Online Appendix

BUILDING RESILIENT HEALTH SYSTEMS:
EXPERIMENTAL EVIDENCE FROM SIERRA LEONE AND THE 2014 EBOLA OUTBREAK

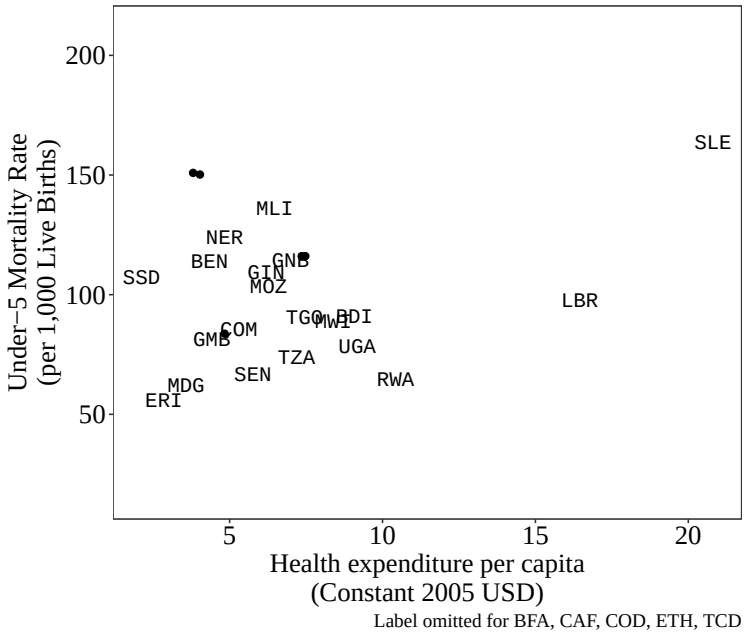
Darin Christensen (UCLA)
Oeindrila Dube (University of Chicago)
Johannes Haushofer (Stockholm University)
Bilal Siddiqi (UC Berkeley, CEGA)
Maarten Voors (Wageningen University)

CONTENTS

A. CONTEXT

A.1 Cross-National Health Indicators

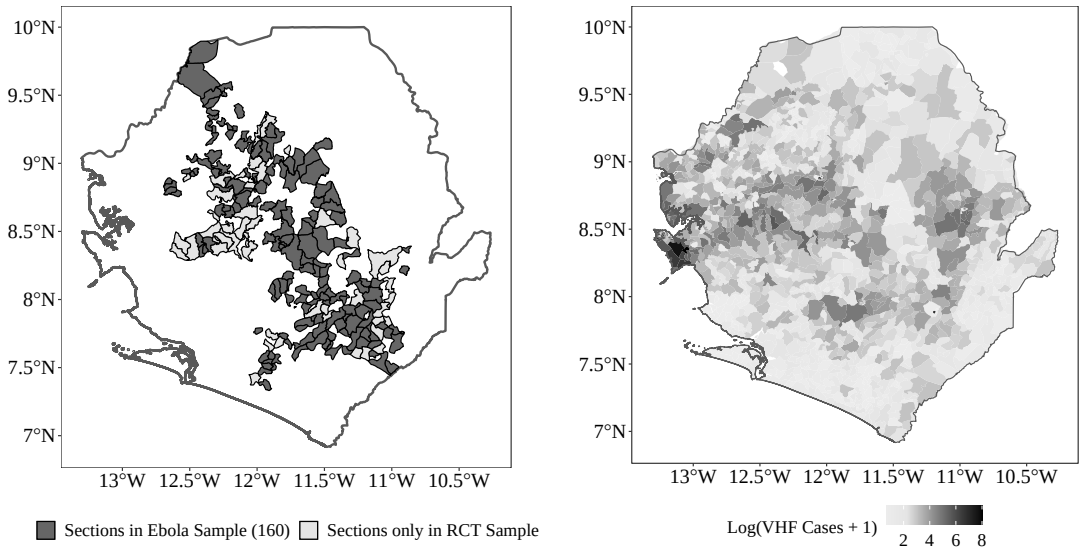
FIGURE A.1
Health Expenditure and Under-5 Mortality in 2010



Notes: We use data from the World Development Indicators from 2010 for under-5 mortality (per 1,000 live births) and health expenditure per capita (in constant 2005 USD). The sample includes countries that the World Bank classifies as low income. Sierra Leone (SLE) appears to the upper right. We omit some country codes to avoid over-plotting; those observations appear as dots.

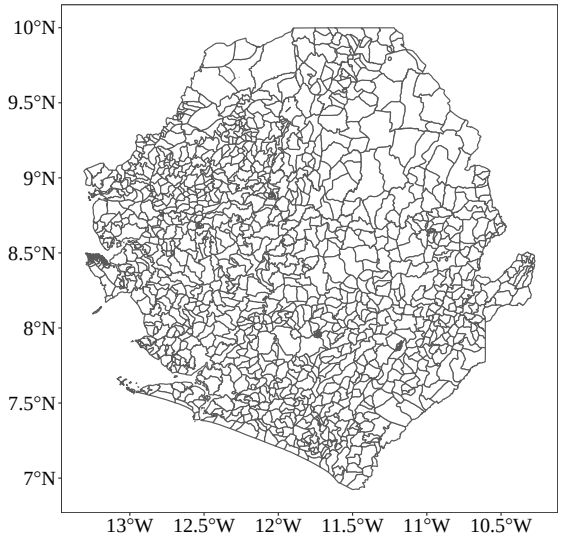
A.2 Administrative Boundaries

FIGURE A.2
Administrative Boundaries



(A) Districts

(B) Chiefdoms



(C) Sections

Notes: Maps of Sierra Leone's different administrative units are provided for reference. Sections (Appendix Figure A.2(c)) nest neatly in chiefdoms (Appendix Figure A.2(b), which nest neatly in districts (Appendix Figure A.2(a)). The randomized experiment was run in four districts: Bombali, Tonkolili, Bo, and Kenema.

B. VARIABLE DESCRIPTIONS

B.1 Pre-specified outcome variables and deviations

Below we detail the families of medium-term outcome variables, which are marked by {i} if measured at the individual level, by {hh} if measured at the household level, by {com} if measured at the community/village level, and by {phu} if measured at the clinic level. Deviations from our analysis plan (AP) are detailed using footnotes.

General Utilization[A1]

(a) Health episodes in response to which individuals visited clinic {i}

(b) Use of traditional healers {i}[A2]

Maternal Utilization (maternal episodes: among mothers who have given birth in the last year)

(a) Antenatal/postnatal care index [standardized summary index of i–ii] {i}

   i. Number of ANC visits

   ii. Number of PNC visits

(b) Childbirth in facility {i}

   i. Proportion of pregnant mothers who gave birth in facility

Health Outcomes

(a) Proportion of households where at least one child under the age of 5 has died (in the past 6 months) {hh}

(b) Proportion of households where women have died during OR due to complications from pregnancy (in the past 6 months) {hh}

(c) Proportion of households where any household member had an illness {hh}

   i. Was this episode an illness, an injury or other consultation?

(d) Anthropometric outcomes {hh}

   i. Child weight-for-height (Among eligible children. Measured at endline only)

[A1] The AP specified examining visits to seek care at clinics as a proportion of health episodes. We use number of visits as the preferred measure since it captures both changes in the propensity to report a health episode, and the propensity to seek care at a clinic conditional on having reported an episode. We draw this distinction since the treatment may have altered what individuals conceptualize to be a health need or health episode. However, all our results are qualitatively similar if we instead use either the proportion of visits or an indicator of any visits to a Western-style clinic. These results are available upon request.

[A2] The AP defined general utilization as an index composed of both the utilization of Western medical clinics (entering the index positively) and utilization of traditional or religious healers (entering negatively). We later found that the survey questions from which we intended to obtain information on use of traditional or religious healers were unsuitable for this purpose. In particular, only the illness/injury module asked utilization questions which explicitly included the traditional healers/religious or spiritual leaders as an option category. For the other three types of health episodes (child birth, vaccinations, and ANC/PNC visits), the answer options contained a health provider category of "other", which could not be (unambiguously) attributed to traditional healers. We therefore restrict our utilization variable to utilization of Western medical clinics in our main specifications. In addition, we also conduct a robustness check with both the utilization of Western clinics and traditional healers, restricting to the illness/injury episodes where both variables can be measured, in Appendix Table D.22.

(e) Vaccines: (Among households with eligible children) [standardized summary index of A-G] {hh}

   i. Proportion of children in household completing full cycle of: (A) BCG, (B) OPV, (C) Penta, (D) Measles, (E) Yellow Fever, (F) RVV, (G) PCV

(f) Childbirth episode [standardized summary index of i–ii] {hh}

   i. Did the mother have health problems during or within two months of the delivery?

   ii. Did the baby have health problems during delivery or within one month of birth?

(g) Child illness index [standardized summary index of i–ii] {phu}

   i. Number of malaria cases (among children under 5)

   ii. Number of diarrhea cases (among children under 5)

Satisfaction

(a) How satisfied are you with your family's health? {hh}

(b) How satisfied are you with the performance of public health workers? {hh}

(c) Satisfaction with services {hh}

   i. The last time you visited [CLINIC] in the past one month, how satisfied were you with the care that you received at the clinic?

   ii. The next time you need medical attention for some other reason, would you visit [CLINIC] again?

Clinic Organization and Services

(a) Clinic service provision [standardized summary index of i–vi] {phu}

   i. Facility organization index [standardized summary index of A-R]

      A. (A) Duty Roster for Staff, (B) Numbered cards for patients, (C) Seating Arrangements, (D) Suggestion box, (E) Name tags for staff, (F) Rooms labeled, (G) Floor clean, (H) Walls clean, (I) Area clean/uncluttered, (J) Drug info available, (K) Smells okay, (L) Coverage graphs, (M) Medicines on floor, (N) Medicines organized by date, (O) Drugs stored in safe area, (P) Storage room clean, (Q) Storage room has limited access, (R) Stock cards available

   ii. Proportion of required services provided by clinic (in the past month) [proportion of A–L the clinic is required to provide]

      A. (A) Immunization, (B) Growth monitoring, (C) Treatment of sick children, (D) Antenatal care, (E) Family planning, (F) Treatment of STIs/STDs, (G) Deliveries (enumerator ask anything associated with delivery e.g. soap, incentive for TBAs), (H) HIV/AIDS counseling and testing (I) Health education, (J) Postnatal care, (K) Nutrition supplementation, (L) Pregnancy test

   iii. Frequency of service provision index [standardized summary of the number of days (ii) are provided]

   iv. Proportion of clinics charging for out of stock equipment

   v. Number of clinic workers on duty

   vi. Reported hours clinic is open (per week)

(b) Proportion of clinics that know about the free health care policy {phu}

(c) Employee satisfaction index [standardized summary index of i–ii] {phu}

   i. Satisfaction with community support/participation

   ii. Satisfaction with job overall

Health Service Delivery[A3]

(a) Absenteeism (among respondents experiencing health episodes) [standardized summary index of i–ii] {i}
   i. Of all the times that you visited the clinic in the past one month, did you ever find no staff present?
   ii. The last time you visited the clinic in the past one month, how long did you wait to see the person who attended to you?

(b) Fee payments (among all health episodes) {i}
   i. Did you pay any money for products or services during this consultation?
   ii. What is the total estimated value of the items (in cash and in kind) that you gave the person/people who assisted you?

(c) Service delivery (among all health episodes) {i}
   i. In the past one month, have you had any problems with the clinic?
   ii. What were these problems?
      A. Staff not present
      B. Drugs not available
      C. Facility not clean
      D. Unpleasant behaviour from staff

(d) Were medicines in-stock and available at the clinic? (among all health episodes) {i}

(e) Satisfaction with services {i}
   i. The last time you visited the clinic in the past one month, how satisfied were you with the care that you received at the clinic?
   ii. The next time you need medical attention for some other reason, would you visit [CLINIC] again?

(f) Last time you visited the clinic in the past one month, how would you rate the attitude of the staff? {i}

Community Support

(a) Reported engagement index [standardized summary index of i-iii] {com}
   i. Health monitoring facility (HMF)/clinic monitoring facility (CMF) exists
   ii. Number of HMC/FMC meetings
   iii. Contributions to clinic (e.g. expenditures, nurse veg garden, etc.)[A4]

(b) Reported community engagement index (past 6 months) [standardized summary index of ii–vi] {phu}
   i. Has the community helped clean this facility?
   ii. Has the community helped you with your personal work? E.g. Farm, back garden, etc.
   iii. How often have community members helped you with your personal work?
   iv. How often has the facility had disputes/conflicts with the community?

Community Development and Political Engagement (CDPE)[A5]

[A3]Per our AP, two satisfaction outcomes appear in both this family and the satisfaction family (measured at the individual and household level, respectively). We verify that this redundancy does not affect the health service delivery index result.

[A4]The AP mis-specified financial contributions as originating from the community survey, instead of the clinic survey.

[A5]Originally, both the CDPE and Community Support indices included the HMC/HMF meetings variables. We retain these as a part of the Community Support index, as this index is intended to gauge the monitoring mechanism more directly. However, we verify that omitting these variables from the CDPE index has no consequence on the estimated effect (available upon request).

(a) Development projects (Excluding NGOs) {com}[A6]

i. Has [the Local Council/the Paramount Chief] done any projects that this community (In the past year, starting May 2012)

ii. Did community members contribute labour, money or local materials for this project (Including work for food and work for pay)?

iii. Were any community members involved in the planning of this project?

(b) Collective action {com}

i. Has this community worked together to address any problem facing this community? For each project: (In the past one year since May 2012)

A. What kind of problem did this community address?

B. Did the community approach any person or organization outside the community for help in addressing this problem?

C. Whom did the community first approach regarding this problem?

D. Is your community satisfied with the way in which the person/organization responded?

E. Has this problem now been resolved?

(c) Voting {hh}

i. Do you have a voter registration card?

ii. Did you vote in the last Local Council Elections? (November 2012 election)

iii. Did you vote in the last General Elections? (November 2012 election)

Water and Sanitation

(a) Household-level index [standardized summary index of i–ii] {hh}

i. Water

A. What is the main source of drinking water for members of your household?

B. What do you usually do to make the water safer to drink?

C. What is the main source of water used by your household for other purposes such as cooking and hand washing?

ii. Toilets

A. What type of toilet facility do members of your household usually use?

(b) Community-level index [standardized summary index of i–ii] {com}

i. Water

A. Is there a water facility in this village/community?

B. What kind of water facility is it?

C. Do people from this community usually get water to drink from this water facility?

D. [If not] Where do people from this community usually get water to drink?

ii. Toilets

A. Is there a Communal Waste Disposal site in this village?

B. Are there any public toilets in your community?

[A6] In the ANCOVA specification, we control for projects in the past two years from the baseline survey.

(c) Satisfaction index {hh}

i. How satisfied are you with the public health and sanitation facilities such as drainage, toilets, garbage bins and access to clean and safe water?

ii. How satisfied are you with the cleanliness of your community?

iii. Over the last year how has the quality of public health and sanitation changed?

Economic Status

(a) Physical asset index: {hh}

i. How many of the following does this household own in either usable or repairable condition? a) Generator, b) Radio, c) Television, d) Mobile, Telephone, e) Non-mobile Telephone, f) Refrigerator, g) Electric Fan, h) Watch or Clock, i) Umbrella, j) Large Cooking Pot, k) Bicycle, l) Motorcycle or Motor scooter, m) Animal-drawn cart, n) Car or Truck, o) Boat with no Motor, p) Boat with a Motor

(b) Agricultural asset index {hh}

i. At present, how many agricultural assets does this household own in either usable or repairable condition? E.g. hoe, cutlass, shovel, spade, sickle, plough, cassava grater, thresher etc.

ii. For each of the animals below, ask "How many "_____" do members of the household own?" a) Cows/Bulls, b) Horses/Donkeys, c) Pigs, d) Goats, e) Sheep, f) Rabbits, g) Rodents, h) Fowl (Chickens), i) Ducks, j) Other Birds.

(c) Dwelling materials index {hh}

i. What is the main material of the floors of the house?

ii. What is the material of the roof of the house?

iii. What is the material of the exterior walls of the house?

(d) Total consumption expenditure {hh}

i. How much in total have members of your household spent on "_____" (in the past month)?

ii. Did you consume "_____" from your own harvest or your own stock in the past month?

A. How much of "_____" did you consume in the past month?[A7]

[A7] The AP also included retails prices, however, these were not properly recorded and are therefore omitted from the index.

B.2 Descriptive statistics

TABLE B.1
Descriptive Statistics at Endline

	Median	Mean	SD	Min	Max	N	BL data
General utilization							
(1) Number of health episodes in which sought Western care	1	0.988	0.382	0	3	4496	Yes
Maternal utilization							
(1) ANC/PNC visits index	-0.187	-0.054	0.956	-1.779	5.602	887	Yes
(2) Birth in Western medicine facility	1	0.862	0.345	0	1	877	Yes
Health outcomes							
(1) U5 Child death per HH	0	0.033	0.178	0	1	5053	Yes
(2) Maternal death per HH	0	0.001	0.034	0	1	5053	Yes
(3) Illness/injury in HH	1	0.583	0.493	0	1	5053	Yes
(4) Child weight for length	0.600	0.621	1.633	-4.910	4.980	1991	No
(5) Vaccine completion index (Under 2)	4	3.117	2.589	0	7	1457	Yes
(6) Child birth complication index	-0.619	-0.002	0.975	-0.619	2.649	856	Yes
(7) Child illness index	-0.091	0.028	0.924	-1.435	3.424	4993	Yes
Satisfaction							
(1) Satisfaction with family health	4	3.469	0.657	1	4	5052	Yes
(2) Satisfaction with public health workers	3	3.291	0.791	1	4	4994	Yes
(3) Satisfaction with care	4	3.658	0.670	1	4	2535	Yes
(4) Individual would return to clinic	1	0.969	0.168	0	1	2527	Yes
Health service delivery							
(1) Absenteeism index	-0.239	0.057	1.070	-0.663	7.471	2874	Yes
(2) Paid for treatment	0	0.404	0.491	0	1	2872	Yes
(3) Amount paid	0	7816.945	35359.126	0	1360000	2843	Yes
(4) Any problem	0	0.061	0.240	0	1	2869	Yes
(5) Staff not present	0	0.020	0.140	0	1	2869	Yes
(6) Drugs not available	0	0.027	0.162	0	1	2869	Yes
(7) Facility not clean	0	0.002	0.042	0	1	2869	Yes
(8) Unpleasant staff behavior	0	0.021	0.142	0	1	2869	Yes
(9) Medicine always in stock	1	0.948	0.221	0	1	2478	No
(10) Individual satisfaction with care	4	3.660	0.674	1	4	2863	Yes
(11) Individual would return to clinic	1	0.971	0.165	0	1	2853	Yes
(12) Staff attitude	4	3.752	0.555	1	4	2845	Yes
Clinic organization and services							
(1) Clinic service provision index	0.034	0.068	1.143	-6.872	3.576	254	Yes
(2) Clinic aware of free health care	1	0.803	0.398	0	1	254	Yes
(3) Employee satisfaction index	0.295	0.012	0.975	-3.652	1.443	254	Yes
CDPE							
(1) Projects with local council/chief	0	0.089	0.285	0	1	507	Yes
(2) Community provided labor	0	0.073	0.261	0	1	504	Yes
(3) Community involved in planning	0	0.050	0.217	0	1	504	Yes
(4) Problem addressed collectively?	1	0.573	0.495	0	1	508	Yes
(5) Proportion has voter card	1	0.986	0.040	0.764	1	489	Yes
(6) Proportion voted in local election	1	0.979	0.050	0.632	1	489	Yes
(7) Proportion voted in general election	1	0.979	0.050	0.632	1	489	Yes
Contributions to clinic							
(1) Contributions to clinic index (community survey)	0.083	0.075	0.934	-1.170	4.193	508	Yes
(2) Contributions to clinic index (facility survey)	0.155	-0.034	1.065	-4.528	3.331	508	Yes
Water and sanitation							
(1) Water and sanitation HH index	0.043	0.050	0.987	-5.667	6.236	5053	Yes
(2) Water and sanitation village index	-0.012	0.098	1.012	-1.212	3.791	5053	Yes
(3) Satisfaction with village sanitation index	0.290	0.050	0.973	-3.415	1.885	5051	Yes
Economic outcomes							
(1) Physical asset index	-0.245	0.014	1.052	-0.701	14.438	5052	Yes
(2) Agricultural asset index	-0.284	0.075	1.803	-0.560	58.153	5051	No
(3) Dwelling materials index	-0.163	0.038	1.018	-7.644	6.723	5052	Yes
(4) Total consumption expenditure	-0.225	0.016	1.031	-1.311	14.540	5053	Yes

C. Manipulation Check and Balance

C.1 Manipulation Checks

Table C.1
Manipulation Checks: Community Meetings

	(1) Control Mean	(2) Pooled	(3) CM	(4) NFA	(5) Difference	(6) N
A community meeting by PLAN, Concern, or IRC took place	0.435	0.269	0.421	0.115	0.306	506
	(0.497)	(0.05)***	(0.05)***	(0.05)**	(0.049)***	
How many meetings took place?	0.897	1.055	1.631	0.483	1.147	498
	(1.218)	(0.14)***	(0.16)***	(0.16)***	(0.164)***	
Was village informed of meeting outcomes?	0.411	0.266	0.403	0.127	0.276	506
	(0.493)	(0.05)***	(0.05)***	(0.06)**	(0.053)***	

Notes: Treatment effects are estimated using cross-sectional OLS at endline and including matching-triplet fixed effects. Column 1 reports standard deviation in parentheses. Columns 2–5 report robust standard errors. Significance: * is significant at the 10% level, ** is significant at the 5% level and *** is significant at the 1% level.

