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CASE STUDY

COMMUNICATION INFRASTRUCTURE AND COMMUNITY MOBILIZATION: THE CASE OF GRAM VAANI'S COVID-19 RESPONSE NETWORK FOR THE MARGINALIZED IN INDIA

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Abstract

In this article, we employed communication infrastructure theory (CIT) to analyze Gram Vaani's ("Voice of the Village") Covid-19 Response Network in India. We reviewed key CIT components (i.e., storytelling network and communication action context) and their applications in civic engagement, health disparities, and crisis mitigation. Our results showed that Gram Vaani's Covid-19 Response Network merged all three types of CIT application into an integrated whole and extended it to marginalized rural and migrant/resident worker communities in India. In 15 months, 870,000 individuals used the organization's Mobile Vaani platforms, made 2.5 million calls, recorded 24,880 voice reports, and shared 2,327 impact stories. Taken together, they amplified the voices of the most vulnerable, provided direct assistance, and held government agencies accountable in three major areas: health promotion and healthcare access, livelihood support and working conditions, and safety nets and essential services. We identified (1) storytelling network actors at all levels (micro, meso, interstitial, and macro), (2) enabling and constraining communication action contexts of pandemic community mobilization, and (3) specific impact pathways for different storytelling network actors to overcome barriers and leverage Mobile Vaani as an enabling and empowering communication action context. This first CIT application and articulation of pandemic community mobilization in the Global South holds important implications for better serving the needs of the marginalized and information have-nots.

Keywords: Covid-19 response, India, rural, migrant workers, Gram Vaani, Mobile Vaani, communication infrastructure theory, community mobilization

Introduction

Since the first documented case of Covid-19 on January 30, 2020 (PIB Delhi, 2020), India has reported 30 million infections and 400,000 deaths in 18 months (Roser et al., 2021). There have been two broad waves (Forbes India, 2021): The first from March 2020 to January 2021, and a second wave from March

2021 to July 2021. During the first wave, the public health response focused on creating awareness of Covid-19 prevention and management, initiating containment protocols and infrastructure for testing and tracing, and a stringent national lockdown to control transmission (Lahariya et al., 2020). The lockdown resulted in calamitous social and economic impacts (Drèze & Somanchi, 2021; Johri et al., 2021), especially for migrant workers (Stranded Workers Action Network, 2020). During the second wave, rapidly rising cases overwhelmed the health services infrastructure and the lack of timely access to beds, oxygen supplies, and supportive care led to tens of thousands of deaths (Bhuyan, 2021). While vaccinations began in January 2021, constraints on vaccine production and procurement, vaccine hesitancy and aversion, and logistics and infrastructural challenges led experts to project a date of late 2022 for a majority of the Indian population to get vaccinated (The Economist Intelligence Unit, 2021). By December 5, 2021, some 34% of eligible Indians were fully vaccinated and 58% had received one dose (Ritchie et al., 2021).

The health and socio-economic impacts of Covid-19 are marked by inequity and disparity. Access to social welfare benefits, both regular and pandemic-related, often excluded marginalized groups (Gupta et al., 2021). During the first wave, access mechanisms for most social welfare programs were digitized, and barriers resulting from the digital divide impeded access to direct cash transfers to rural residents and accountability in grievance redressal. Similar problems resurfaced during the second wave where the instituting of digital mechanisms to seek emergency health services, and the mandated use of the centralized digital platform for vaccine registration and scheduling, revealed a compelling urban and technology bias and indifference towards the underserved and digital have-nots (Katepallewar & Viswanathan, 2021).

