# Religious Messaging Against Covid-19 Misinformation: Experimental Evidence from India*

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**Abstract**

Covid-19 misinformation dilutes beliefs in science and increases social tensions. How can such misinformation be corrected, especially when it is rooted in long-standing belief systems and group identities? We answer this question with an experiment in India that develops a novel correction strategy (N=1600). Since people with higher levels of religiosity and support for religious nationalist parties are more likely believe covid misinformation, we use verses from religious scriptures exhorting people to believe in the truth, alongside corrections, to reduce the uptake of falsehoods. We demonstrate that this technique is significantly effective at improving information processing, even beyond the specific story corrected. We further show that while targeting religious dissonance dilutes beliefs in conspiracy theories, targeting group norms is more effective at reducing medical misinformation. Overall, we demonstrate the importance of religiosity in fueling beliefs in misinformation, and underscore that the efficacy of corrections depends on the type of misinformation at hand.

**Keywords:** COVID-19, Misinformation, WhatsApp, India

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# 1 Introduction

Over the past year, misinformation has exacerbated the damaging effects of the covid-19 pandemic. From Madagascar to the United States, medical misinformation and conspiracy theories have affected elections and public health, worsening social tensions and dampening faith in science. The story is no different in India, where as images of funeral pyres and cries for oxygen became emblematic of the pandemic, misinformation abounded. On the one hand, conspiracy theories suggesting that minority groups were intentionally conspiring to spread the virus resulted in discrimination, harassment and violence towards India's Muslim community, intensifying an already fraught communal divide (Yasir 2020). On the other hand, medical misinformation escalated. In March 2020, a Hindu religious group in New Delhi, India, organized a 200-person event to encourage drinking cow urine to cure the virus. Cow urine and other herbal forms of medicine do not cure covid-19. But their ties to ancient Indian culture have led many to believe in their miraculous properties, often at the expense of scientific advice. As one attendee at the event put it, "We have never felt the need to consume English medicine" (Siddiqui 2020). With about one of five people in the world living in India and one of two in developing countries, India is a particularly important case.

Beliefs in medical misinformation like miracle cures are dangerous if even a fraction of those succumbing to them ignore best practices like social distancing (Bridgman et al. 2020); beliefs in narratives that scapegoat minorities can in turn pave the way for polarization and violence. How can we effectively correct misinformed beliefs, particularly when they are rooted in tradition and difficult to change? Nearly all of the existing literature on misinformation focuses on developed countries, where both the modes of dissemination and the drivers of belief in falsehoods are different from low-income countries (Guess et al. 2020; Badrinathan 2021). In India, as in many developing economies, misinformation is largely spread via encrypted platforms such as WhatsApp, such that the burden of fact-checking falls on users. Further, in contexts like India where religious

rhetoric is instrumental in promoting the popularity of miracle cures and home remedies, and where religious divides are salient societal cleavages, religiosity and religious identity might fuel beliefs in misinformation. In such contexts, fighting misinformation should involve dislodging the linkages between religiosity, religious identities and false claims (Nyhan 2021).

In this study we undertake one such effort to counter covid-19 misinformation by targeting the mechanisms that drive beliefs in falsehoods. We posit that those with high levels of religiosity and those who support religious nationalist parties are more likely to endorse misinformation. We theorize that such endorsement may arise from adherence to longstanding religious beliefs, or alternatively, from pressures to conform to salient (often religious) group identities. We then hypothesize that relieving the mechanisms driving this belief by using religious frames and messaging should help correct misinformation.

We test our hypotheses with an online experiment in India (N=1600). Respondents are shown hypothetical conversations on WhatsApp, the most popular social media messaging application in India. Respondents read conversations with a misinformation stimulus and targeted correction designed to displace associations between group identities and misinformation (Nyhan 2021). To do this, our corrections draw on unlikely sources: just as when Democrats contradicting Democrats is effective (Porter and Wood 2019; Berinsky 2017), we use Hindu religious texts as unlikely sources in order to correct religiously-motivated misinformation. We unearth verses from the Mahabharata and the Bhagavad Gita, two ancient Hindu religious texts, that speak about the virtue of "having correct beliefs" and the virtue of "not slandering one's neighbor". We present these verses to our respondents, along with corrections to misinformation, and measure the effect of these treatments on perceived accuracy of stories on two issues: covid-19 conspiracy theories, and medical misinformation.

Our study yields three main empirical findings. First, we confirm that religious

identity is strongly associated with beliefs in covid-19 misinformation. Those who are highly religious believe twice as many false stories relative to less religious individuals. Further, we find that religious affective polarization is also correlated with false beliefs.

Second, we show that our experimental treatments are effective at reducing belief in misinformation. Relative to the control condition, receiving a corrective treatment leads to a significantly greater number of accurate beliefs and consequently a significant reduction in vulnerability to misinformation. Importantly, we show improvements in respondents' ability to detect misinformation that extend beyond the specific misinformation stimulus used in our treatments. Respondents are able to learn from the treatments and accurately identify additional falsehoods as well. That is, issuing a correction to a story claiming that Ayurveda – a traditional Indian alternative medicine system – can cure covid-19 leads to respondents being able to identify a host of other miracle beliefs as being wrong, such as the false claim that nigella seeds can cure covid.

Third, we demonstrate that treatments with a religious frame are *especially* effective at correcting misinformation. Compared to a standard correction (that does not contain a religious message), treatments that use religious messaging to provide corrections appear to perform better than a baseline standard correction.

Our results imply that corrective information must be targeted and tailored to the type of misinformation at hand. We find suggestive evidence that situational misinformation (such as covid-19 conspiracy theories) appears easier to correct, while long-standing beliefs (such as miracle cure medical misinformation that was prevalent before the pandemic) are harder to dislodge. In our experiment, treatment groups that layer a religious frame correction as well as message about group norms are the only treatments able to correct long-standing miracle cure beliefs.

Overall, these findings point to the salience of group identity as being instrumental to beliefs in and corrections for misinformation. We also demonstrate the importance of religiosity and show that in certain contexts, the basis for motivated reasoning can be

religion. Finally, we underscore that corrective treatments should take into account both the mechanism of belief in falsehoods and the type of misinformation being corrected.

## 2 Covid-19 misinformation in India

False stories during the pandemic in India appear to fall into two broad categories: conspiracy theories about the creation and spread of the virus, and medical misinformation about miracle cures for covid. We argue that conspiracy theories scapegoating minorities as well as miracle cures are both linked to religious beliefs and/or support for religious nationalist parties in India. While evidence about the role of partisanship as a mediator of political beliefs in India is mixed (Guess et al. 2020; Badrinathan 2021), the importance of religion is indisputable. Indian politics has long been dominated by a fundamental cleavage between Hindus and Muslims, and the prominence of religion as a social identity has been central. It is the basis of political mobilization, the rise of nationalism, and the origin of religiously-motivated political parties (Brass 2005).

The Bharatiya Janata Party (BJP), the current ruling party in India, is one such organization that champions the Hindu cause with campaigns to create a Hindu nation and an ideology that focuses on Hindu supremacy (Chatterji, Hansen, and Jaffrelot 2019). Like other religious nationalists, the BJP's movement contains rhetoric based on puritanical elements and moral appeals. Such rhetoric embraces Hindu symbols and personalities for political gains, and can often rely on false information. A recent example is a BJP leader's claim that the discoveries of modern science and technology were known to the people of ancient India, such that the Hindu God Ganesh's elephantine head proves that plastic surgery was prevalent 2,000 years ago. The movement is also a form of majoritarian nationalism, aiming to establish a national identity that excludes and marginalizes religious minorities, specifically, Muslims. Thus, religious messaging is often instrumentalized by political parties like the BJP, and hence partisanship and

strength of religious identity in India likely influence each other (Heath, Verniers, and Kumar 2015; Chhibber and Verma 2019). Consequently, conspiratorial misinformation targeting minorities in India during the covid crisis in India has often stemmed from BJP-aligned sources (Yasir 2020).

In addition to conspiracies, covid-19 has also allowed for the proliferation of medical misinformation in India, including homespun remedies and miracle preventive cures for the virus. Pseudoscientific remedies for covid-19 such as Homeopathy and Ayurveda have roots in traditional Hindu religion and culture, and belief in such remedies is often fueled by an inclination to uphold ancient religious wisdom at the expense of modern scientific knowledge (Dore 2020). Recently, a state governed by the BJP said it would hand out herbal medicine to covid-19 patients, underscoring a fundamental association between religion, politics, and covid-19 misinformation in India (Mishra 2021).

Given the nexus between religiosity, religious nationalist partisanship and falsehoods in India, we argue that individuals who are highly religious and individuals who support the BJP are more likely to believe covid-19 medical misinformation and conspiracy theories (**H1a** and **H1b**).

## 2.1 Correcting Misinformation in India

A large research agenda has measured and tested interventions to combat misinformation. In Western contexts where misinformation spreads on public social media such as Twitter and Facebook, solutions include providing fact-checks and labeling misinformation as false (Clayton et al. 2019), social corrections for misinformation (Vraga and Bode 2017), inoculating users before misinformation is seen (Hameleers 2020; Roozenbeek and van der Linden 2019), and priming the concept of accuracy (Pennycook and Rand 2019). While such efforts have been largely successful, the effectiveness of corrections is sometimes limited by motivated reasoning (Taber and Lodge 2006; Flynn, Nyhan, and Reifler 2017). Individuals choose to believe information that aligns with their predispo-

sitions, and these predispositions are often culturally-based and oriented around social and group identities (Kahan et al. 2017; Benegal and Scruggs 2018). At times of crises and change such as covid-19, humans seek security in groups, and this may make them eager to consume information – including falsehoods – that strengthens belonging with the in-group and increases distance from the outgroup (Tajfel et al. 1979).

In developing contexts, on the other hand, information is largely spread through encyrpted and private messaging applications such as WhatsApp (Gil de Zúñiga, Ardèvol-Abreu, and Casero-Ripollés 2019; Valeriani and Vaccari 2018). In countries like India, political parties are known to organize voters into WhatsApp groups curated by religious and other social identities, a communication strategy that gained popularity after the 2014 elections (Chauchard and Garimella 2022). Given the platform affordances WhatsApp offers in terms of sorting users into private and encrypted homophilic groups, studies on combating misinformation in this context use varying strategies. Garimella and Eckles (2020) use machine learning algorithms to analyze WhatsApp messages, Rossini et al. (2020) survey users in Brazil to understand how they share information on WhatsApp, Badrinathan (2021) and Guess et al. (2020) design in-person media literacy interventions to combat misinformation, Bowles, Larreguy, and Liu (2020) disseminate corrective information via WhatsApp in Zimbabwe.

This paper adds to the literature on misinformation in developing contexts by designing a novel strategy that tailors solutions to misinformation to appeal to the same psychological traits that make people vulnerable to falsehoods to begin with (Nyhan 2021). We posit that in the Indian context, the basis for motivated reasoning may be religion. Religion may affect beliefs through two mechanisms: the need to adhere to longstanding beliefs and practices, or social pressure to conform to perceived group norms. If misinformation is congruent with longstanding religious practices such as reliance on homemade remedies, receiving scientific but incongruent information may cause cognitive dissonance. To eliminate this dissonance, highly religious individuals

might adopt misinformation that reconciles the conflict. Second, believing information incongruent with group beliefs might lead to fear of alienation from the in-group. In this case respondents might engage in identity protective cognition, a type of motivated reasoning that increases pressure to form group-congruent beliefs (Sherman and Cohen 2006).

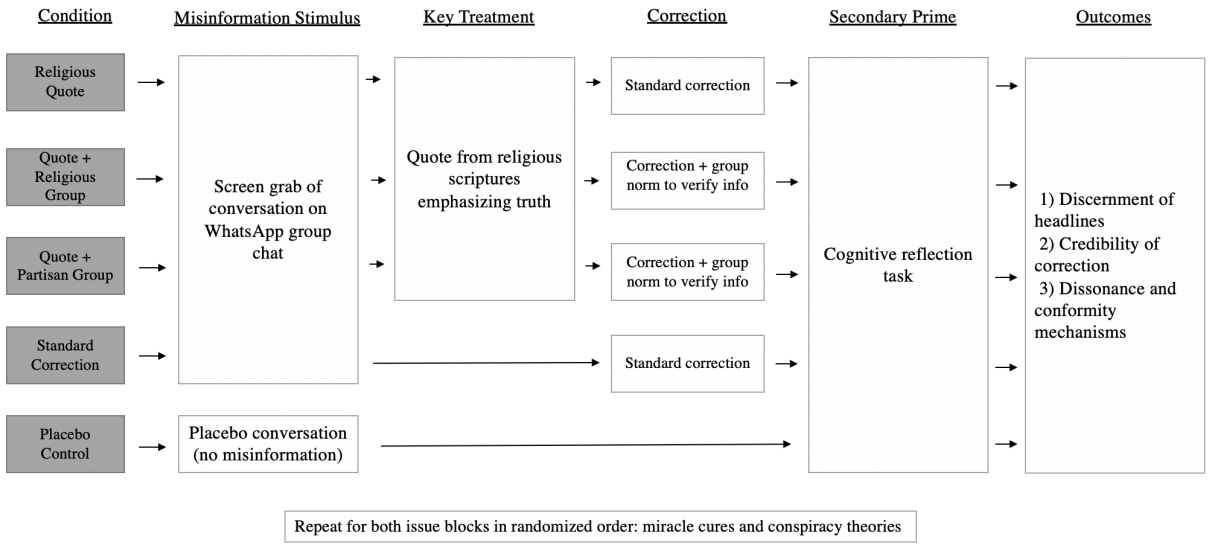
Thus, corrections that relieve dissonance should reduce the prevalence of these beliefs. Drawing on a large literature on perceived norms and conformity effects (Asch 1961; Tankard and Paluck 2016), we additionally argue that relieving the pressure to conform to in-group norms (by changing the perception of a group norm to one that values correct information) constitutes an effective strategy against misinformation. Building on this rationale, we hypothesize that corrections addressing dissonance via religious messaging and corrections addressing group norms will be effective in reducing rates of belief in misinformation relative to a control condition (**H2a**). We further see this as especially likely among highly religious respondents, who would be more likely to pay attention to a religious frame or more likely to be affected by it (**H2b**).

