The economic impacts of Ebola

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Between December 2014 and January 2015, the MIT Governance Lab (MIT GOV/LAB) conducted a survey of over 1,500 residents of Monrovia, Liberia’s capital city. This survey was intended first and foremost to provide information for responders on the ground to target the neighbourhoods most in need of assistance. A secondary aim of our survey was to better understand the social and political causes and consequences of the epidemic. This report highlights some of our key results.

We first focus on understanding the correlates of compliance with control policies that have been essential to halting Ebola’s spread. Our results reveal a robust link between trust in government and compliance: Individuals who are less trusting of government are less likely to support control policies and less likely to adopt preventative measures. These differences persist even after accounting for key demographic and socio-political characteristics and knowledge about EVD.

Our analysis also shows that experiences of hardship and trauma during the epidemic are negatively associated with trust in government and compliance with control measures. These traumatic experiences include losing a job, forgoing healthcare for serious illness, knowing Ebola victims, and witnessing dead bodies in the streets.

These experiences may continue to strain relationships between citizens and government after the epidemic ends. We find that hardship is negatively associated with support for policies essential to state capacity, including taxation, prohibitions on mob violence, and rules against squatting on public lands. Because our data were collected only two months after the height of the epidemic, it remains an open question whether these patterns will persist overtime.

Our analysis also suggests an important and underreported success story in the effort to win citizens’ confidence and cooperation in the fight against Ebola. Throughout the crisis, government and NGO workers conducted community-level outreach to build trust and increase compliance with control measures. We find that government and NGO outreach efforts are associated with greater trust in government, support for control policies, and uptake of preventative measures. Follow-up qualitative research suggests that outreach was especially effective when it deliberately incorporated pre-existing community networks and institutions. Outreach involving government was considerably more effective than NGO outreach, especially in building trust in government.

Trust resulting from government outreach may help to restore relations between citizens and government in the post-Ebola recovery period as well. Citizens that experienced government outreach efforts are more likely to prefer government as opposed to NGO provision of health and education and are more likely to express support for government regulations on taxation, mob violence, and eminent domain.

2. Results from these analyses are available at data4ebolarecovery.org, and the raw data underlying the analysis are available at https://data.hdx.rwlabs.org/dataset/data-for-ebola-recovery
We see no evidence that government quarantines or restrictions on movement decreased citizens’ compliance or trust in government. This non-finding may simply reflect the fact that our survey was conducted in December, when many restrictions had already been lifted, or that the use of quarantines was relatively limited in Liberia. Our qualitative interviews, however, suggest that citizens support household and community quarantines when necessary to control the spread of EVD.

Our analysis provides important lessons for the post-Ebola recovery period. Distrust in government contributed to the crisis by reducing compliance with control measures. Distrust likely increased as a result of hardship endured during the epidemic, undermining cooperation in the fight against Ebola. This suggests the possibility of a vicious cycle in which distrust increased non-compliance, non-compliance increased hardship, and hardship increased distrust. Rebuilding trust between government and citizens will be essential to preventing future crises, health-related or otherwise, and to ensuring citizen cooperation in everyday matters of governance.

Our results suggest that outreach efforts were effective in building trust and generating compliance, especially when undertaken by the government and when incorporating pre-existing community networks and institutions. We encourage the government of Liberia and its international partners to strengthen the public health care system by reinforcing government-community linkages. We also encourage the government of Liberia to continue outreach efforts that integrate community institutions in the post-Ebola recovery period, even as the epidemic wanes and the urgency of raising public awareness recedes. Finally, we advocate for further research to confirm the potential long-term benefits of outreach, and to identify the types of outreach that are most effective in building trust.

**Background and motivation**

The Ebola outbreak in West Africa is the largest in history, with almost 10,000 deaths and nearly 24,000 cases. In Liberia, 4,117 deaths and 9,249 cases had been reported as of March 1, 2015. After rapidly escalating in August-September 2014, the epidemic in Liberia declined quickly. In March 2015, Liberia reported only one new case.