Who, in India, was responding to these marginalized groups? One key player is Gram Vaani ("Voice of the Village"), a social technology enterprise in India that operates a federated Mobile Vaani network of voice-based participatory media platforms, especially for less-literate and low-income populations to empower the marginalized communities (Moitra et al., 2016; Moitra et al., 2018). Most platforms in this network are localized at the level of district administration with a unique phone number through which they can be accessed, while some are pan-India, focusing on specific themes – labor rights, adolescent sexual health, and others (Seth et al., 2020; Wang et al., 2020). Users can call these phone numbers free of cost from any simple mobile phone, and listen to pre-published audio messages through Gram Vaani's Interactive Voice Response (IVR) system (Wang & Singhal, 2018). The audio messages are typically 0.5 to 4-minute recordings, covering local news, health, agriculture or livelihood topics, and folk entertainment. Callers can also record questions, comment on published news, voice grievances, and request help in solving problems they face in accessing government services or other civic amenities. Gram Vaani's content moderators regularly review these voice recordings and pass informational queries to experts for answers. Citizen-reported news and opinions are published back on the platform for others to listen and comment. Requests for help are delegated to a team of 200+ community volunteers who are part of the Mobile Vaani network. Deeply committed to local development, these community volunteers hail from the same communities as the users, and draw attention of the government administration to problems faced by their communities. Grievances raised by the people are published on the Mobile Vaani platforms, serving as a social accountability mechanism for the volunteers to advocate for prompt remedial action by the government (Chakraborty, 2017).

With the onset of the first wave of Covid-19, Gram Vaani repurposed its Mobile Vaani platforms to provide immediate support to affected groups. On March 23, 2020, Gram Vaani launched a Covid-19 Response Network in growing partnerships with Civil Society Organizations (CSOs) and government departments, seeking to engage marginalized communities through the IVR system and Mobile Vaani network (Johri et al., 2021). All ground-based efforts have been documented in detail on Gram Vaani's Covid-19 Response Services page (Gram Vaani, 2021b). With public policies and mainstream media largely serving the urban residents and the digital haves, Gram Vaani's Covid-19 Response Network gives voice to the overlooked and the ignored, representing an inspiring case of pandemic community mobilization in India—i.e., a case worthy of scholarly investigation.

In this article, we employ communication infrastructure theory – a multi-level theoretical framework to understand civic engagement, health disparities, and crisis communication – to guide our investigation of Gram Vaani's Covid-19 Response Network as an effective case of pandemic community mobilization in India. We begin with a brief review of key CIT concepts and relevant

empirical studies, leading to the research questions and unique contributions of this case study. We then apply key CIT concepts to analyze the structure, operations, and IVR data of Gram Vaani's Covid-19 Response Network. Our results feature insights into how a voice-based mobile network of participatory media platforms can meet the needs of rural communities and migrant workers and provide timely support on the ground. We conclude by discussing lessons learned from our CIT case analysis and its important implications for establishing technology-enabled networks for the marginalized and information have-nots.

Literature Review

Communication Infrastructure Theory Overview

Communication infrastructure theory (CIT) is an ecological framework about communication in communities (Ball-Rokeach et al., 2001; Kim & Ball-Rokeach, 2006), and essential for understanding and improving community outreach and mobilization to facilitate civic engagement, reduce health disparities, and mitigate crisis situations (e.g., Cohen et al., 2002; Jung et al., 2013; Wilkin, 2013). While acknowledging the macro-level political, economic, and media infrastructure, CIT particularly emphasizes community-based enablers and constraints at the micro-level, the meso-level, and in between (Kim et al., 2018; Kim & Ball-Rokeach, 2006; Matsaganis et al., 2010; Matsaganis et al., 2014). Put another way, the *communication infrastructure* of a community is essentially a storytelling network set in its communication action context (Ball-Rokeach et al., 2001; Kim & Ball-Rokeach, 2006).

The *storytelling network* (STN) comprises of actors – across different levels, who can share information and tell stories about a community. Micro-level STN actors are individual members who share their lived experiences through interpersonal and/or mediated networks. Meso-level STN actors include community-based organizations and geo-ethnic media that focus their stories on a particular geography (e.g., neighborhoods) and/or a certain population group (e.g., minorities). Macro-level STN actors include governmental agencies and media institutions that broadcast stories about an entire region or country (Kim & Ball-Rokeach, 2006). Recently, CIT extended the STN to include *interstitial actors* who hold a dual identity – i.e., belonging to the same community *and* serving a local organization (Matsaganis et al., 2014). Community health workers are an example of interstitial workers – part of the community and a local health provider at the same time (Matsaganis et al., 2014; Wilkin et al., 2018). In our case, by identifying STN actors at these different levels in Gram Vaani's Covid-19 Response Network, we gain a better understanding of the roles of various stakeholders in overcoming barriers and enabling effective operations on the ground.

