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Abstract

Effective health information campaigns play an important role in raising public awareness and encouraging preventive and health-promoting behavior. We study the extent to which awareness campaigns promoting simple COVID-19 precautionary measures foster health-preserving behavior among people in rural communities. Two weeks after the lockdowns in March 2020, we conducted a randomized controlled trial in Bangladesh and India targeting people living in remote rural areas to disseminate validated COVID-19 information over the phone. We find that relative to the information provided via text-messages, discussing various precautions over the phone can significantly improve rural people's awareness and induce compliance with COVID-19 public health guidelines. We also find compliance to be substantially higher among women, which is partially due to their concerns about the health of household members, and increased awareness. The compliance also persists after three months of the campaign. These findings help shed light on the importance of health communication methods during public health crises for remote rural communities in developing countries, where rumors and myths about diseases are often ubiquitous, and disseminating validated health information remains a challenge.

Keywords: COVID-19, health communications, awareness campaign, compliance, RCT.

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1 Introduction

Globally, more than 47 million people have been infected by the 2019 coronavirus disease (COVID-19) and over 1.2 million deaths have been reported in the first 11 months of its outbreak (WHO, 2020c). As of November 03, 2020, roughly 3.3 million people are being infected every week worldwide, where cases of confirmed infections and deaths in low and middle-income countries are rapidly increasing (WHO, 2020c; Edejer et al., 2020).[1] COVID-19 is highly transmissible that can also spread by airborne transmission (Shereen et al., 2020; Hu et al., 2020). Therefore, to limit its spread, governments and development agencies across the globe started disseminating public health messages to encourage health-preserving behavior, such as social distancing and hand-washing, since the pandemic began. However, an overabundance of information resulted in an 'infodemic'—an epidemic of misinformation—that often misled people to adapt health impairing behavior (Zarocostas, 2020; Galvão, 2020). Moreover, poor health literacy among people worldwide also made it challenging to effectively communicate simple and feasible solutions like frequent hand-washing (Paakkari & Okan, 2020).

During the pandemic, an additional challenge for developing countries is to penetrate remote rural areas with validated information to promote COVID-19 preventative measures (United Nations, 2020c). People living in remote areas are generally 'disconnected' from the digital world of the internet, social media, television, radio, and smartphones (Ahmed & Diesner, 2012; Antara, 2020), that often deprive them of access to the latest, verified information (United Nations, 2020c). As a result, rumors, myths, and misconceptions about the coronavirus are widespread in remote rural areas in developing countries (United Nations, 2020a,b), which can trivialize the risks of COVID-19 and worsen the public health crisis (Galvão, 2020). Poor health literacy also aggravates the problem of misinformation and makes infection control difficult in poor settings (Saleh, 2020; Paakkari & Okan, 2020). Besides, people living in remote rural areas—who are predominantly poor—often cannot protect themselves because of their poor socioeconomic and living conditions (Ravallion, 2020).

To raise awareness about the coronavirus and inform rapid policies on strengthening health security in remote rural areas in developing countries, we carried out over-the-phone campaigns in between early-April and mid-May 2020 targeting rural communities

[1] Besides, estimates from the World Health Organization (WHO) suggest that one in ten people worldwide might have been infected by COVID-19 since its outbreak in December 2019, which is roughly twentyfold larger than the number of confirmed infections in the first 10 months (WHO, 2020b).

of Bangladesh and India. While the internet is not readily accessible, mobile phone penetration in rural areas of Bangladesh and India is very high and has also greatly increased in recent years (Bangladesh Demographic and Health Survey, 2014; McKinsey Global Institute Report, 2019), which made our campaigns feasible. Our campaign targeted 6,485 rural households (across 420 villages) in Khulna and Satkhira districts of Bangladesh and 1,680 rural households (across 40 villages) in Kanpur of Uttar Pradesh, India. These households were randomly selected from a bigger pool of households previously surveyed by two local NGOs—our regional collaborators for this study. NGOs made direct phone calls to one adult person from each household to discuss the COVID-19 health crisis, preventative measures to be adopted to curb the virus spread, and also respond to any queries that they might have had. NGOs also sent text-messages with contents on frequent hand-washing, social distancing, etc., to mimic the ongoing 'text-message' campaign by governments and other local agencies during COVID-19. We then divided these two campaign-approaches into three treatment arms: (1) *text-messages only*, (2) *phone calls only*, and (3) *both text-messages and phone calls*. Given a large number of villages in Bangladesh, our treatments were randomized at the village level in Bangladesh; whereas, the randomization in India was at the household level.[2] Eventually, we assigned roughly one-thirds of study villages/households to each treatment arm. In the experiment, our *text-messages only* treatment was given as status quo 'control' while *phone calls only* and *both text-messages and phone calls* allowed us to examine the effectiveness of alternative communication methods in raising awareness about the coronavirus in poor settings.

A month after the campaign ended, we surveyed participating individuals in mid-June 2020. Through the survey, we measured the two outcomes of this study: (i) people's knowledge about COVID-19 precautions (i.e., awareness), and (ii) their compliance with health guidelines. Since participating individuals were also surveyed by the two NGOs in mid-2019, we were able to use various individual and household characteristics from that survey.

We find that disseminating information through *both text-messages and phone calls* (treatment 3) is the most effective means of communication in improving rural people's knowledge about COVID-19 precautions, followed by communications only via *phone calls* (treatment 2). Specifically, relative to people who only received *text-messages* (treatment 1), knowledge about COVID-19 precautions improved by 45–85 percentage points when they received *both text-messages and phone calls*, whereas awareness among

[2]India was in lockdown during our campaign period and, hence, information spillover within villages was rather low. Moreover, campaigns and surveys took place over the phone, so information could not spread to 'control' households through enumerators in the villages.

those who only received *phone calls* improved by 28–53 percentage points in both countries. Furthermore, we also identify a significant improvement in people's compliance with health guidelines. Both treatments 2 and 3 had positive impacts on an index of people's compliance: between 1–1.5 standard deviations higher in Bangladesh and between 2.2–2.7 standard deviations higher in India. In mid-August 2020, we conducted a second survey on roughly 1,600 randomly selected women participants from Bangladesh. We find that the impact of our campaign on compliance persists after three months. These results are in line with pre-coronavirus evidence from low-income countries that information campaigns can successfully promote good hygiene practices and improve people's health choices (Wilson & Chandler, 1993; De Walque, 2007; Cairncross et al., 2005; Dupas, 2011b; Dixon et al., 2015; Banerjee et al., 2020). Moreover, health communications and consultations through telephones can be effective in improving various health outcomes (Car & Sheikh, 2003; Wright et al., 2006; Härter et al., 2016).

We also examine whether our campaign affects women and men differently in terms of their compliance with coronavirus guidelines. We find that both *phone calls only* and *both text-messages and phone calls* treatments have a stronger effect on women than men, and this effect is more robust in Bangladesh than in India. Further analysis indicates that being worried about the health of household members is an important driver for women to be more compliant than men in Bangladesh. Also, our treatments have been more effective in increasing knowledge about precautions among women than men in both countries, suggesting women either take health issues seriously or they were less difficult to persuade about health risks than men. Furthermore, we also explore whether treatment effects vary by household's exposure to media. We find treatment effects to be stronger among households with television or radio than among households with no exposure to the media. Although this heterogeneity is only present in Bangladesh and not in India, it roughly indicates that our treatments work as complements to information transmitted by television and radio.

To summarize, we carried out an over-the-phone health information campaign at the onset of the COVID-19 pandemic in two 'worst hit' developing countries—India and Bangladesh—to raise awareness about COVID-19 precautions among people living in remote rural communities. Using a randomized controlled trial (RCT), we provide evidence that our campaign has a strong positive impact on rural people's knowledge about COVID-19 precautions and compliance with COVID-19 public health guidelines. Therefore, we contribute to the new line of literature on the causes and consequences of health-preserving behavior, such as social distancing and hand-washing, during the COVID-19 pandemic (Al-Dmour et al., 2020; Allcott et al., 2020; Banerjee et al., 2020;

Barrios et al., 2020; Briscese et al., 2020; Bursztyn et al., 2020; Mheidly & Fares, 2020; Nivette et al., 2020; Pink et al., 2020; Simonov et al., 2020; Yousuf et al., 2020). Specifically, these studies show that political polarization (Allcott et al., 2020), media outlets (Bursztyn et al., 2020; Simonov et al., 2020; Yousuf et al., 2020), social media platforms (Al-Dmour et al., 2020), messaging campaign (Banerjee et al., 2020), sense of civic duty (Al-Dmour et al., 2020), expectations about lockdown-policy duration (Briscese et al., 2020), and sociodemographic factors (Nivette et al., 2020) can influence people's compliance during the COVID-19 pandemic. Our study is most closely related to Banerjee et al. (2020) that evaluates the effectiveness of a messaging campaign in West Bengal, India, through an RCT. This campaign randomly sent YouTube links to informational video clips, delivered by Professor Abhijit Banerjee, via text-messages to residents of West Bengal, India. Through a survey on 677 health workers and 1,883 former and current village council members, this paper shows that the campaign increased their reporting of COVID-19 symptoms, reduced travel, and increased their hand-washing and mask-wearing immediately after the campaign ended. Our paper complements Banerjee et al. (2020) but focuses on remote rural communities where validated information often does not penetrate via the internet, smartphones, social media, news channels, etc., and provides causal evidence that brief one-to-one discussions over the phone can have a strong impact on stay-at-home, social distancing, and hand-washing behavior. To our knowledge, our study provides the first experimental evidence during the COVID-19 pandemic on raising health awareness among remote rural people who are often 'disconnected' from the digital world.

More generally, our work contributes to the growing literature on the causal impact of health information campaigns in developing countries on various health behavior and outcomes, such as HIV infections (Dupas, 2011a; Banerjee et al., 2019; Islam et al., 2020), malaria infections and treatment (Dupas, 2009; Cohen et al., 2015), infant diarrhoeal disease (Levine & Kinder, 2004), and contraceptive use and fertility (Ashraf et al., 2010). We also contribute to the literature on the use of mobile phones to communicate important health information to the public—in particular, through text-messages, calls, mobile apps, etc. (Platt et al., 1997; Fjeldsoe et al., 2009; Graves et al., 2009; Zurovac et al., 2011; Klasnja & Pratt, 2012; Free et al., 2013; Head et al., 2013; Hall et al., 2015). Therefore, our results corroborate findings from a large body of literature that identifies a positive impact of health information campaigns and nudges on various health-promoting behavior and outcomes.

The remainder of this paper proceeds as follows. The next two sections (2 and 3) provides the context and design of our study. We then report our results in section 4

and, later, conclude with some policy implications in section 5.

2 The Context

Bangladesh. As of November 03, 2020, Bangladesh had 410,988 confirmed infections and 5,966 confirmed deaths from COVID-19 (WHO Bangladesh, 2020b). Bangladesh, the most densely populated country in the world, experienced a sudden rise in COVID-19 infections in late March-early April 2020. In response, a nationwide lockdown was implemented on March 26, which was later lifted on May 30, 2020. Parallel to the lockdown, the government, NGOs, and various organizations also reached out to people through different mediums to spread awareness about COVID-19. For instance, media—such as television, radio, and newspapers—and text-messages from the government and mobile phone operators played (and continues to play) an important role in spreading verified information and creating awareness among people. Being freely available for smartphone users in Bangladesh, Facebook users also received an abundance of information through various sources. However, reaching out to people living in rural and remote areas, which constitutes more than 60% of the Bangladeshi population, has been a challenge. The reason being that only 1% of rural households own radios and 38% own televisions (Bangladesh Demographic and Household Survey, 2019). Also, roughly 18% of people use smartphones (LIRNE Asia, 2018) and 4% of people of rural people own computers (Antara, 2020); thus, information through the internet, online video clips, or social media could not reach the majority of people. In contrast, mobile phones (mostly feature-phones) are widely used in Bangladesh, where 94% of rural households own at least one mobile phone (Bangladesh Demographic and Household Survey, 2019).

The government leveraged the wider mobile phone coverage in the country to inform people through voice and text-messages about COVID-19 and steps taken by the government to tackle it. However, the importance of basic protective measures about COVID-19 is often ignored by Bangladeshi people, where poor and rural households often show non-compliance due to illiteracy and lack of awareness, thereby making them susceptible to the spread of COVID-19 (Mahmud, 2020). In particular, roughly 30% of the rural population in Bangladesh are illiterate (Bangladesh Household Income and Expenditure Survey, 2016), which hinders their reading and comprehending written information, such as, through text-messages, public signs, posters, leaflets, etc. Although a few NGOs are currently working in Bangladesh to disseminate COVID-19 information, a recent survey by the Risk Communication and Community Engagement indicates that only 2 out 5 people are complying with protective measures in rural communities (WHO

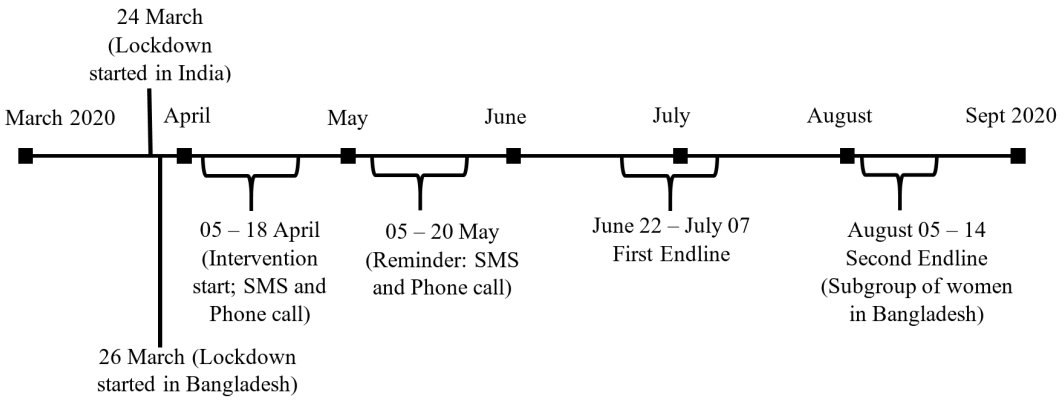
Bangladesh, 2020a).

Our study in Bangladesh took place in remote and rural areas in Khulna and Satkhira districts. In the rural areas of Khulna division (that consists of ten districts, including Khulna and Satkhira districts), 28% of people are illiterate, 34.4% of households own televisions and 5.4% own radios, and 87.5% of households own at least one mobile phone (Bangladesh Household Income and Expenditure Survey, 2016; Bangladesh Demographic and Health Survey, 2014). As of November 03, 2020, the Khulna division had around 23,000 confirmed infections—the third highest in the country (WHO Bangladesh, 2020b). However, these numbers are grossly underestimated as only 40% of the COVID-19 test laboratories are located outside the capital city, Dhaka, and tests are often carried out in urban areas in very few test centers (WHO Bangladesh, 2020b).

India. In India, numbers of confirmed infections and deaths are around 8 million and 120,000 respectively during the first 11 months of the outbreak (WHO India, 2020). This ranks India second in terms of total confirmed infections and third in terms of total confirmed deaths from COVID-19 globally. At the onset, the government imposed a national lockdown on March 24, 2020, and later started reopening the country in five consecutive 'country unlocking' phases, which began on June 8 and concluded on October 31, 2020 (Ministry of Home Affairs India, 2020). During the lockdown period, the government took various initiatives to inform the public about COVID-19. For instance, public announcements on COVID-19 precautions were made via television, radio, newspaper, text-messages, social media, etc. Celebrity videos were also circulated on various social networking platforms. In addition, the police department had also played an active role in making the common people aware of COVID-19, primarily by announcements and distributing posters to individuals about social distancing, hand-cleaning, mask-wearing, etc. Campaigns through social media were possible because about 26.2% of people use smartphones and 24% of households have access to the internet (McKinsey Global Institute Report, 2019). However, text-messages could reach out to the maximum audience because roughly 1.2 out of 1.35 billion Indians have mobile phone subscriptions (McKinsey Global Institute Report, 2019).

Our study in India takes place in the rural areas of Kanpur Nagar district of Uttar Pradesh. With a population of about 200 million, Uttar Pradesh is the most populous state in the country according to the 2011 census (Ministry of Home Affairs India, 2011). The literacy rate in Uttar Pradesh is about 70%, which is ranked 29 out of 36 states and union territories in the country (Ministry of Home Affairs India, 2011). Uttar Pradesh is also one of the BIMARU states, an acronym for four Indian states that

Figure 1: Project timeline



are low performing, slow-growing, and underdeveloped relative to other Indian states. These make Uttar Pradesh one of the nine Indian states to have a very high overall vulnerability to COVID-19 (Acharya & Porwal, 2020).

