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Building Credibility and Cooperation in Low-Trust Settings: Persuasion and Source Accountability in Liberia during the 2014-2015 Ebola Crisis

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Abstract

How can governments in low-trust settings overcome their credibility deficit when promoting public welfare? To answer this question, we evaluate the effectiveness of the Liberian government's door-to-door canvassing campaign during the 2014-2015 Ebola epidemic, which aimed to persuade residents to voluntarily comply with policies for containing the disease. Combining data from an original representative survey of Monrovia during the crisis with variation in the campaign's reach and using multiple identification strategies, we find that the informational campaign was remarkably effective at increasing adherence to safety precautions, support for contentious control policies, and general trust in government. To uncover the pathways through which the campaign proved so effective, we conducted over 80 in-depth qualitative interviews in 40 randomly sampled communities. This investigation suggests that local intermediaries were effective because their embeddedness in communities subjected them to monitoring and sanctioning, thereby assuring their fellow residents that they were accountable and thus credible.

Introduction

In countries where government corruption and abuse of power is pervasive (Keefer 2007; Treisman 2007), citizens often harbor distrust and cynicism about the honesty and intentions of those in government (see, for example, Seligson 2002). But what happens when these governments act in the public interest and need citizens to believe what they say and voluntarily comply with their directives? What can authorities do when they need to implement critical initiatives such as vaccination campaigns or when they face national emergencies and existential threats such as insurgencies or natural disasters?

In this paper we examine political persuasion in low-trust settings. Because coercion tends to be ineffective, counterproductive, and prohibitively costly, government authorities often turn to informational campaigns to persuade citizens that it is in their own interests to voluntarily comply with their directives. But are these campaigns effective? Under what conditions can governments in low-trust settings succeed at persuading citizens to believe what they say?

Theories of political communication and institutional trust give us reason to doubt that deeply distrusted authorities can persuade citizens to believe what they say during times of crisis. This research shows that elites lack credibility as sources of information because citizens are likely to believe they have ulterior motives or incentives to deceive the public (Alt, Lassen, Marshall 2016; Baron 2006). Perceived differences in institutional expertise and institutional trust may also account for variation in credibility. Citizens are more likely to believe messages from elites whom they see as knowledgeable about political issues or, often more importantly, "like-minded" in having similar interests or values (Gilens and Murakawa 1994; Downs 1957, p. 223).

Existing studies, however, say little about how actors can *build* trust and credibility when they do not already have it. Much of this work treats information sources as either credible or not credible, implicitly or explicitly assuming that credibility is time-invariant (see, for example, Lupia and McCubbins, 1998, and experimental studies by Botero et al., 2015; Alt, Lassen, Marshall 2016). Recent studies have shown how existing credibility can be sustained or damaged (e.g., Cone et al., 2019). But little empirical work exists on what an *information source* that has a longstanding reputation for not being credible can do to improve its credibility in the short term.

One approach, at least in the context of the United States, involves direct engagement between government workers and citizens, such as door-to-door canvassing and mass media campaigns (Bagcchi, 2015; Chong & Druckman, 2007, p. 57 & 99-118). Evidence suggests that this form of direct engagement can persuade citizens that particular authorities are trustworthy sources of information, but this research comes almost exclusively from countries where general trust in government is already relatively high. In low-trust settings where citizens believe authorities are predatory or malevolent, government efforts to engage with citizens often fall on deaf ears. Indeed, when individuals mistrust the messenger, they tend to cling to their existing beliefs, even in the face of overwhelming evidence to the contrary (Gerber & Green, 1999, p. 189–210). Uncertainty and fear, which prevail in crisis situations, can exacerbate these tendencies (Jost, Kay, & Thorisdottir, 2009, p. 244). In northern Nigeria, where villagers rarely encounter government service provision, distrust of government led to years of resistance against government vaccination campaigns, contributing to the country's status as one of the last to eradicate the disease (Grossman, Phillips, & Rosenzweig, 2017). In Liberia and Sierra Leone, where civil war and state abuse have made citizens suspicious of the police and other security

forces, widespread non-reporting and reluctance to cooperate with police investigations have proven to be an enduring barrier to police effectiveness and citizen security (Blair, Karim & Morse, 2019).

How can governments in low-trust settings overcome their credibility deficit when promoting public welfare? Empirical research involving systematic data on citizens' attitudes and especially behaviors is scarce, and data from crisis situations, where researchers face unique challenges to collecting data, is scarcer still. Yet it is precisely these settings where the need to understand how governments can persuade their citizens to act in the public interest is most pressing.

In this paper, we address this gap by studying the effectiveness of the Government of Liberia's effort to engender trust and cooperation through ground-level canvassing during the 2014-2015 Ebola Crisis. Widely viewed as both a health crisis and a governance crisis, the epidemic provides a critical case for building our theoretical understanding of how governments can persuade citizens to cooperate under the most challenging of circumstances.

In the initial stages of the epidemic, mistrust rooted in decades of corruption and abuse led many Liberians to believe Ebola was a ploy by the government to generate more aid funding (International Crisis Group, 2015). As a result, many refused to comply with preventative measures and social distancing policies, causing the disease to spread unchecked (Blair, Morse, and Tsai 2017). As conditions deteriorated, the Government of Liberia (GoL) initiated an ambitious public awareness campaign in which locally-recruited intermediaries working on behalf of government were deployed into communities to persuade their fellow citizens to trust health authorities and comply with control policies. To assess the effectiveness of this campaign, we combine data from an original, representative survey of Monrovia conducted during the crisis with variation in where the campaign was and was not able to reach. Using both selection-on-observables and difference-indifferences design strategies, we provide evidence that the outreach campaign was remarkably (and surprisingly) effective. Respondents who report being visited by a canvasser from the campaign were nine percentage points more likely to trust the Ministry of Health, 15 more percentage points supportive of contentious control policies, and 10 percentage points less likely to violate a government-imposed ban on public gatherings. Our results also suggest that the campaign improved trust in the government generally, with those experiencing outreach expressing greater trust in government institutions and greater support for compliance with government laws and regulations outside the health sector.

To uncover the mechanisms through which the campaign proved so effective, we conducted over 80 in-depth, open-ended qualitative interviews from a random sample of communities with individuals involved in the campaign approximately five months after the epidemic had subsided. Analysis of these interviews suggests that local intermediaries were effective in persuading citizens to believe the government's public awareness messages not simply because of pre-existing trust or social ties with their fellow residents, but also because they were embedded in the communities they worked. Being embedded – i.e. being a resident of the community and being part of community social networks and institutions – subjected intermediaries to monitoring and sanctioning from their fellow residents, thereby making them accountable. Because intermediaries' living conditions were observable and easy to monitor, residents could verify that intermediaries were not part of a government scheme to attract and embezzle donor funds through the spread of Ebola, as rumors alleged. And because

intermediaries would have been vulnerable to reprisal and punishment if the information they delivered from the government were false, residents were able to trust that they were telling the truth. Together, the ability of residents to monitor and sanction intermediaries ensured that they were accountable and thus credible sources of information.

Our qualitative interviews further suggest that once intermediaries had won the trust of their fellow residents, they became "opinion leaders" whom residents trusted to provide information about the government (Katz, 1957; Nisbit & Kotcher, 2009), using their standing to counter misinformation and misconceptions about government and thus helping to build trust in the government generally. This model of *mediated outreach* builds on a logic of "costly signaling" (Spence 1973) to shed new light on how authorities can persuade citizens to view them as a credible source of information and a partner for cooperation by making themselves vulnerable to sanctions.

While this logic of persuasion through costly signaling and source accountability should hold across a variety of contexts, mediated outreach may have more practical value in low-trust settings where citizens see authorities as malevolent and potentially predatory, rather than simply under-resourced. In countries like Malawi and Zambia, for example, authorities have limited capacity for development but are not often seen to be ill-intentioned. In these cases, government may simply be able to persuade citizens to cooperate through direct engagement. In contrast, direct engagement is more likely to fail in places like Mali, Guinea, Sierra Leone – and, as we are seeing now, the Democratic Republic of Congo – where prior trust in the intentions and political will of authorities is precariously low. In these places, it is of course not always a good thing for citizens to be persuaded by government. Nevertheless, it is an important question, from

both theoretical and policy perspectives, how mistrusted authorities can successfully persuade citizens to cooperate when it is indeed in the public's interest to do so.

Prior research on government persuasion

Efforts to persuade citizens to work with authorities to promote public welfare often involve government-sponsored media campaigns or face-to-face interaction between government officials and citizens. Public service announcements and public interest films are longstanding and widespread strategies, and have been used to encourage buying government bonds to support war efforts (Horten, 2003), conserving water during periods of drought (Stockmann, Esarey, & Zhang, 2010), and promoting health-seeking behavior (Faase, Gamble, Cundy, & Petrie, 2012).

On the face of it, this form of engagement seems like it should be a good thing. Face-toface interactions, even between people who belong to groups in conflict with one another, can build norms and networks of reciprocity and cooperation (Putnam, 2001, p. 20-21). Shared activities and collective endeavors – for example, agricultural cooperatives, business associations, and parent-teacher committees – can increase information about others' motives and trustworthiness and foster concern for others' welfare, even if they hold different values (Ostrom, 2015; Varshney, 2003).

Research has also found that personal interactions with government officials can increase the likelihood of voluntary compliance when those interactions involve fair and "procedurally just" treatment (Huq, Tyler, & Schulhofer, 2011, p. 419-450). Studies of policing find that positive encounters with individual officers can have a bigger impact on citizens' perceptions of the police than the effectiveness with which they fight crime (Tyler, 2004, p. 84-99), and that such perceptions can begin to improve after just a small number of positive encounters (Mazerolle et al., 2013, p. 33-63). Studies of door-to-door canvassing and direct voter contact

during election campaigns show that just one conversation can increase the probability of turnout (Gerber & Green, 2000, p. 653-663; Green, Gerber, & Nickerson, 2003, p. 1083-1096; Hersh, 2015; Hillygus & Shields, 2008).

While these studies provide important insights into government persuasion in developed countries, it is not clear that they apply to weak states, where mistrust of government is often much more profound. Because source credibility is a key precondition to persuasion, direct outreach by government in these settings is unlikely to be persuasive, and could potentially backfire if such efforts serve only to increase the "fluency" of misinformation (Berinsky, 2017). Alternatively, people may engage in motivated reasoning, resisting information that runs counter to existing beliefs in an effort to defend their worldviews (Festinger 1957; Kunda, 1987, p. 636-47). For example, when US parents who oppose vaccines received information from the Center for Disease Control and Prevention debunking the link between measles vaccines and autism, they became *less* likely to say they intend to vaccinate their child (Nyhan, Reifler, Richey, & Freed, 2014, p. 491-493; Mason & Donnelly, 2000, p. 473-474).

The case of Liberia during the 2014-2015 Ebola epidemic

Liberia provides a critical case for studying the effectiveness of government persuasion due to the extreme levels of mistrust that authorities faced during efforts to curtail the devastating Ebola epidemic of 2014-2015. This lack of trust was rooted in citizens' experiences dating back to the war, when governance failures characterized by autocratic rule, repression, exclusionist policies, and excessive rent-seeking by government officials dominated Liberia's politics (Sawyer 2005), and when acts of state-sponsored violence against civilians were common (Ellis, 1999). Abuse of power has continued in the form of rampant corruption since the incumbent party was inaugurated in January 2005, following the country's historic peace accord in 2003. Despite reforms aimed at rooting out official corruption, wrongdoers have seldom been punished (Epstein, 2014).

Liberia's long history with government corruption and abuse led to levels mistrust that extended beyond simple dissatisfaction with government, to the point where many citizens believed authorities were willing to harm and even kill their own citizens for personal gain at the outset of the epidemic. As one report noted, "[W]hen the Health Ministry requested \$1.5 million in emergency funds to fight Ebola ...many Liberians assumed this was just another scam on the part of a secretive cartel of elites to steal more foreign aid" (Epstein, 2014). In our survey, 38 percent of respondents reported that in July 2014, at the beginning of the epidemic, they believed that Ebola was "a lie just so the government could get money" from external donors. As one of our respondents explained, people did not believe that Ebola was a real disease: "People thought it was a game from the government. They thought that the government would kill for money."¹ Such profound mistrust contributed to a climate in which widespread non-compliance with control policies allowed the easily-preventable disease to spiral out of control (Blair, Morse, and Tsai, 2017; McCoy, 2014).