The *communication action context* (CAC) refers to the physical, technological, psychological, economic, and sociocultural factors that can enable and/or constrain communication among STN actors (Ball-Rokeach et al., 2001). Physical CACs can affect a community's communication capacity such as schools, parks, and libraries. Technological CACs are often part of built environments such as public transportation grid, telecommunication networks, and banking portals that may or may not be visible to community members. Psychological CACs account for the psychological attributes such as residents' perceptions about safety that is related to their engagement in their community. Economic CACs such as labor market, employment policies, and work conditions (i.e., job opportunities, hours and compensation) can motivate or prohibit members to participate in community affairs. Sociocultural CACs include ethnic heterogeneity or homogeneity, shared beliefs and values, cultural diversity, etc. (Ball-Rokeach et al., 2001). Two CAC subcategories are "comfort zones" (i.e., locations residents frequently visit) and "communication hotspots" (i.e., popular places for socialization; Wilkin et al., 2011). In our case, an identification of key enabling and/or constraining factors of CAC for pandemic community mobilization in Gram Vaani's Covid-19 Response Network, will help provide a deeper understanding of why certain operations worked well and where improvements are possible. Such an understanding can inform both strategic policy decisions and adaptive community actions.

Communication Infrastructure Theory Applications

Research insights on CIT have principally come – over two decades – from the Metamorphosis Project on multiethnic communities of the Greater Los Angeles area in the United States and other urban communities in the Global North. Further, CIT has been applied to gain deeper insights into civic engagement, health disparities, crisis communication, geo-ethnic media, globalization, and communication ecology and technologies (Metamorphosis, 2021). For our purposes of examining Covid-19 community mobilization, we highlight the most relevant CIT examples and studies regarding civic engagement, health disparities, and crisis mitigation.

In civic engagement, CIT has guided community-based collaborations to identify critical stakeholders and missing connections, assess individual members' sense of belonging and perceived collective efficacy, and facilitate evidence-based strategies and actions (Broad, 2016; Chen et al, 2018; Kim & Ball-Rokeach, 2006; Villanueva et al., 2017). CIT was employed to construct, maintain, and evaluate a community news website that served residents of Alhambra, California (Chen et al., 2012). To make local news stories more linguistically accessible and culturally relevant, the team adopted a hybrid model of professional-citizen journalism to engage STN actors. The micro-level STN actors included local residents of different cultural backgrounds, the meso-level STN actors included organizations and geo-ethnic media for Chinese, Latinx, and White residents, and the interstitial STN actors included 100+ community members, from students to local activists. A professional editor trained the community members to create original content and volunteers helped translate it into Chinese and Spanish (Chen et al., 2018). A program evaluation revealed a positively reinforcing loop between residents' civic participation and their association with the news website (Liu et al., 2018), marking the importance of utilizing specific geo-ethnic media for sustained engagement (Chen et al., 2018). Applications of CIT in civic engagement also includes programs for food justice (Board, 2016), urban planning (Villanueva et al., 2017), and commuter engagement (Jung & Kim, 2021). The Mobile Vaani platforms similarly engage STN actors who come forward voluntarily from the community to contribute local news relevant for the residents, on topics such as useful government welfare schemes, weather advisory that can benefit farmers, and community events like festivals (Moitra et al., 2016). CIT's application to describing the STN can help reveal different kinds of micro, meso, and macro relationships in the network, and especially how these networks provided valuable support for community mobilization during the pandemic.