Table C.2
Manipulation Checks: Competitions

	(1) Control Mean	(2) Pooled	(3) CM	(4) NFA	(5) Difference	(6) N
Clinic staff heard of a competition?	0.476	0.331	0.190	0.473	−0.282	254
	(0.502)	(0.06)***	(0.07)***	(0.06)***	(0.059)***	
Clinic participated in a competition?	0.155	0.428	0.198	0.657	−0.459	254
	(0.364)	(0.06)***	(0.07)***	(0.06)***	(0.064)***	

Notes: Treatment effects are estimated using cross-sectional OLS at endline and including matching-triplet fixed effects. Column 1 reports standard deviation in parentheses. Columns 2–5 report robust standard errors, clustered by clinic. Significance: * is significant at the 10% level, ** is significant at the 5% level and *** is significant at the 1% level.

C.2 Baseline Balance

TABLE C.3
Baseline Balance

	(1) Control Mean	(2) CM–Control Difference	(3) NFA–Control Difference	(4) CM–NFA Difference	(5) N
Village characteristics					
Motorable road	0.890	-0.009	0.005	-0.014	503
	(0.313)	(0.036)	(0.035)	(0.035)	
Mobile phone coverage within 1 mile from the community	0.813	0.058	0.096	-0.038	504
	(0.390)	(0.044)	(0.041)**	(0.037)	
Distance to the closest clinic	1.326	-0.204	0.338	-0.542	504
	(1.849)	(0.329)	(0.481)	(0.463)	
Travel cost to closest clinic	73.260	-24.273	-24.389	0.116	503
	(738.975)	(72.811)	(74.502)	(65.453)	
Household characteristics and questions to household head					
Household size	4.452	-0.061	0.007	-0.068	4774
	(3.068)	(0.056)	(0.058)	(0.059)	
Number of illness or injury cases per household	0.071	-0.039	-0.026	-0.013	4774
	(0.270)	(0.011)***	(0.012)**	(0.013)	
Birth in household last year	0.158	-0.028	0.009	-0.037	2127
	(0.365)	(0.014)**	(0.015)	(0.014)**	
Child under 2 in household	0.234	-0.013	0.027	-0.040	2126
	(0.424)	(0.018)	(0.018)	(0.018)**	
Prominent village member in household	0.041	-0.007	-0.002	-0.005	2090
	(0.199)	(0.010)	(0.010)	(0.009)	
Believes doctor's advice	0.994	0.000	-0.007	0.007	1977
	(0.078)	(0.004)	(0.005)	(0.004)*	
Health care fees unaffordable	2.317	0.023	0.030	-0.007	2057
	(0.798)	(0.045)	(0.050)	(0.046)	
Trust in the community	1.848	-0.032	-0.010	-0.021	2127
	(0.667)	(0.051)	(0.049)	(0.052)	
Community cohesion	2.421	-0.018	0.009	-0.026	2122
	(0.604)	(0.034)	(0.036)	(0.035)	
Believe VHC members represent your interest	2.761	0.094	0.159	-0.066	984
	(1.084)	(0.107)	(0.122)	(0.104)	
The VHC can be trusted	2.443	-0.171	-0.089	-0.083	1148
	(0.963)	(0.103)*	(0.106)	(0.101)	
Individual characteristics					
Muslim	0.849	-0.037	-0.017	-0.021	9761
	(0.358)	(0.026)	(0.026)	(0.029)	
Mende (Ethnicity)	0.432	-0.019	-0.005	-0.014	9759
	(0.495)	(0.012)	(0.012)	(0.011)	
Temne (Ethnicity)	0.333	0.023	0.078	-0.055	9759
	(0.471)	(0.039)	(0.036)**	(0.035)	
Highest level of education	1.808	0.090	0.323	-0.233	9379
	(2.923)	(0.103)	(0.109)***	(0.112)**	
Joint *F*-test *p*-value		0.564	0.115	0.584	

Notes: This table presents baseline balance for households included in both baseline and endline surveys. Column (1) shows the mean and standard deviation of the control group at baseline. Columns (2) and (3) show regression coefficients on the CM and NFA treatment arm indicators compared to control, with standard errors clustered at the clinic level in parentheses. Column (4) compares the CM treatment arm to the NFA arm. Column (5) displays the sample size. The second panel reports data at the household level. Most questions are based on a sample of 5 households per village; others also include an additional 15 households that were administered a short user feedback survey on recent health episodes, service provision, and satisfaction. The third panel reports data at the individual level, from all individuals in a sampled household. Lower numbers of observations relative to the number of sampled households reflect missing data at baseline, the inability to resurvey a household at endline, or conditionality of variables on other responses. The last row shows p-values from Joint Orthogonality Tests. We aggregate all variables to the clinic (the highest common level) and estimate a Multinomial Logit where the dependent variable is the treatment group and the explanatory variables are all those in this table. In Columns (2)-(3) we set control as the base group and test the null that the coefficients on the explanatory variables are jointly zero for CM and NFA. In column (4) we re-estimate the model instead setting NFA as the base group, and test the null that the coefficients on CM are jointly zero. Significance: is significant at the 10% level, * is significant at the 5% level and *** is significant at the 1% level."

D. Effects Prior to the Ebola Crisis

D.1 Outcome Family tables (raw, not z-scored)

TABLE D.1
General Utilization

	(1) Control Mean	(2) Pooled	(3) CM	(4) NFA	(5) Difference	(6) N
General utilization (SUR)		0.112	0.126	0.099	0.026	4496
		(0.031)***	(0.034)***	(0.036)***	(0.033)	
		[0.003]***	[0.003]***	[0.021]**	[0.748]	
(1) Number of health episodes in which sought Western care	0.962	0.044	0.049	0.039	0.010	4496
	(0.393)	(0.012)***	(0.013)***	(0.014)***	(0.013)	
		[0.001]***	[0.001]***	[0.008]***	[0.763]	

Notes: Treatment effects are estimated using Missing-Indicator ANCOVA, controlling for the community-level average of the outcome family index at baseline and matching-triplet fixed effects. The SUR treatment effects are estimated as an average of the z-scored treatment effects in this table using Seemingly Unrelated Regressions and controlling for average baseline observations of the outcomes at the community level, and including matching-triplet fixed effects. Column 1 reports standard deviation in parentheses. Columns 2–5 report robust standard errors, clustered by clinic. Multiple-inference corrected q-values that adjust for the false discovery rate within treatment arm across all outcomes in this table are shown in square brackets. Health episodes include questions about ante and post natal care, vaccinations and illness/injury episodes (asked for the past one month) and questions about child birth (asked about the past year). Significance: * is significant at the 10% level, ** is significant at the 5% level and *** is significant at the 1% level.

TABLE D.2
Maternal Utilization

	(1) Control Mean	(2) Pooled	(3) CM	(4) NFA	(5) Difference	(6) N
Maternal utilization (SUR)		0.046	0.130	-0.031	0.161	888
		(0.045)	(0.054)**	(0.054)	(0.057)***	
		[0.322]	[0.079]*	[0.468]	[0.044]**	
(1) ANC/PNC visits index	0.000	-0.038	0.008	-0.079	0.087	887
	(1.000)	(0.064)	(0.082)	(0.068)	(0.076)	
		[0.386]	[0.861]	[0.968]	[0.146]	
(2) Birth in Western medicine facility	0.834	0.048	0.094	0.006	0.088	877
	(0.373)	(0.025)*	(0.028)***	(0.030)	(0.031)***	
		[0.114]	[0.002]***	[0.968]	[0.011]**	

Notes: Treatment effects are estimated using Missing-Indicator ANCOVA, controlling for the community-level average of the outcome family index at baseline and matching-triplet fixed effects. The SUR treatment effects are estimated as an average of the z-scored treatment effects in this table using Seemingly Unrelated Regressions and controlling for average baseline observations of the outcomes at the community level, and including matching-triplet fixed effects. Column 1 reports standard deviation in parentheses. Columns 2–5 report robust standard errors, clustered by clinic. Multiple-inference corrected q-values that adjust for the false discovery rate within treatment arm across all outcomes in this table are shown in square brackets. Significance: * is significant at the 10% level, ** is significant at the 5% level and *** is significant at the 1% level.

TABLE D.3
Satisfaction

	(1) Control Mean	(2) Pooled	(3) CM	(4) NFA	(5) Difference	(6) N
Satisfaction (SUR)		0.062	0.056	0.068	-0.012	5052
		(0.029)**	(0.033)*	(0.033)**	(0.033)	
		[0.059]*	[0.124]	[0.079]*	[0.970]	
(1) Satisfaction with family health	3.439	0.053	0.047	0.058	-0.011	5052
	(0.670)	(0.026)**	(0.029)	(0.029)**	(0.027)	
		[0.156]	[0.623]	[0.101]	[1.000]	
(2) Satisfaction with public health workers	3.258	0.061	0.042	0.080	-0.038	4994
	(0.802)	(0.033)*	(0.040)	(0.039)**	(0.042)	
		[0.156]	[0.623]	[0.101]	[1.000]	
(3) Satisfaction with care	3.646	0.039	0.045	0.032	0.013	2535
	(0.696)	(0.034)	(0.039)	(0.039)	(0.036)	
		[0.193]	[0.623]	[0.258]	[1.000]	
(4) Individual would return to clinic	0.967	0.007	0.006	0.007	-0.001	2527
	(0.174)	(0.007)	(0.008)	(0.008)	(0.008)	
		[0.193]	[0.623]	[0.258]	[1.000]	

Notes: Treatment effects are estimated using Missing-Indicator ANCOVA, controlling for the community-level average of the outcome family index at baseline and matching-triplet fixed effects. The SUR treatment effects are estimated as an average of the z-scored treatment effects in this table using Seemingly Unrelated Regressions and controlling for average baseline observations of the outcomes at the community level, and including matching-triplet fixed effects. Column 1 reports standard deviation in parentheses. Columns 2–5 report robust standard errors, clustered by clinic. Multiple-inference corrected *q*-values that adjust for the false discovery rate within treatment arm across all outcomes in this table are shown in square brackets. Significance: * is significant at the 10% level, ** is significant at the 5% level and *** is significant at the 1% level.

TABLE D.4
Health Outcomes

	(1) Control Mean	(2) Pooled	(3) CM	(4) NFA	(5) Difference	(6) N
Health outcomes (SUR)		0.021	0.055	-0.010	0.064	5053
		(0.023)	(0.025)**	(0.027)	(0.024)***	
		[0.322]	[0.089]*	[0.472]	[0.044]**	
(1) U5 child death per HH	0.039	-0.009	-0.015	-0.004	-0.011	5053
	(0.193)	(0.005)*	(0.005)***	(0.006)	(0.005)**	
		[0.544]	[0.039]**	[1.000]	[0.069]*	
(2) Maternal death per HH	0.001	0.000	0.001	-0.001	0.001	5053
	(0.035)	(0.001)	(0.001)	(0.001)	(0.001)	
		[1.000]	[0.462]	[1.000]	[0.297]	
(3) Illness/injury in HH	0.579	-0.003	-0.009	0.004	-0.012	5053
	(0.494)	(0.016)	(0.018)	(0.019)	(0.019)	
		[1.000]	[0.462]	[1.000]	[0.667]	
(4) Child weight for length	0.546	0.133	0.156	0.109	0.048	1991
	(1.682)	(0.081)	(0.093)*	(0.093)	(0.093)	
		[0.544]	[0.252]	[1.000]	[0.667]	
(5) Vaccine completion index (Under 2)	3.085	0.032	0.303	-0.209	0.512	1457
	(2.560)	(0.152)	(0.184)	(0.163)	(0.164)***	
		[1.000]	[0.252]	[1.000]	[0.014]**	
(6) Child birth complication index	0.000	-0.026	-0.126	0.061	-0.187	856
	(1.000)	(0.077)	(0.086)	(0.087)	(0.079)**	
		[1.000]	[0.277]	[1.000]	[0.057]*	
(7) Child illness index	0.002	0.024	0.031	0.018	0.012	4993
	(0.995)	(0.102)	(0.115)	(0.115)	(0.107)	
		[1.000]	[0.513]	[1.000]	[0.667]	

Notes: Treatment effects are estimated using Missing-Indicator ANCOVA, controlling for the community-level average of the outcome family index at baseline and matching-triplet fixed effects. The SUR treatment effects are estimated as an average of the z-scored treatment effects in this table using Seemingly Unrelated Regressions and controlling for average baseline observations of the outcomes at the community level, and including matching-triplet fixed effects. Column 1 reports standard deviation in parentheses. Columns 2–5 report robust standard errors, clustered by clinic. Multiple-inference corrected q-values that adjust for the false discovery rate within treatment arm across all outcomes in this table are shown in square brackets. Maternal death is defined as death relating to either pregnancy complications or childbirth. Vaccine completion includes vaccines against diphtheria, tetanus, whooping cough, hepatitis B, and haemophilus influenza type B. Significance: * is significant at the 10% level, ** is significant at the 5% level and *** is significant at the 1% level.

TABLE D.5
Health Service Delivery

	(1) Control Mean	(2) Pooled	(3) CM	(4) NFA	(5) Difference	(6) N
Health service delivery (SUR)		0.014	0.022	0.012	0.010	2877
		(0.028)	(0.039)	(0.030)	(0.035)	
		[0.521]	[0.483]	[0.472]	[0.970]	
(1) Absenteeism index	0.000	0.098	0.030	0.120	-0.090	2874
	(1.000)	(0.055)*	(0.079)	(0.061)*	(0.084)	
		[1.000]	[1.000]	[0.442]	[0.837]	
(2) Paid for treatment	0.416	-0.014	-0.077	0.007	-0.083	2872
	(0.493)	(0.023)	(0.033)**	(0.023)	(0.030)***	
		[1.000]	[0.333]	[1.000]	[0.082]*	
(3) Amount paid	8520.158	164.006	-2812.243	1137.405	-3949.648	2843
	(31895.827)	(1484.834)	(2206.513)	(1475.317)	(1887.448)**	
		[1.000]	[1.000]	[1.000]	[0.154]	
(4) Any problem	0.063	0.003	0.009	0.001	0.008	2869
	(0.242)	(0.015)	(0.020)	(0.016)	(0.017)	
		[1.000]	[1.000]	[1.000]	[0.909]	
(5) Staff not present	0.019	0.004	-0.000	0.006	-0.006	2869
	(0.137)	(0.008)	(0.010)	(0.009)	(0.011)	
		[1.000]	[1.000]	[1.000]	[0.909]	
(6) Drugs not available	0.031	-0.002	0.003	-0.004	0.007	2869
	(0.174)	(0.009)	(0.012)	(0.009)	(0.009)	
		[1.000]	[1.000]	[1.000]	[0.909]	
(7) Facility not clean	0.003	-0.002	-0.000	-0.002	0.001	2869
	(0.058)	(0.002)	(0.002)	(0.002)	(0.002)	
		[1.000]	[1.000]	[1.000]	[0.909]	
(8) Unpleasant staff behavior	0.022	-0.006	0.006	-0.010	0.016	2869
	(0.148)	(0.007)	(0.011)	(0.007)	(0.009)*	
		[1.000]	[1.000]	[1.000]	[0.205]	
(9) Medicine always in stock	0.952	0.009	0.014	0.008	0.006	2478
	(0.214)	(0.009)	(0.013)	(0.009)	(0.013)	
		[1.000]	[1.000]	[1.000]	[0.909]	
(10) Individual satisfaction with care	3.645	0.034	0.062	0.025	0.037	2863
	(0.703)	(0.040)	(0.055)	(0.041)	(0.045)	
		[1.000]	[1.000]	[1.000]	[0.909]	
(11) Individual would return to clinic	0.969	0.008	0.006	0.008	-0.003	2853
	(0.173)	(0.007)	(0.011)	(0.007)	(0.010)	
		[1.000]	[1.000]	[1.000]	[1.000]	
(12) Staff attitude	3.735	0.042	-0.030	0.065	-0.095	2845
	(0.580)	(0.029)	(0.045)	(0.030)**	(0.044)**	
		[1.000]	[1.000]	[0.442]	[0.154]	

Notes: Treatment effects are estimated using Missing-Indicator ANCOVA, controlling for the community-level average of the outcome family index at baseline and matching-triplet fixed effects. The SUR treatment effects are estimated as an average of the z-scored treatment effects in this table using Seemingly Unrelated Regressions and controlling for average baseline observations of the outcomes at the community level, and including matching-triplet fixed effects. Column 1 reports standard deviation in parentheses. Columns 2–5 report robust standard errors, clustered by clinic. Multiple-inference corrected q-values that adjust for the false discovery rate within treatment arm across all outcomes in this table are shown in square brackets. The absenteeism index is composed of an indicator of whether patients had ever found no staff present when visiting the clinic and the waiting time at the last visit. Significance: * is significant at the 10% level, ** is significant at the 5% level and *** is significant at the 1% level.

TABLE D.6
Clinic Organization and Services

	(1) Control Mean	(2) Pooled	(3) CM	(4) NFA	(5) Difference	(6) N
Clinic organization and services (SUR)		0.055	-0.002	0.112	-0.114	254
		(0.064)	(0.074)	(0.075)	(0.078)	
		[0.322]	[0.644]	[0.157]	[0.350]	
(1) Clinic service provision index	0.000	0.149	0.095	0.203	-0.108	254
	(1.000)	(0.153)	(0.180)	(0.175)	(0.181)	
		[1.000]	[1.000]	[1.000]	[1.000]	
(2) Clinic aware of free health care	0.798	0.005	-0.023	0.033	-0.057	254
	(0.404)	(0.052)	(0.060)	(0.058)	(0.056)	
		[1.000]	[1.000]	[1.000]	[1.000]	
(3) Employee satisfaction index	0.000	0.003	-0.043	0.049	-0.092	254
	(1.000)	(0.127)	(0.141)	(0.152)	(0.146)	
		[1.000]	[1.000]	[1.000]	[1.000]	

Notes: Treatment effects are estimated using ANCOVA, controlling for the community-level average of the outcome family index at baseline and matching-triplet fixed effects. The SUR treatment effects are estimated as an average of the z-scored treatment effects in this table using Seemingly Unrelated Regressions and controlling for average baseline observations of the outcomes at the community level, and including matching-triplet fixed effects. Column 1 reports standard deviation in parentheses. Column 2-5 report robust standard errors. Multiple-inference corrected q-values that adjust for the false discovery rate within treatment arm across all outcomes in this table are shown in square brackets. The Clinic service provision index is composed of measures on facility maintenance (mainly cleanliness, orderly medicine storage and signposting) and whether required services like pre- and post-natal care, immunization, reproductive health and other forms of consultation are provided. The employee satisfaction index consists of employees' satisfaction with their job, with the communities' participation in the clinic and the extend to which they feel supported by the communities. Significance: * is significant at the 10% level, ** is significant at the 5% level and *** is significant at the 1% level.

TABLE D.7
Community Support

	(1) Control Mean	(2) Pooled	(3) CM	(4) NFA	(5) Difference	(6) N
Contributions to clinic (SUR)		0.025	0.034	0.016	0.018	508
		(0.065)	(0.077)	(0.075)	(0.078)	
		[0.543]	[0.483]	[0.499]	[0.970]	
(1) Contributions to clinic index (community survey)	0.000	0.109	0.134	0.084	0.050	508
	(1.000)	(0.078)	(0.092)	(0.092)	(0.096)	
		[0.490]	[0.404]	[1.000]	[1.000]	
(2) Contributions to clinic index (facility survey)	0.000	-0.059	-0.067	-0.052	-0.015	508
	(0.997)	(0.121)	(0.142)	(0.136)	(0.138)	
		[0.490]	[0.471]	[1.000]	[1.000]	

Notes: Treatment effects are estimated using ANCOVA, controlling for the community-level average of the outcome family index at baseline and matching-triplet fixed effects. The SUR treatment effects are estimated as an average of the z-scored treatment effects in this table using Seemingly Unrelated Regressions and controlling for average baseline observations of the outcomes at the community level, and including matching-triplet fixed effects. Column 1 reports standard deviation in parentheses. Columns 2–5 report robust standard errors, clustered by clinic. Multiple-inference corrected q-values that adjust for the false discovery rate within treatment arm across all outcomes in this table are shown in square brackets. The Baseline variables for projects with the local council/chief refer to projects in the past two years while at endline it was inquired for the past one year. Significance: * is significant at the 10% level, ** is significant at the 5% level and *** is significant at the 1% level.