3 Experimental design and empirical strategy

3.1 The Experiment

We collaborated with Global Development Research Initiative (GDRI), a non-profit research organization in Bangladesh, and the Development Policy Research Network (DPRN) at the Indian Institute of Technology Kanpur, India, to carry out two information campaigns in Bangladesh and India to promote social distancing and good hygiene among people in rural and remote areas at the onset of the coronavirus lockdown. We focus on rural and remote areas in these two developing countries because the majority of households are poor with very limited access to digital tools, such as television and internet connection, which often prevents them from receiving verified information about COVID-19. Moreover, rumors and myths about COVID-19 are more likely to pervade these communities, which further heightens the risk to health and spread of fear and stigma (United Nations, 2020a,b). In addition, mobile phone users often receive mass text messages on COVID-19 issues from the government, urging users to practice social distancing and good hygiene. However, many people struggle to understand text messages due to high illiteracy among adults in rural areas (Saleh, 2020), which often makes text messages an ineffective method of communication with rural people. Therefore, to disseminate accurate, reliable information to these people on how to stay healthy and keep safe during the pandemic and to determine the most effective way of educating

rural people on the preventative measures against the spread of the coronavirus, we carried out two over-the-phone campaigns in Bangladesh and India between early-April and mid-May, 2020. Figure 1 lays out the timeline of our project.

Our remote campaigns were possible due to the wider use of cellular (or mobile) phones in rural communities of both countries. For the campaign, important information on social distancing, hand washing, etc., were carefully crafted following the guidelines of the World Health Organization (WHO), UNICEF, and the Ministry of Health in India and Bangladesh. This information was disseminated among selected households in three ways: via a series of text-messages in the local language (*Bangla* in Bangladesh and *Hindi* in India), via direct phone calls from the local NGO, or via both. During the campaign period, one group of randomly selected households received a text message explaining ways to protect oneself from COVID-19, e.g., frequent hand-washing, social distancing, etc. This text-message was sent again after one month, as a reminder. The exact content of this text-message (longer than 160 characters) is provided in section B.1 in Appendix B. In addition, preventative measures were discussed over the phone with members of another group of randomly selected households, following a carefully crafted phone call script prepared by Tabassum Rahman—a public health expert and one of the co-authors of this study. Analogous to text-messages, phone calls were also made twice. The phone call script is provided in section B.2 in Appendix B. During the second phone call, instead of going over the script point-by-point, callers engaged in conversations related to the current COVID-19 situation, the importance of compliance, and responded to queries made by respondents. We did this to avoid repetition and make the discussions more engaging and natural. Furthermore, the third group of randomly selected households received both text messages and phone calls from the local NGO during the campaign period. Each household in this group received two phone calls and two text-messages, where phone calls were always made 2-3 days after sending text-messages. We followed this order to allow participants to read the text-messages and to allow callers from NGOs to refer back to text-messages to facilitate conversation. At the end of each call, participants were also requested to disseminate this information to their household members so that everyone in the household closely follows the health guidelines. Each phone call lasted for about 10-15 minutes. Also, all phone calls and text-messages were addressed by the recipient's full name (according to NGO records). For this campaign, callers from NGOs were carefully trained by Tabassum Rahman through video conferencing.

We use an RCT to evaluate which of these three means of communication is the most effective in increasing COVID-19 awareness and compliance with COVID-19 pub-

lic health guidelines among rural people. To select households for the campaign, we obtained a list of households with mobile phone numbers that were previously surveyed by the two local organizations, GDRI and DPRN, in Bangladesh and India respectively. From this list, we randomly selected roughly 8,000 phone numbers (where each phone number represents a household) in Bangladesh and 1,870 in India.[3] Among the randomly selected households, 81% of households in Bangladesh and 90% of households in India had active phone numbers and were interested to take part in our endline survey. The remaining numbers were either invalid, repeatedly switched off, or respondents were unwilling to partake in the endline survey. Finally, 6,485 rural households (from 420 villages across 50 union councils) in Khulna and Satkhira districts in Bangladesh and 1,680 rural households (from 40 villages) in Kanpur, Uttar Pradesh, India, participated and took part in the endline survey. Characteristics of our samples are similar to the rural population of this age group in Bangladesh and that in the state of Uttar Pradesh in India.

We randomized 420 villages in Bangladesh to three different treatment arms: (i) *text-messages only* (131 villages with 2,361 households), (ii) *phone calls only* (138 villages with 2,031 households), and (iii) *both text-messages and phone calls* (151 villages with 2,093 households). However, given the small number of villages in India, our randomization in India was at the household level. In particular, 561 households were assigned to the *text-messages only* treatment, 601 households to the *phone calls only* treatment, and the remaining 518 households were assigned to the *both text-messages and phone calls* treatment. The exact treatments are as follows:

- *Treatment 1 (text-messages only):* Each participant under this treatment received carefully written text-messages (twice) about the COVID-19 preventative measures. See section B.1 in Appendix B for the exact contents.
- *Treatment 2 (phone calls only):* Each participant under this treatment received phone calls (twice) to briefly discuss (for 10-15 minutes) about the COVID-19 preventative measures and also to respond to any queries about COVID-19 that they might have. See section B.2 in Appendix B for the phone call script.
- *Treatment 3 (both text-messages and phone calls):* Each participant under this treatment first received the text message as in Treatment 1 (twice) and then the phone call as in Treatment 2 (twice).

We do not have a 'pure' control group because mobile phone users often receive text-messages on COVID-19 precautions from the government and other organizations.

[3]This imbalance in the number of households is due to GDRI in Bangladesh having more household contact details than DPRN in India.

Furthermore, on humanitarian ground, we wanted to reach out to as many rural households as possible to spread awareness about the coronavirus. Therefore, we consider *Treatment 1 (text-messages only)* as our control group and, hence, the reference category in our empirical analysis. We provide a map of Bangladeshi subdistricts in Figure A1 in Appendix A to show the distribution of and distances between treatment villages in our study districts.[4]

3.2 Data

Following the information campaign, in between late-June and early-July 2020 (roughly a month after the campaign ended), we collected a rich-set of survey data by phone from the participating individuals. Trained enumerators from GDRI and DPRN contacted respondents to conduct short surveys over the phone, each lasting for 10-15 minutes. These enumerators—locals from the intervention areas—are highly trained with many years of interviewing experiences.[5] Our survey consisted of questions related to respondent's knowledge about COVID-19, degree of compliance with health guidelines (social distancing, mobility, and hygiene), household head's primary occupation, and food insecurity due to COVID-19. We rely on self-reported measures of compliance in this study because other measures, such as coronavirus testing and infection rates, are often not available (also grossly underestimated) for rural areas because of lack of testing and limited access to test centers in rural areas. Also, location and mobility data through smartphones are not available due to a lack of smartphone use and internet access in rural areas.

We also asked questions on how worried respondents are in terms of their household finances and health. Since conducting extensive surveys were not possible during the pandemic, we matched respondents to data that was collected in 2019 by the same local organizations. This 'old' data in Bangladesh includes information on the respondent's age (in years), gender, years of education, monthly household income, number of household members, and whether the household owns a TV or radio. The 'old' data in India includes information on the respondent's age (in years), gender, college completion, monthly household income, number of household members, willingness to take health-related risks (a scale between 0-10, where a higher number corresponds to higher willingness), caste, whether they live in a joint family, whether they live in relatively

[4]We do not provide a similar map for Kanpur, India, because randomization in India was done at the household level, and highlighting treatment/control households across only 40 villages clutters the map, makes it illegible. Instead, we provide a map of India in Figure A2 in Appendix A to show the location of Kanpur in Uttar Pradesh.

[5]Our enumerators and callers (those who made phone calls during the campaign) were different.

urban areas, whether they own their house, any household member with a disability, and whether anyone in the family has long-term illnesses. This additional data from 2019 was available for all participating households in India (1,680 households) but only for 90% of participating households in Bangladesh (5,840 out of 6,485 households). For the remaining 10% in Bangladesh, we inferred the gender and religion of the respondents from their full names. Thus, gender and religion are available for the entire Bangladeshi sample. See Table A1 in Appendix A for a list of all additional variables and at what point were they collected. We use these characteristics as control variables in our regression analysis. Due to the urgency of the campaign, we were unable to conduct a proper baseline survey. However, we use the data from mid-2019 to show a balance in characteristics between our treatment groups. We discuss it later in this section.

Outcomes variables. Below we define our two outcome variables—awareness and compliance—used in the empirical analysis.

Awareness/complete awareness. To measure respondent's knowledge about COVID-19 (a measure of their awareness, one of the two outcomes of this study), enumerators asked respondents *"To the best of your knowledge, what rules should we maintain to protect us from the coronavirus?"*. Enumerators had a list of 5 most common rules that they could tick/check: (i) handwashing with soap and water for at least 20 seconds, (ii) coughing or sneezing in the elbow, (iii) maintaining 2 arms distance from outsiders, (iv) restraining from hugging or shaking hands, and (v) self-isolate if having fever, cough, or difficulty in breathing.[6] Mentioning these rules (i.e., the number of correct responses) revealed the extent of the respondent's knowledge of COVID-19, where providing all five correct answers means the respondent is *completely aware* of COVID-19 precautions. Using these responses, we use the number of correct responses (on a scale between 0 and 5) as the *awareness* outcome variable, where a higher score corresponds to better awareness. We also create an indicator variable for *complete awareness* that we code as 1 if the respondent mentioned all five rules correctly and 0 otherwise. We use both *awareness* and *complete awareness* as outcome variables in the regression analysis.

Compliance. Compliance with COVID-19 public health guidelines (the second outcome of this study) was measured by asking respondents how often they left home in the past week to *(i) go to the market, (ii) visit doctors, (iii) for entertainment purpose (e.g.,*

[6]We did not have 'mask-wearing' as one of the measures because masks were not readily available in remote rural areas when we started our campaign (roughly 10 days after the pandemic lockdown). Besides, WHO only advised mask-wearing in public on June 05, 2020 (WHO, 2020a), roughly two weeks after our campaign ended. We added 'mask-wearing' as one of the precautions in the second endline survey (conducted on women in Bangladesh).

to attend weddings), (iv) for religious purpose (i.e., to offer prayers), and (v) how often they washed their hands, (vi) how often they did not hug or shake hands with outsiders in the past week. These questions were answered on a 6-point scale: 0=Did not go outside, 1=one day, 2=two days, 3=three days, 4=five days, 5=Everyday. Each question was then converted into an indicator variable. For (i) through (iv), we code the activity as 1 if the respondent answered either 0, 1, or 2, and 0 otherwise. For (v) and (vi), which requires reverse scoring, we code the activity as 1 if the respondent answered either 3, 4, or 5, and 0 otherwise (i.e., if answered either 0, 1, or 2). Therefore, 1 corresponds to higher compliance. Using these 6 indicators, we create a standardized compliance index following Kling et al. (2007). That is, we take the mean of the six indicators and then subtract the control group (i.e., *Treatment 1*) mean, and then divide this difference by the control group standard deviation. Eventually, we get a z-score that has a mean zero and standard deviation one for the control group. For robustness check, we also use these indicator variables as our *compliance* indicator outcomes in the regression analysis.

Additional variables. In addition to controlling for variables that were collected during the 2019 survey (see Table A1 in Appendix A), we also use how worried respondents are about their household finances and family's health, household level food insecurity during COVID-19, and occupation as controls in the empirical analysis. We define these additional variables (only collected during the endline survey) below.

Worried about health and finances. We measured respondent's worries regarding family's health and household finances by asking how worried respondents are about *"their family's health and medical treatment"* and *"finding a way to earn money/ensure income for your family"*. These questions were answered on a 3-point scale: 1=not worried, 2=somewhat worried, 3=very worried. We create two indicators, *worried: family health* and *worried: finances*, that are coded as 1 if the respondent answered 2 or 3 (implying worry), and 0 otherwise.

Household food insecurity. We measured household food insecurity differently in Bangladesh and India. To measure the current food insecurity of the participating households in Bangladesh, we used the Food Insecurity Experience Scale (FIES) (Ballard et al., 2013). The FIES consists of eight questions that measure a household's lack of access to sufficient nutritious food to meet their dietary needs. Each question is answered as either *yes* or *no*, where *yes* corresponds to being food insecure. Using these questions, we created a dummy variable that equals 1 if the household is food insecure (answering at least one *yes* to the eight FIES questions) and 0 if answered all *no*.[7] In India, analogous

[7]The FIES questions are: *Was there a time when, because of lack of money or other resources:*

to *Worried about health and finances* questions, we asked *"how worried respondents are in terms of arranging food for every family member"*.[8] These questions were answered on a 3-point scale: 1=not worried, 2=somewhat worried, 3=very worried. We create an indicator for household food insecurity that is coded as 1 if the respondent answered 2 or 3 (implying insecurity), and 0 otherwise.

Occupation. We ask, *"What is the primary occupation of the main earning member of your family?* 1=farmer, 2=farm laborer, 3=day laborer, 4=business, 5=public sector work, 6=private sector work, 7=others. We reduce the categories to four: agriculture (combining 1 and 2), laborer (combining 3 and 7), business, and government/private job (combining 5 and 6).

We do not have a baseline measure of our two outcomes, *awareness* and *compliance*; however, we use various characteristics, such as age, gender, religion, education, etc., that were collected in mid-2019 to show our balance between treatment groups below.

Sample characteristics and balance. We begin by showing the descriptive statistics and comparing whether our treatment groups are similar in terms of demographic and socioeconomic characteristics, such as respondent's age, education, religion, income, etc., in Table 1. Roughly 60% of Bangladeshi and 50% of Indian participants are female and the typical participant was roughly 37 years old in both countries. Households in Bangladesh earned roughly 120 USD and that in India earned roughly 150 USD per month.[9] Moreover, the majority of participants in Bangladesh are Muslims whereas the majority of participants in India are Hindus. In addition, study participants in both countries appear fairly educated.

To check the balance, we regress these characteristics on a treatment dummy while always omitting the sample from the third treatment, so that we are able to compare characteristics between two treatments at a time. We run the following OLS regression:

$$y_i = \beta T_i + \upsilon_i \tag{1}$$

where y_i is the characteristics of household i; T is a treatment dummy, which alterna-

(1) You were worried you would not have enough food to eat?; (2) You were unable to eat healthy and nutritious food?; (3) You ate only a few kinds of foods?; (4) You had to skip a meal?; (5) You ate less than you thought you should?; (6) Your household ran out of food?; (7) You were hungry but did not eat? and (8) You went without eating for a whole day?.

[8]Instead of using the FIES scale, we use this short question on food insecurity in India because we were advised by the NGO in India to compress the questionnaire.

[9]USD 1 equals 70 Indian Rupees and 80 Bangladeshi Taka.

tively equals to (i) one if *Treatment 2* or zero if *Treatment 1* (to compare characteristics between *Treatment 1* and *Treatment 2*), (ii) one if *Treatment 3* or zero if *Treatment 1* (to compare characteristics between *Treatment 1* and *Treatment 3*), or (iii) one if *Treatment 3* or zero if *Treatment 2* (to compare characteristics between *Treatment 2* and *Treatment 3*). We cluster standard errors at the village level.

Table 1 also reports the differences in individual and household characteristics between treatments for both Bangladeshi (Panel A) and Indian (Panel B) samples. We mostly find no statistically significant differences (at conventional levels) between the treatment groups. One of the few exceptions are the proportion of male respondents between *Treatment 2* and *Treatment 3* in Bangladesh (Panel A) and that between *Treatment 1* and *Treatment 3* in India (Panel B), which are both statistically significant at 10% level. Besides, in the Bangladeshi sample (Panel A), occupation between *Treatment 1* and *Treatment 2*, and that between *Treatment 2* and *Treatment 3* are statistically significant at 5% level. Another statistically significant difference (at 5% level) can be observed in terms of whether respondents live in a joint family (between *Treatment 1* and *Treatment 2*; Panel B, India). However, as we run many tests, it is possible the significant differences reported in Table 1 are a product of chance. This is because we run 60 independent tests (20 variables with 3 comparisons in each) and a Bonferroni multiple comparison corrections requires a significance threshold of $\alpha = 0.0008$ for each difference to be significant at 5% level (or $\alpha = 0.002$ for significance at 10% level). Moreover, the differences reported (in the last three columns) are not always in the same direction, suggesting treatment groups might be fairly similar in terms of characteristics.

