

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 is required to 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.

JEL codes: I18, Z12

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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 that they *must* wear a mask in order to attend 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 appealing 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; Dai *et al.*, 2021). 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 most closely related work to this paper is [Abaluck *et al.* \(2021\)](#), who report the results of a large scale randomized campaign across Bangladesh, including intensive engagement with community and religious leaders to involve them in promoting mask wearing. Their intervention package significantly increased mask wearing (with the highest increase in mosques) and reduced COVID prevalence. They find no effect of a cross-randomized *household* level variation in altruism-based or self-protection based promotion. [Abaluck *et al.* \(2021\)](#) added a more intensive religious and community leader engagement protocol partway through study implementation based on learning from the fieldwork the importance of this for achieving effects on masking. While their study highlights the importance of engaging community religious leaders for successful health promotions, our paper complements their findings by testing precise approaches for persuading these leaders to engage.

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 during 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 [A1](#)); 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.¹ Table 1 shows the experimental design. In 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. Response to this call is not correlated with respondents' education or urban/rural location (Table A1, Column 1). 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

¹Participants 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.

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 religious 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 and each year; 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. Response to this call is not correlated with respondents' education, although rural respondents are more likely to answer the mystery shopper call (Table A1, Column 2). We also asked enumerators to record whether the respondent seemed suspicious of the mystery shopper call; approximately 10% of calls were tagged as suspicious. Treatment does not affect whether respondents seemed suspicious, nor are there heterogeneous effects on suspicion by baseline knowledge of COVID or congregation size (Table A2). Web Appendix C discusses ethics aspects of the mystery

shopper call.

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.

Table 1, Columns 6-8 show the breakdown of the sample. 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, of whom 609 were planning to hold Eid prayers at their mosque and were asked questions about prayers;² this is not differential by treatment arm (Table A3, 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):

$$Y_i = \beta_0 + \beta_1 SECULARTREAT_i + \beta_2 COMBINEDTREAT_i + \epsilon_i \quad (1)$$

It is possible that simply answering the baseline survey questions plays a role in making COVID salient to religious leaders and increasing their likelihood of recommending . To test this, we include a super-control arm. Respondents in this group receive a mystery shopper call, but no baseline or treatment call. Again response rates to the mystery shopper calls

²Smaller mosques do not always hold Eid prayers.

do not differ between the control and super-control arms (Table A3, Column 2). 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 respondents assigned before the baseline to the control group (N = 511) and the super-control group (N = 631) (Sample 2).

$$Y_i = \beta_0 + \beta_1 CONTROL_i + \epsilon_i \quad (2)$$

The scripts of the treatments and mystery shopper data collection are detailed in Web Appendix B. We pre-registered the study (AEARCTR-0005740, Version 2.0); Web Appendix D discusses changes in the analysis from the pre-registration.

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 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 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 72 tests, 8 are significant at the 10% level

or greater; the p-value on the joint F test of the significance of all variables in predicting any treatment is 0.1, and on predicting the secular-only treatment 0.08. 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 3 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 (most enumerators are in their twenties and thirties). Perhaps more importantly, the religious importance of congregational prayer for men may be sufficient that religious leaders disregard this component of the official guidelines about COVID; in contrast, wearing a mask or doing ablution before attending still allows members of the congregation to completely fulfill their religious obligations.

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 4 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). Administering a survey alone has no detectable effect on the index of instructions to the mystery shopper.

Table 5 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. We interact these groups with the treatment dummy:

$$Y_i = \beta_0 + \beta_1 TREAT_i \times BASELINEWRONG_i + \beta_2 TREAT_i \times BASELINECORRECT_i + \epsilon_i \quad (3)$$

The effects are completely driven by respondents who gave the correct answers at baseline (β_2), and we can reject at the 5% level that treatment effects are equal on the two groups ($\beta_1 = \beta_2$). 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.

We investigate whether there is heterogeneity in responses by the respondent's relation-

ship with secular and religious authorities. We construct a series of indicators of these relationships and again interact them with the treatment dummy:

$$Y_i = \beta_0 + \beta_1 TREAT_i \times (X_i = 0) + \beta_2 TREAT_i \times (X_i = 1) + \epsilon_i \quad (4)$$

We do not find any pattern of a greater response among those who may have a stronger relationship with secular or religious authorities, whether measured by respondents' survey responses on sources of information they trust, the political alignment of the constituencies where they live, or madrasa training. (Table A4) 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; Bursztyrn *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.

Given the limitations on the effectiveness of generic mass messaging and the infeasibility of direct citizen engagement at a population scale, engaging community and religious leaders is a promising approach to make public information campaigns - for health and other purposes - more effective in low state capacity settings.

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. In our study setting, there is no strategy or government body that has direct communication or engagement with religious or informal leaders. Our results demonstrate that such engagement can be effective.

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 community 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.

