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# Persuasion and public health

Evidence from an  
experiment with  
religious leaders  
during COVID-19  
in Pakistan



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# Persuasion and public health: Evidence from an experiment with religious leaders during COVID-19 in Pakistan

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## Abstract

We use a Randomized Controlled Trial in Pakistan to test whether one-on-one engagement with community religious leaders can encourage them to instruct congregants to comply with public health guidelines when attending religious gatherings. Treated religious leaders are 25% more likely to tell a “mystery shopper” he must wear a mask to attend. Treatment effects are driven by respondents who understand COVID transmission at baseline, suggesting the treatment does not work by correcting basic knowledge about the disease. Rather, it may work by connecting this knowledge to respondents’ pro-social motivations and actions that they can take as community leaders.

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# 1 Introduction

The COVID-19 pandemic has made painfully clear the limited ability of public health authorities to directly enforce health behaviors with positive externalities, such as social distancing and wearing masks. Instead, they must use information and persuasion to influence individuals' choices. But these messages are typically interpreted, challenged or reinforced by influential institutions and leaders, such as politicians or political parties (Grossman *et al.*, 2020; Alcott *et al.*, 2020; Barrios and Hochberg, 2020) and the media (Bursztyn *et al.*, 2020; Simonov *et al.*, 2020).

Religious institutions and leaders may be particularly important in efforts to promote voluntary compliance with public health measures. They are trusted sources of information (or misinformation) with substantial direct influence over the economic, social, and health behaviors of adherents (Bryan *et al.*, 2020; Bassi and Rasul, 2017; Auriol *et al.*, 2020). This potential for influence may be intensified in a crisis as people turn to religion for comfort and guidance (Bentzen, 2020; Alfano *et al.*, 2020). The role of religious institutions may be particularly important in low-income settings or among marginalized populations, who may have low trust in health authorities (Christensen, 2020; Alsan and Wanamaker, 2018). In the specific case of COVID-19, group gatherings are also a venue for the transmission of the disease (McCloskey *et al.*, 2020; Bernheim *et al.*, 2020; Dave *et al.*, 2020); religious gatherings are key opportunities for the disease to spread, especially as many people continue to attend services even during full lockdowns (Lopez-Pena *et al.*, 2020; Malhi *et al.*, 2020). But in many settings, religious leaders may be skeptical of messages from (secular) health authorities, leading them to undermine those messages; religiosity has been associated with lower compliance with public health guidance (Martinez-Bravo and Stegmann, 2018; Defranza *et al.*, 2020). Thus, understanding how the guidance *given* by religious institutions may be malleable is a key public policy challenge.

In this study, we investigate whether and how local religious leaders can be persuaded

to instruct congregants to take pro-social public health measures when attending religious gatherings. We conduct a Randomized Controlled Trial with religious leaders in Pakistan to test a low-cost, light-touch intervention: a one-on-one, interactive persuasive telephone call, focusing on their importance as community leaders in guiding followers and protecting vulnerable members of the congregation. Using “mystery shopper” calls, in which the religious leaders do not know that the caller is associated with the study, we establish that this intervention leads to a large and significant increase in the proportion of respondents who instruct congregants to take protective measures when attending prayer. The proportion who instruct callers to wear a mask increases by 25% over the control group mean. Adding explicitly religious content to the persuasive script is not necessary to achieve these effects. The results are significantly stronger among those who answered baseline questions about COVID transmission *correctly*. This is not consistent with a pure information updating effect. Rather, this result suggests that the interactive conversation has a persuasive effect (Dellavigna and Gentzkow, 2010; Mullainathan *et al.*, 2008), connecting that knowledge to respondents’ pro-social motivation of protecting the vulnerable in their community.

Our study contributes to two strands of literature. First, a broad literature establishes the importance of religious institutions and leaders in influencing individuals’ economic and social behavior (Kuran, 2018; Auriol *et al.*, 2020; Campante and Yanagizawa-Drott, 2015; Clingingsmith *et al.*, 2009; Bryan *et al.*, 2020; Bassi and Rasul, 2017; Rahman, 2019; Mehmood and Seror, 2020; Murphy *et al.*, 2020; Iyer, 2016; Barro and McCleary, 2003; Gruber, 2005; Gruber and Hungerman, 2008). However, less is known about what factors influence the messages religious leaders and institutions choose to promote to followers. This is likely to be particularly important in low state capacity contexts, where support from other institutions may be key for public policies to succeed (Acemoglu and Robinson, 2017; Acemoglu *et al.*, 2020; Khan *et al.*, 2020b). This study contributes to filling that gap. Our findings show that interactive engagement with local religious leaders, with a pro-social message ap-

pealing to their identity as community leaders, can change practical steps that local religious leaders take in their own communities and their instructions to congregants; and that this messaging may not need to rely on explicitly religious content to be effective.

