. Based on these three criteria, 78 interventions were excluded, leaving us with a total of 61 interventions for further analysis.

In line with processes for scoping reviews, we then began a process of categorizing the included interventions. We developed an inductive typology to make sense of the strategies or ‘theories of action’ that the interventions were designed to facilitate. A theory of action describes in concrete terms the way in which a desired outcome (such as prevention of violence or response to violence) will be (hopefully) achieved. It is the implementation mechanism for a theory of

change, which is focused on detailing an overarching logic of how change happens. We identified six such theories of action: emergency assistance social networks, self-assessment/self-learning, incident mapping, incident reporting, resource networks, and record keeping. The breakdown of the 61 interventions across these categories is depicted in Table 2 (by both primary and secondary function), and explained below. Many interventions fell into more than one category, as they provided a variety of features for users. We determined the placement of each intervention based on its primary function (as stated on the website or Google Play or App store description). For example, if an intervention was advertised as a security app which offers a panic button for emergency situations, but also offers educational content or resources for users (e.g., hotline numbers), it could potentially fall into three of our categories (Emergency Assistance Social Network; Self Assessment/Learning; and Resource Network). However, because its primary function is to enhance personal safety, it was grouped under Emergency Assistance. In order to capture interventions with multiple functions, and thus provide a more accurate reflection of the patterns— or ‘state of play’— of the field (i.e. not obfuscating attempts to include multiple and complementary functions), we also categorized by secondary functions.

Finally, in order to generate a picture of the extent to which these interventions were accountable to women's safety in terms of data privacy and governance (our “accountability” parameter), we looked at the following: 1) whether an intervention provides information about the purpose and intent of data collection; 2) whether consent is solicited to use the data collected; and 3) the presence of information regarding measures an intervention implements to ensure the security of collected data.

There are a few limitations to our approach. First, the phased key word search was conducted in English, and thus the online search generated a list of mostly English-language interventions, or interventions that had been written about in English. In order to overcome this limitation, we circulated a list of the interventions identified to expert colleagues who work in non-English languages and in a range of world regions. They directed us to five more interventions, three of which met our criteria (n=3). Second, given the intention of this research, we did not download or test these interventions ourselves, nor did we speak with individuals that had. Third, we did not evaluate these interventions for impact; we focus on features at the level of design and process, and the possible consequences of these design choices. These activities would make for substantive future research. Indeed others have evaluated specific interventions with the women who actually use them; for example, Adams et al. (2021) evaluate the Safecity platform in the context of rural India. However, given the parameters of a scoping methodology and the goal of this paper – to leverage feminist perspectives on SGBV and ICT4D to assess fitness for purpose from the perspective of design features– we focused on analyzing the design of the interventions, and categorizing the aims or intentions, as well as the digital form they take, rather than their usability or impact (though the authors are currently undertaking a separate study on the latter).

Findings

We categorized the 61 included interventions in two ways: first, by type of digital intervention (e.g., app, wearable technology, etc.), and second, by the action the intervention was designed to facilitate (e.g., reporting an incident, self-assessment, etc.).³

³ This approach to classification is distinct from that developed by Eisenhut et al. (2020), who undertook a systematic review of mobile applications addressing VAW. They found that the largest proportion of apps consisted of emergency functions, a finding that we confirm in our scoping review. Still, our approach differs in that it explicitly draws from *feminist* critiques of ICT4D and SGBV practitioner community perspectives to make sense of these interventions.

The 61 interventions we identified used a variety of technologies to prevent and respond to SGBV. Here we were interested in understanding *how* a user would access the service (mobile phone, computer, feature phone⁴, etc.), and whether there were patterns in use of specific types of software or involvement of direct human interaction, for example. We are interested in these types of design questions because different features have different implications for questions of accessibility (for example: What are the costs associated with the intervention? Are there features that accommodate varying levels of literacy?⁵) and accountability. We cross-tabulate the six categories with each interventions' technological availability, accessibility, and affordability in Table 3. Most interventions were mobile app-based (n= 34), meaning that they required users to download the software onto a mobile phone. Seven were web-based, meaning they could be used on a computer (n= 7). An additional five were both mobile app and web-based (n=5). One operated using a virtual video platform (n= 1), and one intervention used wearable technology (n=1), requiring the user to wear a bracelet.