In health promotion, CIT has been employed to formulate communication strategies to reach populations disproportionately affected by health disparities, informing the design, implementation, and monitoring of community-based interventions (e.g., Matsaganis et al., 2014; Wilkin et al., 2011; Wilkin et al., 2018). The 9-1-1 Project in Atlanta, Georgia, used CIT to locate STN actors and relevant CAC to reach 911 callers who were using emergency services for non-emergency purposes, subsequently facilitating their enrollment in suitable healthcare programs (Wilkin et al., 2011). The meso-level STN actors included neighborhood health, recreational, educational, political, and religious centers as well as local newspapers and a telephone message service. The interstitial STN actors included two community health workers, a videographer, and a residential researcher. They leveraged comfort zones and communication hotspots (e.g., local businesses, convenience stores, hair salons, and the YMCA recreational center) to distribute promotional materials and host "mini" health fairs. Barriers such as medical mistrust and lack of transportation were overcome as "hard-to-reach" residents received assistance with blood pressure monitoring and access to other healthcare services (Wilkin et al., 2011). Other CIT projects have helped to clarify the unmet needs and missing linkages in low-income communities and ethnic minority groups in order to reduce health disparities in managing chronic conditions, sexual and reproductive health, and mental health (Abril et al., 2015; Estrada et al., 2018; Matsaganis et al., 2014; Wilkin, 2013; Wilkin et al. 2010; Wilkin et al., 2018). Gram Vaani provides services in remote rural areas with similar issues with a lack of reliable information, and persistent myths and misinformation, which influences the adoption of better health practices in the community. STN actors including community health workers and self-help group networks play a vital role in behavior change communication through interpersonal interactions. Mobile Vaani platforms have also been leveraged to provide authoritative information to community members, and interactive services where community members ask questions regarding their doubts, by bringing in both external experts as well as STN actors from the community itself (Chakraborty et al., 2019). During the pandemic, the Mobile Vaani platforms were heavily used for promotion of safe health practices and to strengthen the STN network.

In crisis communication, CIT has been employed to understand how community members rely on existing communication channels to obtain relevant information, reduce uncertainty, and participate in civic actions. Crises could range from terrorist attacks and natural disasters to everyday chronic stress and long-term effects of urban riots (Cohen et al., 2002; Jung & Moro, 2014; Jung et al., 2013; Matei et al., 2001). CIT researchers found that Tokyo residents responded differently to the 2011 Great East Japan Earthquake depending on their neighborhood STN connectedness and individual internet connectedness (Jung et al., 2013). Social media facilitated communication among community members, functioned as crisis management tools for local governments and media organizations; and enabled information sharing among STN actors across levels (Jung & Moro, 2014). Digital technologies, CIT researchers have emphasized, are a crucial facilitator and catalyst for large-scale and rapid community outreach and mobilization, especially during crises (Ognyanova & Jung, 2018). In our case, Mobile Vaani represents a unique, timely, and empowering communication network in India at the time of a national public health crisis in a global pandemic. It was leveraged at scale during both waves by people to seek assistance on problems related to access to cash entitlements, food shortages, access to health treatment, vaccination scheduling, transportation, and other issues. The Mobile Vaani platform helped connect these people with STN actors such as local community volunteers, government officials, hospitals, and other stakeholders, to provide response and improve accountability in the provisioning of relief services by government agencies and other stakeholders (Johri et al., 2021).

Research Gaps and Present Study

While a majority of the CIT literature has focused on urban communities in the United States or other developed countries, there is a growing number of studies to include marginalized communities in more diverse cultural contexts such as rural residents (e.g., Abril et al., 2015; Estranda et al., 2018), migrants and immigrants (e.g., Lim et al, 2021; Kim & Kim, 2018), and disaster victims (e.g., Jung & Moro, 2014; Jung et al., 2013). In light of the ongoing Covid-19 global pandemic and our case in point, Gram Vaani's Covid-19 Response Network for community mobilization among the marginalized in India, CIT is an especially useful theoretical framework for our study of as it combines aspects of civic engagement, health disparities, and crisis communication. The STN actors connected through the Mobile Vaani platforms provided assistance to the communities on all these fronts, and the use of CIT to contextualize this response can be useful to understand the strengths, weakness, and missed opportunities in Gram Vaani's Covid-19 response. Therefore, the following research questions were posed:

RQ1: Who were the STN actors across different levels?
RQ2: What were the enabling and constraining CACs?
RQ3: How did the STN actors leverage enabling CACs and overcome constraining CACs to foster meaningful impact on the marginalized communities?