Finally, we hypothesize that changing perceptions of in-group norms should be effective among highly religious individuals when the ingroup is defined in religious terms (**H3**) and effective among strong supporters of the BJP when the ingroup is defined in partisan terms (**H4**).

# 3 Methods

To test these hypotheses, we fielded an online experiment in India (N=1600) in November 2020 (pre-registered analysis plan available at OSF: https://bit.ly/3AUZxGi). In our experiment, respondents are randomly assigned to one of five conditions in a between-subjects design (see Figure 1). Three of our treatments contain a correction drawing on a religious frame. We compare these to a correction condition without any religious mes-

Figure 1: Experimental Flow




saging (standard correction). Finally, our last group is a placebo control. Our stimulus material are designed to counter two issues: covid-19 conspiracy theories, and medical misinformation. Respondents encounter each of these two issues in a randomized order and remain in the same condition for both issues.

The treatment intervention asks respondents to read a conversation between two peers on a WhatsApp group chat. We create hypothetical but realistic WhatsApp screenshots shown to respondents as part of the treatment.[1] The screenshots display a conversation between two users in a private WhatsApp chat group. In this exchange, the first user posts a piece of misinformation. In response, the second user uses a variety of correction strategies corresponding to our different treatment groups.

## 3.1 Treatment Conditions

Our experiment includes four treatment conditions. In the Religious Quote treatment, we include a correction accompanied by a religious message. The religious message

[1]WhatsApp messages are protected by encryption which means that only peers can correct or respond to each other by design, hence reading a conversation between two peers adds external validity to our design (rather than having respondents merely read the text of our intervention directly on their survey screen). Research in this area also demonstrates that images can be particularly influential as they act as visual cues, adding to the realism of the study (Zannettou et al. 2019).

draws on Hindu religious scriptures that discuss either the truth as an important virtue or the imperative not to slander, with the goal of relieving dissonance with longstanding religious beliefs. Specifically, the user in the conversation who corrects misinformation also posts verses from Hindu religious scriptures (the Bhagavad Gita and the Mahabharata) that rely on religious messaging alongside Hindu religious iconography, that exhort together exhort people to consider the truth.[2]

This technique builds on prior work on the importance of framing issues to align with one's audience, shown to be successful in using religious frames to shape responses to climate change (Goldberg et al. 2019). This technique also builds on work emphasizing that unlikely sources are more effective, as when Democrats contradict Democrats (Porter and Wood 2019). False messages about miracle cures in India often exhort readers to believe in homespun remedies since they uphold sacred truths from religious scriptures (Sachdev 2017); conspiracy theories targeting minorities often seek to further entrench religious divides. In our treatment, we leverage this frequent recourse to religion by demonstrating that religious sources emphasize restraint from slander and value the truth.

Next, our Quote + Religious Group and Quote + Partisan Group treatments test whether relieving perceived pressures to conform to the ingroup can further attenuate belief in misinformation. To manipulate ingroup membership, these WhatsApp groups signal the purpose and identity of the group: the name of the group chat is revealed so as to prime membership to a specific religious (Hindu) or partisan (BJP) group.[3] These treatments involve a correction to misinformation along with the correcting user highlighting a group norm to verify questionable information before posting. Importantly, the corrective treatment in these experimental groups build upon the Religious Quote treatment by adding the group norm and group name aspects to the treatment.

Thus, these are additive treatments by design. Their goal is to measure whether

[2]All treatment stimuli are available in Online Appendix B.

[3]In all other experimental groups, the group name is blanked out, under the pretense of anonymity.

religious corrections alone can correct misinformation, or whether additionally manipulating ingroup conformity pressures is necessary to correct beliefs. These treatments add to a growing body of research showing that structured communication networks can significantly enhance social learning, leading to the elimination or reduction of partisan biases on contentious political topics (Becker, Brackbill, and Centola 2017; Guilbeault and Centola 2020; Vraga and Bode 2017). Here, we build on this prior work in our group identity treatments to determine whether in-group social networks can improve covid-19 information processing by alleviating pressures to conform.

Further, we include a Standard Correction treatment group that provides respondents with a correction that does not include a religious quote or group norm. In this treatment, the correction by the second user is simple and minimal: the second user simply says that the first user's claim is incorrect. Since our treatments are bundled and additive, we include this condition to separate whether the corrective effects observed are due to the religious messaging, or simply exposure to any corrective information.

Finally, we compare these treatment conditions to a placebo control condition. In this condition respondents read a WhatsApp conversation about an apolitical topic such as wildlife or sports; the conversation does not contain a misinformation stimulus.[4]

After respondents read the WhatsApp screenshots, they are asked to reflect on the material they were exposed through a cognitive reflection task where respondents are asked to write a brief paragraph about the conversation they saw. This gives a two-part prime: respondents read a conversation; its point is reinforced by the reflection task. Since we are looking at changing misinformed beliefs by messaging targeting the mechanisms of dissonance and shared group identity, this technique ensures that the targeted mechanism introduced in our treatments has been effectively primed (Levendusky 2018). We repeat this experimental flow for two issue blocks, conspiracy theories and medical

[4]We intentionally did not include a condition that had a misinformation stimulus but no correction. We do this to minimize the adverse effects of not having an immediate correction for misinformation at a contentious time in the country. Thus in every condition that we introduce a misinformation stimulus, respondents simultaneously see a correction.

misinformation. All treatment stimuli are available in Online Appendix B.

## 3.2 Outcomes

We measure the effect of these treatments on the perceived accuracy of two sets of headlines appearing in randomized order: COVID-19 conspiracy theories and medical misinformation. Each set contains two true headlines and four false headlines, presented in randomized order. Importantly, the headlines in our outcome measure include the misinformation corrected in the treatment, as well as 3 additional misinformation headlines, along with 2 true headlines. Thus we are able to measure whether the treatment reduced belief in false headlines beyond the specific story corrected.[5]

Relying on these data, our main outcome of interest, in line with our pre-analysis plan as well as previous research in this context (Badrinathan 2021), is a count of respondents' ability to correctly identify true and false stories.[6] Within each issue block we provide respondents with 6 real headlines, both true and false. We measure respondents' perceived accuracy of each headline on a four-point scale ranging from very accurate to not at all accurate. The list of headlines that comprise this measure as well as rationale for their selection is available in Appendix C.

## 3.3 Sample Characteristics

We recruited 1600 adult respondents in India through an online panel maintained by one of India's leading online polling firms, Internet Research Bureau (IRB). Respondents

[5]Our headlines, both true and false, were selected from a list of several stories that we pretested. Of these stories, we selected six headlines for each issue on the basis of pretest data on how widely they were believed. Since Indian respondents report high levels of trust in search engines such as Google and Yahoo (Aneez et al. 2019), we present each story in the form of an actual headline mimicking the style of stories on Google News, with a headline, subheadline, source, and image. But simultaneously, we block out the source so as to mimic the context of WhatsApp messaging where users receive forwarded text messages without a source, brand, or a URL, with the text of the news/information copied in the body of the WhatsApp message (Badrinathan 2021).

[6]As detailed below, as a robustness test we also re-analyze our data with a discernment measure.

were selected to be as representative as possible of the Indian adult population by age, gender and region.[7] Key demographics on our sample are in Appendix D.

We limit our sample to Hindu respondents to maximize statistical power, as the number of non-Hindu respondents would not have allowed us to make meaningful inferences (82% of Indians are Hindu) on a sample this large. Consequently our treatments are designed to appeal to the Hindu population in India. Further, we control for partisan imbalance in the sample by using a randomized block design where the sample is divided into two blocks based on support for the BJP. Within each block, respondents are assigned to one of the five experimental conditions with equal probability.

# 4 Results

We first discuss descriptive statistics on the prevalence of misinformation in our sample as well as correlations between such prevalence and religiosity, partisanship, and polarization. Next, we present the main effect of our treatments on discernment between true and false headlines. Finally, we provide additional tests to compare the relative effectiveness of our different treatment conditions, including robustness checks.

## 4.1 Descriptive Data: the Prevalence of Misinformation

Figure 2 lists the 12 stories used in the dependent variable measure in this study and plots the share of respondents in the sample who believed the misinformation in each story. For false stories, this is the share believing the headline was true; for true stories, this is the share believing the headline was false. Two aspects of this figure are striking. First, general belief in misinformation in our sample is high. Over 50% of all respondents in the sample believed every single false headline containing misinformation,

[7] As with most online panels in India, our sample is not representative of the entire Indian population, despite our efforts in this direction. However, it is more representative of India's population with Internet access, which is skewed towards educated, wealthy, pro-BJP and upper-caste male respondents.

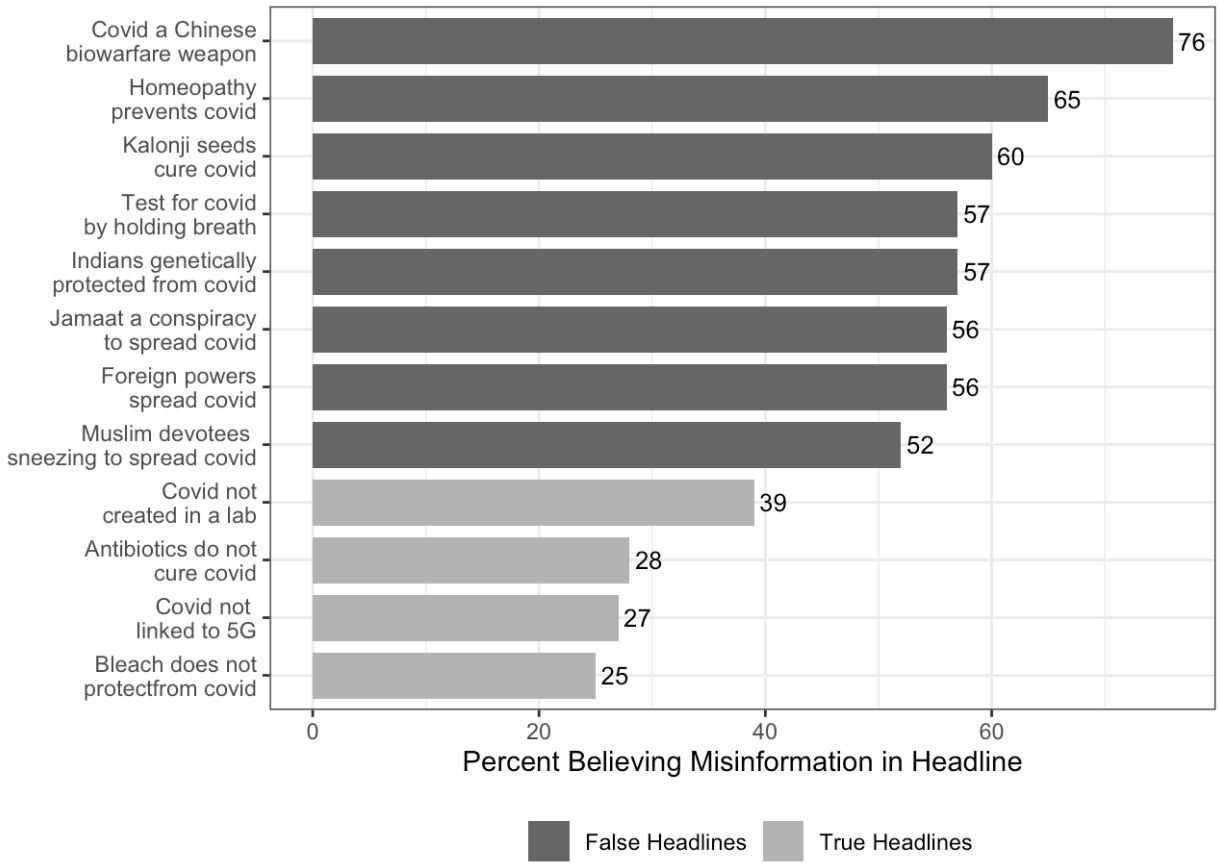
with rates of belief in some stories even higher. Amongst conspiracy theories, over three quarters of the sample believed the headline that covid is a Chinese biowarfare weapon. Amongst miracle cures, about 65% of the sample believed that homeopathy – an alternative medicine system with roots in traditional Hindu culture – can cure covid-19. These strikingly high levels of belief in misinformation are in line with previous research on India (Guess et al. 2020). Second, respondents were more vulnerable to false stories than they were to true headlines, with a much lower fraction of the sample wrongly believing that a true headline was false.[8] Overall, respondents correctly classified an average of 6.02 stories out of 12, alluding to both the challenging nature of our dependent variable measure, as well as to the prevalence of misinformation in this context.

Given the high prevalence of misinformation in this sample, we are interested in understanding which subpopulations are most vulnerable to fake news. In H1a and H1b we hypothesized that religiosity and religious nationalist partisanship should be correlated with misinformed beliefs, and hence that individuals with these characteristics should be especially likely to believe misinformation.

To test these hypotheses, we count the number of headlines that respondents correctly classified as true or false. This constitutes our outcome measure in line with our pre-registered analysis plan. We regress this outcome on two variables. First, a categorical variable that captures strength of respondent support for the BJP on a 4-point scale ranging from strongly support to strongly oppose. Second, we create a continuous variable capturing respondent religiosity. To measure religiosity, we use a battery of eight items adapted from Verghese (2020). We score each of the items such that higher values indicate that someone is more religious; we then add the eight scores and standardize the measure such that we have a scale of religiosity with mean 1 and

[8]We note here that our true headlines are negations of false stories by design, since there is no direct opposite of a conspiracy theory or medical misinformation in the Indian context. Thus, it is possible that a lower rate of belief in the true headlines, relative to false, is a function of the true stories being easier to detect due to acquiescence response bias (Winkler, Kanouse, and Ware 1982). Despite this, we underscore that high rates of belief in false stories is not unusual for Indian samples, as demonstrated by previous research in this context (Guess et al. 2020).