References

- ABALUCK, J., KWONG, L. H., STYCZYNSKI, A., HAQUE, A., KABIR, A., BATES-JEFFRIES, E., CRAWFORD, E., BENJAMIN-CHUNG, J., RAIHAN, S., RAHMAN, S., BENHACHMI, S., ZAMAN, N., WINCH, P. J., HOSSAIN, M., REZA, H. M., JABER, A. A., MOMEN, S. G., BANI, F. L., RAHMAN, A., HUQ, T. S., LUBY, S. P. and MOBARAK, A. M. (2021). The Impact of Community Masking on COVID-19: A Cluster-Randomized Trial in Bangladesh.
- ACEMOGLU, D., CHEEMA, A., KHWAJA, A. I. and ROBINSON, J. A. (2020). Trust in state and nonstate actors: Evidence from dispute resolution in pakistan. *Journal of Political Economy*, **128** (8), 3090–3147.
- and ROBINSON, J. (2017). The emergence of weak, despotic and inclusive states. *NBER Working Paper 23657*.
- ALCOTT, H., BOXELL, L., CONWAY, J., GENTZKOW, M., THALER, M. and YANG, D. (2020). Polarization and Public Health: Partisan Differences in Social Distancing during the Coronavirus Pandemic. *NBER Working Paper 26946*.
- ALFANO, V., ERCOLANO, S. and VECCHIONE, G. (2020). Religious Attendance and COVID-19: Evidences from Italian Regions. *Cesifo Working Paper 8596*, (September).
- ALSAN, M. and WANAMAKER, M. (2018). Tuskegee and the health of black men. *Quarterly Journal of Economics*, **133** (1), 407–455.
- ASHRAF, N., BANDIERA, O. and JACK, B. K. (2014). No margin, no mission? A field experiment on incentives for public service delivery. *Journal of Public Economics*, **120**, 1–17.

- AURIOL, E., LASSEBIE, J., PANIN, A., RAIBER, E. and SEABRIGHT, P. (2020). God insures those who pay? Formal insurance and religious offerings in Ghana. *Quarterly Journal of Economics*, **135** (4), 1799–1848.
- BANERJEE, A., ALSAN, M., BREZA, E., CHANDRASEKHAR, A., CHOWDHURY, A., DUFLO, E., GOLDSMITH-PINKHAM, P. and OLKEN, B. (2020). Messages on Covid-19 Prevention in India Increased Symptoms Reporting and Adherence to Preventive Behaviors Among 25 Million Recipients with Similar Effects on Non-Recipient Members of Their Communities. *NBER Working Paper 27496*.
- BARARI, S., CARIA, S., DAVOLA, A., FALCO, P., FETZER, T., FIORIN, S., HENSEL, L., IVCHENKO, A., JACHIMOWICZ, J., KING, G., KRAFT-TODD, G., LEDDA, A., MACLENNAN, M., MUTOI, L., PAGANI, C., REUTSKAJA, E., ROTH, C. and SLEPOI, F. R. (2020). Evaluating COVID-19 public health messaging in Italy: Self-reported compliance and growing mental health concerns. *medRxiv*, pp. 1–19.
- BARRIOS, J. M. and HOCHBERG, Y. V. (2020). Risk Perception Through the Lens of Politics in the Time of the COVID-19 Pandemic. *NBER Working Paper 27008*.
- BARRO, R. J. and MCCLEARY, R. M. (2003). Religion and economic growth across countries. *American Sociological Review*, **68** (5), 760–781.
- BASSI, V. and RASUL, I. (2017). Persuasion: A case study of Papal influences on fertility-related beliefs and behavior. *American Economic Journal: Applied Economics*, **9** (4), 250–302.
- BENNETT, D., NAQVI, A. and SCHMIDT, W.-P. (2018). Learning, hygiene and traditional medicine. *Economic Journal*, **128**, 545–574.
- BENTZEN, J. S. (2020). In Crisis, We Pray: Religiosity and the COVID-19 Pandemic. *CEPR Discussion Papers 14824*.

