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# Epidemics and economic impacts: evidence from West Africa

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# Overview

**Question 1** How large were the economic impacts, and how do they map onto the intensity of the epidemic?

**Question 2** What social interventions were effective in moderating its spread, and what determined their success?

# Background

Short and long term effects of epidemics on economic activity

- “ General literature: Thirumurthy et al. (2008), Kalemli-Ozcan (2010), Evans & Miguel (2007), Young (2005), etc
- “ Ebola outbreak:
  - “ Over 27,000 cases confirmed, over 11,000 deaths since start of outbreak
  - “ Macro estimates . World Bank estimates of >\$1.6bn lost output in 2015 across Liberia, Sierra Leone and Guinea
  - “ Micro-level estimates almost entirely absent from initial debates

# Studies

**Bowles J, Hjort J, Melvin T & Werker E** (2015). *Ebola, jobs and economic activity in Liberia*, Journal of Epidemiology & Community Health.

**Glennerster R & Suri T** (2014, 2015). *The implications of the Ebola outbreak on markets, trade and food security in Sierra Leone*, IGC Economic Impacts of Ebola Bulletin 4.

**Grepin K & Chunara R** (2015). *Using SMS data to monitor exposure to the Ebola outbreak and to estimate its impact on health-seeking behaviour in Liberia*. IGC Economic Impacts of Ebola Bulletin 5.

**Tsai L, Blair R & Morse B** (2015). *Patterns of trust and compliance in the fight against Ebola: results from a population-based survey of Monrovia*. IGC Economic Impacts of Ebola Bulletin 3.





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# 1. How do economic impacts relate to epidemic intensity?

Evidence from firms in Liberia

# Overview

**Question** To what extent did Ebola affect firm-level economic outcomes?

**Data** Baseline/sample frame provided by NGO Building Markets, two follow-up surveys in September/November 2014

**Design** Difference-in-differences across more/less affected areas of Liberia

**Results** Large first-order impacts across the country; outside Monrovia, little relationship between intensity and economic impacts

# Background

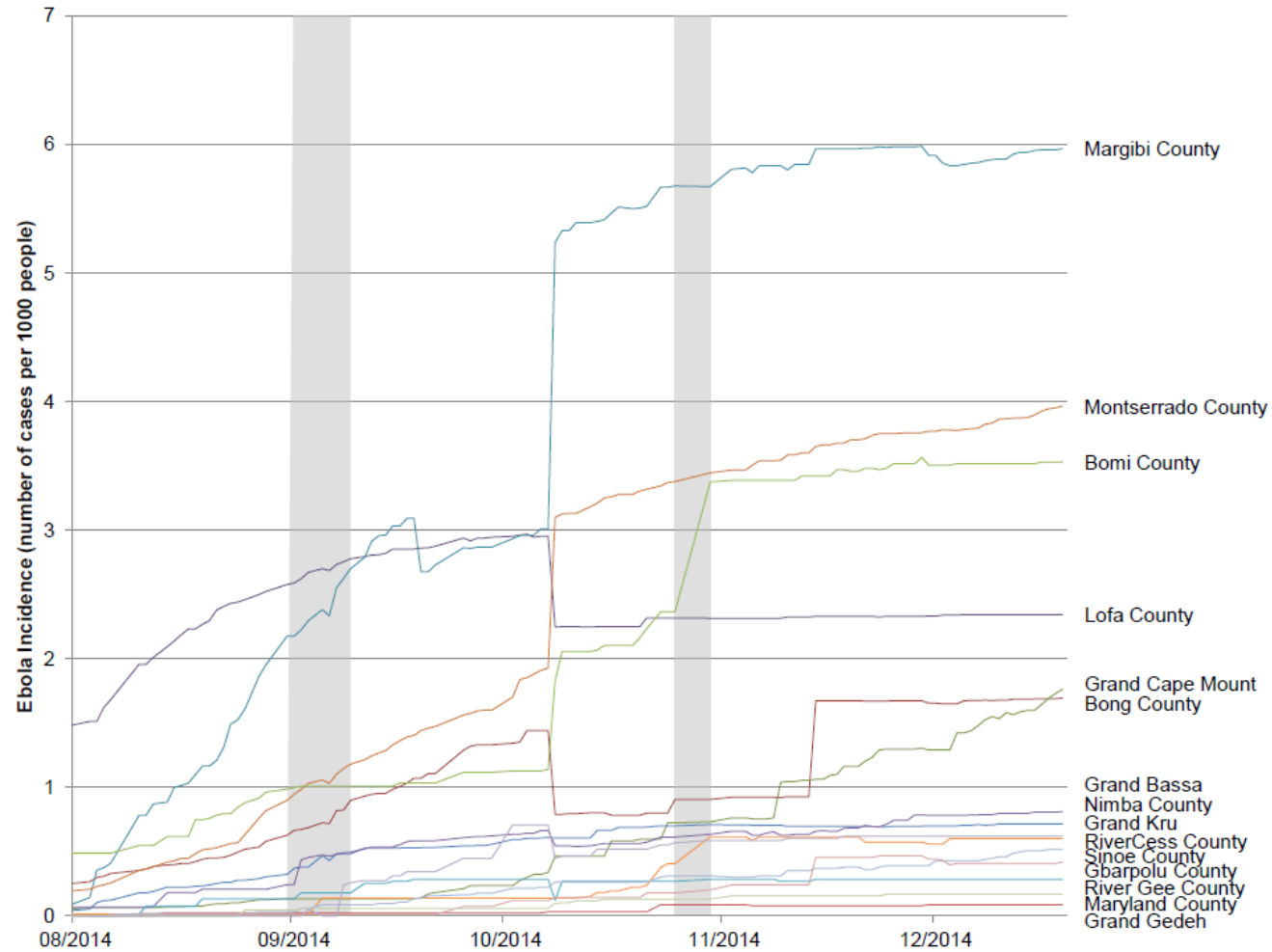


Figure 1. Evolution of cumulative cases (per 1000 people) across Liberian counties