Figure 2: Prevalence of Misinformation




standard deviation 0. These items include questions that measure the practice of Hindu religion on a quotidian basis, including frequency of prayer, the need to consult an astrologist before fixing a wedding date, the need to fast for religious purposes, etc.[9]

These analyses provide empirical support for both of our hypotheses. As seen in Figure 3, support for the BJP is strongly and significantly correlated with a greater vulnerability to covid-19 misinformation in India. We plot the predicted number of headlines accurately identified as true or false by respondents' level of support for the BJP. While partisans who oppose or somewhat support the BJP are not more or less likely to be vulnerable to misinformation, we find that strong supporters of the BJP correctly identify significantly fewer stories.

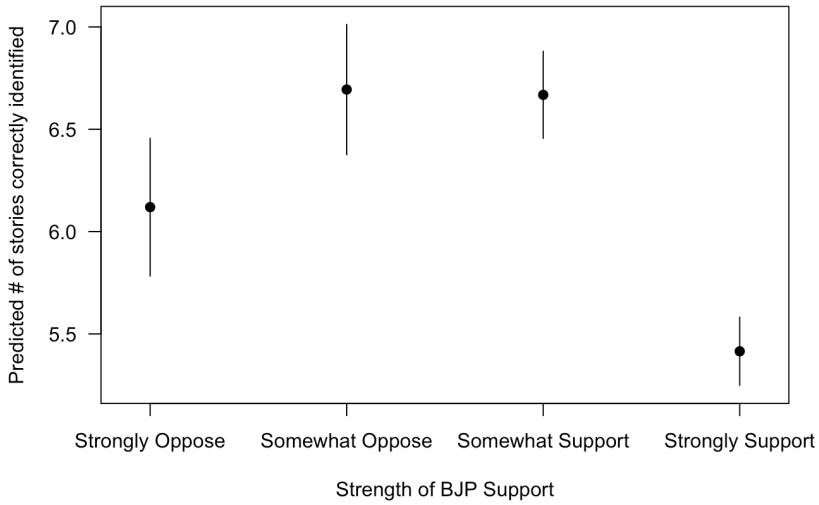
Figure 4 graphs the predicted number of stories accurately classified as a function

[9]The items included in the scale are included in our survey instrument (Appendix K).

of religiosity. Those who score low on the religiosity scale are significantly better at identifying misinformation relative to those who score high on the religiosity scale. In fact, respondents with the lowest levels of religiosity are able to correctly classify double the number of headlines (about 9 headlines) relative to respondents with the highest levels of religiosity (about 4.5 headlines).[10]

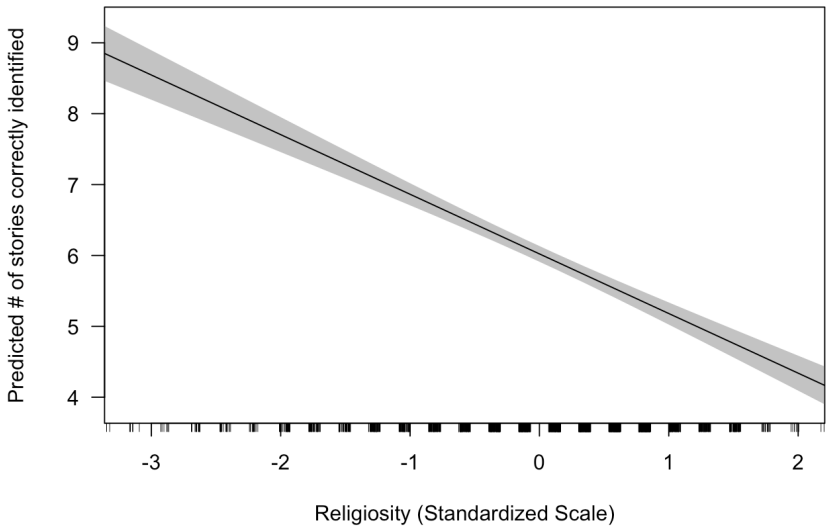
We also examine whether religious affective polarization is linked to belief in misinformation. We measure religious polarization by asking respondents whether they would be upset if a friend married someone who was a Muslim. We find that those who say they would be very upset or somewhat upset are significantly more vulnerable to beliefs that miracle cures can be effective against covid-19. Specifically, respondents in this group classify 1.1 fewer headlines correctly, relative to respondents who say they would not be upset if a friend married someone of the other religion (see Appendix J for results). These descriptive findings underscore that religious practice is highly associated with covid-19 misinformation in India, and that antipathy towards religious outgroups also conditions belief in misinformation.

Figure 3: Belief in Misinformation, By Partisanship




[10]We replicate Figures 3 and 4 controlling for demographic and pre-treatment covariates and find that our results hold. See Appendix H for results.

Figure 4: Belief in Misinformation, By Religiosity




## 4.2 Experimental Results

We now move to discussing experimental results. We estimate effects of the treatments on outcomes in a between-subjects design. All estimates are ordinary least square (OLS) regressions, and empirical models are specified relying on random treatment assignment to control for potential confounders. First we analyze data for the main effect of the different treatments on ability to discern misinformation. Our results are visualized in Figures 5 and 6 and presented in Table 1.

Here we compare estimates from each of the different treatment groups to the placebo control group, the condition in which respondents were not exposed to any misinformation. Our main outcome of interest is a count of respondents' ability to identify true and false stories in a set of six stories. We estimate the effect of each treatment separately for conspiracy theory misinformation (column 1) and medical misinformation (column 2).

Results in Table 1 and Figure 5 demonstrate that when it comes to conspiracy theories, all of our treatments are able to significantly improve beliefs. Respondents who are assigned to any of the treatment groups are able to identify misinformation

Figure 5: Main Effect: Conspiracy Theory Headlines

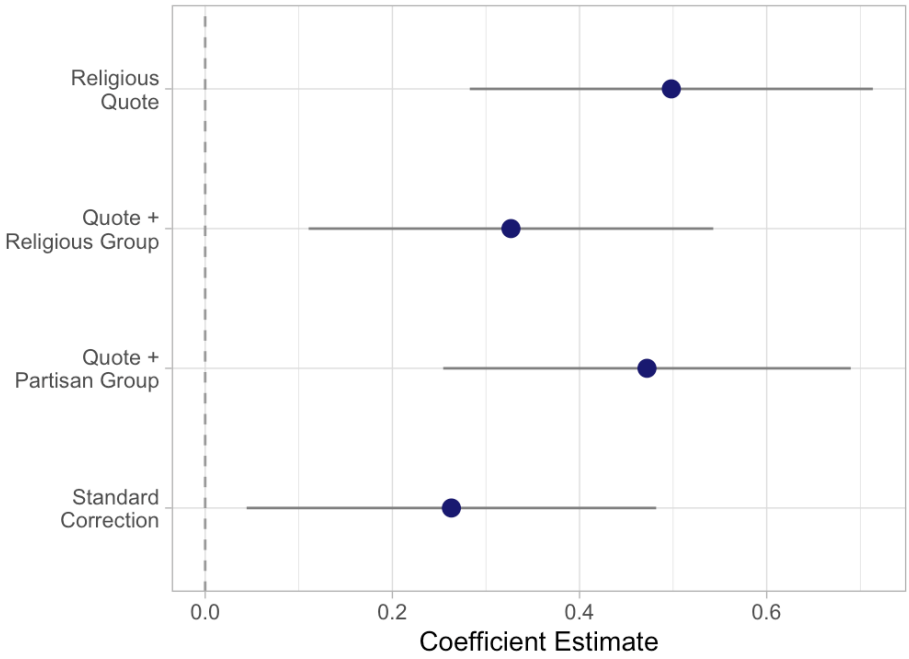
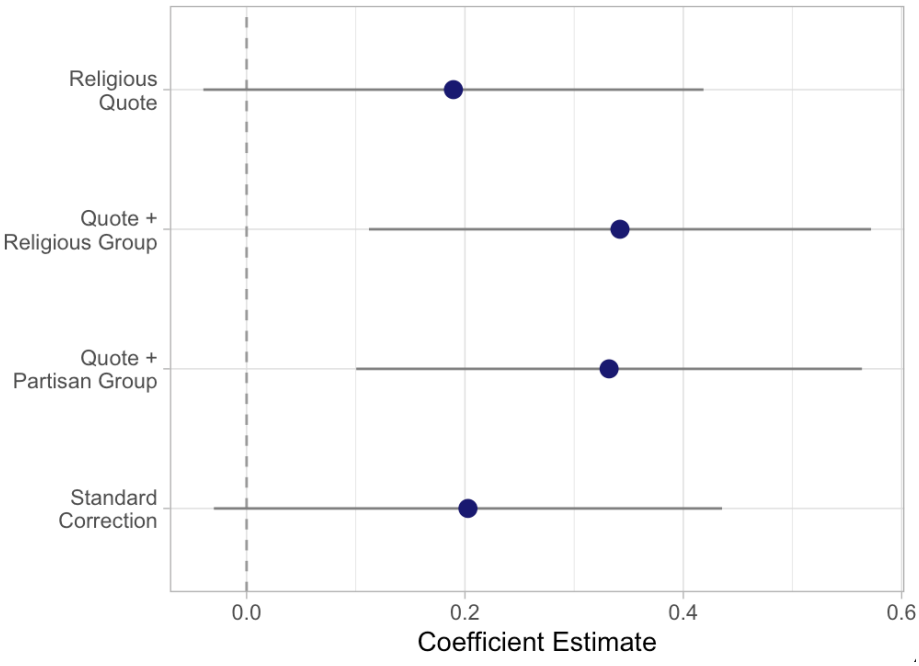



Figure 6: Main Effect: Medical Misinformation Headlines



significantly better relative to those assigned to the control group. In addition, these effects are substantively large, with those assigned to the Religious Quote or Quote + Partisan Group treatment group demonstrating a 15% increase in discernment capacity relative to control. Lastly, although smaller in magnitude, we also see a significant effect of receiving the Standard Correction, demonstrating that even minimal corrections may be able to improve information processing in this context, mirroring existing findings in the same context (Badrinathan and Chauchard 2020).

On the other hand, when it comes to medical misinformation (Figure 6), we find that while respondents in the Quote + Religious Group, and Quote + Partisan Group treatments are significantly better at identifying misinformation, this effect does not obtain for the other treatments. In particular, the Religious Quote treatment, which produced the largest positive effect for conspiracy theories, appears to have no impact in the case of miracle cures: the average treatment effect is indistinguishable from zero. It is important to note that these are additive treatments, hence the religious and partisan group treatments add an additional layer to the information being presented in the Religious Quote treatment, by revealing group norms and the group name.

These results suggest that different types of misinformation (here, conspiracies vs. medical falsehoods) condition effective strategies of correction. We show that the mechanisms of belief in conspiracy theories and in medical misinformation may be distinct, and thus distinct approaches must be adopted to correct them. Covid-19 conspiracy theory misinformation is new and situational. Stories that foreign governments or minority groups are deliberately conspiring to spread the virus or that the virus is a biowarfare weapon constitute novel narratives that emerged in the wake of the pandemic. On the other hand, covid-19 medical misinformation in India comprises largely of miracle cures, such as the reliance on homeopathy, ayurveda, or home remedies. These alternative medicinal systems have existed long before covid-19, and hence the misinformation that stems from them, while related to covid, also taps into longstanding belief systems

Table 1: Main Effect of Treatments

| | *Dependent variable: Number of stories correctly identified* | |
|---|---|---|
| | ConspiracyMisinfo | MedicalMisinfo |
| | (1) | (2) |
| Religious Quote | 0.498*** | 0.189 |
| | (0.110) | (0.117) |
| Quote + Religious Group | 0.327* | 0.342* |
| | (0.110) | (0.117) |
| Quote + Partisan Group | 0.472*** | 0.332* |
| | (0.111) | (0.118) |
| Standard Correction | 0.263* | 0.203 |
| | (0.112) | (0.119) |
| Constant | 2.633*** | 2.865*** |
| | (0.078) | (0.083) |
| Observations | 1,600 | 1,600 |
| $R^2$ | 0.016 | 0.007 |
| Adjusted $R^2$ | 0.014 | 0.004 |
| Residual Std. Error (df = 1595) | 1.405 | 1.494 |
| F Statistic (df = 4; 1595) | 6.592*** | 2.784* |
| *Note:* | | *p<0.05; **p<0.001; ***p<0.001 |

in society. Thus we posit that miracle cure medical misinformation is harder to correct to begin with. This is evidenced by a worse identification in the control group for medical misinformation headlines, relative to conspiracy headlines.

Consequently, situational misinformation is easier to correct. Our findings demonstrate that even standard corrections work to dislodge these beliefs in India, though corrections that draw on religious sources are able to achieve effects of greater magnitude. But for misinformation relying on longstanding belief systems, in addition to religious messaging, tapping into group identity appears crucial. These findings reinforce the idea that information processing can be affected by elites in networks, or when group norms are fostered with a focus on veracity.

We confirm the robustness of the results in Table 1 by controlling for key demographic and pre-treatment covariates (Appendix E). Our key results remain unchanged. We also replicate these findings controlling for respondent attention during the survey (Appendix F). Additionally, we demonstrate that some of our treatments work even beyond the specific story corrected. That is, on receiving a correction for one story, we find a spillover effect that carries forward to other stories in the same category. To analyze this, we recalculate our count outcome measure omitting the specific story that was corrected in the treatment WhatsApp conversation. For example, if the treatment corrected the misinformation headline that reliance on homeopathy and ayurveda can cure covid, we now omit this story and calculate a count measure of the remaining 5 medical misinformation headlines. On doing this, we find that for conspiracy theories, every treatment except the standard correction achieves a significant effect. While the standard correction works on the specific story that was corrected, spillover effects for non-corrected stories are only seen with the religious quote treatments. For miracle cures, only the Quote + Partisan Group treatment has a significant effect. Results are presented in Appendix I.

