Public Health and Public Trust:* Survey Evidence from the Ebola Virus Disease Epidemic in Liberia

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Acknowledgements: This project received financial support from the Omidyar Network, the International Growth Centre, the MIT Governance Lab (MIT GOV/LAB) and the School of Humanities, Arts, and Social Sciences at MIT. Gregory Kitt and David Lamah at Parley Liberia provided invaluable research assistance.

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Abstract

Trust in government has long been viewed as an important determinant of citizens' compliance with public health policies, especially in times of crisis. Yet evidence on this relationship remains scarce, particularly in the developing world. We use results from a representative survey conducted during the 2014-15 Ebola Virus Disease (EVD) epidemic in Monrovia, Liberia to assess the relationship between trust in government and compliance with EVD control interventions. We find that respondents who expressed low trust in government were much less likely to take precautions against EVD in their homes, or to abide by government-mandated social distancing mechanisms designed to contain the spread of the virus. They were also much less likely to support potentially contentious control policies, such as "safe burial" of EVD-infected bodies. Contrary to stereotypes, we find no evidence that respondents who distrusted government were any more or less likely to understand EVD's symptoms and transmission pathways. While only correlational, these results suggest that respondents who refused to comply may have done so not because they failed to understand how EVD is transmitted, but rather because they did not trust the capacity or integrity of government institutions to recommend precautions and implement policies to slow EVD's spread. We also find that respondents who experienced hardships during the epidemic expressed less trust in government than those who did not, suggesting the possibility of a vicious cycle between distrust, non-compliance, hardships and further distrust. Finally, we find that respondents who trusted international non-governmental organizations (INGOs) were no more or less likely to support or comply with EVD control policies, suggesting that while INGOs can contribute in indispensable ways to crisis response, they cannot substitute for government institutions in the eyes of citizens. We conclude by discussing the implications of our findings for future public health crises.

Research highlights

- Large representative survey conducted during the Ebola crisis in Monrovia, Liberia.
- One of few quantitative studies on trust and public health in the developing world.
- Shows that Liberians who distrusted government took fewer precautions against Ebola.
- Those who distrusted government were also less compliant with Ebola control policies.
- Demonstrates the deadly role distrust can play in exacerbating public health crises.

Keywords

Ebola Virus Disease; trust in government; Liberia; household surveys; epidemics

Acknowledgements

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Ethics approval

Data collection for this project was approved by the MIT Committee on the Use of Humans as Experimental Subjects, COUHES Protocol #1412006783.

1 Introduction

Trust in government has long been viewed as an important determinant of citizens' compliance with public health policies, restrictions and guidelines. In the late 1990s in the UK, hesitancy towards the measles-mumps-rubella (MMR) vaccine was linked to "historic levels of distrust" in the British government, which magnified existing fears about the vaccine's safety and precipitated the spread of the virus around the country (Larson and Heymann 2010, 271). The 2015 measles outbreak in Orange County, California was linked to similar fears, again compounded by parents' distrust of public health agencies in the US (Salmon et al. 2015). Similar patterns emerged with the outbreak of HIV/AIDS, which some Americans believed to be a "man-made weapon of racial warfare" (Whetten et al. 2006, 716).

The public health risks posed by distrust may be especially severe in less developed countries, where mechanisms for mass communication are unreliable, health care is often inaccessible, and suspicions are compounded by long legacies of state weakness, absence or predation, and potentially by unfamiliarity with Western medicine as well. In these settings, even small-scale outbreaks can escalate into large-scale emergencies, affecting thousands of people and spilling across borders. In Nigeria in 2003, for example, a boycott of the polio vaccine precipitated a resurgence of cases not just in Nigeria, but also in multiple neighboring countries previously certified polio-free (Jegede 2007). As Larson and Heymann (2010, 272) write in a commentary in the *Journal of the American Medical Association*, "times of uncertainty and risk are times when public trust is most needed." When that need goes unmet, "lack of trust can cause health programs to fail with harmful consequences."

Most research on the relationship between public health and public trust has been anecdotal or based entirely on qualitative evidence. In a study of HIV-positive patients in the US, Whetten et al. (2006, 716) write that they were "unable to find any peer-reviewed studies of associations between patients' level of trust in systems of care...and their use of health services." Ten years later, empirical evidence on this relationship remains scarce.

Of the more systematic studies (qualitative or otherwise), most have focused on vaccine hesitancy in the US and UK (Freed et al. 2011; Marlow et al. 2007; Salmon et al. 2005). Research in less developed countries is rare, and quantitative research rarer still. (For partial exceptions, see Barnhoorn and Adriaanse 1992; Hewlett and Amola 2003; Onyeneho et al. 2015).

We report results from a large-N representative survey conducted in the midst of the 2014-15 Ebola Virus Disease (EVD) epidemic in Monrovia, Liberia. Media and non-governmental organizations (NGOs) have consistently emphasized the deadly role that distrust of government played in precipitating the spread of EVD (see, e.g., Epstein 2014; Leaf 2014). Existing scholarship, however, has tended to focus either on modeling EVD's transmission dynamics (Chowell et al. 2004) or on assessing its economic costs and consequences (Bowles et al. 2015; Fallah et al. 2015). In their review of epidemiological models of EVD, Chowell and Nishiura (2014, 11) write that they "cannot overemphasize the importance of collecting data relating to population behaviors influencing disease spread and control," and of recording the "level of adoption of preventive and social distancing measures in the community." Our study is, in effect, a response to this call, and is one of only a few quantitative studies on the relationship between trust and public health in the developing world.

We find that Liberians who expressed low trust in government were much less likely to comply with EVD control measures or to support contentious EVD control policies, including restrictions on travel and "safe burial" of EVD-infected bodies by government health workers. Contrary to stereotypes, and to the findings of some previous research on vaccine hesitancy (e.g. Raithatha et al. 2003; Salmon et al. 2005), we find no evidence that Liberians who distrusted government were any more or less likely to hold erroneous beliefs about EVD transmission, symptoms and treatment. While only correlational, these results suggest that respondents who refused to comply may have done so not because they misunderstood how EVD is transmitted, but rather because they did not trust the capacity or integrity of government institutions to promote mechanisms and implement policies to slow EVD's spread

(at least at the time of the survey).

The EVD epidemic imposed myriad hardships on Liberians, which may have further exacerbated distrust of government. Consistent with this intuition, we find that respondents who experienced hardships such as losing their jobs or foregoing health care expressed much less trust in government than those who did not. Again, while this is only a correlation, it raises the possibility of a vicious cycle: if those who experienced hardships were less likely to trust government and therefore less likely to comply with EVD control policies, then they may have exposed themselves to a higher risk of infection, and thus a higher risk of suffering further hardships.

Finally, we find that trust in international NGOs (INGOs) was not correlated with support for, or compliance with, EVD control interventions. INGOs such as Médecins Sans Frontières and the American Red Cross were intimately involved in the response to the EVD epidemic. While they did not have the legal authority to impose curfews, restrict travel or ban public gatherings, they nonetheless encouraged compliance with these policies, and issued guidelines for preventing the spread of the virus (e.g. using hand sanitizer). Our results suggest, however, that while INGOs may have contributed in indispensable ways to ending the crisis, ultimately they could not substitute for government institutions in the eyes of citizens.

Our results are broadly consistent with intuitions underlying the health belief model (HBM, though studies using the HBM typically do not consider trust in government), and more specifically with studies arguing that the spread of EVD and similar diseases may be determined as much by social, cultural and political factors as by characteristics of the virus itself (Abramowitz et al. 2015; Chowell and Nishiura 2014; Hewlett and Amola 2003; Modarres 2015). We conclude by arguing that scholars and policymakers should take these factors more explicitly into consideration when designing control interventions in future, and when modeling the spread of otherwise easily preventable diseases like EVD.

2 Background

2.1 The 2014-15 EVD epidemic in West Africa

The 2014-15 EVD epidemic in West Africa was unprecedented in magnitude, duration and geographical scope. Over 28,000 cases were documented over the course of the epidemic, resulting in over 11,000 deaths in Guinea, Liberia and Sierra Leone. Even months before the epidemic was over, its toll had already far surpassed the total number of cases reported in all previous outbreaks combined (Chowell and Nishiura 2014).

The crisis had devastating effects on the economies and health care systems of the three most severely affected countries. At the peak of the epidemic, most employers, government agencies and local NGOs ceased operations, exacerbating unemployment and creating food shortages. Hospitals closed due to a lack of staff, many of whom stayed home for fear of contracting the virus. Quarantines, nighttime curfews and bans on public gatherings further limited social and economic activity. Many citizens lost their jobs, forewent treatment for even the most common illnesses, or witnessed EVD-infected bodies lying uncovered in the streets (Morse et al. 2016). Incidents of civil unrest were common.

Compliance with government-mandated social distancing policies was crucial to slowing the virus's spread. In weak states like Guinea, Liberia and Sierra Leone, however, these policies constituted a dramatic and largely unprecedented intrusion of government authority into citizens' daily lives. Citizens were mandated to comply with quarantines, case reporting and contact tracing, and were instructed not to care for loved ones suffering from EVD-like symptoms, or to wash the bodies of the dead prior to burial (as is customary). In Liberia, public gatherings were banned from July 2014 to January 2015; schools were closed; a 6:00 PM curfew was put into effect; and handshaking, kissing and touching were all strongly discouraged.

By most accounts, compliance with these restrictions was low in the early months of the

epidemic (Chan 2014). EVD was mysterious and compliance was costly and inconvenient, and in some cases contravened cultural norms and basic human instincts to care for the ill and honor the dead. Rumors that government officials either manufactured EVD or facilitated its spread found a receptive audience among citizens accustomed to government corruption and dysfunction. Liberians who lost their jobs or struggled to find treatment for common illnesses may have blamed government institutions for their hardships, exacerbating distrust and non-compliance, which is believed to have been a key contributor to EVD's proliferation throughout the region (Epstein 2014; Leaf 2014).