3.3 Empirical strategy

Main specification. We are interested in estimating the effect of our awareness campaign on outcomes associated with COVID-19 related knowledge (i.e., awareness) and compliance. To do so, we estimate the treatment effects using the following OLS regression:

$$Outcome_i = \alpha + \beta_1 T2_i + \beta_2 T3_i + X_i'\delta + \tau + \epsilon_i \tag{2}$$

where $Outcome_i$ is the outcome (*awareness* or *compliance*) of household i; $T2$ is an indicator for *phone call only* treatment and $T3$ is an indicator for *both text and phone call* treatment (thus our reference category is the *text only* treatment); and X is a vector of controls that are described in section 3.2 and listed in Table A1 in Appendix A. In India, since each village have both treatment and control households, we use village fixed effects to control for community characteristics. However, randomization in Bangladesh

Table 1: Characteristics and Balance Checks

Variables	**All** (*Std. Dev.*)	**T1 (*SMS*)** (*Std. Dev.*)	**T2 (*Call*)** (*Std. Dev.*)	**T3 (*Both*)** (*Std. Dev.*)	**T2-T1** (*SE*)	**T3-T1** (*SE*)	**T3-T2** (*SE*)
			Panel A: Bangladesh				
Age$^{\perp}$(in years)	36.73	37.06	36.60	36.48	-0.45	-0.58	-0.13
	(9.08)	*(8.93)*	*(9.26)*	*(9.09)*	*(0.69)*	*(0.67)*	*(0.71)*
Education$^{\perp}$ (in years)	8.37	8.35	8.48	8.28	0.13	-0.07	-0.20
	(2.92)	*(2.87)*	*(2.81)*	*(3.09)*	*(0.17)*	*(0.19)*	*(0.19)*
Monthly income$^{\perp}$ (in BDT)	9,403	9,201	9,300	9,733	99.00	531.95	432.95
	(6,571)	*(6,236)*	*(6,137)*	*(7,294)*	*(388)*	*(424)*	*(415)*
Number of of household members$^{\perp}$	4.33	4.29	4.31	4.40	0.02	0.11	0.09
	(1.31)	*(1.32)*	*(1.25)*	*(1.35)*	*(0.06)*	*(0.07)*	*(0.06)*
Male (or Female)	0.40	0.40	0.42	0.38	0.01	-0.03	-0.04*
	(0.49)	*(0.49)*	*(0.49)*	*(0.48)*	*(0.01)*	*(0.01)*	*(0.02)*
Muslim (or Hindu)	0.71	0.74	0.69	0.69	-0.06	-0.05	0.01
	(0.46)	*(0.44)*	*(0.46)*	*(0.46)*	*(0.05)*	*(0.04)*	*(0.05)*
Occupations:	-	-	-	-	-0.073**	-0.002	0.070**
					(0.04)	*(0.02)*	*(0.03)*
Govt. or private job (or not)	0.09	0.08	0.10	0.09	-	-	-
	(0.29)	*(0.28)*	*(0.30)*	*(0.28)*			
Farmer (or not)	0.17	0.17	0.18	0.17	-	-	-
	(0.38)	*(0.37)*	*(0.38)*	*(0.38)*			
Day laborer (or not)	0.41	0.42	0.42	0.40	-	-	-
	(0.49)	*(0.49)*	*(0.49)*	*(0.49)*			
Owns Business (or not)	0.32	0.33	0.30	0.34	-	-	-
	(0.47)	*(0.47)*	*(0.46)*	*(0.47)*			
Sample Size	6,485 (5,841$^{\perp}$)	2,361 (2,191$^{\perp}$)	2,031 (1,763$^{\perp}$)	2,093 (1,887$^{\perp}$)	-	-	-
			Panel B: India				
Age (in years)	37.43	38.31	36.76	37.27	-1.55	-1.04	0.52
	(14.11)	*(13.99)*	*(14.44)*	*(13.82)*	*(0.77)*	*(0.81)*	*(0.77)*
Has college degree (or not)	0.13	0.13	0.14	0.13	0.01	0.00	-0.01
	(0.34)	*(0.34)*	*(0.35)*	*(0.34)*	*(0.02)*	*(0.02)*	*(0.02)*
Male (or Female)	0.50	0.53	0.50	0.47	-0.03	-0.06*	-0.03
	(0.50)	*(0.50)*	*(0.50)*	*(0.50)*	*(0.03)*	*(0.03)*	*(0.03)*
Residence near marketplace (or not)	0.35	0.36	0.35	0.33	-0.00	-0.03	-0.02
	(0.48)	*(0.48)*	*(0.48)*	*(0.47)*	*(0.02)*	*(0.03)*	*(0.03)*
Monthly income (in INR)	10,951	11,107	10,974	10,756	-132.74	-351.2	-218.4
	(6,451)	*(6,752)*	*(6,461)*	*(6,104)*	*(373)*	*(377)*	*(354)*
Living in a joint family (or not)	0.53	0.57	0.49	0.54	-0.08**	-0.03	0.05
	(0.50)	*(0.49)*	*(0.50)*	*(0.50)*	*(0.03)*	*(0.03)*	*(0.04)*
Whether own their house (or not)	0.96	0.95	0.97	0.95	0.01*	0.00	-0.02*
	(0.20)	*(0.21)*	*(0.18)*	*(0.22)*	*(0.01)*	*(0.01)*	*(0.01)*
Any HH member with a disability (or not)	0.08	0.08	0.07	0.07	-0.01	-0.01	0.00
	(0.27)	*(0.28)*	*(0.26)*	*(0.26)*	*(0.01)*	*(0.02)*	*(0.02)*
Married (or not)	0.83	0.84	0.81	0.85	-0.03*	0.00	0.04
	(0.37)	*(0.36)*	*(0.39)*	*(0.36)*	*(0.02)*	*(0.02)*	*(0.02)*
Employed (or not)	2.43	2.38	2.44	2.46	0.06	0.08	0.01
	(0.80)	*(0.82)*	*(0.79)*	*(0.80)*	*(0.04)*	*(0.05)*	*(0.05)*
Any HH member with long-term illness (or not)	0.36	0.33	0.36	0.39	0.03	0.06*	0.03
	(0.48)	*(0.47)*	*(0.48)*	*(0.49)*	*(0.02)*	*(0.03)*	*(0.03)*
Hindu (or not)	0.79	0.79	0.78	0.81	-0.01	0.01	0.03
	(0.41)	*(0.41)*	*(0.42)*	*(0.40)*	*(0.02)*	*(0.03)*	*(0.02)*
Caste categories:	-	-	-	-	-0.032	-0.161	-0.091
					0.07	*0.04*	*0.07*
General category (GC)	0.27	0.25	0.27	0.30	-	-	-
	(0.45)	*(0.43)*	*(0.45)*	*(0.46)*			
Scheduled caste (SC)	0.21	0.22	0.21	0.21	-	-	-
	(0.41)	*(0.42)*	*(0.41)*	*(0.41)*			
Schedules tribe (ST)	0.00	0.00	0.00	0.00	-	-	-
	(0.04)	*(0.04)*	*(0.00)*	*(0.06)*			
Other backward classes (OBC)	0.51	0.52	0.52	0.49	-	-	-
	(0.50)	*(0.50)*	*(0.50)*	*(0.50)*			
Sample Size	1,680	561	601	518	-	-	-

Note: First four columns report the mean of the corresponding variable with standard deviations in parentheses. Last three columns report the difference between treatments with standard errors in parentheses clustered at the village level. All variables with "or not" in parentheses are dummy variables and are self explanatory. Variables in Panel A with $^{\perp}$ corresponds to data collected earlier in 2019 and, thus, the corresponding sample sizes are smaller (reported in parentheses) because this data is only available for roughly 90% of the Bangladeshi sample. All variables in Panel B were collected in 2019. In Panel A, 'Occupation' has four categories, defined in section 3.2. In Panel B, 'Caste Categories' has four categories: General category means the household belongs to a caste that is considered "upper" or forward; SC, ST, and OBC means the household belongs to either a scheduled caste, schedules tribe, or to other backward classes. *** p<0.01, ** p<0.05, * p<0.10.

was at the village level, so we use union council (the smallest rural administrative unit in Bangladesh) fixed effects.[10] Therefore, the comparisons in Bangladesh are within the same union councils (we have 50 union councils). Thus, τ corresponds to village and union council fixed effects in India and Bangladesh respectively. Since we provide information to everyone in the treatment groups but do not eventually observe whether participants listened/read or understood information through text-messages for instance, $\hat{\beta}_1$ and $\hat{\beta}_2$ are our intent-to-treat effects. Using an ordered probit model for the ordered dependent variables (e.g., awareness on a scale between 0 and 5) and a probit model for binary outcomes (e.g., complete awareness indicator), our results presented in section 4 remain largely consistent and qualitatively similar.

Inference. We cluster standard errors at the village level (420 villages in Bangladesh and 40 villages in India). Although treatments in India varies at the household level, we allow the error term to be clustered at the village level. Results reported in section 4 using Indian data do not change if standard errors are not clustered. Since the number of villages (i.e., clusters) in India is relatively small (40 relative to 420 in Bangladesh), we also compute p-values using the wild bootstrap-t clustering method for the Indian sample (Cameron et al., 2008, CGM). We report these CGM p-values in our main results tables. We also compute and report p-values from a permutation test at the village-level (in Bangladesh) or at the household-level (in India) by randomly shuffling the treatment status 1,000 times (Young, 2019). We also report these randomization inference (RI) p-values in our main results tables. Our results reported in section 4 are robust throughout and conclusions are largely consistent using these different methods.

Correction for multiple hypotheses testing. We also adjust our p-values for multiple hypothesis testing. We have two treatments and we examine its impacts on various outcomes. For instance, for robustness checks, we use six compliance indicator outcomes and two treatments, which gives us 12 hypothesis tests and, thus, 12 p-values. Therefore, in such cases, we adjust p-values to reduce the likelihood of wrongly rejecting a null hypothesis (type-I error) by using Westfall & Young (1993, WY) adjustments. This method uses bootstrap resampling (1,000 replications, in our case) to account for correlation across different outcomes. Under the main regression tables, we report these Family Wise Error Rate (FWER) adjusted p-values. In addition, we also adjust p-values using the more conservative Bonferroni adjustments and find that Bonferroni adjusted p-values align closely with WY FWER adjusted p-values and, thus, the conclusions are

[10] An union council consists of fifteen villages on average in Bangladesh.

Figure 2: Summary of Results

Note: Each bar in graphs A1 and B1 represent the average number of correct responses and that in graphs A2-A3 and B2-B3 represents proportion. All bars are reported with 95% confidence interval.

largely consistent using these two methods.

4 Results

4.1 Results for awareness

Raw comparisons. Raw comparisons of *awareness* outcome between treatment groups show that both treatments 2 and 3 (i.e., *phone calls only* and *both text-messages and phone calls* respectively) have been significantly more effective than treatment 1 (i.e., *text-messages only*) with regards to increasing COVID-19 awareness among participants in both countries. Figure 2 presents raw results on the averages of awareness in Bangladesh (column A) and India (column B). For instance, in Bangladesh (graph A1, column A), participants in treatments 2 and 3 reported roughly 1.7 and 2.1 more correct COVID-19 precautions (imply higher awareness) than participants in treatment 1 that only reported 2.1 out of 5 common COVID-19 precautions, and these differences are statistically significant at 1% level using a two-sided T-test (T-test: both $p < 0.01$). Moreover, the difference in awareness between Bangladeshi participants in treatment 2 and treatment 3 is also statistically significant (T-test: $p < 0.01$), suggesting treatment 3 is more effective than treatment 2 in terms of raising awareness. Similarly, in India (graph B1, column B), participants in treatments 2 and 3 reported about 2.6 and 3.4 more correct COVID-19 precautions than participants in treatment 1 (reported 1.5 out of 5 precautions) and these differences are significant at 1% level (T-test: both $p < 0.01$). Low awareness among participants in treatment 1 could be due to the low presence of NGOs and other agencies promoting messaging campaigns in India. The difference in *awareness* between participants from treatment 2 and treatment 3 in India is also statistically significant (T-test: $p < 0.01$), implying treatment 3 being more effective than treatment 2 in spreading awareness. These differences within both countries also remain largely significant when we compare *complete awareness* (i.e., people who reported all COVID-19 precautions correctly) of participants between treatments (Pearson's Chi-squared or CS-test: all $p < 0.01$). *Complete awareness* summaries of participants are shown in graphs A2 and B2 in Figure 2.

Treatment effects. We then regress respondents' reported *awareness* on the treatment indicators while also controlling for various individual and household-level characteristics as in equation 2. We report these OLS estimates in Table 2 in two panels, one for the Bangladeshi sample (Panel A) and the other for the India sample (Panel B). The first three columns (1-3) use the number of correctly reported awareness rules as the dependent variable (between 0-5, where a higher number corresponds to better awareness) and the last three columns (4-6) use the indicator for *complete awareness*

(=1 if reported all awareness rules correctly) as the dependent variable. We report the results without any covariates in columns 1 and 4, then with covariates in subsequent columns. For instance, in Panel A (Bangladeshi sample), we add control variables in columns 2 and 5 that were collected during the endline, and then in columns 3 and 6, we add the additional controls that were collected through an old survey conducted in 2019 in Bangladesh (that is only available for 90% of the Bangladeshi sample). Likewise, in Panel B (Indian sample), we add demographic controls in columns 2 and 5, and the remaining controls in columns 3 and 6. We explain how these variables are constructed in section 3.2, define it briefly under Table 2, and again list these controls in Table A1 in Appendix A to show which variable is available for each country and at what point were they collected.

Our estimates with or without covariates show positive and statistically significant effects of both treatments (*phone calls only* and *both text-messages and phone calls*) on raising coronavirus awareness among participants in both countries (all $p < 0.01$ in Table 2). Moreover, the effect of treatment 3 is significantly larger than the effect of treatment 2 (F-test: $p < 0.01$), suggesting communication through both phone calls and text messages is the most effective approach for spreading COVID-19 awareness in remote rural communities. For instance, participants that received both phone calls and text messages were likely to report roughly 0.4-0.5 more correct COVID-19 precautions on average than participants that only received phone calls (T3 minus T2 in column 3, both panels). Similarly, participants that received treatment 3 are also more likely to be completely aware of COVID-19 precautions than participants that received treatment 2 (column 6, both panels). As a robustness check, we also estimate equation 2 using an ordered probit (for columns 1-3) and a probit (for columns 4-6) regression model and find that our results are robust and qualitatively similar to using these alternative models. We report these estimates in Table A2 in Appendix A. In addition, we also estimate the effect of our treatments on the precautions individually (rather than on an ordered scale between 0-5), where stating each precaution correctly is recorded as 1 and 0 otherwise. Thus, we have 5 dummy outcomes that we call *awareness indicators*. These estimates are provided in Table A3 in Appendix A. Our results remain robust and significant in all five columns for both countries, suggesting the effects of our treatments are present throughout the entire *awareness* distribution.[11]

[11] In Table A3 in Appendix A, we report OLS estimates of the Bangladeshi sample in two separate panels (A and B), where panel A uses all control variables (that is available for 90% of Bangladeshi participants) and panel B uses the controls that were only collected at the endline (thus, available for all Bangladeshi participants). Although we do not report, results on awareness indicators are also robust to using probit estimates.