TABLE D.8
Community development and political engagement (CDPE)

	(1) Control Mean	(2) Pooled	(3) CM	(4) NFA	(5) Difference	(6) N
CDPE (SUR)		0.132	0.116	0.150	-0.033	508
		(0.047)***	(0.056)**	(0.055)***	(0.059)	
		[0.022]**	[0.089]*	[0.021]**	[0.964]	
(1) Projects with local council/chief	0.054	0.047	0.050	0.043	0.007	507
	(0.226)	(0.022)**	(0.026)*	(0.026)*	(0.029)	
		[0.090]*	[0.465]	[0.129]	[1.000]	
(2) Community provided labor	0.042	0.040	0.038	0.042	-0.004	504
	(0.201)	(0.019)**	(0.022)*	(0.023)*	(0.025)	
		[0.090]*	[0.465]	[0.129]	[1.000]	
(3) Community involved in planning	0.030	0.022	0.026	0.018	0.008	504
	(0.171)	(0.016)	(0.020)	(0.020)	(0.023)	
		[0.103]	[0.465]	[0.161]	[1.000]	
(4) Problem addressed collectively?	0.583	-0.021	-0.024	-0.018	-0.006	508
	(0.494)	(0.040)	(0.045)	(0.046)	(0.046)	
		[0.277]	[0.533]	[0.247]	[1.000]	
(5) Proportion has voter card	0.983	0.005	0.003	0.007	-0.004	489
	(0.045)	(0.003)	(0.004)	(0.004)*	(0.004)	
		[0.103]	[0.533]	[0.129]	[1.000]	
(6) Proportion voted in local election	0.973	0.009	0.005	0.012	-0.007	489
	(0.054)	(0.004)**	(0.005)	(0.005)**	(0.005)	
		[0.090]*	[0.465]	[0.099]*	[1.000]	
(7) Proportion voted in general election	0.973	0.009	0.008	0.011	-0.004	489
	(0.055)	(0.005)**	(0.005)	(0.005)**	(0.005)	
		[0.090]*	[0.465]	[0.109]	[1.000]	

Notes: Treatment effects are estimated using ANCOVA, controlling for the community-level average of the outcome family index at baseline and matching-triplet fixed effects. The SUR treatment effects are estimated as an average of the z-scored treatment effects in this table using Seemingly Unrelated Regressions and controlling for average baseline observations of the outcomes at the community level, and including matching-triplet fixed effects. Column 1 reports standard deviation in parentheses. Column 2-5 report robust standard errors, clustered by clinic. Multiple-inference corrected q-values that adjust for the false discovery rate within treatment arm across all outcomes in this table are shown in square brackets. The two indices of contributions to the clinic are composed of variables that measure support and contributions once from the perspective of key informants in the villages and once by health personnel. In the community survey, we ask about meetings between the clinic and community as well as labor contributions to the clinic. In the clinic survey, we ask about labor or financial contributions as well as disputes between the community and the clinic. Significance: * is significant at the 10% level, ** is significant at the 5% level and *** is significant at the 1% level.

TABLE D.9
Water and Sanitation

	(1) Control Mean	(2) Pooled	(3) CM	(4) NFA	(5) Difference	(6) N
Water and sanitation index (SUR)		0.110	0.066	0.154	-0.088	5053
		(0.044)**	(0.051)	(0.051)***	(0.050)*	
		[0.037]**	[0.224]	[0.021]**	[0.261]	
(1) Water and sanitation HH index	0.000	0.068	-0.022	0.159	-0.180	5053
	(1.000)	(0.058)	(0.068)	(0.063)**	(0.062)***	
		[0.089]*	[0.362]	[0.040]**	[0.012]**	
(2) Water and sanitation village index	-0.016	0.175	0.132	0.218	-0.087	5053
	(1.003)	(0.087)**	(0.097)	(0.104)**	(0.102)	
		[0.073]*	[0.298]	[0.040]**	[0.655]	
(3) Satisfaction with village sanitation index	0.000	0.087	0.087	0.086	0.001	5051
	(1.000)	(0.043)**	(0.049)*	(0.050)*	(0.051)	
		[0.073]*	[0.298]	[0.059]*	[1.000]	

Notes: Treatment effects are estimated using Missing-Indicator ANCOVA, controlling for the community-level average of the outcome family index at baseline and matching-triplet fixed effects. The SUR treatment effects are estimated as an average of the z-scored treatment effects in this table using Seemingly Unrelated Regressions and controlling for average baseline observations of the outcomes at the community level, and including matching-triplet fixed effects. Column 1 reports standard deviation in parentheses. Columns 2–5 report robust standard errors, clustered by clinic. Multiple-inference corrected q-values that adjust for the false discovery rate within treatment arm across all outcomes in this table are shown in square brackets. The household index is comprised of water sources for drinking, for other uses, the existence and type of toilet facilities and the actions households take to make water safe to drink. The village index contains the existence and types of water sources for drinking and general use as well as the existence of public toilets and waste facilities. The satisfaction index consists of questions about sanitation and health services offered as well as village cleanliness. Significance: * is significant at the 10% level, ** is significant at the 5% level and *** is significant at the 1% level.

TABLE D.10
Economic Outcomes

	(1) Control Mean	(2) Pooled	(3) CM	(4) NFA	(5) Difference	(6) N
Economic outcomes (SUR)		0.053	0.036	0.070	-0.034	5053
		(0.032)	(0.037)	(0.040)*	(0.042)	
		[0.138]	[0.311]	[0.116]	[0.748]	
(1) Physical asset index	0.000	0.020	-0.023	0.063	-0.086	5052
	(1.000)	(0.048)	(0.053)	(0.059)	(0.060)	
		[1.000]	[1.000]	[0.404]	[0.246]	
(2) Agricultural asset index	0.000	0.120	0.174	0.065	0.109	5051
	(1.000)	(0.044)***	(0.057)***	(0.050)	(0.063)*	
		[0.026]**	[0.010]***	[0.404]	[0.246]	
(3) Dwelling materials index	0.000	0.053	0.020	0.087	-0.067	5052
	(1.000)	(0.053)	(0.060)	(0.058)	(0.055)	
		[0.875]	[1.000]	[0.404]	[0.246]	
(4) Total consumption expenditure	0.000	0.019	-0.027	0.066	-0.093	5053
	(1.000)	(0.045)	(0.050)	(0.055)	(0.056)*	
		[1.000]	[1.000]	[0.404]	[0.246]	

Notes: Treatment effects are estimated using Missing-Indicator ANCOVA, controlling for the community-level average of the outcome family index at baseline and matching-triplet fixed effects. The SUR treatment effects are estimated as an average of the z-scored treatment effects in this table using Seemingly Unrelated Regressions and controlling for average baseline observations of the outcomes at the community level, and including matching-triplet fixed effects. Column 1 reports standard deviation in parentheses. Columns 2–5 report robust standard errors, clustered by clinic. Multiple-inference corrected *q*-values that adjust for the false discovery rate within treatment arm across all outcomes in this table are shown in square brackets. Significance: * is significant at the 10% level, ** is significant at the 5% level and *** is significant at the 1% level.

D.2 Outcome family tables (z-scored)

We omit the z-scored general utilization table here, since this outcome family has only one ingredient variable. For that outcome and its SUR index, the coefficients on the treatment indicators replicate the coefficients reported in Table I and are therefore redundant.

TABLE D.11
Maternal utilization (z-scored)

	(1) Control Mean	(2) Pooled	(3) CM	(4) NFA	(5) Difference	(6) N
Maternal utilization (SUR)		0.046	0.130	-0.031	0.161	888
		(0.045)	(0.054)**	(0.054)	(0.057)***	
		[0.322]	[0.079]*	[0.468]	[0.044]**	
(1) ANC/PNC visits index	0.000	-0.038	0.008	-0.079	0.087	887
	(1.000)	(0.064)	(0.082)	(0.068)	(0.076)	
		[0.386]	[0.861]	[0.968]	[0.146]	
(2) Birth in Western medicine facility	0.000	0.130	0.252	0.017	0.236	877
	(1.000)	(0.066)*	(0.074)***	(0.082)	(0.084)***	
		[0.114]	[0.002]***	[0.968]	[0.011]**	

Notes: Treatment effects are estimated using Missing-Indicator ANCOVA, controlling for the community-level average of the outcome family index at baseline and matching-triplet fixed effects. The SUR treatment effects are estimated as an average of the z-scored treatment effects in this table using Seemingly Unrelated Regressions and controlling for average baseline observations of the outcomes at the community level, and including matching-triplet fixed effects. Column 1 reports standard deviation in parentheses. Columns 2–5 report robust standard errors, clustered by clinic. Multiple-inference corrected q-values that adjust for the false discovery rate within treatment arm across all outcomes in this table are shown in square brackets. Variables are control-group normalized at endline (z-scored). Significance: * is significant at the 10% level, ** is significant at the 5% level and *** is significant at the 1% level.

TABLE D.12
Satisfaction (z-scored)

	(1) Control Mean	(2) Pooled	(3) CM	(4) NFA	(5) Difference	(6) N
Satisfaction (SUR)		0.062	0.056	0.068	-0.012	5052
		(0.029)**	(0.033)*	(0.033)**	(0.033)	
		[0.059]*	[0.124]	[0.079]*	[0.970]	
(1) Satisfaction with family health	0.000	0.079	0.071	0.087	-0.016	5052
	(1.000)	(0.039)**	(0.044)	(0.043)**	(0.040)	
		[0.156]	[0.623]	[0.101]	[1.000]	
(2) Satisfaction with public health workers	0.000	0.076	0.053	0.100	-0.047	4994
	(1.000)	(0.042)*	(0.050)	(0.049)**	(0.052)	
		[0.156]	[0.623]	[0.101]	[1.000]	
(3) Satisfaction with care	0.000	0.056	0.065	0.046	0.019	2535
	(1.000)	(0.049)	(0.055)	(0.056)	(0.052)	
		[0.193]	[0.623]	[0.258]	[1.000]	
(4) Individual would return to clinic	0.000	0.038	0.036	0.040	-0.004	2527
	(1.000)	(0.039)	(0.046)	(0.043)	(0.046)	
		[0.193]	[0.623]	[0.258]	[1.000]	

Notes: Treatment effects are estimated using Missing-Indicator ANCOVA, controlling for the community-level average of the outcome family index at baseline and matching-triplet fixed effects. The SUR treatment effects are estimated as an average of the z-scored treatment effects in this table using Seemingly Unrelated Regressions and controlling for average baseline observations of the outcomes at the community level, and including matching-triplet fixed effects. Column 1 reports standard deviation in parentheses. Columns 2–5 report robust standard errors, clustered by clinic. Multiple-inference corrected *q*-values that adjust for the false discovery rate within treatment arm across all outcomes in this table are shown in square brackets. Variables are control-group normalized at endline (z-scored). Significance: * is significant at the 10% level, ** is significant at the 5% level and *** is significant at the 1% level.

TABLE D.13
Health outcomes (z-scored)

	(1) Control Mean	(2) Pooled	(3) CM	(4) NFA	(5) Difference	(6) N
Health outcomes (SUR)		0.021	0.055	-0.010	0.064	5053
		(0.023)	(0.025)**	(0.027)	(0.024)***	
		[0.322]	[0.089]*	[0.472]	[0.044]**	
(1) U5 child death per HH	0.000	-0.047	-0.075	-0.019	-0.056	5053
	(1.000)	(0.025)*	(0.027)***	(0.030)	(0.027)**	
		[0.544]	[0.039]**	[1.000]	[0.069]*	
(2) Maternal death per HH	0.000	0.000	0.017	-0.017	0.034	5053
	(1.000)	(0.026)	(0.031)	(0.028)	(0.028)	
		[1.000]	[0.462]	[1.000]	[0.297]	
(3) Illness/injury in HH	0.000	-0.005	-0.018	0.007	-0.025	5053
	(1.000)	(0.033)	(0.037)	(0.039)	(0.038)	
		[1.000]	[0.462]	[1.000]	[0.667]	
(4) Child weight for length	0.000	0.079	0.093	0.065	0.028	1991
	(1.000)	(0.048)	(0.055)*	(0.055)	(0.055)	
		[0.544]	[0.252]	[1.000]	[0.667]	
(5) Vaccine completion index (Under 2)	0.000	0.012	0.118	-0.082	0.200	1457
	(1.000)	(0.059)	(0.072)	(0.064)	(0.064)***	
		[1.000]	[0.252]	[1.000]	[0.014]**	
(6) Child birth complication index	0.000	-0.026	-0.126	0.061	-0.187	856
	(1.000)	(0.077)	(0.086)	(0.087)	(0.079)**	
		[1.000]	[0.277]	[1.000]	[0.057]*	
(7) Child illness index	0.000	0.024	0.031	0.018	0.012	4993
	(1.000)	(0.102)	(0.115)	(0.116)	(0.108)	
		[1.000]	[0.513]	[1.000]	[0.667]	

Notes: Treatment effects are estimated using Missing-Indicator ANCOVA, controlling for the community-level average of the outcome family index at baseline and matching-triplet fixed effects. The SUR treatment effects are estimated as an average of the z-scored treatment effects in this table using Seemingly Unrelated Regressions and controlling for average baseline observations of the outcomes at the community level, and including matching-triplet fixed effects. Column 1 reports standard deviation in parentheses. Columns 2–5 report robust standard errors, clustered by clinic. Multiple-inference corrected q-values that adjust for the false discovery rate within treatment arm across all outcomes in this table are shown in square brackets. Maternal death is defined as death relating to either pregnancy complications or childbirth. Vaccine completion includes vaccines against diphtheria, tetanus, whooping cough, hepatitis B, and haemophilus influenza type B. Variables are control-group normalized at endline (z-scored). Significance: * is significant at the 10% level, ** is significant at the 5% level and *** is significant at the 1% level.

TABLE D.14
Health service delivery (z-scored)

	(1) Control Mean	(2) Pooled	(3) CM	(4) NFA	(5) Difference	(6) N
Health Service Delivery (SUR)		0.014	0.022	0.012	0.010	2877
		(0.028)	(0.039)	(0.030)	(0.035)	
		[0.521]	[0.483]	[0.472]	[0.970]	
(1) Absenteeism index	0.000	0.098	0.030	0.120	-0.090	2874
	(1.000)	(0.055)*	(0.079)	(0.061)*	(0.084)	
		[1.000]	[1.000]	[0.442]	[0.837]	
(2) Paid for treatment	0.000	-0.028	-0.155	0.014	-0.169	2872
	(1.000)	(0.047)	(0.067)**	(0.047)	(0.062)***	
		[1.000]	[0.333]	[1.000]	[0.082]*	
(3) Amount paid	0.000	0.005	-0.088	0.036	-0.124	2843
	(1.000)	(0.047)	(0.069)	(0.046)	(0.059)**	
		[1.000]	[1.000]	[1.000]	[0.154]	
(4) Any problem	0.000	0.011	0.035	0.003	0.032	2869
	(1.000)	(0.064)	(0.083)	(0.066)	(0.072)	
		[1.000]	[1.000]	[1.000]	[0.909]	
(5) Staff not present	0.000	0.031	-0.002	0.043	-0.045	2869
	(1.000)	(0.057)	(0.076)	(0.062)	(0.078)	
		[1.000]	[1.000]	[1.000]	[0.909]	
(6) Drugs not available	0.000	-0.011	0.019	-0.021	0.040	2869
	(1.000)	(0.053)	(0.068)	(0.054)	(0.052)	
		[1.000]	[1.000]	[1.000]	[0.909]	
(7) Facility not clean	0.000	-0.027	-0.008	-0.033	0.025	2869
	(1.000)	(0.027)	(0.036)	(0.029)	(0.037)	
		[1.000]	[1.000]	[1.000]	[0.909]	
(8) Unpleasant staff behavior	0.000	-0.043	0.040	-0.071	0.110	2869
	(1.000)	(0.051)	(0.074)	(0.050)	(0.062)*	
		[1.000]	[1.000]	[1.000]	[0.205]	
(9) Medicine always in stock	0.000	0.042	0.064	0.036	0.028	2478
	(1.000)	(0.041)	(0.062)	(0.044)	(0.062)	
		[1.000]	[1.000]	[1.000]	[0.909]	
(10) Individual satisfaction with care	0.000	0.048	0.088	0.035	0.052	2863
	(1.000)	(0.057)	(0.078)	(0.058)	(0.065)	
		[1.000]	[1.000]	[1.000]	[0.909]	
(11) Individual would return to clinic	0.000	0.044	0.032	0.048	-0.016	2853
	(1.000)	(0.042)	(0.066)	(0.041)	(0.059)	
		[1.000]	[1.000]	[1.000]	[1.000]	
(12) Staff attitude	0.000	0.072	-0.051	0.112	-0.163	2845
	(1.000)	(0.050)	(0.077)	(0.052)**	(0.075)**	
		[1.000]	[1.000]	[0.442]	[0.154]	

Notes: Treatment effects are estimated using Missing-Indicator ANCOVA, controlling for the community-level average of the outcome family index at baseline and matching-triplet fixed effects. The SUR treatment effects are estimated as an average of the z-scored treatment effects in this table using Seemingly Unrelated Regressions and controlling for average baseline observations of the outcomes at the community level, and including matching-triplet fixed effects. Column 1 reports standard deviation in parentheses. Columns 2–5 report robust standard errors, clustered by clinic. Multiple-inference corrected q-values that adjust for the false discovery rate within treatment arm across all outcomes in this table are shown in square brackets. The absenteeism index is composed of an indicator of whether patients had ever found no staff present when visiting the clinic and the waiting time at the last visit. Variables are control-group normalized at endline (z-scored). Significance: * is significant at the 10% level, ** is significant at the 5% level and *** is significant at the 1% level.

TABLE D.15
Clinic Organization and Services (z-scored)

	(1) Control Mean	(2) Pooled	(3) CM	(4) NFA	(5) Difference	(6) N
Clinic organization and services (SUR)		0.055	-0.002	0.112	-0.114	254
		(0.064)	(0.074)	(0.075)	(0.078)	
		[0.322]	[0.644]	[0.157]	[0.350]	
(1) Clinic service provision index	0.000	0.149	0.095	0.203	-0.108	254
	(1.000)	(0.153)	(0.180)	(0.175)	(0.181)	
		[1.000]	[1.000]	[1.000]	[1.000]	
(2) Clinic aware of free health care	0.000	0.012	-0.058	0.083	-0.140	254
	(1.000)	(0.129)	(0.148)	(0.144)	(0.138)	
		[1.000]	[1.000]	[1.000]	[1.000]	
(3) Employee satisfaction index	0.000	0.003	-0.043	0.049	-0.092	254
	(1.000)	(0.127)	(0.141)	(0.152)	(0.146)	
		[1.000]	[1.000]	[1.000]	[1.000]	

Notes: Treatment effects are estimated using ANCOVA, controlling for the community-level average of the outcome family index at baseline and matching-triplet fixed effects. The SUR treatment effects are estimated as an average of the z-scored treatment effects in this table using Seemingly Unrelated Regressions and controlling for average baseline observations of the outcomes at the community level, and including matching-triplet fixed effects. Column 1 reports standard deviation in parentheses. Columns 2–5 report robust standard errors. Multiple-inference corrected q-values that adjust for the false discovery rate within treatment arm across all outcomes in this table are shown in square brackets. The Clinic service provision index is composed of measures on facility maintenance (mainly cleanliness, orderly medicine storage and signposting) and whether required services like pre- and post-natal care, immunization, reproductive health and other forms of consultation are provided. The employee satisfaction index consists of employees' satisfaction with their job, with the communities' participation in the clinic and the extend to which they feel supported by the communities. Variables are control-group normalized at endline (z-scored). Significance: * is significant at the 10% level, ** is significant at the 5% level and *** is significant at the 1% level.

TABLE D.16
Community Support (z-scored)

	(1) Control Mean	(2) Pooled	(3) CM	(4) NFA	(5) Difference	(6) N
Contributions to clinic (SUR)		0.025	0.034	0.016	0.018	508
		(0.065)	(0.077)	(0.075)	(0.078)	
		[0.543]	[0.483]	[0.499]	[0.970]	
(1) Contributions to clinic index (community survey)	0.000	0.109	0.134	0.084	0.050	508
	(1.000)	(0.078)	(0.092)	(0.092)	(0.096)	
		[0.490]	[0.404]	[1.000]	[1.000]	
(2) Contributions to clinic index (facility survey)	0.000	-0.060	-0.067	-0.052	-0.015	508
	(1.000)	(0.121)	(0.143)	(0.136)	(0.139)	
		[0.490]	[0.471]	[1.000]	[1.000]	

Notes: Treatment effects are estimated using ANCOVA, controlling for the community-level average of the outcome family index at baseline and matching-triplet fixed effects. The SUR treatment effects are estimated as an average of the z-scored treatment effects in this table using Seemingly Unrelated Regressions and controlling for average baseline observations of the outcomes at the community level, and including matching-triplet fixed effects. Column 1 reports standard deviation in parentheses. Columns 2–5 report robust standard errors, clustered by clinic. Multiple-inference corrected q-values that adjust for the false discovery rate within treatment arm across all outcomes in this table are shown in square brackets. The Baseline variables for projects with the local council/chief refer to projects in the past two years while at endline it was inquired for the past one year. Variables are control-group normalized at endline (z-scored). Significance: * is significant at the 10% level, ** is significant at the 5% level and *** is significant at the 1% level.