Further, as an additional robustness check, we re-run our analyses with a discernment measure as the outcome, which calculates the difference between the average

accuracy rating for true and false stories. We find that our main results hold: religious treatments overall tend to improve respondents' ability to discern true from false information. While signs point in the same direction, significance levels are, however, slightly smaller in this configuration, implying that some of the effects detected in Table 1 fall into insignificance. This is, for instance, the case for the effect of our Quote + Religious Group treatment on belief in conspiracies. Interestingly, this is the case for both estimates on our standard corrections, implying that *only* our religious corrections did move the needle in the right direction, once again underscoring the power of religious frames in this context. Results are in Appendix I.

Contrary to what we hypothesized in H2b, we additionally do not find that corrections including religious frames are especially effective at reducing the rate of belief in falsehoods among highly religious people. To test this hypothesis, we compare our outcome of interest in the Religious Quote treatment group relative to the control group and interact our continuous religiosity measure with a dummy variable indicating assignment to treatment. Our findings demonstrate that treatment effects do not differ as a function of religiosity: respondents with both high and low levels of religiosity are able to learn from the treatment.

Similar to this, we also hypothesized that those who have stronger religious or partisan group identities will be more receptive to messaging that calls on group norms (H3 and H4). However, similar to the results from H2b, we find that treatment effects do not differ as a function of religiosity or partisanship. Thus while our treatments are able to achieve large effects on average relative to control, we do not detect heterogeneous effects of religiosity or partisanship (see results in Appendix G). These findings again suggest that our treatments may be even more effective than expected, as their effect is not limited to a specific sub-population of respondents.[11]

[11]While we do not detect heterogeneous effects by religion, we cannot exclude the possibility that religiosity would interact with our treatment among specific caste subgroups. In the Indian context, this might be the case among highly religious upper caste respondents. Running such a triple interaction, however, returns insignificant results, though we note that this may merely reflect low statistical power.

Finally, we ascertain whether our religious and conformity treatments performed better than the standard correction, in order to evaluate whether the corrective effects we observe are due to the religious or partisan elements of the treatments, or simply to exposure to *any* corrective information. In Table 2, we switch the reference category to the Standard Correction treatment to test whether our religious treatments perform better than a standard correction.

Table 2: Comparisons with Standard Correction

| | *Dependent variable: Number of stories correctly identified* | |
|---|---|---|
| | ConspiracyMisinfo | MedicalMisinfo |
| | (1) | (2) |
| Religious Quote | 0.235* | −0.013 |
| | (0.111) | (0.119) |
| Quote + Religious Group | 0.064 | 0.139 |
| | (0.112) | (0.119) |
| Quote + Partisan Group | 0.209 | 0.129 |
| | (0.113) | (0.120) |
| Placebo Control | −0.263* | −0.203 |
| | (0.112) | (0.119) |
| Constant | 2.896*** | 3.068*** |
| | (0.080) | (0.085) |
| Observations | 1,600 | 1,600 |
| $R^2$ | 0.016 | 0.007 |
| Adjusted $R^2$ | 0.014 | 0.004 |
| Residual Std. Error (df = 1595) | 1.405 | 1.494 |
| F Statistic (df = 4; 1595) | 6.592*** | 2.784* |
| *Note:* | | *p<0.05; **p<0.001; ***p<0.001 |

Looking at conspiracy theories (column 1), we find that the Religious Quote treatment is the only one able to improve upon the standard correction. This is a crucial finding: while all of our experimental treatments performed better than the control, when comparing to a standard correction only the Religious Quote treatment achieves a statistically significant effect. Interestingly, we show that the additive treatments men-

tioning group norms are no different from the standard correction. On the other hand, looking at medical misinformation (column 2), we find that the standard correction is no different from any of the other treatment groups. However, as we note in Table 1, for miracle cures our standard correction does not improve the outcome relative to control. Only the group conformity treatments are able to achieve a significant effect.

Taken together, these results suggest that situational misinformation (such as conspiracy theories specifically about the pandemic) might be easier to correct, as more treatments are able to effectively attenuate these beliefs even beyond a standard correction. However, deep-rooted beliefs which have existed since before the covid-19 crisis, such as reliance on traditional medicine, might be harder to dislodge.

# 5 Discussion and Conclusion

In this paper, we present new evidence on ways to reduce the uptake of covid-19 misinformation in contexts where misinformation is driven by traditional religious beliefs and/or religious group identities. Using an experiment in India employing treatments specifically designed for the Indian context, such as using Hindu religious scriptures to prime the truth alongside corrections, our study yields important findings.

We first find a strong connection between religiosity and belief in covid-19 misinformation. Those who score high on our religiosity scale, support religious nationalist parties, and display religious affective polarization are significantly more vulnerable to misinformation. Second, our corrective treatments are effective at reducing the uptake of misinformation. Moreover, respondents are able to learn from the treatment and apply it to identify additional falsehoods as well. Third, we show suggestive evidence that treatments using a religious frame are significantly more effective than standard corrections without religious messaging.

These findings are important because they indicate that many Indians, and espe-

cially Hindus (who constitute 82% of the Indian population), are willing to view health crises through a religious lens, and that messages that frame corrections to misinformation as a religious issue could encourage greater engagement and foster more accurate beliefs among this population. Of practical importance, these results suggest that public health communication campaigns that use social identity-based frames and messaging to counter misinformation or increase the uptake of health measures would be effective because they resonate with existing values that citizens may have. Contentious issues surrounding crises like the covid-19 pandemic such as vaccine uptake and reliance on scientific information require the long-term and large-scale engagement of citizens. Hindus constitute a large majority of the Indian populace, and consequently, messages designed to resonate with their social and religious identities hold promise as a means to build belief in accurate news over misinformation.

Despite these positive findings, we consider some limitations of the study and avenues for future research. First, it is worth noting that while we focus on religiosity in this paper, we cannot truly disentangle the causal effects of religiosity and partisanship as drivers of beliefs. In the Indian context, while religion itself has been a long-standing social cleavage, parties tap into religious beliefs in order to further their own causes. In our data, too, religiosity is correlated with increasing support for the BJP. Thus while it is theoretically likely that religiosity drives beliefs in misinformation, it is empirically difficult to determine whether this relationship is orthogonal to party identity, or whether partisanship itself increases the strength of Hindu religious beliefs. While our paper focused on correcting misinformation, future research should look into the precise factors that cause citizens to believe falsehoods in the first place.

Next, we underscore that the particular treatment we used – Hindu religious texts – is necessarily context-specific. However, we believe the premise of our study, the idea that treatments should target mechanisms and identities that drive belief in falsehoods in the first place, is applicable to several other contexts. Specifically, we note several other

developing countries that have had an uptick in the spread of miracle cure misinformation during covid-19. Countries such as Afghanistan, Madagascar, Mali, Mexico and Brazil not only share commonalities in the type of misinformation that spread during the pandemic, but also have social media environments similar to India that rely heavily on encrypted platforms such as WhatsApp.

Further, as Nyhan (2021) notes, such an approach would also do well to reduce the uptake of misinformation in the Western world. The link between religiosity and belief in conspiracy theories is not solely an Indian phenomenon; indeed, recent data demonstrate that evangelical Christians in the United States are not only more likely to believe in QAnon narratives, but also in conspiracies about the 2020 election, vaccines, or the moon landing (O'Donnell 2021). Across contexts, the least religious appear to be the least credulous. As polarization intensifies around the world, there are lessons to be drawn from these data for developing countries and Western contexts alike.

In addition, we underscore that more work needs to be done to understand how those identifying with other religious identities respond to such treatments. We focused in this study on Hindu respondents, who make up a very large share (82%) of the population in India and importantly, an overwhelming majority of online samples. Because of power concerns, as well as restrictions allowing for online sampling only during the pandemic, we were unable to sample beyond this subgroup. In our own future work, we aim to extend this research to make it representative of religious diversity in India. Because we used an online panel in India, our sample is necessarily more educated and more digitally literate. While these are populations more likely to be represented among social media users, future work could look more deeply at less privileged samples with new access to Internet. In related works in a similar setting, we find that lesser educated respondents are more prone to believing misinformation. This implies that with a sample that is less educated, we might find higher levels of vulnerability to misinformation than we do with the present sample. Consequently, in lesser educated samples we may

expect our religious treatments to have even more efficacy than we currently find.

While we were limited by our sample size and concerns about power, we hope to extend this work in the future to include fully crossed designs where we can peel apart the different elements in each treatment, for example, by using moral messages without any religious framing. Additionally, the design over-sampled false news stories in the outcome measure. While this was done to maximise belief reduction in as many false stories with perilous consequences, future work could balance true and false stories, as well as generate true stories that are not negations of false headlines, to study how these factor shape the efficacy of such treatments.

Finally, we acknowledge that in our design respondents witnessed a correction rather than were corrected themselves. The encrypted nature of WhatsApp poses logistical and ethical problems in conducting such a study within actual WhatsApp groups. Given these constraints, we attempt as far as possible to have treatments that maximize external validity (for example, having respondents read a WhatsApp conversation so as to approximate the environment of a social media group chat, rather than see corrections on their screen devoid of that context). While we cannot fully approximate the environment of a WhatsApp group chat, we believe this approach has the most utility relative to labeling or correcting misinformation on platforms like Facebook or Twitter, as most Indian citizens do not use these apps. We hope that future research will continue to find ways to make studying encrypted platforms more externally valid, an especially pressing concern to gain insights into misinformation in the developing world.

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# Online Appendix for
# *Religious Messaging Against Covid-19 Misinformation: Experimental Evidence from India*

## Contents

# A Pretest Data

We pretested a selection of 43 stories, 23 false and 20 true, on a sample of 400 Indian adults recruited via Mechanical Turk in June 2020. These stories were real headlines shared on Indian social media during the early months of the pandemic.

We used Google News to pick the true stories. The false stories were rated false by at least one third-party fact-checking organization such as altnews.in or boomlive.in. For each story we asked respondents to rate its perceived accuracy on a 4-point scale (very accurate, somewhat accurate, not very accurate, not at all accurate). In the graphs below we plot the share of respondents in the pretest sample who said each story was either very accurate or somewhat accurate.

We subsequently used these data to select stories for our main study. Our final selection of stories reflects false stories believed the most and true stories believed the least, so as to maximize the effect of the treatment on headlines where there is a lot of scope to move beliefs towards the truth.

In each case, we roughly classified each story in a given category of claims: claims about medical misinformation and miracle cures (”cure”), claims invoking a conspiracy in the development or the spreading of COVID-19 (”conspiracy”), and claims about transmission modes of the disease (”transmission”).

