Information Operations Increase Civilian Reports of Roadside Bombs

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Motivation

- Information (pshychological) operations are at the core of modern warfare:

  "The battlefield is not necessarily a field anymore. Its in the minds of the people. Its what they believe to be trust that matters" —Admiral Michael Mullen
- More than 250 million invested in various campaigns in AFG and Iraq.
- Yet we little (no) rigorous evidence evaluating the effectiveness of PSYOPS in the context of an ongoing insurgency.

Overview

- We **study** whether and how information operations influence civilian attitudes and behaviors.
- We **investigate** these impacts in Afghanistan using confidential military surveys (conducted by multiple actors in parallel) as well as declassified military records covering combat, neutralization, and intelligence activities.
- We **find** robust evidence that PSYOPS shift attitudes/behaviors: (study 1) exposed individuals are substantially more likely to report roadside bombs, (study 2) exposed civilians are much more tolerant of reintegration.

Theory

Models of propaganda

- The audience should be rational about the interaction it participates in. That is, it knows that it is being influenced and how it is being influenced.
- Technically, the audience knows the *ex ante* distribution over the possible states of the world and the strategy used by the propagandist, who knows the state of the world precisely.
- Members of the audience should satisfy the incentive compatibility constraint for consuming propaganda. That is, they should have a reason to consume information from the propaganda channel.
- Our model is a particular case of "Bayesian persuasion" (Kamenica and Gentzkow, 2011, Bergemann and Morris, 2018)

Setup

- There is a government that commits to an information design and a unit continuum of agents who have heterogeneous costs of listening to radio.
- For each $i \in [0,1]$, the cost of listening to radio, ε_i, is uniformly distributed over $[0,1]$.
- Agent i is deciding on whether or not to report IEDs to the local government office, and her willingness to do this depends on whether or not the government is friendly (f) or unfriendly (u).
- If the government is friendly, then reporting IEDs brings the benefit of $v(R)$; if unfriendly, $v(R) - c$. Not reporting to the unfriendly government brings the benefit of $v(N)$, while not reporting to the friendly government, $v(N) - a$.

Propaganda

- Agents are uncertain about the government friendliness. The common prior $P(g = f) = \theta$.
- The propaganda channel commits to a signal $\widehat{g}$ with $P(\widehat{g} = f|g = f) = 1$, $P(\widehat{g} = f|g = u) = \beta$, before learning the government's type.
- In the absence of any information, agents prefer not report.
- The government chooses β to maximize the number of reports, and agents maximize their utility.

Equilibrium

- For any β, agent i listens to radio as long as the difference of the value of having access to information and the value of not having access exceeds the cost,
- The audience is

$$I_G(\beta) = (\theta + (1-\theta)\,\beta)\,(v(R) - v(N)) - (1-\theta)\,\beta c + \theta a.$$

- The equilibrium level of propaganda is

$$\beta^* = \frac{1}{2}\frac{\theta}{1-\theta}\frac{2v(R) - c - 2v(N) + a}{c - v(R) + v(N)}.$$

Context

Literature

- Adena, Enikolopov, Petrova, Santarosa, and Zhuravskaya (2015): radio-based information campaigns helped the Nazis to prop up their popularity and incite anti-Semitic acts and denunciations of Jews to authorities by ordinary Germans.
- Yanagizawa-Drott (2014): Rwandan authorities used radio broadcasts to encourage participation in killings of Tutsi minority by both militia groups and ordinary civilians.
- Della Vigna, Enikolopov, Mironova, Petrova, and Zhuravskaya (2017): Nationalistic Serbian radio incited ethnic hatred toward Serbs in Croatia.

Psychological Operations in Afghanistan

- We study PSYOPS in Afghanistan, where ISAF has used information campaigns to raise awareness of various threats and shape public opinion towards coalition forces.
- Afghans were critical to the PSYOPS campaign, often developing messaging side-by-side with ISAF.
- US DoD commissioned RAND study of PSYOPS; relied on interviews and anecdotal/informal assessments of effectiveness. Claimed mixed results.

