

Accost, Accede, or Amplify: Attitudes towards COVID-19 Misinformation on WhatsApp in India

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ABSTRACT

Social media has witnessed an unprecedented growth in users based in low-income communities in the Global South. However, much remains unknown about the drivers of misinformation in such communities. To fill this gap, we conducted an interview-based study to examine how rural and urban communities in India engage with misinformation on WhatsApp. We found that misinformation led to bitterness and conflict – rural users who had higher social status heavily influenced the perceptions and engagement of marginalized members. While urban users relied on the expertise of gatekeepers for verification, rural users engaged in collective deliberations in offline spaces. Both rural and urban users knowingly forwarded misinformation. However, rural users propagated hyperlocal misinformation, whereas urban users forwarded misinformation to reduce their efforts to assess information credibility. Using a public sphere lens, we propose that the reactions to misinformation provide a view of Indian society and its schisms around class, urbanity, and social interactions.

CCS CONCEPTS

• Human-centered computing → Empirical studies in HCI.

KEYWORDS

Misinformation, WhatsApp, encrypted platforms, rural, disinformation, public sphere

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1 INTRODUCTION

The risks of misinformation are extremely high for millions of new social media users in low-income communities who may lack the capacity to verify information [108]. In this environment,

misinformation has led to devastating events, including lynchings [124] and deaths of several people [62]. Yet, the overwhelming share of research on misinformation is situated in Western environments [59, 76, 113], in turn leading to interventions that disregard the linguistic, cultural, and political settings in the Global South [2, 22, 77, 96]. A growing body of work has taken this challenge head-on, especially in large nation states like Brazil and India that have seen massive increases in misinformation in the public sphere [9, 64, 86, 97]. However, much of the existing research has focused mainly on political misinformation shared by urban users [9, 37, 50, 64, 80, 97], who have grown into social media use after having been Internet users for a while. Little is published on the drivers of misinformation in low-income, rural settings where users are new to online information environments and often lag behind their urban counterparts in digital skills [25, 115].

We present a comparative examination of attitudes and experiences, using semi-structured interviews with nineteen WhatsApp users from rural communities and nine users from urban communities in India. Our work considers the commonalities and differences between participants in how they interact with misinformation, what factors shape their perceptions and engagements, and which strategies they employ to combat the risks of misinformation. To understand everyday misinformation experiences of our participants, we focused on health misinformation propagating on closed WhatsApp groups. Our findings paint a troubling picture, wherein WhatsApp groups of both communities were fraught with COVID-19 health misinformation, which resulted in conflict and harms in offline and online settings. We found that people who had higher social status controlled and influenced the perceptions and engagement of marginalized people in rural areas. We also found important differences in how participants assess information credibility. While both rural and urban participants forwarded misinformation in their WhatsApp groups even when they were unsure of the authenticity, rural participants deliberately propagated hyperlocal disinformation to reinforce communal biases. While urban participants only occasionally pushed back against misinformation messages online, rural participants employed community-driven tactics, such as deliberations in social gatherings and announcements through repurposed vehicles with loudspeakers that traversed physical spaces.

To analyze collective engagement practices on WhatsApp groups and relate them to offline social practices, we turn to the *public sphere*, a lens to study public interactions undertaken by individuals in a community for different kinds of collective purposes, such as opinion formation [57]. Building on the prior work that examined modern social media spaces through the lens of the public sphere [23, 74, 92], we find ways in which WhatsApp groups, as online

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public spheres in rural communities, were mainly accessible to people with power, who promoted their own interpretations of misinformation. Hierarchies allowed the reinforcement of beliefs aligned with dominant sociopolitical ideologies. Yet, we also found spaces people created to collectively deliberate and assist people to contest and make sense of misinformation – both in-person and on WhatsApp groups, as an outcome of forwarded online misinformation. We end by discussing the importance of offline public spheres in fighting misinformation, especially in rural communities. Our study contributes to the study of misinformation in HCI4D and CSCW literature as follows.

- (1) We show how rural communities, largely understudied, engage with misinformation on closed WhatsApp groups, providing complementary perspectives to the prior computational studies conducted on public groups [50, 64].
- (2) We contrast how people in rural and urban communities discover, verify, propagate, and combat misinformation.
- (3) Using the lens of public sphere, we provide rich insights to design features that could enable effective participation of marginalized members of the community in collective deliberations to curb the spread of misinformation.

2 BACKGROUND AND RELATED WORK

Misinformation is inaccurate [48], incomplete [78], or vague [68] information that is shared by individuals with varied motivations [129]. Misinformation literature has its roots in rumor studies. While misinformation and rumors have several commonalities (e.g., both may resurface despite corrections [70, 71]), unlike rumors whose veracity cannot be verified [35, 43], misinformation is always deemed as inaccurate.

Research on online misinformation has grown rapidly with the rising influence of social media in the Global North. In particular, HCI scholars have studied misinformation with diverse stakeholders (e.g., journalists) [18, 47, 99, 109, 112, 113] on various media (e.g., news, tweets) [9, 30, 31, 50, 54, 59, 60] through a range of disciplinary perspectives [27, 46, 67, 79, 82]. Within the Global South, social media has witnessed an unprecedented growth, often exploiting new technology users' lack of hindsight of dealing with digital disinformation [116], leading to dramatic consequences such as lynchings [124], civic unrest [98], and political polarization [9, 10]. Despite this, the tools and approaches to studying misinformation continue to be situated largely in the Global North [34, 87, 125].

A nascent but growing body of work in HCI has started investigating misinformation in the Global South to understand misinformation propagation [50, 64, 97], to build typology of misinformation messages [9, 11, 80], and more recently to understand misinformation engagement practices [45, 79, 123]. Although this line of work offers useful insights about how people in the Global South engage with misinformation, little work has been done to study experiences of rural communities who have limited digital awareness and different mental models around emergent technologies [19, 20, 36, 115]. Our study contributes to this line of research by asking the following **RQ**: What are the key differences and commonalities between rural and urban communities in how they (1) discover and verify, (2) propagate, and (3) combat misinformation on closed WhatsApp groups.

2.1 Navigating Misinformation

Discovering and Verifying Misinformation. Prior research on misinformation discovery has focused on different processes that individuals use to label information as accurate or misinformation. These processes can be either driven by an individual's internal perceptions [46] or their external actions [76]. Internal perceptions are often influenced by the message source [76, 79, 118], content characteristics (e.g., the overall tone of the message [31, 46]), design cues (e.g., number of shares, likes, or comments), and individuals' personality traits [31, 31, 75, 95] when assessing information credibility [51].

Conversely, external actions refer to the assistance individuals take from interpersonal and institutional resources to verify information veracity [118], such as reaching out to individuals for verification [26, 59] and online verification [53]. Within the Global South, urban users often relinquish their responsibility of verification to social media platforms and news agencies [58]. Our work extends this body of work by characterizing the internal perceptions and external practices of rural social media users that shape their opinions around misinformation.