# Design

- Baseline data from NGO Building Markets (BM)
  - BM works to facilitate contracts between SMEs and large buyers in Liberia
  - To be listed as a supplier on BM's portal (Yellow Pages+), SMEs must be registered with the government, and surveyed and verified by BM every ~6 months
  - When Ebola outbreak hit, BM's portal included ~25% of all firms that were formally registered in Liberia in 2013
- We drew a random sample of 403 of these firms, stratifying by region and sector, and conducted two follow-up surveys with BM



# Design

- Using the incidence of Ebola cases per 1000 people, we constructed three sets of counties:
  - Less affected: Nimba, Grand Bassa, Grand Cape Mount, Grand Cedehe
  - Most affected: Lofa, Margibi, Bomi, Bong
  - Montserrado (Monrovia area)

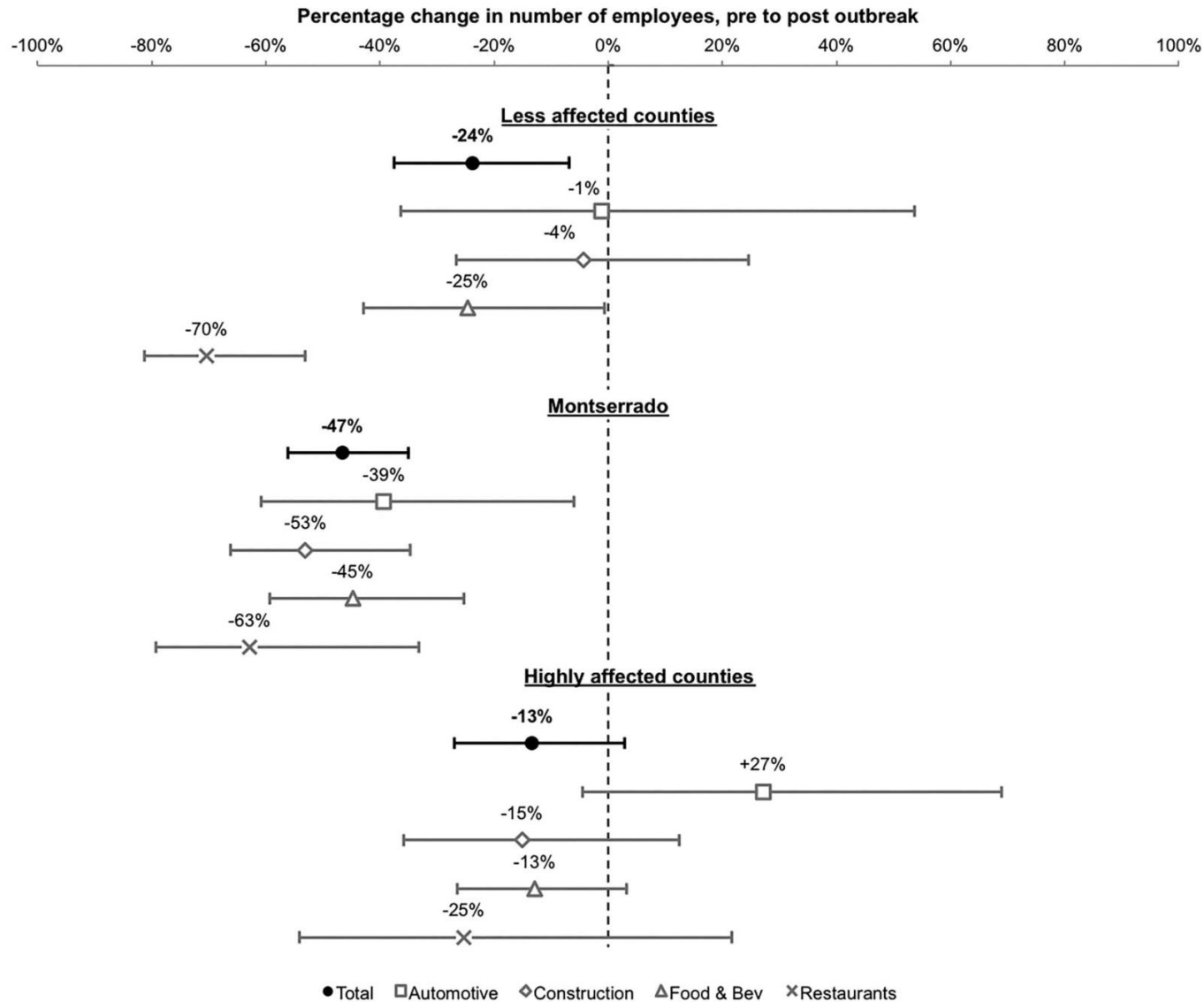
	Automotive	Construction	Food & Bev	Restaurants	Total
Less affected counties	8	47	52	20	98
Montserrado	15	47	43	16	110
Most affected counties	15	61	70	10	129
<b>Total</b>	<b>38</b>	<b>155</b>	<b>165</b>	<b>46</b>	

Table 1. Frequency of regions and sectors in sample<sup>2</sup>

# Results (firm closure)

- Out of all firms in sample, 12.5% had reported closing
- Disproportionately many food & beverages, and restaurants reported closing down
- Significantly more firms reported closing in Montserrado compared to less affected ( $p=.04$ ) and most affected ( $p=.01$ ) counties
- Insignificant difference between less and most affected counties ( $p=.61$ )