Emergency Assistance Social Network

The most common primary feature of the digital technologies included in this study (n= 19) was a personal safety component that we call “emergency assistance social network.” The main premise of these interventions is to promote a user’s safety by alerting emergency contacts that the user has pre-designated. The alert is typically in the form of a message accompanied by the user’s GPS location. The features intended to promote users’ safety vary depending on the

⁴ A feature phone is a basic mobile phone that does not have a touch screen (like a smart-phone). They have buttons, and mainly allow for voice calls and text messaging.

⁵ The OECD uses 5 levels to measure literacy, see (OECD, 2000).

intervention, but may include: GPS location sending and tracking, audio-visual recording, calling, live streaming, SOS alerts, email, SMS/texting, voice or motion activation.

Self-Assessment/ Self-Learning

The second most common primary function of the interventions included in our review was “self-assessment/self-learning” (n=16). This category refers to educational interventions that are designed to increase users’ understanding of violence. For example, the interventions provide content that provides definitions of different types of violence, that seeks to educate users on how to differentiate between healthy and unhealthy relationships, and uses quizzes or surveys to help users assess the risk of abuse or danger in a relationship. These interventions may also provide information about resources or routes of care or justice for victims/survivors.

This category was the second most populous in terms of an intervention’s secondary function (n=7).

Incident Mapping

Mapping software was used to document violence in eight of the interventions captured in our review (n= 8). Through crowdsourcing/ self-reporting, these interventions geographically map instances of SGBV that take place in public spaces using geographic information system (GIS) software. The act of reporting violence through these interventions may require users to disclose

any of the following information: where and when the incident took place, a description of what happened, what type of incident/violence occurred (e.g., touching, catcalling, or other forms of perceived harassment), the individual's role in the incident (e.g., victim/survivor or witness), and whether or not anyone else intervened. The technology then drops a pin where the incident occurred, allowing other users of the intervention to access the report details by clicking on the pin. The data that these interventions collect and visualize are meant to be accessed and utilized by the public, whether by individuals, communities, organizations, or governments, in order to spread awareness about the prevalence of street-based violence as well as to provide the building blocks to develop data-driven strategies, solutions, and legislation for preventing and responding to SGBV. The mapping format of these interventions may also offer a safe navigation component by enabling women and individuals at risk of SGBV to identify and avoid areas in which violence has taken place.

Incident Reporting

Interventions that fall under the incident reporting category serve primarily as tools for reporting SGBV to specific authoritative entities or institutions, such as law enforcement, colleges, or community forums. These interventions provide victims/survivors with: a) a space for collective/community acknowledgement, support, and solidarity; and/or b) different approaches or options for seeking justice and/or healing. The reports also generate data that may be useful to institutions interested in identifying SGBV trends and developing victim/survivor-oriented and data-driven solutions to preventing and responding to violence. Our review captured seven interventions for which incident reporting was the primary feature (n=7).

Resource network

The resource network category includes interventions that connect users to SGBV resources, including hotlines as well as law enforcement, housing, medical, mental or emotional health, or legal services. Interventions in this category are centered on facilitating access to key information and services for victims/survivors. Our review captured eight interventions for which providing a resource network was the primary function.

Interestingly, while only eight interventions had Resource Network as a primary function, 23 had this category as a secondary function, often in conjunction with Self-Assessment (n=7).

Record Keeping

Interventions that enable record keeping enable the victim/survivor to document acts of violence for future personal use, such as for pursuing legal action. Interventions in this category are intended to provide a centralized and secure place to store evidence of abuse, typically consisting of an assortment of features, such as a diary or note taking, audio-visual recording/camera, or contact information for key resources, including hotlines, connection to law enforcement, lawyers, or mental health workers. We captured three interventions for which record keeping was the primary function.