Propagating Misinformation. People often share misinformation unintentionally [59] when emotional proximity to the subject and prior beliefs cloud their judgment [89, 100]. Even on realizing that they shared misinformation, people often justify their action by putting responsibility on other people for not doing their own research [16]. On rare occasions, individuals explicitly correct themselves by deleting the message or adding clarification for their imagined audience [83, 119] to be a socially responsible citizen [16]. People also deliberately share misinformation [119], contributing to faster and farther spread of misinformation than the factual information [12, 127]. Prior literature outlines diverse motivations for people to share disinformation, including receiving financial benefits [28] and safeguarding individual or communal agenda [9, 24, 82, 128], among others. We contribute to this line of research by describing the sociotechnical factors and practices that shape how misinformation propagates in urban and low-income rural communities.

Combating Misinformation. Scholars have also studied the tools, techniques, and strategies people use to curb misinformation in their everyday lives. One strategy is to provide people multiple warnings ahead of time about the potential exposure of misinformation [44, 76, 104]. However, timing of such warnings remain controversial as a few studies have shown reduced effectiveness of such warnings post-exposure to misinformation [44, 104], while more recent work shows contrary evidence [27]. Another strategy that people often use to correct misinformation include providing an alternative evidence-based narrative [76, 105, 113]. Prior studies have also explored the scope of computational tools in assisting people to fight misinformation by providing visual aids and data-driven crowdsourced cues to distinguish misinformation [66, 93, 106, 107]. Our work expands Uddin et al.'s [122] research in this area by examining the range of local and contextualized strategies rural participants use to combat misinformation and contrasting them with those used by urban participants. Taken together, our findings present a critical and timely addition to the literature on the

drivers of engagement with misinformation by studying different communities in India.

2.2 Public Sphere as a Lens

To examine the engagement practices of rural and urban communities with misinformation, we draw upon the notion of *public sphere*. The concept of *public sphere* was put forth by German social theorist Jurgen Habermas to describe an aspect of social life where individuals with common needs and issues can gather freely to deliberate with an intent to influence collective action [57]. The term has a broad and multi-faceted meaning, ranging from “strong” public spheres that engage in formal and large-scale deliberations to achieve a *political* outcome to more “weak” ones that engage in small-scale discussions and information exchanges to achieve *opinion* formation [49]. A common theme across these different types of public spheres is that the information that flows through these types of groups pertain to the public at large. This is in contrast to *private sphere* which is defined as a space where an individual experiences a degree of freedom, privacy and authority, unrestricted by external interventions [57]. Historically, women and people of color have been excluded from participation in the public sphere. As a result, women have mostly kept to private sphere for childcare and domestic work, whereas men have dominated the public sphere [101].

The theoretical development of the public sphere attributed important characteristics to the physical spaces. First, for successful collective deliberations, the public sphere should reflect the absence of power structures by enabling free and equal standing among participants through mutual respect, empathy, and solidarity [56, 65, 114]. Second, the public sphere should also be marked by equal participation and exchange of ideas [33], with a focus on common good [114] and willingness by members to reevaluate through competing validity of claims [55]. Although Habermas himself distinguishes normative principles of his theory from the practical ones, subsequent research on the public sphere has criticized the theory for inadequate conception of the notion for unequal communities and their participation in the public sphere [49]. In recent years, technological tools, such as online forums [40], collaborative spaces [15], and instant messaging apps like WhatsApp [124] have replaced traditional public spheres as new spaces of collective deliberations. These tools provide inter-connectivity and democratic communication with potential audiences through ability to reshare, comment, like, or react [41, 94, 103].

In order to understand the contribution of such technologies in formation and maintenance of online public sphere, Dahlgren [42] proposed three key dimensions, namely *structural*, *interactional*, and *representational*. Structural dimension provides an understanding of how configurations of online technologies affect access and inclusion of different communities. Interactional dimension focuses on the exchange of opinion among different group members. Lastly, representational dimension focuses on plurality of such exchanges, engaging ways in which different communities are represented in such deliberations. For example, from the lens of public sphere, WhatsApp enable users to create and maintain public and private groups (structural) and to share information with different individuals, such as colleagues, friends, and family (interactional). These

groups also provide a space for collective deliberations and discourse that cross geographic boundaries by facilitating exchange of global news, user-generated content, and state announcements between diverse individuals in the communities (representational) [88, 90, 91]. In our study, we discuss our findings through important characteristics of public sphere to examine how rural and urban communities engage in collective deliberations around misinformation.

3 METHODOLOGY

To answer our research questions, we draw on 28 semi-structured interviews conducted with rural and urban participants who were part of active WhatsApp groups across four states in India. We used a breadth approach to reach a more dispersed set of respondents across parts of India. The interviews lasted four months (Aug–Oct, 2020) and were conducted remotely during the period of rising COVID-19 cases in India.

Participant Recruitment. We used a combination of snowball and convenience sampling to recruit participants from different rural and urban communities. We present distinct characteristics of participants from these communities in the demographic section. To recruit rural participants, we contacted six well-known non-governmental organizations that work with rural communities on community health issues. Of these, three organizations that were running COVID-19-related programs expressed interest.

We partnered with them and recruited participants through their established networks. Based on our diverse requirement criteria, the organizations reached out to potential participants through both WhatsApp messages and telephone calls, explained the purpose of our study to them, and then gave us the contact information of those who expressed an interest in participating. All of our interactions with the organization and participants took place remotely. We set up pre-interview conversations with interested candidates to understand their participation in WhatsApp groups and experience with COVID-19 misinformation. All shortlisted participants were part of several WhatsApp groups and routinely saw COVID-19-related messages. We also recruited participants who did not possess smartphones, but were intermediate users of WhatsApp (i.e., even though they did not have a WhatsApp account, they routinely saw messages through other people).

To recruit urban participants, we composed a WhatsApp-based recruitment message containing basic study details along with first author’s email address, phone number, and a direct URL to contact him on WhatsApp. We then shared the message in our active WhatsApp groups of friends, acquaintances, and colleagues. We also requested our social connections to forward it in their own personal active WhatsApp groups. We set up a pre-interview conversation with the interested candidates to understand their participation in WhatsApp groups and experience with COVID-19 misinformation. During recruitment phase, we made an explicit decision to recruit low-income users from rural areas, in part because of their relatively higher isolation from major forms of information environments [85] in comparison to urban low-income users who are exposed to other forms of information [111]. Overall, we recruited nineteen rural and nine urban participants. After each interview, we refined

our probes, stopping when we reached a theoretical saturation in our participants' narratives.