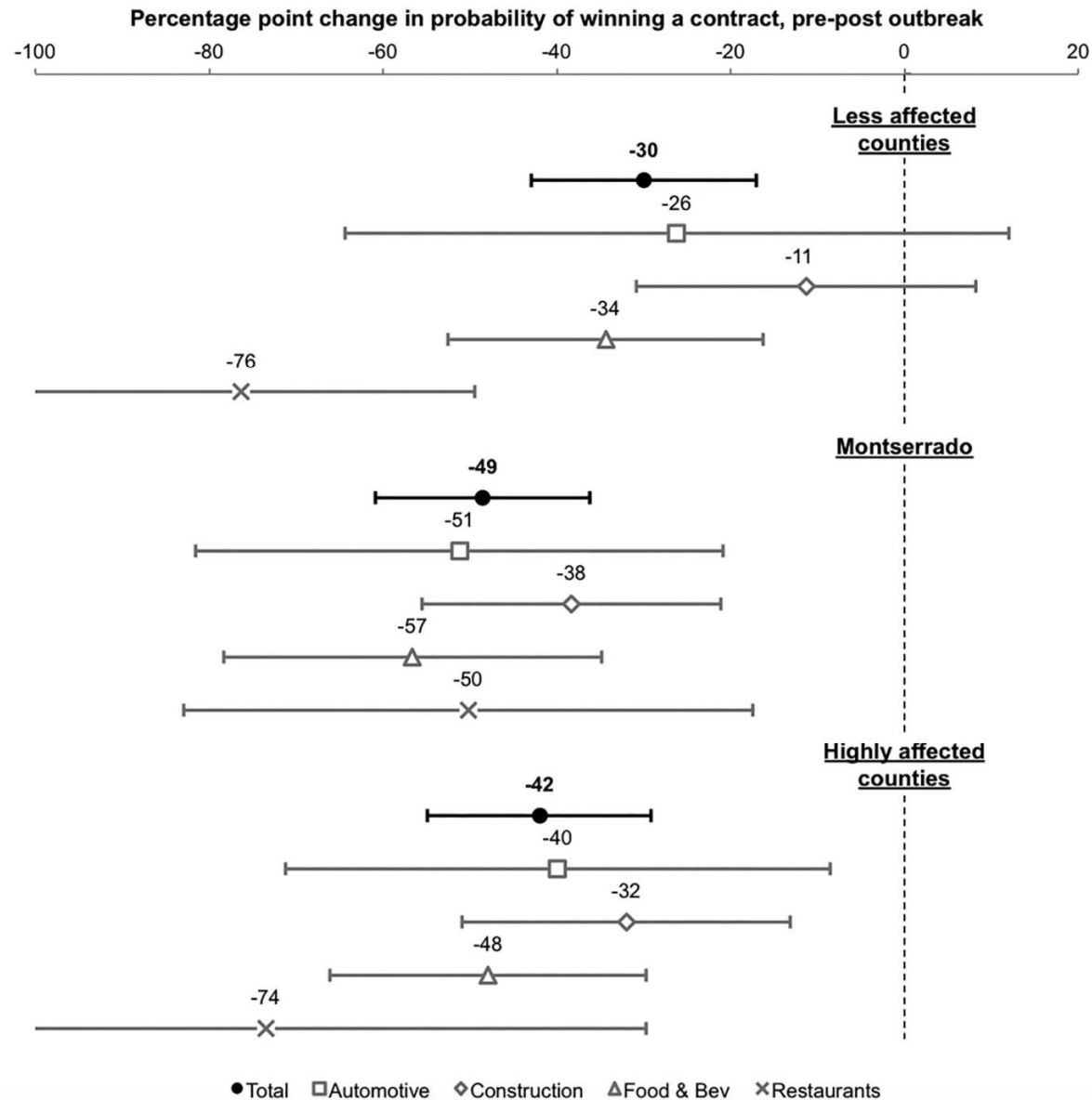
# Results (employment)



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- Number of employees per firm in less affected counties had fallen significantly by 24% since outbreak
- Montserrado affected significantly worse: 47% fall in employees per firm
- No significant difference between most and less affected counties outside Montserrado
- Sectoral results: food & beverages firms have seen broad decreases in employment; construction accounts for much of Montserrado's worse employment impacts

# Results (contracts)



# Results (contracts)

- Proportion of firms winning contracts in less affected counties had decreased by 30pp
- Montserrat significantly worse hit: 48.5pp decrease
- No significant difference between most and less affected
- Sectoral results: very similar to employment outcomes - food & beverages firms have seen broad decreases in contract winning; construction firms doing differentially worse in Montserrat

# Implications

- Evidence of large, negative effects on economic activity across all of Liberia
- Limited relationship between Ebola incidence and economic effects outside of Montserrado
- Sectoral results indicate biggest impact on employment in the food & beverages sector, while construction accounts for the greater total effect in Montserrado
- Efforts to rebuild the healthcare system should be complemented by targeted monitoring of economic recovery



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# 1. How do economic impacts relate to epidemic intensity?