Table 2: Effects on awareness of COVID-19 precautions

	Awareness (scale 0-5)			Completely Aware		
VARIABLES	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
	Panel A: Bangladesh					
T2 (Call Only)	1.644***	1.637***	1.580***	0.315***	0.312***	0.281***
	(0.049)	(0.049)	(0.050)	(0.013)	(0.013)	(0.015)
T3 (Both Text & Call)	2.064***	2.061***	2.108***	0.446***	0.444***	0.448***
	(0.048)	(0.048)	(0.047)	(0.013)	(0.013)	(0.014)
New Controls	No	Yes	Yes	No	Yes	Yes
Old Controls	No	No	Yes	No	No	Yes
Union Council FE	Yes	Yes	Yes	Yes	Yes	Yes
F-test p-value (T2-T3)	0.000	0.000	0.000	0.000	0.000	0.000
WY FWER p-values (T2)	0.000	0.000	0.000	0.000	0.000	0.000
WY FWER p-values (T3)	0.000	0.000	0.000	0.000	0.000	0.000
RI p-values (T2)	0.000	0.000	0.000	0.000	0.001	0.001
RI p-values (T3)	0.001	0.001	0.001	0.001	0.001	0.000
Observations	6,485	6,485	5,840	6,485	6,485	5,840
R-squared	0.419	0.422	0.447	0.200	0.206	0.221
	Panel B: India					
T2 (Call Only)	2.587***	2.579***	2.920***	0.333***	0.329***	0.532***
	(0.077)	(0.076)	(0.085)	(0.027)	(0.027)	(0.037)
T3 (Both Text & Call)	3.387***	3.368***	3.394***	0.853***	0.841***	0.848***
	(0.065)	(0.066)	(0.062)	(0.037)	(0.037)	(0.037)
Demographic Controls	No	Yes	Yes	No	Yes	Yes
Additional Controls	No	No	Yes	No	No	Yes
Village FE	Yes	Yes	Yes	Yes	Yes	Yes
F-test p-value (T2-T3)	0.000	0.000	0.000	0.000	0.000	0.000
WY FWER p-values (T2)	0.000	0.000	0.000	0.000	0.000	0.000
WY FWER p-values (T3)	0.000	0.000	0.000	0.000	0.000	0.000
RI p-values (T2)	0.001	0.000	0.000	0.000	0.001	0.001
RI p-values (T3)	0.000	0.001	0.000	0.000	0.001	0.001
CGM p-values (T2)	0.000	0.000	0.000	0.000	0.000	0.000
CGM p-values (T3)	0.000	0.000	0.000	0.000	0.000	0.000
Observations	1,680	1,680	1,680	1,680	1,680	1,680
R-squared	0.804	0.810	0.821	0.551	0.576	0.613

Robust standard errors clustered at the village level are in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Note: OLS estimates are reported; the dependent variable in columns (1)-(3) is the number of correct mentions of COVID-19 rules (on a scale between 0 and 5) and the dependent variable in columns (4)-(6) is a dummy that equals 1 if a respondent correctly mentioned all five COVID-19 rules correctly and 0 if not. In **Panel A**, the new controls include: gender dummy (=1 if male), religion dummy (=1 if follows Islam), occupation of main earning member, worried about health of family members dummy, worried about finances dummy, and household food insecurity dummy. Old controls include information that was collected in 2019: age (in years), log of monthly household income, years of schooling, household size, and an indicator for media exposure (=1 if households belong televisions or radios). In **Panel B**, the demographic controls include: age (in years), gender dummy (=1 if male), religion dummy (=1 if Hindu), caste categories (General, SC/ST or OBC), log of monthly household income, college education dummy (=1 if attended college), residence near marketplace dummy (=1 if lives in a marketplace area), joint family dummy (versus nuclear family or single), owns own house dummy (versus rented), disability dummy (=1 if at least one household member is disabled), married dummy (=1 if married) and employment status dummy (=1 if employed). In addition, additional controls include: willingness to take health related risks (scale 0-10); worried about family's health and household finances dummies; whether the respondent has any long term disease dummy; and, household food insecurity dummy. p-value (T2-T3) compares T2 and T3 coefficients using an F-test. WY FWER p-values are the Westfall-Young stepdown adjusted p-values (with 1,000 replications) (Westfall & Young, 1993). RI p-value is the Alwyn Young randomization inference based p-values (with 1,000 replications) (Young, 2019). CGM p-value on treatments are the p-values calculated using the wild bootstrap-t clustering method (Cameron et al., 2008). All standard errors are clustered at the village level.

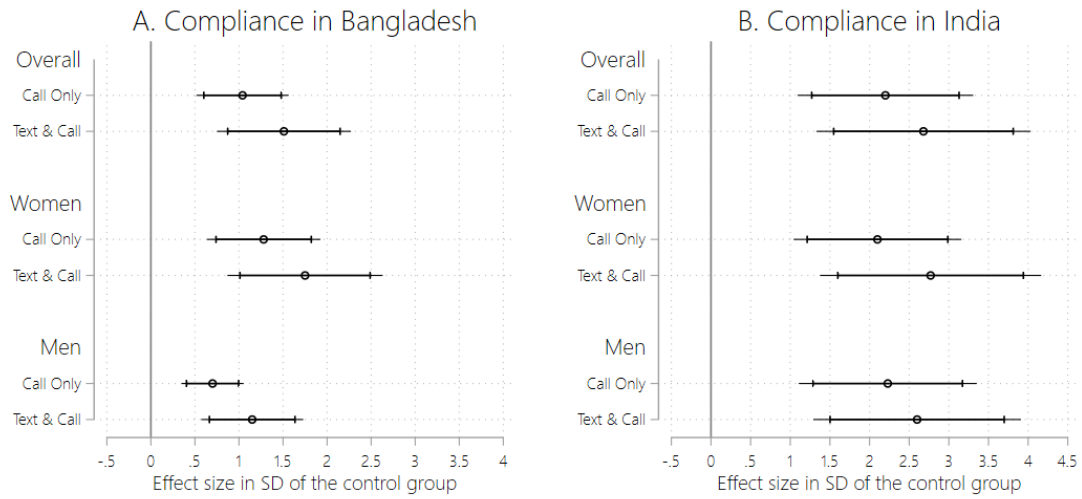
4.2 Results for compliance

Raw comparisons. Raw comparisons of *compliance* with COVID-19 regulations reveal that participants in treatments 2 and 3 in both countries reported complying more often with COVID-19 regulations, such as going outdoors less often, washing hands with soap frequently, and avoiding physical contact with outsiders, than participants in treatment 1. Figure 2 presents raw results on the averages of compliance in both Bangladesh (graph A3) and India (graph B3). Since these compliance responses are recorded as indicators (six in total), Pearson's Chi-squared tests reveal that participants in treatment 2 and treatment 3 comply significantly more often than participants in treatment 1 in terms of going less often to the market, for entertainment and religious purposes, washing hands more often, and avoiding physical contact with outsiders (CS-test: all $p < 0.01$ for both Bangladesh and India). *Compliance* summaries also suggest that the likelihood of compliance is higher for participants in treatment 3 than in treatment 2. To check whether the effectiveness in compliance between treatments 2 and 3 statistically differ, we compare compliance of participants between these two treatments and find that all but 'avoiding going outside to see doctors' are statistically significant at 1% level. Furthermore, in India, there is no significant raw difference in terms of 'avoiding going outside for religious purpose' between participants in treatment 2 and treatment 3, suggesting these two treatments are equally effective in these domains.

Treatment effects. We then estimate equation 2 with the compliance index z-score as the dependent variable. We report these results in Table 3 and Figure 3. Through these estimates, we know where the averages of our two treatment groups lie in the distribution of the control group (which is *text-messages only*) in terms of standard deviation units. Initially, we focus on results in columns 1, 2, and 5, and leave columns 3 and 4 for discussions on results using COVID-19 compliance measured during the second endline survey in Bangladesh. Columns 1 and 2 report estimates without and with 'old' control variables respectively for the Bangladeshi sample, and column 5 reports estimates for the entire Indian sample. Positive and statistically significant effects in columns 1, 2, and 5 suggest that both treatments 2 and 3 were effective in increasing participant's compliance with COVID-19 regulations in both countries. In addition, analogous to the *awareness* results, the effects of treatment 3 are much larger in magnitude than that of treatment 2 across the three columns and these differences are also significant at 1% level (all F-test: $p < 0.01$).[12] This implies that participants that received both phone

[12]Similarities between awareness and compliance are expected because being well-informed should lead individuals to increased compliance with COVID-19 regulations. The correlation between these two

Figure 3: Effect of the campaign on compliance



Note: Estimated treatment effects in standard deviations, pooled and by gender, are reported with 99% and 95% confidence intervals.

calls and text messages followed COVID-19 regulations more often than participants that only received phone calls. A plausible reason for such difference is that callers from the NGOs always referred to the text-message during the phone-call discussion to tag it as a continuous reminder for participants.

We also estimate equation 2 with compliance indicators—the six indicator variables for compliance that we use to construct the index—to complement results from Table 3. We report these estimates in Tables A5 and A6 in Appendix A. From columns 1 through 6, our dependent variables are six different indicators for compliance with COVID-19 rules, namely going to the market (column 1), visiting the doctor (column 2), going outside for entertainment purpose (column 3), going outside to attend prayers (column 4), washing hands frequently (column 5), and avoiding physical contact with outsiders (column 6). Estimates in all columns, in both panels, are statistically significant, implying the effects occur throughout the entire *compliance* distribution. Moreover, the directions of treatment effects in all six domains are consistent with the hypothesis that our campaign will induce people's compliance with COVID-19 regulations. As another robustness check, we redo the regressions with compliance indicators using probit and find qualitatively similar results. Probit estimates are provided in Table A7 in Appendix A.

is provided in Table A4 in Appendix A.

Table 3: Effects on compliance with COVID-19 health regulations

	A: Bangladesh Endline 1			B: Bangladesh Endline 2	C: India
VARIABLES	**All** (1)	**All** (2)	**Female** (3)	**Female** (4)	**All** (5)
T2 (Call Only)	1.039***	1.015***	1.227***	1.811***	2.201***
	(0.037)	(0.040)	(0.044)	(0.076)	(0.096)
T3 (Both Text & Call)	1.509***	1.538***	1.765***	2.635***	2.677***
	(0.034)	(0.035)	(0.035)	(0.067)	(0.055)
New Controls (BD)	Yes	Yes	Yes	Yes	-
Old Controls (BD)	No	Yes	Yes	Yes	-
All Controls (India)	-	-	-	-	Yes
Union Council FE	Yes	Yes	Yes	Yes	-
Village FE	-	-	-	-	Yes
F-test p-values (T2-T3)	0.000	0.000	0.000	0.000	0.000
RI p-values (T2)	0.000	0.000	0.000	0.000	0.001
RI p-values (T3)	0.001	0.001	0.001	0.000	0.000
CGM p-values (T2)	-	-	-	-	0.000
CGM p-values (T3)	-	-	-	-	0.000
Observations	6,485	5,840	3,523	1,583	1,679
R-squared	0.415	0.426	0.462	0.573	0.642

Robust standard errors clustered at the village level are in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Note: OLS estimates are reported; columns 1 and 2 report estimates using the total Bangladeshi sample in endline 1; columns 3 and 4 report estimates using the female Bangladeshi sample in endline 1 and endline 2 respectively; column 5 reports estimates using the entire Indian sample. All dependent variables are standardized compliance indices. Following Kling et al. (2007), the control group mean was subtracted from the compliance score of each individual and then divided this difference by the control group standard deviation. Thus, for the control group, the compliance index has a mean 0 and standard deviation 1. 'New Controls (BD)' refers to control variables collected during endline 1 in Bangladesh; 'Old controls (BD)' refers to control variables collected during the 2019 survey in Bangladesh and, thus, is available for 90% of the Bangladeshi sample; all control variables are defined and listed under Table 2 and Table A1 in Appendix A.

4.3 Compliance of women in Bangladesh: second endline

Survey. 1.5 months after the first endline survey (see Figure 1 for the timeline), we approached a randomly selected number of women participants in Bangladesh and measured their compliance with COVID-19 rules for the second time. A second survey on compliance during the pandemic was possible because the NGO in Bangladesh, GDRI, decided to reach out to a subset of women who took part in the initial survey of this study (for simplicity, we call this our 'first endline') to provide them with remote health and well-being support during the pandemic. For this, GDRI randomly selected roughly 40% of our female sample (which is 1,600 out of 3,908 from the first endline). We leverage this opportunity to measure the compliance of 1,583 women through a very

short survey.[13] For simplicity, we call this our 'second endline'. During this endline, we implemented a few changes to our compliance questions. First, we combined three compliance questions on *"going outside to the market"*, *"going outside to see doctors"*, and *"going outside for entertainment purpose"* from the first endline and asked a single question instead: *"How often they do not go outside unless absolutely necessary?"*. Second, we asked three additional compliance questions on *"keeping at least 2 feet distance from outsiders"*, *"use handkerchief or elbow while coughing/sneezing"*, and *"wear masks/have face-coverings when they leave home"*. Third, we reversed the negative question on *"how often respondents go outside for prayers"* to a positive question *"how often they do not go outside for prayers"*. Finally, we also randomized the order of these questions. In total, we asked seven compliance questions, one more than in the first endline. We implemented these changes to ensure the second compliance survey does not appear identical to the first one, mainly to avoid getting biased responses. In addition to compliance questions, we also asked food insecurity questions (using the FIES scale) and asked whether their household chores have increased recently to get up-to-date information on these two aspects and how that might be affecting their compliance three months after the campaign. All questions were asked using the same Likert scale as in the first endline survey.[14] Our comparison of characteristics between women who only participated in the first endline survey with women who took part in both endlines, presented in Table A8 in Appendix A, suggests that women participants are fairly similar across the two endlines.

Treatment effects. Using the compliance questions, we construct seven compliance indicators and a standardized compliance index in the same manner as described in section 3.2. We then estimate equation 2 with the compliance index as the dependent variable and report these estimates in column 4 of Table 3. Analogous to our results from the first survey—reported in the same table in column 1 for the whole sample and column 3 for the female sample in Bangladesh—we find that compliance under both treatment 2 (*phone calls only*) and treatment 3 (*both text-messages and phone calls*) groups relative to the control group (*tex-messages only*) remain large and statistically significant at 1% level, suggesting the impacts of our treatments among women in Bangladesh persist after three months. Moreover, although different samples, effects are about 50% larger

[13] These women are distributed across 393 villages in 50 union councils in Khulna and Satkhira districts. We could not reach the remaining 17 women because their phone numbers were repeatedly switched off during the second survey period.

[14] Also, all compliance questions were *'positive'* in the second endline, so that answering 'more often' would mean 'more compliance' in all seven questions.

in column 4 than in column 3 (female participants from the first endline). To complement these results and also examine the effect on the distribution of compliance, we also estimate equation 2 with compliance indicators as dependent variables and report these estimates in Table A9 in Appendix A. All positive and statistically significant effects (all $p < 0.01$) suggest that effects occur throughout the entire distribution of compliance.

Table 4: Heterogeneous treatment effects on compliance in Bangladesh: first endline

	by Gender									by Media
	All	Female only				Male only				All
VARIABLES	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**	**(10)**
T2 (Call Only)	1.274***	1.388***	0.972***	1.454***	1.234***	0.763***	0.862***	0.586***	0.782***	0.859***
	(0.040)	(0.073)	(0.113)	(0.107)	(0.098)	(0.096)	(0.201)	(0.121)	(0.132)	(0.059)
T3 (Both Text & Call)	1.741***	1.849***	1.565***	1.919***	1.832***	1.230***	1.028***	1.225***	1.184***	1.463***
	(0.035)	(0.061)	(0.113)	(0.070)	(0.079)	(0.096)	(0.195)	(0.142)	(0.141)	(0.049)
Male	-0.642***									
	(0.044)									
T2×Male	-0.576***									
	(0.066)									
T3×Male	-0.588***									
	(0.066)									
Muslim		0.017				-0.221***				
		(0.058)				(0.082)				
T2×Muslim		-0.153*				-0.083				
		(0.086)				(0.120)				
T3×Muslim		-0.131*				-0.111				
		(0.072)				(0.120)				
Worried: family health			0.063				0.190*			
			(0.069)				(0.106)			
T2×Worried: family health			0.328***				-0.172			
			(0.115)				(0.212)			
T3×Worried: family health			0.204*				0.133			
			(0.117)				(0.203)			
Worried: finances				0.136**				0.080		
				(0.063)				(0.091)		
T2×Worried: finances				-0.221*				0.151		
				(0.117)				(0.130)		
T3×Worried: finances				-0.212***				-0.094		
				(0.076)				(0.154)		
Household food insecurity					0.039				0.007	
					(0.066)				(0.100)	
T2×Household food insecurity					0.054				-0.102	
					(0.108)				(0.148)	
T3×Household food insecurity					-0.096				-0.046	
					(0.086)				(0.155)	
Media exposure										0.015
										(0.039)
T2×Media exposure										0.240***
										(0.071)
T3×Media exposure										0.115*
										(0.059)
New Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Old Controls	No	No	No	No	No	No	No	No	No	Yes
Union Council FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	6,485	3,908	3,908	3,908	3,908	2,577	2,577	2,577	2,577	5,840
R-squared	0.426	0.451	0.452	0.452	0.451	0.181	0.182	0.182	0.181	0.427

Robust standard errors clustered at the village level are in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Note: The dependent variable is the standardized compliance index. Columns 1-9 report estimates of heterogeneous treatment effects by gender and column 10 reports that by media exposure. All variables are defined under Table 2 and in section 3.2.

