Cell Phone Coverage and Conflict: Reporting Bias or Collective Action?

Keng-Chi Chang · University of California San Diego · Replication Project for MLE · 2019-06-05

Overview: Telecom Increases Violence?

- Pierskalla and Hollenbach (2013) APSR
  - In Africa, more cell phone coverage, more conflict
  - Might be driven by lowering cost for collective action
- Weidmann (2016) AJPS ← [Main focus of this replication]
  - Result is due to reporting bias, since easier to report
  - Illustrate by using data in Afghanistan
- Finding: Result is replicated, and both views can hold
  - Consider zero-inflated models for possible underreporting
  - Find low correlation between reporting bias and coverage

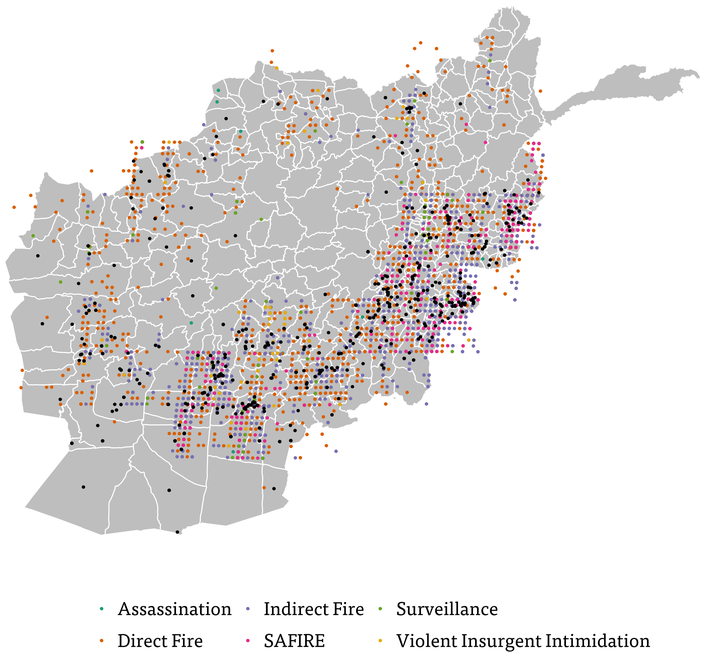
Data: Media-Reported vs. Military-Based

Count of conflict events in Afghanistan in 2008

- Media-Reported: UCDP GED, by media/NGO ($N = 354$)
- Military-Based: SigAct, by US military ($N = 1243$)

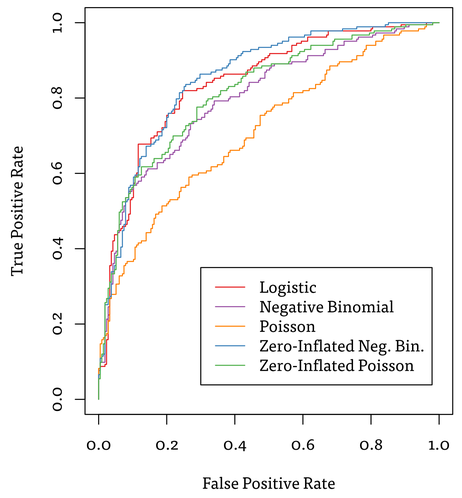
Conflicts in Afghanistan in 2008

Black: Media-Reported (UCDP GED) / Colored: Military-Based (SigAct)



	Media-Reported Data			Military-Based Data			Report Bias (:= Military − Media)		
	𝟙(Conflict > 0)	Conflict Count		𝟙(Conflict > 0)	Conflict Count		𝟙(Bias > 0)	Report Bias	
	Logit	ZINB	ZIP	Logit	ZINB	ZIP	Logit	ZINB	ZIP
Cell Phone Coverage	0.971**	0.696**	0.548***	0.071	0.373	0.430***	0.235	0.256	0.373***
	(0.451)	(0.304)	(0.204)	(0.428)	(0.244)	(0.100)	(0.435)	(0.255)	(0.120)
Log Population Density	0.347**	0.774***	0.786***	0.398***	0.477***	0.549***	0.376**	0.400***	0.444***
	(0.160)	(0.115)	(0.066)	(0.148)	(0.099)	(0.038)	(0.151)	(0.110)	(0.045)
Log Distance Nearst City	0.406**	0.383***	0.370***	−0.080	0.291***	0.350***	−0.060	0.237**	0.334***
	(0.177)	(0.125)	(0.081)	(0.160)	(0.102)	(0.043)	(0.163)	(0.110)	(0.053)
Spatial Lag of Conflict	0.163***	0.041***	0.038***	0.078***	0.016***	0.013***	0.079***	0.014***	0.012***
	(0.024)	(0.007)	(0.004)	(0.010)	(0.002)	(0.0005)	(0.010)	(0.002)	(0.001)
Constant	−7.524***	−10.388***	−10.232***	−5.275***	−5.629***	−6.355***	−5.428***	−4.734***	−5.334***
	(1.992)	(1.580)	(1.018)	(1.770)	(1.248)	(0.528)	(1.818)	(1.354)	(0.623)
Observations	398	398	398	398	398	398	398	398	398
Log Likelihood	−188.532	−356.073	−373.607	−210.449	−648.544	−894.476	−203.118	−567.883	−751.396