Discussion: Assessing Accessibility, Theory of Action, and Accountability

To what extent are the available ICT for SGBV interventions ‘fit for purpose’? Drawing on the scholarly and practitioner work cited above, we analyzed the available interventions using an analytical framework that accounts for accessibility, theory of action, and accountability.

Feminist Perspectives on ICT4D: from “accessibility” to “agency”

Interventions that address SGBV through the use of digital technology have the potential to provide a lifeline to women who have experienced violence, or are at risk of experiencing violence, because help can be as close as a mobile phone in one’s pocket. This potential is related to various factors, including both accessibility—does a woman have a phone available to her—and agency—does it enable her to make decisions and exercise power to bring about her desired outcome. We explore both of these.⁶

A prerequisite for accessibility is ownership of a mobile phone and ability to use mobile internet. While it does not make sense to critique a digital intervention based on women’s lesser access to the technology itself (smart phone, internet) relative to men—the gender digital divide—it is still worth mentioning that globally, women are still 8 percent less likely than men to own a mobile

⁶ We do not engage explicitly with the other “As” in Tongia et al.’s framework (availability, affordability and awareness). We engage implicitly with “availability” insofar as we only included interventions currently available on the market (at the time of review), although these were available for use in the US and potentially not elsewhere. We also engage implicitly with “affordability,” noting the rare occasion when the digital technology was only available for purchase. We do not engage with “awareness,” which would require qualitative methods such as interviewing or focus groups.

phone, and 20 percent less likely to use mobile internet (GSMA, 2020). Thus, the accessibility of the interventions included here are conditioned by the *status quo ante* of women's social, economic, and geographical limitations to mobile phone ownership and meaningful use. However, we also acknowledge that many marginalized women do have access to phones (with varying degrees of functionality), and thus our intention here is to discuss the importance of specific design features (e.g., including accommodating features) for interventions that require access to digital tools and technologies.

The accessibility of digital technologies is not only a question of physical access to a phone or the internet, however. We noted a lack of design considerations that make use of accommodating features (e.g., audio-visual options, pre-written messages) or alternative service access options for women who may lack smartphone access but who do have feature phone access (GSMA, 2015, 2018). 52 out of 61 interventions expected that women have a medium to high level of literacy, and 32 of these did not offer alternatives (or accommodating design features) for women with low levels of literacy. These literacy parameters can serve as barriers to access for women, rendering the tools and resources these interventions offer for SGBV prevention and responses null for women without high or medium levels of literacy. Some interventions that permit users to listen to and record voice notes, for example, facilitate accessibility.

SGBV perspective: do theories of action make use of evidence-based strategies?

International bodies like UN Women and the World Health Organization have crafted robust evidence-based protocols around SGBV prevention and response interventions in everyday “offline” life; we contend that these standards should also be reflected across digital

interventions. Moreover, we suggest that those standards need to be made more rigorous to account for the ways in which ICTs might compound existing, or create new, power inequities (O'Donnell & Sweetman, 2018). Our focus on 'theory of action' trains our attention on whether an intervention leverages and prioritizes evidence-based strategies for addressing SGBV, thus shoring up the possibility that an intervention will not only be effective but will also do no harm.

The interventions identified in our scoping review were most likely to rely on theories of action that seek to ensure safety in situations of immediate risk, mostly by alerting friends, family, or authorities of the user's whereabouts (Emergency Assistance Social Network, n=19). Of these 19 interventions, ten had no secondary function. For example, Easy Rescue (Turkey), Gwen Alert (US), IGoSafely (India), and Kitestring (worldwide) are designed so that pre-designated emergency contacts are alerted if the user does not check in at an agreed upon time, and some allow users to send pre-written messages (e.g., "I am in trouble!"). Other interventions in this category are designed to alert authorities (sometimes in addition to social circle contacts): for instance, TecSOS (UK), Positive Pathways (Australia), and Pukar (India), are directly integrated with local police emergency response systems. These interventions also rely on GPS so that emergency contacts and official responders can locate the user. As feminist and women's rights advocates have noted, digital devices of this nature tend to put the onus on women to manage their own safety (e.g., download an app, designate your safety contacts, provide your GPS location to authorities) (Shelby, 2019; White & McMillan, 2019). Indeed, such interventions may risk replicating the logic embedded in the still pervasive myth that women themselves can prevent their own sexual assaults—whether that is by avoiding being alone at night, avoiding consuming alcohol, or avoiding dressing 'inappropriately' (Shelby, 2019). The available