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Over the course of the outbreak, the Government of Liberia enacted a number of measures to control the spread of the disease. These measures affected citizens’ everyday patterns of activity and behaviour and marked an extraordinary attempt to exert government authority over the lives of citizens. Citizens were mandated to comply with case reporting, contact tracing, quarantines, and cremation of dead bodies resulting from Ebola-like symptoms. They were also instructed not to care for loved ones suffering from Ebola-like symptoms, and not to wash dead bodies prior to burial, as is customary. From July 2014 to January 2015, public gatherings were banned, schools were closed, a 6 PM curfew was in effect, and handshaking, kissing, and touching were strongly discouraged.

In the early stages of the epidemic, the public was resistant to these policies. Ebola was mysterious and not yet widespread, and preventative measures were costly, inconvenient, and contravened basic human instincts to care for the ill and honour the dead. By most accounts, initial non-compliance with control measures was a major contributing factor to the rapid rise of Ebola in August and September.

By early September, however, in-country observers were already reporting a dramatic shift in local attitudes and behaviours. No longer unsure of Ebola’s danger and acutely aware of its spillover effects throughout society, citizens adopted preventative measures (such as hand washing), complied with control policies (such as the curfew), and mobilised community outreach and awareness groups to assist government in case reporting and contact tracing. These attitudinal and behavioural changes were essential to slowing the spread of Ebola in Liberia.

The important role of outreach

Throughout the crisis, increasing public awareness and building support for control measures has been crucial. In the early stages of the epidemic, persuading a wary population to adopt preventative measures and comply with control policies was a priority no less important than the direct response to victims and contact tracing. In the later stages, maintaining vigilance was (and remains) essential to achieving zero cases.

To educate residents about Ebola and build support for control measures, the Government of Liberia and its international partners initiated a massive public awareness campaign that entailed radio, signboards, and ground-level canvassing of communities. The campaign informed citizens about the signs and symptoms of Ebola, demonstrated proper preventative techniques, disseminated information on where to get care, and encouraged compliance with control policies.

In our sample, 40% of citizens report that government workers came to their community to conduct outreach at least once, and 66% report that NGO workers came to their community to conduct outreach at least once. Within Monrovia, government and NGO campaigns often integrated existing community activists, networks, and institutions into their outreach efforts, and
this integration played a central role in the effectiveness of outreach.

**Typology of Community Outreach**

In Monrovia, community outreach varied primarily along two dimensions—whether organised by NGOs or government, and whether and to what extent it integrated pre-existing community networks and institutions.

At one end of the spectrum were government and NGO teams composed of people from outside the community who did not utilise community networks and institutions at all. Outside teams sometimes drove through communities in jeeps, broadcasting public awareness messages through megaphones. Outside teams might also go door to door to deliver public awareness messages.

As the crisis deepened, even outside teams became more likely to engage with community leaders and networks. Outside teams sometimes used this process to identify trusted individuals in the community to visit households with them in order to gain the trust of residents.

Over time, government and NGO outreach efforts also absorbed and trained pre-existing groups and institutions that communities themselves had organised to conduct outreach and public awareness. Government and NGO authorities would ask communities to identify local residents to attend workshops on public awareness and case finding, and then would give these representatives T-shirts or vests identifying them as part of a government or NGO outreach effort. In many cases, outreach was very clearly structured, with communities divided into blocks and individuals assigned to sensitise and monitor the households within their block.

Our follow-up qualitative research suggests that outreach efforts that utilised existing community networks and institutions were particularly important because citizens often had negative initial reactions to outreach teams. In these cases, trusted individuals within communities often invested significant effort and their own social standing within the community to build trust in government and overcome these negative reactions.

**Objectives**

With this background in mind, the primary objective of our study is to understand the correlates of compliance with control policies that have been essential to halting Ebola’s spread. We look first at the link between trust in government and compliance. Second, we assess the influence of hardship experiences during the epidemic—losing a job, forgoing healthcare, knowing Ebola victims, and observing dead bodies—on trust in government and compliance. Finally, we assess whether citizens’ experiences with government during the epidemic, both positive (e.g. outreach) and negative (e.g.
quarantines), correlate with trust and compliance.