Method

We adopted a case study approach to explore community mobilization through Gram Vaani's Covid-19 Response Network over a 15-month period. This method allowed us to develop a multi-faceted and holistic understanding of a rapidly evolving and complex public health phenomenon (Crowe et al., 2011). The primary source of this study is the Gram Vaani (2021b) Covid-19 Response Services page with detailed documentation from March 21, 2020 to June 24, 2021 and 283 hyperlinked supplementary documents. Our authorship team consists of two members of Gram Vaani, a public health expert, and two communication scholars – all with a history of collaboration. Through multiple iterations, we established mutual understandings of CIT key tenets (i.e., STN and CAC) and applied research examples. We then extracted relevant data from the source documents and discussed their relevance to answer the research questions. First, we collectively reviewed and agreed on the major areas of pandemic community mobilization to help organize our analysis and results. Then we used an iterative process to identify micro-level, meso-level, interstitial, and macro-level STN actors in each of the three major areas. Similarly, we focused on the most enabling and constraining CACs in each specific area. Finally, we selected a diverse array of significant impact pathways, including a description of the

problems faced by the communities and how the STN actors helped address them by improving the CAC infrastructures. We also added a concrete impact story that Gram Vaani featured in their fieldwork of community mobilization during our study time period.

Results

In 15 months, 870,000 individuals used the Mobile Vaani platforms, made 2.5 million calls, recorded 24,880 voice reports, and shared 2,327 impact stories (Gram Vaani, 2021a). The Gram Vaani Covid-19 Response Network dynamically evolved with changing community needs. Using real-time, two-way communication through its IVR system, response services were mobilized to bridge exclusionary gaps faced by communities in *three* major areas (Gram Vaani, 2021b), which we used to organized our case analysis and findings:

1. *Health promotion and healthcare access:* raising Covid-19 awareness, facilitating preventive and curative Covid-19 healthcare access, and assisting with non-Covid-19 healthcare access. During both the first and second waves, organizational partners who were trained in public health helped create appropriate awareness messages related to Covid-19 prevention, detection, and management. These messages were published as audio recordings on Mobile Vaani to bring actionable information to people who did not have access to any other digital media channels. During the second wave, the Covid-19 Response Network especially responded to immediate health needs of communities by assisting people with ambulances and coordinating supply of oxygen cylinders at local health facilities, and tele-consultancy services to provide professional medical advice families with infected patients in home care.
2. *Livelihood support and working conditions*: helping migrant workers cope with sudden loss of livelihood, seeking of alternatives, and community advocacy for improving working conditions. Due to a sudden loss of sources of income especially during the first wave when a national lockdown was hurriedly imposed without any warning, emergency cries for help about food and cash shortages was raised by people on Mobile Vaani. These came both from rural areas as well as by stranded migrant workers in the cities. Mobile Vaani channeled these cases to CSO partners who were helping communities in these geographies by providing food-kits and cash support. Rapid surveys on Mobile Vaani of stranded migrant workers were also used to ascertain demand for inter-state travel, including what trains were to be arranged in cooperation with other CSO partners and government departments. During and after the first wave, Gram Vaani team members and their research collaborators used the Mobile Vaani voice reports to publish articles in the mass media. Other collaborators in the Covid-19 Response Network used this data for public interest litigations. These efforts helped highlight the problems faced by vulnerable communities, leading to a demand prompt action by the government.
3. *Safety nets and essential services*: overcoming challenges for accessing social protection services, and helping communities cope with disruptions in educational services and local governance. Voice reports on Mobile Vaani about poorly functioning public services and access to welfare schemes were used by the interstitial actor network of volunteers to escalate issues to local government authorities. Many voice reports were also publicly published on Mobile Vaani to demand social accountability, resulting in smoother provisioning of these services. Volunteers working with Mobile Vaani also directly assisted people through online registration for social welfare schemes and helped correct their personal details due to which they had faced problems in accessing governmental emergency measures.

Multilevel STN Actors

As shown in Table 1, the micro-level STN actors were Mobile Vaani users who lived in rural communities and in urban areas (e.g., migrant workers) and called the IVR system for information and/or share their concerns. The interstitial STN actors included various volunteers in addition to the paid frontline workers. The meso-level STN actors were a diverse set of CSO partners who, together with Gram Vaani, formed a Covid-19 Response Network to fulfill various goals—content production

and dissemination, service access and delivery, and research and advocacy. Macro-level STN actors included government departments who responded to citizen concerns raised through the Mobile Vaani network, and mass media channels that carried news articles about these concerns to amplify the plight of marginalized groups.