Evidence from agriculture in Sierra Leone



# Overview

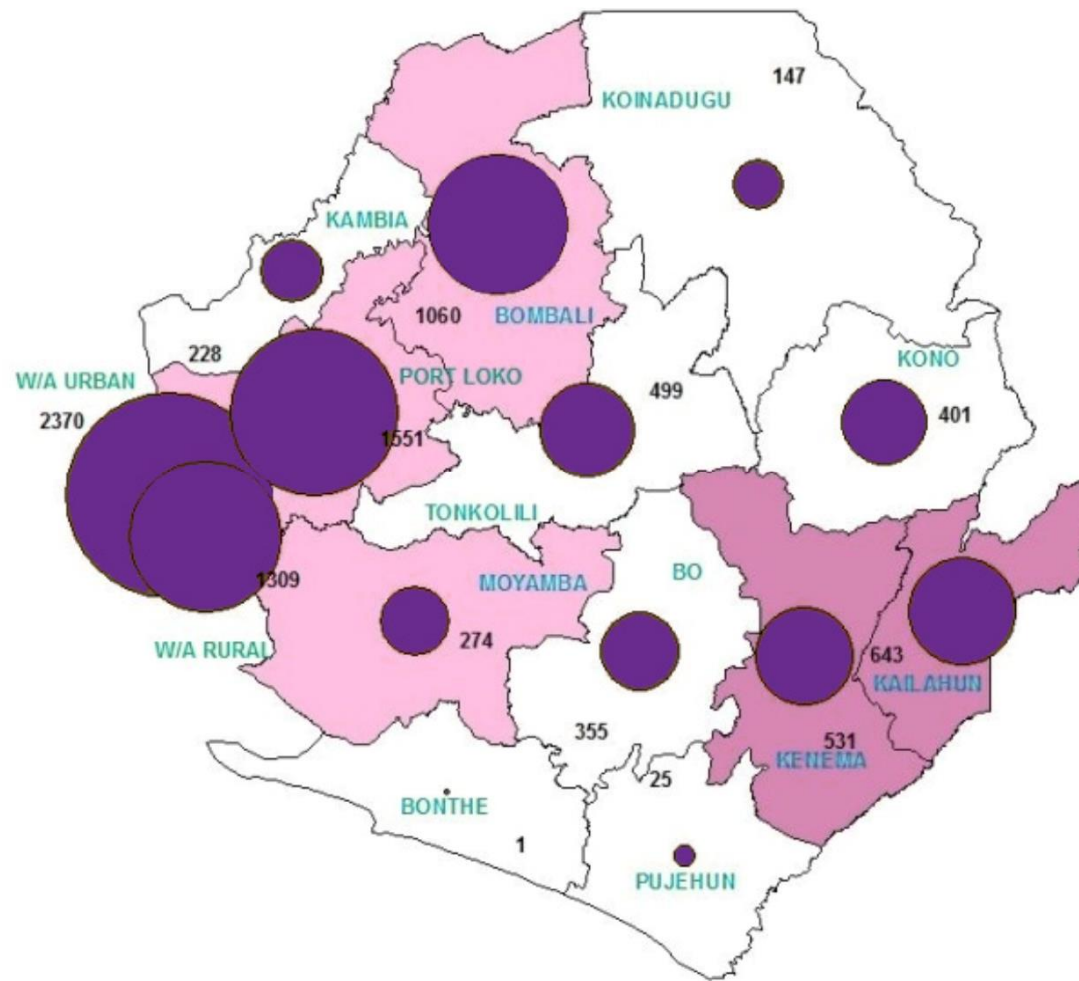
**Question** How were agricultural markets in Sierra Leone affected by the Ebola outbreak?

**Data** Multiple rounds of surveys of 208 agricultural markets, from August 2014 . March 2015

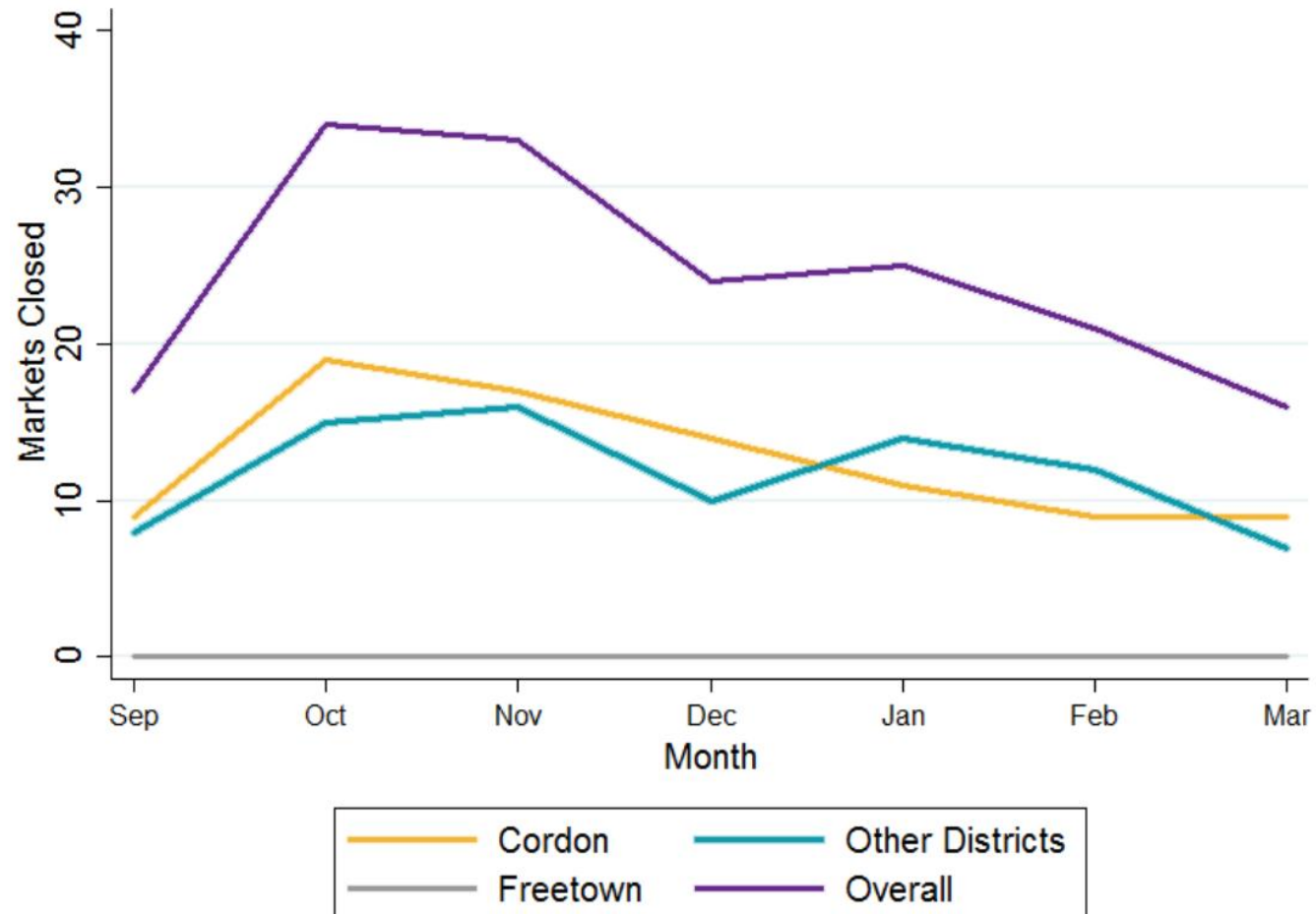
**Design** Trend analysis using baseline from similar 2012 surveys

**Results** Closed markets peaked in October; commodity prices lower in cordoned areas than non-cordoned but number of traders sharply lower; informal trade depressed but food prices largely stable