4.4 Heterogeneous treatment effects on compliance

To explore heterogeneous treatment effects on complying to COVID-19 regulations, we estimate the following interaction model using OLS:

$$Outcome_i = \alpha + \beta_1 T2_i + \beta_2 T3_i + \beta_3 (T2 \times Z)_i + \beta_4 (T3 \times Z)_i + X_i'\delta + \tau + \epsilon_i \quad (3)$$

where we interact our treatment dummies with the variable Z that is, alternatively, an indicator for gender or media exposure. Negative (positive) coefficients on the interactions, $\hat{\beta}_3$ and $\hat{\beta}_4$, would suggest that women (households with media exposure) comply with COVID-19 regulations more often than men (households without media exposure) in treatment groups relative to the control group. That is, coefficients on the interaction terms give us the difference-in-differences estimates. We do not have any specific hypotheses on how the campaign would affect compliance of women versus men. It is possible that women respond to campaign information more strongly than men or the campaign is less effective among women because traditional norms in these communities discourage women from leaving home in general. Moreover, although endogenous, households with access to television or radio are likely to be better informed about COVID-19 than households without any media exposure and, hence, our treatments might affect differently to those with or without media exposure. Since the media exposure question is only available for the Bangladeshi sample, we use the information on whether households are located near marketplaces in India as a proxy for their exposure to media. That is, households located near marketplaces are more likely to have televisions or radios (due to the quality of neighborhoods) and, thus, likely to have better access to reliable information on COVID-19 than households that are located further from marketplaces. We explore these two main sources of heterogeneity below.

Heterogeneity in Bangladesh. Table 4 examines heterogeneous treatment effects on compliance by gender in columns 1-9 using the Bangladeshi data. Results pooling all sample are reported in column 1, where negative and statistically significant coefficients on the interaction terms show that women complied with COVID-19 regulations more often than men in both treatments. Then to examine heterogeneity within gender, we focus on four types of heterogeneity. First, we examine if our treatments complement the traditional religious norms (proxied by religious affiliation) that impose various restrictions on women's mobility and social interactions, where the constraints are often stronger for Muslim than for Hindu women but do not apply to men (Field et al., 2010). Second, our treatments might be stronger among women that often worry

Table 5: Heterogeneous effects on compliance by gender: understanding the channels

		Religion		Worried: health		Worried: finances		Food insecure	
	All	Muslim	Hindu	Yes	No	Yes	No	Yes	No
VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Panel A: Bangladesh								
T2 (Call Only)	1.274***	1.239***	1.380***	1.303***	0.789***	1.233***	1.433***	1.274***	1.323***
	(0.040)	(0.048)	(0.077)	(0.042)	(0.160)	(0.043)	(0.110)	(0.045)	(0.106)
T3 (Both Text & Call)	1.741***	1.705***	1.923***	1.758***	1.498***	1.693***	1.912***	1.729***	1.843***
	(0.035)	(0.041)	(0.066)	(0.036)	(0.138)	(0.037)	(0.087)	(0.038)	(0.091)
Male	-0.642***	-0.720***	-0.412***	-0.630***	-0.756***	-0.661***	-0.582***	-0.648***	-0.621***
	(0.044)	(0.052)	(0.074)	(0.044)	(0.136)	(0.044)	(0.099)	(0.047)	(0.102)
T2×Male	-0.576***	-0.552***	-0.702***	-0.609***	-0.113	-0.505***	-0.870***	-0.605***	-0.527***
	(0.066)	(0.083)	(0.110)	(0.069)	(0.256)	(0.070)	(0.153)	(0.074)	(0.163)
T3×Male	-0.588***	-0.564***	-0.687***	-0.595***	-0.464**	-0.566***	-0.661***	-0.576***	-0.635***
	(0.066)	(0.083)	(0.102)	(0.067)	(0.230)	(0.070)	(0.155)	(0.070)	(0.161)
New Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Old Controls	No	No	No	No	No	No	No	No	No
Union Council FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	6,485	4,586	1,899	5,998	487	5,092	1,393	5,228	1,257
R-squared	0.426	0.420	0.447	0.429	0.443	0.419	0.470	0.433	0.432

		Religion		Worried: health		Worried: finances		Food insecure	
	All	Hindu	non-Hindu	Yes	No	Yes	No	Yes	No
VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Panel B: India								
T2 (Call Only)	2.279***	2.292***	2.243***	2.167***	1.287***	2.246***	4.243***	2.286***	1.491
	(0.121)	(0.134)	(0.270)	(0.135)	(0.306)	(0.127)	(0.824)	(0.126)	(0.940)
T3 (Both Text & Call)	2.771***	2.771***	2.820***	2.772***	2.171***	2.770***	4.028***	2.760***	2.300**
	(0.077)	(0.080)	(0.200)	(0.073)	(0.378)	(0.076)	(0.852)	(0.079)	(0.951)
Male	0.120	0.118	0.102	0.092	0.586	0.113	2.102***	0.118	-1.087
	(0.082)	(0.086)	(0.294)	(0.084)	(0.355)	(0.084)	(0.761)	(0.082)	(2.200)
T2×Male	-0.148	0.049	-0.779***	0.134	-0.641*	-0.123	-3.423***	-0.123	-0.040
	(0.122)	(0.126)	(0.190)	(0.209)	(0.375)	(0.129)	(1.090)	(0.126)	(2.214)
T3×Male	-0.183**	-0.157*	-0.200	-0.155*	-1.146**	-0.183*	-2.145***	-0.169*	0.872
	(0.088)	(0.083)	(0.275)	(0.086)	(0.460)	(0.091)	(0.776)	(0.092)	(2.089)
All Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Village FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,679	1,330	349	1,182	497	1,583	96	1,600	79
R-squared	0.643	0.703	0.565	0.747	0.309	0.640	0.799	0.641	0.897

Robust standard errors clustered at the village level are in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Note: The dependent variable is the standardized compliance index. Columns 2-9 report estimates on split samples. Columns 2-3 report heterogeneous effects on Muslims (column 2) and Hindus (column 3) separately in Panel A. The same in Panel B is on Hindus (column 2) and non-Hindus (column 3) separately. Columns 4-5 report heterogeneous effects on those who are worried about health (column 4) and those who are not (column 5) separately. Columns 6-7 report heterogeneous effects on those who are worried about finances (column 6) and those who are not (column 7) separately. Columns 8-9 report heterogeneous effects on those who are food insecure (column 8) and those who are not (column 9) separately. All variables are defined under Table 2 and in section 3.2.

about the health of household members because women share a greater burden of care responsibilities of sick and vulnerable household members, which might prompt them to be more compliant with COVID-19 rules. Third, campaign information might not be

very effective among individuals that worry about household income as they often need to leave home for a better livelihood. Fourth, our treatments might be weaker among men—who are often the primary income earners in these communities—with increased household food insecurity, as men have a greater burden on seeking alternative sources of income and providing food for the household. To examine these, we estimate equation 3 separately for females and males to examine heterogeneous effects on compliance by traditional norms (proxied by religion), being worried about household health and finances, and being food insecure. Columns 2-5 examine heterogeneity among females and columns 6-9 examine heterogeneity among males. We find some interesting patterns among females. For instance, in column 2, both treatments were more effective among Hindu than among Muslim women, but this difference is only marginally significant (both $p < 0.10$). Although traditional religious institutions impose various restrictions on women's mobility and social interactions (Field et al., 2010), our treatments not complementing the traditional norm is rather surprising. Moreover, in column 3, we observe that women who often worry about the health of their family members comply significantly more to COVID-19 rules in both treatments. Then, in column 4, women that worry more about household finances comply significantly less than women that do not worry about household finances in the treatment groups. This pattern is consistent with household income being one of the main supply-side factors for female work participation in developing countries, where women begin working when household income falls (Klasen & Pieters, 2015).[15] Finally, in column 5, we find that treatment effects do not vary among women with household food insecurity (defined in section 3.2). In contrast, among men (columns 6-9), we do not observe any heterogeneity by any of the four factors. Finally, column 10 in Table 4 explores heterogeneity by media exposure in Bangladesh. We find evidence for strong treatment effects among households with television or radio than among households with no exposure to the media. This suggests that our treatments work as complements to information transmitted by television and radio. Results presented in columns 1-10 are also robust to adding 'old' covariates to these models, which is only available for 90% of the Bangladeshi sample. Table A10 in Appendix A reports these results.

Then, to better understand the factors that facilitate the gender difference that we observe, we zoom in on gender and examine heterogeneity within categories of religion, being worried about health and finances, and household food insecurity. For instance, within religion, we look at heterogeneity by gender but among Muslims and Hindus

[15] Although we do not ask compliance questions that are directly associated with leaving home for work, but our questions are largely concentrated on compliance in terms of avoiding leaving home.

individually using split samples. This analysis should help illuminate the channels that might be driving the treatment differences between female and male participants in Bangladesh. These additional results are reported in Panel A of Table 5. We find that treatment effects are stronger for women within all four factors. Although not formally tested, it appears gender difference in compliance is larger among Hindus (column 3), among the more-worried about household health (column 4), and among the less-worried about household finances (column 7) in both treatments. Then focusing only on the heterogeneity by gender among those who are worried about household health (columns 4 and 5), we find that, among the very worried participants, treatment effects are stronger among women than men in both treatments; however, this difference weakens (also disappears in treatment 2) among those that are not worried about household health. Thus, it appears that being worried about the health of household members is an important driver for women to be more compliant than men.

Another possibility for treatment effects being stronger among women is that women might take health risks more seriously than men or persuading men regarding health-preserving behavior might be more difficult than persuading women, and these might be driving the differences that we observe. Although it is difficult to isolate these two channels using our data, we can simply examine heterogeneity in awareness by gender. As already reported, we find a strong, positive, and statistically significant correlation between awareness and compliance (see Table A4 in Appendix A). Then when we examine heterogeneity on awareness by gender (results reported in Table A11 in Appendix A), we observe the same pattern as in Table 5. That is, we find that our treatments have been more effective in increasing awareness among women than that among men. Thus, women might have perceived our campaign information more carefully than men leading to better awareness among women, which might be inducing them to comply more with COVID-19 health regulations than their male counterparts.

We also carry out a battery of additional analysis that we report in Appendix A. First, we disaggregate the compliance index into the six compliance indicators and examine heterogeneous treatment effects on these indicators, individually, by gender in Bangladesh. We see that differences appear only in terms of 'avoiding going to the market', 'hand-washing', and 'avoiding physical contact' with outsiders. These results are available in Table A12 in Appendix A. Repeating the same but to examine heterogeneity by media exposure, we find that there are heterogeneous effects only on 'avoiding going to the market and for prayers' and 'hand-washing'. Estimates of the latter are reported in Table A13 in Appendix A. Second, we also examine heterogeneous treatment effects on compliance using the second endline data from Bangladesh (where participants are only

Table 6: Heterogeneous treatment effects on compliance in India

	by Gender									by Marketplace
	All	Female only				Male only				All
VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
T2 (Call Only)	2.279***	1.520***	1.885***	3.446***	2.657**	1.159***	1.023***	3.086***	1.806***	2.230***
	(0.121)	(0.195)	(0.277)	(1.076)	(0.989)	(0.166)	(0.120)	(0.531)	(0.545)	(0.131)
T3 (Both Text & Call)	2.771***	2.705***	2.687***	3.713***	3.307***	2.460***	1.485***	3.229***	2.192***	2.654***
	(0.077)	(0.172)	(0.321)	(1.076)	(0.871)	(0.174)	(0.297)	(0.504)	(0.363)	(0.067)
Male	0.120									
	(0.082)									
T2×Male	-0.148									
	(0.122)									
T3×Male	-0.183**									
	(0.088)									
Hindu		-0.092				0.091				
		(0.173)				(0.172)				
T2×Hindu		0.717***				1.376***				
		(0.206)				(0.137)				
T3×Hindu		0.075				0.174				
		(0.187)				(0.185)				
Worried: family health			-0.242				-0.889***			
			(0.254)				(0.117)			
T2×Worried: family health			0.244				1.249***			
			(0.285)				(0.202)			
T3×Worried: family health			0.080				1.111***			
			(0.326)				(0.310)			
Worried: finances				0.865				0.749*		
				(1.096)				(0.440)		
T2×Worried: finances				-1.389				-0.878		
				(1.109)				(0.535)		
T3×Worried: finances				-0.944				-0.629		
				(1.090)				(0.515)		
Household food insecurity					0.623				-0.398*	
					(0.871)				(0.204)	
T2×Household food insecurity					-0.561				0.428	
					(0.986)				(0.539)	
T3×Household food insecurity					-0.544				0.409	
					(0.892)				(0.378)	
Residence near marketplace										0.486***
										(0.166)
T2×Residence near marketplace										-0.086
										(0.192)
T3×Residence near marketplace										0.075
										(0.121)
All Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Village FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,679	831	831	831	831	848	848	848	848	1,679
R-squared	0.643	0.659	0.652	0.655	0.653	0.690	0.660	0.659	0.659	0.643

Robust standard errors clustered at the village level are in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Note: The dependent variable is the standardized compliance index. Columns 1-9 report estimates of heterogeneous treatment effects by gender and column 10 reports that by residence near marketplace (a proxy for media exposure). All variables are defined under Table 2 and in section 3.2.

women), we find no heterogeneity by religion, being worried about health and finances, household food insecurity, and media exposure. This result is reported in Table A14 in Appendix A. In addition to these five, during the second endline, we also collected information on whether women are experiencing an increase in their daily household chores because increased household chores might restrain women from leaving home. This additional heterogeneity is reported in column 5 of Table A14. Again, we do not observe any heterogeneous treatment effects on compliance by household chores.

Heterogeneity in India. Although the sample size in India is relatively small (1,680 versus 6,480 in Bangladesh), we nevertheless examine heterogeneous treatment effects on compliance using the Indian data. Our analysis here is analogous to the analysis carried out using the Bangladeshi data. That is, we estimate heterogeneous treatment effects by gender (column 1) and by media exposure (column 10)—proxied by residence near marketplaces—using equation 3 and report these results in Table 6. Then we examine heterogeneity for female (columns 2-5) and male (columns 6-9) respondents separately by their religious affiliation (a proxy for traditional religious norms), being worried about household health and finances, and household food insecurity. In column 1, we find some evidence of treatment effects being stronger among women than men. Relative to heterogeneous effects by gender observed in Bangladesh, only treatment 3 seems to affect women's compliance strongly ($p < 0.05$), whereas treatment 2 does not appear to affect the compliance of women and men differently in India. We also report heterogeneity by religion among women and men participants separately (columns 2 and 6 respectively). We find that only treatment 2 is stronger among Hindus whereas treatment 3 does not affect Hindus' and non-Hindus' compliance differently.[16] In terms of being worried about household health, we find that treatment effects are stronger among men who are worried about the health of household members relative to men that are not worried (column 7). Whereas among women, we do not find any heterogeneous effects by being worried about household health (column 3) and this result is not consistent with the results observed in Bangladesh. Furthermore, we do not find any heterogeneity within gender by being worried about household finances (columns 4 and 8) and food insecurity (columns 5 and 9). In column 10, we also do not find any heterogeneous effects on compliance by media exposure (proxied by residence near marketplaces).

Although heterogeneous treatment effects by gender in India are not as strong as that in Bangladesh, we nevertheless examine heterogeneity by gender but within categories of religion, being worried household health and finances, and food insecurity to check the factors that might be inducing women to comply with COVID-19 regulations more than men in treatment 3. Focusing only on coefficients of the interaction term $T3 \times Male$ in Panel B of Table 5 and only that are significant at 5% level, we find

[16] Although we do not report, we also examine heterogeneity among Hindus by their castes to test if treatment effects vary across individuals in different social hierarchies. Field et al. (2010) suggests traditional religious norms in terms of mobility and social interaction of women are more strict for Hindu women of upper castes than for Hindu women of lower castes; however, we do not find any support for heterogeneous treatment effects by castes among women (and neither among men). However, it should be noted that the sample size in each cell (which is also within the Hindu and female subsample) is very small and might not have sufficient statistical power to detect an effect.

that treatment 3 has been stronger for women who were relatively less worried about both household health (column 5) and finances (column 7) than their male counterparts. For the remaining results in this row, we observe coefficients being negative, implying stronger treatment effects among women but they never reach statistical significance at 5% level. Overall, the heterogeneous treatment effects on compliance in India are rather weak. However, one should note that sample sizes in each cell while examining heterogeneity are often very small in India, e.g., only 96 individuals are not worried about household finances and among the 96, 51 are in treatment 3 and 45 are in the control group. Therefore, these results should be interpreted and comprehended with caution.

