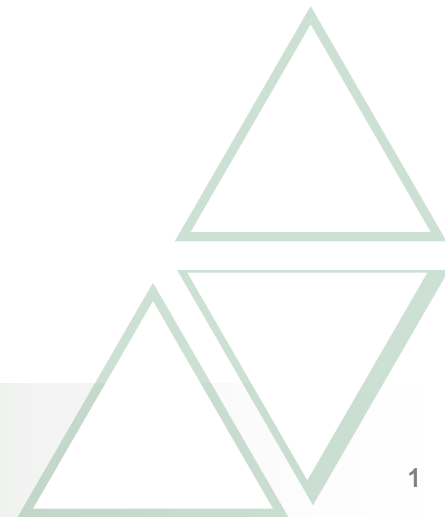


# Modeling of Organizational Violence

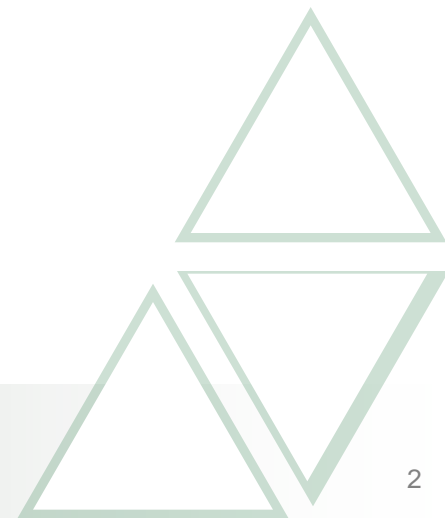
## Violent Intent Modeling and Simulation (VIMS)

Georgiy Bobashev, Burton Levine, Joe Eyerman, Michael Schwerin, and Richard Legault