Participant Demographics. Boundaries between rural and urban communities are complex to tease out precisely [126], both because of the fluidity of peoples' movements and connectivity, and the increasing ubiquity of services across regions. However, some important distinctions remain in place. Rural participants were in geographically smaller contiguous settlements. Our sampled villages had an average of 2,700 people, while small towns averaged 80,000 residents. While respondents in both locations had offline connections besides online engagement with other members of their WhatsApp groups, a key characteristic of rural populations was physical proximity with their group members. This proximity was layered over other hierarchies – participants in the WhatsApp groups included village council members and community elders besides community health workers, low-income vendors, homemakers, young graduates, NGO workers, and laborers. Out of the nineteen rural participants, eight were women, five of whom were homemakers and three participated in social work. Six participants had less than twelve years of formal education, ten participants were graduates, and three were postgraduates. Most participants belonged from low-income households, with median monthly family income of \$145. This is inline with similar studies in the Global South with low-income communities [63, 115]. The majority of the participants practiced Hinduism (n=15), which is roughly comparable to the national spread on religion, while the rest were Muslim (n=2) and Christian (n=1). Rural participants spoke Hindi, Oriya, and Telugu. Most of the households had limited experience with technology and smartphones were often shared among multiple family members. Internet was mainly accessed through mobile phones. Rural participants used WhatsApp and Facebook messenger for everyday communication. They also used YouTube and apps similar to Tiktok (e.g., Chingari, Mitron) for daily entertainment.

In contrast, the urban respondents were from cities with a population greater than one million. These participants comprised students, information technology consultants, homemakers, and white collar workers in finance, market research, and law. Five out of nine urban participants were women. Majority of these women participants were employed (n=4). Six participants were graduates and rest were postgraduates. Most urban participants were from middle-income households with a median monthly family income of \$530. With respect to faith and religion, six participants were practicing Hinduism, two were Christians, and one was Muslim. Urban participants mainly conversed in English or Hindi. Table 1 shows the demographic details of our participants. Unlike their rural counterparts, all the urban participants had exclusive ownership and access to their smartphones. They also invested in paid subscription to high-speed broadband connection, in addition to mobile data plans. In addition to WhatsApp, urban participants also used Snapchat, Telegram, and Instagram for daily communication. They also actively used YouTube, Twitter, LinkedIn, and Facebook.

Procedure. Due to rising cases of COVID-19 worldwide, we developed a remote interview protocol with diverse options, including video call on Zoom or WhatsApp and voice call via mobile network, to account for participants' preferences and Internet bandwidth issues. We also asked participants to choose 1–2 WhatsApp group(s)

with the most COVID-related activity in the last three months. Participants were then encouraged to peruse the group before the interview and shortlist interesting COVID-related conversations (using the “favorite” option in WhatsApp or by writing them down). During the interview process, we asked participants to share the shortlisted messages along with the relevant context. This process helped us develop a better understanding of the participants' use of these WhatsApp groups. The participants shared messages by either sharing their smartphone screen through Zoom, forwarding messages over WhatsApp to us, or reading the messages out loud.

The interview protocol was divided into three parts. We started the interview with questions that explored how participants discovered and verified the authenticity of misinformation messages (e.g., “Can you walk us through a few messages that you trusted the most in the group?”). The next part explored their motivations for interacting with misinformation (e.g., “What different factors do you take into consideration while forwarding a message?”). The last part investigated their willingness and strategies to curb misinformation (e.g., “What do you do with the COVID related messages that you don't trust? Why do you use this strategy?”). We conducted interviews in the language preferred by participants and recorded the conversation with participants' consent. The interviews lasted an average of 60 minutes (min: 45 minutes, max: 2 hours). The participants were not provided with any compensation for the interviews.

Data Collection and Analysis. We collected a total of 32.5 hours of interview data. All the recordings were translated into English and transcribed. As the interviews were conducted in multiple languages, appropriate care was taken to ensure consistency in the translation process. The interview sessions also produced 84 misinformation messages and 59 pages of detailed notes. First author who conducted the interviews also engaged in the qualitative coding using inductive thematic analysis [29]. We took multiple passes on the transcribed data, notes, and the misinformation messages to conduct open coding. We avoided using any presupposed codes and instead let the codes emerge from our data. Credibility was established through prolonged engagement with the data by all authors. Major disagreements in this process were resolved through multiple rounds of peer-debriefing in which all the authors participated [39]. Over the course of analysis, all authors regularly met to: (1) discuss coding plans, (2) develop preliminary codebook, (3) review the codebook and refine/edit codes, and (4) develop categories and themes. Finally, using abductive approach [120], we further structured, mapped, and categorized the themes around the key concepts of public sphere, such as *discourse*, *opinion formation*, *structure*, and *representation*, among others. At the end of multiple passes, our collaborative analysis produced 51 codes. Example codes included *social verification strategies*, *power structures influencing trust*, and *communal angle around forwarding*. Codes were further condensed into five key themes around *misinformation discovery*, *misinformation propagation*, *combating misinformation*, *effects of misinformation*, and *misinformation characteristics*. Our final codebook, themes, and the prevalence of each code is provided in the Appendix.

Positionality & Ethical Considerations. Our study was approved by IRB at Cornell University. All participants were briefed about the implications of the study. During recruitment, to accommodate

Participants	RURAL	URBAN
Count	19	9
Gender	Women: 8; Men: 11	Women: 5; Men: 4
Age (years)	Min: 20; Max: 57; Avg: 34; St.D: 12.43	Min: 20; Max: 53; Avg: 31; St.D: 12.17
Education	High School or less: 6; Graduate: 10; Post-graduate: 3	Graduate: 6; Post-graduate: 3
Location (states)	Maharashtra: 8; Andhra Pradesh: 3; Orissa: 4; Telangana: 4	Maharashtra: 2; Andhra Pradesh: 2; Orissa: 4; Telangana: 1
Group types	Friends: 10; Family: 6; Colleagues: 5; Society: 5; Self-help: 4	Friends: 6; Family: 10; Colleagues: 4; COVID-19: 3
Group size	Min: 12; Max: 103; Avg: 31; St.D: 26.25	Min: 12; Max: 45; Avg: 31; St.D: 10.72
Family Income (Rupees/month)	Min: 3,500; Max: 18,000; Avg: 8,182.35; St.D: 4,231.16	Min: 21,000; Max: 55,000; Avg: 34,300; St.D: 10,500
Smartphone ownership	Own personally: 3; Own & share: 8; Only share: 5; No access: 3	Own personally: 7; Own & share: 2; Only share: 0; No access: 0
Profession Types	Govt. employed: 4; NGO: 4; Salaried: 4; Business: 4; Unemployed: 3	NGO: 2; Salaried: 6; Business: 1; Unemployed: 1
Professional Experience (Years)	Min: 3; Max: 17; Avg: 6 years	Min: 1; Max: 22; Avg: 8.5 years

Table 1: Participants' demographic details across Rural and Urban communities

unanticipated personal issues, participants were given the option to reschedule, cancel or conduct the interview in multiple sessions. Due to exploratory nature of our research, we did not influence participants' existing beliefs and interaction practices with misinformation messages through any form of intervention. At the same time, we shared our understanding of COVID-19 misinformation by sharing simple strategies to identify misinformation compiled by the Ministry of Health ¹. To safeguard participant's misinformation interaction practices, all the participants' personally identifiable information, including their narratives and shared messages, were anonymized.