5 Conclusion

Preventing the spread of COVID-19 requires persuading people to significantly change their behavior. Despite the pandemic spread across the globe, in many developing countries, people living in remote rural communities often do not come by validated information about the health consequences of contracting the virus and simple precautions against it. This is largely due to their poor health literacy and generic health communications from public authorities (Paakkari & Okan, 2020), as penetrating remote areas with reliable health information is often challenging (United Nations, 2020a). In its absence, misinformation or lack of information might trivialize the risks of COVID-19 in rural communities and worsen the public health crisis (Galvão, 2020).

Taking this into consideration, we carried out a COVID-19 awareness campaign experiment using phone calls and text-messages in two 'worst hit' developing countries—Bangladesh and India—immediately after both countries went into lockdowns. Using this randomized experiment, we provide one of the first experimental evidence on the impact of raising COVID-19 awareness in remote rural communities on people's compliance with COVID-19 health guidelines. The results in this study show that directly calling people on their cellphone to discuss COVID-19 precautions and common *dos and don'ts* during the pandemic were significantly more effective in raising awareness and inducing compliance than only sending text-messages. Moreover, sending both text-messages and phone calls turned out to be the most effective means of communication in raising awareness and compliance in rural communities. Note that phone calls within Bangladesh and India are very cheap, where the cost of phone calls can be between 0.08-0.7 cents (USD) per minute.[17] Thus, spending about 10 cents (an upper bound) on

[17] Jio and Grameenphone are two leading mobile phone operators in India and Bangladesh respectively.

calls per rural household can significantly improve their health choices.

One important lesson from our findings is the importance of targeted health communications during health crises in developing countries. While text and video messages, television and radio broadcasts, social media, newspapers, posters, and leaflets are often the most commonly used methods for disseminating health information among the urban, literate population, these approaches might not be as effective in poverty-stricken rural communities in developing countries. The reason being that illiteracy, poor health literacy, lack of internet and technology, etc., can be strong barriers in communicating important health information to improve health literacy and choices of the poor. Our paper highlights how low-cost brief phone calls can be very effective in breaking such barriers to penetrate remote rural communities to encourage the health-preserving behavior of naive, rural people in developing countries. Of course, such information campaigns have limits and they might not always overcome barriers from structural disadvantages in poor settings (Ravallion, 2020). However, conveying the right information can certainly improve the choices of those that are capable but often misguided due to lack of verified information. Therefore, governments in collaboration with regional NGOs and organizations can easily reach out to the rural poor to help improve their health choices. Policies aimed at building partnerships with local community-level organizations, such as regional NGOs, cooperative groups, clubs, etc., and proving low-cost telephone-health advice to the poor should therefore be considered.

The call rate for Jio users in India is 6 *paise* per minute and the call rate for Grameenphone users in Bangladesh is 60 *poisha* per minute. Note that USD 1 equals 70 Indian Rupees (1 Rupee equals 100 *paise*) or 80 Bangladeshi Taka (1 Taka equals 100 *poisha*).

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Raising COVID-19 Awareness in Rural Communities: A Randomized Experiment in Bangladesh and India

Appendix

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A Additional Tables and Figures

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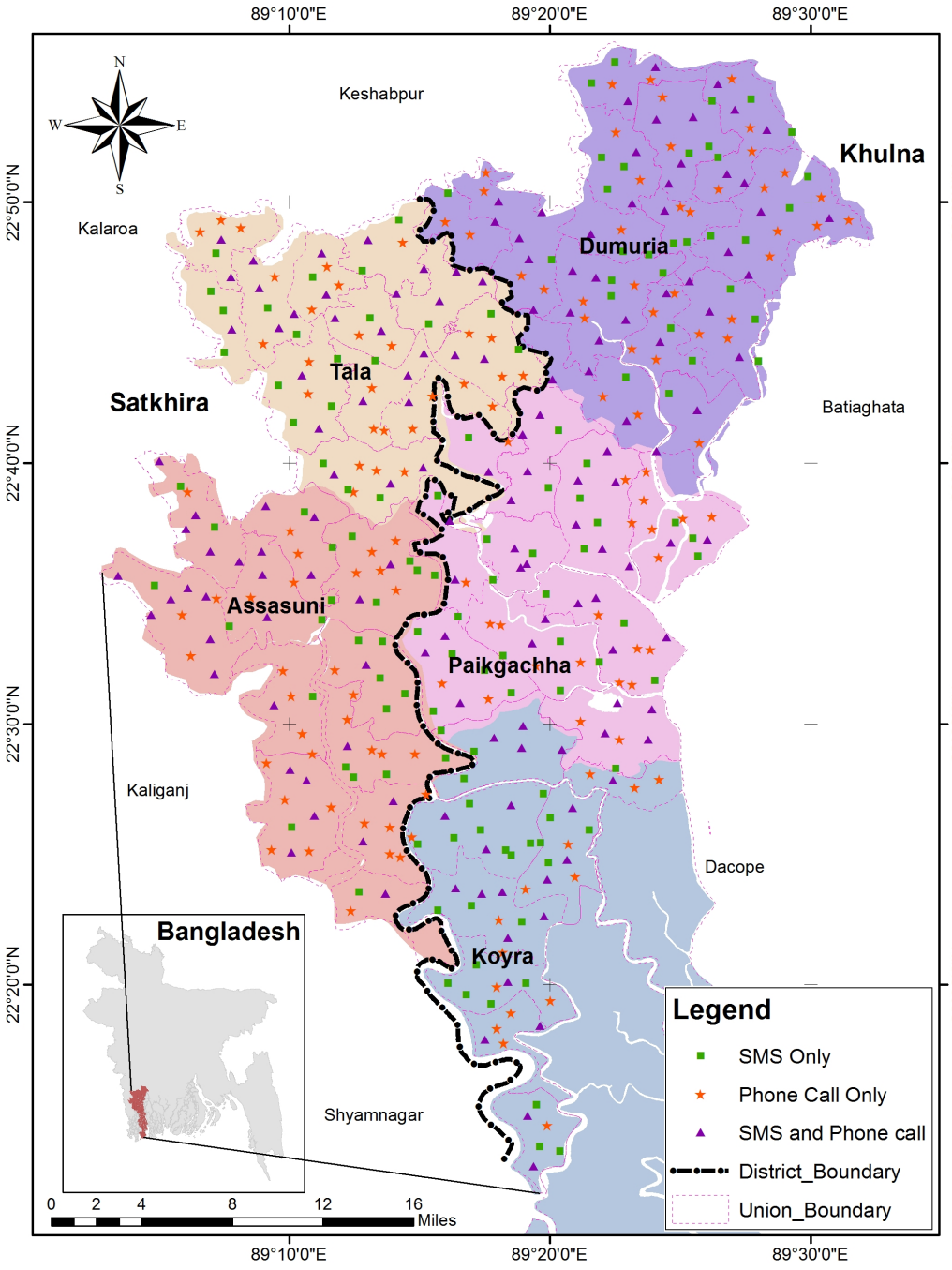
Figure A1: Distribution of treatment villages in Bangladesh.



Note: White areas within subdistricts and union councils outside the subdistrict boarders are due to rivers. The rightmost empty area within the Koyra subdistrict is part of the Sundarbans mangrove forest.

Figure A2: Kanpur in Uttar Pradesh, India.

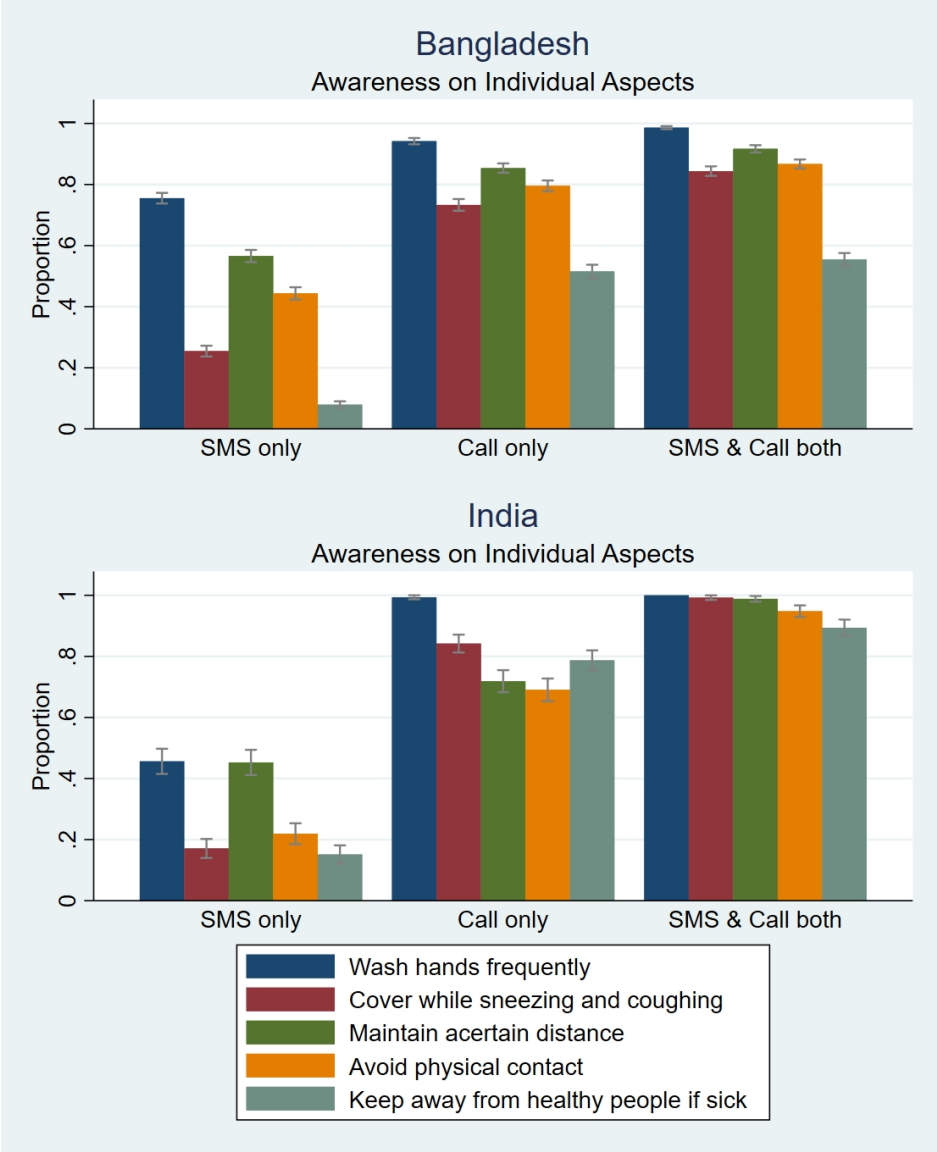
Note: The red area is Uttar Pradesh.

Table A1: List of Control Variables

VARIABLES	**Bangladesh (new)**	**Bangladesh (old)**	**India (new)**	**India (old)**
Gender	√	√	√	√
Religion	√	√	√	√
Occupation	√		√	
Food insecurity	√		√	
Worried about health	√		√	
Worried about finances	√		√	
Age		√		√
Education		√		√
Log of monthly income		√		√
No. of household members		√		
Whether household has TV or radio		√		
Willingness to take health related risks				√
Caste				√
Employment status				√
Residence near marketplace				√
Lives in a joint family				√
Lives in own house				√
Household member with disability				√
Household member with long-term illness				√
Marital status				√
Village Fixed Effects			√	√
Union Council Fixed Effects	√	√		
Sample size	6,485	5,840	1,680	1,680

Note: See section 3.2 for variable description and see Table 1 for summary statistics. The columns with 'new' include control variables that were collected during the endline. The columns with 'old' include control variables that were collected previously, during the 2019 survey. This additional data from 2019 is available for all Indian sample but only for 90% of the Bangladeshi sample.

Figure A3: Summary of Awareness, by Indicators



Note: Each bar represents the proportion of respondents who stated that particular COVID-19 rule (i.e., wash hands frequently, cover mouth while sneezing or coughing, etc.) with 95 percent confidence interval.

Table A2: Effects on awareness: Alternative models

	Awareness (scale 0-5) ***(Ordered Probit)***			**Completely Aware** ***(Probit)***		
VARIABLES	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
	Panel A: Bangladesh					
T2 (Call Only)	1.400***	1.398***	1.374***	1.401***	1.395***	1.337***
	(0.048)	(0.048)	(0.049)	(0.056)	(0.057)	(0.063)
T3 (Both Text & Call)	1.825***	1.829***	1.917***	1.755***	1.756***	1.809***
	(0.049)	(0.049)	(0.050)	(0.056)	(0.056)	(0.061)
New Controls	No	Yes	Yes	No	Yes	Yes
Old Controls	No	No	Yes	No	No	Yes
Union Council FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	6,485	6,485	5,840	6,485	6,485	5,840
	Panel B: India					
T2 (Call Only)	2.881***	2.918***	3.659***	10.358***	10.566***	10.987***
	(0.125)	(0.130)	(0.159)	(0.391)	(0.405)	(0.459)
T3 (Both Text & Call)	4.495***	4.575***	4.858***	12.184***	12.550***	12.469***
	(0.182)	(0.187)	(0.173)	(0.413)	(0.450)	(0.479)
Demographic Controls	No	Yes	Yes	No	Yes	Yes
Additional Controls	No	No	Yes	No	No	Yes
Village FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,680	1,680	1,680	1,680	1,680	1,680

Robust standard errors clustered at the village level are in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Note: Columns (1)-(3) reports ordered probit regression estimates and columns (4)-(6) reports probit regression estimates; the dependent variable in columns (1)-(3) is the number of correct mentions of COVID-19 rules (on a scale between 0 and 5) and the dependent variable in columns (4)-(6) is a dummy that equals 1 if a respondent correctly mentioned all five COVID-19 rules and 0 if not. See the note under Table 2 for the list of controls. All WY FWER, RI, and CGM p-values < 0.01.

Table A3: Effect on awareness using indicators

VARIABLES	Wash Hands (1)	Cover Mouth (2)	Keep Distance (3)	No Contact (4)	Away from Healthy (5)
	Panel A: Bangladesh (with all controls)				
T2 (Call Only)	0.175***	0.462***	0.244***	0.298***	0.400***
	(0.010)	(0.016)	(0.018)	(0.021)	(0.015)
T3 (Both Text & Call)	0.231***	0.602***	0.356***	0.433***	0.485***
	(0.008)	(0.013)	(0.015)	(0.019)	(0.015)
New Controls	Yes	Yes	Yes	Yes	Yes
Old Controls	Yes	Yes	Yes	Yes	Yes
Union Council FE	Yes	Yes	Yes	Yes	Yes
p-value (T2-T3)	0.000	0.000	0.000	0.000	0.000
Observations	5,840	5,840	5,840	5,840	5,840
R-squared	0.143	0.309	0.180	0.233	0.244
	Panel B: Bangladesh (without 'old' controls)				
T2 (Call Only)	0.180***	0.468***	0.260***	0.317***	0.412***
	(0.010)	(0.016)	(0.017)	(0.020)	(0.014)
T3 (Both Text & Call)	0.229***	0.585***	0.353***	0.420***	0.475***
	(0.009)	(0.013)	(0.015)	(0.019)	(0.014)
New Controls	Yes	Yes	Yes	Yes	Yes
Old Controls	No	No	No	No	No
Union Council FE	Yes	Yes	Yes	Yes	Yes
p-value (T2-T3)	0.000	0.000	0.000	0.000	0.000
Observations	6,485	6,485	6,485	6,485	6,485
R-squared	0.115	0.295	0.173	0.215	0.228
	Panel C: India				
T2 (Call Only)	0.550***	0.730***	0.419***	0.597***	0.624***
	(0.028)	(0.029)	(0.043)	(0.039)	(0.036)
T3 (Both Text & Call)	0.556***	0.817***	0.546***	0.729***	0.745***
	(0.028)	(0.022)	(0.027)	(0.028)	(0.033)
Demographic Controls	Yes	Yes	Yes	Yes	Yes
Additional Controls	Yes	Yes	Yes	Yes	Yes
Village FE	Yes	Yes	Yes	Yes	Yes
p-value (T2-T3)	0.555	0.000	0.000	0.001	0.002
Observations	1,680	1,680	1,680	1,680	1,680
R-squared	0.467	0.585	0.278	0.440	0.483

Robust standard errors clustered at the village level are in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Note: OLS regression estimates reported; all dependent variables are dummies: in column (1) it equals to 1 if the respondent mentioned hand washing for at least 20 seconds as one of the rules of COVID-19 and 0 if not; in column (2) it equals to 1 if the respondent mentioned covering mouth during coughing and sneezing as one of the rules of COVID-19 and 0 if not; in column (3) it equals to 1 if the respondent mentioned keeping at least 1.5 meters distance from outsiders as one of the rules of COVID-19 and 0 if not; in column (4) it equals to 1 if the respondent mentioned not hugging or shaking hands with outsiders as one of the rules of COVID-19 and 0 if not; in column (5) it equals to 1 if the respondent mentioned staying away from healthy people and indoors if they feel ill as one of the rules of COVID-19 and 0 if not. See the note under Table 2 for the list of controls. All WY FWER, RI, and CGM p-values < 0.01.