Table 1: Multilevel Storytelling Network Actors of Gram Vaani's Covid-19 Response Network in India

STN Actors	Health Promotion and Healthcare Access	Livelihood Support and Working Conditions	Safety Nets and Essential Services
Micro-level actors	Mobile Vaani users in rural and peri-urban areas, low income, low digital literacy	Mobile Vaani users who are migrant/resident workers	Mobile Vaani users in rural communities and migrant/resident workers in peri-urban areas
Interstitial actors	Mobile Vaani volunteers Frontline workers	Mobile Vaani volunteers Frontline workers Stranded Workers Action Network volunteers Ghar Bheji Campaign volunteers Migrant Transport Support Network volunteers	Mobile Vaani volunteers Frontline workers
Meso-level actors	Content partners Regional language translation partners Content dissemination and amplification partners Covid-19 self-assessment, tracking and referral partners Vaccination registration support partners Tele-consultancy partners Emergency support partners Non-emergency health counseling partners	Food and cash support partners Transportation support partners Research and advocacy partners	Access to emergency, regular, and supplementary social protection partners Research partners Knowledge sharing partners Content partners Content delivery and advocacy partners Civic amenities partners
Macro-level actors	Government departments Mainstream media Donors for CSOs	Government departments Mainstream media Donors for CSOs	Government departments Mainstream media Donors for CSOs

Note. A comprehensive and detailed table is available at https://bit.ly/3AaSsk7

Enabling and Constraining CAC

Table 2 summarizes the enabling and constraining CACs. Our analysis pointed to several poorly functioning infrastructures for health promotion and healthcare access. These included quarantine facilities for migrant workers, transportation services to health centers, and provisioning of emergency aid – i.e., shortage of oxygen, thermometers, oximeters, and medications for Covid-19 and non-Covid-19 treatments. Further, work-related systems were severely dysfunctional, including timely processing of wages or withdrawals of social security contributions. These greatly impaired livelihoods and living conditions of migrant and residential workers. Barriers existed for workers to access safety nets and essential services. The infrastructure for providing emergency rations and cash transfers to poor families

was often absent. Linkages between bank accounts and digital-ID systems for cash transfers were broken, records mismatched due to data-entry errors, and food security schemes were non-inclusive. Local officials – banking agents or operators of Fair Price Shops – were often non-cooperative. Across all areas, the Mobile Vaani participatory media platforms served as not only an enabling and but an empowering CAC, channeling problems and grievances to appropriate STN actors, and offering real-time on-the-ground assistance through volunteers. Thus, social accountability of macro-level actors – such as government departments – to respond to citizens' needs was enforced.

Table 2: Communication Action Contexts of Gram Vaani's Covid-19 Response Network in India

CAC Factors	Health Promotion and Healthcare Access	Livelihood Support and Working Conditions	Safety Nets and Essential Services
Enabling CACs	Mobile Vaani technological infrastructure Assistance for overcoming the digital divide by Gram Vaani volunteers (e.g., vaccine registration)	Mobile Vaani technological infrastructure (e.g., channeling cries of help for food and cash to appropriate CSOs) Assistance for overcoming the digital divide by Gram Vaani volunteers (e.g., facilitate/support during various processes viz. pre-registration to end point while availing schemes)	Mobile Vaani technological infrastructure Assistance from Gram Vaani's volunteers to assist callers with getting their entitlements, demanding social accountability, and ensuring prompt actions government officials
Constraining CACs (poorly functioning /absent infrastructures)	Quarantine centers Health centers and emergency aid (oxygen, thermometer, oximeter, medications) for COVID and non-COVID treatment Toll-free helplines Transport (ambulances) COVID vaccination online portals	Work allocation or wage payment processing Employee records	Back-end processing stage, due to Aadhaar linkage, spelling error, blocked accounts, etc. Ration card Lack of cooperation/non-compliant behavior on the part of local officials, individual banking agents, or operators at Fair Price shops Cash transfer apps National Payments Corporation of India's digital infrastructure Food kits

Impact Pathways and Stories

Three major impact pathways existed to address the exclusionary gap in health promotion and healthcare access. First, during both waves, meso-level STN actors with public health expertise helped create and tailor messages on Mobile Vaani for Covid-19 prevention, detection, and management, bringing actionable information to the information have-nots and thereby providing an enabling CAC. Second, STN actors across various levels responded to communities' immediate health needs – especially during the second wave – by assisting with coordination of ambulances and oxygen cylinders at local health facilities, and facilitating tele-consultations with professional medical personnel for families with infected patients in home care. This enabling CAC was performed by channeling requests made by Mobile Vaani users to CSO partners that had matching support capabilities. Third, Mobile Vaani effectively connected community members with the interstitial STN actors – the local volunteers,

who helped organize vaccination camps and assisted with digital vaccine registration for non-Internet users. Figure 1 shows one of many impact stories in this area.