**Methodology**

From December 6, 2014 to January 7, 2015, we conducted a representative survey of Monrovia, Liberia. The survey entailed face-to-face interviews and used handheld electronic survey devices. The selection of respondents followed a three-stage sampling procedure. In the first stage, 78 communities were randomly selected from all of Monrovia’s fifteen administrative wards in proportion 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 survey. 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. An important advantage of our survey over other studies conducted to date was that it entailed face-to-face interviews with experienced enumerators, rather than interviews conducted remotely via cell phone. This method resulted in a very high response rate of 95%. It also helped establish trust between respondent and enumerator, potentially increasing the accuracy of responses.

Starting on March 24, 2015, we also initiated qualitative data collection to examine the findings from the survey research in greater depth. The qualitative research includes interviews with government and NGO decision makers, as well as ordinary citizens, community leaders and authorities, and the social mobilisers, community health volunteers, and outreach workers who participated in government and NGO outreach efforts.

3. 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%. See Kristen Himelein et al. (2014), The Socio-Economic Impacts of Ebola in Liberia: Results from a High Frequency Cell Phone Survey, available at http://www.worldbank.org/content/dam/Worldbank/document/Poverty%20documents/Socio-Economic%20Impact%20of%20Ebola%20on%20Households%20in%20Liberia%20Nov%202015.pdf. The World Bank study involves nationally representative surveys conducted at more regular intervals than our own. We view our survey as a complement to (rather than substitute for) these surveys.
Findings

Trust in government is essential in the fight against Ebola

Popular narratives link the rapid spread of Ebola to widespread distrust of government. We assess the accuracy of this narrative in a correlates analysis of two summary measures of compliance. Our first measure is an index of support for contentious control policies, including the ban on public gatherings, “safe burial” by health workers, travel restrictions, curfews, and cremation. Our second measure is an index of self-reported compliance with control policies and preventative measures, including compliance with the curfew, compliance with the ban on public gatherings, use of hand sanitiser, and use of a chlorine bucket outside the home.  

We then examine the association between these two summary measures and a variety of variables that may affect compliance, including a summary measure of distrust in government and perceptions of government corruption. Each of these variables is binary, so the relative influence of each measure is comparable.  

Figure 1 presents the results. A blue circle indicates the strength of the association and horizontal grey bars indicate 95% confidence intervals. Distrust in government, perceptions of government corruption and support for opposition parties are all strongly associated with lower support for control policies and lower levels of compliance with preventative measures – even after controlling for knowledge of the disease, fear of Ebola, number of known infected persons, and basic demographic characteristics. High distrust in government (High distrust in govt) is associated with a 9% decrease in support for control policies and a 7% decrease in compliance with preventative measures. Conversely, having the equivalent of a high school education or above (High Edu) is associated with a 5% increase in support for control policies and a 5% increase in compliance with preventative measures.

4. For both measures, each input variable is re-scaled from 0 to 1 and included with equal weight in the additive index.

5. Continuous variables, such as income, education, trust in government, and perceptions of government corruption, are dichotomised at the 50th percentile.
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Figure 1: Correlates of Support for Control Policies and Compliance with Preventative Measures. Estimates obtained via OLS multivariate regression with standard errors clustered by neighbourhood. Neighbourhood fixed effects included, not shown.

Hardships endured during the EVD Outbreak are associated with lower trust in government and lower compliance with control measures

The Ebola outbreak brought severe hardship to Liberia. With the health sector partially shut down, citizens commonly forewent treatment for common illnesses and urgent non-Ebola maladies. Employment dropped precipitously, causing severe food shortages. Many citizens witnessed their neighbours’ die of Ebola or saw dead bodies lie uncovered in the streets.

6. See http://www.data4ebolarecovery.org/
Figure 2A shows the association of these experiences with trust in government and compliance after controlling for a rich set of control variables. A circle indicates the estimated magnitude of the association, while vertical bars indicate 95% confidence intervals. Figure 2A reveals that hardship experiences are associated with lower trust in government, higher perceptions of government corruption, lower evaluations of government intentions, lower support for control policies, and lower compliance with Ebola preventative measures. These patterns are consistent across the four measures of hardship.