2.2 Existing evidence on public health and perceptions of government

The EVD epidemic is hardly the first time that scholars have emphasized the importance of public trust for ensuring citizens' compliance with government officials and institutions. Trust in government has been identified as a key correlate of tax compliance (Scholz and Lubell 1998), of the decision to report crimes to the police (Tyler 2006), and of "the effective exercise of political power" more generally (Gilley 2009, xi). Trust can increase citizens' tolerance of otherwise intrusive government interventions; conversely, distrust can foment "antagonism to government policy and even active resistance" (Levi 2003, 9).

Research on trust in the field of public health has largely focused on vaccine hesitancy among parents of school-aged children in the US and UK. Studies have found that parents of unvaccinated children in the US tend to express disproportionately low trust in government, and tend to be skeptical of government-provided information about the risks and efficacy of vaccines (Salmon et al. 2005). Research on hesitancy towards the MMR vaccine in the UK has further emphasized the "urgent need" to address the concerns of parents who lack trust in government agencies (Raithatha et al. 2003, 161), and the importance of recognizing how "people's engagements with MMR reflect wider changes in their relations with science and the state" (Poltorak et al. 2005, 709). More polemically, at least one study has argued that

because many UK parents report considerable distrust in government, physicians' ability to advise them "could be undermined if a government were to directly promote the vaccine" (Casiday et al. 2006, 177).

Most of these studies rely on internet (e.g. Freed et al. 2011) and/or mail surveys (e.g. Salmon et al. 2005; Marlow et al. 2007), which generally yield low response rates and are thus susceptible to potentially severe selection effects. Moreover, findings from more developed countries may not generalize to less developed ones, where empirical evidence on the relationship between trust and public health is scarce and generally confined to anecdotal case studies (e.g. Jegede 2007; Renne 2006) or purely qualitative investigations (e.g. Liefooghe et al. 1995; Okeibunor et al. 2007; Rashid et al. 2001). Quantitative research is rare, especially in times of crisis. Our study aims to help fill this gap.

3 Data and methods

3.1 Sampling frame and response rate

We conducted a representative survey of Monrovia, Liberia from December 6, 2014 to January 7, 2015, in collaboration with Parley Liberia, a local NGO. The survey was administered in person by trained Liberian enumerators using handheld tablets. Our use of in-person surveys rather than remote cell phone surveys constituted an important advantage of our study over others conducted at the time, and contributed to our high response rate of 95%. By comparison, the first two rounds of a World Bank-sponsored high-frequency cell phone survey conducted around the same time achieved a combined response rate of approximately 20% (Himelein 2014). The use of in-person surveys also helped establish rapport between respondents and enumerators, potentially increasing the accuracy of responses. (We discuss safety precautions in Section 3.2 below.) The survey lasted 50 minutes on average.

Selection of respondents followed a three-stage sampling procedure. In the first stage, 78 neighborhoods were randomly selected from among Monrovia's fifteen administrative

wards, with a probability of selection proportional to population size. In the second stage, twenty households were randomly selected within each neighborhood following a random walk procedure (described in more detail in the online appendix). In the third stage, a single adult respondent was randomly selected within each household. If the respondent was not home at the time of the enumerator's visit, an appointment was made for later that day or the following day. If the respondent was not available within 48 hours, the household was replaced.

3.2 Safety precautions

We took extensive precautions to ensure the safety of our survey enumerators. First, enumerators avoided any neighborhood with known active EVD cases or contacts. Within neighborhoods, enumerators coordinated with local leaders to avoid households with known EVD victims (past or present), suspected EVD victims (past or present) or otherwise sick persons (present). Enumerators were trained to avoid physical contact and to maintain a two-foot distance when interacting with respondents. They also monitored their temperatures daily, and were provided with rubber boots and hand sanitizer as additional precautions. No adverse events to Parley staff or respondents were reported at any time during the survey.

3.3 Variable construction

Variables are divided into six categories. We measured **trust in government** using six questions about the perceived capacity, integrity and trustworthiness of the Liberian government generally, and the Liberian Ministry of Health specifically, with response options following a 5-point Likert scale. We recoded these responses as indicators taking a 1 for any respondent who "agreed" or "strongly agreed" with the corresponding statement. We then aggregated these indicators into an additive index of trust in government with values ranging from 0 to 6. (As we show in the online appendix, our results are unchanged if we aggregate the Likert scores instead.) For purposes of comparison we also measured **trust in**

INGOs using two of the same six questions used to measure trust in government.

We used five questions to measure **compliance with EVD control measures**. Respondents were asked whether they kept a bucket with chlorinated water in the home; whether they used hand sanitizer on a daily basis; whether they avoided physical contact with others; and whether they had broken the nighttime curfew or the ban on public gatherings in the past two weeks. We coded answers to these questions as indicators, which we then aggregated into an additive index of compliance ranging from 0 to 5.

To measure **support for EVD control interventions**, we asked respondents to express their support (using 5-point Likert scales) for five policies: the nighttime curfew, the ban on public gatherings, cremation of EVD-infected bodies, "safe burial" of EVD-infected bodies by government health workers, and restrictions on travel. We again recoded answers to these questions as indicators, then aggregated the indicators into an additive index ranging from 0 to 5. (Again, our results are unchanged if we use an index of Likert scales instead.)

We measured **knowledge about EVD** by asking respondents whether they believed each of three misconceptions that were common in Liberia during the epidemic: that EVD can spread before symptoms show, that it can be cured by drinking salt water, and that it can spread through the air. We aggregated answers to these questions into an additive index. We then asked respondents to name as many EVD symptoms and transmission pathways as they could, and recorded the number of correct answers they provided.

Finally, we measured **hardships experienced during the epidemic** by asking respondents whether they had lost their job in the last six months; whether they had seen dead bodies lying in the street; whether they knew any EVD victims; and whether they or any of their family members had foregone medical treatment in the past three months as a result of the epidemic. We aggregated answers to these questions into an additive index as well.

3.4 Estimation

To demonstrate the robustness of our findings, we report results from four ordinary least squares (OLS) regression specifications: (1) without controls, (2) with controls, (3) with controls and ward fixed effects, and (4) with controls and neighborhood fixed effects. Standard errors are clustered at the neighborhood level throughout. For ease of interpretation, all but two of our dependent variables are standardized to have mean 0 and unit standard deviation. (We do not standardize number of known EVD symptoms or number of known transmission pathways.) We standardize our indices of trust in government and INGOs as well.

Control variables include indicators for gender, above median education, above median income, age bracket (31-40, 40-50, 51-60, and 61 or more years of age), religion, and above median household size. We also include indicators for voting in the 2011 presidential election, and for membership in a "secret society"—traditional institutions designed to regulate members' behavior and protect them from harm. Descriptive statistics for these controls are reported in the online appendix.

3.5 Limitations

Our analysis is not without limitations. As with any study using self-reports to measure potentially sensitive topics, our survey is susceptible to social desirability bias. It is possible, for example, that respondents who trusted government may have over-reported compliance with government-mandated restrictions. While we cannot eliminate this possibility altogether, respondents were repeatedly reassured of the confidentiality of their responses, and were given the option of skipping any question they preferred not to answer. Pre-testing suggested that our questions were not perceived as particularly sensitive, which is consistent with the many affirmative responses we received to questions about non-compliance in Table 1 below.

In addition, our survey began in December 2014, four months after the peak of the epidemic. As a result, our findings may not reflect the relationship between trust and compliance at the height of the crisis. Our data also cover Monrovia alone, and our findings may not generalize to other parts of Liberia, or to neighboring Guinea and Sierra Leone, where quarantines and other social distancing interventions were longer and more onerous. If anything, we expect these limitations should cause us to underestimate the strength of the correlation between distrust and non-compliance. Moreover, Monrovia constitutes an important study site in and of itself, as over half of all confirmed EVD cases in Liberia were recorded in the capital city and its environs (based on author calculations using World Health Organization data from February 2015, available at http://apps.who.int/gho/data/node.ebola-sitrep.ebola-country-LBR-20150218?lang=en, accessed September 21, 2016.)

Finally, to ensure the safety of our enumerators, we limited our sample to households whose members were not known or suspected to have EVD. We expect this limitation should cause us to underestimate the correlation between trust in government and hardships experienced during the epidemic. (As we discuss below, the correlation between trust and knowing an EVD victim is strongly negative, and we expect the correlation with *being* an EVD victim to be even more so.) While sampling EVD victims themselves would have generated further insights, this simply was not possible without resorting to cell phone surveys, which are limited in the ways described above.

4 Results

4.1 Descriptive statistics

Table 1 provides descriptive statistics for the six categories of variables described above. Distrust of government was pervasive among our respondents. Only 15% believed the government was willing to provide health care for citizens, and only 35% believed it had the capacity to do so. Less than one-quarter (24%) expressed trust in government generally,

and just 27% expressed trust in the Ministry of Health specifically. Nearly three-quarters (73%) described the government as corrupt, and over two-thirds (67%) said the same of the Ministry of Health. In contrast, 73% of respondents expressed trust in INGOs, and only 19% described them as corrupt.

Overall, compliance with EVD control measures was high. 89% of respondents reported always obeying the nighttime curfew in the last two weeks, 77% reported always obeying the ban on public gatherings, and 82% reported avoiding physical contact. Over three-quarters (77%) of respondents reported keeping a bucket with chlorinated water in their homes, though less than half (44%) reported using hand sanitizer on a daily basis, perhaps because buckets were more widely available than hand sanitizer when the epidemic began.

Support for EVD control interventions was overall high as well, but varied across policies. 80% of respondents supported the ban on public gatherings, but only 19% supported cremation of EVD-infected bodies. Respondents were more evenly divided on the nighttime curfew, restrictions on travel and "safe burial," with 68%, 60% and 52% supporting each of these policies, respectively.

While respondents did harbor some misconceptions about EVD, these would have favored more rather than less caution towards the virus. While less than one-quarter of respondents (21%) believed EVD can spread through the air, nearly two-thirds (60%) believed it can spread before symptoms manifest. Only 9% believed EVD can be cured by drinking salt water. Respondents could name about three EVD symptoms on average, and about three transmission pathways as well.

