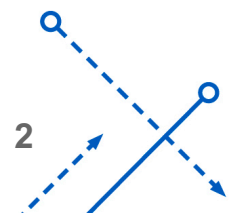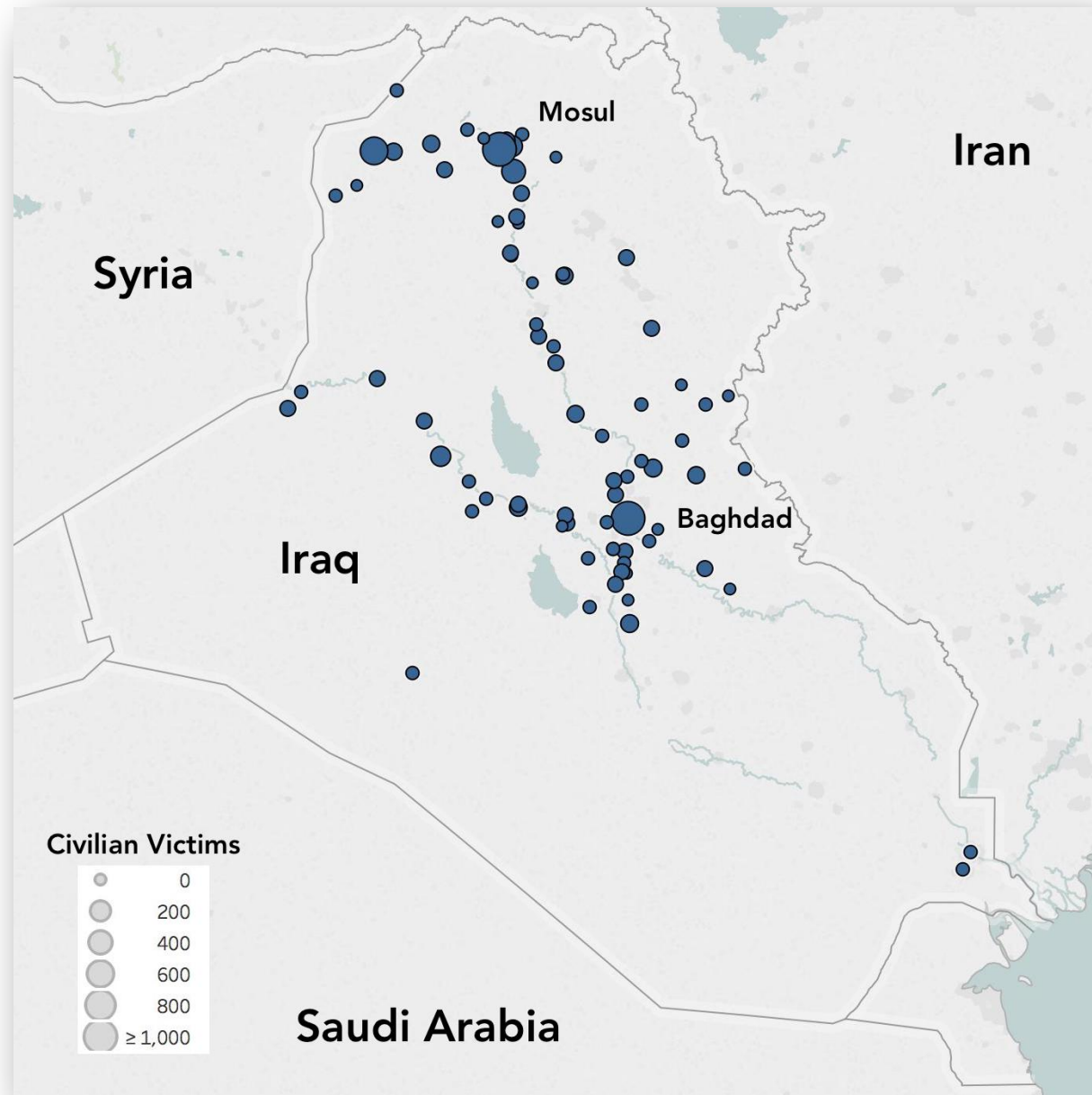# UNFORESEEN CONSEQUENCES:

The Effect of Aerial Bombardment on ISIS Civilian Victimization
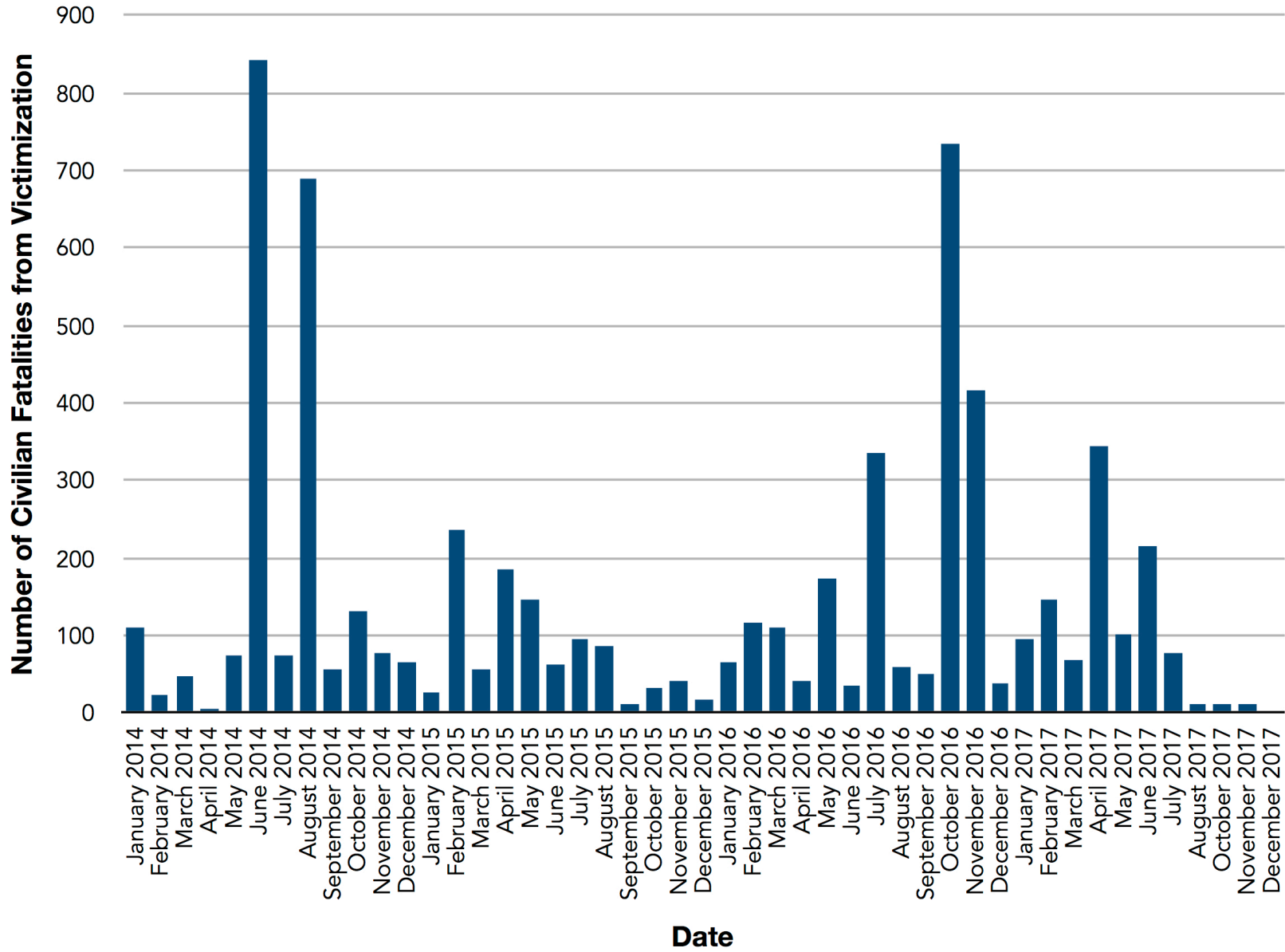
Colin Tucker