Second, we contribute to a literature investigating how communication may influence pro-social public health behavior. A wide literature tests the impact of information campaigns on health behavior. Such interventions often focus on inducing individuals to update their baseline beliefs about the private returns to health behaviors, even when the targeted behaviors have large positive spillovers: convincing individuals to wash their hands (Bennett *et al.*, 2018), use a bednet to prevent the spread of malaria (Rhee *et al.*, 2005), have their children vaccinated (Nyhan *et al.*, 2014), or avoid risky sexual behavior (de Walque, 2007; Kerwin, 2020; Dupas, 2011; Duflo *et al.*, 2015). However, the effects of an approach emphasizing private returns may face limitations in situations where the positive spillover of a health behavior is large relative to the private returns, such as mask use by young, health people in the case of COVID, or the takeup of childhood vaccinations. Appealing to pro-social motivations may have potential in such situations, particularly given recent evidence on the importance of pro-social motivation in incentivizing health sector workers (Ashraf *et al.*, 2014; Deserranno, 2018; Khan, 2020) and the relevance of social signalling concerns in motivating vaccination takeup (Karing, 2021). However, few studies have examined health information treatments that appeal to respondents' pro-social motivations in changing their behavior, and several recent studies have found no detectable effects of such variations in information delivered to the general public (Guiteras *et al.*, 2016; Banerjee *et al.*, 2020; Khan *et al.*, 2020a). The message in our intervention has a strong pro-social focus: respondents are asked in their capacity as leaders to take safety measures in the mosque to protect the elderly and vulnerable in their congregations, and to influence others to do the same. The strong response to this treatment suggests the potential of pro-social messaging in information campaigns targeted to community leaders, who may be positively selected for pro-social

motivation, or feel that communities expect them to take greater responsibility for protecting members as part of their role.

The remainder of the paper proceeds as follows. Section 2 describes the context. Section 3 details the experimental design. Section 4 presents results, and 5 concludes.

## 2 Setting

We study these issues in the context of Pakistan, a setting with a low degree of trust in secular authorities and their public health guidance. In the 2012 World Values Survey, 60% of Pakistanis reported that they feel little or no confidence in the government ([World Values Survey, 2012](#)). In national polls carried out the COVID-19 pandemic, 50% agreed that COVID-19 is a foreign conspiracy ([Gallup Pakistan, 2020](#)).

Religious institutions, on the other hand, enjoy a high degree of trust. The vast majority of the population (96%) are Muslim ([Pakistan Bureau of Statistics, 1998](#)). Religiosity is among the highest in the world, with 94% saying religion is “very important” in their lives ([Pew Research Center, 2018](#)). About 80% of respondents in the World Values Survey agree that it is an essential characteristic of democracy for religious authorities to interpret the laws ([World Values Survey, 2012](#)). Attending Friday prayers in congregation at the mosque is generally considered obligatory for men, and this involves close contact: the Sunnah (example of the Prophet) is to stand shoulder to shoulder during the prayer. Islam has no central religious authority; any cleric with a certain level of legal qualification (a mufti) can issue a fatwa, or Islamic legal opinion, and many clerics who are not officially muftis do so as well; thus, there may be many contradictory opinions issued by authoritative leaders on any given issue, and these are not considered binding. Thus local religious leaders in Islam have substantial discretion to determine practice.

In March 2020, with COVID-19 cases rising, the government announced a nationwide lockdown including the suspension of congregational prayers. However, there was limited

compliance with this rule. Nationally influential clerics announced opposition to the rule, and in some cases police attempting to enforce it clashed with worshippers outside mosques. Government and a group of influential clerics at the national level met for a series of negotiations and then announced a joint plan. Mosques would stay open but would follow twenty key guidelines to reduce the spread of COVID. The most clearly defined of these were as follows: (1) prayer mats should be removed and the floor should be washed with chlorinated water; (2) people over 50 years of age and children should not be allowed to attend; (3) six feet of distance during congregational prayers; (3) people should perform ablution at home; and (4) congregants should wear face masks. However, implementation of these rules was limited, with NGOs reporting in May that 80% of mosques were not following these rules ([Pattan Development Organization, 2020](#)). After the first major religious holiday of the year, Eid ul Fitr in May 2020, cases climbed faster (Figure 1); many attributed this rise in part to religious and social gatherings on the holiday including congregational prayers in mosques ([Deutsche Welle, 2020](#)). In the period leading up to Eid ul Azha, the second major religious holiday of the year at the end of July, policymakers were concerned that cases could spike again due to large scale gatherings over the holiday. Self-reported weekly mosque attendance continued to climb after a low during lockdown, reaching 77% by the time of Eid ul Azha ([Gallup Pakistan, 2020](#)).

### 3 Experimental design

We carried out our experiment over a three week period in July 2020, leading up to the Eid ul Azha holiday. The treatments and data collection reference this holiday. We draw a random sample of religious leaders from community mosques across 19 districts of urban and rural Punjab from a government listing.<sup>1</sup> Table 1 shows the experimental design. In

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<sup>1</sup>Participants are drawn from a sample frame of individuals licensed to register marriages, provided by the Government of Punjab for a separate experiment ([Field and Vyborny, 2020](#)). Approximately two thirds of individuals in this sample frame are local religious leaders (who typically conduct a marriage and then register it); we restrict the sample to this group.

the first call, the enumerator identifies himself as a researcher from the Center for Economic Research in Pakistan. He emphasizes that he is not calling from the government, but rather as part of a research study. He then confirms the identity of the respondent and his role as a religious leader. For the religious leaders who are reached and agree to be surveyed, he carries out the baseline survey, collecting information on baseline beliefs about COVID and existing steps taken to prevent spread in the mosque.