The epidemic affected the vast majority of Liberians in some way, whether directly or indirectly, and three-quarters of our respondents reported experiencing at least one of the four hardships we measured. Nearly one-quarter (24%) reported seeing dead bodies awaiting retrieval in the streets, over one-quarter (28%) knew at least one EVD victim, and nearly one-third (32%) reported foregoing health care. Nearly half (47%) reported losing their job in the past 6 months, and most attributed their job loss to EVD specifically.

4.2 Compliance with EVD control measures, support for EVD control interventions and trust in government

Table 2 reports correlations between our index of trust in government and our indices of compliance and support for EVD control measures. The first and second columns report results with and without controls, respectively; the third and fourth columns add ward and neighborhood fixed effects, respectively. For compactness we report coefficients on the trust index only; tables with coefficients on the control variables are included in the online appendix. To further illustrate the substantive significance of these correlations, Figure 1 displays the predicted probability of compliance and support for specific EVD control interventions among respondents with the most (6 on our index) and least (0 on our index) trust in government, adjusting for neighborhood fixed effects and holding all other controls at their means. (We display these comparisons in table form in the online appendix.)

Trust in government was strongly positively associated with compliance among our respondents. From Table 2, a one standard deviation increase on our trust in government index predicted a 0.12-0.15 standard deviation increase on our index of compliance with EVD control measures (depending on the specification). From Figure 1, compared to those with the least trust in government, those with the most trust were 11 percentage points more likely to report keeping a bucket with chlorinated water in the home (74% vs. 85%, $p < 0.01$); 9 percentage points more likely to report avoiding physical contact (80% vs. 89%, $p < 0.05$); 8 percentage points more likely to report obeying the nighttime curfew (87% vs. 95%, $p < 0.01$); 17 percentage points more likely to report obeying the ban on public gatherings (74% vs. 91%, $p < 0.001$); and 7 percentage points more likely to report using hand sanitizer on a daily basis (43% vs. 50%, though this difference is not quite statistically significant at conventional levels—$p = 0.11$).

Trust was strongly positively associated with support for EVD control policies as well. From Table 2, a one standard deviation increase on our index of trust predicted a 0.18-0.22

standard deviation increase on our index of support. From Figure 1, compared to those with the least trust in government, those with the most trust were 30 percentage points more likely to support the nighttime curfew (61% vs. 91%, $p < 0.0001$); 21 percentage points more likely to support the ban on public gatherings (76% vs. 97%, $p < 0.0001$); 14 percentage points more likely to support "safe burial" (49% vs. 63%, $p < 0.01$); and 16 percentage points more likely to support restrictions on travel (56% vs. 72%, $p < 0.0001$). All of these correlations are substantively large, highly statistically significant and robust to changes in specification. Those with the most trust in government were also 6 percentage points more likely to support cremation of EVD-infected bodies (18% vs. 24%), but this difference is not statistically significant.

4.3 Knowledge about EVD and trust in government

Table 3 reports correlations between our index of trust in government and our indices of erroneous beliefs about EVD and knowledge of EVD symptoms and transmission pathways. (Our index of erroneous beliefs is standardized for purposes of this analysis; our indices of known EVD symptoms and transmission pathways are not.) To again illustrate the substantive significance of our results, Figure 2 reports predicted scores on these indices (or their component parts) among respondents with the most and least trust in government.

While some studies of vaccine hesitancy suggest that citizens who distrust government may be especially susceptible to fallacious or scientifically unfounded beliefs about the dangers vaccines pose (Raithatha et al. 2003; Salmon et al. 2005), we find no evidence of an analogous relationship between trust in government and erroneous beliefs about EVD in Liberia. The correlation between our trust index and our index of erroneous beliefs is substantively and statistically insignificant across specifications. Compared to those with the least trust in government, those with the most trust were no more or less likely to believe drinking saltwater can cure EVD, and no more or less likely to believe EVD can spread through the air.

Indeed, if anything we find that Liberians who trusted government were *less* informed than those who did not. The correlation between trust and number of known EVD transmission pathways is negative and statistically significant across specifications. (The correlation between trust and number of known EVD symptoms is negative across specifications as well, but is not statistically significant after including controls.) Compared to those with the least trust in government, those with the most trust were also 10 percentage points more likely to believe EVD can spread before symptoms show (57% vs. 67%, $p < 0.05$). We return to these results in the conclusion.

4.4 Hardships experienced during the EVD epidemic and trust in government

Table 4 reports correlations between trust in government and hardships experienced during the EVD epidemic. Hardships were strongly negatively associated with trust: a one standard deviation increase in our hardships index predicted a 0.17-0.21 decrease in our index of trust in government, again depending on specification. As we show in the online appendix, these correlations are strongest among those who reported seeing dead bodies awaiting retrieval, and weakest among those who reported losing their jobs or foregoing health care—a perhaps unsurprising result given that delay in retrieving dead bodies was among the more obvious and striking signals of the government's lack of capacity during the epidemic.

4.5 Compliance with EVD control measures, support for EVD control interventions and trust in INGOs

Finally, Table 5 reports correlations between our index of trust in INGOs and our indices of compliance and support for EVD control interventions. Neither compliance nor support appears to have been positively correlated with trust in INGOs. Indeed, if anything the opposite appears to be true: the coefficients on our trust index are negative across spec-

ifications, though, with one exception, they are not statistically significant. (As we show in the online appendix, these negative correlations are driven by one form of compliance in particular—keeping a bucket with chlorinated water in the home—and one form of support: approval of restrictions on travel.) We return to these results in the conclusion as well.

5 Conclusion

Trust in government is widely considered a key determinant of citizens' compliance with public health policies, especially in times of crisis. Quantitative evidence supporting this intuition remains rare, however, particularly in less developed countries, where the need for compliance is arguably most urgent, but where data is most scarce.

Using a large-N representative survey conducted in Monrovia, Liberia in the midst of the 2014-15 EVD epidemic, we find that Liberians who expressed trust in government were much more likely to support and comply with social distancing restrictions designed to contain the spread of the virus, and were much more likely to take precautions to prevent transmission in the home. These results are substantively large, highly statistically significant and robust to specification. While they are only correlations, they nonetheless suggest that trust may indeed play a crucial role in sustaining public health, especially when compliance is onerous (e.g. nighttime curfews) or unfamiliar (e.g. keeping a bucket with chlorinated water in the home), or when public health restrictions are culturally contentious (e.g. cremation of EVD-infected bodies).

Contrary to stereotypes and to the results of some previous studies, we also find that the least trusting respondents were no more or less knowledgeable about EVD than the most trusting, and no more or less susceptible to erroneous or scientifically unfounded beliefs about EVD prevention and treatment. (Indeed, if anything the opposite appears to be true.) While only correlational, these results suggest that respondents who refused to comply at the time of the survey may have done so not because they failed to understand how EVD spreads,

but rather because they did not trust the capacity or integrity of government institutions to implement interventions and recommend precautions to mitigate the threat that EVD posed. Distrust also may have fomented rumors of the government's complicity in manufacturing EVD, in which case respondents may have believed that policies ostensibly designed to contain the virus were actually intended to spread it. It is also possible that the least trusting respondents were the most motivated to seek credible independent information from other sources, though unfortunately we cannot test this possibility with our data. Whatever the explanation, our results suggest that information alone may not generate compliance if citizens do not trust the source of that information in the first place.

We also find that Liberians who experienced hardships during the epidemic expressed much less trust in government than those who did not. This correlation suggests the possibility of a vicious cycle in which distrust exacerbated non-compliance, which in turn compounded the risk of experiencing hardships, which then further aggravated distrust. Our analysis here is limited to a single cross-section of data, and so we cannot assess this sequential logic empirically. Nonetheless, it is consistent with our results, and suggests that distrust may be self-perpetuating in times of crisis.

Finally and perhaps most surprisingly, we find that the correlation between trust, support and compliance may be specific to government institutions. While INGOs played a lead role in ending the epidemic, our results suggest that they may not be able to substitute for government in the eyes of citizens, even (or perhaps especially) in places where government institutions are weak and widely distrusted. While our analyses do not address mechanisms for building trust between citizens and their elected representatives, we speculate that INGOs might facilitate this process by ensuring that government officials and health workers are seen on the front lines of the response (assuming they are willing to take the corresponding risks). INGOs might even consider allowing the government to claim partial credit for their efforts (e.g. through the use of co-branding). Government health workers might also coordinate with local NGOs, whose capacity may be limited, but whose reputation within their communities

might lend credibility to health workers' actions (Abramowitz et al. 2015).

Overall, our study lends credence to arguments that the spread of EVD and similar diseases may be determined as much by social, cultural and political factors as by epidemiological ones, such as the basic reproduction number (Chowell and Nishiura 2014; Hewlett and Amola 2003). Some scholars have already begun incorporating these factors into their predictive models, even if only informally, in the hope of improving forecasts in future (e.g. Chowell and Nishiura 2014). EVD spread much more rapidly than most observers anticipated, but also abated much more quickly than most models predicted, at least in Liberia. Quantifying and modeling non-epidemiological factors strikes us as a promising avenue for researchers to pursue.