ROC Curves for Model Evaluation



Models: Binary Response and Event Count

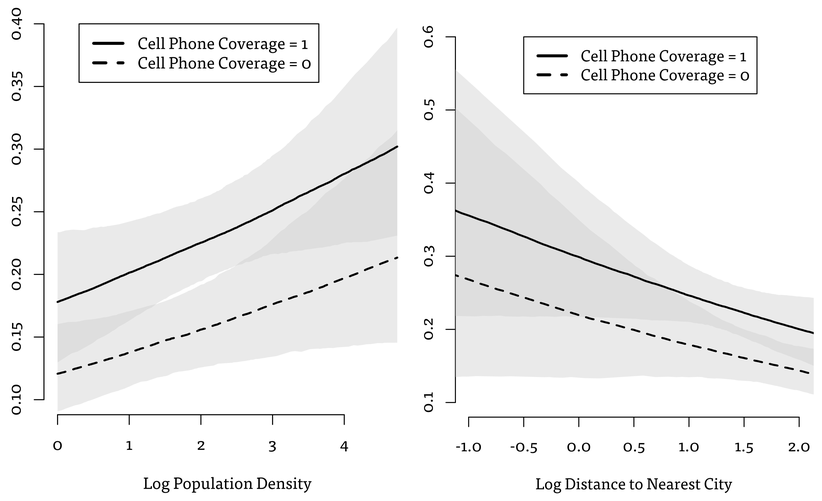
For district i,

$$\text{Conflict}_i = \alpha + \beta \cdot \text{CellCoverage}_i + \gamma \cdot \log(\text{Population})_i + \delta \cdot \log(\text{DistNearCity})_i + \theta \cdot \text{SpatialLag}_i + \varepsilon_i$$

Possibly fake zeros, also extend to zero-inflated models

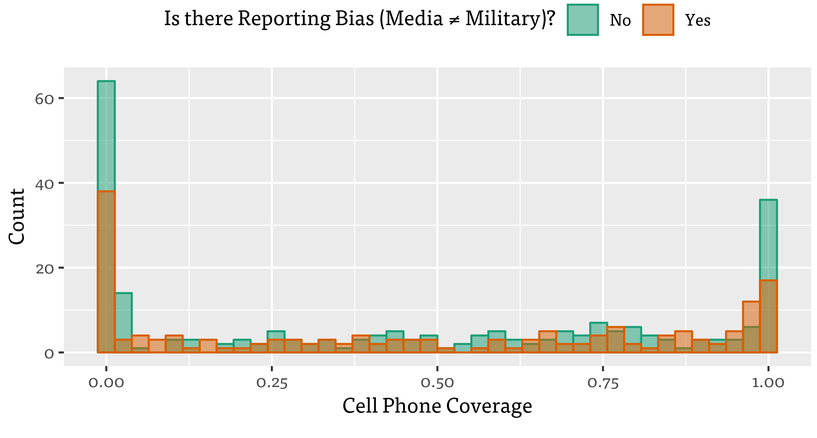
$$P(\text{Conflict}_i = y_i) = \begin{cases} \pi_i + (1-\pi_i) f_Y(0|\lambda_i) & \text{if } y_i = 0, \\ (1-\pi_i) f_Y(y_i|\lambda_i) & \text{if } y_i > 0. \end{cases}$$

Predicted Probability of Conflict Being Reported Based on Cell Phone Coverage



Finding: Corr(Rep Bias, Cell Cov) is Low

Extensive Margin: Reporting Bias Occurs Everywhere



Intensive Margin: Reporting Bias & Coverage Uncorrelated