Ph.D. Candidate
Department of Political Science
ColinTuckerUSA@gmail.com

UB University at Buffalo The State University of New York

Civilian Victims

- 0
- 200
- 400
- 600
- 800
- ≥ 1,000

STRATEGIC

Civilian victimization is **deliberate** and **goal-oriented.**

[
Territorial Control
Battlefield-Dynamics
Civilian Affiliation
]

ORGANIZATIONAL

Civilian victimization results from poor **constraint** and **discipline**
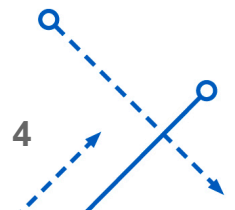
[
Funding Source
Group Cohesiveness
Unit Discipline
]

AIRSTRIKES

- Degrade Local Resources
- Eliminate High-Echelon Fighters
- Impose Psychological Impairments

DEGRADES LOCAL RESOURCES

1 **Civilians choose to migrate when the costs of staying outweigh the costs of leaving.**

Moore & Shellman, 2004

2 **As civilians leave and infrastructure is destroyed, insurgencies become weaker.**

Lyall, 2009

3 **As insurgencies become weaker, they abuse civilians more.**

Hultman, 2009
Wood, 2010
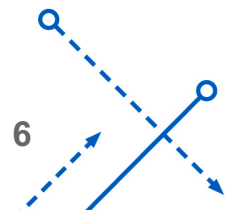
ELIMINATES HIGH-ECHELON FIGHTERS

1 **Most disciplined and ideologically driven fighters remain "in the rear"**

Speckhard & Yayla, 2017

2 **Air campaigns expand geographic scope of insurgency fatalities to those behind the front-line, targeting high-echelon fighters.**

3 **Greater losses among the group's high-echelon fighters reduces organizational cohesion and relaxes constraints on civilian abuse.**

Humphrey & Weinstein, 2006
Abrahms & Mierau, 2017
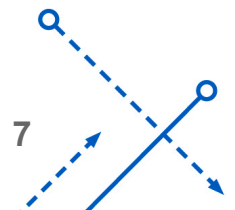
IMPOSES PSYCHOLOGICAL IMPAIRMENTS

1 **Sustained aerial bombardment causes fear, anxiety, and stress.**

RAND, 1996

2 **Fighters seek cover in civilian population centers, placing fighters and civilians face-to-face.**

3 **Local unit-cohesion breaks down; civilians are blamed for strikes; fear of internal subversion intensifies.**

Speckhard & Yayla, 2015
Speckhard & Yayla, 2017

AIRSTRIKES

Degrade Local Resources:

Fighters demand more and receive less.

Eliminate High-Echelon Fighters:

More authority is placed in less ideologically-driven fighters.

Impose Psychological Impairments:

Unit cohesion is impaired and fear promotes confrontation with civilians.

H₁ The **greater the number of airstrikes** within a territorial region, the greater the magnitude of civilian victimization by ISIS in that region.

9
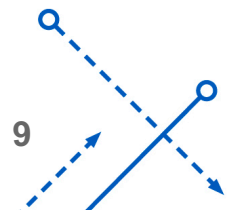
RESEARCH DESIGN

Scope:
July 2014 to December 2017
Iraq

Level of Analysis:
Second-Order Administrative Units (x109)
Semi-Month (x84)

Dependent Variable:
Number of Civilian Deaths
UCDP Georeferenced Event v18.1

Statistical Test
Zero-Inflated, Negative Binomial Regression
Clustered Standard Errors on Admin. Unit

SAMPLE SELECTION

To eliminate the portion of the sample that we can be reasonably confident that ISIS was absent in…