Data

Data

- Throughout the campaign (and after), ISAF has conducted ongoing national surveys and gathered intelligence reports.
- We rely on two surveys: Afghanistan Nationwide Quarterly Assessment Research (ANQAR) and FOGHORN. Both conducted by ACSOR. Province :: District :: Villages :: Households.
- We pair these data with significant activity (SIGACTS) reports. Typically only include combat operations. Our release included counterinsurgent missions and intelligence reports.

Main specification: survey data

We estimate the following least squares model:

$$tips_i = \alpha + \beta messaging_i + \theta X_i + \epsilon \tag{1}$$

where $tips_i$ is the respondent i's willingness to report roadside bombs and $messaging_i$ is an indicator for exposure to counter-IED messaging in the prior six months. Standard errors are clustered by administrative district and models are adjusted using sampling weights.

Main specification: survey + intel data

We estimate the following least squares model:

$$tips_{dw} = \alpha + \beta_1 messaging_{dw} + \beta_2 messaging_{dw}^2 + \theta X_{dw} + \epsilon \quad (2)$$

where $tips_{dw}$ is the sum of IED tips in district d in the six months prior to wave w. $messaging_{dw}$ and $messaging_{dw}^2$ capture the percentage of respondents (from 0 to 100) reporting exposure to government messaging and the square of this term. The square is added to capture the non-linearity suggested by Figure **??**. X_{dw} varies by model. Standard errors are clustered by district.

Main specification: intel data

We estimate the following least squares model:

$$y_{dt} = \alpha + \beta_1 tips_{dt-1} + \mu_d + \eta_t + \gamma X_{dt} + \epsilon \tag{3}$$

where y_{dt} is the number of counterinsurgent actions in district d in week t. μ_d is a district fixed effect; η_t denotes a week-of-year fixed effect; X_{dt-1} is a vector of district-week specific control variables, including trends in tips and combat activity. Standard errors are clustered by district.

Results

Table 1: Impact of psychological messaging exposure on civilian's willingness to provide tips about deployed roadside bombs

	(1) Basic Model	(2) Baseline Model w. Fixed Effects + Demo. Controls	(3) Baseline Model w. Village Security	(4) Baseline Model w. Political and Security Controls
Messaging Exposure	0.172***	0.106***	0.106***	0.0936***
	(0.0328)	(0.0147)	(0.0148)	(0.0150)
SUMMARY STATISTICS				
Outcome Mean	0.482	0.482	0.482	0.482
Outcome SD	0.500	0.500	0.500	0.500
PARAMETERS				
District + Wave Fixed Effects	No	Yes	Yes	Yes
Demographic Controls	No	Yes	Yes	Yes
Village Insecure	No	No	Yes	Yes
Police Patrols Weekly	No	No	No	Yes
Govt. going Wrong Direction	No	No	No	Yes
Terr. Control (Govt./Ins./Mixed)	No	No	No	Yes
MODEL STATISTICS				
N	24620	24620	24620	24620
Clusters	339	339	339	339

Notes: Outcome of interest is willingness to report insurgents planting IEDs. Unit of analysis is individual survey respondent. Baseline models include administrative district fixed effects (using ESOC boundaries), survey wave fixed effects, and demographic controls (age, education, gender, ethnicity, socio-economic status). See table notation for additional details. Standard errors are clustered at the district level and presented in parentheses; *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Behavioral outcomes