Table A4: Correlation between awareness (scale 0-5) and compliance indicators

VARIABLES	Going to the market (1)	Going to the doctor (2)	Going out for entertainment (3)	Going out for religious reasons (4)	Wash hands (5)	Avoid contact (6)
	Panel A: Bangladesh (with all controls)					
Awareness (scale 0-5)	0.077***	0.001	0.020***	0.014***	0.179***	0.189***
	(0.004)	(0.001)	(0.003)	(0.004)	(0.004)	(0.004)
New Controls	Yes	Yes	Yes	Yes	Yes	Yes
Old Controls	Yes	Yes	Yes	Yes	Yes	Yes
Union Council FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	5,840	5,840	5,840	5,840	5,840	5,840
R-squared	0.167	0.013	0.100	0.145	0.349	0.371
	Panel B: Bangladesh (without 'old' controls)					
Awareness (scale 0-5)	0.075***	0.001	0.018***	0.014***	0.182***	0.190***
	(0.004)	(0.001)	(0.003)	(0.004)	(0.003)	(0.004)
New Controls	Yes	Yes	Yes	Yes	Yes	Yes
Old Controls	No	No	No	No	No	No
Union Council FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	6,485	6,485	6,485	6,485	6,485	6,485
R-squared	0.168	0.011	0.093	0.140	0.350	0.370
	Panel C: India					
Awareness (scale 0-5)	0.041***	0.018***	0.020***	0.006***	0.244***	0.255***
	(0.006)	(0.004)	(0.003)	(0.002)	(0.003)	(0.003)
All Controls	Yes	Yes	Yes	Yes	Yes	Yes
Village FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,680	1,680	1,680	1,680	1,680	1,680
R-squared	0.093	0.056	0.076	0.062	0.687	0.731

Robust standard errors clustered at the village level are in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Note: OLS regression estimates reported; all dependent variables are compliance dummies: in column (1) it equals to 1 if the respondent went to the market at least on 3 separate days in the past week and 0 otherwise; in column (2) it equals to 1 if the respondent went to the doctor at least on 3 separate days in the past week and 0 otherwise; in column (3) it equals to 1 if the respondent went out for entertainment purpose at least on 3 separate days in the past week and 0 otherwise; in column (4) it equals to 1 if the respondent went out for religious purpose at least on 3 separate days in the past week and 0 otherwise; in column (5) it equals to 1 if the respondent washed hands five times in a day at least on 3 separate days in the past week and 0 otherwise; in column (6) it equals to 1 if the respondent did not have any close contact with outsiders at least on 3 separate days in the past week and 0 otherwise; Awareness (scale 0-5) is a count measure of awareness, where 0 means not aware and 5 means completely aware of COVID-19 health guidelines. See the note under Table 2 for the list of controls. All standard errors are clustered at the village level.

Table A5: Effects on compliance indicators

VARIABLES	Going to the market (1)	Going to the doctor (2)	Going out for entertainment (3)	Going out for religious reasons (4)	Wash hands (5)	Avoid contact (6)
	Panel A: Bangladesh					
T2 (Call Only)	0.131***	0.008**	0.066***	0.050***	0.367***	0.366***
	(0.014)	(0.004)	(0.011)	(0.014)	(0.013)	(0.014)
T3 (Both Text & Call)	0.187***	0.008**	0.083***	0.061***	0.513***	0.581***
	(0.014)	(0.004)	(0.011)	(0.015)	(0.013)	(0.012)
New Controls	Yes	Yes	Yes	Yes	Yes	Yes
Old Controls	No	No	No	No	No	No
Union Council FE	Yes	Yes	Yes	Yes	Yes	Yes
WY FWER p-values (T2)	0.000	0.068	0.000	0.003	0.000	0.000
WY FWER p-values (T3)	0.000	0.068	0.000	0.000	0.000	0.000
RI p-values (T2)	0.000	0.019	0.000	0.000	0.001	0.001
RI p-values (T3)	0.001	0.032	0.001	0.001	0.001	0.000
Observations	6,485	6,485	6,485	6,485	6,485	6,485
R-squared	0.133	0.012	0.098	0.142	0.252	0.296
	Panel B: India					
T2 (Call Only)	0.005	0.042**	0.059***	0.021**	0.802***	0.853***
	(0.041)	(0.018)	(0.010)	(0.009)	(0.035)	(0.026)
T3 (Both Text & Call)	0.153***	0.058***	0.066***	0.018**	0.926***	0.948***
	(0.021)	(0.013)	(0.011)	(0.007)	(0.015)	(0.012)
All controls	Yes	Yes	Yes	Yes	Yes	Yes
Village FE	Yes	Yes	Yes	Yes	Yes	Yes
WY FWER p-values (T2)	0.015	0.002	0.021	0.051	0.000	0.000
WY FWER p-values (T3)	0.004	0.033	0.010	0.087	0.000	0.000
RI p-values (T2)	0.001	0.000	0.000	0.001	0.001	0.001
RI p-values (T3)	0.000	0.002	0.000	0.018	0.001	0.001
CGM p-values (T2)	0.000	0.000	0.000	0.004	0.000	0.000
CGM p-values (T3)	0.000	0.000	0.000	0.005	0.000	0.000
Observations	1,680	1,680	1,680	1,680	1,680	1,680
R-squared	0.095	0.050	0.069	0.058	0.681	0.707

Robust standard errors clustered at the village level are in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Note: OLS regression estimates reported; all dependent variables are compliance dummies: in column (1) it equals to 1 if the respondent went to the market at least on 3 separate days in the past week and 0 otherwise; in column (2) it equals to 1 if the respondent went to the doctor at least on 3 separate days in the past week and 0 otherwise; in column (3) it equals to 1 if the respondent went out for entertainment purpose at least on 3 separate days in the past week and 0 otherwise; in column (4) it equals to 1 if the respondent went out for religious purpose at least on 3 separate days in the past week and 0 otherwise; in column (5) it equals to 1 if the respondent washed hands five times in a day at least on 3 separate days in the past week and 0 otherwise; in column (6) it equals to 1 if the respondent did not have any close contact with outsiders at least on 3 separate days in the past week and 0 otherwise. See the note under Table 2 for the list of controls. See Table A6 in Appendix A for Panel A results with all control variables.

Table A6: Effects on compliance indicators in Bangladesh (with all controls)

VARIABLES	Going to the market (1)	Going to the doctor (2)	Going out for entertainment (3)	Going out for religious reasons (4)	Wash hands (5)	Avoid contact (6)
T2 (Call Only)	0.126***	0.011***	0.076***	0.049***	0.352***	0.350***
	(0.014)	(0.004)	(0.011)	(0.016)	(0.014)	(0.016)
T3 (Both Text & Call)	0.196***	0.010**	0.091***	0.058***	0.521***	0.585***
	(0.014)	(0.004)	(0.011)	(0.015)	(0.014)	(0.013)
New Controls	Yes	Yes	Yes	Yes	Yes	Yes
Old Controls	Yes	Yes	Yes	Yes	Yes	Yes
Union Council FE	Yes	Yes	Yes	Yes	Yes	Yes
WY FWER p-values (T2)	0.000	0.015	0.000	0.015	0.000	0.000
WY FWER p-values (T3)	0.000	0.021	0.000	0.002	0.000	0.000
RI p-values (T2)	0.000	0.001	0.000	0.001	0.001	0.001
RI p-values (T3)	0.001	0.014	0.001	0.001	0.001	0.000
Observations	5,840	5,840	5,840	5,840	5,840	5,840
R-squared	0.133	0.015	0.106	0.146	0.268	0.304

Robust standard errors clustered at the village level are in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Note: OLS regression estimates reported; all dependent variables are compliance dummies. See the note under Table A5 for details on the outcomes, controls, and various test p-values.

Table A7: Effect on compliance indicators (Probit estimates)

VARIABLES	Going to the market (1)	Going to the doctor (2)	Going out for entertainment (3)	Going out for religious reasons (4)	Wash hands (5)	Avoid contact (6)
	Panel A: Bangladesh (with all controls)					
T2 (Call Only)	0.495***	0.405***	0.403***	0.210***	1.275***	1.095***
	(0.052)	(0.135)	(0.057)	(0.063)	(0.055)	(0.052)
T3 (Both Text & Call)	0.853***	0.403**	0.512***	0.258***	1.735***	1.776***
	(0.057)	(0.157)	(0.065)	(0.063)	(0.057)	(0.049)
New Controls	Yes	Yes	Yes	Yes	Yes	Yes
Old Controls	Yes	Yes	Yes	Yes	Yes	Yes
Union Council FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	5,840	5,840	5,840	5,840	5,840	5,840
	Panel B: Bangladesh (without 'old' controls)					
T2 (Call Only)	0.520***	0.275**	0.356***	0.208***	1.266***	1.122***
	(0.052)	(0.121)	(0.053)	(0.057)	(0.052)	(0.046)
T3 (Both Text & Call)	0.818***	0.317**	0.483***	0.266***	1.663***	1.751***
	(0.056)	(0.141)	(0.061)	(0.061)	(0.054)	(0.046)
New Controls	Yes	Yes	Yes	Yes	Yes	Yes
Old Controls	No	No	No	No	No	No
Union Council FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	6,485	6,485	6,485	6,485	6,485	6,485
	Panel C: India					
T2 (Call Only)	-0.004	0.371	1.643***	15.621***	3.262***	3.777***
	(0.163)	(0.226)	(0.307)	(1.922)	(0.239)	(0.243)
T3 (Both Text & Call)	0.795***	0.721***	5.810***	17.315***	4.491***	4.939***
	(0.111)	(0.154)	(0.435)	(2.277)	(0.246)	(0.293)
All Controls	Yes	Yes	Yes	Yes	Yes	Yes
Village FE	Yes	Yes	Yes	No	Yes	Yes
Observations	1,680	1,680	1,680	1,680	1,680	1,680

Robust standard errors clustered at the village level are in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Note: Probit regression estimates reported; all dependent variables are compliance dummies. See the note under Table A5 for details on the outcomes and controls. Please note that we could not estimate column 4 in Panel C with village fixed effects. Thus, probit estimates in column 4, Panel C, are without village FE.

Table A8: Comparison between women from the first and second endline in Bangladesh

	Endline 1		Both Endlines		Difference	
Variables	**Mean (1)**	***Std. Dev.***	**Mean (2)**	***Std. Dev.***	**(2) minus (1)**	***SE***
Age$^{\perp}$ (in years)	35.73	*9.50*	35.98	*9.72*	0.26	*0.44*
Education$^{\perp}$ (in years)	8.43	*2.62*	8.37	*2.65*	-0.06	*0.12*
Monthly household income$^{\perp}$	9,449	*6,202*	9,226	*6,968*	-223	*254*
Number of household members$^{\perp}$	4.32	*1.24*	4.32	*1.32*	0.00	*0.04*
Muslim dummy	0.72	*0.45*	0.67	*0.47*	-0.04*	*0.02*
Professions						
Farmer	0.18	*0.39*	0.17	*0.38*	-0.01	*0.01*
Labourer	0.40	*0.49*	0.44	*0.50*	0.04**	*0.02*
Self-employed	0.32	*0.47*	0.31	*0.46*	-0.01	*0.02*
Professional	0.09	*0.29*	0.08	*0.27*	-0.02	*0.01*
Sample size	2,325 (2,102$^{\perp}$)	-	1,583	-	-	-

Note: Comparisons in characteristics (collected during the first endline) between women that only participated in endline 1 (*Endline 1* column) and women that participated in both endlines (*Both Endlines* column). Difference column reports the difference between *Both Endlines* and *Endline 1* (*Both Endlines* minus *Endline 1*). The rightmost column, SE, corresponds to standard errors (clustered at the village level). Variables with $^{\perp}$ corresponds to data collected earlier in 2019 and, thus, the corresponding sample sizes are smaller (reported in parentheses in *Endline 1* column). However, we have the 2019 survey data for all respondents from the second endline. See the note for Panel A under Table 1 for all variable descriptions. *** p<0.01, ** p<0.05, * p<0.1.

Table A9: Effects on compliance indicators in Bangladesh: second endline

VARIABLES	**Wash hands (1)**	**Not going outside (2)**	**Not going for prayers (3)**	**Keep 1.5m distance (4)**	**Use masks (5)**	**Sneeze/cough with care (6)**	**Avoid contact (7)**
T2 (Call Only)	0.474***	0.267***	0.107***	0.203***	0.345***	0.326***	0.413***
	(0.028)	(0.026)	(0.025)	(0.027)	(0.029)	(0.028)	(0.029)
T3 (Both Text & Call)	0.601***	0.359***	0.187***	0.436***	0.472***	0.463***	0.587***
	(0.024)	(0.026)	(0.023)	(0.028)	(0.025)	(0.024)	(0.025)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Union Council FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
WY FWER p-values (T2)	0.000	0.000	0.001	0.000	0.000	0.000	0.000
WY FWER p-values (T3)	0.000	0.000	0.000	0.000	0.000	0.000	0.000
RI p-values (T2)	0.000	0.000	0.000	0.000	0.000	0.001	0.001
RI p-values (T3)	0.000	0.000	0.001	0.000	0.001	0.000	0.000
Observations	1,583	1,583	1,583	1,583	1,583	1,583	1,583
R-squared	0.341	0.146	0.097	0.202	0.214	0.203	0.304

Robust standard errors clustered at the village level are in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Note: OLS regression estimates reported; all dependent variables are compliance dummies: in column (1) it equals to 1 if the respondent washed hands five times in a day at least on 3 separate days in the past week and 0 otherwise; in column (2) it equals to 1 if the respondent did not leave home at least on 3 separate days in the past week and 0 otherwise; in column (3) it equals to 1 if the respondent did not go out for religious purpose at least on 3 separate days in the past week and 0 otherwise; in column (4) it equals to 1 if the respondent maintained a 1.5 meter distance from others when they were outside and 0 otherwise; in column (5) it equals to 1 if the respondent used a mask/face covering when they were outside and 0 otherwise; in column (6) it equals to 1 if the respondent always sneezed/coughed in a handkerchief or in elbows and 0 otherwise; in column (7) it equals to 1 if the respondent did not have any close contact with outsiders at least on 3 separate days in the past week and 0 otherwise. Controls correspond to all control variables (both new and old controls) listed under Table 2.