Administrative-Unit Excluded if:
- No Battlefield Violence by ISIS Recorded
- No Civilian Victimization by ISIS Recorded
- No Territorial Contestation by ISIS Recorded
- No Counter-Insurgency Airstrikes Recorded

Zero-Inflated Model:
- Presence of Battlefield Violence by ISIS {0,1}
- Presence of Victimization by ISIS {0,1}
- Presence of Contestation by ISIS {0,1}
- Presence of Counter-Insurgency Airstrikes {0,1}
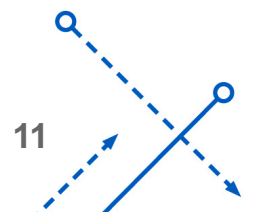
INDEPENDENT VARIABLE

AIRWARS PROJECT

- Measured as number of "strikes" in preceding semi-month

- Defined as "one or more kinetic events that occur in roughly the same geographic location"

- Sourced from regular military briefings and reports

- Independent analysis finds most records fall within 10 km of actual strike location

- Russia excluded

- 68% are USA

CONTROL VARIABLES

- **Territorial Control/Contest**

- **Oil Revenue**

- **Battlefield Fatalities**

- **Ratio of Fatalities**

- **Population**

- **Previous Victimization**

- **Time**

- **Sunni Demographic**

RESULTS

Table II. Zero-Inflated Negative Binomial Regression of ISIS Civilian Victimization

	(1)	(2)	(3)	(4)	(5)	(6)
Airstrikes $_{t-1}$	0.032* (0.01)	0.032* (0.01)	0.033* (0.01)	0.032* (0.01)	0.029** (0.01)	0.015** (0.01)
Territory: ISIS Control (Strict) $_{t-1}$	-1.605*** (0.44)	-1.607*** (0.42)	-1.616*** (0.44)	-1.659*** (0.46)	-1.486*** (0.37)	-0.486 (0.33)
Territory: Contested (Strict) $_{t-1}$	-1.231* (0.54)	-1.246* (0.54)	-1.238* (0.54)	-1.181* (0.52)	-1.057* (0.45)	-0.813*** (0.22)
Battlefield Fatality Ratio $_{t-1}$		0.224 (0.67)				
Fatalities: ISIS $_{t-1}$			-0.000 (0.01)			
Fatalities: Government $_{t-1}$			-0.003* (0.01)			
Total ISIS Territories (Strict) $_{t-1}$				0.155 (0.11)		
Log(Oil Revenues) $_{t-1}$					0.219 (0.14)	

RESULTS

Table III. Zero-Inflated Negative Binomial Regression of Airstrikes

	(7)	(8)	(9)	(10)
Civilian Victimization $_{t-1}$	-0.001 (0.01)	-0.000 (0.01)		-0.001 (0.01)
Civilian Victimization $_{t-2}$		**-0.003*** (0.01)		
Civilian Victimization $_{t-3}$		0.000 (0.01)		
Civilian Victimization $_{t-4}$		0.000 (0.01)		
Civilian Victimization $_{m-1}$			-0.002 (0.01)	
Fatalities: ISIS $_{t-1}$				**-0.003*** (0.01)
Fatalities: Government $_{t-1}$				0.000 (0.01)
Battlefield Fatalities $_{t-1}$	**-0.002*** (0.01)	**-0.003** (0.01)	**-0.002** (0.01)	

15
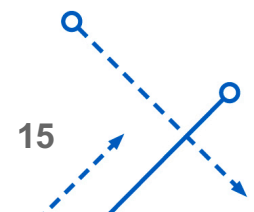
Predicted Civilian Fatalities from ISIS Victimization

Legend: ■ 0   ■ 1+   ■ 100+

Y-axis: Cumulative Predicted Probability (0% to 100%)