Even after the severity of Ebola was indisputable, mistrust continued to impede the government's ability to engender voluntary compliance. In September 2014, rumors circulated that government health workers were poisoning wells to spread Ebola (Epstein, 2014). And in December, allegations that emergency measures such as the ban on gatherings were a political ploy to suppress the opposition and avoid defeat in the December Senatorial bi-election led many to question whether the ban was justified (MacDougall and Fink, 2014). These rumors

¹ Interview with Marcus J. (pseudonym), Community A, Slipway, Monrovia, May 15, 2015. We use pseudonyms throughout this paper to protect the anonymity of respondents.

undermined government efforts to control the spread of the virus, as mistrustful citizens proved less likely to support Ebola control policies and less likely to comply with Ebola-related social distancing measures (Blair, Morse, & Tsai, 2017, p. 89-97).

Community outreach during the epidemic

In response to the epidemic's growing threat, the Government of Liberia initiated an ambitious public awareness campaign in June 2014 involving the mass media and ground-level canvassing.² Initially, the government used its own staff from the Ministry of Health to go door to door delivering public awareness messages to supplement radio and other media efforts. However, this model of direct outreach was quickly abandoned because it was met with disbelief and outright violence. A WHO update in July 2014 identified "persisting denial and resistance in the community" as a critical challenge to the government's crisis response (WHO, 2014). Many of our respondents expressed similarly negative sentiments about direct outreach by government workers. According to one rumor, the government was dispatching strangers to infest community wells with poison and increase the death rate. Another rumor held that government was sending people into communities to spray poison through windows.³

The failure of government direct engagement during Ebola suggests that the benefits of face-to-face engagement may not materialize during crisis situations in fragile states, where the stakes are high, mistrust is severe, and time is of the essence. The Liberian government's experience is more consistent with theories emphasizing how negative reactions rooted in mistrust, fear, and uncertainty can render efforts to persuade ineffective. As Liberian President Ellen Johnson Sirleaf noted, "We have been unable to control the spread due to continued

² For a timeline of the epidemic and our study, see the Appendix.

³ Interview with Abraham F. (pseudonym), Community A, Paynesville, Monrovia, May 19, 2015.

denials, cultural varying practices, disregard for the advice of health workers and disrespect for the warnings by the government."⁴

Mediated outreach in response to the failure of direct outreach

After direct engagement failed, government officials adopted a model of mediated outreach in which they recruited local intermediaries to canvas communities on their behalf. As one social worker from the Monrovia city government explained, "The communities and people were saying government was responsible for the disease and bloodshed and also Uncle Sam gave the government money to come and test the experiment. Some said Ellen [President Sirleaf] knew exactly what was going on so she was just pretending.... These people were very harsh in talking to us and were not ever willing to listen. We went first – no good result. Second – the same thing, and third – also nothing good. So we strategized by giving their own community people the opportunity to visit them and talk to them. They too, caught a little tough time from the beginning – and gradually they succeeded."5

To recruit intermediaries, government authorities posted fliers in markets and main intersections, aired radio advertisements, and identified volunteers through word-of-mouth. These intermediaries – many of whom were already engaged in self-organized community crisis response initiatives – were invited to attend one to two-day training workshops on Ebola prevention protocols and public awareness.

Once trained, volunteers were issued T-shirts, vests, bibs, or badges to identify them as part of the government's outreach campaign.⁶ They were assigned to particular neighborhoods or

^{4 2014,} August 21. Liberia Police fire at Monrovia protests. *Reuters*. Retrieved from http://www.bbc.co.uk/news/world-africa-28879471.

⁵ Interview with Doris F. (pseudonym), Community A, Sinkor, Monrovia; March 28, 2015.

⁶ According to our qualitative interviews, having some form of official identification was essential throughout the crisis for gaining household's initial reception, even when already familiar with residents. In our view, this likely reflects the climate of uncertainty, suspicion of strangers, and generalized mistrust that characterized the crisis.

blocks within their communities to educate citizens about the symptoms of Ebola, disseminate information about where to get care, and encourage voluntary compliance with control policies through door-to-door canvassing.⁷ Most volunteers regularly reported to supervisors with information about community conditions, such as whether citizens were receptive to the outreach campaign, whether they were adhering to control policies, and whether there were any new suspected cases. Though they tried to reach all households, invariably some were missed, a fact we exploit in our quantitative analysis below.

Evaluating the impact of mediated government outreach

To evaluate the impact of government outreach on citizens' attitudes toward government and cooperation with public health recommendations, we conducted a representative survey of Monrovia, Liberia in December 2014. While Ebola spread throughout Liberia, we conducted our survey in Monrovia because it is where more than 80% of Liberia's roughly 10,678 cases were reported, making it the epicenter of the epidemic and the place where both citizen resistance and government efforts towards persuasion were most intense (WHO, 2015). The survey was administered in-person by Liberian enumerators using handheld electronic devices. The selection of respondents followed a three-stage sampling procedure. In the first stage, 78 communities were randomly selected from each of Monrovia's fifteen administrative wards with selection probabilities proportional to their population size. In the second stage, twenty households were randomly selected within each community following a random-walk procedure. In the third stage, within each household, a single adult respondent was randomly selected for the

⁷ Communities in Monrovia are sub-divided into anywhere from three to six 'blocks', which are akin to small neighborhoods or street blocks in the United States. Blocks have well-delineated boundaries, are typically home to anywhere from 50 to 300 people, and usually have their own 'block leader' who reports to the Chairman of the Community as a whole.

survey.8 A unique strength of our survey was that it entailed face-to-face interviews with experienced local enumerators rather than interviews conducted remotely via cell phone. This method resulted in a response rate of 95 percent.9 The random walk procedure, the precautions taken to ensure enumerator safety, and other details are outlined in further detail in the Appendix.10

Independent variables

The as-if random nature of the GoL's outreach campaign provides a unique opportunity to rigorously assess the effectiveness of mediated outreach in a crisis situation without the ethical dilemmas that would arise in a field experiment. To measure exposure to this campaign, we asked respondents whether "government health workers" ever visited them to raise awareness about Ebola in the past five months and if so, with what frequency (daily, weekly, or monthly). We use these data to construct a dichotomous variable coded as 1 for any affirmative response and 0 otherwise. In our sample, 40% of respondents report government outreach (Appendix Table 1).11 The modal frequency for government outreach was weekly.12

⁸ 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 they were not available on either day, they were skipped. Respondent anonymity and confidentiality was ensured throughout the survey and data analysis.

⁹ By comparison, the first two rounds of a World Bank-sponsored high-frequency cell phone survey in Liberia achieved a combined response rate of approximately 20 percent (Himelein & Kastelic, 2014).

¹⁰ By the time our survey began, Monrovia had only a handful of active Ebola cases. Precautions to ensure enumerator safety included: avoiding communities with active cases, using community guides to avoid households with sick persons, use of rubber boots and hand sanitizer, maintenance of a minimum distance while enumerating, and daily monitoring of body temperature. No adverse events occurred during the survey.

¹¹ To verify our characterization of the campaign as conducted by local intermediaries, we asked respondents ""Did you personally know any of these government workers before they came to your community to do outreach?" 30% responded affirmatively, which we believe accords with our characterization of government outreach as conducted primarily by local intermediaries.

¹² Our survey also asked about exposure to NGO outreach, which was also common during the epidemic. However, the focus of this paper and our analysis is on the impact of government's outreach campaign. Throughout our analysis, we control for exposure to NGO outreach. It is also worth noting that while NGO outreach associates positively with knowledge of Ebola, it does not associate strongly with voluntary compliance or attitudes toward government, in contrast to government outreach. For full results, see Appendix Table 2.

Citizens categorized canvassers as government-affiliated based on the T-shirts they wore and the ID cards they carried. These means of identification were essential because at the time, residents were extremely wary of 'outsiders,' even those they may have recognized as being from their own community. The importance of being visibly associated with an official organization – even one as mistrusted as the Ministry of Health – reflects the level of fear that gripped Monrovia during the crisis. For the purposes of this study, it also helps to limit concerns about recall bias – respondents were able to recall who gave them information because knowing who said what and whether they were credible was often a matter of life and death.

Dependent variables

We assess the impact of mediated outreach on six sets of outcomes that are central to debates about political persuasion and building trust in government: 1) factual knowledge about Ebola; 2) "self-interested" or instrumental voluntary compliance with Ebola preventative measures; 3) "contentious" voluntary compliance with controversial control policies (such as the ban on public gatherings), which required individuals to incur costs on behalf of the collective good; 4) trust in government authorities generally and in the health sector specifically (5); and 6) support for everyday laws and regulations mandated by government.

To measure factual knowledge about Ebola, we asked respondents to report as many symptoms and transmission pathways as they could. We then asked about three common misconceptions: whether Ebola could spread through the air or before symptoms present, and whether drinking salt water could help cure Ebola. The latter three outcomes are coded as indicators for correct responses; the former most outcome is standardized on a 0 to 1 scale. We then aggregate these four outcomes into an additive *knowledge of Ebola* index, scaled to range from 0 to 1.

We measure self-interested voluntary compliance using two variables: whether respondents report using hand sanitizer daily, and whether they maintained a bucket of chlorinated water outside their home for hand washing, recommended by authorities at the time. Both outcomes are coded as indicators for affirmative responses and analyzed individually.

Support for contentious control policies is measured attitudinally and behaviorally. For our attitudinal measure, we asked respondents whether they supported six controversial control policies: the ban on public gatherings, travel restrictions, curfew, burials by government health workers, and cremation of those who died while suffering from Ebola-like symptoms. The latter policy was particularly contentious because it contravened traditional customs, and because Ebola's symptoms are similar to other common ailments, such as malaria. Responses were measured on four-point scale ranging from "strongly disagree" to "strongly agree", from which we construct indicators for "agree" or "strongly agree" responses. The *support for contentious control policies index* takes the average of these four indicator variables before being rescaled to range from 0 to 1.

To measure voluntary compliance, we asked respondents whether they had attended any public gatherings "such as video clubs, entertainment centers, or other crowded areas" in the past two weeks, as well as how many days they had gone out at night, also in the past two weeks. At the time of our survey, both activities were illegal under the state of emergency. Though these questions may be subject to response bias, we believe such bias was rare, as field reports during the pretesting of our survey suggest these questions were not viewed as sensitive. Such bias seems particularly unlikely given the sizable number of affirmative responses reported (Appendix Table 1). Moreover, because these questions were not viewed as sensitive or overtly

indicative of support for government, we do not believe whatever response bias did occur to associate with outreach – a contention supported by the placebo tests reported below.

We measure trust in government health authorities by asking respondents whether they trust the Ministry of Health; whether they believe the Ministry of Health is corrupt; whether they believe the government "has the heart to provide high quality health care"; and whether the government is *capable* of providing high quality healthcare. Each of these variables is coded as an indicator denoting "Agree" and "strongly agree" responses and analyzed individual.

We measure general trust in government using a similar battery of questions about the Ministry of Education, the Liberian National Police, and "the government" in general. We used these questions to construct three indicator variables for "Agree" and "strongly agree" responses. We then take the average of the individual responses for the *index of trust in government index*, which is then rescaled to range from 0 to 1.

Separately, we ask respondents which service provider – government, NGOs, traditional authorities, or community leaders – they would most prefer for three sectors: education, security, and healthcare. We use these questions to construct three indicator variables denoting "government" responses; the index of *preferences for government service provision* takes the average of these three variables before being scaled from 0 to 1.

We measure *support for government regulations* by asking respondents about their support of tax compliance, crime reporting, and support for rules against squatting on public lands. We construct three indicator variables denoting "Agree" and "Strongly agree" responses, with the index taking the average of these three variables before being scaled on a 0-1 scale. Lastly, we ask respondents to express their level of agreement with the statement "I am willing to do what the government tells me to do, even if I do not agree with what they say,"

constructing an indicator for "agree" and "strongly agree" responses. Appendix Table 1 summarizes the raw variables that make up each of the composite indices.