We randomized respondents individually into one of four experimental conditions. For the two treatment groups, the persuasion script follows immediately after the survey. Both treatment arms include basic information on COVID asymptomatic spread and how it can occur at the mosque through breathing and coughing when people stand close together or use the communal wash tap. Both treatments (secular persuasion; secular + religious persuasion) emphasize the importance of the respondent's leadership role in the community and appeal to him in protecting vulnerable community members from COVID. In addition, they both emphasize the key actionable points in the official protocols for mosques, and ask the respondent to follow them and to spread the word to his community through his sermons and mosque loudspeaker announcements. The script is interactive, involving frequent elicitation of the respondent's reactions and agreement, as well as asking him to commit to action. In this way it differs substantially from mass media messages about COVID, which were widely disseminated during this period.

In addition to these elements, the secular + religious persuasion treatment arm includes an appeal to religious authority. This includes (1) the fact that the top religious leaders have endorsed the protocols for mosques; (2) hadith (sayings of the Prophet) about avoiding spread of plague; (3) international Sunni and Shia authorities' pronouncements (fatwas) on the importance of complying with official authorities to prevent spread of COVID; (4) examples of other Muslim countries following strong measures to prevent COVID spread.

Our main followup data collection uses mystery shoppers to obtain a measure of the reli-



gious leader’s instructions to members of the mosque congregation free of social desirability bias. A different enumerator from the original surveyor calls each respondent in the days before Eid, posing as a member of the community saying he and his father want to confirm the timing for Eid prayer services at the mosque. Timings are usually set 1-2 days before Eid and differ for each mosque; thus community members must enquire to confirm the time. These calls were credible to respondents; a number of respondents later called back to let the mystery shopper callers know the confirmed time of prayers. We also asked enumerators to record whether the respondent seemed suspicious of the mystery shopper call; approximately 10% of calls were tagged as suspicious, and this does not differ between treatment arms (result available on request).

After asking about the time of prayer services, the caller asks several questions about how he should prepare for attending mosque given COVID conditions, e.g. by wearing a mask, bringing his own prayer mat or doing ablution at home. This is credible during the Eid prayers as it is a larger gathering than usual, and congregants who do not frequently attend the mosque are likely to attend. We construct our key outcome variables as follows: (1) whether the respondent advises wearing a mask; (2) says wearing a mask is required when the caller says he would prefer not to wear it; (3) tells the caller to bring a prayer mat (i.e. because the mosque mats would have been removed); (4) indicates the caller should do ablution at home; and (5) asks about the caller’s father’s age (because the elderly are not supposed to attend the mosque). We present a simple index which is the mean of these five binary variables, as well as results for the five individual components.<sup>2</sup>

Of the 819 respondents who were surveyed successfully in the treatment and control groups and called by “mystery shoppers,” 629 (75%) answered the mystery shopper calls,

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<sup>2</sup>Due to an error in coordination between post-pilot questionnaire revisions and registration, the outcome “asks the respondent to bring his own prayer mat” was left out of the registry entry inadvertently. We show in the appendix that our results are not dependent on the inclusion of this variable. The full script of the instrument, available on the author’s website, demonstrates that all the mystery shopper outcome variables collected are presented in the paper.

of whom 609 were planning to hold Eid prayers at their mosque and were asked questions about prayers;<sup>3</sup> this is not differential by treatment arm (Table 3, Column 1). To quantify the main treatment effect of interest, the impact of persuasion, we compare mystery shopper outcomes between treatment and control arms for these 609 respondents whom we reached at baseline (Sample 1).

It is possible that simply answering the baseline survey, which makes COVID salient to respondents, influences respondents' answers in the mystery shopper calls. To test this, we include a super-control arm. Respondents in this group receive a mystery shopper call, but no baseline or treatment call. Because we have no baseline for the super-control group, we cannot restrict the sample to baseline responders; therefore, we compare mystery shopper outcomes between all respondents assigned before the baseline to the control group (N = 889) and the super-control group (N = 1067) (Sample 2). Again response rates to the mystery shopper calls are do not differ between the control and super-control arms (Table 3, Column 2).<sup>4</sup>

The full scripts of all the instruments are available on the author's website. We pre-registered the study (AEARCTR-0005740, Version 2.0).<sup>5</sup> Duke's IRB approved the study under protocol number 2020-0432.

## 4 Results

Table 2 shows descriptive statistics and balance for the main sample from the baseline survey. Respondents lead community mosques with an average of 40 people attending daily evening

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<sup>3</sup>Smaller mosques do not always hold Eid prayers.

<sup>4</sup>At the end of the first call, after the persuasion script was complete for the treatment group, we also asked respondents in all treatment arms to report their planned steps to reduce the spread of COVID in the mosque. We consider these variables weaker evidence than the mystery shopper data, because they are self-reported and therefore subject to response bias. We pre-registered these self-reported variables as outcome variables; however, because of variation in the length of the call between treatment and control, response rates to this module differ between treatment arms, causing potential sample selection bias in the estimates. Appendix Table A1 shows the results for these variables with and without Lee (2009) bounds.