November 04, 2010

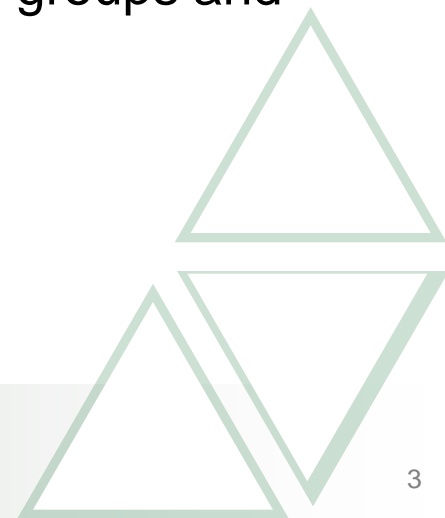


# VIMS Background



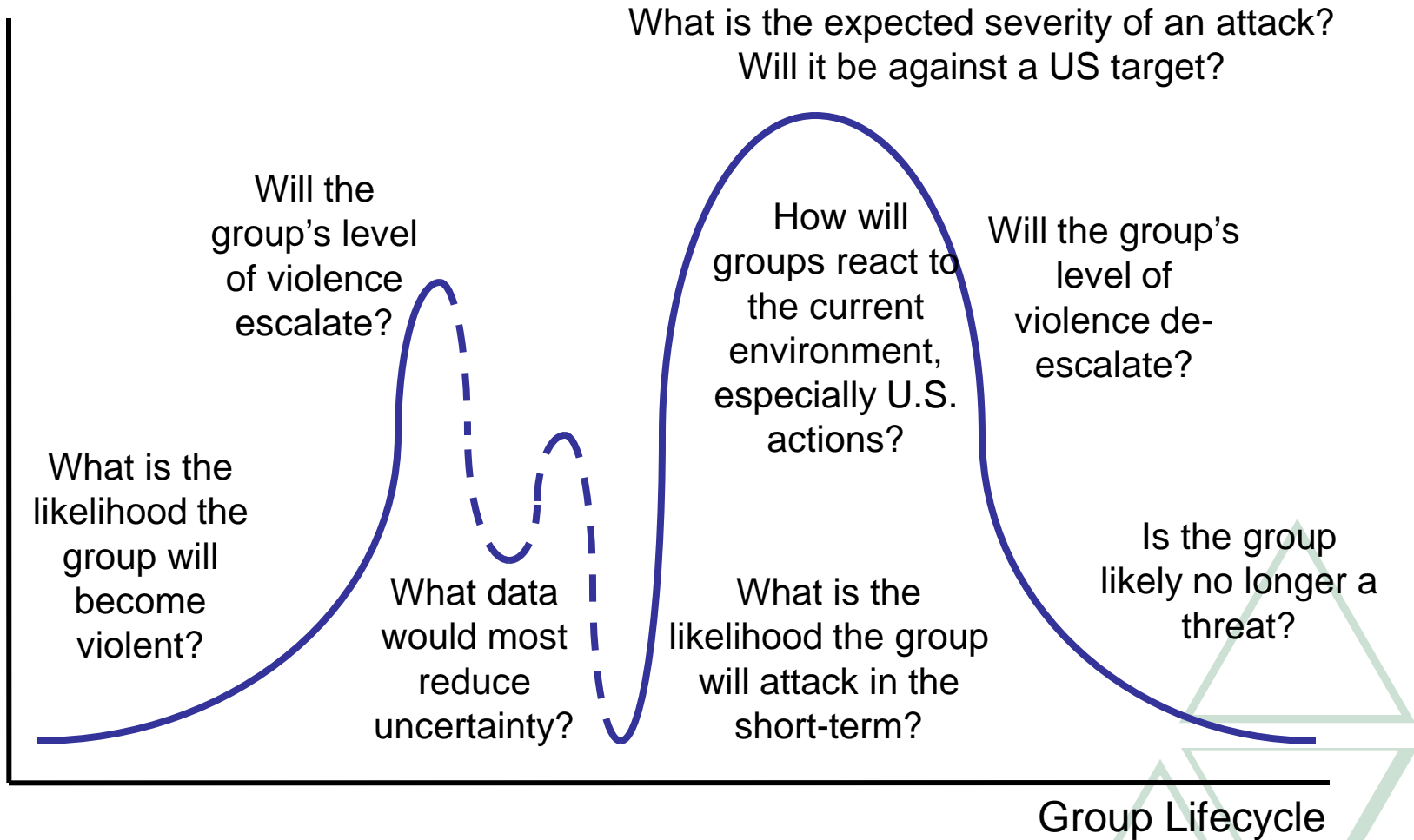
# VIMS: Background

- R&D sponsored by Human Factors Division at DHS S&T
- Initial work conducted by DoE laboratories
- Transitioned to IHSS in 2008
- Objectives of VIMS 2.0:
  - Incorporate social science theories into intelligence analysis
  - Design a system that follows the intelligence analyst (IA) workflow
  - Build a system architecture that is ready for the analyst desktop
  - Generate models to interpret motivations of violent groups and identify key predictors of violence escalation

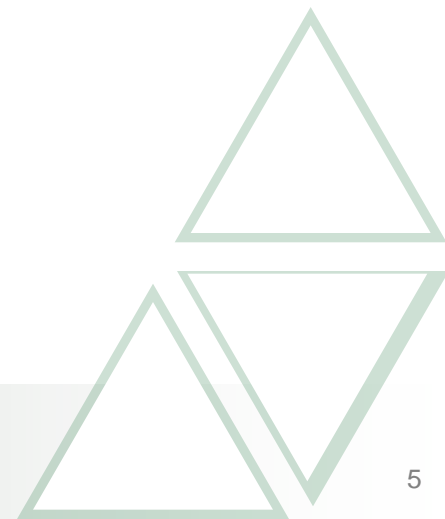


# Potential Utility of VIMS for IA Decision Support

Level of Violence



# VIMS Modeling



# Modeling Challenges

1. Produce models that will help analysts assess risks group and organizational violence
  - Use social science theories to assist analysis in understanding potential scenarios
2. Produce models that would help analysts to forecast future violence outcomes
  - Violence against humans
  - Violence escalation/de-escalation
  - Violence initiation/cessation



# Four Types of Models

## – Measurement models

- How do we measure certain constructs from available data?
  - Variable passports and text analytic tools

## – Exploratory models

- What does the data show us?
  - data reduction, descriptive analyses, and correlation analysis

## – Criteria-based models

- Based on Social Theories what is a set of criteria that is associated with violence? How to interpret them?

## – Predictive models

- Can we predict (and if yes how well) violence outcomes such as attack timing, targets and fatality?