- BERNHEIM, B. D., FREITAS-GROFF, Z., BUCHMANN, N. and OTERO, S. (2020). The Effects of Large Group Meetings on the Spread of COVID-19 : The Case of Trump Rallies. *Mimeo, Stanford University*, pp. 1–15.
- BRYAN, G., CHOI, J. and KARLAN, D. (2020). Randomizing religion: the impact of protestant evangelism on economic outcomes. *Quarterly Journal of Economics*, pp. 1–88.
- BURSZTYN, L., RAO, A., ROTH, C. and YANAGIZAWA-DROTT, D. (2020). Misinformation During a Pandemic. *NBER Working Paper 27417*.
- CAMPANTE, F. and YANAGIZAWA-DROTT, D. (2015). Does Religion Affect Economic Growth? *Quarterly Journal of Economics*, pp. 615–658.
- CHRISTENSEN, D. (2020). Building Resilient Health Systems: Experimental Evidence from Sierra Leone and the 2014 Ebola Outbreak. *NBER Working Paper 27364*.
- CLINGSMITH, D., KHWAJA, A. and KREMER, M. (2009). Estimating the impact of the Hajj: religion and tolerance in Islam’s global gathering. *Quarterly Journal of Economics*, **124** (August), 1133–1170.
- DAI, H., SACCARDO, S., HAN, M. A., ROH, L., RAJA, N., VANGALA, S., MODI, H., PANDYA, S., SLOYAN, M. and CROYMANS, D. M. (2021). Behavioral Nudges Increase COVID-19 Vaccinations. *Nature*, (April).
- DAVE, D. M., FRIEDSON, A. I., MCNICHOLS, D. and SABIA, J. J. (2020). The contagion externality of a superspreading event: the Sturgis motorcycle rally and COVID-19. *NBER Working Paper 27813*.
- DE WALQUE, D. (2007). How does the impact of an HIV/AIDS information campaign vary with educational attainment? Evidence from rural Uganda. *Journal of Development Economics*, **84** (2), 686–714.

- DEFRANZA, D., LINDOW, M., HARRISON, K., MISHRA, A. and MISHRA, H. (2020). Religion and Reactance to COVID-19 Mitigation Guidelines. *American Psychologist*.
- DELLAVIGNA, S. and GENTZKOW, M. (2010). Persuasion: Empirical evidence. *Annual Review of Economics*, **2**, 643–669.
- DESERRANNO, E. (2018). Financial Incentives as Signals: Experimental Evidence from the Recruitment of Village Promoters in Uganda. *American Economic Journal: Applied Economics*, (0001852).
- DEUTSCHE WELLE (2020). Eid festivities raise coronavirus surge fears in South Asia.
- DUFLO, B. E., DUPAS, P. and KREMER, M. (2015). Education, HIV and Early Fertility: Experimental Evidence from Kenya. *American Economic Review*, **105** (9), 2757–2797.
- DUPAS, P. (2011). Do teenagers respond to HIV risk information? Evidence from a field experiment in Kenya. *American Economic Journal: Applied Economics*, **3** (1), 1–34.
- FIELD, E. and VYBORNÝ, K. (2020). Information gaps and de jure legal rights: evidence from Pakistan. *EDI working paper series*.
- GALLUP PAKISTAN (2020). Attitude tracker survey Pakistan Wave 8 Results.
- GERBER, D. and GREEN, A. (2019). *Get Out the Vote: How to Increase Voter Turnout*.
- GROSSMAN, G., KIM, S., REXER, J. and THIRUMURTHY, H. (2020). Political partisanship influences behavioral responses to governors' recommendations for COVID-19 prevention in the United States. *Working paper*.
- GRUBER, J. and HUNGERMAN, D. M. (2008). The church versus the mall: What happens when religion faces increased secular competition? *Quarterly Journal of Economics*, **123** (2), 831–862.

- GRUBER, J. H. (2005). Religious Market Structure, Religious Participation, and Outcomes: Is Religion Good for You? *Advances in Economic Analysis & Policy*, **5** (1).
- GUI TERAS, R. P., LEVINE, D. I., LUBY, S. P., POLLEY, T. H., KHATUN-E-JANNAT, K. and UNICOMB, L. (2016). Disgust, shame, and soapy water: Tests of novel interventions to promote safe water and hygiene. *Journal of the Association of Environmental and Resource Economists*, **3** (2), 321–359.
- IYER, S. (2016). The new economics of religion. *Journal of Economic Literature*, **54** (2), 395–411.
- KARING, A. (2021). Social Signaling and Childhood Immunization: A Field Experiment in Sierra Leone. *Working Paper*.
- KERWIN, J. T. (2020). Scared Straight or Scared to Death? Fatalism in Response to Disease Risks. *Working paper*.
- KHAN, A., NASIM, S., SHAUKAT, M. and STEGMANN, A. (2020a). Building Trust in the State with Information: Evidence from Urban Punjab. *World Bank Policy Research Working Paper 9469*, (November).
- KHAN, M. Y. (2020). Mission Motivation and Public Sector Performance: Experimental Evidence from Pakistan. *Working Paper*.
- KHAN, R. S., KLASSEN, S. and PASHA, A. (2020b). Asset ownership and female empowerment : Evidence from a natural experiment in Pakistan. pp. 1–4.
- KURAN, T. (2018). Islam and economic performance: Historical and contemporary links. *Journal of Economic Literature*, **56**, 1292–1359.
- KUSHNER GADARIAN, S., GOODMAN, S. W. and PEPINSKY, T. B. (2020). Partisanship,

Health Behavior, and Policy Attitudes in the Early Stages of the COVID-19 Pandemic.
Working paper.

LEE, D. S. (2009). Training, wages, and sample selection: Estimating sharp bounds on treatment effects. *Review of Economic Studies*, **76** (3), 1071–1102.