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Table 1: Descriptive statistics

	Mean	S.D.	N
Trust in government			
Believes government willing to provide health care	0.15	0.36	1,557
Believes government able to provide health care	0.35	0.48	1,555
Trusts government	0.24	0.43	1,557
Trusts Ministry of Health	0.27	0.44	1,557
Believes government is corrupt	0.73	0.44	1,557
Believes Ministry of Health is corrupt	0.68	0.47	1,557
Trust in INGOs			
Trusts INGOs	0.73	0.44	1,557
Believes INGOs are corrupt	0.19	0.39	1,557
Compliance with EVD control measures			
Keeps bucket with chlorinated water in home	0.77	0.42	1,561
Uses hand sanitizer daily	0.44	0.50	1,561
Avoids physical contact	0.82	0.38	1,561
Obeys nighttime curfew	0.11	0.31	1,572
Obeys ban on public gatherings in last 2 weeks	0.23	0.42	1,572
Support for EVD control interventions			
Supports nighttime curfew	0.68	0.47	1,543
Supports ban on public gatherings	0.80	0.40	1,542
Supports cremation of EVD-infected bodies	0.19	0.39	1,543
Supports "safe burial" by public health workers	0.52	0.50	1,541
Supports restrictions on travel	0.60	0.49	1,543
Knowledge about EVD			
Believes EVD can spread before symptoms	0.60	0.49	1,552
Believes EVD can be cured by drinking salt water	0.09	0.29	1,549
Believes EVD can spread through air	0.21	0.41	1,560
# of known symptoms	3.21	1.52	1,572
# of known transmission pathways	2.79	1.57	1,572
Hardships experienced during epidemic			
Lost job	0.47	0.50	1,553
Saw dead bodies awaiting retrieval	0.24	0.43	1,449
Knows EVD victims	0.28	0.45	1,572
Forewent health care	0.32	0.47	1,557

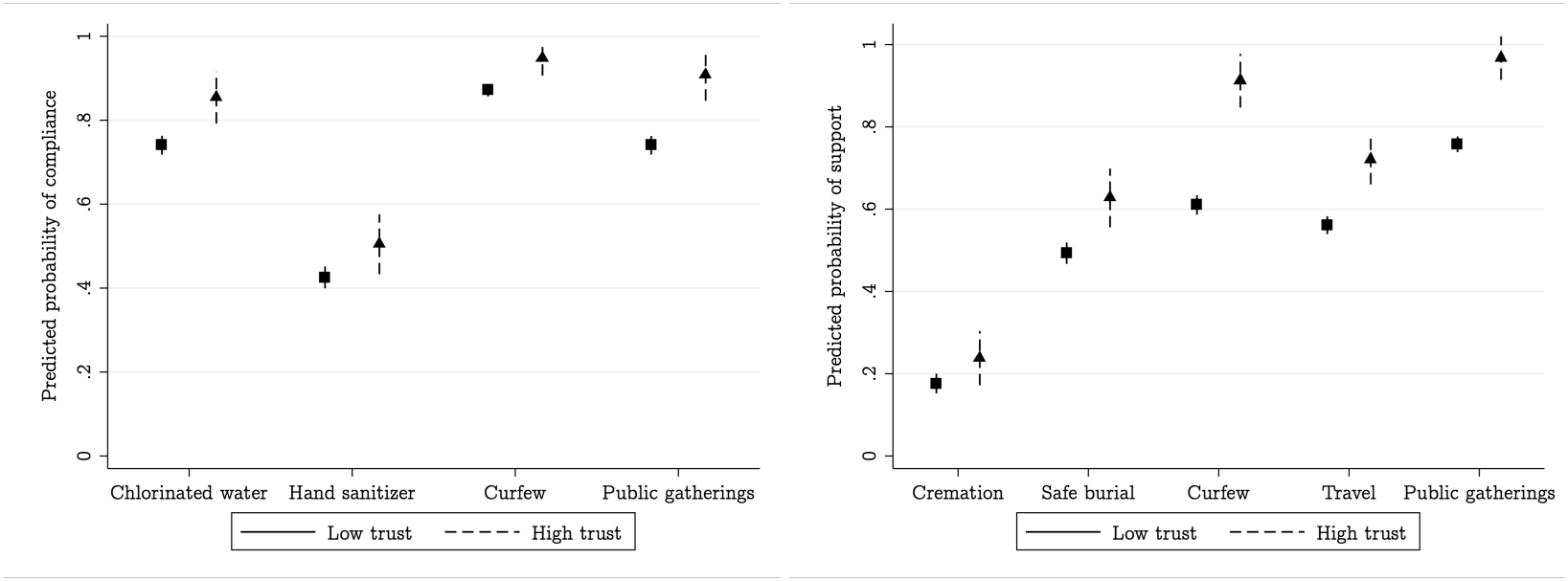
Notes: Means and corresponding standard deviations and number of observations for key dependent and independent variables.

Table 2: Compliance with EVD control measures, support for EVD control interventions and trust in government

	(1)	(2)	(3)	(4)
DV = compliance index				
Trust in government index	0.15	0.15	0.14	0.12
	[0.03]***	[0.02]***	[0.02]***	[0.03]***
Observations	1,545	1,487	1,487	1,487
R^2	0.03	0.06	0.09	0.16
DV = support index				
Trust in government index	0.22	0.20	0.20	0.18
	[0.03]***	[0.03]***	[0.03]***	[0.03]***
Observations	1,524	1,467	1,467	1,467
R^2	0.04	0.06	0.08	0.15
Controls	N	Y	Y	Y
Ward FE	N	N	Y	N
Neighborhood FE	N	N	N	Y

Notes: Coefficients from OLS regressions. The dependent variables are a standardized additive index of compliance with EVD control measures (top panel) and a standardized additive index of support for EVD control interventions (bottom panel). The independent variable of interest is a standardized additive index of trust in government. Coefficients on the control variables are excluded for compactness here, but are included in the online appendix. Column 1 reports correlations without controls. Column 2 reports correlations with controls. Column 3 reports correlations with controls and ward fixed effects. Column 4 reports correlations with controls and neighborhood fixed effects. Standard errors are in brackets, and are clustered at the neighborhood level throughout. $^{+}$p<0.1; *p<0.05; **p<0.01; ***p<0.001.

Figure 1: Predicted probability of compliance with EVD control measures and support for EVD control interventions at high and low trust in government



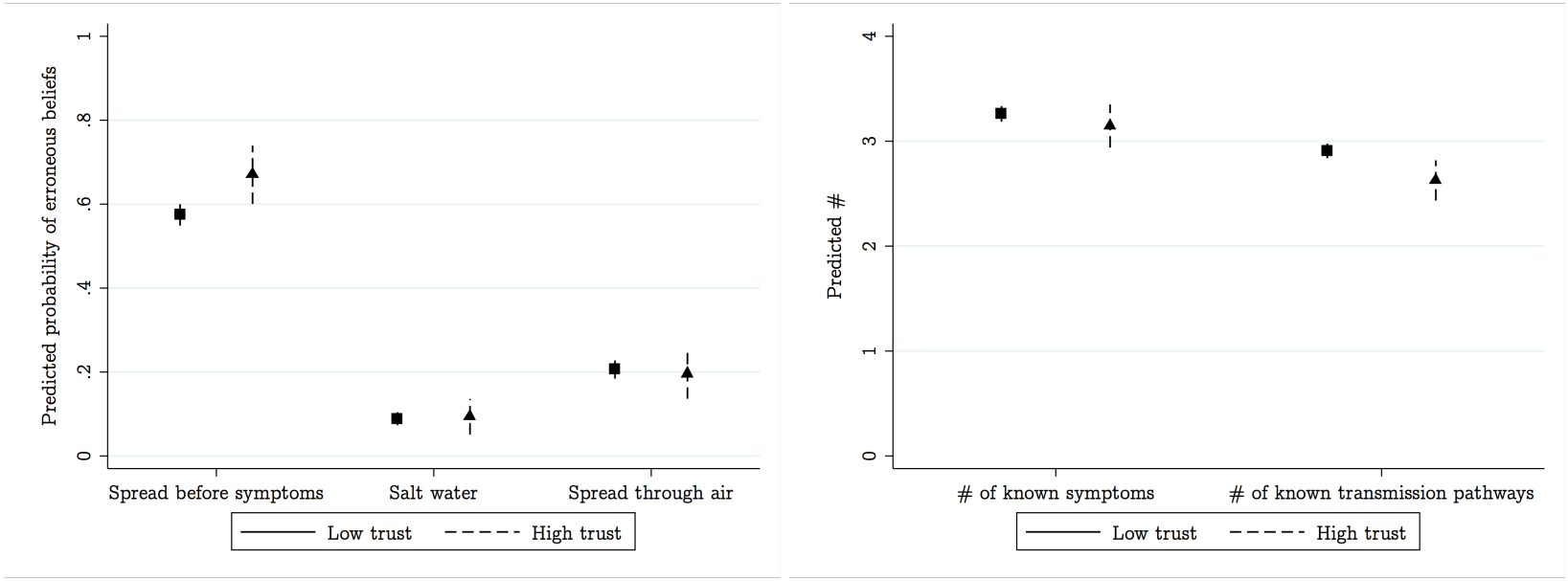
Notes: Predicted probabilities from OLS regressions. The dependent variables are four indicators of compliance with EVD control measures (left plot) and four indicators of support for EVD control interventions (right plot). Indicators of compliance include keeping a bucket with chlorinated water in the home; using hand sanitizer daily; obeying the nighttime curfew; and obeying the ban on public gatherings. Indicators of support include support for the nighttime curfew; support for the ban on public gatherings; support for cremation of EVD-infected bodies; support for "safe burial;" and support for restrictions on travel. The independent variable of interest is an additive index of trust in government. Squares and solid lines denote point estimates and 95% confidence intervals, respectively, for respondents taking a 0 (minimum) on the additive index, holding all controls at their means. Triangles and dashed lines denote point estimates and 95% confidence intervals for respondents taking a 6 (maximum) on the additive index, again holding all controls at their means. Standard errors are clustered at the neighborhood level.

Table 3: Knowledge about EVD and trust in government

	(1)	(2)	(3)	(4)
DV = erroneous beliefs index				
Trust in government index	0.04	0.02	0.02	0.03
	[0.03]	[0.03]	[0.03]	[0.03]
Observations	1,531	1,475	1,475	1,475
R^2	0.00	0.08	0.09	0.14
DV = # of known symptoms				
Trust in government index	-0.13	-0.06	-0.05	-0.03
	[0.04]**	[0.04]	[0.04]	[0.04]
Observations	1,555	1,497	1,497	1,497
R^2	0.01	0.06	0.08	0.14
DV = # of known transmission pathways				
Trust in government index	-0.17	-0.12	-0.11	-0.08
	[0.04]***	[0.04]**	[0.04]**	[0.04]*
Observations	1,555	1,497	1,497	1,497
R^2	0.01	0.07	0.11	0.20
Controls	N	Y	Y	Y
Ward FE	N	N	Y	N
Neighborhood FE	N	N	N	Y

Notes: Coefficients from OLS regressions. The dependent variables are a standardized additive index of erroneous beliefs about EVD (top panel) and additive indices of known EVD symptoms and transmission pathways (middle and bottom panels, respectively). The independent variable of interest is a standardized additive index of trust in government. Coefficients on the control variables are excluded for compactness here, but are included in the online appendix. Column 1 reports correlations without controls. Column 2 reports correlations with controls. Column 3 reports correlations with controls and ward fixed effects. Column 4 reports correlations with controls and neighborhood fixed effects. Standard errors are in brackets, and are clustered at the neighborhood level throughout. $^{+}$p<0.1; *p<0.05; **p<0.01; ***p<0.001.