X-axis: Number of Airstrikes (t-1) (0 to 35)
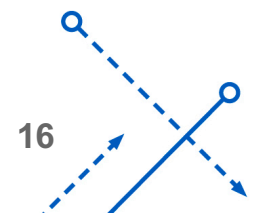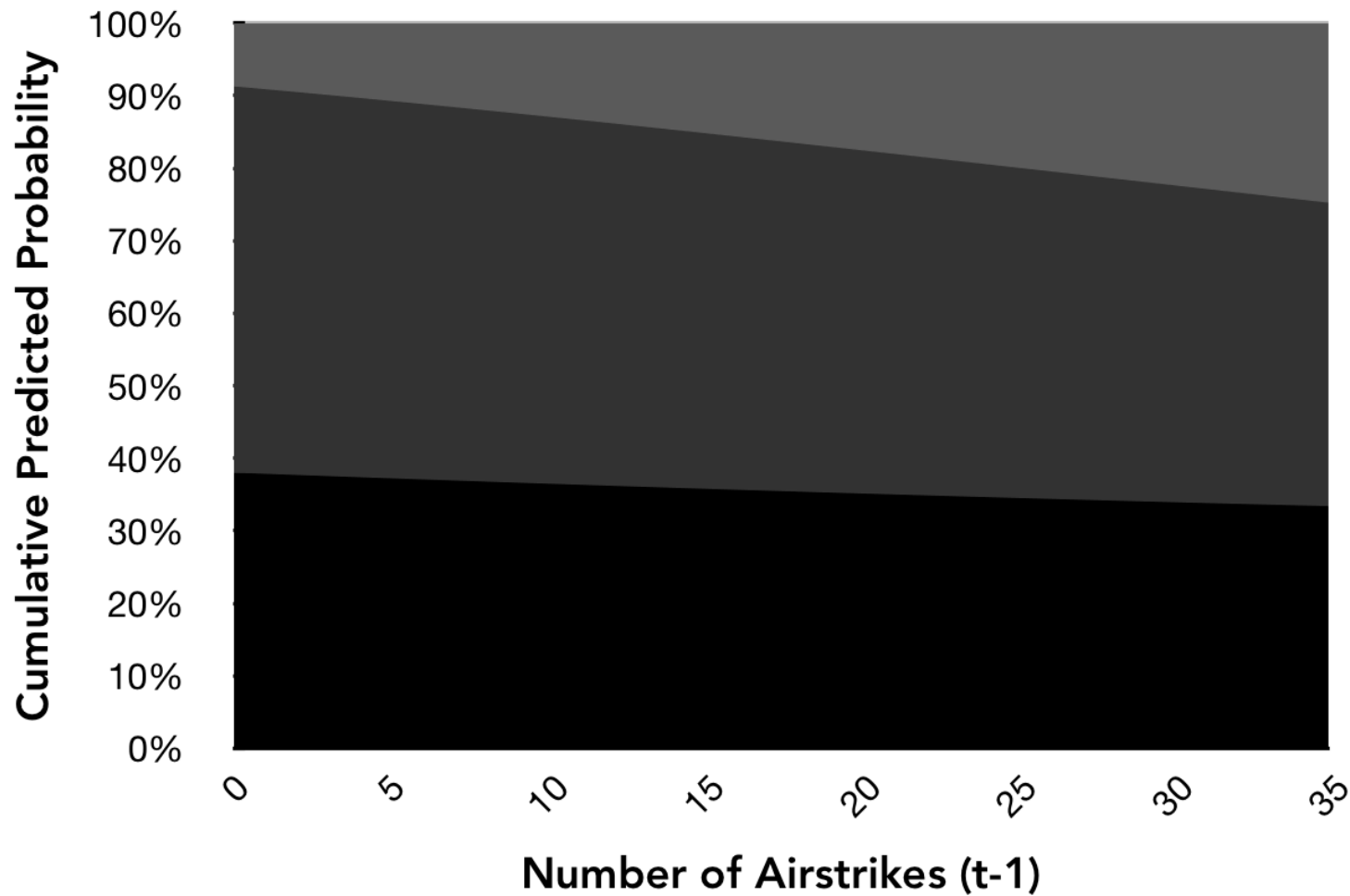
POLICY IMPLICATIONS

WHAT IS KNOWN:

- Military interventions trade short-term spikes in violence for long-term peace.