evidence calls into serious question whether emergency ICT-SGBV tools, such as wearable anti-rape technologies, are effective at preventing sexual assault and whether they may even increase risk, particularly when they rely on surveilling women's bodies and movements (White & McMillan, 2019).

It is also worth noting that the interventions in this category that were designed to trigger an emergency response from police and other authorities may be more fit for purpose in some contexts (where authorities are trusted by women to respond) than in others. There is compelling evidence from across low-, middle- and high-income contexts that women who are particularly vulnerable—for reasons that range from (im)migration status, ethnicity and race, disability, age, or profession—often have a deep mistrust and fear of law enforcement, often for good reason (Lichtenstein & Johnson, 2009; Wachholz & Miedema, 2009). The nature of our study meant that we were unable to gauge whether or not such dynamics were considered in the interventions captured in our review.

Theories of action that involve education and awareness about healthy relationships (relationship skill strengthening) are among those included in the practitioner frameworks discussed above (WHO, 2019). The second most populous category was Self-Assessment/Self-Learning (n=16), which includes relationship skill strengthening. The majority of the interventions in this category (n=9) explicitly identify women/young women as their target users. For example, I-DECIDE (Australia), Mi Amiga (Colombia), My Plan (US), and Sunny (Australia) provide definitions related to SGBV, exercises to help women evaluate the nature of their interpersonal relationships, and other types of safety assessments and largely self-driven problem solving

tools. But as with the interventions discussed above in the Emergency Assistance category, the majority are targeting women and girls by encouraging them to learn and reflect upon the dynamics of healthy/unhealthy relationships and to self-identify risk of SGBV. With that said, of the 16 interventions, 12 had Resource Network as a secondary function; this is a positive sign, as it highlights that developers are both helping women to learn and also providing direction in terms of connecting them with information and services that respond to and prevent SGBV. Indeed, this design feature reflects a recognition of the importance of meeting women's immediate needs (in this case, information about services), even if an intervention is also seeking to advance medium and long-term goals related to the future empowering or preventative potential of educational content. Moreover, as practitioners note, transforming attitudes and beliefs that normalize SGBV (in relationships and beyond) requires engagement with men and boys (WHO 2019). It is therefore concerning that only one intervention in this review explicitly identified men and boys as the target users (MakankFien in Egypt).

While the majority of the interventions identified in this study rely on strategies for which there is relatively little substantive evidence of effectiveness, we also found that interventions in the Resource Network and Reporting categories (both Incident mapping and Incident reporting) are integrating some promising practices that meaningfully align with SGBV prevention and response strategies established in practitioner communities, including efforts to make public environments safer for women and strategies to facilitate victims'/survivors' access to multi-sectoral services (e.g., Keesbury et al., 2012; WHO, 2019). Interventions in the Reporting categories generate data that can, in theory, be used to improve upon or create new SGBV prevention strategies or response services. For example, using GIS technology, Mapping

Reporting interventions such as Safe City (India and worldwide), My Safetipin (India, Colombia, worldwide), and HarassTracker (Lebanon) collect crowdsourced information about women's experiences with sexual harassment and other forms of street-based violence with a view to enabling women to create safer routes on their walking or public transport journeys. Certainly, these interventions again place much of the onus of SGBV prevention on women themselves (to navigate their safety by avoiding areas of high incidence); however, it is notable that they also encourage stakeholders from government and civil society to leverage the victim/survivor generated data to increase awareness of and improve responses to SGBV⁷; we see this as a potential site of best practice for feminist ICT design.