Follow-up data

At the end of the December-January survey, respondents were asked whether they would be willing to participate in a follow-up phone survey. In March 2015, we randomly re-sampled 774 of our respondents, 610 of whom were successfully re-surveyed. Attrition is not associated with socio-demographic variables, suggesting our follow-up sample remains representative of the general population in Monrovia (see Appendix).13

The resulting panel provides data on the three outcome categories that remained relevant in March 2015 – self-interested voluntary compliance, trust in government generally, and trust in the health sector specifically¹⁴ – as well as information on government outreach that occurred between January and March 2015. We use these data to test the assumptions underlying our research design and to test the robustness of our results to alternative estimation strategies.

Empirical strategy

Our main analysis compares individuals who reported government outreach to those that did not after accounting for differences in socio-demographic factors and community of residence. Formally, we estimate:

$Y_{ic} = \alpha_c + \beta_1 GovtOutreach + X_{ic}\theta + \epsilon_{ic}$

¹³ While three months may seem like a relatively short time-span between the first and second survey waves, we view this as a virtue for purposes of our difference in differences analysis since it minimizes the risk of time-varying confounders. In addition, the epidemic and associated outreach activities were quickly winding down by March 2015, so the outcomes of interest in this study would have been almost irrelevant had we waited any longer. For a timeline of the epidemic and our study, see the Appendix.

¹⁴ The curfew, ban on gatherings, and travel restrictions were lifted in early 2015; cremation was phased out in late 2014.

where Y_{ic} denotes one of our dependent variables for individual *i* in community *c*; α_c denotes community fixed effects (N=78), and X_{ic} is a vector of the individual-level controls listed in Table 1.15 Interpreting β_1 as a causal estimate of the impact of government outreach requires the assumption that individuals who received outreach are comparable to those that did not, after controlling for observed factors like age, education, income, gender, 2011 vote choice, and community of residence. More specifically, it requires that, after accounting for these observable factors, canvassers did not target residents within a community in a way that may have made them more likely to reach trusting and compliant citizens.

To evaluate this assumption, we conducted field interviews with community activists in a random sample of 40 communities between March and May 2015, as well as more than twenty elite interviews with decision makers from the Ministry of Health, local government, and humanitarian organizations involved in the crisis response. In these interviews, we asked respondents to describe how outreach was conducted in an open-ended way. We then followed up our initial questions by inquiring whether those conducting outreach went door to door delivering the campaign to every household, how they decided what geographic location in their community they would cover, and whether they ever encountered residents that tried to hide from them.

All of our respondents maintained that no particular households or neighborhoods were targeted for outreach within communities. To the contrary, organizers made efforts to reach every neighborhood within a given community, and canvassers were instructed to visit every

¹⁵ We also control for exposure to outreach by NGOs, though our results remain substantively unchanged when excluding this variable as a control.

household within their coverage area.¹⁶ However, due to the scale of the effort, intermediaries simply could not reach all households. Our empirical strategy thus exploits the haphazard, within-community variation in where canvassers were or were not able to reach.

Table 1 explores the plausibility of the assumption that canvassers did not deliberately target particular types of individuals by comparing individuals who reported outreach to individuals that did not across a range of socio-demographic variables. Individuals reporting government outreach were less likely to be female than those that did not, but were otherwise similar in terms of education, age, income, religion, political participation and vote choice in the 2011 election, which we use as an indirect measure of pre-crisis distrust of government.

(1)

	× ,
Independent variable name	Government outreach
Female	-0.1
	[0.03]***
Above median education	-0.05
	[0.03]
Above median pre-Ebola income	0
	[0.03]
Age 31-40	0.01
	[0.04]
Age 40-50	-0.02
	[0.04]
Age 51-60	0.07
	[0.06]
Age 60 or above	-0.03
	[0.07]
Muslim	-0.06
	[0.06]
Above median household size	-0.06

Table 1: Balance

¹⁶ While some canvassers reported encountering residents who hid from them, these incidents were rare, and nearly all of these canvassers also described how they were able to overcome them through persistence and strategies such as those discussed in Section 5, below.

	[0.03]*
Voted in 2011 election	0.05
	[0.05]
Voted for main opposition party in 2011 election	-0.06
	[0.05]
Voted for incumbent in 2011 election	0
	[0.04]
Observations	1,188
R-squared	0.13
Y Mean	39%

Estimation via OLS with community fixed effects and standard errors clustered by community. *** p<0.01, ** p<0.05, * p<0.1.

As a second test of our assumption that exposure to outreach was independent of potential trust and voluntary compliance outcomes, we use our panel data to assess whether those who expressed high levels of trust in government and voluntary compliance in our December survey were subsequently more likely to experience outreach in January, February, and March. Because outreach during this time period was similar to outreach in earlier periods,17 this analysis serves as a direct test of our identification assumption, namely that outreach was not inherently targeted towards trusting, compliant individuals. The results, reported in Table 2, reveal no association between trust and voluntary compliance in our initial survey and subsequent exposure to outreach.

outreach in winter 2015	Association with Government	N
Knowledge of Fhole	outreach	
Knowledge of Ebola index (0-1)	0.17 [0.12]] 610

17 Indeed, outreach conducted between January and March 2015 appears to have many of the same impacts as outreach conducted between July 2014 and December 2014.

Table 2: (Non-)Association between outcomes in December 2014 and

Self-interested voluntary compliance			
Bucket for hand-washing outside home?	-0.04	[0.05]	607
Use hand sanitizer daily?	0.01	[0.04]	607
Contentious voluntary compliance			
Support for contentious control policies index (0-1)	0.03	[0.08]	595
Violate ban on public gatherings past 2w?	-0.01	[0.05]	610
Break curfew in past 2w?	-0.07	[0.07]	610
Attitudes toward government in health sector			
MoH well-intentioned?	-0.01	[0.08]	605
Trust MoH?	-0.05	[0.05]	605
MoH is corrupt?	0.01	[0.05]	605
MoH capable of providing quality healthcare?	0.01	[0.05]	605
Prefer MoH provide healthcare over NGOs?	0.00	[0.04]	605
Attitudes toward government generally			
Trust in government index (0-1)	-0.03	[0.12]	605
Support for everyday laws and regulations (0-1)	0.04	[0.07]	597
Willing to obey Govt even if you disagree?	-0.03	[0.08]	605
Prefer Govt over NGO service provision?	0.03	[0.05]	610

Estimation via OLS regression with community fixed effects, individual controls, and standard errors clustered by community. Full regression tables shown in the Appendix. *** p<0.01, ** p<0.05, * p<0.1.

Together, our fieldwork and balance analyses support our assumption that outreach was not targeted towards certain types of individuals within communities, and in particular was done without bias towards individuals who were inherently more trusting or compliant.

Results

Table 3 reports the association between outreach and measures for each of our five outcome clusters, controlling for community and socio-demographic factors. To correct for multiple comparisons across outcomes within clusters, we also report average standardized effects (AES), following the procedure outlined in proposed in Clingingsmith, Khwaja and Kremer (2009).

Our first finding is that government outreach is associated with greater factual knowledge about Ebola. Respondents reporting outreach were able to list 0.5 more transmission pathways and 0.6 more symptoms relative to those that did not; they were also six percentage points more likely to know that Ebola is not an airborne disease.

Perhaps as a result of their improved knowledge, respondents who reported outreach were ten percentage points more likely to use hand sanitizer daily. Though they were no more or less likely to have a chlorinated bucket outside their home, this may be explained by the fact that the practice was already common at the time (77 percent of our respondents reported using a chlorinated bucket). Moreover, because this practice is particularly conspicuous, one might expect respondents to adopt it regardless of whether canvassers had reached them.

These results suggest that outreach was effective at increasing knowledge of the disease and promoting self-interested voluntary compliance. It is thus likely that these efforts helped to turn the tide on a disease that had initially spread unchecked amongst an ill-informed population.

But ending the epidemic required more than just educating citizens and building voluntary compliance with minimally invasive measures. To stamp out active transmission chains and prevent their reoccurrence, authorities needed to persuade citizens to put aside their customs and comply with a host of onerous restrictions, including the ban on social gatherings, a nighttime curfew, quarantines, and cremation by government health workers – a controversial practice that many viewed as alien and certain to deny the dead a peaceful afterlife. Changing these behaviors required building trust in the government's capacity and intentions amidst widespread fear and distrust.

On this count, government outreach was remarkably effective. Respondents who were visited by government canvassers were four percentage points more likely to believe the

Ministry of Health (MOH) was well-intentioned; nine percentage points more likely to say they trusted the MOH; eight percentage points less likely to believe the MOH was corrupt; nine percentage points more likely to prefer that government take the lead in providing healthcare; and one-tenth of a standard deviation more trusting of government in general, relative to those that did not experience government outreach. (We do not, however, observe differences in perceptions of the MOH's capacity among those reporting government outreach).

Turning to voluntary compliance, those reporting government outreach were eight percentage points more likely to support the ban on gatherings, ten percentage points more likely to support the curfew, 26 percentage points more likely to support burial by government workers, and eleven percentage points more likely to support cremation of those who died while suffering from Ebola-like symptoms. We also find that outreach improved voluntary compliance with (and support for) the ban on social gatherings: those reporting outreach were ten percentage points less likely to report attending a social gathering in the past two weeks.

Table 3 suggests that outreach may have improved voluntary compliance with government laws and regulations outside the health sector as well. In particular, those reporting government outreach were more likely to express support for reporting crimes to the police; more likely to support government regulations against squatting on public lands; and more likely to support the government's right to tax citizens. They were also nine percentage points more likely to agree with the statement "I am willing to do what the government tells me to do, even if I do not agree with what they say."

Table 3: Impact of outreach on knowledge of Ebola, voluntary compliance and attitudes toward government

Effect of	v	
Government	1 Maan	Ν
outreach	Weall	

Knowledge of Ebola				
Knowledge of Ebola Index (0-1)	0.06	[0.01]***	0.49	1,188
Self-interested voluntary compliance				
Bucket for hand-washing outside home?	0.04	[0.03]	77%	1,182
Use hand sanitizer daily?	0.1	[0.03]***	44%	1,182
Average Standardized Effect (AES)	.14	[0.05]***	NA	1,182
Contentious voluntary compliance				
Support for contentious control policies	0.15	[0.02]***	0.56	1,163
Violate ban on public gatherings past 2w?	-0.10	[0.03]***	23%	1,188
Break curfew in past 2w?	-0.01	[0.02]	11%	1,188
Average Standardized Effect (AES)	.25	[0.05]***	NA	1,188
Attitudes toward government in health sector				
MoH wants to provide healthcare?	0.04	[0.02]	15%	1,180
Trust MoH?	0.09	[0.03]***	27%	1,180
MoH is corrupt?	-0.08	[0.03]**	68%	1,180
MoH capable of providing quality healthcare?	0.01	[0.04]	35%	1,180
Prefer MoH provide healthcare over NGOs?	0.09	[0.03]***	50%	1,180
Average Standardized Effect (AES)	.15	[0.04]***	NA	1,180
Attitudes toward government generally				
Trust in government index (0-1)	0.07	[0.01]***	0.31	1,180
Support for everyday laws and regulations (0-1)	0.12	[0.02]***	0.67	1,164
Willing to obey Govt even if you disagree?	0.09	[0.02]***	45%	1,180
Prefer Govt over NGO service provision? (0-1)	0.04	[0.02]**	53%	1,188
Average Standardized Effect (AES)	.32	[0.04]***	NA	1,156

Estimation via OLS regression with community fixed effects, individual controls, and standard errors clustered by community, following Equation 1. Full regression table shown in the Appendix. *** p<0.01, ** p<0.05, * p<0.1.

Robustness checks

The validity of our analysis rests on the assumption that exposure to outreach was independent of potential trust and compliance outcomes after accounting for community of residence and observable characteristics captured by our survey. To defend this assumption, we have shown that outreach is balanced across socio-demographic variables and pre-crisis measures of trust, and that those with high levels of trust and voluntary compliance in December were not subsequently more likely to experience outreach between January and March, 2015.