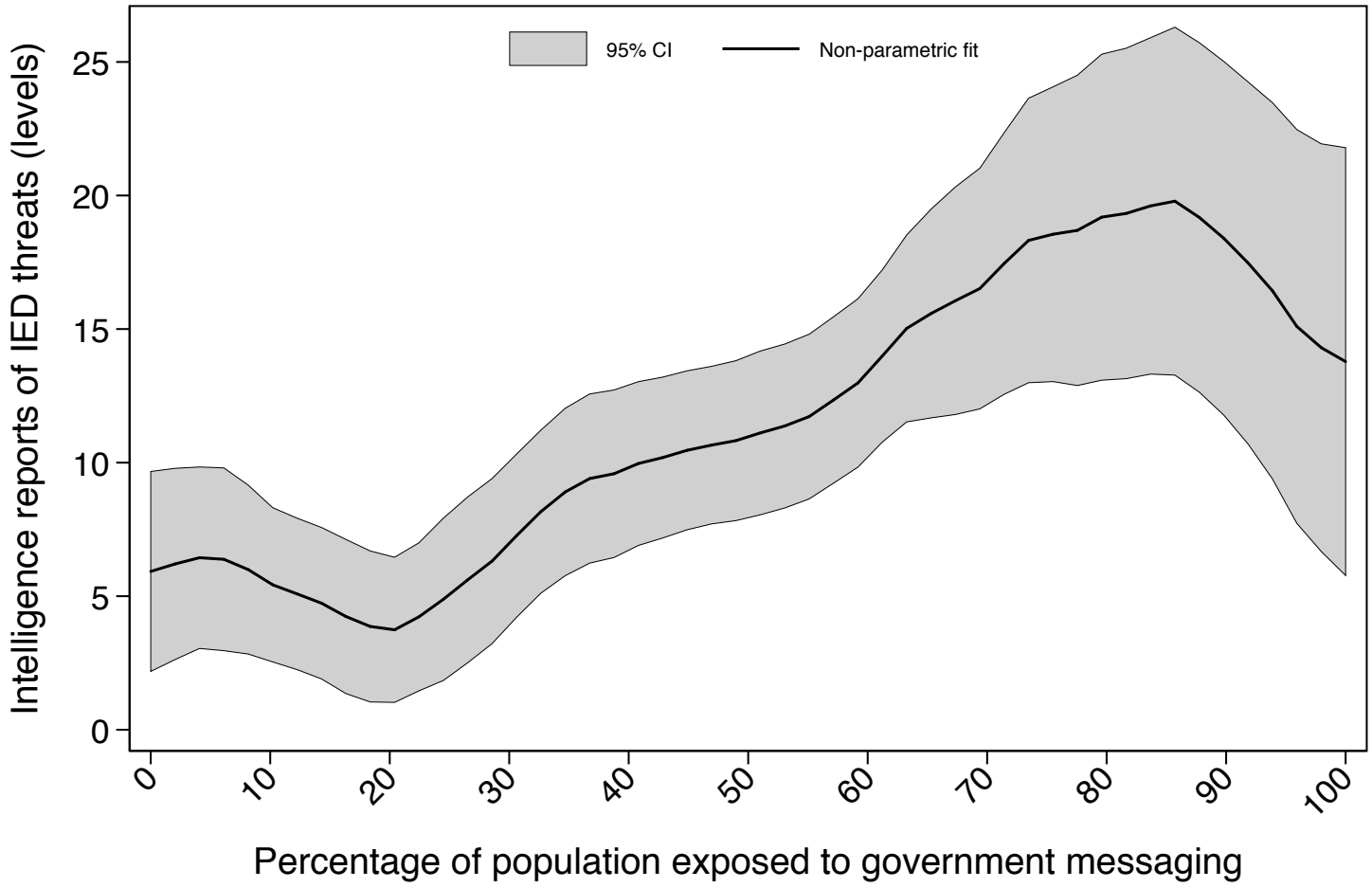

95% CI
Non-parametric fit
Intelligence reports of IED threats (levels)
0
5
10
15
20
25
0
10
20
30
40
50
60
70
80
90
100
Percentage of population exposed to government messaging

Table 4: Impact of psychological messaging exposure on civilian tips about roadside bombs documented in military records

	(1) Baseline Model w. IED deton. + FC Trends	(2) Baseline Model w. Informant Kill. Trends	(3) Baseline Model w. Combat Trends	(4) Baseline Model w/o Collab. Outlier (Kabul)
Messaging Exposure	0.384***	0.382***	0.355***	0.361***
	(0.100)	(0.1000)	(0.1000)	(0.0916)
Messaging Exposure^2	-0.00256***	-0.00255***	-0.00233**	-0.00278***
	(0.000936)	(0.000923)	(0.000969)	(0.000779)
Summary Statistics				
Outcome Mean	13.89	13.89	13.89	12.41
Outcome SD	33.97	33.97	33.97	21.48
Parameters				
IED Detonations	Yes	Yes	Yes	Yes
IED Neutralizations	Yes	Yes	Yes	Yes
Informant/Recruit Killings	No	Yes	Yes	Yes
Close Combat Trends	No	No	Yes	Yes
Remote Combat Trends	No	No	Yes	Yes
Exclude Outlier (Kabul)	No	No	No	Yes
Model Statistics				
N	631	631	631	629
Clusters	339	339	339	338