Meanwhile, a handful of interventions (n=7) in the Resource Network category are primarily designed to connect victims/survivors to SGBV services and resources. For example, Daisy (Australia), Path of Strength (UK), WRAPP (Zambia), ShelterSafe (Canada), and Meddig Mehet (Hungary) help connect users to shelters, legal advocates, psychologists, and police or emergency responders. Despite being the fifth least populous category for primary function, 23 interventions had Resource Network as a secondary function, often (n=7) in conjunction with Self-Assessment/Self-Learning. As practitioners note, SGBV victims/survivors require a host of advocacy and protection services, and the prioritization between, for example, medical or legal attention will depend on the specific case (Macy et al., 2011). Therefore, a key SGBV strategy is to ensure that women do not “fall through the cracks” of available webs of support, whether those are formal (e.g., counseling services) or informal (e.g., community support groups) (Kiss et

⁷ Whether or not ICT-generated data about SGBV is actually used by decision-makers to close gaps in SGBV service provision is a question of political will, resources, and technical capacity to use that data.

al., 2012). From this perspective, ICT-based SGBV interventions that connect women to the services and resources available to them are providing information that they might otherwise not have ready access to (a factor which should be considered when designing interventions). These types of interventions cannot ensure that women actually access the services or resources they are connected to, nor can they ensure that those services and resources are of high quality – but they can serve a very important function in terms of providing women with an entry point into the web of available support services and to access referral pathways.⁸

Accountability

Finally, we bring together feminist perspectives on ICT4D to propose an additional A: Accountability. Drawing on the nascent field of feminist data governance, and also building upon earlier feminist engagements with the concept of accountability in development, we assert that if women/ ICT4D users are not treated as subjects with rights to data privacy, informed consent, and data ownership, interventions will fall short when it comes to facilitating women's agency and empowerment.

When it comes to accountability, 39 out of the 61 interventions did not have privacy policies, making it unclear what/whether user data is being collected, what is being done with the data, and who has access to it.⁹ Twenty-two interventions did have privacy policies. Of these interventions, 14 collected personally identifiable information (PII).¹⁰ In most cases, a user's

⁸ One intervention, however (Cosas de Mujeres, Colombia) provides women with information for SGBV services while simultaneously generating anonymous data that is analyzed and fed back to the service providers, with a view to improving the accessibility and quality of these services (Ladysmith 2020).

⁹ Thirteen of these interventions did have a privacy policy on the organization or company website, but not one that specifically addressed the digital intervention.

¹⁰ Data that can be used to identify a person, such as: name, address, email address, mobile number, birthdate, mobile device identifier, IP address, national identifier, social media username, etc.

willingness to relinquish PII was a prerequisite for their use of the service, in full or in part (e.g. certain features would be made unavailable if the user did not agree to the collection of their PII). Only four interventions provided users with a choice about personal data collection, while still allowing users to fully use the intervention if they chose to opt out of sharing PII.

While some interventions expressed the purpose of the data collection on their websites, such as in the organization's mission or operational goals, only eight interventions provided explicit explanations in their privacy policies for why this data collection was necessary, and any planned uses for the data. Ten interventions stated that users have the right to request that their data is deleted (although this request may be denied), and sixteen outlined that users either have access to their data or the right to request access. Nine interventions provided information regarding data storage and/or retention. Similarly, information surrounding data privacy and security was limited. Only six interventions anonymized user data. Twelve privacy policies stated that they shared data with other entities; however, most did not specify which additional parties had access to the data and whether or not they had access to PII. Four interventions used data encryption and eleven outlined the use of other data security measures, such as passwords or firewalls.