<sup>5</sup>Version 1.0 was registered during early-stage piloting; observations collected during piloting, before Version 2.0 was registered, are not included in the analysis presented here.

prayer before COVID. Most respondents have less than 10th grade (Matric) education and some training in madrasa (religious schooling). The majority report that they are receiving frequent messages about COVID. However, the majority do not believe COVID is present in their communities. Respondents reported steps they have taken to prevent spread of COVID in the mosque, without being prompted with any specific step; almost all respondents mentioned at least one step, but only about 25% mention requiring masks. Respondents answered two basic questions about COVID transmission: whether it can be spread by people who show no symptoms, and whether it can be spread through coughing even if two people do not touch. About 60% of respondents answered both questions correctly in the affirmative and were confident in their answers; a third were unsure; and 10% gave a definite “no” to one or both questions.

Overall, the randomization is well balanced; of 87 tests, 8 are significant at the 10% level or greater, of which two are significant at the 1% level, similar to what would be expected by chance. Respondents in the control group appear to be slightly more likely to believe that COVID is present in their community, and more likely to report discouraging the elderly or sick from attending mosque during the pandemic. Both of these apparent imbalances should not drive our treatment effects of interest; if anything, they should bias our estimates towards zero.

Table 4 shows the main results of the experiment. In the control group, respondents recommended on average 38% of the counter-COVID measures to callers; about half recommended the caller bring his own prayer mat and do ablution at home, 44% recommended a mask and only 36% said a mask was required. Only 2% of respondents asked the caller (unprompted) about his father’s age. Respondents may not have imagined the callers’ fathers to be elderly or connected his caller’s statement that “my father and I wanted to know the time of Eid prayers” to the prohibition on elderly people attending.

Panel A shows the main treatment effects, comparing treatment and control groups

(Sample 1). Overall, the treatment increased the index of COVID compliance instructions by 18% (seven percentage points). The effects are driven by an increase in recommendations to do ablution at home and to wear a mask; the proportion who tell callers they are required to wear a mask increases by 25% over the control group mean. Panel B uses the same sample to break down the results by treatment arm, to investigate whether religious persuasion has any additional effect with religious leaders. The two treatment effects are similar in size and statistically indistinguishable.

Table 5 uses Sample 2 to investigate whether simply receiving the baseline survey, which has no informational content but makes COVID salient to respondents, drives our results. We compare the responses between the control (baseline survey + mystery shopper) and super control group (mystery shopper only). Because not all respondents in the control group picked up the baseline call, we instrument receiving a baseline survey with randomized assignment to the control group. Administering a survey alone has no detectable effect on the index of instructions to the mystery shopper.

Table 6 investigates whether the effect of the treatment ran through giving new information about COVID. We divide the sample first by whether the respondent correctly answered two questions about COVID at baseline: whether it can be transmitted by people who show no symptoms, and whether it can be transmitted through coughing or sneezing without touching. In Panel A, respondents who gave the correct answers but were uncertain are classified as having correct knowledge at baseline. The effects are completely driven by respondents who gave the correct answers at baseline, and we can reject at the 5% level that treatment effects are equal on the two groups. To investigate the role of the treatment in resolving uncertainty, Panel B splits respondents into three groups: those who answered the knowledge questions correctly at baseline, those who were uncertain, and those who gave the wrong answer but said they were certain about it. The effects are driven completely by those who are correct and certain in their beliefs at baseline. This demonstrates that simply

providing basic information about COVID transmission is *not* the mechanism for our results. Rather, the one-on-one persuasion, which made salient the importance of the mosque as a venue for transmission and emphasized the respondents' key leadership role in protecting the vulnerable in their community, mobilizes respondents who already believe that there is a risk of COVID spread to respond.

Table 7 tests for heterogeneity in responses by the respondent's relationship with secular and religious authorities. We do not find any pattern of a greater response among those who have a stronger relationship with the secular authorities. The point estimate of the treatment effect is larger for respondents who did not name government announcements as a trusted source of information about COVID (Column 1), although we cannot reject that the effects are equal for the two groups. The point estimates are similar for respondents in the constituency of the governing party (Pakistan Tehreek-e-Insaf) and those in opposition constituencies (Column 2). Treatment effects are similar between respondents with and without madrasa training, as well as those who mentioned clerics as sources of information about COVID and those who did not. This result contrasts to recent evidence from the US and Brazil on the politicization of responses to COVID-19 public health advice (Grossman *et al.*, 2020; Alcott *et al.*, 2020; Bursztyn *et al.*, 2020; Painter and Qiu, 2020; Milosh *et al.*, 2020; Kushner Gadarian *et al.*, 2020). This could be because these patterns are particular to the high degree of polarization in those countries (Barari *et al.* (2020) find no relationship between reported COVID compliance and trust in government across Italian respondents). Alternatively, it may be because personal interaction is more effective than mass communications in crossing party lines, as consistently shown in the political science literature on voter mobilization (Gerber and Green (2019) review this literature in detail).

## 5 Discussion

In this study, we use a randomized controlled trial to establish that one-on-one persuasion can be effective in influencing community religious leaders to instruct congregants to take public health measures in their mosques. We find that the effect of the intervention is not driven by simply making COVID salient or providing information about how it spreads.