LOPEZ-PENA, P., DAVIS C., A., MOBARAK A., M. and RAIHAN, S. (2020). Prevalence of COVID-19 symptoms, risk factors, and health behaviors in host and refugee communities in Cox's Bazar: a representative panel study. *Bulletin of the World Health Organization*, (11 May 2020), 1–17.

MALHI, F., AFTAB, Z. and BANURI, S. (2020). When norms collide: The effect of religious holidays on compliance with COVID guidelines. *Working paper.*

MARTINEZ-BRAVO, M. and STEGMANN, A. (2018). In vaccines we trust? The effect of the CIA's vaccination ruse on immunization in Pakistan. *CEMFI Working paper 1713*.

MCCLOSKEY, B., ZUMLA, A., IPPOLITO, G., BLUMBERG, L., ARBON, P., CICERO, A., ENDERICKS, T., LIM, P. L. and BORODINA, M. (2020). Mass gathering events and reducing further global spread of COVID-19: a political and public health dilemma. *The Lancet*, **395** (10230), 1096–1099.

MEHMOOD, S. and SEROR, A. (2020). Religion, politics, and judicial independence: theory and evidence. *Working paper*, pp. 1–61.

MILOSH, M., PAINTER, M., VAN DIJCKE, D. and WRIGHT, A. L. (2020). Unmasking Partisanship: How Polarization Influences Public Responses to Collective Risk.

MULLAINATHAN, S., SCHWARTZSTEIN, J. and SHLEIFER, A. (2008). Coarse thinking and persuasion. *Quarterly Journal of Economics*, (May), 577–619.

- MURPHY, D. M. A., NOURANI, V. and LEE, D. R. (2020). Chatting at Church : Information Diffusion through Religious Networks. *Working paper*.
- NYHAN, B., REIFLER, J., RICHEY, S. and FREED, G. L. (2014). Effective messages in vaccine promotion: A randomized trial. *Pediatrics*, **133** (4).
- PAINTER, M. and QIU, T. (2020). Political Beliefs affect Compliance with COVID-19 Social Distancing Orders. *SSRN Electronic Journal*.
- PAKISTAN BUREAU OF STATISTICS (1998). Population by Religion.
- PATTAN DEVELOPMENT ORGANIZATION (2020). Overwhelming pandemic, overwhelmed by fatalist mindset in Pakistan.
- PEW RESEARCH CENTER (2018). The age gap in religion around the world.
- RAHMAN, K. W. (2019). Remitting Religiosity : Evidence of International Migrants Changing Norms in Their Home Country. *Working paper*.
- RHEE, M., SISSOKO, M., PERRY, S., MCFARLAND, W., PARSONNET, J. and DOUMBO, O. (2005). Use of insecticide-treated nets (ITNs) following a malaria education intervention in Piron, Mali: A control trial with systematic allocation of households. *Malaria Journal*, **4**, 1–9.
- SIMONOV, A., SACHER, S., DUBE, J.-P. H. and BISWAS, S. (2020). The Persuasive Effect of Fox News: Non-Compliance with Social Distancing During the COVID-19 Pandemic. *NBER Working Paper 27237*, (May).
- TAUCHMANN, H. (2014). Lee (2009) treatment-effect bounds for nonrandom sample selection. *Stata Journal*, **14** (4), 884–894.
- WORLD VALUES SURVEY (2012). World Values Survey 2012.

Table 1: Experimental design

	Baseline questions	Health information	Government persuasion	Religious persuasion	"Mystery shoppers"	N individuals who responded to:		
						Baseline + treatment call	Mystery shopper	Both
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Secular T	Yes	Yes	Yes	No	Yes	283	213	213
Secular + religious T	Yes	Yes	Yes	Yes	Yes	261	185	185
Control	Yes	No	No	No	Yes	285	511	211
Super control	No	No	No	No	Yes	NA	631	NA
Total						829	1540	609

Notes: In the treatment arms, respondents were only attempted for the mystery shopper if they responded to the baseline. For the control and super control arms, all respondents were attempted for the mystery shopper. Thus, for our main comparisons between treatment and control, we use the sample in Column 8 (Sample 1): those who responded to both the baseline and mystery shopper ($N = 211 + 213 + 185 = 609$). For comparisons between control and super control, we use column 7 (sample 2): those who responded to the mystery shopper ($N = 511 + 631 = 1142$).