The qualitative interpretation of the resultant data is shaped by our prior research and experience with studying misinformation in the Global South. All authors are of Indian origin and have extensive experience conducting field research with both rural and urban populations in the Global South. The interviews were conducted by the first author, a PhD student, whose urbanity, education, and social status placed him in a position of power, especially with participants in rural areas. All authors have routinely received several of these COVID-related misinformation messages on WhatsApp groups they are part of. Our commitment to studying the impact of misinformation in rural settings is part of a longer-term engagement of understanding the benefits and harms of emergent technologies to marginalized communities with limited digital literacy and know-hows. We view HCI research from the lens of postcolonial computing [61], aiming to conduct formative research to understand how people in low-resource environments interact with misinformation, experience associated harms and burdens, and devise novel strategies to curb its propagation.

4 DESCRIPTION OF WHATSAPP GROUPS

We now briefly describe the WhatsApp groups and conversations our participants shortlisted to discuss with us. WhatsApp is a popular social media platform in both rural and urban India. The WhatsApp groups that the participants shortlisted were well-known in their social circles. A majority of the groups were accessible through an invitation link. In the remaining groups, participants were manually added by the administrators. However, in such groups, several members were made administrators to make it easier to add members. All the members of the group were allowed to post without any restrictions and administrators rarely performed any moderation activities, such as a removing members from the group.

Urban Groups. Our urban participants were part of diverse WhatsApp groups of friends, family, and colleagues. Friend groups mainly comprised people who had known each other from school or college. Family groups had extended family members along with distant relatives. Colleague groups often had peers with shared identity (e.g., working at the same company) and interest (e.g., group for informal conversations). Half of these groups existed for over two years (avg = 3.3 years) while the other half were formed within the last six months in response to the COVID-19 pandemic. Unlike other groups where the pandemic was one of many topics of discussion, these groups were dedicated for discussion on COVID-19. On average, these groups had 21 participants (min=12, max=28). Conversations and forward messages shared with us from these WhatsApp groups were mostly in English, with periodic conversations in code-mixed Hindi and Marathi.

Rural Groups. Along with WhatsApp groups of friends and family members, our rural participants also shortlisted other types of WhatsApp groups that we call Society groups and Self-help groups. Society groups were made by Panchayat (village administration)

¹<https://www.mohfw.gov.in>

staff and consisted of mostly men. These groups were used by Panchayat staff to share general information and facilitate informal conversations. These groups were also the largest in our study, accommodating 80–103 members. Self-help groups were formed by community health workers (CHWs) to assist women with specific needs. These groups had conversations around health, childcare, and household work, among other topics. These groups were relatively small averaging about 25 members. Most of the messages in these groups were in the local language.

Types of Misinformation on WhatsApp groups. Overall, participants shared 84 COVID-related potential misinformation messages with us during the interview. We manually fact-checked the veracity of all the messages with two different leading fact-checking websites, Alt News [5] and India Today [6]. A total of 65 messages had misinformation as verified by third-party fact-checkers. These messages were *global misinformation* and were highly pervasive in both rural and urban areas, with same content appearing in different languages. Within these, there were four main types of COVID-related misinformation. The first type of messages were communal in nature, specifically targeting minority communities and blaming them for spreading coronavirus (e.g., Figure 2.A). The other types of misinformation included (1) fictitious data (e.g., number of new infections), (2) false information (e.g., fake government mandates around lockdown), (3) and false health recommendations (e.g., herbal and homeopathic treatments of COVID-19).

Apart from the global misinformation, we also discovered messages that were highly contextual and contained misinformation specific to a particular local community. We call these messages *hyperlocal* misinformation. In addition to following similar themes as the global misinformation, these messages contained inaccurate facts about individuals in the community who contracted COVID-19, such as manipulated content along with images of sick or dead individuals to wrongfully show deaths from COVID-19. These messages, unlike the global misinformation messages, often contained personally identifiable information (e.g., name, address) of the individuals in the community. Our manual fact-checking process that we followed for verifying global misinformation proved ineffective against these messages. As a result, we relied on triangulation wherein we inquired community members to corroborate the narrative and events described in these message [121]. We captured their understanding of the message and if we received multiple accounts of the events described in the message from two or more people, we labelled it as hyperlocal misinformation.

5 FINDINGS

Our findings are organized as follows. We first discuss factors that participants consider during discovery and verification of misinformation on WhatsApp groups. Then, we present reasons people report for propagating misinformation in other WhatsApp groups. Finally, we discuss strategies they use to counter or combat misinformation in these groups.

5.1 Discovery

Offline Intermediaries. Our participants had varying levels of access to smartphones, which influenced their exposure to misinformation and the experience with associated harms. In rural areas, some participants did not own personal smartphones. Instead, they either shared a smartphone with other family members or were secondary users of WhatsApp in the sense that they participated in closed WhatsApp groups through other people, like family members, who had a WhatsApp account [102]. Often, primary WhatsApp users relayed the dialogue back and forth between the secondary users and members of the WhatsApp groups. In line with the findings from prior work, these secondary users were typically women [8], elderly, and low-wage workers (e.g., casual vendors or day laborers). Even when women had their own WhatsApp account, male family members often shaped how, and with whom, they engaged in discussions in online settings. Manoj, a senior male, described how WhatsApp use was gendered in his village:

“All of the WhatsApp groups mostly have men. You will only find a few women. Women have keypad phones... in our village whatever information comes in these groups, it goes through men. They forward it to their wives... sometimes women have their own groups like with health workers... they are not the main ones like ours. I know 10–15 main groups. There is not a single woman in them.”

By “main” groups, Manoj meant active WhatsApp groups that have key influential people (e.g., village administrators) as members. Inability to access and participate in these main groups systematically excluded women from collective deliberation processes in offline and online public spheres.

The discernible power asymmetries enabled primary users (or intermediary-users) to play a big role in influencing secondary users’ (or beneficiary-users’) trust and awareness around misinformation. For example, for Lata, a housewife, her husband shaped her understanding around the COVID-19 pandemic by saying things like “*What I am sharing with you is useful and important, not what others say!*” or “*You would have seen this COVID nonsense on TV, you should listen to what I am sharing.*” During the interview, Lata shared multiple messages containing misinformation, which she believed to be true because her husband shared them. He in turn had ostensibly got these messages on social media, which he believed more than news in mainstream media. We also saw other examples of secondary users who were professionally related to primary users. Harshit, an NGO employee described how he felt “responsible” to share COVID-related updates with laborers who did not own smartphones or used WhatsApp. He often read aloud forward messages or showed videos that he received in a WhatsApp group of people of his caste to the laborers during breaks between work sessions.