Notes: Outcome of interest is tips reporting the location of implanted roadside bombs. Unit of analysis is district-wave. Data on intelligence records and combat activity (SIGACTS) were declassified by the US Department of Defense and are calculated using the six month window prior to each survey wave (consistent with survey wording regarding messaging exposure). Data on messaging exposure is drawn from the ANQAR survey and calculated by district-wave as a percentage of the population reporting exposure. See table notation for additional details. Standard errors are clustered at the district level and presented in parentheses; *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Battlefield outcomes

Table 5: Impact of civilian tips on battlefield outcomes

	(1) Baseline Model Roadside Bombs Found/Cleared	(2) Baseline Model Weapon Caches Found/Cleared	(3) Baseline Model Tactical Safe House Raids	(4) Baseline Model Insurgents Captured and Detained
Tips about IED deployment, Lagged	0.0153**	0.0147***		
	(0.00777)	(0.00360)		
All Tactical Tips, Lagged			0.00289***	0.0421**
			(0.000849)	(0.0182)
SUMMARY STATISTICS				
Outcome Mean	0.236	0.0769	0.00689	0.0785
Outcome SD	1.187	0.583	0.106	0.491
PARAMETERS				
District Fixed Effect	Yes	Yes	Yes	Yes
Week Fixed Effect	Yes	Yes	Yes	Yes
IED Detonation Trends	Yes	Yes	Yes	Yes
Close Combat Trends	Yes	Yes	Yes	Yes
Remote Combat Trends	Yes	Yes	Yes	Yes
MODEL STATISTICS				
N	171936	171936	171936	171936
Clusters	398	398	398	398

Notes: Outcome of interest varies by column and is noted in each model heading: (1) roadside bombs found and neutralized (cleared); (2) weapon caches (depots) found and neutralized (cleared); (3) tactical safe house raids yielding actionable intelligence about insurgent operations; (4) insurgents captured and detained by security forces. In (1) and (2) the explanatory variable is the number of tips about IED deployment lagged by one week. In (3) and (4), we investigate the number of tactical tips (including all combat activity) lagged by one week. Unit of analysis is district-week from 2006 to 2014. Data on intelligence records and combat activity (SIGACTS) were declassified by the US Department of Defense. All models include district (unit) and week (time) fixed effects. See table notation for additional details. Standard errors are clustered at the district level and presented in parentheses; *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Results, part i

We find robust evidence that:

- Exposure to government counter-IED campaign increases (hypothetical) willingness to report IEDs.
- These effects are substantially enhanced among individuals with preexisting exposure to government institutions or with pro-government sentiments.
- Exposure at the district-wave level strongly correlates with increasing tips regarding roadside bombs (conditional on IED trends).

Results, part ii

We find robust evidence that:

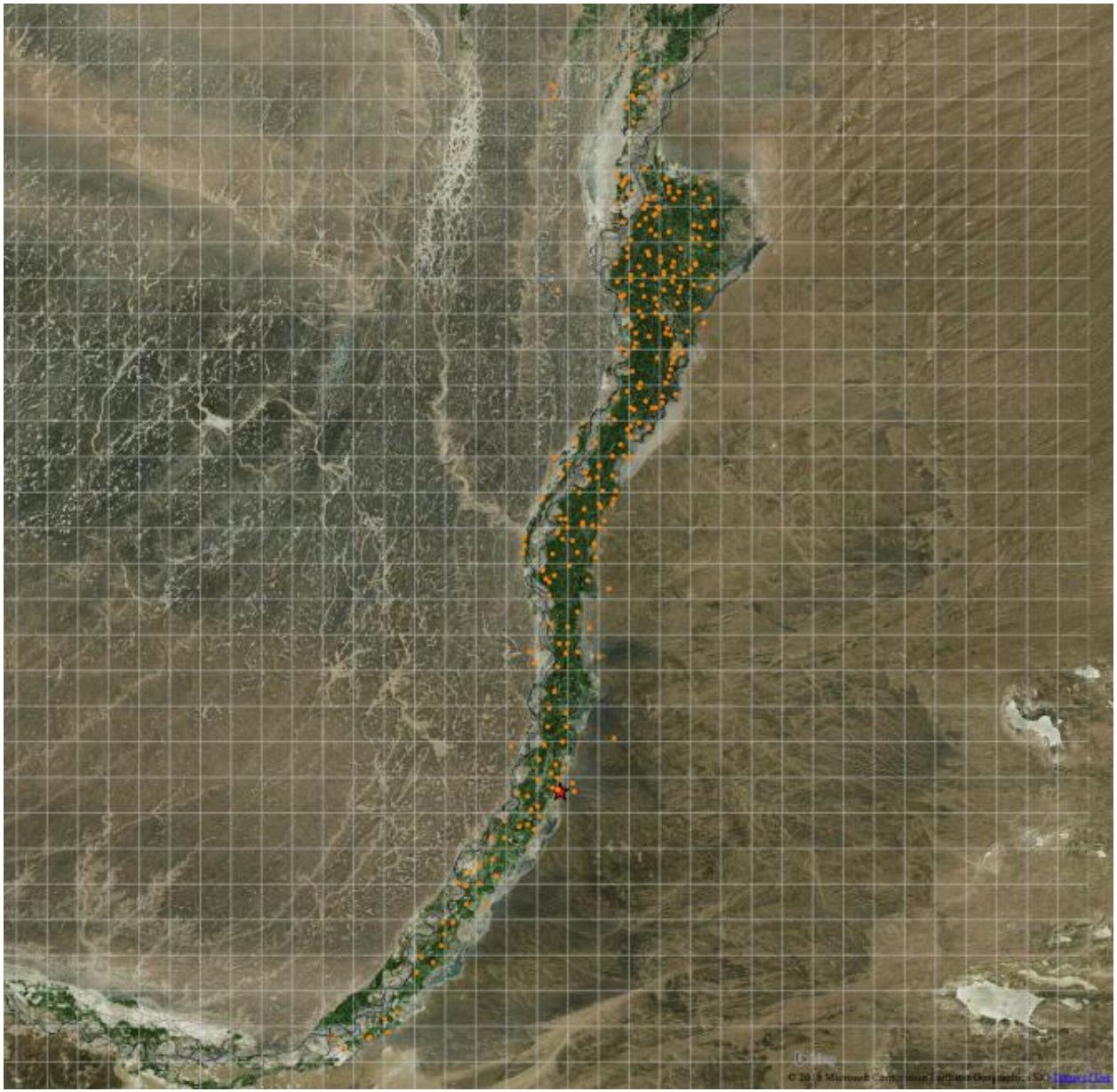
- Intensity of intelligence reports (IEDs/tactical) strongly correlated with counterinsurgent effectiveness: increasing bomb neutralizations, weapon cache seizures, safe house raids, and combatants captured.
- Evidence from Garmser Radio-in-a-Box (RIAB) program yields consistent evidence that PSYOPS exposure increases IED neutralizations (net detonations) and civilian collaboration with ISAF/Afghans.