Table 2: Descriptive statistics and balance

Variable	(1) Combined secular + religious		(2) Secular only		(3) Control		T-test Difference		
	N	Mean/SE	N	Mean/SE	N	Mean/SE	(1)-(2)	(1)-(3)	(2)-(3)
Ed Matric or above	185	0.465 (0.037)	213	0.493 (0.034)	211	0.431 (0.034)	-0.028	0.034	0.062
Attended madrasa	178	0.831 (0.028)	208	0.841 (0.025)	207	0.758 (0.030)	-0.010	0.073*	0.083**
Typical daily congregation pre COVID	169	39.592 (3.330)	202	36.327 (3.008)	193	38.995 (4.453)	3.265	0.597	-2.668
Urban	185	0.211 (0.030)	213	0.239 (0.029)	211	0.213 (0.028)	-0.029	-0.002	0.026
Governing party constituency	158	0.430 (0.040)	170	0.376 (0.037)	174	0.362 (0.037)	0.054	0.068	0.014
Believes COVID may be present in community	173	0.116 (0.024)	202	0.084 (0.020)	199	0.186 (0.028)	0.031	-0.070*	-0.102***
BL COVID knowledge: Certain and correct	162	0.580 (0.039)	191	0.576 (0.036)	188	0.580 (0.036)	0.004	0.000	-0.004
BL COVID knowledge: Uncertain	162	0.321 (0.037)	191	0.293 (0.033)	188	0.324 (0.034)	0.028	-0.003	-0.031
BL COVID knowledge: Certain and wrong	162	0.099 (0.024)	191	0.131 (0.024)	188	0.096 (0.022)	-0.032	0.003	0.035
Received few / no COVID messages last week	168	0.333 (0.036)	200	0.350 (0.034)	195	0.318 (0.033)	-0.017	0.015	0.032
Baseline step: Short sermon	131	0.061 (0.021)	181	0.088 (0.021)	187	0.086 (0.021)	-0.027	-0.024	0.003
Baseline step: Clean mosque	131	0.313 (0.041)	181	0.359 (0.036)	187	0.289 (0.033)	-0.046	0.024	0.070
Baseline step: Soap	131	0.328 (0.041)	181	0.260 (0.033)	187	0.246 (0.032)	0.069	0.082	0.014
Baseline step: Remove mats	131	0.565 (0.043)	181	0.564 (0.037)	187	0.572 (0.036)	0.001	-0.007	-0.009
Baseline step: Elderly / sick	131	0.099 (0.026)	181	0.155 (0.027)	187	0.166 (0.027)	-0.055	-0.067*	-0.011
Baseline step: Distancing	131	0.634 (0.042)	181	0.586 (0.037)	187	0.588 (0.036)	0.048	0.045	-0.003
Baseline step: Announcements	131	0.115 (0.028)	181	0.133 (0.025)	187	0.128 (0.025)	-0.018	-0.014	0.004
Baseline step: Ablution at home	131	0.191 (0.034)	181	0.227 (0.031)	187	0.225 (0.031)	-0.036	-0.034	0.002
Baseline step: Mask	131	0.221 (0.036)	181	0.276 (0.033)	187	0.219 (0.030)	-0.055	0.002	0.057
Baseline step: Other step	131	0.107 (0.027)	181	0.171 (0.028)	187	0.150 (0.026)	-0.064*	-0.043	0.022
Baseline step: Number of steps	131	2.634 (0.126)	181	2.818 (0.126)	187	2.668 (0.122)	-0.184	-0.035	0.149
Reports no steps to prevent COVID in mosque	131	0.038 (0.017)	181	0.055 (0.017)	187	0.080 (0.020)	-0.017	-0.042	-0.025
Gov't trusted source	168	0.214 (0.032)	196	0.173 (0.027)	194	0.180 (0.028)	0.041	0.034	-0.007
Ulema trusted source	167	0.707 (0.035)	195	0.790 (0.029)	193	0.699 (0.033)	-0.083*	0.007	0.090**

Notes: P-values of F-test for joint significance of all variables in predicting assignment to any treatment: .1 ; Secular only arm: .08. Notes: Sample sizes for covariates vary because of non-response to baseline questions due to some respondents hanging up before completing the baseline call. The value displayed for t-tests are the differences in the means across the groups. Standard errors are robust. ***, **, and * indicate significance at the 1, 5, and 10 percent critical level.

Table 3: Impact of persuasion treatment on religious leaders' instructions to mystery shopper

Panel A: Effect of persuasion treatment (pooled)						
	Index components:					
	Index - advice to MS	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:					
	Index - advice to MS	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
Covariates	No	No	No	No	No	No
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 D1). Robust standard errors. * $p < 0.1$; ** $p < 0.05$; *** $p < .01$.

Table 4: Effect of receiving baseline survey on religious leaders' instructions to mystery shoppers: control versus super control

	(1) Index - advice to MS
Control group (assigned to baseline survey)	0.019 (0.018)
Observations	1142

Notes: Comparison of control versus super control in Sample 2 (respondents who answered the mystery shopper call). Robust standard errors. * $p < 0.1$; ** $p < 0.05$; *** $p < .01$.