- Air campaigns can help degrade an insurgency's military effectiveness.

NEW INFORMATION:

- Aerial strikes could induce civilian victimization in the short-term.

- It may be optimal to focus targeting on insurgency strongholds.
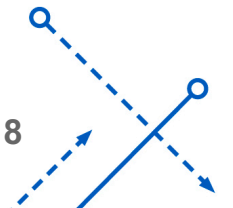
Thank you!

Table II. Zero-Inflated Negative Binomial Regression of ISIS Civilian Victimization

	(1)	(2)	(3)	(4)	(5)	(6)
Airstrikes $_{t-1}$	0.032*	0.032*	0.033*	0.032*	0.029**	0.015**
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Territory: ISIS Control (Strict) $_{t-1}$	-1.605***	-1.607***	-1.616***	-1.659***	-1.486***	-0.486
	(0.44)	(0.42)	(0.44)	(0.46)	(0.37)	(0.33)
Territory: Contested (Strict) $_{t-1}$	-1.231*	-1.246*	-1.238*	-1.181*	-1.057*	-0.813***
	(0.54)	(0.54)	(0.54)	(0.52)	(0.45)	(0.22)
Battlefield Fatality Ratio $_{t-1}$		0.224				
		(0.67)				
Fatalities: ISIS $_{t-1}$			-0.000			
			(0.01)			
Fatalities: Government $_{t-1}$			-0.003*			
			(0.01)			
Total ISIS Territories (Strict) $_{t-1}$				0.155		
				(0.11)		
Log(Oil Revenues) $_{t-1}$					0.219	
					(0.14)	
Sunni Minority	1.848*	1.872*	1.824*	1.736*	1.136	-1.816***
	(0.84)	(0.86)	(0.88)	(0.86)	(0.86)	(0.41)
Log(Population)	-0.034	-0.025	-0.040	-0.070	-0.326	0.813***
	(0.45)	(0.43)	(0.45)	(0.47)	(0.31)	(0.12)
Civilian Victimization $_{t-1}$	0.001	0.001	0.001	0.001	0.002	0.004***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Battlefield Fatalities $_{t-1}$	-0.001	-0.001		-0.001	-0.000	0.002
	(0.01)	(0.01)		(0.01)	(0.01)	(0.01)
Time	-0.012	-0.009	-0.012	-0.036	-0.106*	0.011
	(0.02)	(0.02)	(0.02)	(0.04)	(0.05)	(0.01)
Time^2	0.000	0.000	0.000	0.000	0.002**	-0.000*
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Constant	3.679	3.428	3.758	3.621	7.462	-13.636***
	(6.20)	(5.98)	(6.26)	(6.24)	(4.24)	(1.59)
Dummy: Civilian Victimization $_{t-1}$	-3.062***	-3.060***	-3.062***	-3.038***	-2.699***	
	(0.29)	(0.28)	(0.28)	(0.27)	(0.29)	
Dummy: Battlefield Fatalities $_{t-1}$	-1.585***	-1.588***	-1.585***	-1.572***	-1.448***	
	(0.37)	(0.37)	(0.37)	(0.37)	(0.41)	
Dummy: Airstrikes $_{t-1}$	-0.233	-0.235	-0.232	-0.248	-0.336	
	(0.30)	(0.31)	(0.30)	(0.31)	(0.32)	
Territory: Government Control (Strict) $_{t-1}$	0.101	0.104	0.100	0.076	-0.097	
	(0.62)	(0.63)	(0.62)	(0.61)	(0.61)	
Constant	3.753***	3.753***	3.754***	3.784***	3.681***	
	(0.48)	(0.47)	(0.48)	(0.45)	(0.45)	
Alpha	0.995*	0.995*	0.995*	0.953*	0.818*	
	(0.44)	(0.43)	(0.44)	(0.43)	(0.38)	
N	4,731	4,731	4,731	4,731	3,249	2,905
Log-Likelihood	-1367.418	-1367.278	-1367.350	-1366.846	-1123.248	-1155.005
X^2	59.780	153.556	65.603	69.120	266.104	193.934
AIC	2766.835	2768.556	2768.700	2767.693	2280.496	2330.011
BIC	2870.225	2878.408	2878.552	2877.545	2383.960	2389.753