TABLE D.17
Community Development and Political Engagement (CDPE, z-scored)

	(1) Control Mean	(2) Pooled	(3) CM	(4) NFA	(5) Difference	(6) N
CDPE (SUR)		0.132	0.116	0.150	-0.033	508
		(0.047)***	(0.056)**	(0.055)***	(0.059)	
		[0.022]**	[0.089]*	[0.021]**	[0.964]	
(1) Projects with local council/chief	0.000	0.208	0.223	0.192	0.032	507
	(1.000)	(0.095)**	(0.114)*	(0.116)*	(0.127)	
		[0.090]*	[0.465]	[0.129]	[1.000]	
(2) Community provided labor	0.000	0.200	0.190	0.209	-0.019	504
	(1.000)	(0.095)**	(0.112)*	(0.116)*	(0.126)	
		[0.090]*	[0.465]	[0.129]	[1.000]	
(3) Community involved in planning	0.000	0.127	0.150	0.103	0.047	504
	(1.000)	(0.095)	(0.117)	(0.115)	(0.132)	
		[0.103]	[0.465]	[0.161]	[1.000]	
(4) Problem addressed collectively?	0.000	-0.043	-0.049	-0.037	-0.012	508
	(1.000)	(0.080)	(0.092)	(0.094)	(0.093)	
		[0.277]	[0.533]	[0.247]	[1.000]	
(5) Proportion has voter card	0.000	0.102	0.061	0.145	-0.084	489
	(1.000)	(0.076)	(0.087)	(0.087)*	(0.084)	
		[0.103]	[0.533]	[0.129]	[1.000]	
(6) Proportion voted in local election	0.000	0.163	0.099	0.231	-0.131	489
	(1.000)	(0.082)**	(0.094)	(0.092)**	(0.090)	
		[0.090]*	[0.465]	[0.099]*	[1.000]	
(7) Proportion voted in general election	0.000	0.172	0.140	0.206	-0.066	489
	(1.000)	(0.085)**	(0.097)	(0.096)**	(0.091)	
		[0.090]*	[0.465]	[0.109]	[1.000]	

Notes: Treatment effects are estimated using ANCOVA, controlling for the community-level average of the outcome family index at baseline and matching-triplet fixed effects. The SUR treatment effects are estimated as an average of the z-scored treatment effects in this table using Seemingly Unrelated Regressions and controlling for average baseline observations of the outcomes at the community level, and including matching-triplet fixed effects. Column 1 reports standard deviation in parentheses. Columns 2–5 report robust standard errors, clustered by clinic. Multiple-inference corrected q-values that adjust for the false discovery rate within treatment arm across all outcomes in this table are shown in square brackets. The two indices of contributions to the clinic are composed of variables that measure support and contributions once from the perspective of key informants in the villages and once by health personnel. In the community survey, we ask about meetings between the clinic and community as well as labor contributions to the clinic. In the clinic survey, we ask about labor or financial contributions as well as disputes between the community and the clinic. Variables are control-group normalized at endline (z-scored). Significance: * is significant at the 10% level, ** is significant at the 5% level and *** is significant at the 1% level.

TABLE D.18
Water and Sanitation (z-scored)

	(1) Control Mean	(2) Pooled	(3) CM	(4) NFA	(5) Difference	(6) N
Water and sanitation (SUR)		0.110	0.066	0.154	-0.088	5053
		(0.044)**	(0.051)	(0.051)***	(0.050)*	
		[0.037]**	[0.224]	[0.021]**	[0.261]	
(1) Water and sanitation HH index	0.000	0.068	-0.022	0.159	-0.180	5053
	(1.000)	(0.058)	(0.068)	(0.063)**	(0.062)***	
		[0.089]*	[0.362]	[0.040]**	[0.012]**	
(2) Water and sanitation village index	0.000	0.174	0.131	0.218	-0.086	5053
	(1.000)	(0.086)**	(0.097)	(0.104)**	(0.102)	
		[0.073]*	[0.298]	[0.040]**	[0.655]	
(3) Satisfaction with village sanitation index	0.000	0.087	0.087	0.086	0.001	5051
	(1.000)	(0.043)**	(0.049)*	(0.050)*	(0.051)	
		[0.073]*	[0.298]	[0.059]*	[1.000]	

Notes: Treatment effects are estimated using Missing-Indicator ANCOVA, controlling for the community-level average of the outcome family index at baseline and matching-triplet fixed effects. The SUR treatment effects are estimated as an average of the z-scored treatment effects in this table using Seemingly Unrelated Regressions and controlling for average baseline observations of the outcomes at the community level, and including matching-triplet fixed effects. Column 1 reports standard deviation in parentheses. Columns 2–5 report robust standard errors, clustered by clinic. Multiple-inference corrected q-values that adjust for the false discovery rate within treatment arm across all outcomes in this table are shown in square brackets. The household index is comprised of water sources for drinking, for other uses, the existence and type of toilet facilities and the actions households take to make water safe to drink. The village index contains the existence and types of water sources for drinking and general use as well as the existence of public toilets and waste facilities. The satisfaction index consists of questions about sanitation and health services offered as well as village cleanliness. Variables are control-group normalized at endline (z-scored). Significance: * is significant at the 10% level, ** is significant at the 5% level and *** is significant at the 1% level.

TABLE D.19
Economic Outcomes (z-scored)

	(1) Control Mean	(2) Pooled	(3) CM	(4) NFA	(5) Difference	(6) N
Economic outcomes (SUR)		0.053	0.036	0.070	-0.034	5053
		(0.032)	(0.037)	(0.040)*	(0.042)	
		[0.138]	[0.311]	[0.116]	[0.748]	
(1) Physical asset index	0.000	0.020	-0.023	0.063	-0.086	5052
	(1.000)	(0.048)	(0.053)	(0.059)	(0.060)	
		[1.000]	[1.000]	[0.404]	[0.246]	
(2) Agricultural asset index	0.000	0.120	0.174	0.065	0.109	5051
	(1.000)	(0.044)***	(0.057)***	(0.050)	(0.063)*	
		[0.026]**	[0.010]***	[0.404]	[0.246]	
(3) Dwelling materials index	0.000	0.053	0.020	0.087	-0.067	5052
	(1.000)	(0.053)	(0.060)	(0.058)	(0.055)	
		[0.875]	[1.000]	[0.404]	[0.246]	
(4) Total consumption expenditure	0.000	0.019	-0.027	0.066	-0.093	5053
	(1.000)	(0.045)	(0.050)	(0.055)	(0.056)*	
		[1.000]	[1.000]	[0.404]	[0.246]	

Notes: Treatment effects are estimated using Missing-Indicator ANCOVA, controlling for the community-level average of the outcome family index at baseline and matching-triplet fixed effects. The SUR treatment effects are estimated as an average of the z-scored treatment effects in this table using Seemingly Unrelated Regressions and controlling for average baseline observations of the outcomes at the community level, and including matching-triplet fixed effects. Column 1 reports standard deviation in parentheses. Column 2-5 report robust standard errors, clustered by clinic. Multiple-inference corrected q-values that adjust for the false discovery rate within treatment arm across all outcomes in this table are shown in square brackets. Variables are control-group normalized at endline (z-scored). Significance: * is significant at the 10% level, ** is significant at the 5% level and *** is significant at the 1% level.

D.3 Additional Outcome Tables

TABLE D.20
Utilization of Government-Run Clinics

	(1) Control Mean	(2) Pooled	(3) CM	(4) NFA	(5) Difference	(6) N
Number of health episodes in which sought Western care	0.962	0.044	0.049	0.039	0.010	4496
	(0.393)	(0.012)***	(0.013)***	(0.014)***	(0.013)	
Number of health episodes in which sought Western care at PHU	0.883	0.059	0.065	0.053	0.012	4496
	(0.463)	(0.017)***	(0.019)***	(0.020)**	(0.018)	

Notes: Treatment effects are estimated using Missing-Indicator ANCOVA, controlling for the community-level average of the outcome family index at baseline and matching-triplet fixed effects. Column 1 reports standard deviation in parentheses. Columns 2–5 report robust standard errors, clustered by clinic. Significance: * is significant at the 10% level, ** is significant at the 5% level and *** is significant at the 1% level.

TABLE D.21
Utilization of Western and Traditional Medicine among Patients with Illnesses and Injuries

	(1) Control Mean	(2) Pooled	(3) CM	(4) NFA	(5) Difference	(6) N
Number of illness/injury episodes in which sought Western care	0.899	0.028	0.031	0.025	0.005	2617
	(0.301)	(0.013)**	(0.015)**	(0.015)*	(0.014)	
Number of illness/injury episodes in which sought traditional or religious care	0.073	-0.021	-0.016	-0.026	0.010	2611
	(0.260)	(0.011)*	(0.012)	(0.012)**	(0.011)	

Notes: Treatment effects are estimated using Missing-Indicator ANCOVA, controlling for the community-level average of the outcome family index at baseline and matching-triplet fixed effects. Column 1 reports standard deviation in parentheses. Columns 2–5 report robust standard errors, clustered by clinic. Significance: * is significant at the 10% level, ** is significant at the 5% level and *** is significant at the 1% level.

TABLE D.22
Utilization of Western and Traditional Medicine among Patients with Illnesses and Injuries (z-scored)

	(1) Control Mean	(2) Pooled	(3) CM	(4) NFA	(5) Difference	(6) N
Number of illness/injury episodes in which sought Western care	0.000	0.093	0.102	0.084	0.018	2617
	(1.000)	(0.044)**	(0.050)**	(0.049)*	(0.046)	
Number of illness/injury episodes in which sought traditional or religious care	-0.000	-0.079	-0.060	-0.099	0.039	2611
	(1.000)	(0.042)*	(0.048)	(0.047)**	(0.042)	

Notes: Variables are control-group normalized at endline (z-scored). Treatment effects are estimated using Missing-Indicator ANCOVA, controlling for the community-level average of the outcome family index at baseline and matching-triplet fixed effects. Robust standard errors, clustered by clinic, are shown in parentheses. Significance: * is significant at the 10% level, ** is significant at the 5% level and *** is significant at the 1% level.

TABLE D.23
Comparing Effects on Two Absenteeism Measures

	(1) Control Mean	(2) Pooled	(3) CM	(4) NFA	(5) Difference
Ever no staff present among all clinic visits	0.055	0.042	0.023	0.048	2870
	(0.228)	(0.013)***	(0.019)	(0.015)***	
No staff present on last clinic visit	0.007	0.005	0.009	0.004	1885
	(0.083)	(0.006)	(0.010)	(0.006)	

Notes: Treatment effects are estimated using Missing-Indicator ANCOVA, controlling for the community-level average of the outcome family index at baseline and matching-triplet fixed effects. Column 1 reports standard deviation in parentheses. Columns 2–4 report robust standard errors, clustered by clinic, in parentheses. Significance: * is significant at the 10% level, ** is significant at the 5% level and *** is significant at the 1% level.

TABLE D.24
Main Outcome Families When Controlling for Baseline Imbalances

	(1) Control Mean	(2) Pooled	(3) CM	(4) NFA	(5) Difference	(6) N
General utilization	0.000	0.096	0.106	0.085	0.020	4451
	(1.000)	(0.033)***	(0.035)***	(0.040)**	(0.035)	
		[0.041]**	[0.014]**	[0.120]		
Maternal utilization index	0.000	0.061	0.178	-0.060	0.238	878
	(1.000)	(0.070)	(0.081)**	(0.083)	(0.086)***	
		[0.310]	[0.081]*	[0.583]		
Satisfaction index	0.000	0.104	0.089	0.121	-0.032	5002
	(1.000)	(0.043)**	(0.049)*	(0.048)**	(0.048)	
		[0.072]*	[0.144]	[0.120]		
Health outcomes index	0.000	0.084	0.170	-0.008	0.178	5003
	(1.000)	(0.050)*	(0.055)***	(0.058)	(0.055)***	
		[0.182]	[0.014]**	[0.923]		
Health service delivery index	0.000	0.048	0.073	0.040	0.033	2845
	(1.000)	(0.059)	(0.082)	(0.061)	(0.075)	
		[0.310]	[0.395]	[0.583]		
Clinic organization and services index	0.000	0.149	0.056	0.257	-0.201	254
	(1.000)	(0.158)	(0.182)	(0.187)	(0.192)	
		[0.310]	[0.612]	[0.313]		
CDPE index	0.000	0.026	0.046	0.006	0.041	501
	(1.000)	(0.097)	(0.113)	(0.111)	(0.114)	
		[0.166]	[0.219]	[0.251]		
Contributions to clinic index	0.000	0.156	0.151	0.161	-0.010	501
	(1.000)	(0.086)*	(0.104)	(0.101)	(0.112)	
		[0.646]	[0.612]	[0.923]		
Water and sanitation index	0.000	0.114	0.066	0.165	-0.100	5003
	(1.000)	(0.062)*	(0.071)	(0.072)**	(0.071)	
		[0.166]	[0.395]	[0.120]		
Economic outcomes index	0.000	0.041	0.053	0.028	0.025	5003
	(1.000)	(0.051)	(0.060)	(0.060)	(0.062)	
		[0.310]	[0.395]	[0.667]		

Notes: Treatment effects are estimated using Missing-Indicator ANCOVA, controlling for the community-level average of the outcome family index at baseline and matching-triplet fixed effects. Column 1 reports standard deviation in parentheses. Columns 2–5 report robust standard errors, clustered by clinic. Multiple-inference corrected *q*-values that adjust for the false discovery rate within treatment arm across all outcomes in this table are shown in square brackets. In this table, we control for baseline variables displaying imbalance in Appendix Table C.3 – namely, phone coverage, household size, the number of births in the household in the last year, the share of the village population of Temne ethnicity, education, whether they believe what the doctors tell them, and the number of illness or injury cases in the household. Where imbalanced baseline characteristics are measured at a different level of observation, we average or assign to each member as needed. Significance: * is significant at the 10% level, ** is significant at the 5% level and *** is significant at the1% level.

TABLE D.25
Effects on Record Keeping

	(1) Control Mean	(2) Pooled	(3) CM	(4) NFA	(5) Difference	(6) N
Clinic registers available	0.988	-0.012	-0.024	-0.000	-0.023	254
	(0.109)	(0.017)	(0.020)	(0.020)	(0.019)	
Tally sheets available	0.929	0.006	-0.006	0.018	-0.024	254
	(0.259)	(0.034)	(0.039)	(0.039)	(0.039)	
DHIS monthly report available	0.988	-0.000	-0.012	0.012	-0.024	254
	(0.109)	(0.015)	(0.017)	(0.017)	(0.017)	
Medicine stock cards available	0.952	-0.012	-0.036	0.012	-0.048	254
	(0.214)	(0.032)	(0.037)	(0.037)	(0.036)	
Cumulative coverage record for ante-natal care is available	0.452	0.011	-0.025	0.047	-0.073	254
	(0.501)	(0.065)	(0.075)	(0.075)	(0.075)	
Cumulative coverage record for BCG vaccine is available	0.417	0.016	-0.027	0.059	-0.086	254
	(0.496)	(0.064)	(0.074)	(0.074)	(0.073)	
Cumulative coverage record for measles vaccine is available	0.417	0.023	-0.026	0.071	-0.098	254
	(0.496)	(0.064)	(0.073)	(0.073)	(0.073)	
Cumulative coverage record for penta3 vaccine is available	0.393	0.059	-0.002	0.119	-0.121	254
	(0.491)	(0.065)	(0.074)	(0.074)	(0.074)	

Notes: Treatment effects are estimated using ANCOVA, controlling for the community-level average of the outcome family index at baseline and matching-triplet fixed effects. Column 1 reports standard deviation in parentheses. Columns 2–5 report robust standard errors. Significance: * is significant at the 10% level, ** is significant at the 5% level and *** is significant at the 1% level.

TABLE D.26
Perceived Quality of Care Full Sample

	(1) Control Mean	(2) Pooled	(3) CM	(4) NFA	(5) Difference	(6) N
Perceived quality of care	-0.000	0.150	0.149	0.151	-0.003	5041
	(1.000)	(0.039)***	(0.045)***	(0.044)***	(0.045)	
General utilization	0.945	0.043	0.046	0.041	0.005	3330
	(0.349)	(0.013)***	(0.014)***	(0.014)***	(0.013)	
Satisfaction with public health workers	3.258	0.055	0.036	0.074	-0.038	4994
	(0.802)	(0.034)	(0.040)	(0.039)*	(0.042)	
Relative effectiveness of western medicine	-0.350	0.040	0.048	0.031	0.017	4290
	(0.578)	(0.022)*	(0.025)*	(0.025)	(0.024)	

Notes: Treatment effects are estimated using Missing-Indicator ANCOVA, controlling for the community-level average of the outcome family index at baseline and matching-triplet fixed effects. Column 1 reports standard deviation in parentheses. Columns 2–5 report robust standard errors, clustered by clinic. Significance: * is significant at the 10% level, ** is significant at the 5% level and *** is significant at the 1% level.

E. Longer-run Effects during the Ebola Crisis

E.1 Training for Health Care Workers on Infection Prevention and Control

TABLE E.1
Health Care Worker (HCW) Training Schedule

Week Ending	HCWs Trained	% Total HCWs Trained (4,264)
11/28/2014	2,440	57%
12/05/2014	3,450	81%
12/12/2014	3,980	93%
12/19/2014	4,200	98%
12/26/2014	4,200	98%

Notes: Approximate counts extracted from report from the Ebola Response Consortium, "Infection Prevention and Control (IPC) and Screening of Suspected Ebola Cases," p. 4 (https://bit.ly/2JclnhO.)

E.2 Geo-coding Procedure

The VHF data includes information on individuals' residences, including their district, chiefdom, and village or parish. We use this information to place observations within sections. Our geo-location protocol involves several steps. First, a human coder inspected and cleaned all district and chiefdom names that did not exactly match the conventional spelling. Of 85,410 entries in the case data, we can code the chiefdom of residence for 97% of observations.

Second, we employ fuzzy string matching to match the available village or parish names to gazetteer files of placenames from Sierra Leone. Fortunately, in the chiefdoms that include our sample, only 14 confirmed, suspected, or probable Ebola cases do not include village or parish information.[A8] We employ the gazetteer file from Open Street Map (www.openstreetmap.org/), which includes 9,975 entries, ranging from hamlets to cities. We prefer this list to the 2004 census data from Sierra Leone, which only provides names for around 5,000 localities. Moreover, during the Ebola epidemic, Open Street Map mounted a humanitarian effort aimed at updating and verifying information on the locations of villages and roads in Sierra Leone.[A9]

Ten sample entries from OSM gazetteer file:

	osm_id	name	coordinates
1	27565056	Freetown	(-13.26802 8.479002)
2	314001434	Bo	(-11.73665 7.962065)
3	314005602	Kenema	(-11.18639 7.885936)
4	314007819	Koidu	(-10.97163 8.642281)
5	320058940	Kambia	(-12.91934 9.125073)
6	320060481	Kamakwie	(-12.24125 9.496301)
7	320060535	Pujehun	(-11.72124 7.356632)
8	320060540	Zimmi	(-11.31032 7.312338)
9	370327499	Goderich	(-13.28887 8.432966)
10	370495828	Murray Town	(-13.26534 8.491613)

Fuzzy string matching calculates the string distance between each village or parish name in the VHF data and each placename in the gazetteer file that falls within the exact same district and chiefdom.[A10] An exact match returns a distance of zero; "FREE TOWN" and "FREETOWN," for example, would return a distance of 1. We do not match any entries with a string distance that exceeds 2.

While the geo-coding process introduces measurement error, we expect this is uncorrelated with treatment and, thus, only going to attenuate our estimates. To bolster this assumption, we look at whether placenames in the gazetteer file tend to be more numerous or longer in treated versus control sections. We see no indication that treated sections have significantly more or shorter placenames; moreover, the placenames are not more likely to contain a space between words (see Appendix Table E.2).

[A8] Of all entries in the case data that fall within the chiefdoms the include our sample, only 0.07 percent are missing an entry for village or parish of residence.

[A9] http://wiki.openstreetmap.org/wiki/2014_West_Africa_Ebola_Response

[A10] We use optimal string alignment distance, a variant of the Levenshtein distance, which is commonly employed in geo-coding algorithms.