Table 5: Heterogeneous effects by baseline knowledge about COVID transmission

	Panel A					
	(1)	(2)	(3)	(4)	(5)	(6)
	Index - advice to MS	Bring own prayer mat	Ablution at home	Mask recommended	Mask required	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 Baseline knowledge correct	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)	(2)	(3)	(4)	(5)	(6)
	Index - advice to MS	Bring own prayer mat	Ablution at home	Mask recommended	Mask required	Asks father's age
Treat x BL COVID knowledge certain and correct	0.117*** (0.036)	0.084 (0.059)	0.142** (0.059)	0.154*** (0.059)	0.182*** (0.058)	0.020 (0.015)
Treat x BL COVID knowledge uncertain	0.012 (0.050)	0.033 (0.080)	-0.007 (0.079)	0.050 (0.080)	0.003 (0.078)	-0.021 (0.032)
Treat x BL COVID knowledge certain and wrong	-0.015 (0.093)	-0.123 (0.140)	0.103 (0.139)	0.075 (0.140)	-0.072 (0.137)	-0.056 (0.054)
Observations	541	541	541	541	541	541
Control mean - certain and correct	0.370	0.510	0.500	0.460	0.370	0.010
Control mean - uncertain	0.400	0.540	0.590	0.460	0.380	0.050
Control mean - certain and wrong	0.400	0.610	0.560	0.390	0.390	0.060
Proportion of sample - certain and correct	0.580	0.580	0.580	0.580	0.580	0.580
Proportion of sample - uncertain	0.310	0.310	0.310	0.310	0.310	0.310
Proportion of sample - certain and wrong	0.110	0.110	0.110	0.110	0.110	0.110
P-value - TE equal on all groups	0.146	0.385	0.318	0.558	0.078	0.239

Notes: Sample 1 (treatment and control arms, respondents who answered baseline survey and mystery shopper call). Sample size varies from Table 3 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.

Appendices - For Online Publication Only

Appendix A: Additional Figures and Tables

Figure A1: Timeline

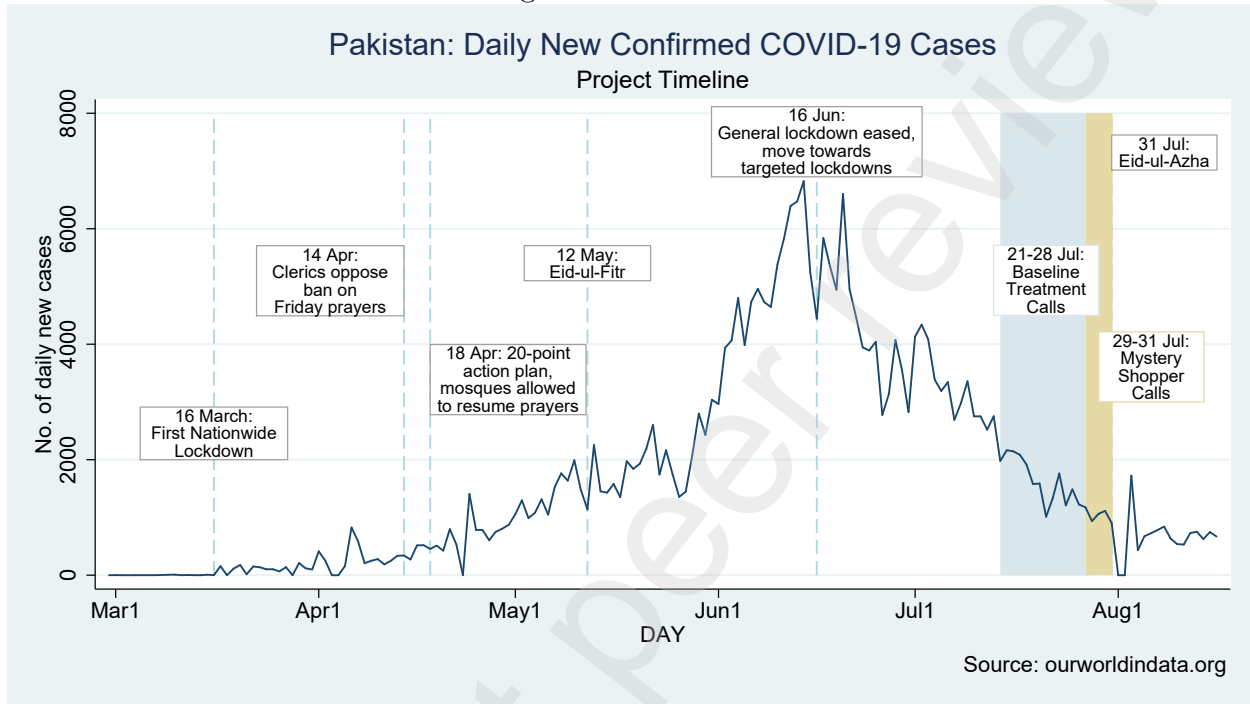


Table A1: Correlates of response to baseline survey and mystery shopper call

	Responded to baseline survey (1)	Responded to Mystery Shopper call (2)
Rural	-0.013 (0.022)	0.050** (0.023)
Primary	-0.016 (0.057)	0.024 (0.066)
Middle	0.010 (0.057)	0.015 (0.065)
Matric	-0.033 (0.056)	-0.022 (0.065)
Intermediate	-0.039 (0.063)	-0.055 (0.072)
Graduate	-0.012 (0.063)	0.012 (0.071)
Post Graduate/PhD	0.016 (0.067)	0.070 (0.074)
Constant	0.330*** (0.057)	0.600*** (0.064)
Observations	2700	2489