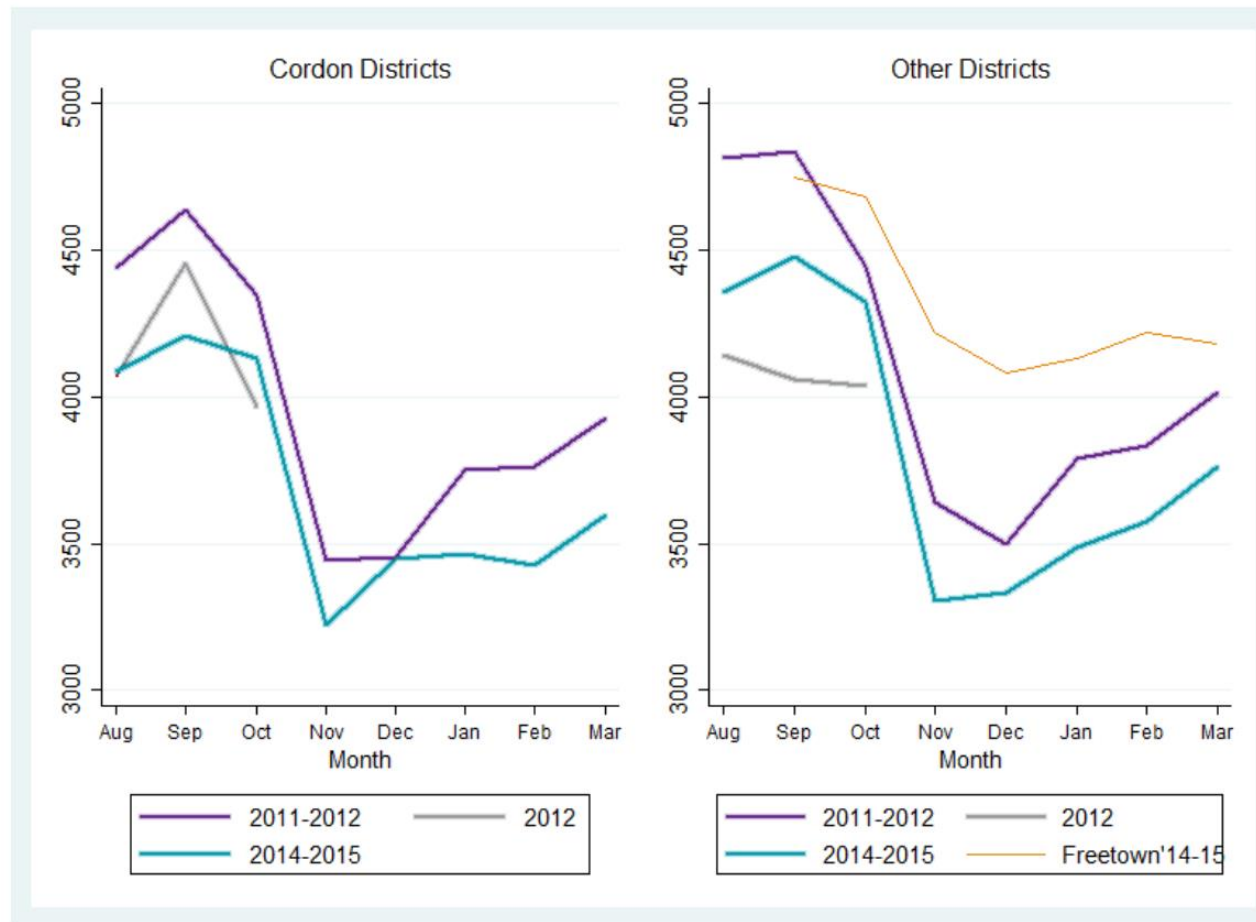
# Background



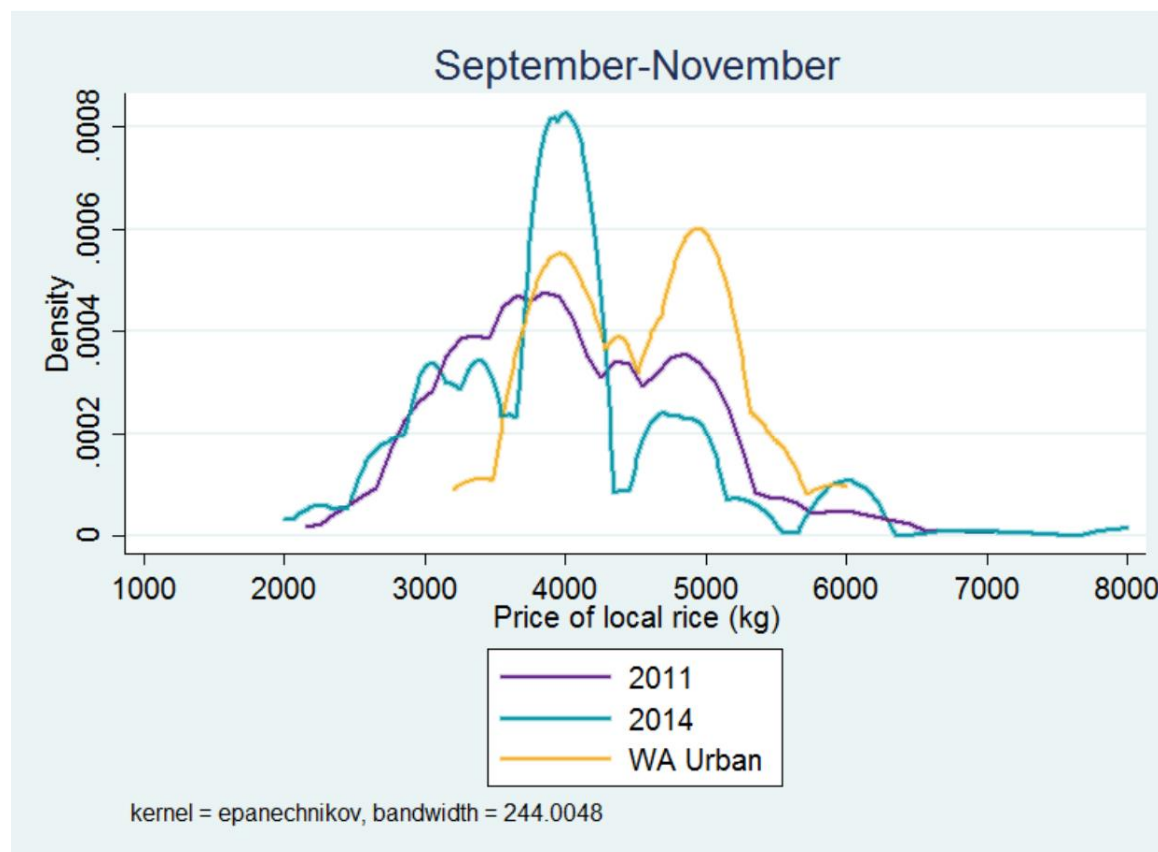
# Results (market closure)