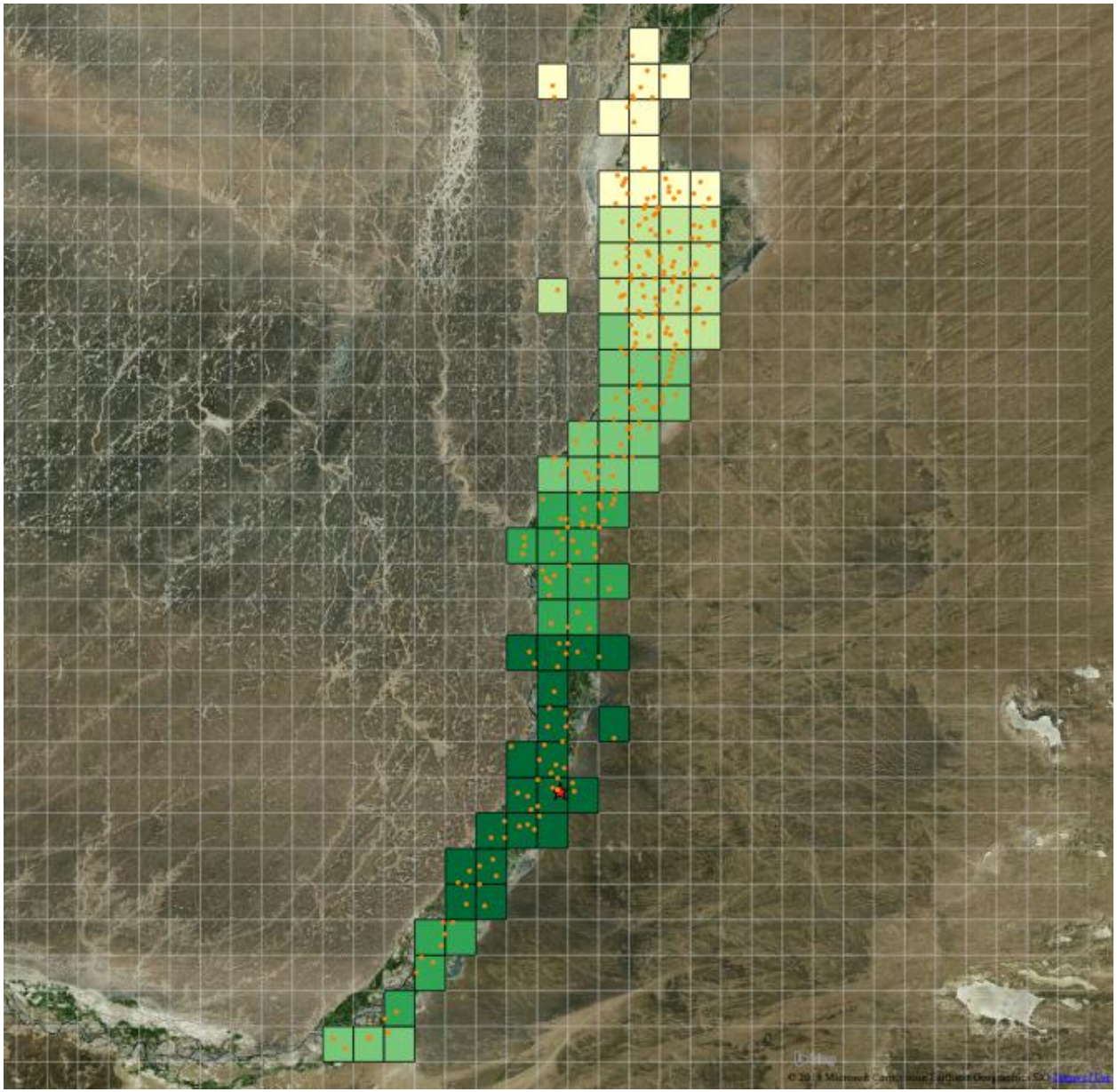
Results, part iii