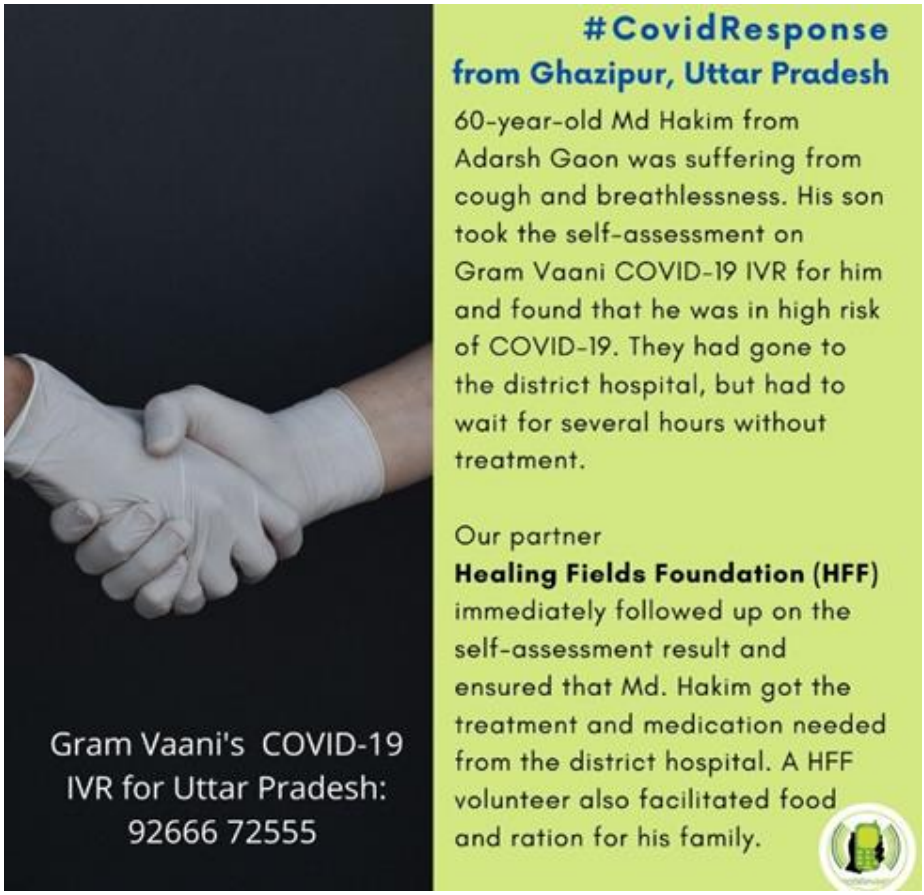

Figure 1: Mobile Vaani Impact Story for Health Promotion and Healthcare Access

Three major impact pathways existed to address the exclusionary gap in the area of livelihood support and working conditions. First, the Mobile Vaani platform directly assisted rural residents and stranded urban migrant workers with food and cash on account of loss of income, especially during the first wave when a national lockdown was hurriedly imposed without warning. Mobile Vaani channeled these need-based cases to meso-level CSO partners in these geographies so they could provide food-kits and cash support. Second, the Gram Vaani team and their partners used rapid IVR surveys to collect data from migrant workers, leveraging the research findings for advocating with government officials. By sharing findings on the mass media and through public interest litigations, the government was pressured to promptly arrange trains for interstate travels and provide access to employment-related benefits to not violate labor laws. Third, a new partnership was forged, especially during the second wave, through the emergence of a crowd-funded network that mobilized resources for food-kits and cash transfers to assist households whose livelihoods were severely impacted (e.g., visually impaired citizens who had lost their jobs). Figure 2 shows one of many impact stories in this area.