Robust standard errors (clustered on second-order, administrative unit) in parentheses.

Two-tailed significance tests;

* = p < 0.05   ** = p < 0.01   *** = p < 0.001

Table III. Zero-Inflated Negative Binomial Regression of Airstrikes

	(7)	(8)	(9)	(10)
Civilian Victimization $_{t-1}$	-0.001	-0.000		-0.001
	(0.01)	(0.01)		(0.01)
Civilian Victimization $_{t-2}$		-0.003***		
		(0.01)		
Civilian Victimization $_{t-3}$		0.000		
		(0.01)		
Civilian Victimization $_{t-4}$		0.000		
		(0.01)		
Civilian Victimization $_{m-1}$			-0.002	
			(0.01)	
Fatalities: ISIS $_{t-1}$				-0.003***
				(0.01)
Fatalities: Government $_{t-1}$				0.000
				(0.01)
Battlefield Fatalities $_{t-1}$	-0.002***	-0.003**	-0.002**	
	(0.01)	(0.01)	(0.01)	
Territory: ISIS Control (Strict) $_{t-1}$	0.774*	0.744*	0.765*	0.779*
	(0.34)	(0.34)	(0.33)	(0.34)
Territory: Contested (Strict) $_{t-1}$	0.823*	0.786*	0.816*	0.820*
	(0.36)	(0.35)	(0.35)	(0.36)
Airstrikes $_{t-1}$	0.054***	0.055***	0.054***	0.054***
	(0.01)	(0.01)	(0.01)	(0.01)
Time	-0.015	-0.010	-0.016	-0.016
	(0.01)	(0.01)	(0.01)	(0.01)
Time^2	0.000	0.000	0.000	0.000
	(0.01)	(0.01)	(0.01)	(0.01)
Constant	1.212***	1.116***	1.226***	1.223***
	(0.31)	(0.34)	(0.30)	(0.31)
Dummy: Civilian Victimization $_{t-1}$	-0.151	-0.229	-0.148	-0.148
	(0.38)	(0.34)	(0.38)	(0.38)
Dummy: Battlefield Fatalities $_{t-1}$	-0.783**	-0.849***	-0.855***	-0.782**
	(0.24)	(0.23)	(0.24)	(0.24)
Dummy: Airstrikes $_{t-1}$	-5.342***	-5.183***	-5.288***	-5.336***
	(0.77)	(0.63)	(0.73)	(0.76)
Territory: ISIS Control (Strict) $_{t-1}$	-1.616*	-1.723*	-1.648*	-1.617*
	(0.72)	(0.74)	(0.73)	(0.72)
Territory: Contested (Strict) $_{t-1}$	-1.282**	-1.380**	-1.309**	-1.284**
	(0.44)	(0.44)	(0.44)	(0.44)
Constant	3.501***	3.525***	3.500***	3.503***
	(0.38)	(0.38)	(0.38)	(0.38)
Alpha	-0.076	-0.112	-0.080	-0.079
	(0.16)	(0.16)	(0.16)	(0.16)
N	4731.000	4560.000	4674.000	4731.000
Log-Likelihood	-4202.553	-4140.832	-4195.346	-4201.726
X^2	284.187	361.236	262.801	309.600
AIC	8435.105	8317.665	8420.693	8435.452
BIC	8532.034	8433.316	8517.439	8538.842