For marginalized and at risk populations, including women at risk of SGBV, collecting PII can have major safety repercussions. For example, GPS tracking technology poses specific threats to women who are at risk of violence from controlling partners, or in the case of (im)migrant women, who may be at risk of violence by state authorities. It is therefore of utmost importance that women who choose to download or engage with a digital intervention to prevent or respond to SGBV have complete and digestible information about what data is being collected, who will

see it, and how it will be used. Even if an intervention does not collect data from users, it should still have a privacy policy which documents this in order to be clear to users. Broadly speaking, digital interventions that seek to reduce women's vulnerability to violence must also account for the role that the interventions themselves may play in creating or exacerbating insecurity and risk, and take multiple steps to mitigate this, including by empowering users to make informed decisions about their PII. Indeed, as feminist scholars in the gender and development field have long-emphasized, accountability failures are most likely to occur when the interests of the women who are meant to benefit from an initiative are either ignored, obscured, or placed secondary to the interests of donors and implementers (see Goetz, 1995, pp. 7). Framing accountability in terms of the latter stakeholders' responsibility and answerability to women beneficiaries elevates the ICT-SGBV design horizon beyond "doing no harm".

Conclusion

There is high-level agreement among experts and practitioners in the field of SGBV that standalone or "once-off" interventions are ineffective. Instead, addressing SGBV requires making use of multiple and integrated strategies that can tackle the various social, cultural, political, and economic factors that contribute to SGBV (e.g. Flood, 2018; Macy et al., 2011). ICT4D is not a magic bullet for the gender equality agenda in general, or SGBV in particular. Existing laws and policies that uphold a woman's right to live a life free from violence require implementation, and "offline" SGBV services such as shelters, preventative education, and the social protection services that shore up women's ability to leave or avoid violent situations all require adequate financing.

That said, digitally-supported interventions, when thoughtfully designed and grounded in feminist theories of change, can be important tools for raising public awareness about SGBV and connecting women to vital services. For example, to create our abovementioned intervention, *Cosas de Mujeres*, we drew on the principles of feminist human-centered design to center the voices of the migrant and host community women we were trying to connect to SGBV services. Before launching we held a series of stakeholder interviews with service providers and grassroots women's organizations, and administered a survey with migrant women to understand their levels of digital connectivity. We also hold regular user-driven feedback sessions led by our team of community social workers; this allows us to make iterations that better reflect women's expressed needs when it comes to information and service provision, including in the context of Covid-19 (Zulver et al., 2021, pp. 7). The success of the intervention relies on its ability to draw on situated knowledge, to create a balance between on- and offline engagement with users, and to pivot when women share feedback with us.¹¹

At a high-level, and across contexts, practitioners and advocates agree that SGBV victims/survivors require a range of information and support services that will vary from case to case; it is therefore encouraging to note that many of the digital interventions in our sample are indeed focusing their efforts on connecting women to essential (formal and informal) services and resources, even if not as a primary function; of the 61 interventions, we saw that eight had Resource Network as a primary function, and 23 had this as a secondary function, meaning that developers intentionally included ways for women to reach out to "real life" service providers.

¹¹ During the writing of this paper, *Cosas de Mujeres* was put on standby mode as we seek new funding.

We have suggested that being ‘fit for purpose’ also requires that interventions are ‘fit for context’ (see Abima et al., 2021) and have accounted, to the best of their ability, for the various barriers that vulnerable women may face in making use of a well-intentioned intervention. The dictum that “context matters” by itself does not “amount to a coherent alternative vision of more appropriate ICT4D design and implementation” (Holeman & Barrett, 2015). Thus, beyond a landscape scoping review, we suggest that there are broader questions to be asked about what is happening in the digital SGBV world more broadly –including in terms of design and implementation practices through which practitioners adapt these products and services to make them relevant for particular local contexts. Our review also suggests that there is more scope to align digital interventions with established, evidence-based practice for SGBV prevention and response. Finally, the fact that there is still a good deal of “grey space” when it comes to data rights and feminist approaches to data governance is not an excuse for non-action. Developers, practitioners, donors, and the researchers who support them can look to the increasing number of feminist actors defining what is required to uphold women’s rights in digital spaces.¹²