# Publicly Available Datasets Used in the Analysis

Data has been provided by START center at the University of Maryland

- Minorities at Risk Organizational Behavior (MAROB)
- Global Terrorism Database (GTD)
- The Big Allied And Dangerous (BAAD)
- Terrorism in Western Europe: Events Data (TWEED)



# Criteria-based Models

- Objectives
  - Identify the best set of variables (criteria) associated with violence
  - Outcome: violence against people
- Data
  - MAROB (113 minority organizations in Middle East and North Africa)
- Variable selection process
  - Theory-based bivariate associations
  - Variable crosswalk
  - Multivariate associations
  - Tiers 1 and 2



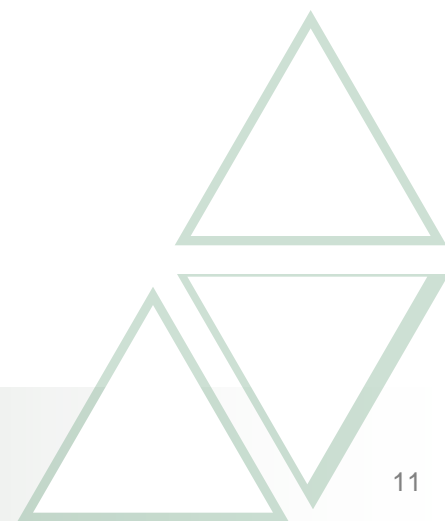
# Criteria-based Models

- Between-group comparison
  - Which of the groups show most threat?

Criterion	Organization Number									
	1	2	3	4	5	6	7	8	9	10
Total events per million pop	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
Organization legal	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red
State treatment of organization	Yellow	Yellow	Green	Yellow	Yellow	Green	Green	Green	Green	Yellow
Foreign state nonviolent military support	Green	Green	Red	Red	Green	Green	Green	Red	Red	Red
Military wing	Red	Red	Red	Red	Red	Red	Green	Green	Red	Red
Inter-organizational conflict	Red	Red	Green	Red	Red	Green	Green	Green	Red	Green
Organization advocates exclusion of women	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
State violence	Yellow	Yellow	Green	Yellow	Green	Yellow	Green	Green	Green	Yellow
Organization received support from Diaspora	Green	Green	Green	Green	Red	Green	Green	Green	Red	Green
Violent intra-organizational conflict	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green

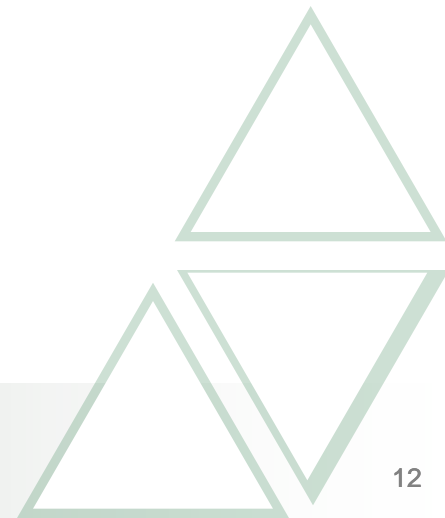
- Within the group comparison
  - Is a group moving towards violence or away from it?
- Finding similar groups
  - Which groups in the past are similar to the one of interest?

# Example



# Example Objective and Approach

- Objective: Group 37 is violent in 1999, what are the expected trajectories over the next 5 years?
- Approach: Identify similar groups in earlier years (e.g., 1993) and examine what happened to them in the ext several years.



# Finding Similar Groups

Group	Year				
	1993	1994	1995	1996	1997
38	V	V			
39	V	V	V		
40	V	V	V	V	V
72	V	V			
80	V		V	V	
96	V	V			
98	V	V	V		

# Finding Similar Groups (Red=Violent, Green=Non-violent)

Group	Year				
	1993	1994	1995	1996	1997
38	Red	Red	Green	Green	Green
39	Red	Red	Red	Green	Green
40	Red	Red	Red	Red	Red
72	Red	Red	Red	Green	Green
80	Red	Green	Red	Red	Green
96	Red	Red	Green	Green	Green
98	Red	Red	Red	Green	Green

37	Red	Red	Red	Green	Green
Group	1999	2000	2001	2002	2003
	Year				

# Summary

- We examined 7 groups in 1993 that would be similar to group 37 in 1999.
- Most of the groups have ceased violence in 5 years. Their characteristics have also changed in time.
- The pattern of their characteristic change crudely corresponds to the pattern of violence.
- In the period 1999-2003 group 37 ceased being violent in 3 years, about the average time for the similar set of groups in 1993.

# Thank you

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