TABLE E.2
Balance: Placenames for Geocoding

	Control Mean	Pooled	CM	NFA	N
Number of Places	8.056	1.096	0.721	1.387	160
	(6.456)	(1.303)	(1.592)	(1.487)	
Number of Placenames	7.222	0.856	0.651	1.016	160
	(5.709)	(1.304)	(1.594)	(1.489)	
Average Length of Placenames	6.443	0.021	0.085	-0.029	160
	(1.945)	(0.3)	(0.367)	(0.343)	
Proportion of Placenames with Whitespace	0.033	-0.004	-0.008	0	160
	(0.114)	(0.015)	(0.018)	(0.017)	

Notes: Differences estimated using OLS including matching-triplet fixed effects. Significance: * p < 0.10, ** p < 0.05, and *** p < 0.01

E.3 Descriptive Statistics for Reported Ebola Cases

TABLE E.3
Descriptive Statistics for Ebola Sample

	Control	Pooled
Total Ebola Cases		
Observations	1836	3604
Sum	515	1530
Average	0.281	0.425
Std. Dev.	0.727	1.282
Minimum	0	0
Maximum	6	31
Proportion with no cases	0.818	0.789
Proportion with cases	0.182	0.211
Cofirmed Ebola Cases		
Observations	1836	3604
Sum	21	248
Average	0.011	0.069
Std. Dev.	0.129	0.687
Minimum	0	0
Maximum	3	28
Proportion with no cases	0.991	0.97
Proportion with cases	0.009	0.03

Notes: Descriptive statistics for total and confirmed reported Ebola cases in control and pooled (CM or NFA) treatment arms. The sample includes 160 sections over 34 weeks.

E.4 Baseline Balance in Ebola Sample

TABLE E.4
Baseline Balance (Ebola sub-sample)

	(1) Control Mean	(2) CM–Control Difference	(3) NFA–Control Difference	(4) CM–NFA Difference	(5) N
Village characteristics					
Motorable road	0.853	0.108	0.045	0.063	318
	(0.355)	(0.059)*	(0.050)	(0.055)	
Mobile phone coverage within 1 mile from the community	0.763	0.078	0.174	-0.096	318
	(0.427)	(0.076)	(0.058)***	(0.065)	
Distance to the closest clinic	1.305	0.338	0.909	-0.571	318
	(2.129)	(0.532)	(0.905)	(0.505)	
Travel cost to closest clinic	112.994	-29.666	-46.167	16.501	317
	(916.205)	(132.127)	(124.628)	(102.778)	
Household characteristics and questions to household head					
Household size	4.445	-0.023	0.051	-0.074	3021
	(3.086)	(0.075)	(0.073)	(0.083)	
Number of illness or injury cases per household	0.069	-0.039	-0.016	-0.024	3021
	(0.267)	(0.017)**	(0.016)	(0.018)	
Birth in household last year	0.166	-0.012	0.016	-0.028	1340
	(0.372)	(0.020)	(0.021)	(0.020)	
Child under 2 in household	0.246	-0.022	0.004	-0.027	1339
	(0.431)	(0.028)	(0.025)	(0.026)	
Prominent village member in household	0.046	-0.028	-0.030	0.002	1331
	(0.210)	(0.014)**	(0.013)**	(0.014)	
Believes doctor's advice	0.993	0.003	-0.003	0.006	1235
	(0.083)	(0.006)	(0.007)	(0.007)	
Health care fees unaffordable	2.352	-0.028	0.031	-0.059	1289
	(0.814)	(0.077)	(0.078)	(0.082)	
Trust in the community	1.902	-0.111	-0.038	-0.072	1339
	(0.679)	(0.065)*	(0.057)	(0.073)	
Community cohesion	2.375	-0.020	0.035	-0.055	1336
	(0.595)	(0.047)	(0.050)	(0.054)	
Believe VHC members represent your interest	2.932	-0.115	-0.186	0.072	618
	(0.992)	(0.127)	(0.132)	(0.114)	
The VHC can be trusted	2.373	-0.098	0.131	-0.229	725
	(0.895)	(0.121)	(0.109)	(0.119)*	
Individual characteristics					
Muslim	0.835	0.003	0.007	-0.005	6168
	(0.371)	(0.042)	(0.037)	(0.047)	
Mende (Ethnicity)	0.508	-0.036	0.006	-0.042	6167
	(0.500)	(0.017)**	(0.016)	(0.018)**	
Temne (Ethnicity)	0.266	0.098	0.140	-0.042	6167
	(0.442)	(0.057)*	(0.046)***	(0.057)	
Highest level of education	1.667	0.146	0.657	-0.511	5924
	(2.838)	(0.151)	(0.146)***	(0.160)***	
Joint F-test p-value		0.564	0.115	0.584	

Notes: This table presents baseline balance for households included in both baseline and endline surveys in the Ebola sub-sample, the 160 sections that contain a single clinic, and hence unique treatment status. Column (1) shows the mean and standard deviation of the control group at baseline. Columns (2) and (3) show regression coefficients on the CM and NFA treatment arm indicators compared to control, with standard errors clustered at the clinic level in parentheses. Column (4) compares the CM treatment arm to the NFA arm. Column (5) displays the sample size. The second panel reports data at the household level. Most questions are based on a sample of 5 households per village; others also include an additional 15 households that were administered a short user feedback survey on recent health episodes, service provision, and satisfaction. The third panel reports data at the individual level, from all individuals in a sampled household. Lower numbers of observations relative to the number of sampled households reflect missing data at baseline, the inability to resurvey a household at endline, or conditionality of variables on other responses. The last row shows p-values from Joint Orthogonality Tests. We aggregate all variables to the clinic (the highest common level) and estimate a Multinomial Logit where the dependent variable is the treatment group and the explanatory variables are all those in this table. In Columns (2)-(3) we set control as the base group and test the null that the coefficients on the explanatory variables are jointly zero for CM and NFA. In column (4) we re-estimate the model instead setting NFA as the base group, and test the null that the coefficients on CM are jointly zero. Significance: * is significant at the 10% level, ** is significant at the 5% level and *** is significant at the 1% level.

E.5 Extending Panel to August 2014

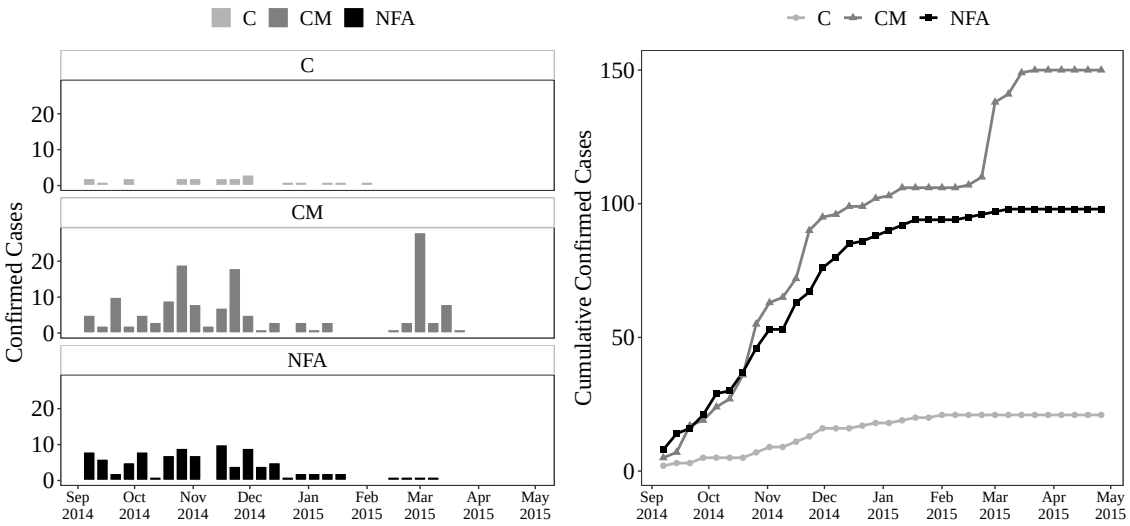
TABLE E.5
Effect on Reported Cases in Extended Panel (August 2014–April 2015)

	Control Mean	Pooled	CM	NFA	Difference	N
Ebola Cases						
Total	0.257	0.163	0.189	0.142	0.048	6,079
	(0.706)	(0.077)**	(0.106)*	(0.091)	(0.122)	
Confirmed	0.014	0.058	0.079	0.041	0.038	6,079
	(0.146)	(0.022)**	(0.034)**	(0.025)*	(0.038)	
Negative	0.216	0.092	0.074	0.105	-0.031	6,079
	(0.621)	(0.055)*	(0.07)	(0.068)	(0.084)	
IHS(Ebola Cases)						
Total	0.189	0.078	0.088	0.07	0.018	6,079
	(0.454)	(0.039)**	(0.052)*	(0.046)	(0.059)	
Confirmed	0.011	0.028	0.032	0.025	0.007	6,079
	(0.109)	(0.01)***	(0.014)**	(0.011)**	(0.016)	
Negative	0.163	0.054	0.048	0.058	-0.01	6,079
	(0.415)	(0.032)*	(0.04)	(0.039)	(0.047)	

Notes: Treatment effects estimated using OLS including matching-triplet and week fixed effects. Column 1 reportsstandard deviation in parentheses. Column 2-4 report robust standard errors, clustered by section, in parentheses.Difference column reports the difference between the CM and NFA coefficients; the standard error is computed usingthe delta method. We drop a single outlying observation from Konjo Njeigor for the week of August 24, 2014, whichis 25 times larger than any other weekly total from that section and 5 times larger than any other observation in the fulltime-series. Konjo Njeigor is a CM section, so removing this observation only depresses the pooled and CM treatmenteffects. Significance: * is significant at the 10% level, ** is significant at the 5% level and *** is significant at the 1% level.

E.6 Time-series of Confirmed Cases

FIGURE E.1
Confirmed Ebola Cases by Treatment



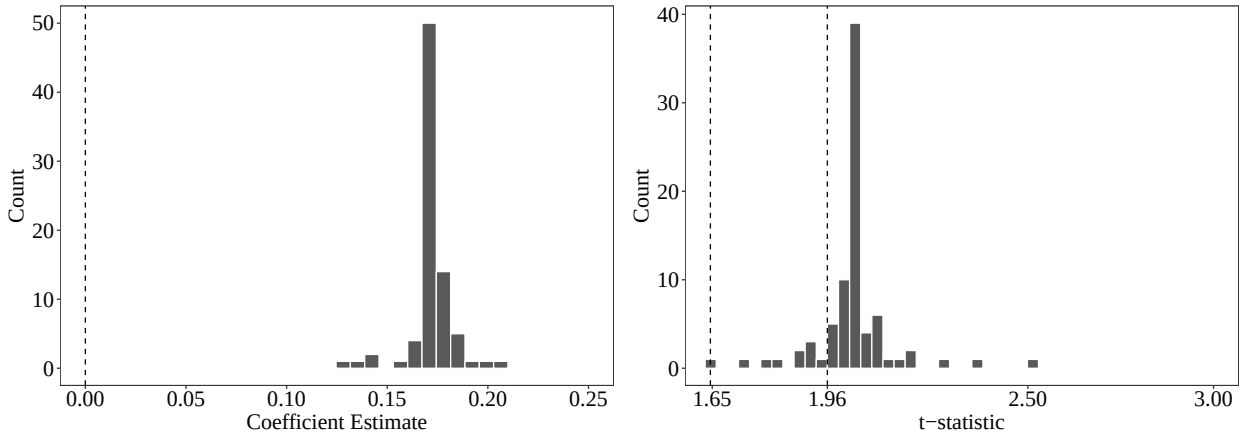
(A) Sections Used in Ebola Analysis

(B) Cumulative Counts

Notes: Appendix Figure E.1(a) plots the time series of confirmed Ebola cases by week; bars represent the raw counts. C refers to control; CM refers to community monitoring; NFA refers to non-financial awards. We use the date that the case was first saved in the VHF, which is available for 96% of cases in our sample. Appendix Figure E.1(b) graphs the cumulative count of confirmed Ebola cases by treatment group.

E.7 Dropping Triplets

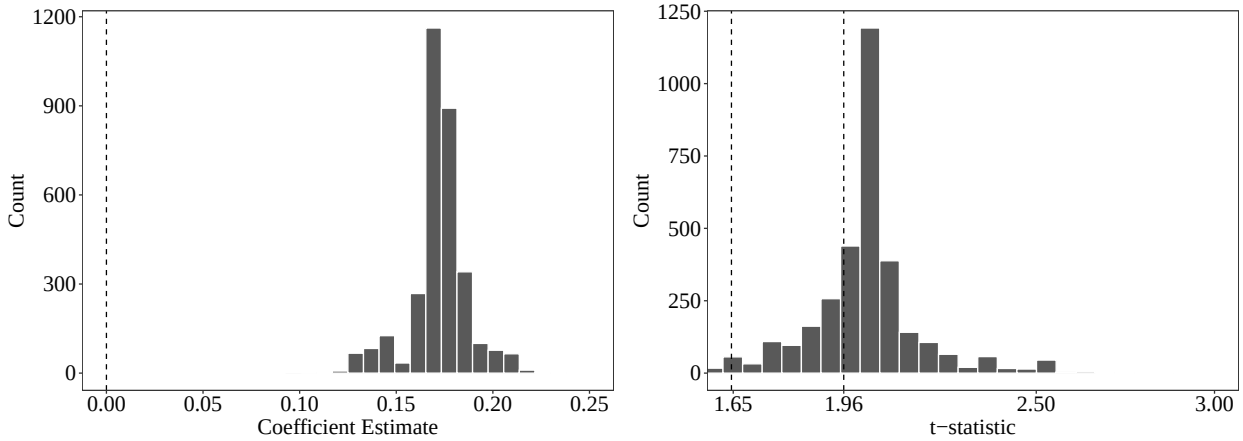
FIGURE E.2
Estimates Dropping Each Triplet from Sample



(A) Coefficient ($\widehat{\beta}$) (B) t-Statistic

Notes: We re-estimate Equation 3 dropping one triplet (i.e., block) from the sample with each iteration. Appendix Figure E.2(a): distribution of coefficient estimates. Appendix Figure E.2(b): distribution of t-statistics.

FIGURE E.3
Estimates Dropping Each Pair of Triplets from Sample

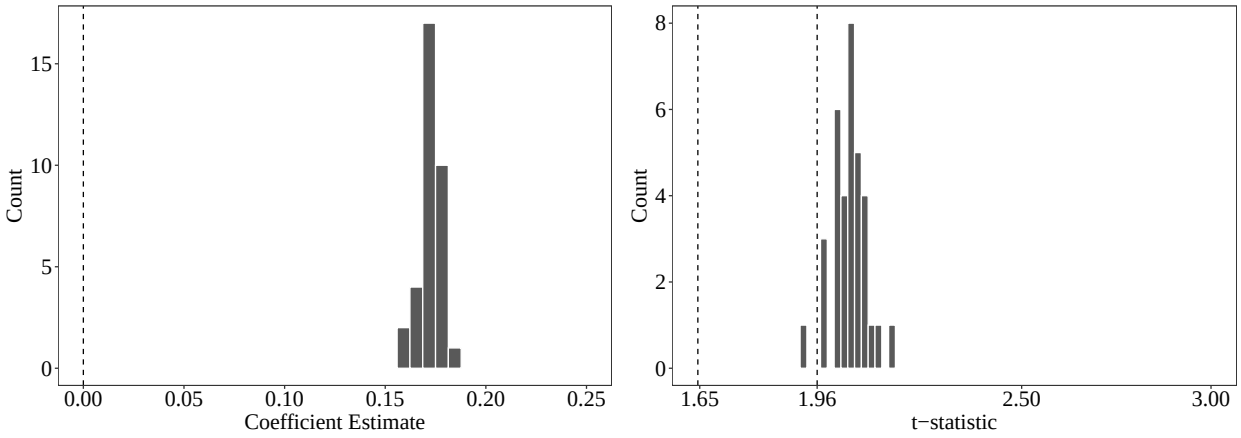


(A) Coefficient ($\widehat{\beta}$) (B) t-Statistic

Notes: We re-estimate Equation 3 dropping pairs of triplets (i.e., block) from the sample with each iteration. Appendix Figure E.3(a): distribution of coefficient estimates. Appendix Figure E.3(b): distribution of t-statistics.

E.8 Dropping Weeks

FIGURE E.4
Estimates Dropping Each Week from Sample



(A) Coefficient ($\widehat{\beta}$)

(B) t-Statistic

Notes: We re-estimate Equation 3 dropping one week from the sample with each iteration. Appendix Figure E.4(a): distribution of coefficient estimates. Appendix Figure E.4(b): distribution of t-statistics.

E.9 Effect on Patient Deaths

TABLE E.6
Patient Deaths per Section per Week

Total Cases in Last 2 Weeks	Control (C)	Pooled (P)	CM	NFA	C - P	C - CM	C - NFA
2 Cases	0.49	0.36	0.31	0.45	-0.13	-0.18	-0.05
	(0.04)	(0.05)	(0.06)	(0.04)	(0.06)**	(0.07)**	(0.05)
5 Cases	1.23	0.8	0.6	1.13	-0.43	-0.63	-0.1
	(0.11)	(0.17)	(0.18)	(0.11)	(0.19)**	(0.2)***	(0.14)
10 Cases	2.45	1.53	1.09	2.27	-0.92	-1.38	-0.2
	(0.21)	(0.36)	(0.39)	(0.23)	(0.4)**	(0.43)***	(0.3)

Notes: Treatment effects estimated using OLS including matching-triplet and week fixed effects. Robust standard errors, clustered by section, in parentheses Predicted deaths based on estimates in Table IV model 1. Significance: * is significant at the 10% level, ** is significant at the 5% level and *** is significant at the 1% level.

TABLE E.7
Effect on Delays between Symptom Onset and Reporting

	Control Mean	Pooled	CM	NFA	Difference	N
Delay: Symptom Onset and Reporting	4.729	0.218	0.583	-0.066	0.649	160
	(3.229)	(0.51)	(0.62)	(0.579)	(0.626)	

Notes: Treatment effects estimated using OLS including matching-triplet fixed effects. Column 1 reports standard deviation in parentheses. Column 2-4 report robust standard errors in parentheses. Difference column reports the difference between the CM and NFA coefficients; the standard error is computed using the delta method. Delays greater than 60 days were removed to limit the influence of outliers. Significance: * is significant at the 10% level, ** is significant at the 5% level and *** is significant at the 1% level.

E.10 Calculating Reduction in the Reproduction Rate

R_0 is the reproduction rate of a disease: the average number of secondary cases generated by the average infectious individual. To calculate the implied reduction in R_0 due to our treatments we follow the approach of Pronyk et al. (2016), which the authors detail in their online appendix.[A11] R_0 is calculated by multiplying the disease transmission rate by the average duration of infectiousness, $D \geq 0$. The duration of infectiousness is time during which an infected patient can spread disease.

We adopt Pronyk et al. (2016) assumption that transmission rates do not change following public health interventions (in their case the construction of Community Care Centers). Conditional on an infected individual and susceptible individual coming into contact, the likelihood that Ebola is transmitted between the two is unaffected by treatment. Under this assumption, treatment can affect R_0 by changing $D(T)$, which is calculated as follows:

$$D(T) = t(T)r(T) + 10[1 - r(T)]$$

where $t(T)$ is the time between symptom onset and isolation among individuals who are isolated; $r(T)$, the proportion of individuals who are isolated; and T is a binary treatment indicator. If an individual does not report, Pronyk et al. (2016) assume they remain infectious for 10 days.

The average time between symptom onset and reporting—$\bar{t}(T=1)$ and $\bar{t}(T=0)$—can be calculated from data. In our sample, $\bar{t}(T=0) = 4.73$ and $\bar{t}(T=1) = 4.97$; we cannot reject the null that these are equal (see Appendix Table E.7).

Pronyk et al. (2016) assume a baseline reporting rate of 50 percent from mid-November to January, which is also the period that the disease was a major threat in our study area. 50 percent is consistent with other estimates, though it may understate the extent of under-reporting; the CDC's initial estimate was 40 percent.[A12] Going forward, assume $r(T=0) = 0.5$ and $r(T=1) = r(T=0) \cdot \tau$, where τ is the treatment effect.

Assuming the (initial) stock of Ebola cases is balanced across treatment and control, then $\tau = y(T=1)/y(T=0)$, where $y(T)$ is the number of reported cases and can be calculated from our data. Our estimates in Table III imply that $\widehat{\tau} = (0.281 + 0.173)/(0.281) = 1.62$.