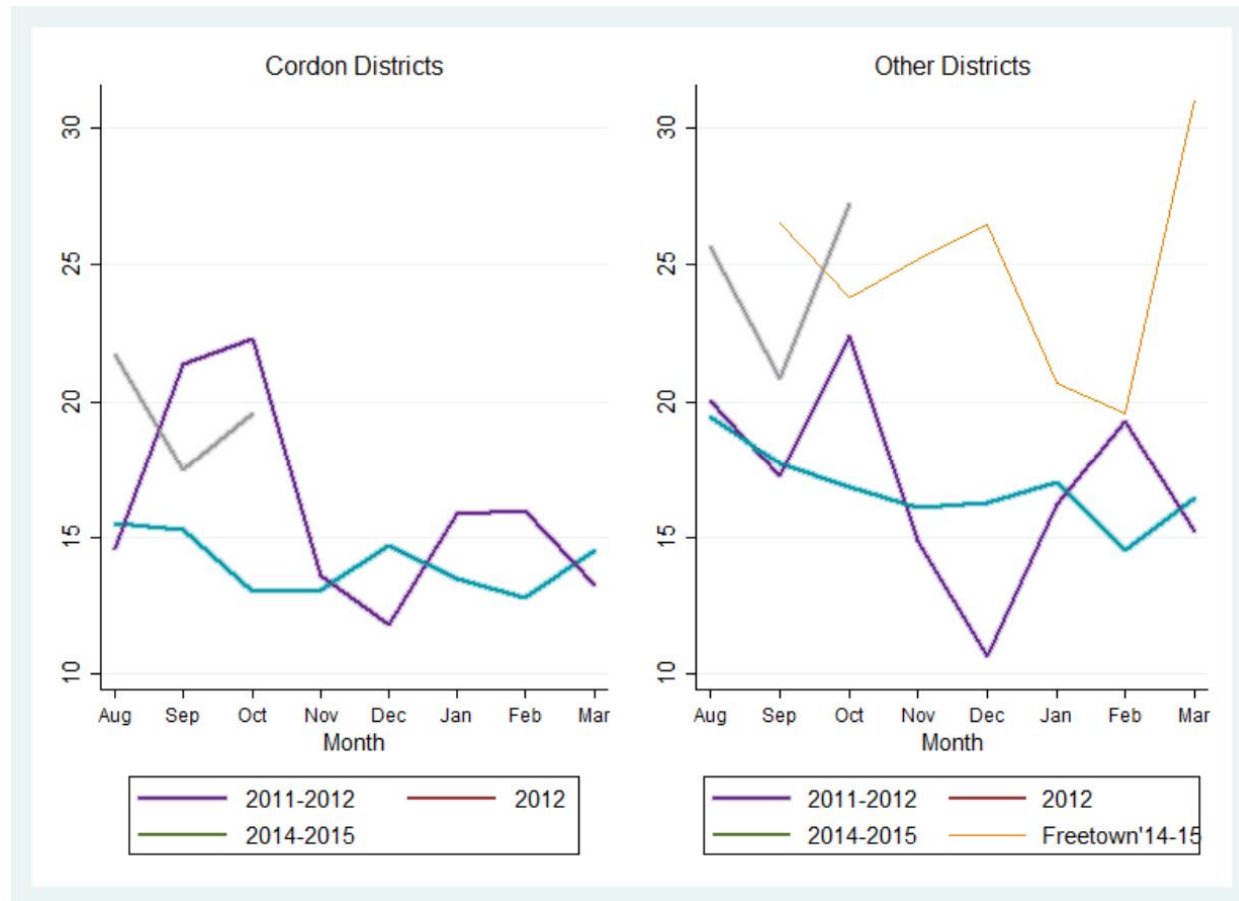
# Results (commodity prices)



# Results (commodity prices)



# Results (trading activity)



# Implications

- Limited relationship between epidemic intensity (cordoned areas) and changes in market behaviour
  - Number of traders sharply lower at peak of outbreak
  - Prices, if anything, a little lower
  - More price outliers than in 2012
- Agricultural trade appeared to return to normal by around January 2015 . similar trends to pre-outbreak years



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## **2. What social interventions worked, and why?**