Figure A.1: Belief in False Pretest Stories

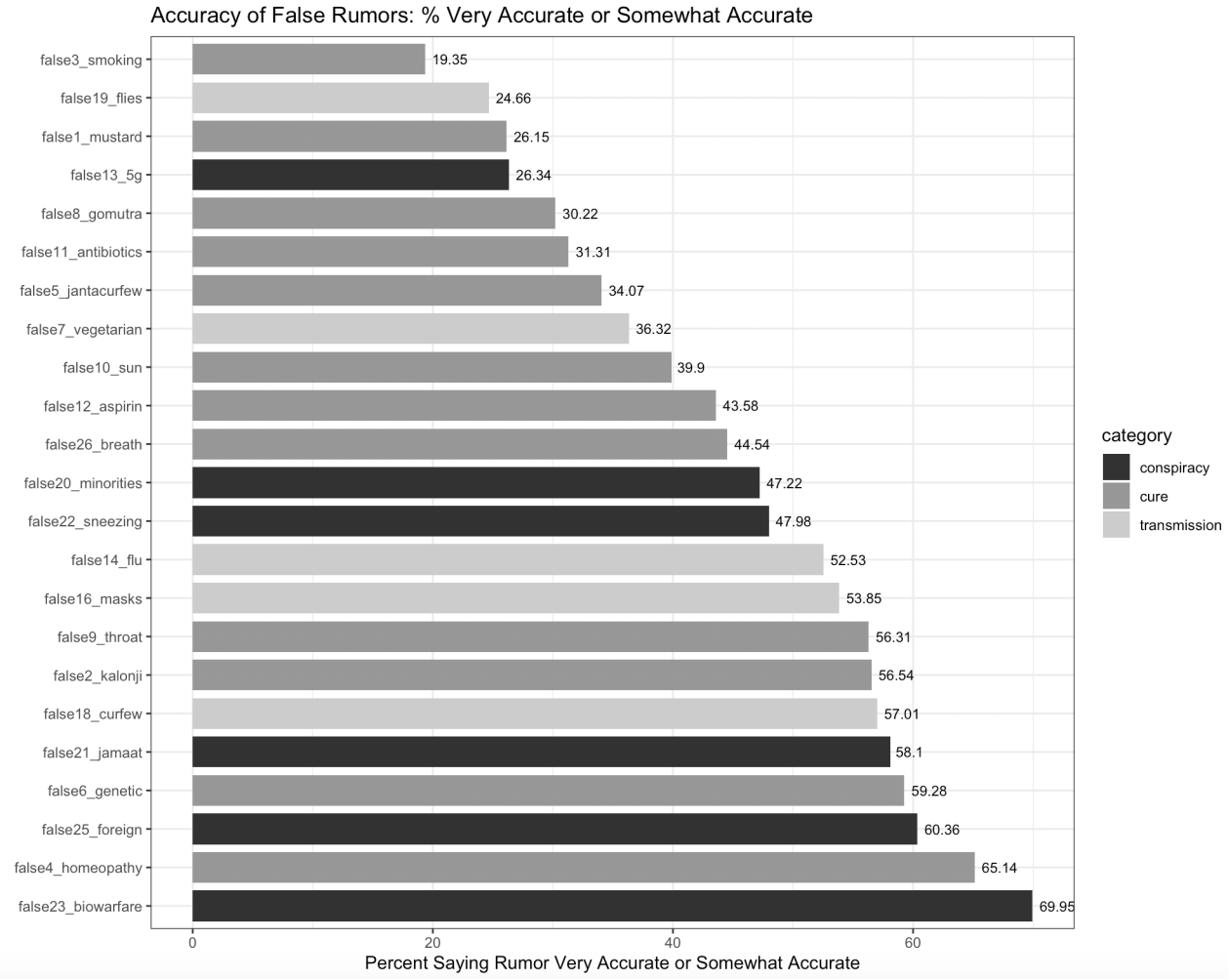


Figure A.2: Belief in True Pretest Stories

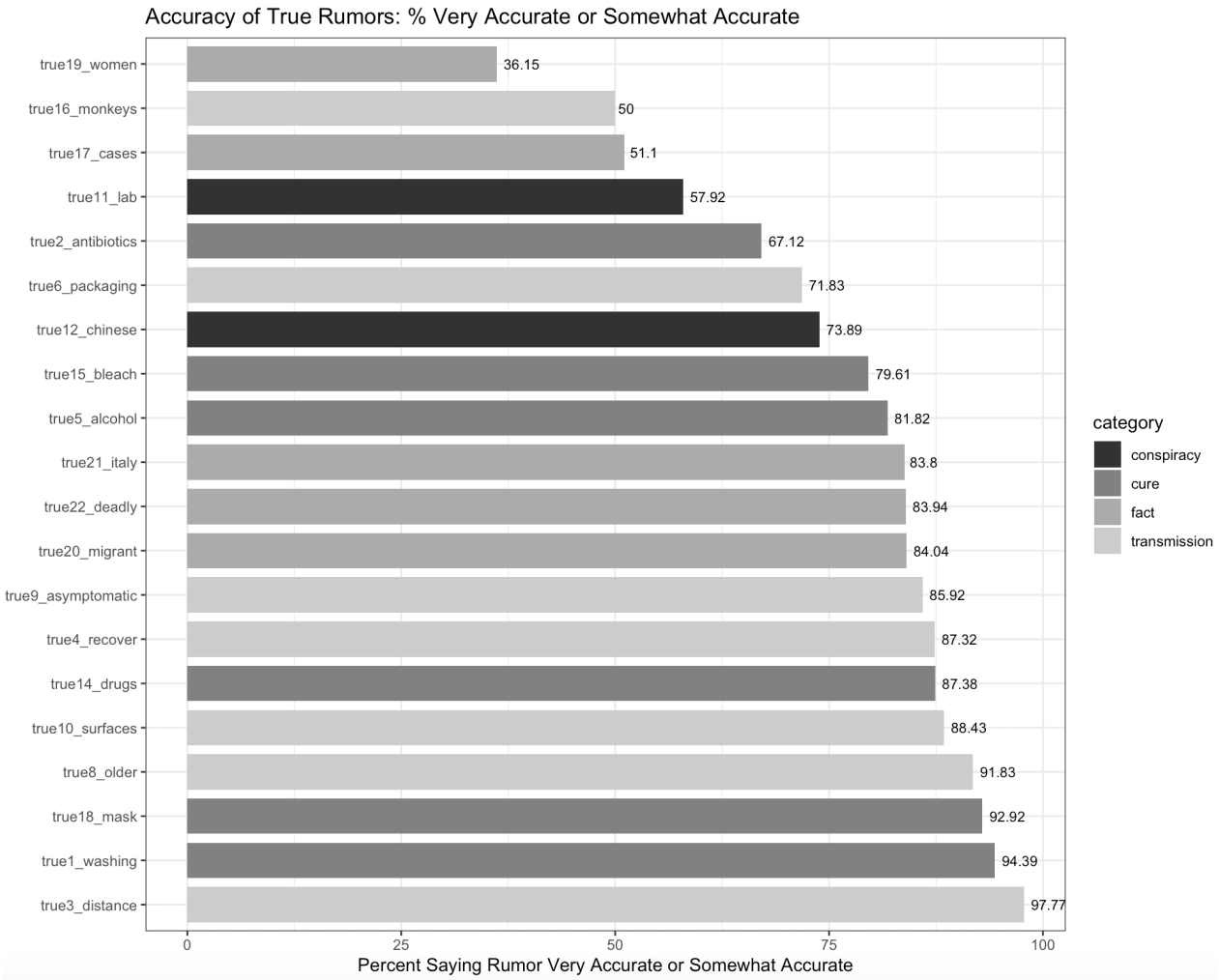


Table A.1: List of False Pretest Stories

| **Variable Name** | **Headline** |
|---|---|
| *false*1_*mustard* | Applying Mustard Oil To One's Nostrils Eliminates The Coronavirus In A Person's Stomach |
| *false*2_*kalonji* | Kalonji Seeds Contain Hydroxychloroquine, Which Prevents COVID-19 |
| *false*3_*smoking* | Smoking Reduces The Risk of COVID-19 |
| *false*4_*homeopathy* | Ayurveda, Homeopathic and Unani Medicines Help Prevent Coronavirus |
| *false*5_*jantacurfew* | Vibrations From Group Clapping During Janta Curfew Can Repel Coronavirus |
| *false*6_*genetic* | Research Shows Indians Have Genetic Protection Against Coronavirus |
| *false*7_*vegetarian* | No Vegetarian Affected By Coronavirus |
| *false*8_*gomutra* | Properties in Traditional Remedies Such as Cow Dung and Gomutra May Help Cure COVID-19 |
| *false*9_*throat* | Keep Your Throat Moist to Avoid Catching COVID-19 |
| *false*10_*sun* | Exposing Yourself to The Sun or to Temperatures Higher Than 25 Degrees Can Prevent The Coronavirus |
| *false*11_*antibiotics* | COVID-19 Can Be Cured With Painkillers And Antibiotics |
| *false*12_*aspirin* | Aspirin Mixed With Lemon Juice And Honey Protects Against Coronavirus |
| *false*13_5*g* | Radiation Emitted From 5G Technology Can Lead To COVID-19, Study Shows |
| *false*14_*flu* | Most People Who Have The Flu Vaccine Test Positive For COVID-19 |
| *false*16_*masks* | Face Masks Could Create Problems Like Increasing CO2 Intake, Leading To Brain Damage |
| *false*18_*curfew* | A 14-hour Janta Curfew Could Break The Chain Of Transmission Of COVID-19 |
| *false*19_*flies* | Studies Show That House Flies Can Transmit COVID-19 |
| *false*20_*minorities* | 85% of Muslim Communities Refuse COVID-19 Tests For Religious Reasons |
| *false*21_*jamaat* | Tablighi Jamaat: A Conspiracy To Spread Coronavirus? |
| *false*22_*sneezing* | Video Evidence Shows Muslim Devotees Sneezing Purposefully Together To Spread Coronavirus |
| *false*23_*biowarfare* | Coronavirus Likely A Chinese Bio-Warfare Weapon |
| *false*25_*foreign* | Foreign Powers Are Deliberately Causing The Spread Of Coronavirus |
| *false*26_*breath* | Holding One's Breath For Thirty Seconds Is A Self-diagnosing Test For COVID-19 |

Table A.2: List of True Pretest Stories

| **Variable Name** | **Headline** |
|---|---|
| *true*1_*washing* | Thorough Hand Washing With Soap Is The Most Effective Way To Kill The COVID-19 Virus |
| *true*2_*antibiotics* | Antibiotics Do Not Work To Cure COVID-19 |
| *true*3_*distance* | Maintaining Physical Distance Reduces Chances Of Catching The Coronavirus From Others |
| *true*4_*recover* | Studies Show That Most People Who Get COVID-19 Recover From It |
| *true*5_*alcohol* | No, Drinking Alcohol Does Not Protect You Against COVID-19: New Research |
| *true*6_*packaging* | Good news for Swiggy, Amazon: No Confirmed Case Of Coronavirus Transmitted Through Food Or Packaging |
| *true*8_*older* | COVID-19 Deaths Disproportionally Concentrated Among Older People |
| *true*9_*asymptomatic* | It Is Possible To Catch COVID-19 From Someone Who Does Not Feel Sick: Study |
| *true*10_*surfaces* | New Research Shows COVID-19 Can Survive On Surfaces |
| *true*11_*lab* | COVID-19 Has A Natural Origin And Was Not Created In A Lab |
| *true*12_*chinese* | Chinese Authorities Have Worked Hard To Combat Coronavirus. Here Are The Measures They Took |
| *true*14_*drugs* | There Are Currently No Drugs Commercially Licensed For The Treatment Or Prevention Of COVID-19 |
| *true*15_*bleach* | Spraying And Introducing Bleach, Other Disinfectants Into Your Body Will Not Protect Against COVID-19 |
| *true*16_*monkeys* | Monkeys Snatch Blood Samples Of Suspected COVID-19 Patients In India |
| *true*17_*cases* | India Has The Highest Number Of Serious COVID Cases After The United States |
| *true*18_*mask* | Widespread Mask Wearing Could Prevent Covid-19 Second Wave, Study Shows |
| *true*19_*women* | Indian Women With COVID-19 At Higher Risk Of Death Than Men |
| *true*20_*migrant* | India's Lockdown Brought Death And Despair As Migrant Workers Had To Flee Cities |
| *true*21_*italy* | India Overtakes Italy In Coronavirus Cases Amid Easing Of Lockdown |
| *true*22_*deadly* | Scientists Warn COVID-19 More Deadly Than The Common Flu, Swine Flu |

# B Treatment Stimuli

Respondents in each condition read a single conversation presented as a WhatsApp group chat. The text for each condition as well as an example of the WhatsApp template is shown below.

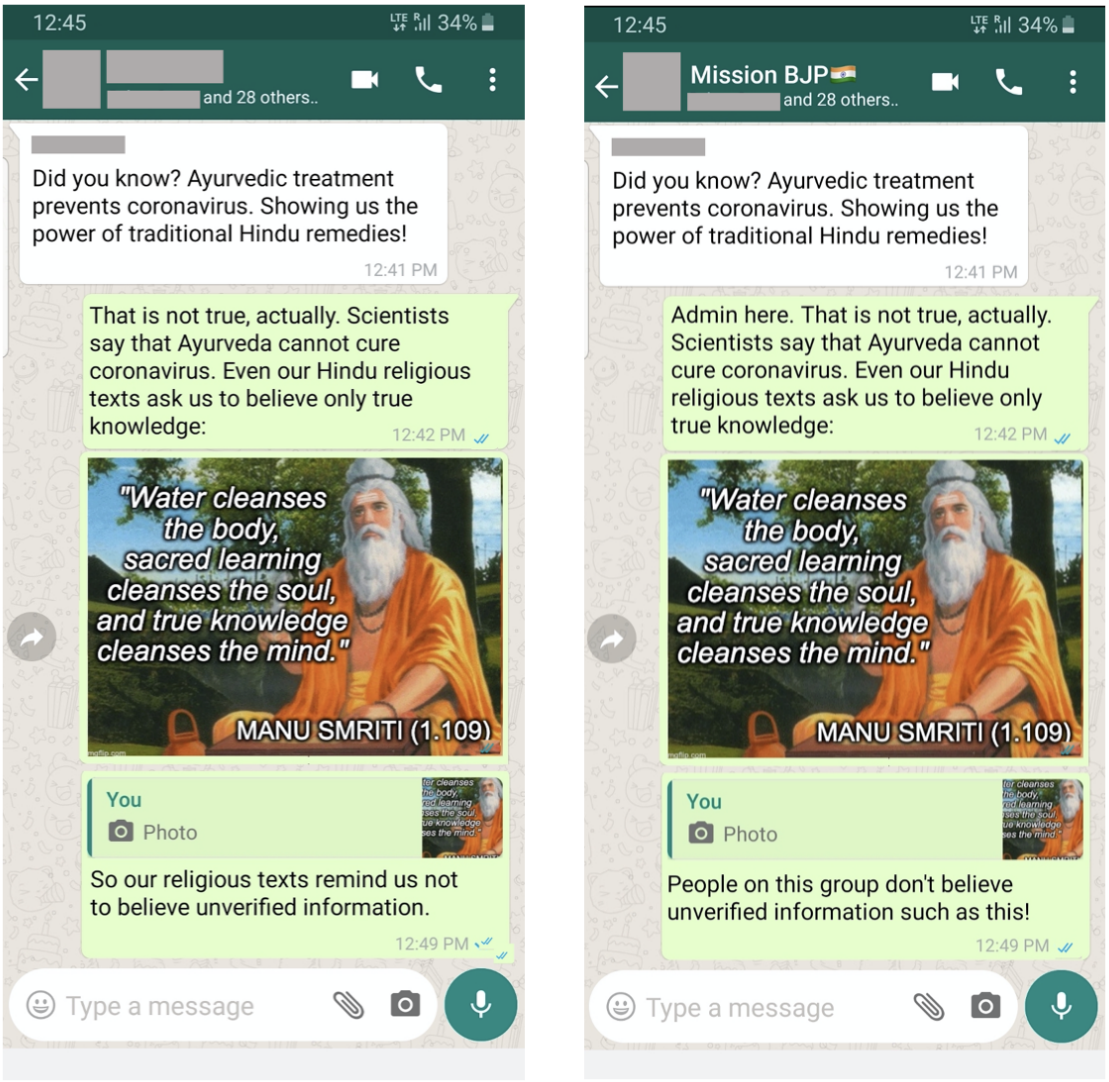
Figure B.1: Text of Treatment Stimuli: Medical Misinformation Issue Block

| Condition | Issue | Rumor (User 1) | Correction (User 2) | Visual (User 2) | Message (User 2) |
|---|---|---|---|---|---|
| Religious Quote | Medical Misinfo | Did you know? Ayurvedic treatment prevents coronavirus. Showing us the power of traditional Hindu remedies! | That is not true, actually. Scientists say that Ayurveda cannot cure coronavirus. Even our Hindu religious texts ask us to believe only true knowledge. | [paste on photo] Manu Smriti (1.109): Water cleanses the body, sacred learning cleanes the soul, and true knowledge cleanses the mind. | So our religious texts remind us not to believe unverified information. |
| Quote + Religious Group | Medical Misinfo | Did you know? Ayurvedic treatment prevents coronavirus. Showing us the power of traditional Hindu remedies! | Admin here. That is not true, actually. Scientists say that Ayurveda cannot cure coronavirus. Even our Hindu religious texts ask us to believe only true knowledge. | [paste on photo] Manu Smriti (1.109): Water cleanses the body, sacred learning cleanes the soul, and true knowledge cleanses the mind. | People on this group don't believe unverified information such as this! |
| Quote + Partisan Group | Medical Misinfo | Did you know? Ayurvedic treatment prevents coronavirus. Showing us the power of traditional Hindu remedies! | Admin here. That is not true, actually. Scientists say that Ayurveda cannot cure coronavirus. Even our Hindu religious texts ask us to believe only true knowledge. | [paste on photo] Manu Smriti (1.109): Water cleanses the body, sacred learning cleanes the soul, and true knowledge cleanses the mind. | People on this group don't believe unverified information such as this! |
| Standard Correction | Medical Misinfo | Did you know? Ayurvedic treatment prevents coronavirus. Showing us the power of traditional Hindu remedies! | That is not true, actually. Scientists say that Ayurveda cannot cure coronavirus. | [image Happy Birthday] | And a happy birthday to our dear friend XXXXX[name hidden] |
| Placebo Control | Medical Misinfo | Did you know? the Tiger population in India appears to be increasing again... | Yes! India is now home to 3,000 tigers according to latest tiger census, a third more than it had four years ago! | [image tigers] | This is a major conservation initiative!! we should avoid conflict with humans to keep preserving this great species! [thumbs up] |