With these quantities in hand, we can calculate $D(T)$:

$$D(T=0) = (4.72)(0.5) + 10[1 - (0.5)] = 7.46$$
$$D(T=1) = (4.97)(0.5 \cdot 1.62) + 10[1 - (0.5 \cdot 1.62)] = 5.93$$

This implies that treatment generated a 19 percent reduction in R_0. Pronyk et al. (2016) estimate that Community Care Centers contributed to a 13–32 percent reduction in R_0.[A13]

[A11] https://ajph.aphapublications.org/doi/suppl/10.2105/AJPH.2015.303020/suppl_file/web+appendix+r2.docx

[A12] https://stacks.cdc.gov/view/cdc/24901

[A13] Their estimate is likely conservative, as they do not incorporate how Community Care Centers affect reporting rates.

E.11 Effect on Reported Cases by Month

TABLE E.8
Reported Ebola Cases per Section per Week by Month

	Control Mean	Pooled	CM	NFA	Difference	N
2014						
09-07 to 09-28	0.093	0.064	0.096	0.04	0.057	640
	(0.432)	(0.051)	(0.085)	(0.079)	(0.128)	
10-05 to 10-26	0.065	0.325	0.393	0.272	0.122	640
	(0.298)	(0.132)**	(0.201)*	(0.141)*	(0.217)	
11-02 to 11-30	0.248	0.16	0.16	0.161	-0.001	800
	(0.733)	(0.114)	(0.155)	(0.128)	(0.165)	
12-07 to 12-28	0.167	0.216	0.109	0.298	-0.189	640
	(0.472)	(0.087)**	(0.109)	(0.117)**	(0.147)	
2015						
01-04 to 02-01	0.485	0.055	-0.009	0.105	-0.114	800
	(0.932)	(0.109)	(0.144)	(0.127)	(0.159)	
02-08 to 03-01	0.319	0.287	0.337	0.249	0.088	640
	(0.804)	(0.158)*	(0.237)	(0.169)	(0.252)	
03-08 to 03-29	0.495	0.091	0.231	-0.017	0.248	640
	(0.894)	(0.133)	(0.184)	(0.151)	(0.206)	
04-05 to 04-26	0.329	0.214	0.376	0.089	0.287	640
	(0.783)	(0.113)*	(0.151)**	(0.125)	(0.16)*	

Notes: Treatment effects estimated using OLS including matching-triplet and week fixed effects. Column 1 reports standard deviation in parentheses. Column 2-4 report robust standard errors, clustered by section, in parentheses. Difference column reports the difference between the CM and NFA coefficients; the standard error is computed using the delta method. N varies because case counts are recorded weekly, and there can be 4 or 5 weeks within each period. Significance: * is significant at the 10% level, ** is significant at the 5% level and *** is significant at the 1% level.

E.12 Placebo Test with Nearest Neighboring Out-of-sample Sections

For the 160 sections in our sample, we identify their nearest out-of-sample neighbor (using the distance between the centroids of sections). We then assign that nearest neighbor the treatment status of the in-sample section and re-run our analysis.

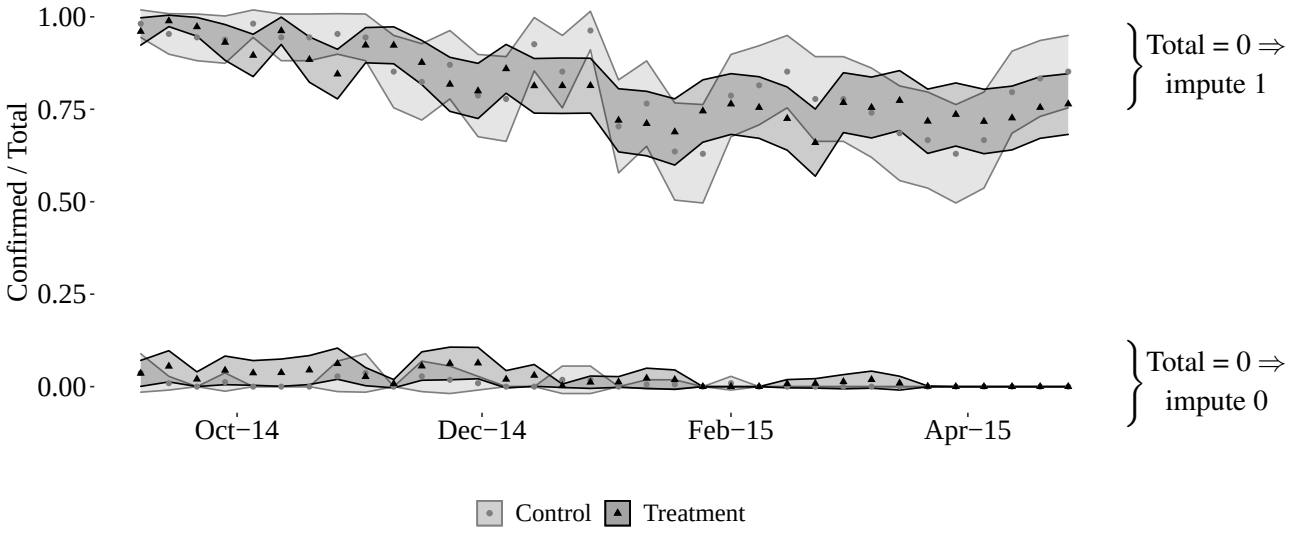
TABLE E.9
Placebo: Reported Cases using Nearest Neighboring Section

	Control Mean	Pooled	CM	NFA	Difference	N
Ebola Cases						
Total	0.222	0.057	0.043	0.069	-0.026	5,440
	(0.957)	(0.063)	(0.076)	(0.072)	(0.078)	
Confirmed	0.029	0.01	0.001	0.016	-0.015	5,440
	(0.371)	(0.023)	(0.03)	(0.027)	(0.033)	
Negative	0.169	0.042	0.033	0.049	-0.015	5,440
	(0.653)	(0.04)	(0.047)	(0.046)	(0.047)	
IHS(Ebola Cases)						
Total	0.153	0.041	0.033	0.048	-0.015	5,440
	(0.419)	(0.031)	(0.036)	(0.035)	(0.036)	
Confirmed	0.018	0.008	0.004	0.012	-0.009	5,440
	(0.164)	(0.012)	(0.016)	(0.014)	(0.017)	
Negative	0.125	0.032	0.024	0.038	-0.013	5,440
	(0.37)	(0.025)	(0.029)	(0.028)	(0.028)	

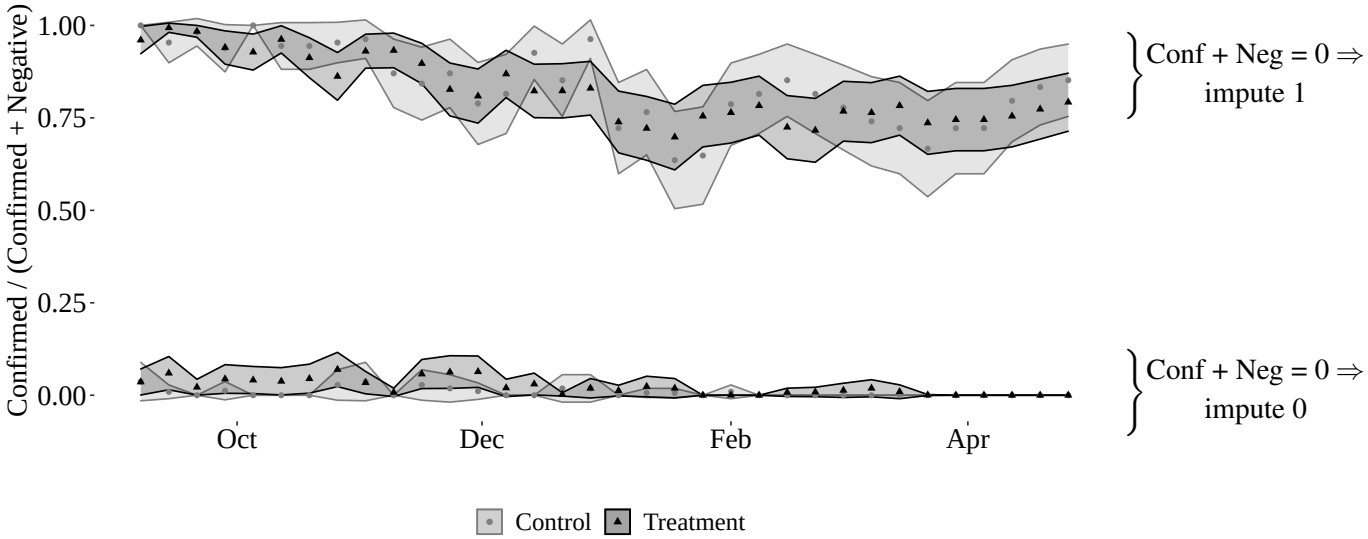
Notes: Treatment effects estimated using OLS including matching-triplet and week fixed effects. Column 1 reportsstandard deviation in parentheses. Column 2-4 report robust standard errors, clustered by section, in parentheses.Difference column reports the difference between the CM and NFA coefficients; the standard error is computed usingthe delta method. The three major cities in our study districts (Bo Town, Kenema Town, and Makeni Town) are excludedas potential nearest neighbors. Significance: * is significant at the 10% level, ** is significant at the 5% level and ***is significant at the 1% level

E.13 Ratio of Confirmed and Total Cases

FIGURE E.5
Ratio of Confirmed to Total Cases



(A) Ratio Confirmed to Total



(B) Ratio Confirmed to Confirmed and Negative

Notes: Appendix Figure E.5(a) computes the ratio of confirmed to total cases for each section-week and then average across treatment and control. If there are no cases in a section-week, the ratio is undefined. The ribbons at the top of the plot display the averages when we impute 1 for those undefined observations; the ribbons at the bottom display the averages when we instead impute 0. Appendix Figure E.5(b) computes the ratio of confirmed to confirmed plus negative cases. If the sum of confirmed and negative cases is zero in a section-week, the ratio is undefined. The ribbons at the top of the plot display the averages when we impute 1 for those undefined observations; the ribbons at the bottom display the averages when we instead impute 0. In both figures, the shaded areas connect the 95% confidence intervals around these proportions.

E.14 Bounding Exercise: Unintended Increase

Data on Ebola incidence in Sierra Leone is incomplete. As a result, we cannot directly rule out an increase in exposure by comparing the total number of cases in treatment and control areas. To be a confirmed case in the available Ebola data, an individual must be infected with Ebola and known to health workers through self-reporting or surveillance. CM and NFA could theoretically affect case counts by unintentionally increasing either exposure rates, reporting propensities, or both. We use our empirical results and a simple model to clarify what must be assumed to attribute our results to changes in exposure.

Sequence and Information

Each individual i observes whether they are symptomatic, $s \in \{0,1\}$; prior to testing, i does not know with certainty if they are infected, $I \in \{0,1\}$. The CDC lists the following as Ebola symptoms: fever, severe headache, muscle pain, weakness or fatigue, diarrhea, vomiting abdominal pain, or unexplained hemorrhage. They also observe the treatment status of their local health facility, $T \in \{0,1\}$. i knows that $\Pr[s = 1 \mid I = 1] = 1$: if you have Ebola, you will show symptoms. They also know that $\Pr[s = 1 \mid I = 0] = p \in (0,1)$, i.e., that symptoms like fevers and diarrhea happen to those that are not infected.[A14] The infection rates within control and treatment communities, $e_1 = \mathbb{E}(I \mid T = 1)$ and $e_0 = \mathbb{E}(I \mid T = 0)$, are also common knowledge.

i must decide whether to report their symptoms and be tested, $R \in \{0,1\}$. They cannot, however, condition this decision on their actual infection status, because this is not known to i prior to testing.

Notation

- Reporting among Symptomatic in Control: $\Pr(R \mid s = 1, T = 0) = h \in [0,1]$
- Reporting among Symptomatic in Treatment: $\Pr(R \mid s = 1, T = 1) = \min\{h\tau_h, 1\}$ where $\tau_h \in \mathbb{R}^1_+$ is the treatment effect on reporting among symptomatic individuals
- Reporting among Asymptomatic in Control: $\Pr(R \mid s = 0, T = 0) = l \in [0,1]$
- Reporting among Asymptomatic in Treatment: $\Pr(R \mid s = 0, T = 1) = \min\{l\tau_l, 1\}$ where $\tau_l \in \mathbb{R}^1_+$ is the treatment effect on reporting among asymptomatic individuals

We assume $l \leq h$ (i.e., individuals with symptoms are more likely to report than those without). To minimize terms, we define $d = l/h$. This is the ratio of reporting probabilities of asymptomatic to symptomatic individuals in control areas. $d = 0.5$, for example, implies that symptomatic individuals in control areas are twice as likely to report as those displaying no symptoms.

[A14] This is likely a considerable proportion of Sierra Leone's population: a 2016 assessment for example found that 27 percent of children under 5 had malaria in the *two weeks* prior to the survey (Leone et al. (2016)). Over months, the probability of flu-like symptoms due to illnesses unrelated to Ebola is quite likely.

Logic

We estimate the percentage difference in confirmed cases between treatment and control β where:

$$\begin{aligned} \frac{\mathbb{E}[R*I \mid T=1]}{\mathbb{E}[R*I \mid T=0]} &= \beta \\ \mathbb{E}[R*I \mid T=1] &= \beta\, \mathbb{E}[R*I \mid T=0] \\ \frac{e_1}{e_0}\tau_h = \mathscr{E}\tau_h &= \beta \end{aligned} \tag{4}$$

where $\mathscr{E}$ is the effect of the treatment on exposure to Ebola. This estimate could confound the effect of the treatment on exposure $\mathscr{E}$ and reporting τ_h by symptomatic individuals.

In the cross-sectional results, we estimate $\widehat{\beta} \approx 1.4$. If we make the extreme assumption that treatment has no impact on the reporting decisions of symptomatic individuals ($\tau_h \to 1$), then β reflects the different rates of exposure in treatment and control areas. Conversely, as $\tau_h \to \beta$, the possible treatment effect on exposure attenuates to zero ($\mathscr{E} \to 1$).

Second, we find that the ratio of confirmed to total cases does not differ with treatment status:

$$\frac{\mathbb{E}[R*I \mid T=1]}{\mathbb{E}[R \mid T=1]} = \frac{\mathbb{E}[R*I \mid T=0]}{\mathbb{E}[R \mid T=0]}$$

Rearranging equation (4) and substituting,

$$\beta = \frac{\mathbb{E}[R \mid T=1]}{\mathbb{E}[R \mid T=0]}$$

This implies

$$\tau_l = \tau_h \left(\frac{\mathscr{E} d(1-e_0)(1-p) + p(\mathscr{E}-1)}{d(1-e_1)(1-p)} \right)$$

If treatment increased exposure, then it must have also increased reporting among asymptomatic individuals, such that the ratio of confirmed to total cases is not elevated in treated areas.

Using these two equations, we vary the parameters $\{\tau_h, p, d\}$ over plausible ranges and compute the implied increases in exposure ($\mathscr{E}$) and reporting among asymptomatic individuals (τ_l). We set $\beta = \widehat{\beta} \approx 1.4$ and $e_1 = 0.01$.[A15] This exercise clarifies what we must be true for the treatment to increase communities' exposure to Ebola ($\mathscr{E} > 1$) and still produce our empirical results:

- There is some pathway whereby treatment increased exposure.
- $\tau_h < \beta$. As $\tau_h \to \beta$, the potential positive effect on exposure attenuates to zero (i.e., $\mathscr{E} \to 1$).
- $\tau_h < \tau_l$. Treatment must have had a *larger* effect on reporting among those *without* symptoms.

[A15] The exact value of e_1 is not consequential at low values of e_1. We do not need to set e_0, as this is equal to $\beta\tau_h/e_1$.

- This differential effect (τ_l/τ_h) must be larger when d is smaller or p is larger. If baseline reporting is much lower among asymptomatic individuals and/or Ebola symptoms are common among uninfected individuals, then τ_l/τ_h must be large.

Numerical Examples

Suppose that individuals with no symptoms report 25 percent as often as those with symptoms ($d = 0.25$) and that 25 percent of individuals display flu-like symptoms over the course of several months even when uninfected ($p = 0.25$). If treatment has no effect on reporting among symptomatic individuals ($\tau_h = 1$), then the 40 percent increase in exposure would have to be accompanied by roughly two times as much reporting by individuals with no symptoms ($\tau_l = 1.94$). If treatment led to a 20 percent increase in reporting among those with symptoms ($\tau_h = 1.2$), then exposure can only increase by 16 percent, and τ_l must reach 1.67.

TABLE E.10
Implied $\mathscr{E}$ and τ_l

p	d	τ_h	τ_l	$\mathscr{E}$
0.25	0.25	1.00	1.94	1.40
0.50	0.25	1.00	3.02	1.40
0.25	0.50	1.00	1.67	1.40
0.50	0.50	1.00	2.21	1.40
0.25	0.25	1.20	1.67	1.17
0.50	0.25	1.20	2.21	1.17
0.25	0.50	1.20	1.54	1.17
0.50	0.50	1.20	1.81	1.17

For reasonable choices of p and d, we find these scenarios unlikely. First, in our NFA treatment, there is no plausible pathway whereby treatment increased exposure. Even in CM areas, the last planned community meeting took place a year prior to the Ebola outbreak.

Second, these imply large treatment effects and high relative rates of reporting among individuals with no symptoms to report. One cannot preemptively test for Ebola—the virus can only be detected days after symptoms begin. There is no reason for asymptomatic individuals to report, and widespread fear that deterred the use of health facilities even among those in desperate need of medical care. Elston et al. (2016, 675) report reductions in hospital attendance during the Ebola crisis in Sierra Leone, including significantly lower numbers of "women admitted during labor, urgent paediatric hospital admissions including children hospitalized with malaria and outpatient consultations."

Third, ceiling effects are unlikely. One might be concerned that h is close to 1. In that case, there is less room for treatment to affect reporting among those displaying symptoms, as $h\tau_h \leq 1$. However, the CDC forecasts used an underreporting factor of 2.5 for Sierra Leone and Liberia based on expert opinions.[A16] (This would correspond to $h = 0.4$ in our terms.) This implies that τ_h could be as large as 2.5 before hitting any ceiling effects. We can rule out any increase in exposure when $\tau_h \geq 1.4$. Qualitative evidence stresses

[A16] https://www.cdc.gov/mmwr/pdf/other/su6303.pdf

underreporting as a major concern during Sierra Leone's Ebola crisis. This implies that many symptomatic individuals were failing to seek care and, thus, might have changed their decision as a consequence of treatment.

In sum, the data do not allow us to rule out an increase in exposure. However, to reconcile this explanation with our pattern of results requires behavioral responses among asymptomatic individuals that we find difficult to believe. Of course, this conclusion rests on taking seriously the patterns we observe in the data, in particular the constant ratio of confirmed to total cases regardless of treatment status.

E.15 Surveillance

The WHO defines contact tracing as: "identification and follow-up of persons who may have come into contact with a person infected with the Ebola virus."[A17]

TABLE E.11
Contact Tracing among Confirmed Patients by Treatment

			Proportion among Contacts	
Treatment	Total Traced	Propotion Traced	Family	Outside
C	17	0.59	0.50	0.50
CM	55	0.22	0.61	0.39
NFA	28	0.24	0.55	0.45

Notes: Total Traced (column 2) counts the number of cases subject to contact tracing across the treatment arms. Pro-portion Traced then divides this number by the total number of confirmed cases. In the final two columns, we restrictattention to cases subject to contact tracing and compute the proportion of contacts from the patients' family or outsidetheir family. Family here includes individuals within the nuclear family, e.g., parents, children, siblings.

TABLE E.12
Effect on Surveillance Proxies

	Control Mean	Pooled	CM	NFA	Difference	N
Pr(Lab Test)	0.926	0.012	0.018	0.008	0.01	144
	(0.099)	(0.016)	(0.02)	(0.018)	(0.02)	
Delay: Reporting and Lab Result	5.029	-2.874	-3.072	-2.72	-0.352	160
	(16.915)	(1.978)	(2.419)	(2.259)	(2.441)	
Log(Case Workers + 1)	1.672	0.125	0.134	0.117	0.016	160
	(0.952)	(0.18)	(0.221)	(0.206)	(0.223)	

Notes: Treatment effects estimated using OLS including matching-triplet fixed effects. Column 1 reports standarddeviation in parentheses. Column 2-4 report robust standard errors in parentheses. Difference column reports thedifference between the CM and NFA coefficients; the standard error is computed using the delta method. Significance:* is significant at the 10% level, ** is significant at the 5% level and *** is significant at the 1% level.