Evidence from surveys in Monrovia



# Overview

**Question** What socio-economic factors explain the spread of Ebola in Liberia?

**Data** Survey in December 2014 of 1500 representative households in Monrovia, Liberia

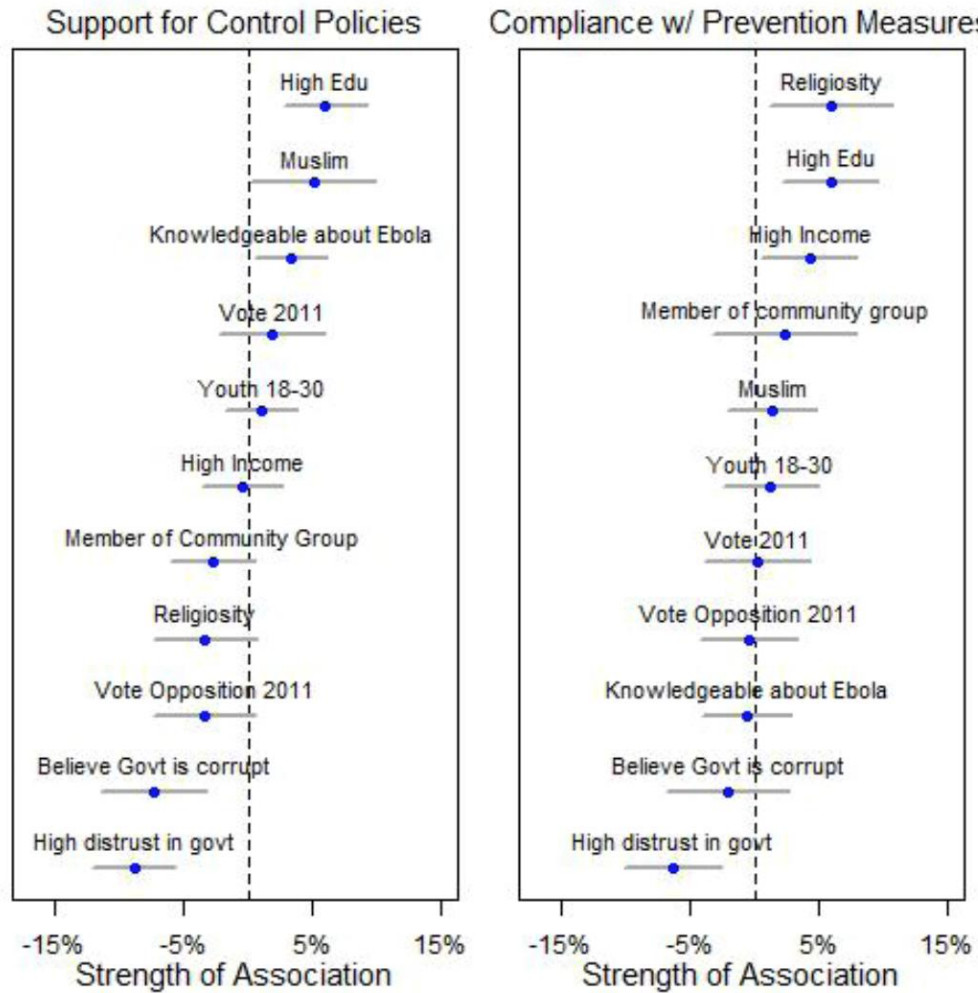
**Design** Questionnaire responses on the correlates of compliance with Ebola-limiting strategies

**Results** Robust link between compliance and trust in government . both as a cause and consequence of Ebola; government outreach perceived as more effective than NGO outreach

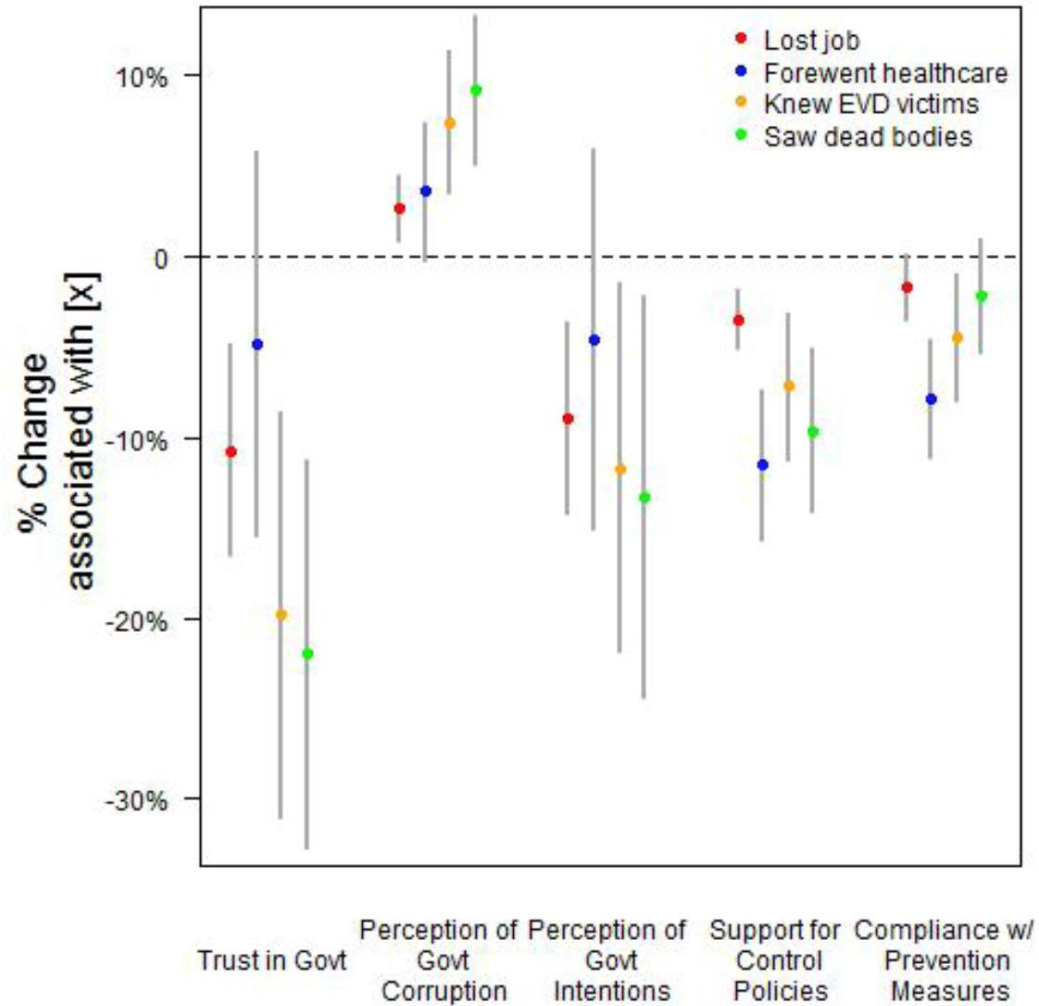
# Background

- By most accounts, initial non-compliance with epidemic control measures was a major contributing factor to its spread
- By early September, compliance with control measures had dramatically increased . why?
- Role of outreach/informational programmes . both from the government and international partners, and incorporating various degrees of pre-existing community institutions