During our interview, we found that many messages that Harshit shared contained false health advice. Other intermediaries, such as government representatives and community health workers, who similarly mediated access to information, based on what they consumed on WhatsApp groups, exercised their authority in the

Stage	Rural Participants	Setting (Sphere)	Urban Participants	Setting (Sphere)
Discovery	Intermediaries controlled access and influenced trust	Home Offline Private	Influencers shared opinions and shaped trust	Home and Small Groups Offline Private
	High trust in institutional actors and video messages	WhatsApp groups Online Public	Reliance on source and message characteristics	WhatsApp groups Online Public
Verification	Collective deliberations in small groups using interpersonal networks	Social gatherings Offline Public	Gatewatching by “experts”	Main WhatsApp groups Online Public
			Collective deliberations and use of digital skills	Satellite WhatsApp groups Online Public
Propagation	Shared hyperlocal and communal misinformation	WhatsApp groups Online Public	Shared misinformation that could be potentially useful	WhatsApp groups Online Public
	Members coerced to propagate misinformation		Shared misinformation to save verification time	
Combat	Focused on hyperlocal messages	Community Offline Public	Focused on select messages	WhatsApp groups Online Public
	Aggressive confrontation and public service announcements		Used soft nudges and persuasion	

Figure 1: Table summarizing key practices of rural and urban participants around misinformation and the corresponding spheres in which they occur.

community by playing this role of informal broadcasters for community members who lacked direct access to devices. For example, government representatives during informal social gatherings and community health workers in women-only group meetings decided *who* is part of the conversations, *what* information is deemed as credible, and *which* recommendations are worth acting upon when discussing WhatsApp messages. Often people with marginalized identities were hesitant to express their opinions freely in these public spaces and were discouraged from participating in the process of collective deliberation. Similar power structures also permeated online public spheres of the closed WhatsApp groups.

In-network Influencers. Unlike some rural participants, all urban participants had access to personal smartphones, uninterrupted internet access, and membership to multiple WhatsApp groups. No participant relied on an intermediary to access information in the WhatsApp groups. We found that participants’ perceptions of information credibility were shaped by people with whom they had strong ties offline. We call such people *in-network influencers*, who included family members, relatives, friends, neighbors, and colleagues with strong ties. Unlike intermediaries in rural areas, influencers did not control participants’ access to the information or interaction in WhatsApp groups. Instead, they shaped participants’ trust by playing the role of a sounding board and lending their opinions when solicited.

For example, Ankit, a senior accountant, periodically sat with his 32-year-old son to discuss COVID-related WhatsApp messages that he found suspicious and took his son’s suggestions on which

messages to trust. He shared how he came to trust a message that falsely claimed an Ayurvedic medicine to prevent COVID-19 (see Figure 2.B), when his son endorsed it. Similarly, Meena, a young graduate student, instructed her parents to forward suspicious messages to her before forwarding these messages to the wider audience, to avoid any embarrassment in case the forwarded messages turns out to be fake. During dinner, Meena routinely shared her opinions on some of the messages with her parents and encouraged them to think critically. She acknowledged how her parent’s blind acceptance of such messages contributed to regular emotional distress. Even though influencers proactively shaped participants’ opinions, unlike the case of intermediaries and beneficiaries in rural regions, participants could still proactively engage in agentic practices around the messages. Meena described how despite her objections, her parents ordered a homeopathic medicine that was mentioned as a cure for COVID-19 in a WhatsApp forward (see Figure 2.C).

Sender Influence. When judging credibility of WhatsApp messages, both rural and urban participants placed a lot of emphasis on “who” sent the message. Rural participants who used WhatsApp groups reported high levels of trust in local government representatives (e.g., panchayat members) and community health workers who routinely shared COVID-related messages on WhatsApp groups as well as in offline settings. Participants reasoned that local government representatives had a long history of working with their community, establishing trust, and sharing reliable information (e.g., via local government pamphlets and circulars).

However, local government representatives often inadvertently forwarded WhatsApp messages containing false health advice, often when the information in the messages aligned well with their own personal beliefs. Arti, a senior coordinator of community health workers, recounted that a few of her subordinates forwarded messages containing multiple inaccurate home-based remedies and misinformation against a minority community. Arti elaborated one particular instance:

“During training, one health worker shared a video of a Muslim vegetable seller licking produce. She felt that it was true. She told me that other Muslim vendors in her area also do like this. I did not question her because I didn’t want to make her feel bad...For my peers, I feel local people and local news is the only source to verify information if something they get on WhatsApp is fake or not...if these messages are fake they start to believe wrong things. I don’t think they do it on purpose.”

Local government representatives and health workers were well-aware of people’s trust in them and the influence of their messages. In an environment of uncertainty on what is officially known or communicated through the state, these representatives played an important part in peoples’ information environments. For example, Govind, a panchayat official described, *“If I send a COVID-related message to people in the village, people feel that if sir [Govind] has sent the message then it will be right.”* Often these representatives shared COVID-related prescriptive messages that were beyond the scope of their official duties. Consequently, the officials became a vehicle for expressing and enforcing biases.

Source and Message Characteristics. Urban participants highlighted greater trust in forwarded messages that contained links or names of news sources well-aligned with their political views. Yasmin, an analyst, described how she particularly trusted messages that had the link of the original article from news websites like the *Times of India*.

Urban participants had varying opinions on credibility of WhatsApp messages that linked to a Twitter, Facebook, or Instagram post. In general, we found that younger participants felt that they could trust such messages and believed that people would hesitate to share fake messages on public platforms like Twitter than on closed WhatsApp groups. Yasmin expressed how she trusted Facebook and Twitter posts more because unlike WhatsApp groups, she could control whose messages appeared in her feed, for example, by following journalists and unfollowing people who share misinformation. Moreover, the engagement in the form of likes and comments on the posts also helped participants like Yasmin assess credibility. On the other hand, older participants in urban areas expressed explicit distrust over messages that had Facebook or Instagram links. Ankit shared how he did not trust messages especially from Facebook because *“anyone could create an account, but on WhatsApp someone has to use his own number.”*

Our urban respondents also expressed relative distrust on video-based social media platforms like YouTube and TikTok and were somewhat aware of deepfake technology. On the contrary, rural participants trusted video messages the most. They felt that video

messages are a living account that something happened and provided contextual cues to gauge if things are presented out of context. Poornima, an NGO worker, described:

“I trust video messages the most because I can understand what I am seeing. We cannot really believe all the text messages. A few can be fake also. You don’t know where they copied the text from. In the video, we can see what actually happened so I trust those kind of messages more. If someone I don’t know sends a suspicious message in the WhatsApp groups, I do not believe it unless its a video message.”

Like Poornima, several rural participants had no mental models of deepfake technologies. Unlike text messages, video messages were perceived as *“harder to edit.”* These results provide a cause for concern as prior research shows that a significant portion of misinformation on WhatsApp propagates in multimedia formats [98]. Urban participants described how they developed intuitive *“skills”* to assess message credibility. For example, Jatin, a recent graduate, described how the use of emoticons in COVID-related forwards was a red flag for him. Urban participants also reported other cues, such as message length, engagement of members with a message, and the number of times they received the same message from different group members, to judge the authenticity. In contrast, rural participants trusted form-factor elements of WhatsApp messages that mimicked the style of government-sanctioned physical pamphlets and circulars (e.g., containing official logos, signature of purported officials).