Figure B.2: Text of Treatment Stimuli: Conspiracy Theory Issue Block

| Condition | Issue | Rumor (User 1) | Correction (User 2) | Visual (User 2) | Message (User 2) |
|---|---|---|---|---|---|
| Religious Quote | Conspiracy | A breaking news from this week. Muslim groups have been deliberately spreading coronavirus... seems like a way to target the Hindu population | This is not true! We have no proof for this. In fact, spreading information like this can be dangerous for the whole country. The virus does not see religion before striking | Even our Hindu religious texts say not to blame people or spread information that can cause harm | The devotees of God are free from malice, have compassion, absence of the disposition to slander others —The Mahabharata, 14.38, BG 12.13-14: |
| Quote + Religious Group | Conspiracy | A breaking news from this week. Muslim groups have been deliberately spreading coronavirus... seems like a way to target the Hindu population | This is not true! We have no proof for this. In fact, spreading information like this can be dangerous for the whole country. The virus does not see religion before striking | In this group we do not like to blame people or spread news that can cause harm. Let's keep this group free from false news | The devotees of God are free from malice, have compassion, absence of the disposition to slander others —The Mahabharata, 14.38, BG 12.13-14: |
| Quote + Partisan Group | Conspiracy | A breaking news from this week. Muslim groups have been deliberately spreading coronavirus... seems like a way to target the Hindu population | This is not true! We have no proof for this. In fact, spreading information like this can be dangerous for the whole country. The virus does not see religion before striking | In this group we do not like to blame people or spread news that can cause harm. Let's keep this group free from false news | The devotees of God are free from malice, have compassion, absence of the disposition to slander others —The Mahabharata, 14.38, BG 12.13-14: |
| Standard Correction | Conspiracy | A breaking news from this week. Muslim groups have been deliberately spreading coronavirus... seems like a way to target the Hindu population | This is not true! We have no proof for this. In fact, spreading information like this can be dangerous for the whole country. The virus does not see religion before striking | Best wishes! | [good morning visual] |
| Placebo Control | Conspiracy | Anyone watch the England-West Indies test match yesterday? | Yes! It was great to see West Indies put up a good fight against them. Does anyone know what the schedule for the full series is? | Here it is! Hope England can fight back so we have some entertaining games to watch | [cricket schedule image] |

Figure B.3: WhatsApp Group Chat Template. Left Panel: Religious Quote Condition. Right Panel: Quote + Partisan Group Condition



# C Dependent Variables

The main outcome of interest is the perceived accuracy of news headlines. To construct this measure, respondents evaluate the accuracy of a number of headlines on a 4-point scale ranging from very accurate (4) to not at all accurate (1). Within each issue block (conspiracy or medical misinformation), participants rate the accuracy of 6 common COVID-related claims (some false, some true) on a four-point scale:

*To the best of your knowledge, is the above headline accurate? [very accurate, somewhat accurate, not very accurate, not at all accurate]*

All of the headlines were published by actual news sources or circulated on Indian social media during the pandemic; the false headlines were rated as false by at least one third-party fact-checking organization.

Our headlines, both true and false, were selected from a list of several stories that we pretested (see Online Appendix Section A). Of these stories, we selected six headlines for each issue on the basis of how widely they were believed and the potential harm they could cause. We present each story in the form of an actual headline mimicking the style of stories on Google News, with a headline, subheadline, source, and image. We block out the source so as mimic WhatsApp conversations where messages are often received without a source. In Figure C.1 we provide examples. The final set of headlines selected for the main experiment is listed in Tables C.1 and C.2.

Figure C.1: Dependent Variable Headline Examples

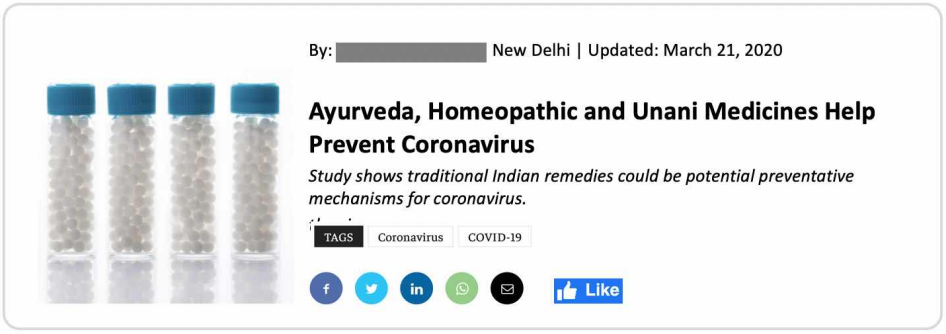



Table C.1: Conspiracy Theory Headlines

| **Headline** | **Veracity** |
|---|---|
| Tablighi Jamaat: A Conspiracy To Spread Coronavirus? | False |
| Coronavirus Likely A Chinese Bio-Warfare Weapon | False |
| Video Evidence Shows Muslim Devotees Sneezing Purposefully Together To Spread Coronavirus | False |
| Foreign Powers Are Deliberately Causing The Spread Of Coronavirus | False |
| COVID-19 Has A Natural Origin And Was Not Created In A Lab | True |
| 5G Radiation and Mobile Signals Cannot Transmit Coronavirus | True |

Table C.2: Medical Misinformation Headlines

| **Headline** | **Veracity** |
|---|---|
| Ayurveda, Homeopathic and Unani Medicines Help Prevent Coronavirus | False |
| Research Shows Indians Have Genetic Protection Against Coronavirus | False |
| Kalonji seeds contain hydroxychloroquine, which prevents COVID-19 | False |
| Holding One's Breath For Thirty Seconds Is A Self-Diagnosing Test For COVID-19 | False |
| Spraying And Introducing Bleach, Other Disinfectants Into Your Body Will Not Protect Against COVID-19 | True |
| Antibiotics Do Not Work To Cure COVID-19 | True |

# D Sampling

**Recruitment**

The experiment was fielded in November 2020. Participants were recruited through the Internet Research Bureau (IRB)'s online sampling panel and were selected using quotas to be approximately representative of the Indian adult population by age, gender and region.

Non-Hindus are less than 20% of the Indian population, and this group is further split into several religions. Even with a very representative sample, we are unlikely to have power to detect respondent religion effects in response to the treatment. Given that our treatment is primarily religious, we expect religion to play a role in how participants respond to the treatment. To avoid imbalance in the sample by religion, we thus limited our sample to Hindu respondents.

**Randomization**

We use a randomized block design with two blocks. The two blocks are based on partisan identity where respondents supporting the BJP are one block and respondents opposing the BJP are another block. Within each block, respondents are assigned to one of the five experimental conditions with equal probability using simple randomization. For those not assigned to the placebo control group, the order of issues (medical misinformation and conspiracy theories) is also randomized. For those assigned to placebo control, respondents read WhatsApp conversations on wildlife and sports in random order.

**Power**

Our sample size was 1600 respondents. We base our sample size on a power analysis using Alexander Coppock's power calculator. Our goal was to obtain .95 power to detect a small effect size of .15 at the standard .05 alpha error. Given this calculation and our priors about experimental findings on misinformation and India, we end up with a minimum of 283 respondents per experimental group. Accounting for some attrition, we sampled 1600 respondents overall.

**The Sample: Descriptive Statistics**

In Table D.1 we provide summary statistics for the key variables used in this paper. The variable Religiosity is a continuous scale standardized such that it has mean 0 and standard deviation 1; higher values indicate stronger religiosity. Items included in this

Table D.1: Descriptive Statistics for Sample

| Variable | N | Mean | St. Dev. | Min | Median | Max |
|---|---|---|---|---|---|---|
| Religiosity | 1,600 | 0.000 | 1.000 | −3.362 | 0.118 | 2.206 |
| BJP Support | 1,600 | 0.756 | 0.429 | 0 | 1 | 1 |
| Gender | 1,600 | 1.421 | 0.494 | 1 | 1 | 2 |
| Age Category | 1,600 | 3.627 | 1.314 | 2 | 3 | 7 |
| Income | 1,600 | 4.016 | 2.022 | 1 | 4 | 9 |
| Education | 1,600 | 2.261 | 0.749 | 1 | 2 | 3 |
| Upper Caste | 1,600 | 0.572 | 0.495 | 0 | 1 | 1 |
| WhatsApp Use Frequency | 1,600 | 1.354 | 0.735 | 1 | 1 | 6 |
| Concern about covid-19 | 1,597 | 9.555 | 1.987 | 1 | 10 | 11 |
| Science Knowledge | 1,600 | 5.842 | 1.470 | 0 | 6 | 8 |

scale are detailed in Online Appendix K. BJP Support is a binary variable that takes on the value of 1 if a respondent strongly or somewhat supports the Bharatiya Janata Party (BJP). Gender has two values, 1 if male and 2 if female (while our survey provided options beyond this, every respondent in the sample selected 1 or 2). The variable Age Category ranges from 2 to 7, with 2 referring to those 18 to 24 years old and 7 referring to those 65 and older. Income ranges from 1 to 9 with larger numbers indicating higher annual incomes. Education is recoded to have three categories: 1 if a respondent is grade 12 (high school / junior college) educated or lower; 2 if a respondent has a college degree; 3 if a respondent has a higher education (masters or PhD) degree. Upper Caste is a binary variable that takes on the value of 1 if the respondent identifies as a member of the General / Upper caste category. WhatsApp Use Frequency ranges from 1 (several times a day) to 6 (never). Concern about covid-19 is a numeric variable where higher values indicate greater concern. Science Knowledge is a scale that counts the number of science questions out of 8 that respondents correctly answer.

# E Main Effects With Covariates

Table E.1: Main Effect With Covariates

| | *Dependent variable: Number of stories correctly identified* | |
|---|---|---|
| | ConspiracyMisinfo | MedicalMisinfo |
| | (1) | (2) |
| Religious Quote | 0.458*** | 0.178 |
| | (0.101) | (0.110) |
| Quote + Religious Group | 0.297* | 0.320* |
| | (0.102) | (0.110) |
| Quote + Partisan Group | 0.397*** | 0.272* |
| | (0.102) | (0.111) |
| Standard Correction | 0.229* | 0.213 |
| | (0.103) | (0.112) |
| Religiosity | −0.431*** | −0.313*** |
| | (0.034) | (0.037) |
| BJP Supporter | −0.105 | −0.147 |
| | (0.082) | (0.089) |
| Age Category | 0.119*** | 0.030 |
| | (0.026) | (0.028) |
| Male | 0.169* | 0.186* |
| | (0.070) | (0.076) |
| Income | −0.008 | −0.032 |
| | (0.017) | (0.019) |
| Education | −0.005 | −0.077 |
| | (0.046) | (0.050) |
| Upper Caste | 0.126 | 0.047 |
| | (0.069) | (0.074) |
| Science Knowledge | 0.180*** | 0.247*** |
| | (0.023) | (0.025) |
| WhatsApp Use Frequency | −0.038 | 0.018 |
| | (0.047) | (0.050) |
| Concern about covid-19 | 0.002 | 0.017 |
| | (0.017) | (0.019) |
| Constant | 1.171*** | 1.423*** |
| | (0.276) | (0.298) |
| Observations | 1,597 | 1,597 |
| $R^2$ | 0.174 | 0.137 |
| Adjusted $R^2$ | 0.166 | 0.129 |
| Residual Std. Error (df = 1582) | 1.291 | 1.397 |
| F Statistic (df = 14; 1582) | 23.766*** | 17.887*** |
| *Note:* | | *p<0.05; **p<0.001; ***p<0.001 |

# F Attention Checks

We ask two questions in the survey to measure respondent attention. The first asks respondents to select a specific color from a list; the second asks respondents to select a specific news source from a list. 85% of respondents answered the first question correctly and 64% of respondents answered the second question correctly. Overall, 61% of the sample passed both attention checks.

Below we show the main effect of the treatments while controlling for respondent attention. Our variable Attention Checks is a continuous measure ranging from 0 checks passed to 2 checks passed.