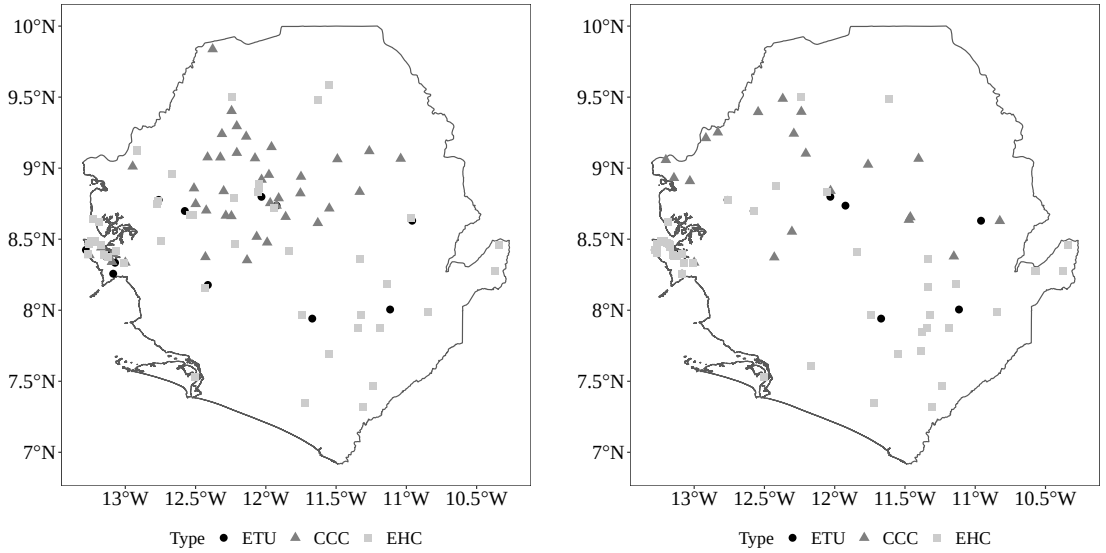
[A17] https://www.who.int/csr/resources/publications/ebola/contact-tracing-guidelines/en/

E.16 Ebola-specific Balance Tests

The UN Mission for Emergency Ebola Response (UNMEER) compiled information on three types of treatment facilities:

- Ebola Treatment Unit (ETU): 17 facilities with an average of 32 beds;
- Ebola Holding Center (EHC): 49 facilities with an average of 18 beds; and
- Community Care Center (CCC): 41 facilities with an average of 10 beds

FIGURE E.6
Location of Ebola Treatment Facilities



(A) UNMEER (B) National Ebola Response Center (NERC)

Notes: Maps of three types of treatment facilities: Ebola Treatment Units (ETUs), Ebola Holding Centers (EHCs), and Community Care Centers (CCCs). The plots differ in the source of the information: data on the left come from the National Ebola Response Center (NERC); the right, from UNMEER. These sources largely overlap, though the NERC data contains fewer CCCs and more missing geo-coordinates than the UNMEER data. Both datasets were accessed through the Humanitarian Data Exchange.

TABLE E.13
Balance: Specialized Ebola Facilities and Non-sample Clinics

	Control Mean	Pooled	CM	NFA	Difference	N
NERC						
Total	0.056	-0.03	-0.054	-0.011	-0.043	160
	(0.231)	(0.042)	(0.051)	(0.048)	(0.051)	
EHC	0.019	0.006	-0.016	0.023	-0.04	160
	(0.136)	(0.033)	(0.04)	(0.037)	(0.04)	
CCC	0.019	-0.018	-0.027	-0.011	-0.015	160
	(0.136)	(0.021)	(0.026)	(0.024)	(0.026)	
Beds	0.463	-0.18	-0.66	0.194	-0.854	160
	(2.044)	(0.493)	(0.596)	(0.556)	(0.601)	
UNMEER						
Total	0.093	0.03	0.024	0.035	-0.011	160
	(0.293)	(0.065)	(0.079)	(0.074)	(0.08)	
EHC	0.019	-0.012	-0.013	-0.011	-0.001	160
	(0.136)	(0.029)	(0.035)	(0.033)	(0.036)	
CCC	0.056	0.06	0.048	0.069	-0.021	160
	(0.231)	(0.056)	(0.068)	(0.064)	(0.069)	
Beds	0.759	0.347	0.351	0.345	0.006	160
	(2.495)	(0.623)	(0.762)	(0.712)	(0.769)	
MoHS						
Non-Sample Clinics	0.204	-0.126	-0.17	-0.091	-0.079	160
	(0.762)	(0.093)	(0.114)	(0.106)	(0.115)	

Notes: Differences estimated using OLS including matching-triplet fixed effects. Top panel uses data from the Sierra Leone National Ebola Response Center (NERC); middle panel from the UN Mission for Ebola Emergency Response (UNMEER); and the bottom panel from the Ministry of Health and Sanitation (MoHS). ETU refers to Ebola Treatment Unit; EHC, to Ebola Holding Center; CCC, to Community Care Center; and Non-Sample Clinics, to clinics not included in the RCT. Significance: * is significant at the 10% level, ** is significant at the 5% level and *** is significant at the 1% level.

TABLE E.14
Balance: Minimum Distance to Specialized Ebola Facilities

	Control Mean	Pooled	CM	NFA	Difference	N
NERC						
ETU	33.986	0.588	-1.302	2.056	-3.358	160
	(17.422)	(3.795)	(4.626)	(4.319)	(4.668)	
EHC	20.715	-2.034	-0.315	-3.369	3.054	160
	(11.479)	(2.115)	(2.563)	(2.394)	(2.587)	
CCC	49.794	-5.353	-3.257	-6.98	3.723	160
	(31.244)	(4.09)	(4.984)	(4.654)	(5.03)	
UNMEER						
ETU	33.57	0.82	-1.156	2.354	-3.511	160
	(17.495)	(3.777)	(4.602)	(4.297)	(4.644)	
EHC	20.586	-2.361	-1.105	-3.337	2.232	160
	(10.445)	(2.011)	(2.446)	(2.284)	(2.468)	
CCC	54.163	-7.277	-5.159	-8.921	3.762	160
	(43.64)	(3.819)*	(4.651)	(4.343)**	(4.693)	

Notes: Maps of three types of treatment facilities: Ebola Treatment Units (ETUs), Ebola Holding Centers (EHCs), and Community Care Centers (CCCs). The plots differ in the source of the information: data on the left come from the National Ebola Response Center (NERC); the right, from UNMEER. These sources largely overlap, though the NERC data contains fewer CCCs and more missing geo-coordinates than the UNMEER data. Both datasets were accessed through the Humanitarian Data Exchange

TABLE E.15
Balance: Proxies for Exposure

	Control Mean	Pooled	CM	NFA	Difference	N
Dist(Patient Zero in Guinea)	196.354	10.93	8.158	13.083	-4.925	160
	(42.021)	(5.079)**	(6.186)	(5.777)**	(6.242)	
Dist(Patient Zero in SL)	91.104	11.627	7.758	14.632	-6.873	160
	(62.208)	(6.441)*	(7.838)	(7.319)**	(7.91)	
Primary Road Density	0.007	0.008	-0.012	0.023	-0.035	160
	(0.029)	(0.015)	(0.018)	(0.017)	(0.018)*	
Secondary Road Density	0.019	0.011	0.013	0.01	0.002	160
	(0.053)	(0.011)	(0.014)	(0.013)	(0.014)	
Tertiary Road Density	0.084	-0.009	0.01	-0.024	0.034	160
	(0.158)	(0.024)	(0.029)	(0.027)	(0.03)	
Ruggedness	35.915	-4.394	-3.679	-4.95	1.271	160
	(34.693)	(6.405)	(7.832)	(7.313)	(7.903)	
Number of Rivers	2.333	0.407	0.17	0.591	-0.421	160
	(1.197)	(0.344)	(0.418)	(0.39)	(0.422)	

Notes: Differences estimated using OLS including matching-triplet fixed effects. Outcomes are at section level. Distances are in kilometers. Road density is road length normalized by area. Ruggedness is the standard deviation of elevation in meters. Significance: * is significant at the 10% level, ** is significant at the 5% level and *** is significant at the 1% level.

E.17 Alternative Functional Forms for Reported Cases

TABLE E.16
Effect on Reported Cases (Alternative Specifications)

	Control Mean	Pooled	CM	NFA	Difference	N
Linear Probability Model						
Total	0.182	0.047	0.057	0.039	0.018	5,440
	(0.386)	(0.026)*	(0.034)*	(0.031)	(0.038)	
Confirmed	0.009	0.021	0.022	0.02	0.002	5,440
	(0.096)	(0.007)***	(0.01)**	(0.008)***	(0.011)	
Negative	0.164	0.038	0.038	0.037	0.002	5,440
	(0.371)	(0.024)	(0.03)	(0.029)	(0.034)	
Log(Count + 1)						
Total	0.16	0.065	0.074	0.057	0.017	5,440
	(0.363)	(0.033)*	(0.044)*	(0.039)	(0.05)	
Confirmed	0.007	0.023	0.027	0.019	0.008	5,440
	(0.077)	(0.008)***	(0.012)**	(0.009)**	(0.013)	
Negative	0.139	0.045	0.04	0.049	-0.008	5,440
	(0.335)	(0.027)*	(0.034)	(0.033)	(0.04)	
Poisson						
Total	0.281	0.469	0.552	0.407	0.144	5,440
	(0.727)	(0.213)**	(0.286)*	(0.25)	(0.322)	
Confirmed	0.011	1.669	2.008	1.369	0.639	5,440
	(0.129)	(0.513)***	(0.58)***	(0.569)**	(0.5)	
Negative	0.238	0.342	0.276	0.389	-0.113	5,440
	(0.648)	(0.201)*	(0.268)	(0.234)*	(0.3)	
Rare Events Logit						
Total	0.182	0.332	0.417	0.273	0.144	5,440
	(0.386)	(0.184)*	(0.245)*	(0.213)	(0.272)	
Confirmed	0.009	1.114	1.156	1.086	0.07	5,440
	(0.096)	(0.275)***	(0.345)***	(0.281)***	(0.286)	
Negative	0.164	0.293	0.307	0.283	0.024	5,440
	(0.371)	(0.186)	(0.241)	(0.218)	(0.267)	

Notes: Treatment effects estimated including matching-triplet and week fixed effects. Dependent variable in top and bottom panel is a dummy, indicating if a section-week reported any case. The top two panels are estimated using OLS, the third panel uses Poisson and final panel uses Rare Event Logit. Column 1 reports standard deviation in parentheses. Column 2-4 report robust standard errors, clustered by section, in parentheses. Difference column reports the difference between the CM and NFA coefficients; the standard error is computed using the delta method. Significance: * is significant at the 10% level, ** is significant at the 5% level and *** is significant at the 1% level.

E.18 Cross-sectional Results for Reported Cases

TABLE E.17
Effect on Reported Cases (Cross-Sectional)

	Control Mean	Pooled	CM	NFA	Difference	N
Ebola Cases						
Total	9.537	5.868	6.925	5.047	1.878	160
	(12.462)	(4.05)	(5.636)	(4.787)	(6.448)	
Confirmed	0.389	2.012	2.909	1.315	1.594	160
	(1.235)	(1.152)*	(1.817)	(1.23)	(1.97)	
Negative	8.093	3.383	2.689	3.922	-1.233	160
	(10.617)	(2.909)	(3.728)	(3.64)	(4.481)	
Log(Ebola Cases + 1)						
Total	1.798	0.294	0.417	0.198	0.219	160
	(1.11)	(0.22)	(0.291)	(0.255)	(0.317)	
Confirmed	0.171	0.38	0.413	0.354	0.059	160
	(0.456)	(0.142)***	(0.204)**	(0.156)**	(0.214)	
Negative	1.674	0.227	0.348	0.133	0.215	160
	(1.07)	(0.212)	(0.266)	(0.249)	(0.292)	
Linear Probability Model						
Total	0.833	0.072	0.091	0.057	0.034	160
	(0.376)	(0.068)	(0.091)	(0.073)	(0.088)	
Confirmed	0.148	0.251	0.234	0.265	-0.03	160
	(0.359)	(0.083)***	(0.114)**	(0.096)***	(0.125)	
Negative	0.833	0.048	0.096	0.011	0.086	160
	(0.376)	(0.073)	(0.094)	(0.082)	(0.096)	
IHS(Ebola Cases)						
Total	2.242	0.335	0.484	0.22	0.264	160
	(1.328)	(0.259)	(0.341)	(0.298)	(0.369)	
Confirmed	0.221	0.474	0.505	0.45	0.055	160
	(0.587)	(0.175)***	(0.249)**	(0.193)**	(0.262)	
Negative	2.097	0.264	0.424	0.14	0.285	160
	(1.291)	(0.252)	(0.317)	(0.295)	(0.345)	
Poisson						
Total	9.537	0.469	0.552	0.407	0.144	160
	(12.462)	(0.056)***	(0.066)***	(0.062)***	(0.062)**	
Confirmed	0.389	1.669	2.008	1.369	0.639	160
	(1.235)	(0.231)***	(0.244)***	(0.245)***	(0.152)***	
Negative	8.093	0.342	0.276	0.389	-0.113	160
	(10.617)	(0.062)***	(0.075)***	(0.069)***	(0.073)	

Notes: Treatment effects estimated using OLS (except for bottom panel which uses Poisson count model) including matching-triplet fixed effects. Dependent variable in third panel is a dummy, indicating if a section reported any case. Column 1 reports standard deviation in parentheses. Column 2-4 report robust standard errors in parentheses. Difference column reports the difference between the CM and NFA coefficients; the standard error is computed using the delta method. Significance: * is significant at the 10% level, ** is significant at the 5% level and *** is significant at the 1% level.

E.19 Dose-response Models

TABLE E.18
Dose-Response with All Sections in Study Area

	Total Cases		Total Cases per Clinic		Total Cases per 1k	
	(1)	(2)	(3)	(4)	(5)	(6)
Proportion of Clinics Treated	0.173**	0.159*	0.165**	0.169**	0.052*	0.053*
	(0.084)	(0.084)	(0.084)	(0.082)	(0.031)	(0.031)
Population (1000s)				0.059***		
				(0.016)		
Number of Clinics						0.074***
						(0.015)
	Confirmed Cases		Confirmed Cases per Clinic		Confirmed Cases per 1k	
	(1)	(2)	(3)	(4)	(5)	(6)
Proportion of Clinics Treated	0.059**	0.059**	0.059**	0.059**	0.015**	0.015**
	(0.024)	(0.024)	(0.024)	(0.024)	(0.006)	(0.006)
Population (1000s)				0.007		
				(0.005)		
Number of Clinics						0.008**
						(0.003)
Ebola Sample	✓					
Full Sample		✓	✓	✓	✓	✓
Sections	160	205	205	205	205	205
Observations	5,440	6,970	6,970	6,970	6,970	6,970

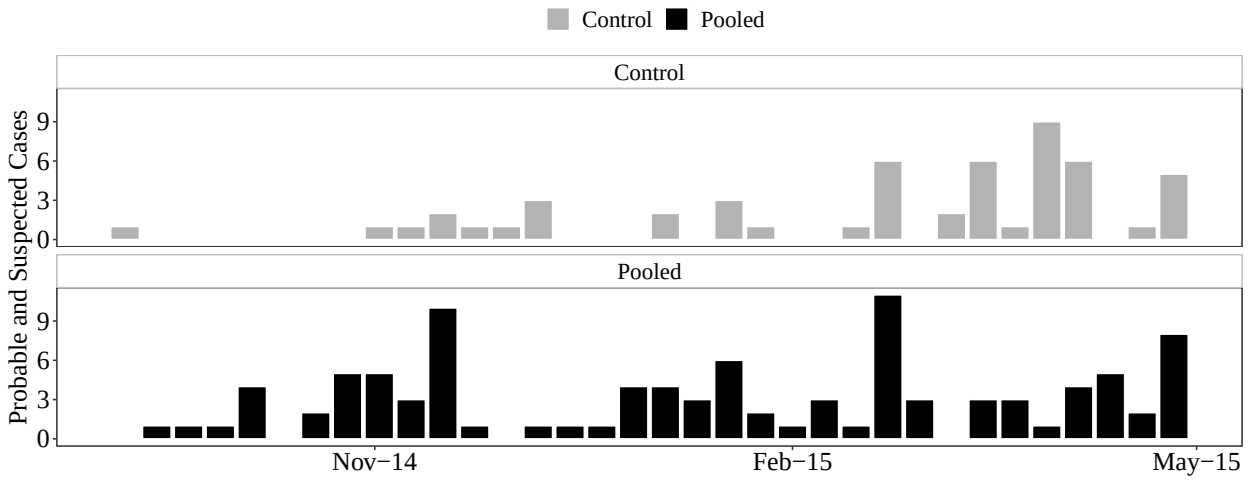
Notes: Treatment effects estimated using OLS including matching-triplet and week fixed effects. Robust standard errors, clustered by section, in parentheses. The sample includes all 205 sections that contain at least one clinic from the experimental sample. We regress total reported and confirmed cases on the proportion of clinics within these sections that received either the CM or NFA treatment. Significance: * is significant at the 10% level, ** is significant at the 5% level and *** is significant at the 1% level.

E.20 Effect on Probable and Suspected Cases

During the study period from September 2014 until April 2015, there are 19 probable and 134 suspected cases. Appendix Figure E7 plots the time series of probable and suspected Ebola cases by week. The VHF uses the following criteria to classify probable and suspected cases:

- **Probable** (unconfirmed) cases are suspected cases that meet one of two additional criteria: (1) they were screened by a clinician; or (2) deceased individuals with an epidemiological link with a confirmed case. In our sample and study period, there are 19 probable cases.
- **Suspected** cases include (1) the onset of high fever and contact with a suspected, probable, or confirmed individuals or a dead or sick animal; (2) the onset of high fever and at least three of the following symptoms: headaches, vomiting, anorexia/loss of appetite, diarrhea, lethargy, stomach pain, aching muscles or joints, difficulty swallowing, breathing difficulties, or hiccup; any person with inexplicable bleeding; or any sudden, inexplicable death. In our sample and study period, there are 134 suspected cases.

FIGURE E.7
Weekly Counts of Probable and Suspected Cases



Notes: Bars represent the raw counts of Probable and Suspected Ebola cases by week for control and pooled treatment sections.

TABLE E.19
Effect on Probable and Suspected Cases

	Control Mean	Pooled	CM	NFA	Difference	N
Ebola Cases						
Probable and Suspected	0.029 (0.208)	0.003 (0.008)	0.015 (0.011)	-0.007 (0.009)	0.022 (0.011)*	5,440
Log(Ebola Cases + 1)						
Probable and Suspected	0.018 (0.123)	0.002 (0.005)	0.009 (0.007)	-0.004 (0.005)	0.013 (0.007)*	5,440
Linear Probability Model						
Probable and Suspected	0.022 (0.148)	0.002 (0.006)	0.011 (0.008)	-0.005 (0.006)	0.016 (0.008)*	5,440
IHS(Ebola Cases)						
Probable and Suspected	0.023 (0.159)	0.002 (0.006)	0.012 (0.008)	-0.005 (0.007)	0.017 (0.009)*	5,440

Notes: Treatment effects estimated using OLS including matching-triplet and week fixed effects. Column 1 reports standard deviation in parentheses. Column 2-4 report robust standard errors, clustered by section, in parentheses. Difference column reports the difference between the CM and NFA coefficients; the standard error is computed using the delta method. Significance: * is significant at the 10% level, ** is significant at the 5% level and *** is significant at the 1% level.

TABLE E.20
Effect on Reported Cases (Removing Probable and Suspected)

	Control Mean	Pooled	CM	NFA	Difference	N
Ebola Cases						
Total	0.252	0.17	0.188	0.155	0.033	5,440
	(0.672)	(0.08)**	(0.11)*	(0.094)	(0.127)	
IHS(Ebola Cases)						
Total	0.188	0.083	0.09	0.078	0.012	5,440
	(0.445)	(0.041)**	(0.054)*	(0.049)	(0.062)	

Notes: Treatment effects estimated using OLS including matching-triplet and week fixed effects. Column 1 reports standard deviation in parentheses. Column 2-4 report robust standard errors, clustered by section, in parentheses. Difference column reports the difference between the CM and NFA coefficients; the standard error is computed using the delta method. Difference column reports the difference between the CM and NFA coefficients; the standard error is computed using the delta method. Significance Significance: * is significant at the 10% level, ** is significant at the 5% level and *** is significant at the 1% level.

E.21 Controlling for Unbalanced Baseline Variables in Ebola Sample

Covariates included based on imbalance reported in Appendix Table E4: (1) birth in household last year; (2) trust in community; (3) Mende; (4) Temne; (5) highest education level; (6) number of illness or injury cases per household; (7) motorable road; and (8) mobile phone coverage.