5.2 Verification

Online Gatewatchers. Participants did not always verify the credibility of messages they found suspicious. But when they did, they used a gamut of strategies. Urban participants relied on verification from a few gatewatchers in the WhatsApp groups, who did that as a goodwill gesture or social obligation towards group members. Gatewatching is a practice of examining different *gates* or sources of information and selecting the most appropriate pieces, aligning with the interests of the intended community [32, Chapter 2][112]. Gatewatchers in our study were typically credentialed or knowledgeable members of the groups, like nurses. They kept a close eye on the incoming group messages and notified the group when they perceived a particular message as misinformation. In most cases, this responsibility was entrusted to individuals by the group members, instead of individuals volunteering for the role. For example, Sai described how his sister, a constable, was expected to notify members if anyone posted false information about COVID-related lockdowns. Instead of engaging with group members who shared misinformation, she simply diverted the group members’ attention to more accurate resources like trusted websites. Gatewatchers reported becoming the resource that group members sometimes privately reached out to verify the reliability of WhatsApp messages.

A few urban participants formed parallel COVID-specific groups to increase communities’ awareness and assist them in verifying health-related messages. These WhatsApp groups acted as knowledge networks in the public sphere [13]. The founding members of these groups took on the work of disseminating only verified



Figure 2: (A) A Video of a Muslim vegetable vendor applying saliva on produce. Videos like these were used to spread inaccurate claims of Muslims spreading COVID-19; (B) A promotional message claiming Ayurvedic medicine to cure and prevent COVID-19; (C) A forward claiming homeopathic medicine to be a preventive medicine with links and contact information to buy the medicine online.

messages, and often deliberated with each other to agree on a message. Pooja, a member of one such group, recounted how the group helped her find the appropriate treatment when her friend tested positive, by differentiating between messages containing false health advice (e.g., unverified homeopathic cures) and authentic medical information.

Tech-savviness. On an individual level, some urban participants relied on what they called “*tech-savviness*” to distinguish misinformation from authentic information. They occasionally searched online for the text and images in messages that they found suspicious and leveraged external apps to check veracity. For example, Rahul followed medical journalists on Twitter and often looked up their tweets to verify information he came across on WhatsApp groups. Other participants reported cross-verifying with news snippets apps, such as Inshorts [7]. However, none of our participants used fact-checking websites like Alt News [5] and many lacked awareness about professional fact-checking services. Compared to older participants, we found younger urban participants to be more skilled in verifying information. Most respondents expressed greater trust in their own ability to differentiate between fake and credible information, than they did in that of others. This divide was particularly seen in urban respondents’ characterization of rural social media users.

Offline Social Congregations. Unlike their urban counterparts, rural participants rarely used digital skills to verify misinformation. They often ignored global WhatsApp messages and cared more about verifying *hyperlocal* misinformation, which received very limited attention from leading news sources and fact-checkers, thereby rendering online strategies less meaningful for them. Instead, to verify hyperlocal messages, they relied on interpersonal networks in offline public spheres. Many rural participants relied on in-person social congregations during which they discussed topics of national and regional importance, including the COVID-19 pandemic. They often read the messages aloud and sought peers’

perspectives. For example, when Swaroop received multiple forwards about the first COVID-related death in a nearby village, he reached out to his friends in that village to verify the same. When his friends denied the occurrence, he shared that information back in the group. During such offline discussions, rural participants also deliberated collective actions that they took in their respective online WhatsApp groups. For instance, Usha, a female rural resident, described:

“We routinely discuss messages that we get on WhatsApp in our women-only meetups. One of the important discussions around that is whether to forward the messages to other groups or not. There are occasions when my friends are not able to decide if they should forward a message. We have a discussion to decide if the messages are credible or fake and we then forward them accordingly.”

Other collective actions that we found included asking group members to implement health advice or warning them about messages they collectively assessed as fake. Consequently, these deliberations in offline public spheres (i.e., social gatherings) heavily influenced their actions in online public spheres (i.e., WhatsApp groups). We now outline various factors which impacted how and why participants propagated misinformation.

5.3 Propagating Misinformation

Community Obligation. Many participants, both in rural (n=11) and urban (n=4) areas, admitted sharing misinformation on COVID-19 in the past. Some of them said they were driven by a sense of civic obligation and shared any information that could potentially increase members’ awareness. Some deliberately shared fake messages to instill a sense of fear of COVID-19 in people who were behaving irresponsibly – Govind knowingly forwarded a “*fake video in a WhatsApp group showing how patients were mistreated in hospital*” because his friends were not taking the pandemic seriously.



Figure 3: (A) Sender sharing misinformation and asking the group members to verify; (B) An example of religious misinformation that urban participants chose to ignore; (C) An urban participant sharing educational resources to correct the sender who shared a fake message and wrote “forwarded as received”; (D) A garbage truck repurposed to make public announcements on loudspeakers to dispel fake WhatsApp forwards.

Others intentionally forwarded suspicious messages to assess the opinions of group members. Ankit, a senior accountant, forwarded suspicious messages around lockdown rules hoping that someone will correct him if it contained misinformation. In doing so, he felt he was saving “valuable time” which could be invested in other high priority tasks rather than “frustrating fact-checking processes.” These findings are in line with prior research that shows that participants valued opinions of other members in their circles to reduce their own authentication effort [38, 117]. Moreover, participants like Ankit, added keywords such as “forwarded as received” or “shared as received” towards the end of message to safeguard themselves from any backlash from others for sharing misinformation (see Figure 3.C).

Self-interest. Some participants shared misinformation knowingly to protect and preserve their own community members from COVID-19, despite the potential harm the misinformation could cause. Renu, a homemaker, described how she forwarded messages holding a particular community more responsible for rising infections to all her WhatsApp groups:

“This message was showing Muslim people cleaning their plates with tongue and keeping it. Also there was local news on when [Muslim] people came back from Delhi, the cases had gone up. I knew this could be fake and increase communal tension, but I felt I should share [the message] for others safety in the neighborhood.”

Another communal misinformation that participants in rural and urban areas shared showed a video of a mentally unstable Muslim vegetable vendor applying saliva to his produce (see Figure 2.A). Our Muslim participants like Afzal, a vegetable vendor whose shop was forcibly closed for several days because of fake messages related to the incident, believed that such messages were spread by various Hindu communities to sabotage his community’s livelihood. Rural participants also reported that they deliberately crafted hyperlocal misinformation to protect their interests. For instance, Dara, a village head, shared how some community members started

a hyperlocal disinformation campaign to oust people from their jobs:

“A message became viral that four migrant women laborers from our village, who cook food in a primary health center, got infected. The whole village went into a frenzy, turning the situation into a dangerous witch hunt. People forced them to quarantine for 15 days despite a negative test result. They had closed the roads that led to their houses to prevent people from coming in contact with them.”

Eventually this absence forced Dara to find other recruits for the work. This case highlights the horrific impact of misinformation and rumor-mongering, especially on marginalized populations, in close-knit communities [35, 59, 71, 89].

Coercion. Several women participants were also coerced by people around them to forward messages containing misinformation in their WhatsApp groups. In urban areas, *influencers* pushed their own opinions and prescriptive actions in offline and online public spheres. An example of such offline public sphere was housewives who gathered in their free time to socialize. Renu was an influencer of such a group she formed in her society and played an active role in managing group activities like ‘kitty parties’². Renu shaped the opinions of group members about how they should respond to the pandemic, including deciding what messages are discussed during gatherings, applied in their daily lives, and ignored or forwarded to other offline and online groups.