Table F.1: Main Effect Controlling for Attention Checks

| | *Dependent variable: Number of stories correctly identified* | |
|---|---|---|
| | ConspiracyMisinfo | MedicalMisinfo |
| | (1) | (2) |
| Religious Quote | 0.510*** | 0.202 |
| | (0.108) | (0.115) |
| Quote + Religious Group | 0.324* | 0.339* |
| | (0.109) | (0.115) |
| Quote + Partisan Group | 0.435*** | 0.292* |
| | (0.110) | (0.116) |
| Standard Correction | 0.242* | 0.180 |
| | (0.110) | (0.117) |
| Attention Checks (Continuous) | 0.339*** | 0.372*** |
| | (0.049) | (0.052) |
| Constant | 2.139*** | 2.323*** |
| | (0.105) | (0.111) |
| Observations | 1,600 | 1,600 |
| $R^2$ | 0.045 | 0.038 |
| Adjusted $R^2$ | 0.042 | 0.035 |
| Residual Std. Error (df = 1594) | 1.385 | 1.472 |
| F Statistic (df = 5; 1594) | 14.922*** | 12.436*** |
| *Note:* | | *p<0.05; **p<0.001; ***p<0.001 |

# G Results for Hypotheses 2b, 3, 4 (Heterogeneous Effects)

Table G.1: Hypothesis 2b: Religious Quote v. Placebo Control

| | *Dependent variable: Number of stories correctly identified* | |
|---|---|---|
| | ConspiracyMisinfo | MedicalMisinfo |
| | (1) | (2) |
| Religious Quote | 0.476*** | 0.173 |
| | (0.101) | (0.112) |
| Religiosity | −0.400*** | −0.306*** |
| | (0.073) | (0.081) |
| Religious Quote | −0.079 | 0.013 |
| x Religiosity | (0.101) | (0.112) |
| Constant | 2.650*** | 2.878*** |
| | (0.071) | (0.079) |
| Observations | 655 | 655 |
| $R^2$ | 0.135 | 0.046 |
| Adjusted $R^2$ | 0.131 | 0.042 |
| Residual Std. Error (df = 651) | 1.290 | 1.434 |
| F Statistic (df = 3; 651) | 33.871*** | 10.472*** |
| *Note:* | | *p<0.05; **p<0.001; ***p<0.001 |

Table G.2: Hypothesis 3: Religious Group v. Placebo Control

| | *Dependent variable: Number of stories correctly identified* | |
|---|---|---|
| | ConspiracyMisinfo | MedicalMisinfo |
| | (1) | (2) |
| *Q*uote + Religious Group Treatment | 0.309* | 0.328* |
| | (0.102) | (0.116) |
| Religiosity | −0.400*** | −0.306*** |
| | (0.073) | (0.084) |
| *Q*uote + Religious Group x Religiosity | −0.174 | −0.201 |
| | (0.104) | (0.118) |
| Constant | 2.650*** | 2.878*** |
| | (0.072) | (0.082) |
| Observations | 650 | 650 |
| $R^2$ | 0.135 | 0.083 |
| Adjusted $R^2$ | 0.131 | 0.079 |
| Residual Std. Error (df = 646) | 1.299 | 1.482 |
| F Statistic (df = 3; 646) | 33.631*** | 19.515*** |
| *Note:* | | *p<0.05; **p<0.001; ***p<0.001 |

Table G.3: Hypothesis 4: Partisan Group v. Placebo Control

| | *Dependent variable: Number of stories correctly identified* | |
|---|---|---|
| | ConspiracyMisinfo | MedicalMisinfo |
| | (1) | (2) |
| Quote + Partisan Group Treatment | 0.197 | 0.157 |
| | (0.222) | (0.238) |
| BJP Support | $-0.486^{*}$ | $-0.476^{*}$ |
| | (0.178) | (0.191) |
| Quote + Partisan Group x BJP Support | 0.364 | 0.233 |
| | (0.255) | (0.274) |
| Constant | $3.000^{***}$ | $3.225^{***}$ |
| | (0.155) | (0.166) |
| Observations | 641 | 641 |
| $R^2$ | 0.040 | 0.024 |
| Adjusted $R^2$ | 0.035 | 0.019 |
| Residual Std. Error (df = 637) | 1.385 | 1.487 |
| F Statistic (df = 3; 637) | $8.827^{***}$ | $5.238^{*}$ |
| *Note:* | | $^{*}$p<0.05; $^{**}$p<0.001; $^{***}$p<0.001 |

# H Hypothesis 1a and 1b

In H1a and H1b we hypothesized that religiosity and religious nationalist partisanship should be highly correlated with misinformed beliefs, and hence that individuals with these characteristics should be especially likely to believe misinformation. To test these hypotheses, we count the number of headlines that respondents correctly classified as true or false. This constitutes our outcome measure. We regress this outcome on two variables. First, a categorical variable that captures strength of respondent support for the BJP on a 4-point scale ranging from strongly support to strongly oppose (Table H.1). Second, a continuous variable capturing respondent religiosity, where the most religious respondent has a score of 1 and the least religious respondent has a score of 0 (Table H.3). We also replicate these results controlling for demographic and pre-treatment covariates (H.2 and H.4).

Table H.1: Hypothesis 1a

| | *Dependent variable: Number of stories correctly identified* |
|---|---|
| | AllMisinfo |
| BJP Somewhat Oppose | $0.575^{*}$ |
| | (0.236) |
| BJP Somewhat Support | $0.549^{*}$ |
| | (0.203) |
| BJP Strongly Support | $-0.704^{***}$ |
| | (0.192) |
| Constant | $6.120^{***}$ |
| | (0.172) |
| Observations | 1,600 |
| $R^2$ | 0.061 |
| Adjusted $R^2$ | 0.059 |
| Residual Std. Error | 2.329 (df = 1596) |
| F Statistic | $34.592^{***}$ (df = 3; 1596) |
| *Note:* | $^{*}$p<0.05; $^{**}$p<0.001; $^{***}$p<0.001 |

Table H.2: Hypothesis 1a With Covariates

| | *Dependent variable: Number of stories correctly identified* |
|---|---|
| | AllMisinfo |
| BJP Somewhat Oppose | 0.639* |
| | (0.219) |
| BJP Somewhat Support | 0.457* |
| | (0.193) |
| BJP Strongly Support | −0.208 |
| | (0.188) |
| Religiosity | −0.684*** |
| | (0.058) |
| Age Category | 0.164*** |
| | (0.043) |
| Male | 0.413*** |
| | (0.115) |
| Income | −0.030 |
| | (0.029) |
| Education | −0.064 |
| | (0.076) |
| Upper Caste | 0.218 |
| | (0.113) |
| Science Knowledge | 0.395*** |
| | (0.038) |
| WhatsApp Use Frequency | −0.057 |
| | (0.077) |
| Concern about covid-19 | 0.024 |
| | (0.029) |
| Constant | 2.754*** |
| | (0.461) |
| Observations | 1,597 |
| $R^2$ | 0.222 |
| Adjusted $R^2$ | 0.216 |
| Residual Std. Error | 2.124 (df = 1584) |
| F Statistic | 37.690*** (df = 12; 1584) |
| *Note:* | *p<0.05; **p<0.001; ***p<0.001 |

Table H.3: Hypothesis 1b

| | *Dependent variable: Number of stories correctly identified* |
|---|---|
| | AllMisinfo |
| Religiosity | $-0.841^{***}$ |
| | (0.056) |
| Constant | $6.022^{***}$ |
| | (0.056) |
| Observations | 1,600 |
| $R^2$ | 0.123 |
| Adjusted $R^2$ | 0.122 |
| Residual Std. Error | 2.250 (df = 1598) |
| F Statistic | $223.555^{***}$ (df = 1; 1598) |
| *Note:* | $^{*}$p<0.05; $^{**}$p<0.001; $^{***}$p<0.001 |

Table H.4: Hypothesis 1b With Covariates

| | *Dependent variable: Number of stories correctly identified* |
|---|---|
| | AllMisinfo |
| Religiosity | $-0.750^{***}$ |
| | (0.057) |
| BJP Support | $-0.247$ |
| | (0.136) |
| Age Category | $0.158^{***}$ |
| | (0.043) |
| Male | $0.370^{*}$ |
| | (0.116) |
| Income | $-0.044$ |
| | (0.029) |
| Education | $-0.080$ |
| | (0.076) |
| Upper Caste | 0.177 |
| | (0.114) |
| Science Knowledge | $0.426^{***}$ |
| | (0.038) |
| WhatsApp Use Frequency | $-0.023$ |
| | (0.077) |
| Concern about covid-19 | 0.018 |
| | (0.029) |
| Constant | $3.051^{***}$ |
| | (0.445) |
| Observations | 1,597 |
| $R^2$ | 0.206 |
| Adjusted $R^2$ | 0.201 |
| Residual Std. Error | 2.145 (df = 1586) |
| F Statistic | $41.081^{***}$ (df = 10; 1586) |
| *Note:* | $^{*}$p<0.05; $^{**}$p<0.001; $^{***}$p<0.001 |

# I Robustness Checks

## I.1 Treatment Spillover

We recalculate our count outcome measure omitting the specific story that was corrected in the treatment WhatsApp conversation. For example, if the treatment corrected the misinformation headline that reliance on homeopathy and ayurveda can cure covid, we now omit this story and calculate a count measure of the remaining 5 miracle cure stories. On doing this, we find that for conspiracy theories, every treatment except the standard correction achieves a significant effect. While the standard correction works on the specific story that was corrected, spillover effects for non-corrected stories are only seen with the religious quote treatments. For medical misinformation, only the partisan group treatment has a significant effect. Further, while Table I.1 compares each condition to the control, on comparing them to the standard correction we find that for conspiracy theories the Religious Quote treatment still does better than the standard correction.

Table I.1: Treatment Works Beyond Specific Story Corrected

| | *Dependent variable: Number of spillover stories correctly identified* | |
|---|---|---|
| | ConspiracyMisinfo | MedicalMisinfo |
| | (1) | (2) |
| Religious Quote | 0.402*** | 0.074 |
| | (0.088) | (0.098) |
| Quote + Religious Group | 0.229* | 0.209* |
| | (0.088) | (0.098) |
| Quote + Partisan Group | 0.351*** | 0.187 |
| | (0.089) | (0.099) |
| Standard Correction | 0.142 | 0.122 |
| | (0.089) | (0.099) |
| Constant | 2.242*** | 2.606*** |
| | (0.062) | (0.069) |
| Observations | 1,600 | 1,600 |
| $R^2$ | 0.017 | 0.004 |
| Adjusted $R^2$ | 0.014 | 0.001 |
| Residual Std. Error (df = 1595) | 1.124 | 1.251 |
| F Statistic (df = 4; 1595) | 6.707*** | 1.495 |
| *Note:* | | *p<0.05; **p<0.001; ***p<0.001 |

## I.2 Discernment DV

To calculate discernment between true and false stories, we compute averages for true stories (on 4-pt scale where higher = more accurate) and averages for false stories separately. Then we calculate the z-scores for true stories and false stories. Discernment is computed by subtracting z-scores for fake news from z-scores for true news. This measure is the dependent variable in Table I.2.

Table I.2: Discernment as Outcome

| | *Dependent variable: Discernment* | |
|---|---|---|
| | ConspiracyMisinfo | MedicalMisinfo |
| | (1) | (2) |
| Religious Quote | $0.330^{***}$ | 0.117 |
| | (0.086) | (0.085) |
| Quote + Religious Group | 0.136 | $0.213^{*}$ |
| | (0.086) | (0.086) |
| Quote + Partisan Group | $0.302^{***}$ | $0.196^{*}$ |
| | (0.086) | (0.086) |
| Standard Correction | 0.110 | 0.077 |
| | (0.087) | (0.087) |
| Constant | $-0.176^{**}$ | $-0.121^{*}$ |
| | (0.061) | (0.060) |
| Observations | 1,598 | 1,598 |
| $R^2$ | 0.013 | 0.005 |
| Adjusted $R^2$ | 0.010 | 0.003 |
| Residual Std. Error (df = 1593) | 1.093 | 1.090 |
| F Statistic (df = 4; 1593) | $5.166^{***}$ | 2.083 |
| *Note:* | $^{*}$p<0.05; $^{**}$p<0.01; $^{***}$p<0.001 | |

# J Affective Polarization

We measure affective polarization with the question "Suppose a friend of yours was getting married. How would you feel if he or she married a Muslim?". Responses include 1=very upset, 2=somewhat upset, 3=not very upset, 4=not at all upset. Results show that respondents who are less polarized towards Muslims are better at identifying misinformation.

Table J.1: Religious Affective Polarization

| | *Dependent variable:* | |
|---|---|---|
| | CuresMisinfo | ConspiracyMisinfo |
| | (1) | (2) |
| Marrying a Muslim | 0.320*** | 0.407*** |
| | (0.031) | (0.029) |
| Constant | 2.211*** | 1.841*** |
| | (0.092) | (0.084) |
| Observations | 1,598 | 1,598 |
| $R^2$ | 0.062 | 0.113 |
| Adjusted $R^2$ | 0.062 | 0.112 |
| Residual Std. Error (df = 1596) | 1.451 | 1.333 |
| F Statistic (df = 1; 1596) | 105.891*** | 202.690*** |
| *Note:* | *p<0.05; **p<0.01; ***p<0.001 | |

# K Complete Survey Instrument

This study is being conducted by [redacted for peer review]. This is an academic survey and the researchers are not affiliated with any political party. Your participation is voluntary and you may decline the survey or withdraw at any time. No information that identifies you will be collected or retained by the researchers. Any information published will only be in aggregate form. Do you consent to participate in the survey? Yes/No

**Demographics**

How old are you?

1. Under 18
2. 18 - 24
3. 25 - 34
4. 35 - 44
5. 45 - 54
6. 55 - 64
7. 65 - 74
8. 75 - 84
9. 85 or older

What is your gender?

1. Male
2. Female
3. Other

What is the highest level of education that you have completed?