Figure 2: Mobile Vaani Impact Story for Livelihood Support and Working Conditions

Two major impact pathways existed to address the exclusionary gap in the area of safety nets and essential services. First, Mobile Vaani empowered its marginalized users to record voice reports on poorly functioning public services, and when they had difficulty accessing welfare schemes. Their stories were used by the interstitial STN actors of network volunteers to escalate issues to local government authorities. Many were published on Mobile Vaani to demand social accountability, culminating in smoother provision of these services. Second, the Mobile Vaani volunteers directly assisted many needy families, bringing them immediate relief through online registration for social welfare schemes. They also helped them fix personal data mismatches that precluded them from accessing emergency measures announced by the government. Figure 3 shows one of many impact stories in this area.

Figure 3: Mobile Vaani Impact Story for Safety Nets and Essential Services

Discussion

Major Contributions

This case study is the first CIT application of pandemic community mobilization in the Global South with articulations in civic engagement, health disparities, and crisis mitigation. We identified STN actors across all levels as well as enabling and constraining CACs in Gram Vaani's Covid-19 Response

Network for pandemic community mobilization. The impact pathways through which the Mobile Vaani platforms provided an enabling and empowering CAC for relevant STN actors to serve the marginalized citizens – and that too during a pandemic—highlights the enormous value of participatory digital storytelling for community outreach and mobilization. These pathways were effectively mobilized because the micro-level STN actors (the Mobile Vaani users) were connected with meso-level STN actors (CSO partners) and macro-level STN actors (government departments and mass media). These connections worked as the interstitial STN actors (groups of volunteers) directly and promptly assisted those who were needy, while holding government agencies accountable to respond to these needs speedily.

It is the nature of epidemics and pandemics to expose the fault lines in society, wreaking devastation through pathways of pre-existing vulnerabilities (Singhal & Kim, 2021). The greatest impact of Covid-19 in India has indisputably been on the most marginalized and resource-poor citizens. For the most vulnerable, the core social determinants of health – food, livelihoods, and housing – were jeopardized further as a result of pre-existing poverty and lack of social safety nets (Johri et al., 2021). Their futures are deeply endangered too as continued disruption of regular schooling and essential services erodes health, nutritional, and educational gains from past years of social development efforts (Drèze & Somanchi, 2021). By providing a community-based two-way communication channel for these weaker sections of society, Gram Vaani's Covid-19 Response Network amplified the voices of the most vulnerable, addressed their immediate needs on the ground in real time, and swiftly adapted to the unfolding pandemic.

The results of our CIT case study, and the implications arising from them, are not small. They hold tremendous theoretical and heuristic value to engage with resource poor communities in a participatory manner through technology-enabled mobile platforms. Whether for strategic planning, mapping of local resources and actors, or field implementation with accountability, communication infrastructure theory – CIT – represents a framework for deliberation, decision-making, and collective action.

Limitations and Future Directions

Through a CIT application case study of Gram Vaani's Covid-19 Response Network, we identified STN actors at all levels, investigated CACs with enabling or constraining factors, and analyzed how SNT actors leveraged enabling CACs and circumvented constraining CACs to meaningfully impact marginalized communities in India. Constraints of time and resources did not allow us to delve deeper into the IVR survey data to supplement our results with systematic quantitative analyses. Nor could we gather additional primary data collection to enhance or extend the effort to map CIT. For example, social network analysis could have provided additional insights about the STN actors and the patterns of their interconnections (An & Mendiola-Smith, 2018). Key variables in the CIT literature, such as integrated connectedness to community storytelling network (or ICSN; see Nah et al, 2021; Jung & Kim, 2021; Kim & Ball-Rokeach, 2006; Kim & Kim, 2018) can offer more rigorous measures for empirical testing in future research.

Furthermore, our results showed how different stakeholders interacted with the Mobile Vaani network to give voice to those who are typically powerless and marginalized. Digital technology and offline efforts played different roles in these critical processes to fight against the power imbalances (Wang et al., 2020; Wang et al., in press). In particular, Gram Vaani's volunteers are uniquely positioned to reach marginalized groups (Chakraborty et al., 2019; Moitra et al., 2018). In our case study, they represent significant interstitial STN actors who helped the information have-nots overcome the digital divide, ensuring their voices were heard and amplified. Their efforts are not only understudied and deserve attention, but their offline actions need be investigated in how they created an enabling container for social and behavior change communication (Johri et al., 2020).

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