7. To measure drops in employment, we ask respondents whether they lost their job in the past 6 months, and code a dichotomous variable, losejob, accordingly. To measure inability to access healthcare, we ask respondents whether anyone in the respondent’s household felt sick enough that they needed medical treatment, and subsequently, whether they sought care outside the home for the illness. (Of those who did not seek care, 90% attributed their inability to access care to the Ebola virus). From this, we construct a dichotomous variable, foregocare, that takes a value of 1 if they did not seek care, 0 if they sought care, and otherwise missing. Knowebolavictim is coded as 1 for those who responded affirmatively to the question, “Did any of your friends, neighbours, family members, or other people that you personally know in your community get Ebola?” See deadbodies is coded as 1 if affirmative to “Since July 26 day this year, did it ever happen that dead bodies had to wait for long in your community before health workers arrived to pick them up?”

8. Figures 2A and 2B estimated by OLS with standard errors clustered by neighbourhood. Control variables include income, education, age, political affiliation and participation in 2011, occupation, and neighbourhood of residence. Naïve estimates without control variables are nearly identical in magnitude to the conditional estimates. Matching techniques, which reduce the parametric assumptions underlying OLS regression, also return nearly identical estimates.
We also assess the association between hardship and preferences for government service provision in the post-Ebola period and support for regulations essential to law and order. We consider two measures. The first index measures respondents’ preferences for government as the provider of services, rather than NGOs, the UN, or local sources. This index is constructed additively from three survey questions asking respondents who they would prefer to provide health, education, and security services in their community. Second, we construct a measure of support for regulations essential to state capacity, including taxation, prohibitions on mob violence, and rules against squatting on public lands. The results are displayed in Figure 2B. Hardship experiences are negatively associated with a preference for government provision of services and negatively associated with support for regulations essential to state capacity. These results suggest that hardship experienced during the EVD crisis may undermine government-citizen relations in the post-Ebola period.

![Figure 2B: Hardship during the EVD Crisis, Preferences for service provision by government, and support for laws and regulations](image)

These findings come with important limitations. First, despite our efforts to control for key socio-demographic factors and measures of political orientation, we cannot entirely rule out the possibility that individuals who are vulnerable to hardship experiences during crisis are more distrusting of government and less compliant to begin with. It is unlikely that this explanation accounts for the pattern of results, and we discuss this issue in greater detail in the Statistical Appendix. Second, because our data were collected shortly after the height of the epidemic, we cannot assess whether these patterns will persist into the post-Ebola period, or whether they will...
fade overtime. We are currently implementing follow-up surveys to address this question.

**Community outreach is associated with greater trust in government and greater compliance with control measures**

At the height of the epidemic, persuading a wary population to adopt preventative measures was a priority no less urgent than the construction of ETUs and contact tracing. Both government and NGO efforts in community outreach and social mobilisation aimed to educate residents about Ebola’s signs and symptoms, demonstrate proper preventative techniques, and disseminate information on where to get care and how to report and address suspected cases.

Engagement with government and NGO outreach efforts was an overwhelmingly positive experience for citizens. Of the 40% of citizens who report government outreach in their community, 90% report that outreach was well received. Of the 66% who report NGO outreach, 95% report that outreach was well received. When asked in an open-ended question to describe what outreach workers did, citizens commonly use words reflective of positive engagement, such as “teach”, “remind”, “encourage”, and “explain.”

We assess whether these outreach efforts may be an effective means to build trust and compliance with government authority. To do this, we first compare levels of trust among those who reported outreach to those that did not, while controlling for income, education, age, political affiliation and participation in the 2011 national elections, and neighbourhood of residence. We provide additional statistical details, including balance tests, in the Statistical Appendix.

Figure 3 displays the results. A circle indicates the estimated magnitude of the association, while vertical bars indicate 95% confidence intervals.
Figure 3: Government and NGO outreach efforts are associated with higher levels of trust in government.