In our study setting, Pakistan, the government engages extensively with prominent religious leaders at the national level. It is this engagement that led to the 20-point plan for mosques. Yet the lack of compliance with this plan at the community level illustrates the need for engagement at the community level. Our results demonstrate this can be effective; but direct engagement, beyond generic mass messaging, may be needed. Although the intervention we test requires time input at an individual level, its scripted nature and phone based delivery means it is still low cost, at around one dollar per religious leader contacted in our setting. Beyond this specific, standardized intervention, governments could consider establishing a mechanism for community-level engagement with local religious leaders, such as district level outreach teams.

Such approaches may be promising to explore not only for the case of combating COVID-19, but in other public health campaigns of importance (such as encouraging trust in vaccination) as well as a much broader set of policies where establishing public trust is key.

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Figure 1: Timeline

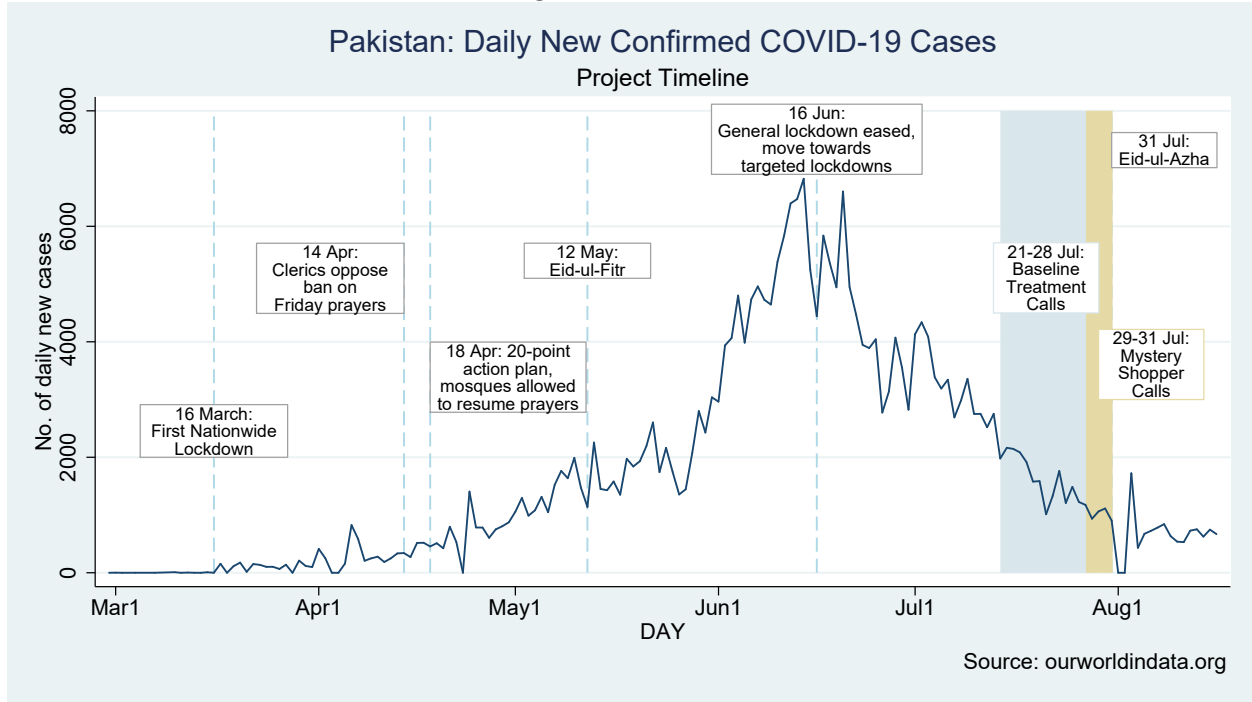


Table 1: Experimental design

	Baseline questions	Health information	Government persuasion	Religious persuasion	“Mystery shoppers”
Control	Yes	No	No	No	Yes
Secular T	Yes	Yes	Yes	No	Yes
Secular + religious T	Yes	Yes	Yes	Yes	Yes
Super control	No	No	No	No	Yes