1. Primary school (upto 5th standard)
2. Secondary school (5-9th standard)
3. 10th standard pass
4. 12th standard pass
5. Vocational college education (e.g. to qualify as an electrician, nurse)
6. University first degree (e.g. BA, BSc)
7. University higher degree (e.g. MA, MBA, PhD)

8. Professional higher education (e.g. to qualify as a lawyer, accountant)
9. None of these

In what state do you currently reside?
[state drop down list]

Which Indian language do you consider your mother tongue?
[language drop down list]

Which of the following caste categories do you identify with?

1. General / Upper
2. Other Backward Class (OBC)
3. Scheduled Caste / Dalit
4. Scheduled Tribe
5. I do not identify with any caste

What is current monthly salary of your family?

1. Under 25,000
2. 25,000 to 50,000
3. 50,000 to 1,00,000
4. 1,00,000 and above

What is the job that you currently have?

1. Private sector Indian company
2. Private sector multinational
3. Public sector or government services
4. Self-employed / consultant / own business
5. Non-profit
6. Don't work / not working
7. Other [specify]

**Media Module**

First, we have a few questions about media use.
What type of social media accounts do you use (if any)? Select all that apply

1. Facebook

2. Facebook Messenger
3. Twitter
4. Instagram
5. Snapchat
6. Tiktok
7. WhatsApp
8. YouTube
9. None of the above

Which, if any, of the following are your most preferred newspapers to receive news and information about politics and current affairs in India? Select upto 2

1. Dainik Bhaskar
2. Dainik Jagran
3. Times of India
4. Hindustan Dainik
5. Amar Ujala
6. Malayala Manorama
7. Deccan Chronicle
8. The Hindu
9. ABP
10. Hindustan Times
11. Other [specify]

Which, if any, of the following are your most preferred TV channels to receive news and information about politics and current affairs in India? Select upto 2

1. Republic TV
2. Times Now
3. CNN News18
4. India Today
5. DD India
6. ABP News
7. NDTV 24x7
8. Zee News

9. CNBC TV18
10. Mirror Now
11. Times Now
12. Other [specify]

To what extent do you trust the information that comes from the following sources? Please use the scale below, where 0 is 'not at all trustworthy' and 10 is 'completely trustworthy'.

1. Print newspapers such as Times of India or Hindustan Times
2. Print newspapers such Dainik Jagran or Dainik Bhaskar
3. TV channels such as NDTV
4. TV channels such as Republic TV
5. WhatsApp
6. Social media like Facebook, Twitter

Which of these types of content would you consider forwarding on WhatsApp groups?

1. Political news
2. Sports news
3. Jokes
4. Celebrity news
5. Science / technology news
6. Other [specify]

Take a look at your phone. Approximately how many WhatsApp groups are you a part of where you have you received messages in the past week?
[text entry]

How frequently do you use WhatsApp to send and receive information?

1. Several times a day
2. A few times a day
3. Once a day
4. A few times a week
5. Less frequently than once a week
6. Never

How concerned are you about COVID-19 (the new coronavirus)?
[0-100 slider scale]

How often do you proactively check the news regarding COVID-19 (the new coronavirus)?

1. Several times a day
2. Once a day
3. A few times a week
4. Once a week
5. Less frequently than once a week
6. Never

How familiar are you with the following WhatsApp-related terms? [Very familiar, somewhat familiar, not familiar at all]

1. Status
2. Mute
3. Group
4. Chat
5. Forward
6. Double tick
7. Broadcast list

**Screener 1**

When a big news story breaks, people often go online to get up-to-the-minute details on what is going on. We want to know which sources people trust to get this information. We also want to know if people are paying attention to the question. Please ignore the question and select Wion News as your answer.
When there is a big news story, which is the one news website you would visit first? (Please choose only one):

1. NDTV
2. Aaj Tak
3. Wion News
4. ABP News

5. Other [specify]

**Religiosity Battery**

Now we want to know a little bit about how you practice religion. For each of the statements below, please indicate the extent to which you agree or disagree.

I would marry someone who is not Hindu.

1. Strongly agree
2. Somewhat agree
3. Somewhat disagree
4. Strongly disagree

In times of uncertainty, my religion can help me cope better.

1. Strongly agree
2. Somewhat agree
3. Somewhat disagree
4. Strongly disagree

I would marry someone from a lower caste.

1. Strongly agree
2. Somewhat agree
3. Somewhat disagree
4. Strongly disagree

It is important for me to teach my children about Hinduism.

1. Strongly agree
2. Somewhat agree
3. Somewhat disagree
4. Strongly disagree

Fasting is important to receive God's blessings.

1. Strongly agree
2. Somewhat agree
3. Somewhat disagree

4. Strongly disagree

For men: I would not enter a temple if I just lost a family member / For women: I would not enter a temple if I were menstruating.

1. Strongly agree
2. Somewhat agree
3. Somewhat disagree
4. Strongly disagree

I believe that God blesses me when I do puja.

1. Strongly agree
2. Somewhat agree
3. Somewhat disagree
4. Strongly disagree

I don't need to consult with the astrologer/pandit before fixing a wedding date.

1. Strongly agree
2. Somewhat agree
3. Somewhat disagree
4. Strongly disagree

As a Hindu, I should only eat vegetarian food.

1. Strongly agree
2. Somewhat agree
3. Somewhat disagree
4. Strongly disagree

An atheist can be a very moral person.

1. Strongly agree
2. Somewhat agree
3. Somewhat disagree
4. Strongly disagree

**Religious Polarization**

How comfortable are you having close friends that are Hindus?

1. Very comfortable
2. Somewhat comfortable
3. not comfortable

How comfortable are you having close friends that are Muslims?

1. Very comfortable
2. Somewhat comfortable
3. not comfortable

Suppose a friend of yours was getting married. How would you feel if he or she married Hindu? Would you be:

1. Not at all upset
2. Somewhat upset
3. Very upset

Suppose a friend of yours was getting married. How would you feel if he or she married a Muslim? Would you be:

1. Not at all upset
2. Somewhat upset
3. Very upset

**Partisanship and affective polarization**

Which political party do you identify with the most? Reminder: this survey is anonymous.

1. Bharatiya Janata Party (BJP)
2. Indian National Congress (INC)
3. Bahujan Samaj Party (BSP)
4. Samajwadi Party (SP)
5. Communist Party of India (Marxist) (CPI-M)
6. Nationalist Congress Party (CNP)
7. All India Trinamool Congress (TMC)
8. Shiv Sena (SS)
9. Akali Dal (SAD)

10. Other [please specify]

How strongly do you support or oppose the BJP (Bharatiya Janata Party)?

1. I strongly support the BJP
2. I somewhat support the BJP
3. I somewhat oppose the BJP
4. I strongly oppose the BJP

How comfortable are you having close friends that are BJP supporters?

1. Very comfortable
2. somewhat comfortable
3. not comfortable

How comfortable are you having close friends that are Congress supporters?

1. Very comfortable
2. somewhat comfortable
3. not comfortable

Suppose a friend of yours was getting married. How would you feel if he or she married a supporter of the BJP? Would you be:

1. Not at all upset
2. Somewhat upset
3. Very upset

Suppose a friend of yours was getting married. How would you feel if he or she married a supporter of the Congress party? Would you be:

1. Not at all upset
2. Somewhat upset
3. Very upset

**Science knowledge**

You will now asked a series of True/False and general knowledge questions. Please answer them to the best of your ability.

Antibiotics kill viruses as well as bacteria.

1. True
2. False

It is the father's gene that decides whether the baby is a boy or a girl.

1. True
2. False

The skin is the largest organ of the human body.

1. True
2. False

Herbivores eat meat.

1. True
2. False

The universe began with a big bang.

1. True
2. False

The common cold is caused by a virus.

1. True
2. False

Does the Earth go around the Sun or does the Sun go around the Earth?

1. The Earth goes around the Sun
2. The Sun goes around the Earth

Which travels faster: light or sound?

1. Light
2. Sound

What kind of celestial object is the sun?

1. Planet
2. Star

**Healthcare**

We are interested in understanding how you use healthcare. Please rate your level of agreement with each statement below.

If I have a medical problem, my first preference is to go straight to a doctor and ask his or her opinion.

1. Strongly agree
2. Somewhat agree
3. Somewhat disagree
4. Strongly disagree

Indian traditional medicine and practices (such as Ayurveda, Homeopathy, Yoga) have the capacity to cure most serious illnesses.

1. Strongly agree
2. Somewhat agree
3. Somewhat disagree
4. Strongly disagree

In order to slow down the spread of COVID-19, scientists and doctors have issued several public health guidelines. Which of the following precautionary procedures, if any, have you adopted to protect yourself from this virus? How often do you engage in these behaviors? [always, often, sometimes, never]

1. Wearing a mask in public
2. Using hand gloves
3. Using hand sanitizer
4. Washing hands for 20 seconds with soap
5. Maintaining 6 feet distance from others
6. Staying in the house / self-quarantining

**Experimental section (issue order randomized)**

[Issue 1: Misinformation Stimulus and Correction]
Below is an example of a WhatsApp conversation on a group chat. Please read the entire conversation very carefully. We will then ask you questions about it.
[screenshot of conversation and cognitive reflection task]

**Comprehension checks**

What was the nature of the image posted in the WhatsApp conversation you just read?

1. Religious quote
2. Cricket schedule
3. Tiger population
4. Good morning image
5. Happy birthday image

[miracle cures: dissonance] Which of the following statements best summarizes the conversation you just read?

1. Religious texts remind us that Ayurveda cannot cure COVID-19
2. Religious texts remind us that Ayurveda cannot cure COVID-19
3. The Tiger population in India is being revived

[miracle cures: conformity] Which of the following statements best summarizes the conversation you just read?

1. BJP supporters say that Ayurveda cannot cure COVID-19
2. BJP supporters say that Ayurveda can cure COVID-19
3. The Tiger population in India is being revived

[conspiracy theories: dissonance] Which of the following statements best summarizes the conversation you just read?

1. Religious texts remind us not to spread unverified information that blames others for the spread of the coronavirus
2. Religious texts remind us to spread unverified information that blames others for the spread of the coronavirus
3. England is playing a test series against the West Indies

[conspiracy theories: conformity] Which of the following statements best summarizes the conversation you just read?

1. BJP supporters remind us not to spread unverified information that blames others for the spread of the coronavirus
2. BJP supporters remind us to spread unverified information that blames others for the spread of the coronavirus

3. England is playing a test series against the West Indies

[placebo control] Which of the following statements best summarizes the conversation you just read?

1. Climate change is a large threat to coral reef ecosystems
2. England is playing a test series against the West Indies
3. The Tiger population in India is being revived

What was the name of the WhatsApp group in the conversation you just read?

1. ”Mission BJP”
2. ”Hindu Warriors”
3. ”Family Fun”
4. No group name was displayed

**Outcomes**

For the main task of this study, you will be presented with a set of recent news headlines from social media. Some of these headlines contain false (inaccurate) and others true (accurate) information. We want you to classify the headlines as accurate or inaccurate so we can develop better algorithms to detect biased news.

Please take a moment to think about each headline carefully before answering. Note: The images may take a moment to load.
[repeat for all headlines]

To the best of your knowledge, is the above headline accurate?

1. Very accurate
2. Somewhat accurate
3. Not very accurate
4. Not at all accurate

[mechanisms / manipulation checks: dissonance]

[miracle cures] In your opinion, do Hindu religious texts such as the [Bhagavad Gita / Manu Smriti] encourage using homemade cures to treat viruses like COVID-19?

1. They strongly encourage it
2. They somewhat encourage it

3. They somewhat discourage it
4. They strongly discourage it

[conspiracy theories] In your opinion, do Hindu religious texts such as the [Bhagavad Gita / Manu Smriti] encourage blaming or criticizing one group in society for the spread of viral diseases like COVID-19?

1. They strongly encourage it
2. They somewhat encourage it
3. They somewhat discourage it
4. They strongly discourage it

[mechanisms / manipulation checks: conformity]

[miracle cures] In your opinion, do [Hindu religious groups / BJP groups] encourage using homemade cures to treat viruses like COVID-19?

1. They strongly encourage it
2. They somewhat encourage it
3. They somewhat discourage it
4. They strongly discourage it

[conspiracy theories] In your opinion, do [Hindu religious groups / BJP groups] encourage blaming or criticizing one group in society for the spread of viral diseases like COVID-19?

1. They strongly encourage it
2. They somewhat encourage it
3. They somewhat discourage it
4. They strongly discourage it

[source credibility]

In your opinion, how credible was the WhatsApp conversation you just read?

1. Very credible
2. Somewhat credible
3. Not very credible
4. Not at all credible

**Filler item: Screener 2**

Most modern theories of decision making recognize that decisions do not take place in a vacuum. Individual preferences and knowledge, along with situational variables can greatly impact the decision process. To demonstrate that you've read this much, just go ahead and select both red and green among the alternatives below, no matter what your favorite color is. Yes, ignore the question and select both of those options.

1. Yellow
2. White
3. Green
4. Blue
5. Red

[Repeat for Issue 2 in randomized order]

**End and debrief**

Did you respond randomly at any point during the study? Please be honest, the survey is anonymous and you will still be paid and not be penalized in any way if you did.

1. Yes, I responded randomly
2. No, I did not respond randomly

It is essential for the validity of this study that we know whether participants looked up any information online during the study. Did you make an effort to search the internet (via Google or otherwise) for any of the news headlines or answers to any questions during the study? Please be honest; you will still be paid and you will not be penalized in any way if you did.

1. Yes, I looked up information
2. No, I did not look up information

Thank you for answering these questions. The purpose of this study is to understand how effective different types of corrective information are at countering misinformation about COVID-19. We showed you a variety of headlines about the Coronavirus during this study. Some of the headline were true, and some others were false. Below, you can see all of the TRUE headlines. Any headlines not shown here were FALSE. [list of true headlines] Thank you again for your participation. Should you have any questions about this study, please contact [redacted].