Both of these results are consistent with what we would expect if outreach were indeed conducted at random. Equally important, they are inconsistent with potential sources of confounding that could still emerge even if outreach were indeed conducted at random. For example, it is unlikely that those who are inherently compliant and supportive of government *over-reported* government outreach because they wanted to praise the government (Bullock, Gerber, Hill, & Huber, 2013), because if this were true, we would expect outreach to associate with pre-crisis measures of trust, like voting for the incumbent in the 2011 election. We would also expect these compliant, pro-government respondents to report higher levels of outreach in winter 2015, which we do not. Similarly, it is unlikely that respondents who simply have a knack for socially desirable responses (mis)report higher levels of trust, voluntary compliance, and outreach, since we would expect these seemingly 'compliant' and 'trustful' individuals to also report higher levels of outreach in March 2015.

While we cannot definitively prove the assumption of no unobserved confounding underlies this interpretation, we argue that the sum of these considerations favors a causal interpretation of our results. Given that outreach is balanced across observables in December 2014 *and* unassociated with prior measures of trust and voluntary compliance in March 2015, the conditions under which unobserved confounding could account for our results are quite limited. More precisely, our results would be confounded only if i) the way that outreach was conducted (or reported) changed between fall 2014 and winter 2015, such that it did not associate with preexisting trust and voluntary compliance in winter 2015 but did associate with these

preexisting outcomes in fall 2014; ii) there were unobserved differences between those reporting and not reporting outreach in fall 2014; and iii) these differences are weakly associated with the covariates measured in our balance analysis but iv) strongly and positively associated with trust and voluntary compliance. We believe the coincidence of these four conditions is unlikely, especially given that outreach in winter 2015 was similar in form and function to outreach in fall 2014 --- and had similar effects, as we show below.18

Sensitivity analysis

Another step we take to rule out unobserved confounding is to conduct a sensitivity analysis following the approach proposed by Oster (2015), which uses the bias eliminated by observed confounders to assess the potential bias induced by unobserved confounders. We present the results from this analysis in the Appendix, showing that unobserved confounders would have to be substantially more confounding than observed confounders to account for our results, a condition we believe is unlikely given the richness of our observed control variables.

Difference-in-differences analysis

Our final robustness check uses our panel data to validate the main findings a through difference-in-differences analysis of the impact of outreach between January 2015 and March 2015 on the subset of outcomes measured in both December 2014 and March 2015. This design allows us to account for all time-invariant confounders that could drive a spurious association

¹⁸ Nearly the same proportion of those reporting outreach in fall 2014 versus winter 2015 said they spent time interacting in a friendly manner with canvassers (80% vs 81%). Asked to describe the canvassers' activities in an open-ended manner, respondents from both surveys used key descriptive words and phrases with roughly the same frequency. And finally, as we show below, outreach had very similar effects in both time periods.

between outreach and trust and voluntary compliance, including the aforementioned sources of reporting bias. We implement this analysis via:

$$\begin{split} Y_{ic} &= \alpha_{c} + \beta_{1} GovtOutreachWinter2015 + \beta_{2} March \\ &+ \beta_{3} GovtOutreachWinter2015 \, x \, March + \, \textbf{X}_{ic}\theta + \, \epsilon_{ic} \end{split}$$

where Y_{ic} denotes one of our dependent variables for individual *i* in community *c*; α_c denotes community fixed effects (N=78), and X_{ic} is a vector of the individual-level controls. β_1 captures the association of receiving government outreach between January and March 2015 on outcomes in *December 2014* (which we expect to be null if outreach is as-if random); β_2 captures any time period differences between December 2014 and March 2015; and β_3 captures the effect of outreach receiving outreach in winter 2015 on outcomes measured in March 2015.

Table 4 reports the results of this analysis, showing that the effects of government outreach in winter 2015 on measures of trust and self-interested voluntary compliance are similar in magnitude to those reported in Section 4.2, though not all impacts are statistically significant due to the smaller sample size. Importantly, estimates of β_1 , the 'pre-treatment' difference between those receiving outreach in Winter 2015 and those not receiving outreach is close to zero across all outcomes, consistent with the results reported in Table 2 and our contention that outreach is as-if random.

		impuer of our eu		on outcomes
	(1)	(2)	(3)	(4)
Variable name	Use hand sanitizer daily?	Bucket for hand-washing outside home?	MoH well- intentioned?	Trust MoH?
Outreach (Winter 2015)	0.00	-0.01	-0.01	-0.06
	[0.04]	[0.04]	[0.04]	[0.04]
March	0.19	0.08	0.03	0.05
	[0.03]***	[0.02]***	[0.03]	[0.03]
Outreach (Winter 2015) x March	0.12	0.07	0.05	0.10
	[0.05]**	[0.04]*	[0.05]	[0.05]*
Observations	1 315	1 315	1 204	1 204
P squared	0.10	0.13	0.10	0.13
K-squared	0.19	0.15	0.10	0.15
-	(5)	(6)	(7)	(8)
_	MoH is corrupt?	MoH able to provide quality healthcare?	Prefer MoH provide healthcare over NGOs?	Trust in government index (0-1)
Outreach (Winter 2015)	0.04	0.04	0.02	0.00
	[0.04]	[0.04]	[0.04]	[0.02]
March	-0.09	0.20	-0.09	0.07
	[0.03]**	[0.03]***	[0.03]***	[0.01]***
Outreach (Winter 2015) x March	-0.01	0.06	0.03	0.05
	[0.06]	[0.05]	[0.05]	[0.02]**
Observations	1,294	1,292	1,295	1,294
R-squared	0.11	0.17	0.12	0.18

Estimation via OLS regression with community fixed effects, individual controls, and standard errors clustered by community. Full regression table reported in the Appendix. NGO = non-governmental organization; OLS = ordinary least squares. * p<0.1. ** p<0.05. *** p<0.01.

These results are important not only because they serve to validate our core findings, but also because they suggest an important degree of external validity. Whereas the fall of 2014 was a period of widespread fear, uncertainty, and hardship under the state of emergency, by winter 2015 the state of emergency had been lifted, new cases of Ebola were rare, and attention was already turning toward economic recovery. Notwithstanding these differences in context, the basic form and content of outreach efforts remained quite similar. The Liberian government's outreach strategy was thus effective at building trust and cooperation in at least two considerably different settings, suggesting its model may be an efficacious means to promote citizen-state cooperation in other settings where distrust is endemic. In the next section, we use qualitative data to document key elements of the model and highlight how they contributed to the program's success.

Unpacking the effectiveness of mediated outreach

Overall, our quantitative evidence suggests that mediated outreach by volunteer intermediaries was remarkably effective at persuading citizens to trust health authorities and comply with contentious control policies. To understand how this campaign proved so effective, we conducted in-depth, open-ended interviews with roughly 80 key informants between March and May 2015. Informants were selected from 40 communities sampled from the December survey. These communities were sampled at random, but we stratified by intensity of outreach and over-sampled communities with the highest levels of outreach (because the purpose was to unpack the effectiveness of outreach, we were less interested in communities with little to no reported outreach). In each community, we asked the town chairman to identify community members who were involved in the anti-Ebola Community Task Force, the institution responsible for conducting outreach during the epidemic. Further details on the selection procedure and interview protocol are provided in the Appendix.

Perhaps the most obvious explanation for why mediated outreach was effective is that local intermediaries were more familiar to community members and thus more trusted than government officials. Indeed, a large literature suggests that persuasion is most effective when it takes place through familiar local intermediaries or opinion leaders (Katz & Lazarsfeld, 1955; Enos & Hersh, 2015, p. 252-278; Middleton & Green, 2008; Sinclair, McConnell, & Michelson,

2013, p. 42-57). Studies of previous epidemics have also suggested that "establishing relationships of trust and confidence with affected communities and involving community and religious leaders and respected individuals are fundamental to a successful response" (Oxfam, 2014).

However, our qualitative data suggest that familiarity and preexisting social bonds cannot fully account for the campaign's effectiveness. To the contrary, many canvassers initially encountered *distrust* and at times intense resistance from their fellow community members, the majority of whom they did not know personally before the crisis.¹⁹ High levels of migration and dislocation during the civil war have resulted in Monrovia neighborhoods that are large, atomized, socially heterogeneous, and often transient (Fagen & Shilue, 2014).²⁰

Initial suspicion and resistance to these locally-recruited canvassers was a common theme in our interviews. One respondent explained: "[P]eople here don't believe in community initiative. People generally believe that if you're coming around, you're trying to trick them."²¹ Since the war, suspicion of young men is particularly high: "When you are a young man, they don't assume you are there for just the community. They assume you are profiting."²² Others recalled: "They would say, 'You're printing these flyers to trick us'"²³ and "They were denial, people throw stones at us, insulted us."²⁴

Throughout our interviews, respondents consistently emphasized how it was essential for intermediaries to alleviate the suspicions of others that they had been co-opted by the

¹⁹ Communities in urban Monrovia are quite large, generally between 3000 and 5000 residents. In our survey, only 30% of respondents reporting outreach said they knew the canvassers prior to the crisis.

²⁰ It is also worth noting that generalized trust is extremely low in Liberia: according to the Round 5 Afrobarometer survey, only 36% of respondents said they trusted their neighbors "Somewhat" or "A lot" – fewer than all other countries except Nigeria, Botswana, and Zambia.

²¹ Interview with Joseph (pseudonym), Community E, Paynesville, Monrovia. May 14, 2015.

²² Interview with Joseph (pseudonym), Community E, Paynesville, Monrovia. May 14, 2015.

²³ Interview with Prince K. (pseudonym), Community B, Paynesville, Monrovia; May 20, 2015.

²⁴ Interview with Bertrand (pseudonym), Community A, Soniwein, Monrovia; May 25, 2015.

government or that they had ulterior motives. One volunteer noted: "When we started, people insulted us. They said we were getting richer from Ebola. But we kept talking to them, and they got to know that we were members in their community. [We would say] 'We are not the government. We are doing this because we are a community. We are trying to protect our community."²⁵ In the Monrovia slum neighborhood of West Point, volunteer intermediaries would knock on doors, disseminate information about symptoms, and then make sure that people knew they were not getting paid: "[We would say] 'We work free of charge because we want to save community. I'm risking life because it is serious. We believe we are the only ones who can talk to you. What you hear outside is not true. Our government wouldn't be that wicked."²⁶

Persuasion through source accountability

If pre-existing trust and familiarity does not fully explain the effectiveness of mediated outreach, what does? Our qualitative evidence suggests that intermediaries' embeddedness in their communities – i.e. physically residing in the community and participating in community social networks and institutions – enabled other community members to monitor, and if necessary, *sanction* intermediaries should the information they deliver from the government prove to be false or harmful. This ability to monitor and sanction, in turn, assured residents that intermediaries were accountable and thus credible sources of information.

The importance of monitoring came up repeatedly during our interviews with intermediaries, in which they repeatedly emphasized how the ability of citizens to monitor them enabled them to dispel the notion that they were complicit in the government's scheme to attract and embezzle donor money through the spread of Ebola. As one resident explained, "the moment

²⁵ Interview with Mary S. (pseudonym), Community C, Paynesville, Monrovia; May 15, 2015.²⁶ Interview with Gary (pseudonym), Community A, West Point, Monrovia; May 25, 2015.

you wear the MOH t-shirt, people become convinced you're eating money ... however, overtime, people became convinced that I was not profiting because they never saw me with any extra materials."²⁷ Echoing this sentiment, another respondent explained how he would reply when people accused him of "helping government identify people to kill": "If I am going up there [to 'big people' in government] to sell you, would I still be wearing slippers? If I benefit in money, you would see my life would change."²⁸

In another community, a respondent explained how people would often disregard his messages because they assumed that since he had no materials such as buckets, soap, or t-shirts to give, he must be keeping them for himself. Asked how he overcame this distrust, he explained how the only way for them to trust him was for "they themselves to see your whole life and see that nothing has improved ... I had one bucket and they had to see it." 29

As these testimonies illustrate, the repeated interaction between residents and local intermediaries and the associated monitoring capacities of ordinary citizens was key to establishing the credibility of intermediaries. However, another key contributor to their credibility was the fact that intermediaries' embeddedness in their communities also exposed them to the risk of retribution and sanctioning. According to those we interviewed, this source of accountability was so valuable that canvassers frequently pursued deliberate strategies to make themselves more vulnerable and thus accountable to citizens. One strategy that our interviewees mentioned on several occasions was to give people information about where they personally lived to enable others to hold them accountable should the information they were disseminating prove to be false. A canvasser from the West Point slum, for example, noted how he would

²⁷ Interview with Beatrice (pseudonym), Community A, Caldwell, May 26, 2015.