However, other women in Renu’s group shared how they felt coerced to implement her suggestions. Rural women experienced similar coercive practices. A few women described how male family members forced them to share COVID-related messages with neighbors and relatives in their subscribed WhatsApp groups to

²Typically a women-only gathering in which a pool of cash, called a kitty, is donated weekly by all the members, with one rotating winner each week allowed to take the whole kitty home

promote male family members' enterprises. Bhanu, a tailor by profession, described how her husband made her market and share messages related to Arsenic Album (a homeopathic medicine) in her WhatsApp groups. These messages included specific details, such as instructions for ordering, visiting card of the doctor, and the details of the clinic selling the medicine. Bhanu obliged to such requests to avoid familial tensions.

5.4 Combating Misinformation

Persuasion. The participants used a range of strategies to actively fight misinformation in online and offline public spheres. Some urban participants tried to reason with those who shared misinformation. Most such engagements took place on the WhatsApp groups and participants were aware that push back could snowball into a conflict. Instead of directly saying that the message has misinformation, they used a discursive strategy, i.e., posing relevant questions to senders and encouraging them to reflect and share their perspectives. Another strategy included sharing educational resources relevant to the misinformation message in the hope that the sender reads them (see Figure 3.C). For example, when Uma received a message that said eating basil leaves can prevent COVID-19 infections, she responded with a link to the ISRC website³ that explained how alternative medications were not proven to be effective against COVID-19. Often, participants softly pushed back against suspicious messages using phrases like “please check” particularly when they had strong ties with sender. They felt such soft nudges encouraged senders to reflect on the shared messages without leading to a confrontation in the group. Rarely participants took a strong stand. But when they did, convincing people that the shared message has misinformation took painstaking back-and-forth communication. Pooja shared:

“My uncle had posted a fake message in our group about how my neighbor has died because of COVID-19. So, I went to my neighbor, confirmed everything, and posted a reply saying that its not true. I also asked him not to believe these messages. He replied back saying that he saw this in the local media and why should he not believe what comes in the media? Then I told him that I had found out personally that it is not true. I showed him the evidence that I procured for my neighbor’s death. It was due to kidney failure...It took a lot of time to convince him.”

Several participants also believed that frequency of their push back actions had a direct impact on their image and the trust they have built. Consequently, they made deliberate choices to not fight misinformation in certain situations and let them propagate in the group, particularly when the sender had considerable authority or when they felt that the message is not going to cause direct harm to group members. For example, some participants perceived insignificant harm to their WhatsApp group members from religious and spiritual misinformation (see Figure 3.B), or home remedies that claimed to boost immunity.

Offline Combating. While rural participants mostly ignored global misinformation messages because of their relevance to only “city

people”, they were concerned about hyperlocal misinformation and felt the need to strongly push back against people spreading such messages. Hyperlocal misinformation, unlike global misinformation, personally affected rural participants, thereby motivating them to engage in more confrontational strategies. Many times this led to verbal and physical altercations with the senders. But, unlike urban participants who only engaged in conversations in the group where fake messages were sent, rural participants adopted methods that penetrated the community’s online as well as offline public spheres. Moni, a student in a small town, described how a WhatsApp misinformation about her father’s friend led to a heated debate in an offline gathering:

“A few members had sent a fake message saying that my father’s friend died because of contracting COVID-19. Somebody drafted a message with his picture stating that his was the first death in the town. Till his dead body came back, they were spreading this false information. This led to a heated debate the next day between my friend and the other people... We even called some of the people who put it on status and asked them to take the messages down.”

When hyperlocal misinformation created unrest among the community members, community leaders adapted local techniques to target large parts of rural communities at once. For example, Dara described how they made public service announcements via makeshift loudspeakers on garbage trucks (or Ghantagadi) that traversed several areas to dispel harmful hyperlocal misinformation (see Figure 2.D). The vehicle was sent out multiple times a day to dispel hyperlocal misinformation that was being spread against laborers and Muslim vendors. Other villages hired *Dhindhora* (drummer) whose job was to go from one street to another with a drum and share similar announcements. These localized methods helped village administrators to cut across and reach village members who were part of multiple online WhatsApp groups. Moreover, people recognized and related to instruments like *Ghantagadi* as trust symbols, bolstering the authenticity of such efforts. However, these strategies propagated corrections in offline public spheres much slower than the velocity of fake WhatsApp forwards in the online public spheres.

6 DISCUSSION

Our findings offer a window into how rural residents navigated misinformation on WhatsApp groups and how their experience differed from urban residents. Using ‘public sphere’ as a theoretical lens, we find that certain qualities accelerated as well as inhibited the spread of misinformation specifically within structural, interactional, and representational dimensions [42]. As a starting point, critical structural characteristics of rural communities – the close-knit relationships, the hierarchies, and in India, the politically charged schisms between groups offer both causes and consequences immediately relevant to misinformation. On one hand, the information people access is likely to be mediated by the caste, community, religion networks they belong to [73], and on another, the consequences and propensities for confrontations are likely to be higher in communities where these faultlines are sharp [19], and

³<https://indscicov.in/for-public/busting-hoaxes/>

mob justice is both dealt lightly or ineffectively by the law [52], enabled by the very social media that fuels it [86].

Structural and Representational Issues. According to Dahlgren [42], while the structural dimension of the public sphere is a key indicator of inclusivity of the collective in online discursive spaces, the representational dimension focuses on the plurality of online exchanges by such communities. Our findings show that rural and urban groups participated in public spheres with different *structural* dynamics to form and shape opinions on health misinformation. For example, men in rural communities not only participated on WhatsApp groups (online public spheres), but also gathered in evenings to discuss topics of local interest (offline public spheres). These online public spheres replicated the social structures present in the offline public spheres, for example, separating public spheres based on gender or caste. This meant that women in rural communities had limited *representation* and were mostly excluded from the dominant publics like the ‘main’ WhatsApp groups (online public spheres) and discouraged from attending certain social gatherings in which men routinely participated (offline public spheres). Instead, women had to participate on these dominant publics through intermediaries, but such arrangements meant that they only received limited, biased information based on what men thought women should know. Moreover, their own perspectives and opinions around misinformation rarely reached back to these online public spheres, contributing to the lack of feminist knowledge production.

Prior feminist literature [21, 116] has documented how women’s knowledge is suppressed by people who occupied higher positions in the patriarchal societal structures. In our study, they had inordinate influence on how marginalized members engaged in collective deliberations in the WhatsApp groups and offline social gatherings. Such power dynamics subdue marginalized participants’ voice, inhibiting them from expressing their perspectives [114]. In response to various exclusions by dominant publics that discourage participation of marginalized groups, Fraser [49] and Bardzell [21] advocated developing multiple alternate public spheres, also known as *sub-altern counterpublics*. We saw some evidence of counterpublics in the form of women-only groups in which women discussed and deliberated on messages they received on WhatsApp. While these practices are in line with recent studies [115] that helped them form an understanding of their identity, interests, and needs, these spaces were far from being ideal. The opinions and deliberations in these spaces were dominated by older women, women in position of power, and community health workers who themselves struggled to distinguish between credible and fake information.