Table 2: Descriptive statistics and balance

Variable	(1) Combined secular + religious		(2) Secular only		(3) Control		Difference		
	N	Mean/SE	N	Mean/SE	N	Mean/SE	(1)-(2)	(1)-(3)	(2)-(3)
Ed Matric or above	192	0.458 (0.036)	220	0.486 (0.034)	217	0.429 (0.034)	-0.028	0.030	0.058
Attended madrasa	185	0.827 (0.028)	215	0.837 (0.025)	213	0.761 (0.029)	-0.010	0.066	0.077**
Typical daily congregation pre COVID	176	39.273 (3.212)	209	35.464 (2.927)	198	38.591 (4.345)	3.809	0.682	-3.127
Urban	192	0.208 (0.029)	220	0.232 (0.029)	217	0.217 (0.028)	-0.023	-0.008	0.015
Governing party constituency	164	0.433 (0.039)	176	0.369 (0.036)	179	0.358 (0.036)	0.064	0.075	0.012
Believes COVID may be present in community	180	0.117 (0.024)	209	0.086 (0.019)	205	0.180 (0.027)	0.031	-0.064*	-0.094***
BL COVID knowledge: Certain and correct	168	0.571 (0.038)	197	0.584 (0.035)	194	0.582 (0.035)	-0.012	-0.011	0.001
BL COVID knowledge: Uncertain	168	0.321 (0.036)	197	0.284 (0.032)	194	0.325 (0.034)	0.037	-0.003	-0.040
BL COVID knowledge: Certain and wrong	168	0.107 (0.024)	197	0.132 (0.024)	194	0.093 (0.021)	-0.025	0.014	0.039
Received few / no COVID messages last week	174	0.328 (0.036)	207	0.353 (0.033)	201	0.323 (0.033)	-0.025	0.004	0.029
Baseline step: Short sermon	134	0.060 (0.021)	188	0.090 (0.021)	193	0.088 (0.020)	-0.031	-0.028	0.002
Baseline step: Clean mosque	134	0.306 (0.040)	188	0.351 (0.035)	193	0.295 (0.033)	-0.045	0.011	0.056
Baseline step: Soap	134	0.343 (0.041)	188	0.266 (0.032)	193	0.249 (0.031)	0.077	0.095*	0.017
Baseline step: Remove mats	134	0.567 (0.043)	188	0.559 (0.036)	193	0.570 (0.036)	0.009	-0.003	-0.011
Baseline step: Elderly / sick	134	0.097 (0.026)	188	0.154 (0.026)	193	0.176 (0.027)	-0.057	-0.079**	-0.022
Baseline step: Distancing	134	0.627 (0.042)	188	0.580 (0.036)	193	0.601 (0.035)	0.047	0.026	-0.021
Baseline step: Announcements	134	0.112 (0.027)	188	0.128 (0.024)	193	0.135 (0.025)	-0.016	-0.023	-0.007
Baseline step: Ablution at home	134	0.187 (0.034)	188	0.229 (0.031)	193	0.233 (0.031)	-0.042	-0.047	-0.004
Baseline step: Mask	134	0.216 (0.036)	188	0.282 (0.033)	193	0.223 (0.030)	-0.065	-0.006	0.059
Baseline step: Other step	134	0.112 (0.027)	188	0.165 (0.027)	193	0.145 (0.025)	-0.053	-0.033	0.020
Baseline step: Number of steps	134	2.627 (0.123)	188	2.803 (0.122)	193	2.715 (0.126)	-0.176	-0.088	0.088
Reports no steps to prevent COVID in mosque	134	0.037 (0.016)	188	0.059 (0.017)	193	0.078 (0.019)	-0.021	-0.040	-0.019
Trusted source: Social media	192	0.078 (0.019)	220	0.186 (0.026)	217	0.120 (0.022)	-0.108***	-0.042	0.067*
Trusted source: Newspapers	192	0.203 (0.029)	220	0.182 (0.026)	217	0.175 (0.026)	0.021	0.028	0.007
Trusted source: TV news	192	0.401 (0.035)	220	0.377 (0.033)	217	0.369 (0.033)	0.024	0.032	0.009
Trusted source: Gov't announcements	192	0.188 (0.028)	220	0.164 (0.025)	217	0.171 (0.026)	0.024	0.017	-0.007
Trusted source: Religious authorities	192	0.057 (0.017)	220	0.036 (0.013)	217	0.083 (0.019)	0.021	-0.026	-0.047**
Trusted source: Friends / family / contacts	192	0.214 (0.030)	220	0.168 (0.025)	217	0.230 (0.029)	0.045	-0.017	-0.062
Trusted source: Other	192	0.078 (0.019)	220	0.082 (0.019)	217	0.078 (0.018)	-0.004	-0.000	0.003

Notes: Sample sizes for covariates vary because of non-response to baseline questions due to some respondents hanging up before completing the baseline call. Robust standard errors in parentheses. \*  $p < 0.1$ ; \*\*  $p < 0.05$ ; \*\*\*  $p < 0.01$ .

Table 3: Balance in response to mystery shopper calls

	(1)	(2)
	Responded to mystery shopper	Responded to mystery shopper
Secular + religious persuasion	-0.025 (0.038)	
Secular persuasion	0.010 (0.036)	
Received baseline survey		-0.041 (0.055)
Constant	0.754*** (0.026)	0.591*** (0.015)
Observations	813	1956
P-value, treatment effects equal	0.350	
P-value, all treatments = 0	0.640	
Sample	Sample 1	Sample 2

Notes: Column 1: Treatment and control arms, respondents who answered baseline survey. Column 2: Control and super-control arms, respondents for whom mystery shopper was attempted. “Received baseline survey” is instrumented with random assignment to control arm. Robust standard errors in parentheses. \*  $p < 0.1$ ; \*\*  $p < 0.05$ ; \*\*\*  $p < 0.01$ .