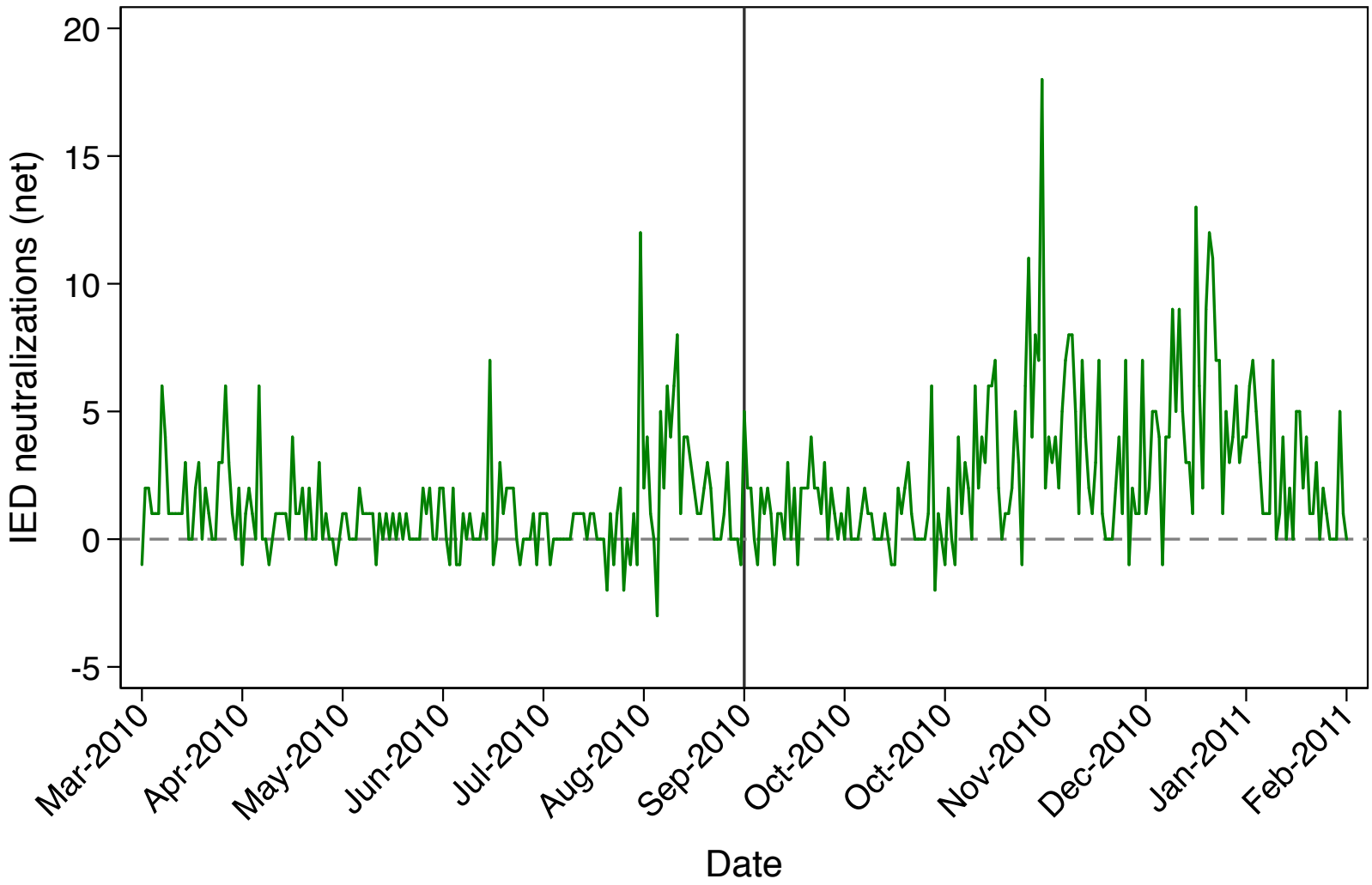
We find robust evidence that:

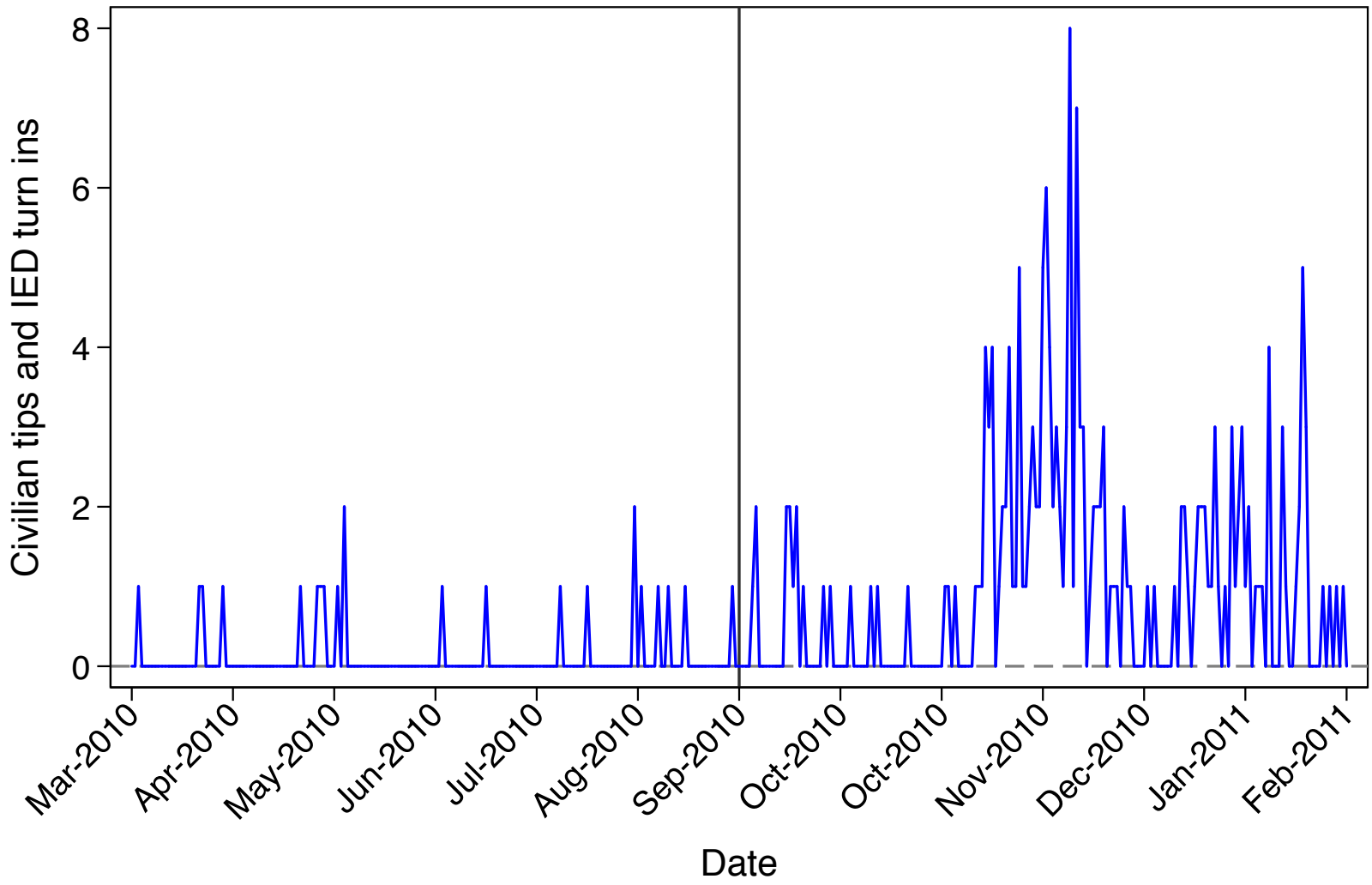
- Exposure to positive messaging about government's reintegration program increases civilian tolerance of former fighters moving to community (even if they've killed/injured a civilian).
- Decreasing marginal return to messaging frequency.
- Mediating role of local social capital (shuras)
- Limited gains from targeting idiosyncratic preferences/trust for/in alternative sources of information.

RIAB study






IED neutralizations (net)
20
15
10
5
0
-5
Mar-2010
Apr-2010
May-2010
Jun-2010
Jul-2010
Aug-2010
Sep-2010
Oct-2010
Oct-2010
Nov-2010
Dec-2010
Jan-2011
Feb-2011
Date


Civilian tips and IED turn ins
0
2
4
6
8
Mar-2010
Apr-2010
May-2010
Jun-2010
Jul-2010
Aug-2010
Sep-2010
Oct-2010
Oct-2010
Nov-2010
Dec-2010
Jan-2011
Feb-2011
Date

Take aways

- PSYOPS can be used to effectively alter civilian attitudes and behaivors.
- These attitudinal/behavioral changes can substantially improve battlefield outcomes.
- Messaging that is moderately frequent and leverages existing local institutions yield benefits; limited returns to high resolution targeting.