One solution to these issues could be to leverage assets-based community development [72, 84] that advocates working with individuals and marginalized groups in identifying and mobilizing their assets or capacities to attain a shared vision. This approach could be useful to build and strengthen capabilities of marginalized members in discovering misinformation in offline and online settings by providing training resources to grassroots organizations.

Generating such training resources for capacity building would require strategic partnerships between fact-checking agencies and grassroots organizations, especially to translate the current fact checking knowledge into accessible formats and generalizable lessons

that can counter hyperlocal misinformation in rural contexts. Alt News [5], a leading fact-checking agency in India, has taken a step in this direction by creating fact-checking video tutorials for novice technology and social media users [1].

Interactional Benefits. Interactional dimension focuses on the fluidity of views and opinions exchange among different group members Dahlgren [42]. The formation and affordances of public spheres played a key role in influencing how people *interacted* with misinformation in the WhatsApp groups. People in rural communities engaged in collective deliberations during social gatherings (offline public spheres) to form and shape opinions around suspicious messages they received in the WhatsApp groups (online public spheres). Similarly, people in urban areas formed parallel WhatsApp groups (online public spheres) to collectively verify misinformation propagating in their other WhatsApp groups. These parallel efforts to counter misinformation resemble *satellite public spheres* that Squires [110] defined as a public that seeks separation from other publics, for reasons other than oppressive relations, but is involved in wider public discourses from time to time. The satellite public spheres in our study allowed participants to seek separation from larger public spheres (i.e., larger WhatsApp groups) and engage in deliberations that they could not have in the larger groups. Unlike Fraser’s counterpublics, members in satellite public spheres enjoyed equal membership in satellite as well as larger public spheres.

Satellite public spheres enabled people to reflect and engage more deeply through deliberations to identify and judge misinformation [17]. This reflective process was especially beneficial in the context of contemporary research that indicates individual’s intuitive and hasty processing plays an important role in promoting belief in false content (e.g., scrolling quickly through news feed or messages) [81]. The satellite public spheres also helped participants avoid social desirability bias, a prevalent issue in online groups where individuals disregard fact-checked information and instead trust the misinformation shared in group to be viewed favorably by the group members [75].

One way to strengthen the collective deliberations and sense-making on the online satellite public spheres could be to integrate new features that support users in identifying misinformation and starting a dialogue. For example, a WhatsApp conversational agent can passively monitor posts in WhatsApp groups and notify group members if any post matches with false posts in public databases built by fact-checkers, such as by Tattle Civic Technologies [4]. The agent can also be integrated with WhatsApp’s web search feature⁴ to show a preview of Google search results for suspicious WhatsApp forwards. Although some of these capabilities could be less useful to counter hyperlocal misinformation in rural regions which rarely gets fact-checked and is hard to verify online, at the very least the agent can help shape mental models of novice users around risks of misinformation by showing them how messages that seem credible could be false or misleading.

The collective deliberations and sensemaking that our participants engaged in larger WhatsApp groups had a few bottlenecks. For example, most participants let suspicious information propagate in their WhatsApp groups unless they sensed an immediate threat

⁴<https://blog.whatsapp.com/search-the-web>

to their communities. They rarely signaled their doubts to group members who shared misinformation to avoid embarrassment and conflicts. When they engaged in such conversations, they found the process laborious and stressful. One approach to enable people to register their doubts could be to allow them to *anonymously* react to misinformation, flag messages, and provide alternate narratives. These features could also increase agency of marginalized members who hesitated to challenge the more influential individuals in their groups. Recent research on collective deliberations to counter online misinformation, by leveraging the wisdom of crowds, has shown promise [14, 69]. Twitter is also exploring a community-driven approach that allows people to identify misleading information and write notes that provide informative context [3]. However, given the important differences between closed WhatsApp groups and Twitter (e.g., closed platform of people with strong ties vs. public platform of people with weaker ties), future work should carefully examine if adding such capabilities to closed WhatsApp groups would lead to generative conversations, or devolve them into utter chaos severing the very social ties that our participants aimed to preserve on closed WhatsApp groups.

7 LIMITATIONS AND CONCLUSION

Our study provides a comparative insight into how rural and urban participants partake in different types of public spheres to discover and interact with prevalent health misinformation. People with power dominated how people in both rural and urban communities developed trust and in-turn shared information. We also saw stark differences in how rural and urban participants fought misinformation. In conclusion, we outline different ways in which rural and urban communities can safeguard themselves from the harms and burdens of online misinformation.

Our work has several limitations. In addition to the inherent limitations of qualitative research, such as a small sample size, our study took place during the COVID-19 pandemic because of which our interactions with participants gravitated more towards the COVID-19-related misinformation. More work is needed to generalize our findings beyond health- and COVID-related misinformation. We also acknowledge that our study does not take into account the viewpoints of many user groups in urban regions who may have different experiences of engaging with information on private WhatsApp groups. We plan to conduct a follow-up study with more diverse populations, such as low-income, low-literate urban residents and migrant urban communities, to identify the commonalities and differences between users of varying socioeconomic status, urbanity, and gender identities.

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Theme / Code	Count	Theme / Code	Count
Misinformation discovery (23.10%)	283	Misinformation propagation (22.61%)	277
Dependancy for discovery	23	Lack of interest to forward	19
Message source as trust influencer	35	Pressure to forward/interact	25
Message sender & relation with them	21	Physical dissemination	19
Power structures influencing trust	16	Forwarding through cross-app discussion	18
Credentials impacting trust	22	Forwarding as a status	20
Message characteristics influence trust	24	Take back forwarding messages	17
Physical rumors	19	Increasing awareness through forwarding	34
Personal perceptions & experiences	12	Forwarding as a reflex	21
Digital verification strategies	21	Forwarding because it feels right	29
Social verification strategies	28	Communal angle for forwarding	12
Challenges with verification	22	Economic angle for forwarding	24
Issues	26	Result of an positive emotion	17
Fake discovery not possible/important	14	Result of a negative emotion	22
Misinformation combat (27.43%)	336	Misinformation Effects (17.22%)	211
Positive motivations for combating	19	Behavior change around misinformation	29
Lack of motivation for combating	32	Physical actions based on forwards	24
Persuasion - educating the sender	35	Harmful communal actions	45
Persuasion - please check/soft pushback	21	purposeful "no action"	15
Reprimanding techniques	36	Physical actions for Others	19
Training/guidance around misinformation	15	Physical actions for Self	14
Delegation to gatekeepers	23	Emotional impact - Positive	28
Delegation to subject experts	43	Emotional impact - Negative	12
Networked corrections	36	Don't think about effects	25
Delegation to govt. authorities	25	Misinformation characteristics (9.63%)	118
Local challenges with combating misinformation	17	Misinformation Group characteristics	45
Localized combating techniques	23	Not trustworthy messages	35
Arguments around misinformation	11	Trustworthy messages	38

Table 2: The complete codebook that resulted from our analysis of interviews, showing our five themes (bold) and 53 codes, including the prevalence (%) for each theme, and the total count for each theme/code. (The count for each theme is the sum of the counts of all codes within that theme.)