Table 4: Impact of persuasion treatment on religious leaders’ instructions to mystery shopper

Panel A: Effect of persuasion treatment (pooled)						
Index components:						
	MS index	Bring own prayer mat	Ablution at home	Mask recommended	Mask required	Asks father’s age
Any treatment	0.066** (0.026)	0.040 (0.042)	0.084** (0.042)	0.109** (0.042)	0.097** (0.041)	-0.001 (0.013)
Observations	609	609	609	609	609	609
Control group mean	0.375	0.531	0.526	0.436	0.360	0.024
Panel B: Disaggregated by individual persuasion scripts						
Index components:						
	MS index	Bring own prayer mat	Ablution at home	Mask recommended	Mask required	Asks father’s age
Secular + religious persuasion	0.054* (0.030)	0.010 (0.050)	0.085* (0.050)	0.094* (0.050)	0.072 (0.049)	0.009 (0.017)
Secular persuasion	0.076** (0.030)	0.065 (0.048)	0.084* (0.048)	0.123** (0.048)	0.119** (0.048)	-0.010 (0.013)
Observations	609	609	609	609	609	609
P-value, treatment effects equal	0.460	0.260	0.990	0.560	0.350	0.230

Notes: Sample 1 (treatment and control, respondents who answered both the baseline survey and the mystery shopper call). “Bring own prayer mat” was included in the instrument but excluded from the pre-analysis plan in error; index results are robust to the exclusion of this variable (Table A2). Robust standard errors. \*  $p < 0.1$ ; \*\*  $p < 0.05$ ; \*\*\*  $p < .01$ .



Table 5: Effect of receiving baseline survey on religious leaders’ instructions to mystery shoppers: control versus super control

	(1) Index - advice to MS	(2) Index - advice to MS
Any treatment	0.066** (0.026)	
Received baseline survey		0.037 (0.034)
Observations	609	1142

Notes: Column 1 compares treatment versus control in Sample 1 (respondents who answered the baseline survey / treatment module and answered the mystery shopper call). Column 2 compares control versus super control in Sample 2 (control and super control, respondents who answered the mystery shopper call). In column 2, “Received baseline survey” is instrumented with random assignment to control arm. Robust standard errors. \*  $p < 0.1$ ; \*\*  $p < 0.05$ ; \*\*\*  $p < .01$ .

Table 6: Heterogeneous effects by baseline knowledge about COVID transmission

	Panel A					
	(1) Index - advice to MS	(2) Bring own prayer mat	(3) Ablution at home	(4) Mask recommended	(5) Mask required	(6) Asks father’s age
T x Baseline knowledge wrong	-0.0223 (0.0501)	-0.0556 (0.0798)	0.0151 (0.0792)	0.0142 (0.0801)	-0.0411 (0.0778)	-0.0443 (0.0337)
T x Baseline knowledge correct	0.1090*** (0.0334)	0.0937* (0.0543)	0.1216** (0.0540)	0.1531*** (0.0542)	0.1568*** (0.0533)	0.0200 (0.0131)
Observations	544	544	544	544	544	544
P-value: effects equal on two groups	0.0295	0.1227	0.2668	0.1513	0.0363	0.0761
Proportion of sample in HTE group	0.6900	0.6900	0.6900	0.6900	0.6900	0.6900
Control mean Y Baseline knowledge wrong	0.4100	0.5600	0.5700	0.4800	0.4000	0.0600
Control group mean Y Baseline knowledge correct	0.3700	0.5200	0.5200	0.4400	0.3600	0.0100
	Panel B					
	(1) Index - advice to MS	(2) Bring own prayer mat	(3) Ablution at home	(4) Mask recommended	(5) Mask required	(6) Asks father’s age
Treat x certain and correct	0.1166*** (0.0363)	0.0843 (0.0592)	0.1425** (0.0587)	0.1540*** (0.0590)	0.1820*** (0.0582)	0.0202 (0.0150)
Treat x uncertain	0.0115 (0.0496)	0.0331 (0.0800)	-0.0068 (0.0793)	0.0502 (0.0804)	0.0026 (0.0781)	-0.0214 (0.0321)
Treat x certain and wrong	-0.0146 (0.0931)	-0.1233 (0.1397)	0.1030 (0.1393)	0.0745 (0.1396)	-0.0718 (0.1367)	-0.0556 (0.0543)
Observations	541	541	541	541	541	541
Control mean - certain and correct	0.3700	0.5100	0.5000	0.4600	0.3700	0.0100
Control mean - uncertain	0.4000	0.5400	0.5900	0.4600	0.3800	0.0500
Control mean - certain and wrong	0.4000	0.6100	0.5600	0.3900	0.3900	0.0600
P-value - TE equal on all groups	0.1461	0.3850	0.3178	0.5575	0.0781	0.2388

Notes: Sample 1 (treatment and control arms, respondents who answered baseline survey and mystery shopper call). Sample size varies from Table 4 because of non-response to baseline questions due to some respondents hanging up before completing the baseline call. Robust standard errors in parentheses. \*  $p < 0.1$ ; \*\*  $p < 0.05$ ; \*\*\*  $p < 0.01$ .