Table A3: Balance in response to mystery shopper calls

	(1) Responded to mystery shopper	(2) Responded to mystery shopper
Secular + religious persuasion	-0.025 (0.038)	
Secular persuasion	0.010 (0.036)	
Control group (assigned to baseline survey)		-0.017 (0.022)
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. Robust standard errors in parentheses. * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

Table A2: Treatment effects on suspicion of mystery shopper caller

	Enumerator noted respondent was suspicious			
	(1)	(2)	(3)	(4)
Any treatment	-0.010 (0.024)			
Secular + religious persuasion		0.007 (0.029)		
Secular persuasion		-0.024 (0.026)		
Any treatment=1			0.018 (0.047)	-0.009 (0.038)
Baseline accurate knowledge on COVID=1			-0.008 (0.044)	
Any treatment=1 \times Baseline accurate knowledge on COVID=1			-0.025 (0.056)	
Large congregation=1				-0.025 (0.042)
Any treatment=1 \times Large congregation=1				-0.006 (0.050)
Observations	629	629	563	583
Control group mean	0.092			

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

Table A4: Heterogeneous effects by relationship with secular and religious authorities

	Panel A: Pooled treatments			
	Index - advice to mystery shopper			
	(1)	(2)	(3)	(4)
β_2 : T \times (interaction variable=0)	0.078** (0.030)	0.062* (0.036)	0.050 (0.059)	0.102* (0.053)
β_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				
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)
β_1 : Secular T \times (interaction variable=0)	0.081** (0.035)	0.077* (0.042)	0.076 (0.069)	0.136** (0.066)
β_2 : Secular + religious T \times (interaction variable=0)	0.074** (0.035)	0.045 (0.042)	0.021 (0.072)	0.073 (0.059)
β_3 : Secular T \times (interaction variable=1)	0.072 (0.073)	0.054 (0.056)	0.080** (0.034)	0.069* (0.037)
β_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				
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 3 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 B - Treatment Scripts

[Click here for full SurveyCTO version of baseline and treatment call including Urdu.](#)

[Click here for full SurveyCTO version of Mystery Shopper call including Urdu.](#)

5.1 Religious arm treatment script

- Islamic scholars have referenced the following Hadiths about avoiding the spread of disease, when discussing how the ummah should respond to Coronavirus threat.
- Abu Salamah reported: The Messenger of Allah, peace and blessings be upon him, said, “There is no infection (without the decree of Allah). Do not mix the sick with the healthy.” Source: Sahih Muslim 2221 b
- Because so many people have the illness without showing any sign, the recommendation is to wear a mask to protect others.
- Do you feel this Hadith is relevant to the situation with Coronavirus?
- ”The Islamic affairs minister in Saudi Arabia has issued strict guidelines about social distancing, wearing masks and performing ablution at home for masjids.
- Do you think these guidelines are helpful for you in planning for congregational prayers at mosque?”
- Leading muftis at Al Azhar University in Egypt have provided the following guidelines on what mosques should do to prevent the spread of coronavirus: “the real danger lies in the rapid spread of the virus, and that gatherings are a direct cause of infection. The Islamic Shariah is keen on taking care of the interests of people both in this world and in the Hereafter, and on warding any harm off them. The major objective of the Shariah is to preserve people’s lives and protect them from all dangers. The pandemic that has hit the whole of humanity constitutes a necessity that leads to using some

juristic concessions in the performance of some Islamic obligations, in order to avoid the danger of the further spread of the virus outbreak.”

- Do you think these guidelines are helpful for you in planning for congregational prayers at mosque?
- There are similar fatwas from Ayatollah Sistani and Ayatollah Khomeini, do you want to hear it?³ “Grand Ayatollah Sayyid Ali Sistani in Iraq has issued a fatwa stating that it is the duty of the believers to follow the health guidelines. He also stated that when health guidelines are ignored where there is fear of becoming infected with the virus and a serious possibility of death or significant harm if the person were to catch the disease, then not adhering to guidelines would be sinful.”
- Do you think these guidelines are helpful for you in planning for congregational prayers at mosque?
- Similarly Ayatollah Khomeini in Iran announced that: “Surely, everything that leads to society’s health and everything that helps prevent the disease from becoming rampant is a good deed and on the contrary, everything that helps the disease become widespread is a sin. Allah the Exalted has made us responsible towards our own health and that of others and the health of the people. So, the first word of advice is that we should consider it our responsibility to completely observe the instructions specified by officials and to act on them”
- Do you think these guidelines are helpful for you in planning for congregational prayers at mosque?