²⁸ Interview with James (pseudonym), Community A, Slipway, May 24, 2015.

²⁹ Interview with Robert (pseudonym), Community A, Old Road, May 14, 2015.

describe in detail the location of his house, at times going so far as to walk with residents to personally show them his house.³⁰ Our interviewees also reported giving out their phone numbers to people to overcome their suspicions.³¹ One described how giving his phone number out to everyone and writing it on walls all over the community got people to listen to him and become less afraid.³²

Another strategy that canvassers used to make themselves more vulnerable and accountable – and thus more credible – was to reveal their workplaces or affiliations with known organizations located within the community. In West Point, for example, canvassers who were affiliated with More than Me, a well-known school and civil society organization within the community itself, made a point of emphasizing their affiliation. According to our interviewees, revealing their affiliation with More than Me was effective not simply because it revealed their status as an upstanding member of the community, but also because it enabled residents to track them down at a later point in time. Other canvassers affiliated with community churches or community task forces also talked about how people had more confidence in them because they knew of the physical location where they could be found. Having brick-and-mortar places where citizens could locate activists and their affiliated organizations allowed fellow community members to contact them for help – but also gave community members the power to hold them accountable and harass them in the case of wrongdoing.³³

A third approach was for volunteers to associate themselves with well-known community actors and places that residents could find and hold accountable in their stead. Several outreach

³² Interviews with Jeremy (pseudonym), Community A, Paynesville. March 28, 2015 and May 15, 2015.
³³ Interview with Dominik (pseudonym), Community C, West Point, Monrovia; May 11, 2015. Interview with Francis (pseudonym), Community B, West Point, Monrovia; May 11, 2015. Interview with Victor, Community D, West Point, Monrovia; May 25, 2015.

³⁰ Interview with Bennett (pseudonym), Community B, West Point, Monrovia. May 25, 2015.

³¹ Interview with James (pseudonym), Community B, West Point, Monrovia. May 11, 2015; Interview with Frederick, Community C, Paynesville, Monrovia. March 28 205.

workers, for example, spoke of reaching out to teachers and schools to assist with outreach. In one community on the eastern side of the city, outreach workers visited schools three times a week, where teachers then took them to classes to talk with students and answer questions.³⁴ In another community, outreach workers reported involving both public and private school teachers in their canvassing.³⁵ As one of the few permanent institutions in Monrovian communities, schools offered an easy-to-find location for unhappy citizens seeking to locate canvassers suspected of deception, or to punish school teachers as proxies for the canvassers. Another variant of this approach was for community volunteers to call mass meetings in each block and ask for volunteers. This public process thus produced common knowledge about who the canvassers were, how to find them, and who else in the community knew them and could be held accountable as proxies.³⁶

Through these strategies of promoting source accountability, embedded intermediaries slowly built trust overtime and established themselves as opinion brokers. They used themselves as *collateral* to persuade their fellow community members to give government authorities the benefit of the doubt and "loan" the government their trust and cooperation. Intermediaries thus acted as *guarantors for the government*, making it possible for community members to enforce social or even physical punishment against them should they (or the government) prove untrustworthy or default on its obligations (Katz & Lazarsfeld, 1955). These strategies are consistent with Hardin's observation that, "the essence of trustworthiness is that the trustee has an interest in fulfilling the truster's trust. One of the most straightforward ways of creating an incentive for the trustee to do so is to enable the trustee to punish the truster for failing to fulfill

³⁴ Interview with Jerry (pseudonym), Community A, Paynesville, Monrovia; May 15, 2015.

³⁵ Interview with Steve (pseudonym), Community A, Slipway, Monrovia. May 12, 2015.

³⁶ Interview with Marvin (pseudonym), Community D, Paynesville, Monrovia; April 28, 2015.

the truster's trust" (Hardin, 1998, p. 9-27). Source credibility increases when sources have no incentive to lie (Weitz-Shapiro & Winters, 2017), and when they deliver information that runs counter to their personal and political interests (Berinsky, 2015). In this case, local canvassers were persuasive because of the costly signals provided by the strategies they pursued for increasing source accountability.

Transferring trust to government

Once intermediaries had won the trust of their fellow residents, they were able to communicate information about Ebola without encountering resistance. However, our interview data suggest that they also began to serve as "opinion leaders," or trustworthy sources of information about the government, and used this position to begin transferring the trust they had won to the government. One activist from West Point, for example, recounted how he and other outreach workers associated with the local nonprofit More than Me built up familiarity and a reputation for public service within the community by first organizing themselves independently from the government to go door-to-door in the community disseminating public health information. By September 2014, after having canvassed the community on a daily basis for weeks, this activist noted, "When they saw I love West Point, they know I am one of them," referring to the tagline on his More than Me t-shirt. But in October, when they began working with the Ministry of Health and started wearing vests distributed in government training workshops, "People became afraid. They tried to waste [dump] water on us. They said, 'Oh no, you are bringing Ebola! Because they were afraid of the MoH." The canvassers began wearing the More than Me T-shirt three days a week and the Ministry of Health vest four days a week:

"We did that so people could see we were the same people doing the same thing [regardless of what we were wearing]."₃₇

Other outreach workers similarly reported working creatively to transfer the trust they developed with residents to the government. One respondent, for example, reported how he started putting on a T-shirt from the Ministry of Health to conduct outreach every day, and people gradually grew to believe in the regulations he was disseminating because "they saw there was a team going around" and "I am a serious person. [People thought:] 'He wouldn't be spending all this time if it wasn't real." Another respondent noted that when they started to wear T-shirts from the Ministry of Health, people in the community started to associate their outreach efforts with the government taking "a stand against Ebola."₃₈

In addition to helping change the "face" of government within communities, intermediaries also helped trigger a paradigm shift in the way citizens viewed government by delivering a coherent alternative to the conspiracy theories circulating about the government's role in creating the epidemic. One volunteer, for example, reported that he would jot down specific points that people gave to explain why they believed the rumors and did not believe in Ebola. He would then contact the government-appointed head of the crisis response effort for factual information that he could use to counter these arguments. As this volunteer observed, "Everyone was confused, but we were giving facts. We erased mindset that government did this."₃₉

Canvassers also informed citizens that the government was expending resources on efforts to fight the epidemic through training workshops, contact tracing forms, and chlorine and

³⁷ Interview with Victor (pseudonym), Community D, West Point, Monrovia; May 25, 2015.

³⁸ Interview with Prince K. (pseudonym), Community B, Paynesville, Monrovia; May 20, 2015.

³⁹ Interview with Victor (pseudonym), Community D, West Point, Monrovia; May 25, 2015.

bucket distributions: "If the government were bringing disease and killing people for money, they wouldn't spend money on saving people. They would just keep it for themselves."⁴⁰ Similarly, canvassers relayed information about government health workers and international doctors were dying of Ebola: "If government brought these people to pay amount for bodies, why would I die? They saw international doctors die, which would cause them to wonder: If they were part of [the conspiracy], why would they be dying?"⁴¹ People who deeply distrusted the government were willing to listen and believe activists from within the community: "When people had denial syndrome, when they came and they know the person, they listen."⁴²

As embedded intermediaries successfully persuaded people that the Liberian government (rather than just individual government health officials) really was trying to halt the epidemic, these anomalous pieces of information about government intentions pushed individuals to change their paradigm for understanding government authorities. As citizens became persuaded that government authorities were genuinely doing good in one area, they came to reconsider their beliefs that those in power were inherently malevolent and simply maximizing power and material gain.

Motivations of volunteer intermediaries

Our results suggest that mediated outreach was effective because local intermediaries made themselves vulnerable to their fellow citizens. But given that they were acting as volunteers, why were intermediaries willing to take these risks? One answer is simply that intermediaries were motivated by self-preservation. Another is what Willer calls "the status

⁴⁰ Interview with Samuel (pseudonym), Community A, Caldwell, Monrovia; May 26 2015.

⁴¹ Interview with Bertrand (pseudonym), Community A, Soniwein, Monrovia; May 25, 2015; Interview with Mathew (pseudonym), Community A, Slipway, Monrovia Liberia; May 21 2015: "Then health workers started dying, so they know no government. Ebola is real."

⁴² Interview with Steve (pseudonym), Community B, Slipway, Monrovia. May 12, 2015.

solution" to the collective action problem. Groups reward individual sacrifice, and desire for social status can motivate individuals to bear the costs of persuasion (Burt, 1999, p. 37-54; Willer, 2009, p. 23-43). Once these individuals have put themselves out there, it becomes important to prove that they are right because they have tied the fate of the community to the results of their choices (Hirsch, 2016, p. 68-84). If their efforts do result in improved public welfare, they then stand to benefit socially from a reputation for good judgment and access to higher-quality information.

Reports from our qualitative interviews are consistent with both of these motivations. Intermediaries often described their work as matter of life and death for themselves and their communities. By the end of the crisis, when our in-depth qualitative interviews were conducted, respect and admiration for community intermediaries was common. People viewed government canvassers favorably for bringing resources and attention from the government to their communities.43

For some, the possibility of material compensation also played some a role. None of our respondents reported increased income and employment from government as a primary reason for coproducing outreach with the government, which is not surprising since no compensation was offered by the government for most of the crisis period. During the last few months, however, the Ministry of Health was eventually able to procure stipends for outreach workers.44 Some outreach workers expressed bitterness about not receiving pay for their work, although

⁴³ Interview with Marshall (pseudonym), Community A, Gardnersville, Monrovia; May 18 2015.
⁴⁴ Respondents commonly reported that stipends were expected to be around \$100 per month, in a place where government health workers and teachers earn approximately \$200-400 per month.

their resentment may have stemmed at least in part from a desire for official acknowledgment of their significant efforts.45

Summary and implications

Our results suggest that authorities who are deeply mistrusted by citizens yet acting in the public interest can overcome their credibility deficit by enlisting embedded local intermediaries to advocate on their behalf. These findings are most likely to generalize to settings where mistrusted government authorities seek to persuade citizens to cooperate during epidemics and other humanitarian crises, and are genuinely acting in the public interest. For example, in the ongoing struggle to contain the 2018-19 Ebola epidemic in the Democratic Republic of Congo, mistrust of authorities has again triggered dozens of attacks on health workers and responders, leading the World Health Organization to invest in anthropologist-led outreach teams who go to great lengths to spend time in remote villages and organize community dialogues (WHO, 2019), and leading Medecins Sans Frontieres to recommend integrating Ebola response into existing health systems rather than relying on outside organizations like itself (Child, 2019).

Our findings may also shed light on other situations where elites need to win the cooperation of suspicious citizens but do not have time to build trust gradually. For the counterinsurgency efforts in Mindanao and northern Nigeria, for example, experts have increasingly advocated for "persuasive counter-terrorism" approaches that center on the use of embedded intermediaries (Schmid & Graaf, 1982; Crelinsten, 1987; Williams, 2008) such as civic education programs and the reorienting and moderating the beliefs of local university

⁴⁵ Dörte, Sondorp, Mayhew, Roura, and Roberts (2013, p. 42-49), for example, report that perceived lack of recognition and support by health workers in rural Liberia leads to the sub-optimal delivery of services, delivery of parallel private services, and absenteeism.

students who can then persuade others at home (Abdulazeez, 2016). In policing, authorities who lack the trust or confidence of residents often use community policing programs to establish groups of local intermediaries who can advocate for the police and facilitate cooperation through activities like crime reporting (Wisler and Onwudiwe, 2008).