Figure 2: Predicted probability of erroneous beliefs about EVD and predicted # of known EVD symptoms and transmission pathways at high and low trust in government



Notes: Predicted probabilities from OLS regressions. The dependent variables are three indicators for erroneous beliefs about EVD (left plot) and two indices of knowledge about EVD (right plot). Indicators of erroneous beliefs include belief that EVD can spread before symptoms; belief that EVD can be cured by drinking salt water; and belief that EVD can spread through the air. The independent variable of interest is an additive index of trust in government. Squares and solid lines denote point estimates and 95% confidence intervals, respectively, for respondents taking a 0 (minimum) on the additive index, holding all controls at their means. Triangles and dashed lines denote point estimates and 95% confidence intervals for respondents taking a 6 (maximum) on the additive index, again holding all controls at their means. Standard errors are clustered at the neighborhood level.

Table 4: Hardships experienced during the EVD epidemic and trust in government

	(1)	(2)	(3)	(4)
DV = trust in government index				
Hardships index	-0.21	-0.19	-0.19	-0.17
	[0.03]***	[0.03]***	[0.03]***	[0.03]***
Observations	1,413	1,361	1,361	1,361
R^2	0.05	0.06	0.08	0.13
Controls	N	Y	Y	Y
Ward FE	N	N	Y	N
Neighborhood FE	N	N	N	Y

Notes: Coefficients from OLS regressions. The dependent variable is a standardized additive index of trust in government. The independent variable of interest is a standardized additive index of hardships experienced during the EVD epidemic. Coefficients on the control variables are excluded for compactness here, but are included in the online appendix. Column 1 reports correlations without controls. Column 2 reports correlations with controls. Column 3 reports correlations with controls and ward fixed effects. Column 4 reports correlations with controls and neighborhood fixed effects. Standard errors are in brackets, and are clustered at the neighborhood level throughout. $^{+}$p<0.1; *p<0.05; **p<0.01; ***p<0.001.

Table 5: Compliance with EVD control measures, support for EVD control interventions and trust in INGOs

	(1)	(2)	(3)	(4)
DV = compliance index				
Trust in INGOs	-0.03	-0.03	-0.03	-0.02
	[0.02]	[0.02]	[0.02]	[0.02]
Observations	1,547	1,489	1,489	1,489
R^2	0.00	0.04	0.07	0.15
DV = support index				
Trust in INGOs	-0.05	-0.03	-0.03	-0.02
	[0.02]*	[0.02]	[0.02]	[0.02]
Observations	1,526	1,469	1,469	1,469
R^2	0.00	0.03	0.05	0.12
Controls	N	Y	Y	Y
Ward FE	N	N	Y	N
Neighborhood FE	N	N	N	Y

Notes: Coefficients from OLS regressions. The dependent variables are a standardized additive index of compliance with EVD control measures (top panel) and a standardized additive index of support for EVD control interventions (bottom panel). The independent variable of interest is a standardized additive index of trust in INGOs. Coefficients on the control variables are excluded for compactness here, but are included in the online appendix. Column 1 reports correlations without controls. Column 2 reports correlations with controls. Column 3 reports correlations with controls and ward fixed effects. Column 4 reports correlations with controls and neighborhood fixed effects. Standard errors are in brackets, and are clustered at the neighborhood level throughout. $^{+}$p<0.1; *p<0.05; **p<0.01; ***p<0.001.

A.1 Online appendix

A.1.1 Random walk procedure

Within each of the 78 Monrovia neighborhoods sampled for the survey, twenty households were randomly selected within each neighborhood following a random walk procedure. Enumerators began by dividing each neighborhood into blocks with the assistance of a local leader. They then selected four blocks at random. Working with the local leader, they next identified the most central location within each block—typically a town square, water pump or "palava hut" from which paths feeding all parts of the neighborhood originated. Enumerators then randomly selected one path and walked the length of it, marking every 5th household with chalk. Upon reaching the end of one path, they turned left and continued walking until they found another. Finally, they returned to each house, created a roster of all individuals living in the house, and selected one of those individuals at random.

A.1.2 Descriptive statistics for control variables

Table A.1 provides descriptive statistics for all control variables used in our analysis. 56% of our respondents were female, 46% had levels of education above the sample median (5 years), and 56% had weekly earnings above the sample median before the EVD epidemic began ($25 USD). Unsurprisingly for a country with a disproportionately young population, a plurality of respondents (38%) were between 18 and 30 years of age. 40% belonged to households above the median size (7 people). 10% identified as Muslim and 27% reported belonging to a secret society. 78% reported voting in the 2011 presidential election, and 28% reported voting for the opposition.

A.1.3 Replication of results in table or figure form

Table A.2 reports the predicted probability of compliance with EVD control measures, support for EVD control interventions and knowledge about EVD among respondents with the most (6 on our index) and least (0 on our index) trust in government, adjusting for neighborhood fixed effects and holding all control variables at their means. Figure A.1 reports predicted scores on our index of trust in government among respondents who did and did not experience hardships during the EVD epidemic. Figure A.2 plots the predicted probability of compliance with EVD control measures and support for EVD control interventions among respondents with the most (2 on our index) and least (0 on our index) trust in INGOs.

A.1.4 Replication of results including coefficients on control variables

Tables A.3 through A.10 replicate the analyses in the manuscript, reporting coefficients on the control variables as well. In general, and unsurprisingly, more educated respondents tended to be less susceptible to erroneous beliefs about EVD (Table A.5), and tended to be more knowledgeable about EVD's symptoms and transmission pathways (Tables A.6 and A.7, respectively), all else being equal. Wealthier respondents tended to be more knowledgeable as well.

More surprisingly, while more educated respondents also tended to be more compliant with EVD control measures (Table A.3) and more supportive of EVD control interventions (Table A.4), they expressed *less* trust in government than respondents with below median education (Table A.8). Wealthier respondents tended to express less trust than poorer ones as well (Table A.8), though they were no more likely to support (Table A.4) or comply with (Table A.3) EVD control policies. Together, these results suggest that the correlation between trust, support and compliance is not an artifact of these basic demographic characteristics alone.

Also unsurprisingly, the youngest respondents (age 18-30) tended to be the least compliant relative to all other age brackets (Table A.3. Note that the coefficients on the 31-40, 41-50, 51-60 and 61 and above age brackets are estimated relative to the 18-30 age bracket in this and all other tables.) Women tended to be more prone to erroneous beliefs about EVD (Table A.5), and tended to know fewer EVD transmission pathways (Table A.7), though they were no more or less knowledgeable than men about EVD's symptoms (Table A.6). Secret society members tended to be less compliant, though only weakly so (Table A.3), and opposition voters tended to be less supportive of EVD control interventions, though again only weakly so (Table A.4). The patterns in Tables A.9 and A.10 are similar to those in Tables A.3 and A.4, except that the latter two tables focus on trust in government while the former two focus on trust in INGOs instead.

A.1.5 Replication of results using indices of Likert scales

Tables A.11 through A.14 replicate the analyses in the manuscript using indices of trust and support constructed from Likert scales rather than indicators. The results are unchanged.

Table A.1: Descriptive statistics for control variables

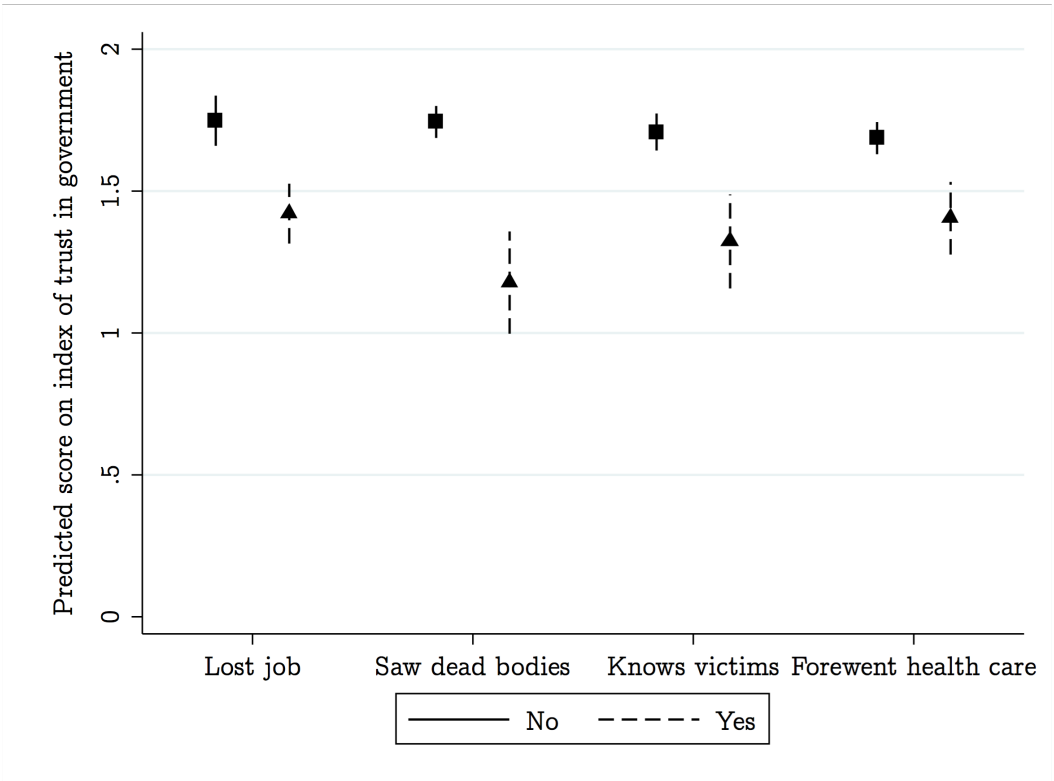
	Mean	S.D.	N
Female	0.56	0.50	1,572
Above median education	0.46	0.50	1,572
Above median pre-EVD income	0.56	0.50	1,572
Age 31-40	0.28	0.45	1,572
Age 41-50	0.19	0.39	1,572
Age 51-60	0.09	0.29	1,572
Age 61 or above	0.06	0.24	1,572
Muslim	0.10	0.30	1,572
Above median household size	0.40	0.49	1,572
Member of secret society	0.27	0.45	1,513
Voted in 2011 election	0.78	0.42	1,572
Voted for opposition in 2011 election	0.28	0.45	1,572