³Shia religious authorities; Shias are a religious minority in Pakistan, thus respondents are prompted to check their interest in this fatwa.

5.2 Secular information: All treatment arms

- According to leading health organizations like World Health Organization and Pakistan Medical Association, when someone coughs, sneezes, or speaks they spray small liquid droplets from their nose or mouth which may contain virus. This makes coronavirus much more contagious than the flu since you can catch the disease from an infected person even if you are standing a few steps away from them.
- Additionally, approximately half the people with Coronavirus don't show any any sign / symptom, so they can spread it to people around them without knowing it.
- Elderly people who catch the Coronavirus have a much higher chance of getting seriously ill and dying as compared to normal flu
- Virus can also be spread when someone touches something - so someone who is sick and doesn't show it, can pass on the virus by touching the door, the wuzu water tap, and other places in the building
- Because the disease is difficult to detect since many infected people do not show any signs, and there are many elderly and vulnerable people around us who are at high risk of catching it, doctors recommend that one must protect oneself and each other by wearing a mask in public, keeping hands clean and avoiding close and unnecessary physical contact (e.g. shaking hands).
- "Did you know the Government of Pakistan [COMBINED T ONLY: AND leading ulema] have jointly endorsed a statement that to avoid spread of COVID:
 - Elderly mus stay at home
 - People must stay spread apart 6 feet
 - No wuzu (religious ablution) in the mosque

- People must wear masks
- Remove the jah namaz / floor mat
- Wash floors between prayers
- Do you feel that these points are relevant for your decisions about planning for your mosque activities in the coming weeks? Why or why not?
- I would like to send you this information via WhatsApp or SMS. Which medium would you prefer?
- As you are an important leader and an example for your community, people look to you as an example and guide on how to face this issue.
- I would like to request you to consider helping protect your community by taking the following four steps:
 - Wear a mask as an example to others;
 - Announce in the khutbah each day that people should wear masks when they come to prayer;
 - Announce the importance of wearing masks over the mosque loudspeaker to the community;
 - Ask people to do wuzu at home and bring their own jah namaz to mosque.
- Would you consider doing this?

5.3 Mystery shopper script

- Assalam-o-alaikum. My father and I wanted to attend the Eid prayers? Could you please tell me when are they being held?
- Do we have to bring our own jah namaz?

- Do we have to do wuzu at home?
- Do we have to wear a mask?
- ENUMERATOR: Did the respondent mention it is COMPULSORY to wear a mask in order to come?
- Thanks so much for your time, goodbye.

Appendix C: Ethics

Duke University Campus IRB approved this study under protocol number 2020-0432.⁴

Some deception will need to be used in this instrument since strong social desirability bias would be expected to influence the answers of respondents if they were informed that the team was calling them for research purposes. In this scenario, it is necessary to use deception in order to observe their advice to congregants in a real life situation. Respondents will not be punished or reported for their answers. The mystery shopper data collected is kept confidential and only used to analyze the impact of the intervention on how they advise the community.

The call asks basic, simple information that other congregants would commonly ask an imam, so this call will be well within the normal scope of activities for respondents. The total time for each call is approximately two minutes, so this instrument does not represent an undue burden on their time.

Mosque activities during communal prayers (prayers, use of masks, social distancing etc.) are public and could be observed by any casual observer in the area by stepping into the mosque. Hence the mystery shopper are not collecting any sensitive or private information. The mystery shopper call thus presents an extremely minimal burden (a two minute call

⁴At the time of the inception of this study, the Center for Economic Research in Pakistan did not have a local IRB, and to our knowledge other institutions in Pakistan do not accept external applications for IRB review.

with only simple information frequently asked from imams and also readily available to any observer in the area).

Appendix D: Variations from study pre-registry

We pre-registered the study (AEARCTR-0005740, Version 2.0).

Registry Version 1.0 was registered during early-stage piloting. We completed piloting, revised the design, and registered Version 2.0 before carrying out the main study fieldwork. Observations collected during piloting, before Version 2.0 was registered, are not included in the analysis presented in the paper.

This Appendix discusses variations between the study pre-registry and the analysis presented in the paper.

Variable included in instrument but omitted from pre-registration in error

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.

The full script of the instrument (Appendix B) demonstrates that all the mystery shopper outcome variables collected are presented in the paper.

Our results are not dependent on the inclusion of this variable. The index results are robust to the exclusion of this variable (Table D1).

Table D1: 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.

Stated intent questions

At the end of the baseline 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 listed these stated intent variables in the study registry. We consider these variables weaker evidence than the mystery shopper data, because they are self-reported and therefore subject to response bias. In addition, 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. Table D2 shows the results for the pre-specified variables from this module with and without Lee (2009) bounds; the results are consistent with the main results but imprecisely estimated after bounding.

Table D2: 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.