Finally, we suggest that the findings presented here have relevance for interventions in other fields of practice beyond SGBV, particularly insofar as these interventions rest on the assumption that ICT4Ds can contribute to women’s empowerment (O’Donnell & Sweetman, 2018, Bailur et al., 2018). If digital technologies are to play an effective role in SGBV prevention and response in various contexts across the globe, they will need to account for and respond to the “offline” inequalities and power relations that shape the world. Thankfully, taking such an approach will not require reinventing the wheel; strategies such as co-design and participatory

¹² See: Consentful Tech (<https://www.consentfultech.io/>); Feminist Data Manifest-No (<https://www.manifestno.com/>); FRIDA 2020.

action research – which have been thoughtfully honed over decades of work by feminist researchers, women’s movements, gender and development, and human-centered design practitioners – provide generative pathways forward. For ICTs to be useful and *used* for the purposes for which they are designed, we must figure out what meaningful collaboration looks like, and recognize that the process of designing and implementing these interventions cannot be linear nor finite. To conclude, we reiterate that while digital technologies, including those leveraged to prevent and respond to SGBV, can support broader research and advocacy efforts, it is important to remember that technologies are tools with some potential power to advance gender equality and gender justice agendas and goals, but they are not solutions in themselves.

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Table 1: Phased key word search

Phase 1	Phase 2
<p>“Gender-based violence (GBV)” “Violence against women (VAW)” “Sexual assault” “Sexual violence” “Harassment” “Anti-rape” “Prevention” “ICTs” “Digital technologies” “Apps” “Mobile apps” “ICT4D”</p>	<p>“Dating violence” “Intimate partner violence (IPV)” “Domestic violence/abuse (DV/A)” “Prevention” “ICTs” “Digital technologies” “Apps” “Mobile apps” “ICT4D”</p>

Table 2: Breakdown of interventions

Category	Number of interventions - primary function	Number of interventions - secondary function
Emergency Assistance Social Network	19	3
Self-Assessment/ Self-Learning	16	7
Incident Mapping	8	3
Incident Reporting	7	4
Resource Network	8	23
Record Keeping	3	2
N/A (no secondary function)	-	19

*Of the eight apps that are no longer available, 4 were Emergency Assistance Social Network, 3 were Self-Assessment, and 2 were Resource Network.

Table 3: Interventions' Availability, Affordability, and Accessibility

		Emergency assistance social networks	Self assessment /self learning	Mapping Reporting	Incident Reporting	Resource Network	Record Keeping
	Total = 61	19	16	8	7	8	3
Availability :	Required technology						
	Smartphone only	15	14	1	3	3	2
	Feature phone friendly only	2	0	0	0	1	0
	Computer/internet only	0	1	5	2	2	0
	smartphone & computer	2	1	2	0	1	1
	feature phone friendly & computer	0	0	0	2	1	0
Affordability :	Cost						
	Free services (ID)	13	14	1	2	2	2
	Free services (IA)	0	1	5	5	4	0
	Free services (ID)	0	1	2	0	1	0

	& IA)						
	Free (limited access)	1	0	0	0	0	0
	Free	0	0	0	0	1	0
	Fee	5	0	0	0	0	1
Accessibility :	Literacy						
	Reading & Writing*						
	no alternatives	5	10	8	4	5	0
	easy to read	0	1	0	0	0	0
	listening	0	1	0	0	0	0
	upload AV	1	1	0	1	0	3
	AV recording	2	0	0	0	0	0
	pre-written texting	1	1	0	0	0	0
	texting aid	0	1	0	0	0	0
	images	0	1	0	0	0	0
	panic button	10	3	0	0	0	0
	Accommodating Features:						
	panic button	2	0	0	0	0	0

	L&S	1	0	0	2	3	0
	verbal activation	1	0	0	0	0	0

ID = Indirect data fee
IA = Internet access fee

***Potentially of concern, is that those with lower literacy levels may be less aware of the security implications of uploading photos and video, given an inability to read privacy policies, if these exist. See the section on Accountability and digital privacy, above.**