Table A.2: Compliance and support at high and low trust in government

	Most trust	Least trust	Difference	p-value
Compliance with EVD control measures				
Keeps bucket with chlorinated water in home	0.85	0.74	0.11	0.009
Uses hand sanitizer daily	0.50	0.43	0.07	0.111
Avoids physical contact	0.89	0.80	0.09	0.021
Obeys nighttime curfew	0.95	0.87	0.08	0.009
Obeys ban on public gatherings in last 2 weeks	0.91	0.74	0.17	0.000
Support for EVD control interventions				
Supports nighttime curfew	0.91	0.61	0.30	0.000
Supports ban on public gatherings	0.97	0.76	0.21	0.000
Supports cremation of EVD-infected bodies	0.24	0.18	0.06	0.175
Supports "safe burial" by public health workers	0.63	0.49	0.14	0.008
Supports restrictions on travel	0.72	0.56	0.16	0.000
Knowledge about EVD symptoms and transmission				
Believes EVD can spread before symptoms	0.67	0.57	0.10	0.049
Believes EVD can be cured by drinking salt water	0.09	0.09	0.00	0.873
Believes EVD can spread through air	0.20	0.21	-0.01	0.798
# of known symptoms	3.14	3.26	-0.12	0.414
# of known transmission pathways	2.63	2.91	-0.28	0.035

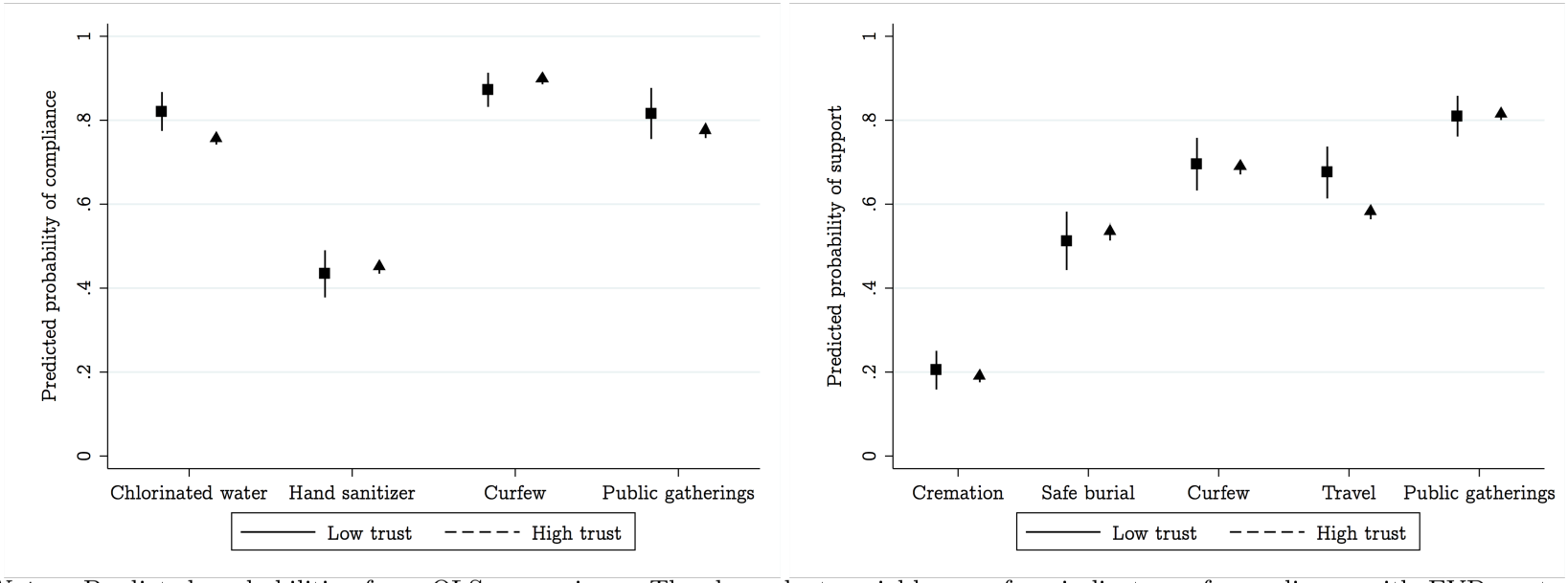
Notes: Predicted probabilities from OLS regressions at high and low trust in government (6 and 0 on our additive index, respectively) with neighborhood fixed effects and all controls held at their means. Controls include gender, education, income, age, religion, household size, secret society membership, an indicator for voting for any party in the 2011 presidential election and an indicator for voting for the opposition party. Standard errors are clustered at the neighborhood level.

Figure A.1: Predicted trust in government among respondents who did and did not experience hardships during the EVD epidemic



Notes: Predicted probabilities from OLS regressions. The dependent variable is an additive index of trust in government. The independent variables are four indicators of hardships experienced during the EVD epidemic. Indicators include losing a job; seeing dead bodies awaiting retrieval; knowing EVD victims; and foregoing health care. Squares and solid lines denote point estimates and 95% confidence intervals, respectively, for respondents who suffered hardships, holding all controls at their means. Triangles and dashed lines denote point estimates and 95% confidence intervals for respondents who did not suffer hardships, again holding all controls at their means. Controls include gender, education, income, age, religion, household size, secret society membership, an indicator for voting for any party in the 2011 presidential election and an indicator for voting for the opposition party. Standard errors are clustered at the neighborhood level.

Figure A.2: Predicted probability of compliance with EVD control policies and support for EVD control interventions at high and low trust in INGOs



Notes: Predicted probabilities from OLS regressions. The dependent variables are four indicators of compliance with EVD control measures (left plot) and four indicators of support for EVD control interventions (right plot). Indicators of compliance include keeping a bucket with chlorinated water in the home; using hand sanitizer daily; obeying the nighttime curfew; and obeying the ban on public gatherings. Indicators of support include support for the nighttime curfew; support for the ban on public gatherings; support for mandatory cremation of EVD-infected bodies; support for "safe burial;" and support for restrictions on travel. The independent variable of interest is an additive index of trust in INGOs. Squares and solid lines denote point estimates and 95% confidence intervals, respectively, for respondents taking a 0 (minimum) on the additive index, holding all controls at their means. Triangles and dashed lines denote point estimates and 95% confidence intervals for respondents taking a 2 (maximum) on the additive index, again holding all controls at their means. Controls include gender, education, income, age, religion, household size, secret society membership, an indicator for voting for any party in the 2011 presidential election and an indicator for voting for the opposition party. Standard errors are clustered at the neighborhood level.

Table A.3: Compliance with EVD control measures and trust in government

	(1)	(2)	(3)	(4)
Trust in government index	0.11	0.11	0.10	0.09
	[0.02]***	[0.02]***	[0.02]***	[0.02]***
Female		0.11	0.12	0.10
		[0.06]+	[0.06]*	[0.06]
Above median education		0.33	0.33	0.32
		[0.06]***	[0.06]***	[0.06]***
Above median pre-EVD income		-0.00	0.00	0.02
		[0.06]	[0.06]	[0.06]
Age 31-40		0.20	0.21	0.20
		[0.06]**	[0.06]***	[0.06]***
Age 41-50		0.12	0.13	0.13
		[0.07]+	[0.07]+	[0.07]+
Age 51-60		0.23	0.24	0.24
		[0.10]*	[0.10]*	[0.11]*
Age 61 or above		0.19	0.17	0.19
		[0.12]	[0.12]	[0.12]
Muslim		0.09	0.05	0.04
		[0.09]	[0.09]	[0.10]
Above median household size		0.09	0.08	0.08
		[0.06]	[0.06]	[0.06]
Member of secret society		-0.13	-0.13	-0.16
		[0.07]+	[0.06]*	[0.06]*
Voted in 2011 election		0.18	0.19	0.14
		[0.07]*	[0.07]**	[0.08]+
Voted for opposition in 2011 election		-0.10	-0.11	-0.11
		[0.07]	[0.07]	[0.07]
Observations	1,545	1,487	1,487	1,487
R^2	0.03	0.06	0.09	0.16
Controls	N	Y	Y	Y
Ward FE	N	N	Y	N
Neighborhood FE	N	N	N	Y

Notes: Coefficients from OLS regressions of an additive index of compliance with EVD control measures on an additive index of trust in government. Column 1 reports unconditional correlations. Column 2 reports correlations with controls. Column 3 reports correlations with controls and ward fixed effects. Column 4 reports correlations with controls and neighborhood fixed effects. Standard errors are in brackets, and are clustered at the neighborhood level throughout. $^{+}$p<0.1; *p<0.05; **p<0.01; ***p<0.001.