Table 7: Heterogeneous effects by relationship with secular and religious authorities

Panel A: Pooled treatments				
Index - advice to mystery shopper				
	(1)	(2)	(3)	(4)
$\beta_2$ : T $\times$ (interaction variable=0)	0.078** (0.030)	0.062* (0.036)	0.050 (0.059)	0.102* (0.053)
$\beta_1$ : T $\times$ (interaction variable=1)	0.026 (0.065)	0.071 (0.048)	0.072** (0.030)	0.065** (0.032)
Observations	558	502	593	555
Interaction variable	Gov't trusted source	Governing party constituency	Studied madrasa	Any cleric COVID info source
P-value $\beta_1 = \beta_2$	0.469	0.880	0.744	0.552
Control mean Y for interaction variable = 0	0.360	0.390	0.370	0.350
Control mean Y for interaction variable = 1	0.460	0.370	0.370	0.390
Proportion of sample with interaction variable = 1	0.190	0.390	0.810	0.730
Panel B: Individual treatment arms				
Index - advice to mystery shopper				
	(1)	(2)	(3)	(4)
$\beta_1$ : Secular T $\times$ (interaction variable=0)	0.081** (0.035)	0.077* (0.042)	0.076 (0.069)	0.136** (0.066)
$\beta_2$ : Secular + religious T $\times$ (interaction variable=0)	0.074** (0.035)	0.045 (0.042)	0.021 (0.072)	0.073 (0.059)
$\beta_3$ : Secular T $\times$ (interaction variable=1)	0.072 (0.073)	0.054 (0.056)	0.080** (0.034)	0.069* (0.037)
$\beta_4$ : Secular + religious T $\times$ (interaction variable=1)	-0.018 (0.074)	0.088 (0.054)	0.062* (0.034)	0.059 (0.038)
Observations	558	502	593	555
Interaction variable	Gov't trusted source	Governing party constituency	Studied madrasa	Any cleric COVID info source
P-value $\beta_1 = \beta_2$	0.837	0.465	0.472	0.350
P-value $\beta_3 = \beta_4$	0.199	0.523	0.588	0.777
P-value $\beta_1 = \beta_3$	0.916	0.738	0.959	0.380
P-value $\beta_2 = \beta_4$	0.264	0.530	0.613	0.844
Control mean Y for interaction variable = 0	0.360	0.390	0.370	0.350
Control mean Y for interaction variable = 1	0.460	0.370	0.370	0.390
Proportion of sample with interaction variable = 1	0.190	0.390	0.810	0.730

Notes: Sample 1 (treatment and control arms, respondents who answered baseline survey and mystery shopper call). Sample size varies from Table 4 and across columns because of non-response to baseline questions due to some respondents hanging up before completing the baseline call (columns 1, 3, and 4), and insufficient geographical information to map some respondents to their political constituency (columns 2). Robust standard errors in parentheses. \* p < 0.1; \*\* p < 0.05; \*\*\* p < 0.01.

# Appendix Tables - For Online Publication Only

Table A1: Treatment effects on stated intent questions asked at end of Call 1

Panel A: Basic estimates												
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Number of steps	Short sermon	Clean mosque	Soap	Remove mats	Elderly / sick	Distancing	Announcements	Ablution at home	Mask	Other step	Answered intent Qs
Any treatment	0.1823 (0.1162)	0.0238 (0.0207)	0.0021 (0.0312)	-0.0108 (0.0302)	0.0535 (0.0351)	0.0051 (0.0263)	-0.0422 (0.0372)	0.0421 (0.0258)	0.0750*** (0.0289)	0.0568* (0.0305)	-0.0285 (0.0345)	-0.1212*** (0.0261)
Observations	670	670	670	670	670	670	670	670	670	670	670	829
Control group mean Y	2.0949	0.0751	0.2292	0.2016	0.2846	0.1423	0.3874	0.1304	0.1542	0.1660	0.3241	

Panel B: Lee bounds											
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
	Number of steps	Short sermon	Clean mosque	Soap	Remove mats	Elderly / sick	Distancing	Announcements	Ablution at home	Mask	Other step
Any treatment lower	-0.1325 (0.1439)	0.0090 (0.0242)	-0.0257 (0.0380)	-0.0392 (0.0358)	0.0086 (0.0415)	-0.0281 (0.0309)	-0.1033** (0.0448)	0.0048 (0.0307)	0.0493 (0.0339)	0.0356 (0.0346)	-0.0780* (0.0425)
upper	0.6301*** (0.1458)	0.0959*** (0.0144)	0.1324*** (0.0466)	0.1189*** (0.0457)	0.1666*** (0.0480)	0.1300*** (0.0438)	0.0548 (0.0480)	0.1559*** (0.0178)	0.2074*** (0.0456)	0.1936*** (0.0457)	0.0801* (0.0477)
Observations	829	829	829	829	829	829	829	829	829	829	829

Notes: Panel A: Treatment and control arms, respondents who answered baseline survey. Robust standard errors in parentheses. Panel B shows Lee (2009) treatment effect bounds estimated using the Leebounds package developed by Tauchmann (2014). \* p < 0.1; \*\* p < 0.05; \*\*\* p < 0.01.

Table A2: Robustness to alternative construction of index

Dependent variables: alternative constructions of MS index			
	(1)	(2)	(3)
Any treatment	0.0659** (0.0263)	0.0629** (0.0269)	0.0623** (0.0244)
Observations	609	621	617
Variables excluded from index	None	Prayer mat	Prayer mat; mask required

Notes: Robust standard errors in parentheses. \* p < 0.1; \*\* p < 0.05; \*\*\* p < 0.01.

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