The results show that individuals who experienced government and NGO outreach are significantly more trusting of government and significantly more likely to express positive evaluations of government intentions and capacities. The association is much weaker for individuals experiencing NGO outreach.

Figure 4A displays the association of government and NGO outreach with our indices measuring support for control policies and uptake of preventative measures. Individuals that experienced government and NGO outreach efforts are more likely to support control policies and adopt preventative measures.
Figure 4A: Government and NGO outreach is associated with greater support for prevention policies and compliance with preventative measures.

Outreach may also help set the stage for rebuilding government’s relations with citizens in the post-Ebola recovery period. Figure 4B, which considers the same set of outcomes as Figure 2B, shows that citizens that experienced government outreach efforts were more likely to prefer government as opposed to NGO provision of health and education, and were more likely to express support for regulations essential to state capacity, including taxation, prohibitions on mob violence, and rules against squatting on public lands.
An important limitation of this analysis is that we cannot distinguish between outreach that integrated community institutions and outreach that did not. Our qualitative work suggests that face-to-face interaction between government or NGO workers and citizens builds trust and confidence in authority. Our qualitative work also suggests that outreach was most effective when it engaged community leadership and respected community members, thereby making citizens more receptive and responsive to outreach. In future rounds of data collection and ongoing qualitative work, we will attempt to distinguish between the various forms of outreach more precisely.

**Quarantines are not associated with lower trust in government or lower compliance with control measures**

The efficacy of quarantines has been hotly debated. Proponents argue that quarantines are necessary to contain the epidemic. Opponents argue that they erode trust in government, generate ill will and reduce cooperation.

We inform this debate by assessing whether movement restrictions or quarantines are associated with lower trust in government or compliance. We asked respondents whether government ever put a quarantine on their community (8% of the sample), as well as whether government prevented their movement “in search of daily bread,” a colloquialism for income generating activities (10% of the sample).
We see no evidence that government quarantines or restrictions on movement decreased trust in government or compliance with government. Our sample only covers Monrovia, however, where community-level quarantines were limited in scope and duration relative to neighbouring Sierra Leone. In addition, our survey was conducted at a time when many restrictions had already been (or were in the process of being) lifted. It is possible that Ebola-related restrictions eroded trust and compliance, but that these effects diminished over time. However, our qualitative interviews suggest that citizens support quarantines when necessary to control the spread of EVD.

Discussion

Building support for control policies and increasing use of preventative measures has been essential to halting the spread of Ebola in Liberia. Trust in government is a major determinant of support for control policies and is strongly associated with the adoption of preventative measures. Equally important, trust in government is essential for citizen cooperation in everyday matters of governance and social service provision.

Our analysis suggests that trust in government deteriorated as a result of hardships experienced during the crisis, leading to lower support for control policies, lower compliance with preventative measures, and weaker preferences for government provision of services in the post-Ebola period.

Our analysis also suggests, however, that ground-level outreach is a promising means by which to re-build trust and build support for essential control policies. Our qualitative follow-up suggests that outreach was especially effective when it involved government efforts and engaged community networks and institutions. Our analysis further suggests that the positive effects of outreach on compliance extend to government policies essential for law and order.

We encourage the government of Liberia to continue to build ties between the government and community networks and institutions, even as the crisis wanes and the urgency of raising public awareness begins to diminish. Community leaders and ordinary citizens appear to value the new connections that have been established between formal structures of government and informal institutions within communities. The government should work to strengthen these connections in the future.

To the extent that NGOs continue to be involved in outreach, we encourage them to help build trust in government as well, perhaps by emphasising the positive role that government has played during the crisis, or by conducting outreach alongside (rather than instead of) government health workers. Finally, we encourage further research to confirm the potential long-term benefits of positive day-to-day interactions between citizens and government both during and after the crisis, and to identify the forms of outreach most conducive to trust and compliance. To that end, we are currently conducting follow-up cell phone surveys with a sub-sample of respondents selected for our face-to-face survey. Results will be published in the coming months.
Statistical appendix

Figures 3 and 4 above compare trust in government and compliance measures, respectively, among individuals that reported government or NGO outreach and those that did not. To attribute these differences in trust and compliance to outreach itself requires the assumption that individuals who did and did not receive outreach are comparable after controlling for observed confounding factors, like age, education, income, and political affiliation. We provide a more detailed discussion of this assumption in this section, which assumes some background in statistics.