Table A.4: Support for EVD control interventions and trust in government

	(1)	(2)	(3)	(4)
Trust in government index	0.18	0.17	0.16	0.14
	[0.02]***	[0.02]***	[0.02]***	[0.02]***
Female		-0.07	-0.03	-0.06
		[0.08]	[0.08]	[0.08]
Above median education		0.27	0.27	0.23
		[0.09]**	[0.08]**	[0.08]**
Above median pre-EVD income		0.07	0.07	0.06
		[0.07]	[0.07]	[0.08]
Age 31-40		-0.07	-0.06	-0.04
		[0.09]	[0.08]	[0.09]
Age 41-50		0.00	0.02	0.00
		[0.10]	[0.09]	[0.10]
Age 51-60		0.16	0.18	0.21
		[0.14]	[0.15]	[0.16]
Age 61 or above		-0.03	0.04	-0.04
		[0.21]	[0.21]	[0.21]
Muslim		0.18	0.20	0.23
		[0.12]	[0.13]	[0.12]+
Above median household size		0.03	0.02	-0.00
		[0.07]	[0.07]	[0.08]
Member of secret society		-0.11	-0.14	-0.16
		[0.10]	[0.10]	[0.10]
Voted in 2011 election		0.04	0.06	0.05
		[0.08]	[0.08]	[0.09]
Voted for opposition in 2011 election		-0.24	-0.23	-0.21
		[0.11]*	[0.11]*	[0.11]+
Observations	1,524	1,467	1,467	1,467
R^2	0.04	0.06	0.08	0.15
Controls	N	Y	Y	Y
Ward FE	N	N	Y	N
Neighborhood FE	N	N	N	Y

Notes: Coefficients from OLS regressions of an additive index of support for EVD control interventions on an additive index of trust in government. Column 1 reports unconditional correlations. Column 2 reports correlations with controls. Column 3 reports correlations with controls and ward fixed effects. Column 4 reports correlations with controls and neighborhood fixed effects. Standard errors are in brackets, and are clustered at the neighborhood level throughout. $^{+}$p<0.1; *p<0.05; **p<0.01; ***p<0.001.

Table A.5: Erroneous beliefs about EVD and trust in government

	(1)	(2)	(3)	(4)
Trust in government index	0.02	0.01	0.01	0.01
	[0.01]	[0.01]	[0.01]	[0.01]
Female		0.18	0.17	0.19
		[0.05]***	[0.05]***	[0.05]***
Above median education		-0.31	-0.30	-0.28
		[0.04]***	[0.04]***	[0.04]***
Above median pre-EVD income		-0.04	-0.03	-0.05
		[0.05]	[0.05]	[0.05]
Age 31-40		-0.06	-0.06	-0.07
		[0.05]	[0.05]	[0.05]
Age 41-50		0.04	0.04	0.05
		[0.07]	[0.07]	[0.07]
Age 51-60		0.04	0.04	0.05
		[0.08]	[0.08]	[0.08]
Age 61 or above		0.06	0.05	0.08
		[0.12]	[0.12]	[0.12]
Muslim		0.10	0.07	0.05
		[0.07]	[0.07]	[0.07]
Above median household size		-0.04	-0.03	-0.04
		[0.03]	[0.04]	[0.04]
Member of secret society		0.11	0.12	0.14
		[0.05]*	[0.05]*	[0.05]*
Voted in 2011 election		-0.02	-0.03	-0.01
		[0.05]	[0.05]	[0.05]
Voted for opposition in 2011 election		0.07	0.08	0.08
		[0.05]	[0.05]	[0.05]
Observations	1,531	1,475	1,475	1,475
R^2	0.00	0.08	0.09	0.14
Controls	N	Y	Y	Y
Ward FE	N	N	Y	N
Neighborhood FE	N	N	N	Y

Notes: Coefficients from OLS regressions of an additive index of erroneous beliefs about EVD on an additive index of trust in government. Column 1 reports unconditional correlations. Column 2 reports correlations with controls. Column 3 reports correlations with controls and ward fixed effects. Column 4 reports correlations with controls and neighborhood fixed effects. Standard errors are in brackets, and are clustered at the neighborhood level throughout. $^{+}$p<0.1; *p<0.05; **p<0.01; ***p<0.001.

Table A.6: # of known EVD symptoms and trust in government

	(1)	(2)	(3)	(4)
Trust in government index	-0.07	-0.03	-0.03	-0.02
	[0.02]**	[0.02]	[0.02]	[0.02]
Female		-0.01	-0.03	-0.06
		[0.08]	[0.08]	[0.08]
Above median education		0.40	0.38	0.35
		[0.08]***	[0.08]***	[0.09]***
Above median pre-EVD income		0.42	0.41	0.40
		[0.08]***	[0.08]***	[0.08]***
Age 31-40		-0.03	-0.03	-0.02
		[0.09]	[0.10]	[0.10]
Age 41-50		0.15	0.16	0.15
		[0.12]	[0.12]	[0.12]
Age 51-60		-0.08	-0.01	-0.04
		[0.18]	[0.18]	[0.19]
Age 61 or above		0.05	0.09	0.03
		[0.20]	[0.20]	[0.19]
Muslim		-0.28	-0.17	-0.11
		[0.14]*	[0.15]	[0.15]
Above median household size		0.10	0.13	0.15
		[0.08]	[0.08]	[0.09]+
Member of secret society		0.17	0.13	0.13
		[0.10]+	[0.09]	[0.09]
Voted in 2011 election		0.24	0.22	0.22
		[0.11]*	[0.11]*	[0.11]*
Voted for opposition in 2011 election		-0.04	0.01	0.04
		[0.09]	[0.09]	[0.10]
Observations	1,555	1,497	1,497	1,497
R^2	0.01	0.06	0.08	0.14
Controls	N	Y	Y	Y
Ward FE	N	N	Y	N
Neighborhood FE	N	N	N	Y

Notes: Coefficients from OLS regressions of number of known EVD symptoms on an additive index of trust in government. Column 1 reports unconditional correlations. Column 2 reports correlations with controls. Column 3 reports correlations with controls and ward fixed effects. Column 4 reports correlations with controls and neighborhood fixed effects. Standard errors are in brackets, and are clustered at the neighborhood level throughout. $^{+}$p<0.1; *p<0.05; **p<0.01; ***p<0.001.

Table A.7: # of known EVD transmission pathways and trust in government

	(1)	(2)	(3)	(4)
Trust in government index	-0.10	-0.07	-0.06	-0.05
	[0.02]***	[0.02]**	[0.02]**	[0.02]*
Female		-0.29	-0.33	-0.36
		[0.10]**	[0.09]***	[0.09]***
Above median education		0.28	0.27	0.29
		[0.10]**	[0.10]**	[0.10]**
Above median pre-EVD income		0.53	0.52	0.47
		[0.08]***	[0.08]***	[0.09]***
Age 31-40		-0.08	-0.11	-0.09
		[0.09]	[0.09]	[0.10]
Age 41-50		0.08	0.06	0.06
		[0.13]	[0.13]	[0.13]
Age 51-60		-0.06	-0.04	-0.04
		[0.16]	[0.16]	[0.16]
Age 61 or above		-0.20	-0.20	-0.30
		[0.21]	[0.21]	[0.22]
Muslim		-0.38	-0.33	-0.30
		[0.14]**	[0.15]*	[0.14]*
Above median household size		0.06	0.08	0.10
		[0.08]	[0.08]	[0.08]
Member of secret society		0.05	0.03	0.05
		[0.10]	[0.09]	[0.08]
Voted in 2011 election		0.21	0.18	0.19
		[0.11]+	[0.11]	[0.12]
Voted for opposition in 2011 election		-0.21	-0.17	-0.14
		[0.10]*	[0.09]+	[0.09]
Observations	1,555	1,497	1,497	1,497
R^2	0.01	0.07	0.11	0.20
Controls	N	Y	Y	Y
Ward FE	N	N	Y	N
Neighborhood FE	N	N	N	Y

Notes: Coefficients from OLS regressions of number of known EVD transmission pathways on an additive index of trust in government. Column 1 reports unconditional correlations. Column 2 reports correlations with controls. Column 3 reports correlations with controls and ward fixed effects. Column 4 reports correlations with controls and neighborhood fixed effects. Standard errors are in brackets, and are clustered at the neighborhood level throughout. $^{+}$p<0.1; *p<0.05; **p<0.01; ***p<0.001.

Table A.8: Hardships experienced during the EVD epidemic and trust in government

	(1)	(2)	(3)	(4)
Hardships index	-0.32	-0.30	-0.30	-0.26
	[0.04]***	[0.04]***	[0.04]***	[0.04]***
Female		-0.09	-0.04	-0.03
		[0.10]	[0.10]	[0.11]
Above median education		-0.25	-0.23	-0.24
		[0.09]**	[0.09]**	[0.09]*
Above median pre-EVD income		-0.28	-0.27	-0.25
		[0.10]**	[0.10]*	[0.11]*
Age 31-40		0.02	0.00	0.01
		[0.13]	[0.13]	[0.14]
Age 41-50		-0.03	-0.04	0.01
		[0.11]	[0.11]	[0.11]
Age 51-60		0.03	0.03	0.08
		[0.16]	[0.16]	[0.17]
Age 61 or above		0.32	0.38	0.41
		[0.26]	[0.26]	[0.29]
Muslim		-0.04	-0.02	-0.08
		[0.17]	[0.17]	[0.18]
Above median household size		0.03	-0.03	-0.09
		[0.10]	[0.09]	[0.10]
Member of secret society		-0.14	-0.15	-0.22
		[0.11]	[0.11]	[0.12]+
Voted in 2011 election		-0.11	-0.10	-0.13
		[0.13]	[0.13]	[0.14]
Voted for opposition in 2011 election		-0.17	-0.17	-0.20
		[0.11]	[0.11]	[0.12]
Observations	1,413	1,361	1,361	1,361
R^2	0.05	0.06	0.08	0.13
Controls	N	Y	Y	Y
Ward FE	N	N	Y	N
Neighborhood FE	N	N	N	Y

Notes: Coefficients from OLS regressions of an additive index of trust in government on an additive index of hardships experienced during the EVD epidemic. Column 1 reports unconditional correlations. Column 2 reports correlations with controls. Column 3 reports correlations with controls and ward fixed effects. Column 4 reports correlations with controls and neighborhood fixed effects. Standard errors are in brackets, and are clustered at the neighborhood level throughout. $^{+}$p<0.1; *p<0.05; **p<0.01; ***p<0.001.