Table A10: Heterogeneous treatment effects on compliance in Bangladesh (with all controls)

	by Gender									by Media
	All	Female only				Male only				All
VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
T2 (Call Only)	1.233***	1.379***	0.983***	1.440***	1.188***	0.760***	0.991***	0.687***	0.851***	0.859***
	(0.044)	(0.077)	(0.112)	(0.112)	(0.097)	(0.096)	(0.200)	(0.130)	(0.138)	(0.059)
T3 (Both Text & Call)	1.762***	1.866***	1.523***	1.976***	1.840***	1.294***	0.952***	1.356***	1.209***	1.463***
	(0.036)	(0.061)	(0.123)	(0.071)	(0.082)	(0.099)	(0.226)	(0.143)	(0.151)	(0.049)
Male	-0.664***									
	(0.044)									
T2×Male	-0.536***									
	(0.070)									
T3×Male	-0.575***									
	(0.067)									
Muslim		0.019				-0.222***				
		(0.057)				(0.083)				
T2×Muslim		-0.214**				-0.062				
		(0.090)				(0.125)				
T3×Muslim		-0.137*				-0.134				
		(0.073)				(0.120)				
Worried: family health			0.027				0.172			
			(0.066)				(0.111)			
T2×Worried: family health			0.264**				-0.298			
			(0.115)				(0.212)			
T3×Worried: family health			0.261**				0.267			
			(0.128)				(0.234)			
Worried: finances				0.180***				0.171*		
				(0.064)				(0.095)		
T2×Worried: finances				-0.264**				0.039		
				(0.120)				(0.138)		
T3×Worried: finances				-0.262***				-0.201		
				(0.078)				(0.156)		
Household food insecurity					0.015				0.007	
					(0.066)				(0.104)	
T2×Household food insecurity					0.048				-0.173	
					(0.106)				(0.155)	
T3×Household food insecurity					-0.090				-0.017	
					(0.089)				(0.168)	
Media exposure										0.015
										(0.039)
T2×Media exposure										0.240***
										(0.071)
T3×Media exposure										0.115*
										(0.059)
New Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Old Controls	No	No	No	No	No	No	No	No	No	Yes
Union Council FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	5,840	3,523	3,523	3,523	3,523	2,317	2,317	2,317	2,317	5,840
R-squared	0.436	0.463	0.463	0.462	0.462	0.202	0.203	0.202	0.202	0.427

Robust standard errors clustered at the village level are in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Note: The dependent variable is the standardized compliance index. Columns 1-9 report estimates of heterogeneous treatment effects by gender and column 10 reports that by media exposure. All variables are defined under Table 2 and in section 3.2.

Table A11: Heterogeneous treatment effects on awareness

	Bangladesh			India	
	by Gender		by Media	by Gender	by Media
VARIABLES	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**
T2 (Call Only)	1.803***	1.725***	1.615***	3.057***	2.933***
	(0.056)	(0.059)	(0.071)	(0.083)	(0.111)
T3 (Both Text & Call)	2.205***	2.248***	2.195***	3.503***	3.415***
	(0.056)	(0.054)	(0.059)	(0.067)	(0.076)
Male	0.179***	0.171***		0.195**	
	(0.055)	(0.054)		(0.093)	
T2×Male	-0.407***	-0.358***		-0.258**	
	(0.075)	(0.077)		(0.096)	
T3×Male	-0.365***	-0.359***		-0.210**	
	(0.073)	(0.073)		(0.094)	
Media Exposure			0.319***		-0.367
			(0.053)		(0.229)
T2×Media Exposure			-0.060		-0.040
			(0.085)		(0.152)
T3×Media Exposure			-0.139**		-0.059
			(0.070)		(0.128)
New Controls	Yes	Yes	Yes	-	-
Old Controls	No	Yes	Yes	-	-
All Controls	-	-	-	Yes	Yes
Union Council FE	Yes	Yes	Yes	-	-
Village FE	-	-	-	Yes	Yes
Observations	6,485	5,840	5,840	1,680	1,680
R-squared	0.426	0.450	0.448	0.822	0.821

Robust standard errors clustered at the village level are in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Note: All dependent variables are awareness scale (between 0-5). Please note that the exposure to media question is only available for 90% of the Bangladeshi sample, so we only present a single column (3) to report heterogeneous treatment effects on awareness by media exposure. While by gender in Bangladesh, we present two columns, one with the total sample (column 1) and one with the full set of controls (column 2). See the note under Table 2 for the list of controls.

Table A12: Heterogeneous treatment effects on compliance indicators, by gender in Bangladesh

VARIABLES	Not going: market (1)	Not going: doctor (2)	Not going: entertainment (3)	Not going: religious reasons (4)	Wash hands (5)	Avoid contact (6)
T2 (Call Only)	0.193***	0.011***	0.068***	0.057***	0.451***	0.431***
	(0.015)	(0.004)	(0.010)	(0.015)	(0.018)	(0.017)
T3 (Both Text & Call)	0.232***	0.009*	0.084***	0.058***	0.633***	0.638***
	(0.014)	(0.005)	(0.010)	(0.013)	(0.016)	(0.014)
Male	-0.124***	-0.001	-0.177***	-0.254***	0.031**	-0.084***
	(0.019)	(0.005)	(0.014)	(0.025)	(0.013)	(0.014)
T2×Male	-0.150***	-0.009	-0.007	-0.016	-0.207***	-0.159***
	(0.026)	(0.006)	(0.018)	(0.032)	(0.026)	(0.023)
T3×Male	-0.114***	-0.000	-0.002	0.010	-0.308***	-0.145***
	(0.025)	(0.007)	(0.018)	(0.033)	(0.025)	(0.024)
New Controls	Yes	Yes	Yes	Yes	Yes	Yes
Old Controls	No	No	No	No	No	No
Union Council FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	6,485	6,485	6,485	6,485	6,485	6,485
R-squared	0.139	0.013	0.098	0.142	0.269	0.301

Robust standard errors clustered at the village level are in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Note: OLS regression estimates reported; all dependent variables are compliance dummies and same as that in Table A5. See the note under Table 2 for the list of controls.

Table A13: Heterogeneous treatment effects on compliance indicators, by media exposure in Bangladesh

VARIABLES	Not going: market (1)	Not going: doctor (2)	Not going: entertainment (3)	Not going: religious reasons (4)	Wash hands (5)	Avoid contact (6)
T2 (Call Only)	0.087***	0.011*	0.067***	0.011	0.316***	0.323***
	(0.023)	(0.006)	(0.020)	(0.022)	(0.022)	(0.024)
T3 (Both Text & Call)	0.201***	0.014**	0.106***	0.013	0.471***	0.586***
	(0.020)	(0.006)	(0.018)	(0.022)	(0.020)	(0.019)
Media Exposure	-0.009	0.003	0.008	-0.041**	0.025*	0.029*
	(0.018)	(0.005)	(0.017)	(0.018)	(0.013)	(0.015)
T2×Media Exposure	0.057**	-0.001	0.011	0.061**	0.058**	0.041
	(0.026)	(0.007)	(0.023)	(0.026)	(0.029)	(0.027)
T3×Media Exposure	-0.008	-0.006	-0.025	0.072***	0.079***	-0.002
	(0.023)	(0.006)	(0.021)	(0.026)	(0.026)	(0.026)
New Controls	Yes	Yes	Yes	Yes	Yes	Yes
Old Controls	Yes	Yes	Yes	Yes	Yes	Yes
Union Council FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	5,840	5,840	5,840	5,840	5,840	5,840
R-squared	0.134	0.015	0.106	0.148	0.269	0.305

Robust standard errors clustered at the village level are in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Note: OLS regression estimates reported; all dependent variables are compliance dummies and same as that in Table A5. See the note under Table 2 for the list of controls.

Table A14: Heterogeneous treatment effects on compliance index in Bangladesh: second endline

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
T2 (Call Only)	1.839***	1.736***	1.783***	1.791***	1.858***	1.876***
	(0.131)	(0.282)	(0.159)	(0.079)	(0.081)	(0.116)
T3 (Both Text & Call)	2.597***	2.217***	2.620***	2.627***	2.696***	2.609***
	(0.108)	(0.253)	(0.130)	(0.068)	(0.071)	(0.118)
Muslim	-0.126					
	(0.094)					
T2×Muslim	-0.040					
	(0.165)					
T3×Muslim	0.056					
	(0.140)					
Worried: family health		0.097				
		(0.154)				
T2×Worried: family health		0.081				
		(0.292)				
T3×Worried: family health		0.442*				
		(0.264)				
Worried: finances			-0.155			
			(0.097)			
T2×Worried: finances			0.038			
			(0.169)			
T3×Worried: finances			0.022			
			(0.142)			
Household food insecurity				0.305		
				(0.188)		
T2×Household food insecurity				0.255		
				(0.259)		
T3×Household food insecurity				0.141		
				(0.223)		
Increased household chores					0.264**	
					(0.117)	
T2×Increased household chores					-0.204	
					(0.175)	
T3×Increased household chores					-0.242	
					(0.158)	
Media exposure						0.217**
						(0.100)
T2×Media exposure						-0.099
						(0.141)
T3×Media exposure						0.044
						(0.140)
All Controls	Yes	Yes	Yes	Yes	Yes	Yes
Union Council FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,583	1,583	1,583	1,583	1,583	1,583
R-squared	0.573	0.574	0.572	0.574	0.574	0.574

Robust standard errors clustered at the village level are in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Note: The dependent variable is the standardized compliance index. 'Household food insecurity' was again collected in the second endline and the coding is identical to the household food insecurity dummy variable from the first wave (defined in section 3.2); 'Increased Household Chores' is a dummy variable that equals 1 if the respondent reported an increase in household chores during the second endline and 0 otherwise; All variables other are defined under Table 2 and in section 3.2.

Table A15: Heterogeneous treatment effects on compliance indicators, by gender in India

VARIABLES	Not going: market (1)	Not going: doctor (2)	Not going: entertainment (3)	Not going: religious reasons (4)	Wash hands (5)	Avoid contact (6)
T2 (Call Only)	0.020	0.048*	0.056***	0.035***	0.814***	0.870***
	(0.052)	(0.027)	(0.018)	(0.011)	(0.042)	(0.028)
T3 (Both Text & Call)	0.203***	0.054**	0.068***	0.032***	0.928***	0.960***
	(0.027)	(0.022)	(0.018)	(0.010)	(0.020)	(0.014)
Male	0.036	0.007	-0.001	0.025**	-0.010	0.038*
	(0.038)	(0.028)	(0.023)	(0.010)	(0.021)	(0.019)
T2×Male	-0.030	-0.011	0.005	-0.026***	-0.023	-0.031
	(0.042)	(0.031)	(0.026)	(0.009)	(0.046)	(0.037)
T3×Male	-0.099**	0.009	-0.005	-0.027***	-0.002	-0.024
	(0.040)	(0.029)	(0.023)	(0.009)	(0.023)	(0.019)
All Controls	Yes	Yes	Yes	Yes	Yes	Yes
Village FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,680	1,680	1,680	1,680	1,680	1,680
R-squared	0.099	0.051	0.070	0.065	0.681	0.707

Robust standard errors clustered at the village level are in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Note: OLS regression estimates reported; all dependent variables are compliance dummies and same as that in Table A5. See the note under Table 2 for the list of controls.

Table A16: Heterogeneous treatment effects on compliance indicators, by residence near marketplace in India

VARIABLES	Not going: market (1)	Not going: doctor (2)	Not going: entertainment (3)	Not going: religious reasons (4)	Wash hands (5)	Avoid contact (6)
T2 (Call Only)	0.004	0.033*	0.061***	0.022**	0.822***	0.865***
	(0.042)	(0.018)	(0.013)	(0.011)	(0.043)	(0.036)
T3 (Both Text & Call)	0.129***	0.046***	0.063***	0.018**	0.942***	0.951***
	(0.025)	(0.016)	(0.013)	(0.008)	(0.014)	(0.011)
Residence near marketplace	0.169***	0.058**	0.075*	0.043***	0.041	0.011
	(0.050)	(0.025)	(0.042)	(0.013)	(0.081)	(0.044)
T2×Residence near marketplace	0.001	0.027	-0.006	-0.003	-0.061	-0.034
	(0.054)	(0.031)	(0.022)	(0.011)	(0.055)	(0.068)
T3×Residence near marketplace	0.073	0.034	0.008	0.000	-0.044	-0.011
	(0.043)	(0.030)	(0.026)	(0.011)	(0.030)	(0.028)
All Controls	Yes	Yes	Yes	Yes	Yes	Yes
Village FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,680	1,680	1,680	1,680	1,680	1,680
R-squared	0.097	0.051	0.070	0.057	0.682	0.707

Robust standard errors clustered at the village level are in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Note: OLS regression estimates reported; all dependent variables are compliance dummies and same as that in Table A5. See the note under Table 2 for the list of controls.

B Campaign Materials

B.1 Five different text messages for treatments with 'text-messages'

"Dear (*name of recipient*), to protect yourself from the coronavirus:

- Wash your hands frequently with soap and water for at least 20 seconds.
- Cough/sneeze into your elbow or use tissue paper/ handkerchief.
- Maintain a minimum distance of 2 arms while talking to another person.
- Do not hug or shake your hands with others.
- Keep yourself away from other healthy persons if you are having fever, cough, or breathing difficulty.

Global Development Research Initiative or *Development Policy Research Network*."

These text messages were translated in *Bangla* (in Bangladesh) and *Hindi* (in India) languages.

B.2 Guidelines for 'phone call' treatments

(Direction to callers: The following messages should be properly conveyed keeping in mind that you are talking over the phone and 'receiver' should understand every word you say. You should not be in a hurry while talking to ensure that they listen to you and understand everything. Please spend at least 5 minutes talking to each person. Emphasize on the <u>BOLD</u> parts.)

Hello (*name of recipient*), Assalamu alaykum (in Bangladesh)/Namaste (in India), I am _____, speaking from GDRN/DPRN. How are you?

Today we have called to inform you about some important guidelines which, if followed, will keep you and your family healthy.

(Direction to callers: Request the person to listen to these guidelines carefully. If the person is busy when you call, ask for a convenient time and call him/her later. Still, if the person is unwilling to talk, do not force and underline his/her name in the list of households that you have. Those who are willing to talk, put a tick mark after their names in the list)

You may know that globally thousands of people have been infected by Coronavirus. Many of them are losing their lives too.

Coronavirus is a virus that is causing disease among humans. The primary symptoms of this disease are similar to normal cough and fever. However, many people are

dying because of this deadly disease.

If you keep yourself clean and tidy and **follow certain guidelines, it is possible to protect you and your family from Coronavirus and stay healthy.** You should...

- Wash your hands frequently with soap and water for at least 20 seconds.
- Cough or sneeze into your elbow or use tissue paper or handkerchief.
- Maintain a minimum distance of 2 arms while talking to another person.
- Not hug or shake your hands with others.
- Keep yourself away from other healthy persons if you are having a fever, cough, or difficulty breathing.

Aged people are the most vulnerable to Coronavirus and they are the ones dying in numbers. Is there any aged person in your family? If yes, e.g., father, mother, grandfather, grandmother etc., please keep a close eye on them. **For the wellbeing of their health, everyone in the family including the aged people should follow the guidelines**.

Please take care of the children in the family and keep a close eye on them too.

In this crucial time, please stay indoors unless it is extremely important or there is an emergency. We know that all of us need to go out for our work and job. The lesser you go out, the better it is for you and your family. **So, if you have to go out, please cover you face.** Suppose no one in your family currently has Coronavirus. By going out, you increase your chance of getting infected. Always remember, the virus can easily transmit to others in the family even if only one of the family members is affected. **That is why it is necessary to follow these guidelines.**

Please also avoid social gatherings. Places like markets, tea stalls, etc. should be avoided as generally there are large numbers of people in these places which increase the chance of transmission. **Please remember, even a healthy looking person can be a carrier of Coronavirus which can be further transmitted to another person.**

We all touch our face, eyes, and nose with our hands. We should particularly stop this as the virus may spread into your body from your hand if you touch your face, eyes, or nose. So, we should be very careful about this and **wash our hands with soap and water frequently.**

Please consult a doctor if anyone in the family is having fever, cough, or difficulty breathing.

These guidelines look straightforward and adhering to them may seem to be unnecessarily going too far. But please remember, you can protect yourself and your family

only by following these guidelines.

You and all your family members can stay healthy and protect yourselves from Coronavirus only by abiding by these pieces of advice. Whatever has been said so far, **you should share with your family members so that they consider these advice as important and follow them accordingly.** In spite of you following the advice, all your family members are still not safe. Therefore, it is extremely important to abide by these guidelines to save the lives of you and your near ones. **Please be aware and follow the advices so that no one from your family becomes infected.**

Did you understand whatever I have said so far? ***(Direction to caller: If 'No', ask which portion he/she did not understand. Repeat that and explain again.)***

Your awareness will be beneficial for you and your family to stay safe and protected from this disease. I hope everyone in your family will follow these advice. Stay safe. We will get back to you again.

Thank you.

End of call

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