TABLE E.21
Effects on Reported Cases Controlling for Unbalanced Baseline Variables

	Control Mean	Pooled	CM	NFA	Difference	N
Cases						
Total	0.281	0.192	0.219	0.166	0.053	5,440
	(0.727)	(0.089)**	(0.119)*	(0.1)*	(0.129)	
Confirmed	0.011	0.06	0.086	0.035	0.051	5,440
	(0.129)	(0.031)*	(0.04)**	(0.032)	(0.039)	
Negative	0.238	0.105	0.085	0.125	-0.04	5,440
	(0.648)	(0.062)*	(0.08)	(0.076)*	(0.094)	
IHS(Cases)						
Total	0.206	0.1	0.116	0.085	0.031	5,440
	(0.47)	(0.043)**	(0.058)**	(0.049)*	(0.065)	
Confirmed	0.009	0.029	0.036	0.023	0.013	5,440
	(0.1)	(0.012)**	(0.016)**	(0.012)*	(0.016)	
Negative	0.179	0.066	0.063	0.068	-0.005	5,440
	(0.433)	(0.035)*	(0.046)	(0.043)	(0.053)	

Notes: Treatment effects estimated using OLS including matching-triplet and week fixed effects. Column 1 reports standard deviation in parentheses. Column 2-4 report robust standard errors, clustered by section, in parentheses. Difference column reports the difference between the CM and NFA coefficients; the standard error is computed using the delta method. Covariates included (all measured as averages): (1) birth in household last year; (2) trust in community; (3) Mende; (4) Temne; (5) highest education level; (6) number of illness or injury cases per household; (7) motorable road; (8) mobile phone coverage, (9) trust in VHC, and (10) prominent village member in household. Significance: * is significant at the 10% level, ** is significant at the 5% level and *** is significant at the 1% level.

E.22 Bounding spillover effects

To consider spillovers based on geographic distance, we calculate each clinic's proximity to the next nearest control clinic in the full sample. (We do not have exact coordinates of clinics, and thus geolocate clinics using the centroids of the census enumeration areas that contain the clinics.) In Appendix Table E.23 we find that treated sections report more cases when their treated clinic is far from the next control clinic—the opposite of what we would expect if spillovers are amplifying our effects.

Spillovers could occur via road networks. Using data from Open Street Map, we count the number of roads and paths from each section that intersect any other control section in the sample (see Appendix Figure E.8). Appendix Table E.24 interacts this variable with our treatment indicator and, again, finds no indication that treated sections more connected to control sections via the road network see a larger increase in total cases.

Finally, we consider ethnicity, since information and people may move more easily among areas that are similar along cultural lines. We use the household survey to determine the plurality ethnic group in each section. Sections tend to be homogeneous: in the median section, 95 percent of respondents report the same ethnicity. For each section, we then count the number of control sections with the same plurality ethnic group and within 10 kilometers. Appendix Table E.25 provides no indication that spillovers occur due to movement of patients between proximate co-ethnic areas.

To test whether imprecision in estimating spillovers may obscure spillovers that bias our results towards zero, we proceed as follows. We assume that instead of the point estimate, the true spillover effect is given by the "most pessimistic" bound of its 95% confidence interval, i.e. the one that would imply the smallest treatment effect. For example, the pooled treatment effect after taking into account spillovers from bordering control sections is 0.360 (Appendix Table E.22, Model 2). The coefficient on the interaction term of treatment and the number of bordering control sections is -0.134, with a standard error of 0.116. The most conservative bound of its 95% confidence interval is therefore $-0.134 + 1.96 \times 0.116 = 0.093$. Evaluated at the average number of bordering control sections, 1.08, it is $1.08 \times 0.093 = 0.104$. Under this "pessimistic" assumption about the interaction term, the pooled treatment effect would still be $0.360 - 0.104 = 0.256$. For the analogous model using the IHS (Model 5), we obtain a worst-case pooled treatment effect of $0.179 - 1.08 \times (-0.070 + 1.96 \times 0.060) = 0.128$. Thus, even with very conservative assumptions, the spillover effect is not large enough to overwhelm the estimated treatment effect. We repeat this exercise for all spillover effects, and find a positive adjusted treatment effect—with the exception of Appendix Table E.24, Model 2, which measures spillovers through the road network. Here we find a conservative estimate of -0.01, but this emerges from the imprecision with which the spillover coefficient is estimated (standard error: 0.074), not a smaller treatment effect (which has coefficient of -0.05). Thus, overall we are able to rule out the possibility that our treatment effects are driven by spillovers.

TABLE E.22
Spillovers from Bordering Sections

	Total			IHS(Total)		
	(1)	(2)	(3)	(4)	(5)	(6)
Pooled	0.173**	0.360**	0.330***	0.083*	0.179**	0.184***
	(0.084)	(0.177)	(0.113)	(0.043)	(0.089)	(0.059)
Bordering Control		0.105			0.052	
		(0.083)			(0.044)	
Pooled × Bordering Control		−0.134			−0.070	
		(0.116)			(0.060)	
Bordering ×Control Pop. (1000s)			0.050**			0.032***
			(0.020)			(0.010)
Pooled × Bordering Control Pop. (1000s)			−0.019			−0.012
			(0.021)			(0.011)
Sections	160	160	160	160	160	160
Weeks	34	34	34	34	34	34
Observations	5,440	5,440	5,440	5,440	5,440	5,440

Notes: Treatment effects estimated using OLS including matching-triplet and week fixed effects. Robust standard errors, clustered by section, in parentheses. Bordering controls is a count of the number of contiguous control sections (mean: 1.08). Bordering controls population measures the population of these contiguous control sections in 1000s (mean: 3.64). Significance: * is significant at the 10% level, ** is significant at the 5% level and *** is significant at the 1% level.

TABLE E.23
Spillovers from Clinic Proximity

	Total		IHS(Total)	
	(1)	(2)	(3)	(4)
Pooled	0.173**	0.809**	0.083*	0.473**
	(0.084)	(0.385)	(0.043)	(0.207)
Proximity to Control		0.010		0.007
		(0.011)		(0.006)
Pooled × Proximity to Control		−0.028*		−0.017*
		(0.017)		(0.009)
Sections	160	160	160	160
Weeks	34	34	34	34
34				
Observations	5,440	5,440	5,440	5,440

Notes: Treatment effects estimated using OLS including matching-triplet and week fixed effects. Robust standard errors, clustered by section, in parentheses. To compute proximity, we measure the distance (in kilometers) to the nearest control clinic in the full sample and then reverse the scale of the variable by subtracting off the maximum and multiplying by minus one (mean: 22.7). Significance: * is significant at the 10% level, ** is significant at the 5% level and *** is significant at the 1% level.

TABLE E.24
Spillovers through Road Network

	Total		IHS(Total)	
	(1)	(2)	(3)	(4)
Pooled	0.173**	0.159	0.083*	0.080
	(0.084)	(0.108)	(0.043)	(0.054)
Connected Controls		0.078		0.037
		(0.071)		(0.040)
Pooled × Connected Controls		−0.050		−0.025
		(0.074)		(0.041)
Sections	160	160	160	160
Weeks	34	34	34	34
Observations	5,440	5,440	5,440	5,440

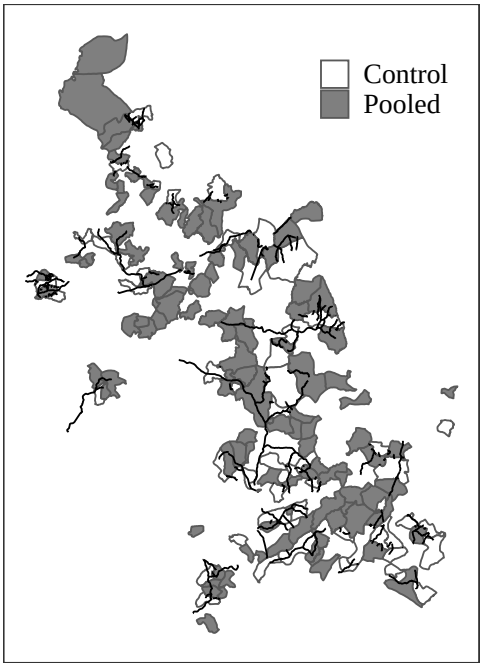
Notes: Treatment effects estimated using OLS including matching-triplet and week fixed effects. Robust standard errors, clustered by section, in parentheses. Connected controls counts the number of roads and paths that intersect both section s and any other control sections in the sample (mean: 1.78). It proxies for the ease of travel to other control sections. Significance: * is significant at the 10% level, ** is significant at the 5% level and *** is significant at the 1% level.

TABLE E.25
Spillovers from Proximate Coethnic Sections

	Total		IHS(Total)	
	(1)	(2)	(3)	(4)
Pooled	0.173**	0.243**	0.083*	0.123**
	(0.084)	(0.117)	(0.043)	(0.058)
Co-ethnic Controls w/in 10 km		0.120		0.056
		(0.083)		(0.048)
Pooled × Co-ethnic Controls w/in 10 km		−0.170		−0.090
		(0.111)		(0.061)
Sections	160	160	160	160
Weeks	34	34	34	34
Observations	5,440	5,440	5,440	5,440

Notes: Treatment effects estimated using OLS including matching-triplet and week fixed effects. Robust standard errors, clustered by section, in parentheses. Co-ethnic controls counts the number of control sections with the same plurality ethnic group (based on the baseline household survey) within a 10 kilometer radius (mean: 0.5). Significance: * is significant at the 10% level, ** is significant at the 5% level and *** is significant at the 1% level.

FIGURE E.8
Roads Intersecting Control Sections



Notes Appendix Figure E.8 maps control and (pooled) treatment sections. Black lines indicate roads and paths intersecting control sections.

E.23 Results for Pre-specified Families in Ebola Sample

TABLE E.26
Pre-specified Families in Ebola Sample

	(1) Control Mean	(2) Pooled	(3) CM	(4) NFA	(5) Difference	(6) N
General utilization	0.000	0.074	0.128	0.036	0.092	2857
	(1.000)	(0.040)*	(0.049)***	(0.042)	(0.043)**	
		[0.234]	[0.373]	[0.397]		
Maternal utilization index	0.000	0.058	0.232	-0.055	0.287	595
	(1.000)	(0.086)	(0.112)**	(0.097)	(0.115)**	
		[0.188]	[0.110]	[0.397]		
Satisfaction index	0.000	0.034	0.085	-0.006	0.090	3183
	(1.000)	(0.062)	(0.069)	(0.074)	(0.071)	
		[0.379]	[0.283]	[0.886]		
Health outcomes index	0.000	0.105	0.101	0.107	-0.006	3183
	(1.000)	(0.054)*	(0.067)	(0.060)*	(0.068)	
		[0.205]	[0.143]	[0.488]		
Health service delivery index	0.000	-0.070	-0.095	-0.061	-0.033	1819
	(1.000)	(0.068)	(0.108)	(0.067)	(0.097)	
		[0.379]	[0.143]	[0.488]		
Clinic organization and services index	0.000	0.311	-0.023	0.565	-0.588	160
	(1.000)	(0.236)	(0.301)	(0.264)**	(0.315)*	
		[0.188]	[0.235]	[0.144]		
CDPE index	0.000	0.264	0.232	0.288	-0.057	320
	(1.000)	(0.108)**	(0.155)	(0.132)**	(0.184)	
		[0.188]	[0.264]	[0.144]		
Contributions to clinic index	0.000	0.173	0.292	0.080	0.212	320
	(1.000)	(0.127)	(0.142)**	(0.148)	(0.140)	
		[0.205]	[0.459]	[0.144]		
Water and sanitation index	0.000	0.167	0.137	0.190	-0.053	3183
	(1.000)	(0.086)*	(0.101)	(0.096)*	(0.097)	
		[0.188]	[0.235]	[0.144]		
Economic outcomes index	0.000	0.151	0.065	0.219	-0.154	3183
	(1.000)	(0.087)*	(0.106)	(0.105)**	(0.121)	
		[0.188]	[0.425]	[0.144]		

Notes: Treatment effects are estimated using Missing-Indicator ANCOVA, controlling for the community-level average of the outcome family index at baseline and matching-triplet fixed effects. Column 1 reports standard deviation in parentheses. Columns 2–5 report robust standard errors, clustered by clinic. Multiple inference corrected q-values that adjust for the false discoveryrate within treatment arm across all outcomes in this table are shown in square brackets. Significance: * is significant at the 10% level, ** is significant at the 5% level and *** is significant at the 1% level.

E.24 2SLS Analysis of the Effects of Perceived Quality of Care on Ebola Cases

TABLE E.27
Perceived Quality of Care and Ebola Cases

	(1)	(2)
First-stage	Perceived Quality of Care	
Pooled (CM or NFA)	0.506	
	(0.120)***	
CM		0.565
		(0.155)***
NFA		0.463
		(0.134)***
IV Estimates	Total Cases	
Perceived Quality of Care	0.390**	0.399**
	(0.183)	(0.188)
First-stage F-statistic	17.75	8.94
Observations	5,440	5,440

Notes: Models include triplet and week fixed effects, as well as the baseline value of the perceived quality of care index. Robust standard errors, clustered by section, in parentheses. "Perceived Quality of Care" is the index shown in Table 5. Significance: * is significant at the 10% level, ** is significant at the 5% level and *** is significant at the 1% level. In column (2), the J statistic is 0.32 with an associated p-value of 0.57.

E.25 Change in perceived quality as predictor of total cases

TABLE E.28
Change in Perceived Quality and Total Ebola Cases in Control Sections

	Dependent variable:			
	Total Cases		IHS(Total Cases)	
	(1)	(2)	(3)	(4)
Change in Perceived Quality (EL-BL)	0.138	0.166	0.058	0.075
	(0.138)	(0.135)	(0.081)	(0.078)
Section Population (1000s)		0.052		0.032*
		(0.032)		(0.018)
Observations	1,836	1,836	1,836	1,836

Notes: Models estimated using OLS including chiefdom and week fixed effects. Robust standard errors, clustered by section, in parentheses. Sample restricted to control sections. Significance: * is significant at the 10% level; ** at the 5% level; *** at the 1% level.

E.26 Cost-effectiveness

This section details the cost-effectiveness comparison of CM and NFA relative to Community Care Centers (CCCs). We calculate the average per-clinic cost of implementing both interventions from the financial reports of each of the three implementing NGOs (Plan International, Concern Worldwide, and the International Rescue Committee). We add a five percent administrative overhead based on the structure of the World Bank project that financed these interventions.[A18]

TABLE E.29
Implementation Costs by NGO

		Non-financial awards			Community monitoring		
NGO	**District(s)**	**Cost**	**Clinics**	**Cost per clinic**	**Cost**	**Clinics**	**Cost per clinic**
Plan	Bombali	$ 180,677	19	$ 10,223	$ 155,358	19	$ 8,790
Concern	Tonkolili	$ 176,304	23	$ 7,665	$ 136,108	23	$ 5,918
IRC	Bo, Kenema	$ 241,184	43	$ 5,609	$ 134,409	43	$ 3,126
		$ 598,165	85	$ 7,037	$ 425,875	85	$ 5,010
+5% admin overhead				$ 7,389			$ 5,261

Notes: Authors' calculations based on Plan International's budget and financial reports from Concern Worldwide and the International Rescue Committee, as shared with the World Bank. Costs are measured in 2013 USD.

On average, the CM intervention cost $7,389 per clinic (in 2013 USD), and NFA cost $5,261, though there is substantial variation across implementing NGOs. The average, which we can think of as the per clinic cost of the "pooled" intervention, is $6,375.

We calculate the average cost of CCCs from financial documents shared by DFID that show the values of individual contracts awarded to the five implementing NGO partners (Partners in Health, UNICEF, the International Rescue Committee, Oxfam GB, and Plan International) to establish a range of Ebola treatment facilities, including CCCs, Ebola Treatment Units (ETUs), and Ebola Holding Centers (EHCs). We use the contract data for UNICEF, which primarily financed 8-bed facilities, consistent with the WHO definition of a CCC.[A19] The average cost per facility is $707,274 in 2013 USD,[A20] but this should be seen as a lower-bound estimate, as the per-facility cost varied widely across NGOs and aggregate project spending data from DFID suggests the cost could have been as high as $1.58 million.[A21]

To benchmark the cost-effectiveness of CM and NFA against CCCs, we compare the relative costs of the pooled intervention and CCCs to their relative benefits, for which we use the point estimates of the treatment effects on reporting of total Ebola cases, including those in which patients turn out to test negative. Reporting of total possible cases facilitates testing and treatment, ultimately helping to contain the spread of the epidemic. In addition, we also use treatment effects for confirmed cases, as reporting of infected patients

[A18] The interventions were financed as part of a $20m World Bank project loan to the Government of Sierra Leone under the Decentralized Service Delivery Project, which covered several project activities including "social accountability" Makori (2012). The loan allowed for $1m administrative costs, or five percent of the total project budget.

[A19] The World Health Organization defines Community Care Centers (CCCs) as "small facilities (10 beds maximum), located within the community and run by community health workers. CCCs provide isolation facilities for Ebola patients in order to prevent further transmission of the virus within their households and communities. People with Ebola virus can also receive basic curative and palliative care in these centres in an environment supported by their family and communities" WHO (2014b).

[A20] UNICEF financed 44 CCCs for £20.40m in 2014, which gives a per-facility cost of £463,636. To convert to 2013 USD, we use the 2013-14 UK inflation rate of 2.57% and the 2013 USD/GBP exchange rate of 1.5647: £463,636 x $/£1.5647/1.0257 = $707,274

[A21] DFID's Development Tracker database, which tracks aggregate project disbursements for all DFID-financed projects, shows that the "Ebola Care Units in Sierra Leone" project (IATI # GB-1-204896) disbursed £42,398,846 in 2014, ultimately financing 41 CCCs according to data from the UN Mission for Ebola Emergency Response (UNMEER) Christensen et al.. This implies a per-facility cost of $1.58 million in 2013 USD. https://devtracker.dfid.gov.uk/projects/GB-1-204896

may be particularly beneficial for targeting treatment and containment efforts.

We compare the treatment effect from our pooled specification (III) to the equivalent treatment effects of CCCs on increased reporting of Ebola cases from Christensen et al. (2020).[A22] At a cost of $6,375, sections in treatment areas saw 0.173 additional cases per section-week, of which 0.059 were confirmed to be Ebola cases. Over the 34-week period, this equals reporting of 5.88 additional cases of which 2 were confirmed cases per section.

In comparison, at a cost of $707,274, sections with CCCs saw 0.544 additional cases per section-week, of which 0.129 were confirmed to be Ebola (Christensen et al. 2020, Table 1). Over 34 weeks, this equals 18.50 additional cases and 4.39 confirmed cases per section.

To assess cost-effectiveness, we have to answer the following question: Is it more cost-effective to make small, but potentially crucial, preemptive investments in the public health system now, knowing that it will cost more to respond effectively later once an epidemic is underway? The answer depends on (i) comparing the cost of each intervention relative to the gain in Ebola reporting, and (ii) the *ex ante* probability of an outbreak.

We first compare the relative costs listed above to the gains in reporting (total and confirmed cases), using the point estimates of the treatment effects: if $C_{pooled}/C_{CCC} < \hat{\beta}_{pooled}/\hat{\beta}_{CCC}$ the pooled intervention is more cost-effective, with an implied rate of return $\mu_{CM} = \left(\hat{\beta}_{pooled} \times C_{CCC}\right) / \left(\hat{\beta}_{CCC} \times C_{pooled}\right)$. These are listed below in column 3 of Appendix Table E.30. The rates of return for the pooled intervention are 35.28 and 50.74, respectively—in other words, the pooled intervention appears, at first cut, to be orders of magnitude more cost-effective, reflecting in large part the cost of intervening under emergency conditions to try to contain and treat a widespread epidemic.

TABLE E.30
Cost effectiveness of pooled intervention vs CCCs

Outcome	β(Pooled)	β(CCC)	μ	Cost-effective	p(Epidemic)
Total cases	0.173**	0.544***	35.28	Pooled	2.83%
Confirmed cases	0.059**	0.129**	50.74	Pooled	1.97%

Notes: Columns 1-2 report treatment effects from Table III. Column 3 shows the ratio of the treatment effect of the pooled intervention to CCCs, compared to the respective costs of each treatment. Column 4 lists the more cost-effective treatment, CCC or the pooled treatment. Column 5 lists the implied probability for an epidemic that would make the pooled treatment more cost-effective.

However, epidemic outbreak is a probabilistic event that would only be realized after preemptive investments are made. The expected rate of return $E(\mu)$ of intervening now is therefore μ multiplied by the probability of an epidemic, $p(Epidemic)$; i.e.—if $\mu \times p(E) > 1$ (or equivalently, $p(E) > 1/\mu$ then intervening now is more cost-effective. For the two outcomes we examine, preemptive investments are more cost-effective than *ex post* interventions under emergency conditions, if there is a 2% or greater probability of an epidemic occurring in any given year. Simulated likelihoods using historical data on pandemics find that the annualized likelihood of another Ebola pandemic of the same scale as 2014–15 is similar at about 1.5% Stephenson et al. (2019).[A23] This suggests that preemptive investments are a worthy investment, not just for their immediate effects, but also as cost-effective ways of preparing for future outbreaks.

[A22] This approach assumes that the marginal social benefit of each outcome and the marginal effect of the treatment on each outcome are both linear; in reality it is likely that there are decreasing returns to both interventions, implying that the benefits to scaling up CM and NFA early on might be higher.

[A23] In their updated database, Stephenson et al. (2020) account for the trend of increasing frequency and severity of events and find a significantly higher annualized likelihood of 7.5%. (Based on email correspondence with N. Stephenson, May 28, 2020.)