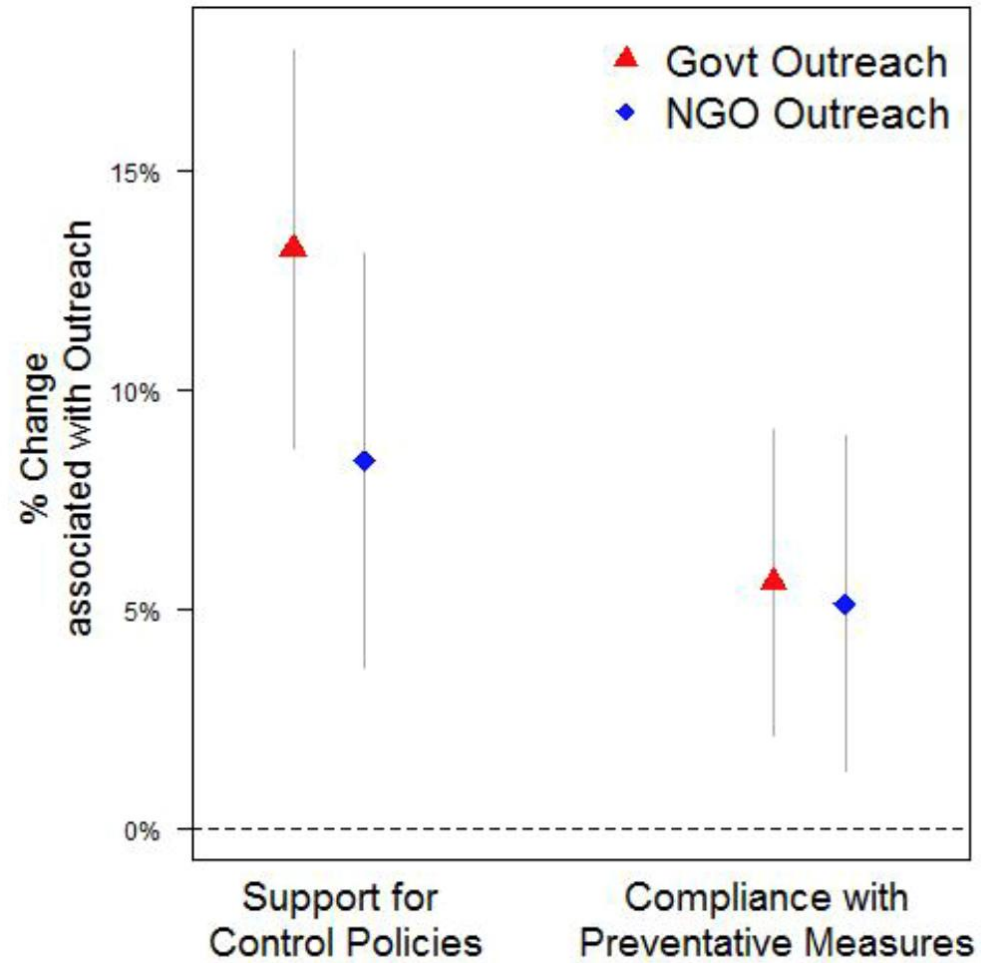
# Results



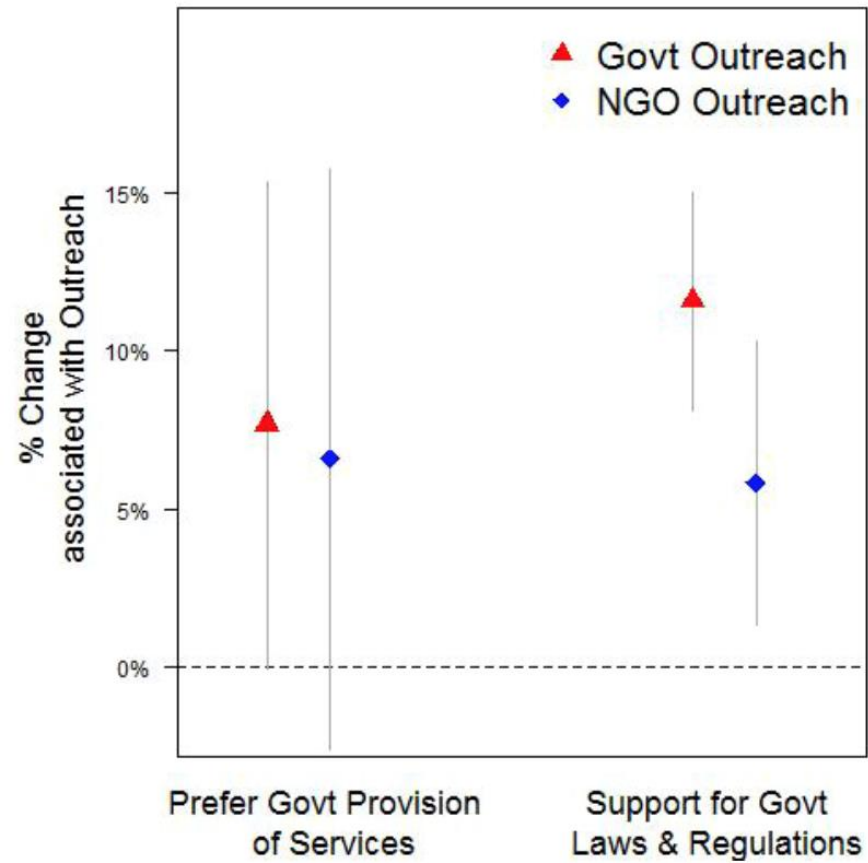
# Results



# Results



# Results



# Implications

- Trust in government is a highly significant predictor of how well individuals complied with control measures . but important for everyday cooperation in governance/social service provision
- Outreach efforts played a key role in combating spread of Ebola . especially when they integrated local institutions
- NGO informational programmes have an important role to play when state capacity is low, but policies to support national government build trust with citizens should be a high priority

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