Table A.9: Compliance with EVD control measures and trust in INGOs

	(1)	(2)	(3)	(4)
Trust in INGOs index	-0.07	-0.05	-0.05	-0.04
	[0.05]	[0.05]	[0.05]	[0.05]
Female		0.11	0.11	0.10
		[0.06]+	[0.06]*	[0.06]
Above median education		0.29	0.30	0.29
		[0.06]***	[0.06]***	[0.06]***
Above median pre-EVD income		-0.04	-0.04	-0.01
		[0.06]	[0.06]	[0.07]
Age 31-40		0.21	0.21	0.20
		[0.06]**	[0.06]**	[0.06]**
Age 41-50		0.12	0.13	0.14
		[0.06]+	[0.07]+	[0.07]*
Age 51-60		0.24	0.25	0.26
		[0.10]*	[0.10]*	[0.11]*
Age 61 or above		0.22	0.21	0.23
		[0.12]+	[0.12]+	[0.12]+
Muslim		0.09	0.05	0.05
		[0.10]	[0.09]	[0.10]
Above median household size		0.08	0.06	0.07
		[0.06]	[0.06]	[0.06]
Member of secret society		-0.16	-0.16	-0.18
		[0.07]*	[0.07]*	[0.06]**
Voted in 2011 election		0.16	0.18	0.13
		[0.07]*	[0.07]*	[0.08]+
Voted for opposition in 2011 election		-0.12	-0.13	-0.13
		[0.07]	[0.07]+	[0.08]+
Observations	1,547	1,489	1,489	1,489
R^2	0.00	0.04	0.07	0.15
Controls	N	Y	Y	Y
Ward FE	N	N	Y	N
Neighborhood FE	N	N	N	Y

Notes: Coefficients from OLS regressions of an additive index of compliance with EVD control measures on an additive index of trust in INGOs. Column 1 reports unconditional correlations. Column 2 reports correlations with controls. Column 3 reports correlations with controls and ward fixed effects. Column 4 reports correlations with controls and neighborhood fixed effects. Standard errors are in brackets, and are clustered at the neighborhood level throughout. $^{+}$p<0.1; *p<0.05; **p<0.01; ***p<0.001.

Table A.10: Support for EVD control interventions and trust in INGOs

	(1)	(2)	(3)	(4)
Trust in INGOs index	-0.10	-0.07	-0.06	-0.05
	[0.05]*	[0.05]	[0.05]	[0.06]
Female		-0.08	-0.03	-0.06
		[0.08]	[0.08]	[0.08]
Above median education		0.22	0.22	0.19
		[0.09]*	[0.09]*	[0.09]*
Above median pre-EVD income		0.00	0.02	0.01
		[0.08]	[0.07]	[0.08]
Age 31-40		-0.07	-0.05	-0.04
		[0.09]	[0.09]	[0.09]
Age 41-50		-0.00	0.02	0.01
		[0.10]	[0.09]	[0.10]
Age 51-60		0.19	0.20	0.24
		[0.14]	[0.15]	[0.16]
Age 61 or above		0.03	0.11	0.03
		[0.20]	[0.20]	[0.21]
Muslim		0.18	0.21	0.23
		[0.11]	[0.12]+	[0.12]+
Above median household size		0.02	-0.01	-0.03
		[0.08]	[0.08]	[0.08]
Member of secret society		-0.16	-0.18	-0.21
		[0.09]	[0.09]+	[0.10]*
Voted in 2011 election		0.02	0.04	0.03
		[0.09]	[0.09]	[0.09]
Voted for opposition in 2011 election		-0.26	-0.25	-0.23
		[0.11]*	[0.11]*	[0.11]*
Observations	1,526	1,469	1,469	1,469
R^2	0.00	0.03	0.05	0.12
Controls	N	Y	Y	Y
Ward FE	N	N	Y	N
Neighborhood FE	N	N	N	Y

Notes: Coefficients from OLS regressions of an additive index of support for EVD control interventions on an additive index of trust in INGOs. Column 1 reports unconditional correlations. Column 2 reports correlations with controls. Column 3 reports correlations with controls and ward fixed effects. Column 4 reports correlations with controls and neighborhood fixed effects. Standard errors are in brackets, and are clustered at the neighborhood level throughout. $^{+}$p<0.1; *p<0.05; **p<0.01; ***p<0.001.

Table A.11: Compliance with EVD control measures, support for EVD control interventions and trust in government using Likert scales

	(1)	(2)	(3)	(4)
Compliance index				
Trust in government index (Likert)	0.05	0.05	0.05	0.04
	[0.01]***	[0.01]***	[0.01]***	[0.01]***
Observations	1,545	1,487	1,487	1,487
R^2	0.04	0.08	0.10	0.17
Support index (Likert)				
Trust in government index (Likert)	0.11	0.10	0.10	0.09
	[0.01]***	[0.01]***	[0.01]***	[0.01]***
Observations	1,453	1,400	1,400	1,400
R^2	0.06	0.08	0.09	0.16
Controls	N	Y	Y	Y
Ward FE	N	N	Y	N
Neighborhood FE	N	N	N	Y

Notes: Coefficients from OLS regressions of additive indices of compliance and support on an additive index of trust in government, where the indices of support and trust are constructed from Likert scales. Omitted controls include gender, education, income, age, religion, household size, secret society membership, an indicator for voting for any party in the 2011 presidential election and an indicator for voting for the opposition party. Column 1 reports unconditional correlations. Column 2 reports correlations with controls. Column 3 reports correlations with controls and ward fixed effects. Column 4 reports correlations with controls and neighborhood fixed effects. Standard errors are in brackets, and are clustered at the neighborhood level throughout. $^{+}$p<0.1; *p<0.05; **p<0.01; ***p<0.001.

Table A.12: Knowledge about EVD and trust in government using Likert scales

	(1)	(2)	(3)	(4)
Erroneous beliefs index				
Trust in government index (Likert)	0.01	0.01	0.01	0.01
	[0.00]	[0.00]	[0.00]	[0.00]
Observations	1,531	1,475	1,475	1,475
R^2	0.00	0.08	0.09	0.14
# of known symptoms				
Trust in government index (Likert)	-0.04	-0.02	-0.02	-0.01
	[0.01]***	[0.01]*	[0.01]+	[0.01]
Observations	1,555	1,497	1,497	1,497
R^2	0.01	0.06	0.08	0.14
# of known transmission pathways				
Trust in government index (Likert)	-0.04	-0.03	-0.02	-0.02
	[0.01]***	[0.01]***	[0.01]**	[0.01]+
Observations	1,555	1,497	1,497	1,497
R^2	0.01	0.07	0.11	0.20
Controls	N	Y	Y	Y
Ward FE	N	N	Y	N
Neighborhood FE	N	N	N	Y

Notes: Coefficients from OLS regressions of additive indices of knowledge about EVD on an additive index of trust in government, where the index of trust is constructed from Likert scales. Omitted controls include gender, education, income, age, religion, household size, secret society membership, an indicator for voting for any party in the 2011 presidential election and an indicator for voting for the opposition party. Column 1 reports unconditional correlations. Column 2 reports correlations with controls. Column 3 reports correlations with controls and ward fixed effects. Column 4 reports correlations with controls and neighborhood fixed effects. Standard errors are in brackets, and are clustered at the neighborhood level throughout.. $^{+}$p<0.1; *p<0.05; **p<0.01; ***p<0.001.

Table A.13: Hardships experienced during the EVD epidemic and trust in government using Likert scales

	(1)	(2)	(3)	(4)
Trust in government index (Likert)				
Hardships index	-1.04	-0.96	-0.95	-0.87
	[0.10]***	[0.10]***	[0.10]***	[0.10]***
Observations	1,413	1,361	1,361	1,361
R^2	0.05	0.07	0.09	0.15
Controls	N	Y	Y	Y
Ward FE	N	N	Y	N
Neighborhood FE	N	N	N	Y

Notes: Coefficients from OLS regressions of an additive index of trust in government on an additive index of hardships experienced during the EVD epidemic, where the index of trust is constructed from Likert scales. Omitted controls include gender, education, income, age, religion, household size, secret society membership, an indicator for voting for any party in the 2011 presidential election and an indicator for voting for the opposition party. Column 1 reports unconditional correlations. Column 2 reports correlations with controls. Column 3 reports correlations with controls and ward fixed effects. Column 4 reports correlations with controls and neighborhood fixed effects. Standard errors are in brackets, and are clustered at the neighborhood level throughout.. $^{+}$p<0.1; *p<0.05; **p<0.01; ***p<0.001.

Table A.14: Compliance with EVD control measures, support for EVD control interventions and trust in INGOs using Likert scales

	(1)	(2)	(3)	(4)
Compliance index				
Trust in INGOs index (Likert)	-0.04	-0.03	-0.02	-0.01
	[0.02]	[0.02]	[0.02]	[0.02]
Observations	1,133	1,094	1,094	1,094
R^2	0.00	0.03	0.06	0.16
Support index (Likert)				
Trust in INGOs index (Likert)	-0.00	0.02	0.02	0.01
	[0.03]	[0.03]	[0.03]	[0.04]
Observations	1,526	1,469	1,469	1,469
R^2	0.00	0.03	0.05	0.12
Controls	N	Y	Y	Y
Ward FE	N	N	Y	N
Neighborhood FE	N	N	N	Y

Notes: Coefficients from OLS regressions of additive indices of compliance with EVD control measures (top panel) and support for EVD control interventions (bottom panel) on an additive index of trust in INGOs, where the index of trust is constructed using Likert scales. Omitted controls include gender, education, income, age, religion, household size, secret society membership, an indicator for voting for any party in the 2011 presidential election and an indicator for voting for the opposition party. Column 1 reports unconditional correlations. Column 2 reports correlations with controls. Column 3 reports correlations with controls and ward fixed effects. Column 4 reports correlations with controls and neighborhood fixed effects. Standard errors are in brackets, and are clustered at the neighborhood level throughout. $^{+}$p<0.1; *p<0.05; **p<0.01; ***p<0.001.