A model of mediated outreach can be effective not only because of greater trust, shared identities, or affective ties, but also because of the source accountability of the intermediaries. When intermediaries are embedded and make themselves vulnerable to monitoring and sanctioning, they allow their fellow residents to hold them accountable should the information they are disseminating prove to be false or inaccurate. Once this channel of accountability has been established, local intermediaries can deliver information about the importance of cooperation with government policies without encountering resistance and begin the process of (re)building trust in government. In developing contexts source accountability may be more likely to operate via intermediaries and personal access established through friendship networks, shared residence in neighborhoods, or shared location of employment, though in theory, it could also be constructed through formal institutions (e.g. libel laws) and technological platforms (as with peer-to-peer lending apps).

Given the advantages of mediated persuasion, why do so many governments turn to strategies of direct persuasion? One possibility is that, as Scott (1998) notes, authorities tend to "see like a state" and favor programs and methods that they can standardize and directly control (UNICEF, 2013). Governments in developing countries often experience pressure from external funders to "act like a state." Confronted with crisis situations, governments – particularly in hybrid and nondemocratic regimes – may tend toward simplistic, top-down approaches such as

mass propaganda, martial law, and coercion when they need to accomplish something rapidly – often only to fail.

Recruiting the assistance of traditional leaders – religious, clan, or tribal authorities – is also a common strategy. But it may be important to distinguish between community intermediaries that persuade versus intermediaries that control. Many traditional leaders draw on established institutions and authority relationships, including means of social and physical coercion, to mobilize compliance. Ordinary people, however, often believe that traditional leaders have an interest in preserving their own power. As a result, they are susceptible to cooptation by government authorities, which can undermine their credibility as a source of information. Thus traditional leaders may be more powerful at commanding obedience, but volunteer intermediaries may well be more *persuasive.*46

Relatedly, our study joins a burgeoning area of research on the range of important functions played by intermediaries and brokers in developing contexts. Much of this work has examined the role of intermediaries in accessing the state and/or brokering votes (for example, Auerbach and Thachil, 2018; Stokes et al. 2013; Krishna, 2011; Kruks-Wisner, 2018). Here we show that it may also be useful for the state to use intermediaries in accessing citizens. In acting as "trust intermediaries" (Coleman, 1988) or "vouching intermediaries" (Karlan et al., 2009), the outreach workers in our study "lend" the state the credibility they have established within communities.

Finally, we contribute to theories of persuasion by going beyond its focus on source credibility to highlight the importance of source *accountability*. Research on political

⁴⁶ Prior literature on social communication in the U.S. has also suggested that the most persuasive opinion leadership within communities is often "horizontal" among individuals of the same socioeconomic status rather than "vertical" (Huckfeldt & Sprague, 1995; Katz & Lazarsfeld, 1955).

communication that examines source credibility defines it almost exclusively in terms of expertise or perceived trustworthiness (Hovland & Weiss, 1951, p. 635-650; Tormala, Brinol, & Petty, 2006, p. 684-691; Pornpitakpan, 2004, p. 243-281). It may, however, be important to consider how mechanisms that enable information recipients to monitor and sanction sources contribute to source credibility (Dennis, 1996, p. 532-550; El-Shinnawy & Vinze, 1997, p. 473-496; Rains, 2007, p. 100-125). This approach to establishing credibility can be particularly critical when message recipients have a negative predisposition towards the advocacy (Sternthal et al., 1978, p. 252), when message recipients are relatively unskilled at analyzing issues or processing information (Kumkale, Albarracin, & Seignourei, 2010, p. 1325-1356), and during crisis situations (Zakaria & Mustaffa, 2014, p. 178-183), all of which are conditions that often plague weak and fragile states.

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Building Credibility and Cooperation in Low-Trust Settings: Persuasion and Source Accountability in Liberia during the 2014-2015 Ebola Crisis

Appendix

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	Ν	mean
Knowledge of Fhola		
Ebola can spread before symptoms?	1 552	60%
Drinking salt water can help?	1,552	9%
Fhola can spread through the air?	1,549	21%
# of known Ebola symptoms	1,500	3 21
# of known Ebola transmission pathways	1,572	2.79
	1,072	,
Self-interested compliance		
Bucket for hand-washing outside home?	1,561	77%
Use hand sanitizer daily?	1,561	44%
Contentious compliance		
Support cremation of deceased suspected of Ebola?	1.543	19%
Support burials by health workers?	1 541	52%
Support ban on curfew?	1 543	68%
Support travel restrictions?	1,543	60%
Support haven resulted ons?	1,542	80%
Break curfew in past 2w?	1,542	11%
Violate han on public gatherings past 2w?	1,572	23%
violate ball on public gaulerings past 2	1,572	2370
Attitudes toward government		
Government has heart to provide health care?	1,557	15%
Government has heart to provide security?	1,557	20%
Government has heart to provide education?	1,557	13%
Trust government?	1,557	24%
Trust MoH?	1,557	27%
Trust the police?	1,557	20%
Government is corrupt?	1,557	73%
MoH is corrupt?	1,557	68%
Police are corrupt?	1,557	76%
Government is capable of providing quality health care?	1,555	35%
Government is capable of providing quality education?	1,557	29%
Government is capable of providing quality security?	1,556	41%
Prefer government provide health care rather than NGOs?	1,557	50%
Prefer government provide education rather than NGOs?	1,557	63%
Prefer government provide security rather than NGOs?	1,557	77%
Support for available and regulations		
Support for everyady daws and regulations	1 5/3	80%
Support Toporting suspected eminiats to the ponce?	1,545	/00%
Support Goves right to force citizens to new taxes?	1,544	サブ% 70%
Willing to obey government even if you discorre?	1,344	12%0 160/
winning to obey government even if you disagree?	1,337	40%
Key independent variables		
Government outreach	1.188	40%

Appendix 1 – Summary Statistics for Outcome Variables

Appendix Table 1: Summary statistics for outcome variables

Electronic copy available at: https://ssrn.com/abstract=3571562

Note: Observations vary due to either non-response or because questions were added partway through the survey when reports from our field staff suggested that community outreach may have played an important role in changing behavior within communities.

Appendix 2 – Full regression tables for main results

Full regression table for Table 3 in paper

	Knowled Ebola	lge about a (std)	Bucket for h outside	hand-washing home?	Use hand sat	nitizer daily?	Support for control	contentious policies
Government outreach	0.05	0.06	0.04	0.04	0.10	0.10	0.15	0.15
	[0.01]***	[0.01]***	[0.03]	[0.03]	[0.03]***	[0.03]***	[0.02]***	[0.02]***
NGO outreach	0.04	0.04	0.05	0.04	0.09	0.07	0.05	0.04
	[0.02]***	[0.02]**	[0.03]*	[0.03]	[0.03]***	[0.03]**	[0.02]**	[0.02]**
Female		0.02	[]	-0.02	[]	-0.08		-0.00
		[0.01]*		[0.03]		[0.03]**		[0.02]
Above median education		0.01		0.13		0.11		0.05
		[0.01]		[0.03]***		[0.03]***		[0.02]**
Above median income		0.05		0.04		0.02		0.00
		[0.01]***		[0.03]		[0.03]		[0.02]
Age 31-40		0.00		-0.01		0.03		-0.00
C C C C C C C C C C C C C C C C C C C		[0.01]		[0.03]		[0.03]		[0.02]
Age 40-50		0.02		-0.00		0.02		0.01
		[0.02]		[0.04]		[0.04]		[0.03]
Age 51-60		0.01		-0.02		-0.03		0.01
		[0.02]		[0.05]		[0.05]		[0.04]
Age 60 or above		0.03		-0.01		-0.16		-0.01
		[0.03]		[0.05]		[0.06]***		[0.04]
Muslim		-0.00		0.06		0.01		0.09
		[0.02]		[0.04]		[0.06]		[0.02]***
Above median household size		0.02		0.04		0.06		0.00
		[0.01]		[0.03]		[0.03]*		[0.02]
Voted in 2011		0.01		0.04		0.08		0.00
		[0.02]		[0.03]		[0.03]**		[0.02]
Voted for opposition in 2011		0.01		-0.03		-0.04		-0.03
		[0.01]		[0.03]		[0.04]		[0.02]
Observations	1,188	1,188	1,182	1,182	1,182	1,182	1,163	1,163
Community fixed effects?	Y	Y	Y	Y	Y	Y	Y	Y
R-squared	0.17	0.19	0.12	0.15	0.13	0.17	0.17	0.19

Estimation via OLS regression with community fixed effects, individual controls, and standard errors clustered by community, following Equation 1 in the main text. *** p<0.01, ** p<0.05, * p<0.1.

Full regressi	ion table for	Table 3 in	paper ((continued))
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Ŭ I	Violate ba	n on public	Break curfew in past 2w?		Government has heart to		Trust MoH?	
	guilering	s past 2w.		2	provide in	cartin cure .		
Government outreach	-0.10	-0.10	-0.01	-0.01	0.04	0.04	0.10	0.09
	[0.03]***	[0.03]***	[0.02]	[0.02]	[0.02]*	[0.02]	[0.03]***	[0.03]***
NGO outreach	0.03	0.03	-0.01	-0.02	-0.01	-0.01	-0.00	0.00
	[0.03]	[0.03]	[0.02]	[0.02]	[0.03]	[0.03]	[0.04]	[0.04]
Female		-0.06		-0.10		-0.02		-0.05
		[0.03]**		[0.02]***		[0.03]		[0.03]
Above median education		0.01		0.01		0.01		-0.04
		[0.02]		[0.02]		[0.02]		[0.03]
Above median income		0.07		0.01		-0.03		-0.10
		[0.03]**		[0.02]		[0.03]		[0.03]***
Age 31-40		-0.06		0.01		-0.02		-0.01
0		[0.03]*		[0.02]		[0.03]		[0.04]
Age 40-50		-0.03		-0.00		-0.02		-0.01
-		[0.04]		[0.02]		[0.03]		[0.04]
Age 51-60		-0.13		-0.04		-0.01		-0.02
		[0.05]***		[0.03]		[0.04]		[0.06]
Age 60 or above		-0.15		-0.03		-0.05		0.08
		[0.05]***		[0.04]		[0.06]		[0.07]
Muslim		0.00		-0.02		-0.06		-0.08
		[0.05]		[0.03]		[0.04]*		[0.05]
Above median household size		-0.01		0.02		-0.01		-0.05
		[0.02]		[0.02]		[0.03]		[0.02]**
Voted in 2011		-0.02		0.03		-0.00		0.01
		[0.03]		[0.02]		[0.03]		[0.03]
Voted for opposition in 2011		0.04		0.01		-0.03		-0.03
		[0.03]		[0.02]		[0.02]		[0.03]
Observations	1,188	1,188	1,188	1,188	1,180	1,180	1,180	1,180
Community fixed effects?	Y	Y	Y	Y	Y	Y	Y	Y
R-squared	0.12	0.15	0.07	0.11	0.09	0.09	0.07	0.09

Estimation via OLS regression with community fixed effects, individual controls, and standard errors clustered by community, following Equation 1 in the main text. *** p<0.01, ** p<0.05, * p<0.1.

Full regression table for Table 3 in paper (continued)

	MoH is corrupt?		MoH is capable of providing quality health care?		Prefer MoH j care rather	provide health than NGOs?
Government outreach	-0.08 [0.03]**	-0.08 [0.03]**	0.02	0.01 [0.04]	0.10 [0.03]***	0.09 [0.03]***
NGO outreach	-0.00	-0.01	0.01	0.01	0.02	0.03
	[0.04]	[0.04]	[0.04]	[0.04]	[0.03]	[0.03]
Female		-0.05		-0.04		0.00
		[0.03]		[0.03]		[0.04]
Above median education		0.09		-0.05		0.01
		[0.03]***		[0.03]		[0.03]
Above median income		0.04		-0.07		-0.09
		[0.03]		[0.04]*		[0.03]***
Age 31-40		0.05		-0.03		0.02
		[0.04]		[0.03]		[0.04]
Age 40-50		-0.00		-0.05		0.04
		[0.04]		[0.03]		[0.04]
Age 51-60		-0.09		-0.07		0.05
		[0.06]		[0.05]		[0.05]
Age 60 or above		-0.12		-0.07		0.09
		[0.07]*		[0.07]		[0.07]
Muslim		-0.01		-0.04		0.05
		[0.07]		[0.05]		[0.05]
Above median household size		0.04		-0.07		-0.04
		[0.03]		[0.03]***		[0.03]
Voted in 2011		0.04		0.02		-0.03
		[0.04]		[0.04]		[0.04]
Voted for opposition in 2011		0.06		-0.04		0.02
		[0.04]		[0.04]		[0.04]
Observations	1,180	1,180	1,180	1,180	1,180	1,180
Community fixed effects?	Y	Y	Y	Y	Y	Y
R-squared	0.09	0.12	0.09	0.10	0.09	0.10

Estimation via OLS regression with community fixed effects, individual controls, and standard errors clustered by community, following Equation 1 in the main text. *** p<0.01, ** p<0.05, * p<0.1.