Appendix Figure 1, left panel, compares individuals that reported government outreach to those that did not across a range of binary variables. The right panel compares individuals that reported NGO outreach to those that did not. Individuals who experienced outreach differ only modestly from those who did not across a range of important control variables that we can observe. For example, those that were a member of a community group were about 6% more likely to report NGO outreach (Right Panel). Overall, these differences are modest and are unlikely to explain the patterns reported in this report. This conclusion is consistent with the context: Given that the need for outreach far exceeded the supply, it is not surprising that people who observed government health workers were similar in many ways to those who did not.

Appendix Figure 1: Balance Tests: We observe modest imbalance in observed control variables. These variables are included as controls in all estimates. Estimates obtained via OLS regression with standard errors clustered by neighbourhood. Neighbourhood fixed effects included, not shown.
However, our analysis cannot rule out imbalance on factors that we do not observe. For example, we cannot entirely rule out the possibility that those who were more trusting of government or compliant before the epidemic were more likely to seek out and therefore report the presence of government and NGO outreach.

While we highlight this possibility as a potential concern, and acknowledge that other possible confounders exist, several considerations increase our confidence in our results. First, we observe balance on opposition vote share in 2011, which is a strong determinant of trust in government. On this important measure of pre-Ebola trust, those that reported outreach are nearly identical to those who did not. Second, we observe coefficient stability between uncontrolled and controlled comparisons, suggesting that if unobserved factors are akin to observed ones, they are unlikely to confound. Lastly, the conditional associations are large, suggesting that even with some degree of confounding, outreach still has an effect.

Matching techniques, which reduce the dependency of our estimates on functional form assumptions, return similar estimates.

Preliminary data of a March follow-up survey allows for a “difference-in-differences” analysis of the outcomes reported in this report and outreach conducted between our survey waves. This analysis reveals close consistency with the patterns described above. In addition, December measurements of the key outcomes reported in this report—support for control policies, compliance with preventative measures, trust in government, and preference for government service provision—do not predict subsequent exposure to outreach in January, February, or March. This provides strong evidence that selection into outreach does not explain the patterns reported in this memo.
Economics of Ebola initiative

Early analysis indicates that the economic costs of the Ebola outbreak will be significant, including panic, loss in confidence, reduction in market interactions, the breakdown of formal systems and institutions, a reduced supply of essential goods, and potentially increased prices. The IGC is committed to providing the Governments of Sierra Leone and Liberia, as well as their development partners, with demand-led research and analysis to ensure that policy responses are evidence-based and that corrective actions are effective and well targeted.

In this set of bulletins on the economic impacts of Ebola, the IGC will disseminate the data collected, including key facts and policy recommendations. The IGC will be sharing these bulletins with the broad group of aid agencies, NGOs, and journalists with an interest in the Ebola epidemic.

Previous editions of the IGC’s economic impact of Ebola bulletin are available online here: http://www.theigc.org/project/economics-of-ebola-initiative/

The IGC has also developed a web page collating the results of IGC and non-IGC research on the economic impacts of Ebola in order to make their policy implications more accessible. This page is available here: http://www.theigc.org/economics-of-ebola-research/

About the International Growth Centre

The International Growth Centre (IGC) aims to promote sustainable growth in developing countries by providing demand-led policy advice based on frontier research. The IGC directs a global network of world-leading researchers and in-country teams in Africa and South Asia and works closely with partner governments to generate high quality research and policy advice on key growth challenges. Based at LSE and in partnership with the University of Oxford, the IGC is funded by the UK Department for International Development (DFID).

Contact the IGC

International Growth Centre
London School of Economics
Houghton Street
London
WC2A 2AE
www.theigc.org

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