	Aggregate i Governme	Aggregate index of pro- Government attitudes		or laws and lations	and Willing to obey government even if you disagrees scale)		overnment Preference for government gree? (0-1 over non-state service provision	
	0.00	0.07	0.12	0.12	0.10	0.00	0.04	0.04
Government outreach	0.08	0.07	0.13	0.12	0.10	0.09	0.04	0.04
	[0.01]***	[0.01]***	[0.02]***	[0.02]***	[0.02]***	[0.02]***	[0.02]**	[0.02]**
NGO outreach	0.01	0.01	0.03	0.01	0.00	0.00	0.01	0.01
	[0.02]	[0.02]	[0.02]	[0.02]	[0.02]	[0.02]	[0.02]	[0.02]
Female		-0.01		-0.08		-0.02		-0.00
		[0.01]		[0.02]***		[0.02]		[0.03]
Above median education		-0.03		0.04		0.00		0.00
		[0.01]**		[0.02]**		[0.01]		[0.02]
Above median income		-0.04		-0.00		-0.05		-0.04
		[0.01]***		[0.02]		[0.02]***		[0.02]*
Age 31-40		0.00		0.03		0.00		0.01
		[0.01]		[0.03]		[0.02]		[0.02]
Age 40-50		0.00		-0.00		-0.01		0.01
		[0.01]		[0.03]		[0.02]		[0.03]
Age 51-60		0.03		0.01		0.04		0.02
		[0.02]		[0.04]		[0.03]		[0.03]
Age 60 or above		0.02		0.01		-0.01		0.03
		[0.03]		[0.04]		[0.04]		[0.05]
Muslim		0.01		0.07		-0.01		0.07
		[0.02]		[0.04]*		[0.02]		[0.03]*
Above median household size		-0.02		-0.05		-0.04		-0.04
		[0.01]**		[0.02]**		[0.02]**		[0.02]*
Voted in 2011		-0.00		0.02		0.00		-0.04
		[0.02]		[0.03]		[0.02]		[0.02]
Voted for opposition in 2011		-0.04		-0.09		-0.03		-0.03
		[0.01]***		[0.03]***		[0.02]		[0.03]
Observations	1,180	1,180	1,164	1,164	1,180	1,180	1,188	1,188
Community fixed effects?	Y	Y	Y	Y	Y	Y	Y	Y
R-squared	0.14	0.17	0.14	0.19	0.11	0.13	0.09	0.10

Full regression table for Table 3 in paper (continued)

Estimation via OLS regression with community fixed effects, individual controls, and standard errors clustered by community, following Equation 1 in the main text. *** p<0.01, ** p<0.05, * p<0.1.

Full regression table for Table 4 in paper

	Use hand sanitizer daily?	Bucket outside home?	MoH well- intentioned?	Trust MoH?	MoH is corrupt?	MoH capable?	Prefer MoH over NGOs?	Trust in government index (0-1)
Outreach (Winter 2015)	0.00	-0.01	-0.01	-0.06	0.04	0.04	0.02	0.00
	[0.04]	[0.04]	[0.04]	[0.04]	[0.04]	[0.04]	[0.04]	[0.02]
March	0.19	0.08	0.03	0.05	-0.09	0.20	-0.09	0.07
	[0.03]***	[0.02]***	[0.03]	[0.03]	[0.03]**	[0.03]***	[0.03]***	[0.01]***
Outreach (Winter 2015) x March	0.12	0.07	0.05	0.10	-0.01	0.06	0.03	0.05
	[0.05]**	[0.04]*	[0.05]	[0.05]*	[0.06]	[0.05]	[0.05]	[0.02]**
Female	-0.07	-0.01	-0.01	-0.08	-0.02	-0.05	-0.03	-0.01
	[0.03]**	[0.03]	[0.02]	[0.03]***	[0.03]	[0.03]	[0.03]	[0.01]
Above median education	0.09	0.08	-0.02	-0.04	0.09	-0.07	0.05	-0.01
	[0.03]***	[0.03]**	[0.02]	[0.03]	[0.03]***	[0.03]**	[0.03]	[0.01]
Above median pre-Ebola income	0.05	0.02	0.03	-0.09	0.07	-0.01	-0.05	-0.03
	[0.03]*	[0.03]	[0.03]	[0.03]***	[0.03]**	[0.03]	[0.04]	[0.01]**
Age 31-40	-0.03	0.01	0.01	-0.02	0.01	-0.04	0.02	0.00
	[0.04]	[0.03]	[0.03]	[0.04]	[0.04]	[0.04]	[0.04]	[0.02]
Age 40-50	-0.08	-0.03	-0.01	-0.07	0.02	-0.09	0.02	-0.01
	[0.05]	[0.04]	[0.04]	[0.04]	[0.05]	[0.04]**	[0.05]	[0.02]
Age 51-60	-0.05	-0.05	0.03	-0.07	-0.12	-0.01	0.10	0.05
	[0.06]	[0.05]	[0.04]	[0.06]	[0.06]*	[0.05]	[0.06]	[0.02]**
Age 60 or above	-0.21	-0.04	-0.00	-0.07	-0.12	-0.07	0.02	0.04
	[0.07]***	[0.07]	[0.06]	[0.06]	[0.07]*	[0.08]	[0.09]	[0.03]
Muslim	-0.06	-0.01	-0.03	-0.04	-0.04	-0.04	0.08	0.03
	[0.05]	[0.04]	[0.04]	[0.06]	[0.06]	[0.07]	[0.06]	[0.02]
Above median household size	-0.03	0.06	0.03	-0.02	0.02	-0.00	-0.04	-0.01
	[0.03]	[0.02]**	[0.02]	[0.03]	[0.03]	[0.03]	[0.04]	[0.01]
Voted in 2011 election	0.03	0.03	-0.03	0.08	-0.02	0.07	0.04	0.04
	[0.04]	[0.03]	[0.03]	[0.04]**	[0.04]	[0.04]*	[0.04]	[0.02]**
Voted for opposition in 2011 election	-0.01	-0.00	-0.03	-0.07	0.07	-0.04	-0.05	-0.06
	[0.04]	[0.03]	[0.02]	[0.03]**	[0.04]*	[0.03]	[0.03]	[0.01]***

Community fixed effects	Y	Y	Y	Y	Y	Y	Y	Y
Observations	1,315	1,315	1,294	1,294	1,294	1,292	1,295	1,294
R-squared	0.19	0.13	0.10	0.13	0.11	0.17	0.12	0.18

Estimation via OLS regression with community fixed effects, individual controls, and standard errors clustered by community. *** p<0.01, ** p<0.05, * p<0.1.

Appendix 3 - Determinants of attrition

	(1)
	Attrition in March
	follow-up survey
	0.02
Female	-0.02
	[0.03]
Above median education	-0.07
	[0.03]**
Above median pre-Ebola income	0.04
	[0.03]
Age 31-40	0.00
	[0.03]
Age 40-50	0.02
	[0.04]
Age 51-60	0.01
	[0.06]
Age 60 or above	0.13
	[0.08]
Muslim	0.08
	[0.04]*
Above median household size	-0.04
	[0.03]
Voted in 2011 election	-0.06
	[0.04]
Voted for opposition in 2011 election	0.05
	[0.04]
Constant	0.26
	[0.05]***
Observations	774
R-squared	0.03

Robust standard errors in brackets, clustered by community. p<0.01, ** p<0.05, * p<0.1

Appendix 4 - Sensitivity analysis

This section uses selection on observables to assess the potential bias from unobserved omitted variables, following Oster (2017). The idea is to use the bias eliminated by observed covariates to assess the potential bias of unobserved, omitted variables.

Consider the following linear regression models:

 $Y = \beta X + \gamma W_1 + \alpha W_2 + \epsilon$ (1)

$$Y = \tilde{\beta}X + \tilde{\gamma}W_1 + \epsilon \tag{2}$$

 $Y = \dot{\beta}X + \epsilon \tag{3}$

where β , the effect of some treatment X, is the coefficient of interest, W_1 is a matrix of observed control variables, and W_2 is a set of unobserved control variables. Equation refers to the true model and returns an unbiased estimate of β . Equation (2) consists of the full set of observed control variables. Estimates of $\tilde{\beta}$ will be biased unless W_2 is uncorrelated with either X, Y, or both. Equation (3) is a naive model. Estimates of $\dot{\beta}$ will be more biased than those of $\tilde{\beta}$.

The Oster approach uses coefficient movements between the naive estimate ($\hat{\beta}$) and the controlled estimate ($\hat{\beta}$) combined with movements in R-squared values to gauge the degree of potential omitted variables bias. Heuristically, estimates that move little with the inclusion of control variables that cause substantial increases in R-squared are indicative of limited omitted variables bias. The approach relies on two assumptions. The first assumption is the so-called "coefficient of proportionality", δ , which is degree to which the observed controls (W_1) determine treatment relative to the unobserved (W_2). $\delta = 1$ allows the unobserved controls to be as influential as the observed controls. This assumption is likely to hold when the observed controls are among the strongest determinants of treatment.

The second assumption is the maximum R-squared value (R_{max}^2) from the hypothetical estimation of Equation (1), the true model. R_{max}^2 and $R_{controlled}^2$ (from Equation (2)) determine the explanatory power of unobserved omitted variables after accounting for the observed control variables. In the presence of measurement error or idiosyncratic variation in the outcome, $R_{max}^2 < 1$.

Oster (2017) shows that with assumptions about R_{max}^2 and δ it is possible to use coefficient movements in β between the naive and controlled regressions to calculate the potential bias from omitted variables. This results in an identified set, bounded on one side by the controlled estimate and on the other by the bias-adjusted estimate, which contains the unbiased estimate. A result is deemed robust if the identified set excludes zero.

Note that using coefficient stability between Equations (2) and (3) to argue for causality is equivalent to arguing treatment is *unconditionally* exogenous: $\dot{\beta}$ varies little from $\tilde{\beta}$ because W_1 does not confound. And because W_1 does not confound, W_2 is also unlikely to confound (especially when we believe W_1 constitutes the strongest determinants of treatment). The framework can easily be extended to the case where treatment is believed to be exogenous only after conditioning on a set of control variables, M. In this case, the variables in equations (1)-(3) are first residualized with respect to M (equivalently, M is included in equations (1)-(3)).

How to select conservative values for R_{max}^2 and δ ? Oster (2017) re-analyzes experimental studies to identify conservative values of R_{max}^2 and δ under which a non-zero bias-adjusted effect would be consistent with exogenous treatment assignment. These parameter values are then recommended as a robust reporting standard. The intuition of this test follows from the discussion above: observational studies implicitly argue that the treatment is exogenous. Including controls should not change the coefficient because there is no confounding. In experimental studies, this assumption is known to hold. Control variables will still influence the coefficient estimate due to idiosyncratic imbalance across groups. Thus it is possible to use the stability of treatment estimates in randomized data as a guide to how much stability would be expected in observational data if the treatment were assigned exogenously. To do so, Oster (2017) draws on a large sample of randomized studies published in *American Economic Review*, *Quarterly Journal of Economics*, Journal of Political Economy, *Econometrica* and the *American Economic Journal – Applied Economics* from 2008 through 2013.

Oster (2017) assumes the effects estimated in randomized data are causal and that they should therefore survive the bias-adjustment procedure. Robustness cutoff values are based on the value of R_{max}^2 and δ under which the bias-adjusted effect is distinct from zero in 90% of experimental studies. This leads to the values of $R_{max}^2 = 1.3 * R_{controlled}^2$ and $\delta = 1$, Substantively, this assumes un-observables explain as much of the variation in treatment as the observables and explain 30% of the variation in the outcome explained by the included controls. For full details, see Oster (2015).

In our set-up, we're interested in the potentially causal varibales from Table 2: knowing ebola victims, observing dead bodies, and exposure to government outreach. W_1 includes the full set of covariates reported in Table 2, including village ward effects, W_2 is the set of all unobserved confounders, and M includes indicators for each survey round. Our test is conservative in that we exceed Oster's recommended standards for robustness by setting $R_{max}^2 = 2 * R_{controlled}^2$ and $\delta = 1$ (rather than $R_{max}^2 = 1.3 * R_{controlled}^2$ and $\delta = 1$). Substantively, this sets unobservables to be as influential as the full set of control variables (including fixed effects) in explaining both the outcome and treatment.

The results of this sensitivity analysis are presented below. The first column shows the baseline effect of the variables in Table 2 on the outcome, estimated from a regression of the outcome on the variable of interest and survey round indicators. The second column presents estimates of the fully controlled effect, reported in Table 2 in the main article. The third and fourth columns show the bias-adjusted effect and identified set under Oster (2017)'s recommended standards for

robustness ($R_{max}^2 = 1.3 * R_{controlled}^2$ and $\delta = 1$). Under this level of confounding, the identified sets exclude zero. The fifth and sixth columns show the bias adjusted effect and identified set assuming $R_{max}^2 = 2 * R_{controlled}^2$ and $\delta = 1$. Even under this level of confounding, the identified sets exclude zero. Substantively, the results of this exercise indicate that omitted unobservables would have to be substantially more confounding than observables to reduce effect sizes to zero.

Appendix 4: Oster (2017) Sensitivity analysis

			R2 max=1	3 x Controlled R2	R2 max=2	x Controlled R2
	Naive effect (Std. Error) [R2]	Controlled effect (Std. Error) [R2]	Bias- adjusted effect	Identified set	Bias- adjusted effect	Identified set
Knowledge about Ebola (std)	0.05 (0.01) [0.16]	0.04 (0.01) [0.19]	0.03	[0.04, 0.03]	-0.03	[0.04, -0.03]
Bucket for hand-washing outside home?	0.05 (0.02) [0.09]	0.05 (0.02) [0.12]	0.03	[0.05, 0.03]	-0.01	[0.05, -0.01]
Use hand sanitizer daily?	0.11 (0.03) [0.1]	0.09 (0.03) [0.13]	0.07	[0.09, 0.07]	-0.01	[0.09, -0.01]
Support for contentious control policies	0.11 (0.01) [0.16]	0.11 (0.01) [0.18]	0.08	[0.11, 0.08]	-0.03	[0.11, -0.03]
Violate ban on public gatherings past 2w?	-0.09 (0.02) [0.14]	-0.08 (0.03) [0.15]	-0.07	[-0.08, - 0.07]	0.03	[-0.08, 0.03]
Break curfew in past 2w?	-0.03 (0.02) [0.14]	-0.02 (0.02) [0.15]	-0.01	[-0.02, - 0.01]	0.24	[-0.02, 0.24]
Trust in government index	0.07 (0.01) [0.11]	0.07 (0.01) [0.14]	0.06	[0.07, 0.06]	0.03	[0.07, 0.03]
Support for laws and regulations	0.14 (0.02) [0.15]	0.12 (0.02) [0.19]	0.10	[0.12, 0.1]	0.03	[0.12, 0.03]

Appendix 5 – Sampling Procedures

Quantitative Survey

In the first stage of our sampling procedure, 78 communities in Monrovia were randomly selected using probability of selection weights proportional to each community's share of the overall population of Monrovia (taken from the 2008 Census).

Within each of these communities, 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. 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 they were not available on either day, they were skipped.

Surveys were conducted in Liberian English. Residents of Monrovia share a common language and culture.

Field reports from our enumerators indicate that residents were generally receptive to the survey and understood the need for quality information on food security, health, and other welfare outcomes collected in the survey. When reluctance did arise, it was generally due to the time the survey was expected to take, or to scheduling concerns. We believe this warm reception partially accounts for our high response rate. In addition, we elected to devote the necessary resources that would allow our enumerators to be flexible in scheduling interviews with respondents, so that they were able to survey them at a time of their convenience. And finally, respondents were much more available than usual due to the decline of the economy and the high rate of unemployment.

Qualitative Interviews

Because the focus of our interviews was to understand the nature and effectiveness of outreach efforts, we over sampled communities with above-median levels of outreach, as measured by our survey. In particular, we randomly sampled 29 communities with above median levels of outreach and nine communities with below median levels of outreach. Within each of these communities, we asked the Town Chairman to identify members of the anti-Ebola Community Task Force, the institution responsible for conducting outreach during the epidemic. Though the majority of our respondents were members of a Community Task Force, we also interviewed other actors involved in the response, including the town chairman, clinicians, community health workers, and active case finders

Appendix 6 – Precautions Taken to Ensure Enumerator Safety

We took extensive precautions to ensure the safety of our survey enumerators. First, enumerators avoided any neighborhood with known active Ebola cases or contacts. Within neighborhoods, enumerators coordinated with local leaders to avoid households with known Ebola victims (past or present), suspected Ebola victims (past or present) or otherwise sick persons (in the present). Enumerators were trained to avoid physical contact and 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 surveys.

Appendix 7 – Additional balance tests

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In this section, we test for balance on exposure to government outreach using alternative measures of income and education, to ensure the balance results reported in the main paper are not sensitive to our use of indicators for above median education/income as our primary measures. In the first column, we measure income using the question "Before Ebola, about how much income did you earn in a normal week?" and we measure Education on a scale from o "No education" to 8 "Post-secondary degree". In Column 2, we measure income using the question "About how much income have you earned in the past week?" and we measure income using four indicators for i) no education, ii) some or completed primary education, iii) some or completed junior high, and iv) some completed high school, omitting the category for post-secondary education.

	Government outreach			
Female	-0.08	-0.08		
	[0.03]**	[0.03]**		
Highest level of education (0-8 scale)	0.00			
	[0.01]			
Income in normal week in USD	-0.00			
	[0.00]			
No edu		-0.05		
		[0.06]		
Primary school edu		-0.02		
		[0.06]		
Junior high edu		0.01		
		[0.05]		
High school edu		-0.05		
		[0.05]		
Income past 7d in USD		0.00		
		[0.00]		
Age 31-40	0.02	0.01		
	[0.04]	[0.04]		
Age 40-50	-0.01	-0.02		
	[0.04]	[0.04]		
Age 51-60	0.09	0.08		
	[0.06]	[0.06]		
Age 60 or above	-0.01	-0.03		
	[0.07]	[0.07]		
Muslim	-0.04	-0.05		
	[0.06]	[0.06]		
Above median household size	-0.06	-0.05		
	[0.03]*	[0.03]*		
Voted in 2011 election	0.05	0.05		
	[0.05]	[0.05]		
Voted for main opposition party in 2011	0.06	0.06		
election	-0.06	-0.06		
Vetel for incompletel i 2011 1 si	[0.05]	[0.05]		
voted for incumbent in 2011 election	-0.01	-0.00		
	[0.04]	[0.04]		
Observations	1 167	1 100		
Observations	1,107	1,100		

Alternative tests of balance

R-sc	mared
11-30	uarcu

0.13 Estimation via OLS with community fixed effects and standard errors clustered by community. *** p<0.01, ** p<0.05, * p<0.1.

Appendix 8 – Qualitative protocol

Purpose

The qualitative protocol was designed with two goals in mind. First, to better understand the government's model of mediated outreach model and contextualize its role in the broader epidemic as a strategy to change citizens attitudes, beliefs, and behaviors. To this end, the protocol asked key informants --- mainly local intermediaries who worked on behalf of the government during the epidemic --- to describe the nature of their affiliation with the government, the training they received, and the procedures they followed to carry out their work. Second, the protocol sought to understand the nature and level of community resistance to mediated outreach, as well as the strategies local intermediaries adopted to overcome such resistance and persuade their fellow citizens of the veracity of their messages. By documenting these strategies, we hoped to shed some light on the mechanisms that contributed to the effectiveness of the mediated outreach model.

Selection criteria

To identify key informants, we followed a two-stage sampling procedure. First, we randomly selected 40 communities in the following manner:

- We first divided the sample of communities included in the quantitative survey into three groups: those with the highest levels of reported government outreach (above the 66th percentile according to the quantitative survey), those with moderate levels of government outreach (between the 34th and 65th percentiles), and those with low levels of community outreach (below the 33rd percentile).
- Next, we randomly sampled 20 communities from the group with the highest outreach intensity, 15 communities from the group with moderate intensity, and five communities from the group with the lowest intensity of outreach.

This procedure was adopted to ensure that communities with high levels of mediated outreach were well-represented in our qualitative interviews, given the focus on uncovering the modalities of the mediated outreach model and unpacking its effectiveness.

In the second stage of the sampling procedure, we asked the town chairman to refer us to members of the anti-Ebola Community Task Force, the institution responsible for conducting outreach during the epidemic. In most communities, we selected two to three members of the Task Force to serve as key informants on the basis of convenience, usually selecting whichever members were available and ready at the time of our visit.

While by no means a random sample, we do not believe this necessarily jeopardizes the integrity of our qualitative interviews since their purpose was to unpack mechanisms, rather than to assess the effectiveness of outreach itself (as we do in the quantitative analysis). If the goal were the latter, we would obviously be concerned that the Chairman might introduce us to those with favorable views of outreach, potentially biasing our analysis. But it is less clear that this type of

bias would apply to our assessment of mechanisms, since informants were asked to report mainly on factual matters related to their experience conducting outreach.

Interviews were conducted by a team consisting of one American research assistant and two local research assistants. In most cases, the team would split up when conducting the actual interview, so that there was either one interviewer per informant or two interviewers per informant. Interviews were semi-structured --- they followed a list of pre-set questions, but we asked any number of follow-up questions depending on informant's responses. Most interviews lasted between 60 and 90 minutes. All interviews were conducted in Liberian English, the language of the vast majority of Monrovians.

Research assistants took detailed notes during the meetings, but did not record the interviews. At the end of each day, they transcribed their notes on the computer and added detail as appropriate.

We elected to focus our qualitative protocol on informants from the Ebola Task Force because of the dual goals of the protocol – to describe and contextualize the mediated outreach model and to unpack the mechanisms underlying its effectiveness. While it would have been informative to also interview ordinary citizens and villagers, our resources did not allow for this.

Questions included in the qualitative protocol:

Descriptive characterization of mediated outreach:

- What was the nature of your relationship with the MoH or government? How did citizens know you were affiliated with the MoH or government?
- What type of community activities were you involved in prior to your work as a mobilizer/contact tracer/active case finder / [other position]?
- When did you first start working with the MoH?
- Were you trained by the MoH? When did this training occur? Where did it occur, and who from the MoH was leading the training?
- What kind of identification did you have to that would associate you with the MoH or government in the eyes of citizens? Can we see this identification?
- What kind of compensation, if any, did you receive from the government or MoH?
- How many other members of your community were also working as mobilizers/contact tracers/other position?
- How did you decide where in your community to do your work?

Overcoming resistance to mediated outreach from community members

- How did people in your community feel about the MoH and government during the epidemic, and how did these feelings change overtime?.
- Did community members have positive or negative feelings about MoH or government when outreach began? Did these feelings change overtime? If so, why did they change? Did people doing outreach help to change these feelings over time? If so, how?
- Were there any cases of resistance to your work? If yes, how did you overcome this

resistance? Please describe in general. Please also describe a memorable case, in detail.

• Were there any instances of people hiding from you? Were there any cases of resistance to your work? If yes, how did you overcome this resistance? Please describe in general. Please also describe a memorable case, in detail.



The above timeline shows the cumulative number of confirmed EVD cases in Liberia, as reported by the WHO, from June 2014 through May 2015. Also depicted are the approximate dates of direct versus mediated outreach by the government, as determined by our field research. Lastly, the timeline shows the start and end dates of our December 2014 and March 2015 surveys.

Appendix 9 – Epidemic and study timeline