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Indiana State Department of Health

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Keynote Speaker

Civilian and EMS Response to Active Shooter Events

Dr. Babak Sarani

Profile of wounding in civilian public mass shooting fatalities: Current State and Next Steps

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Disclosures

- None
- This is NOT a talk about the 2nd Amendment
- This is NOT a talk that will end with "Tourniquets are Bad"

Acknowledgments

- E. Reed Smith, MD
  - Assistant Professor of Emergency Medicine
  - Arlington Co EMS Medical Director, Virginia
- Geoff Shapiro, EMT-P
  - Director, EMS and Operational Medicine Training, George Washington University

Objectives

- Review history of TCCC
- Discuss data on causes of death in civilian active shooter events
- Discuss evolving role of TECC

Background

- Incidence of mass shootings is increasing
- Current response paradigms still rely nearly entirely on highly trained, public agencies for rescue
- Most Police and EMS SOP result in delays in patient transport and care

Background

- Hemorrhage = most common cause of preventable death after injury
  - Hartford Consensus views hemorrhage as the "critical step" in eliminating preventable death in the prehospital setting
- Tactical Combat Casualty Care (TCCC) guidelines stress use of tourniquets
  - Extrapolated to "Stop the bleed" campaign

TCCC

- First developed in 1993
  - 25% of military fatalities were preventable
  - 10% of preventable deaths were due to extremity hemorrhage
- ATLS concepts applied in Somalia were inadequate

Military ATLS Concepts Before TCCC

- Airway before bleeding
- Did not take into account tactical situation
- No tourniquets – direct pressure only
- 2 IVs in all pts, no I/Os
- 2 liters saline and then more saline
- Generous use of ETT
- Antibiotics not mentioned
- Generous use of spinal precautions

TCCC now

- 3 phases: Care under fire, tactical field care, TACEVAC
- Bleeding before airway
  - Tourniquets, hemostatic dressings, plasma, TXA
- NPA in place of ETT
  - Sit out or place in “recovery position”
- Needle thoracostomy
- Heplock IV (or don’t place one at all)
- Hypotensive resuscitation

Our Premise

- Just as the tenets of civilian ATLS did not work in the battlefield, the concepts of TCCC do not translate fully to the civilian environment

Hypothesis

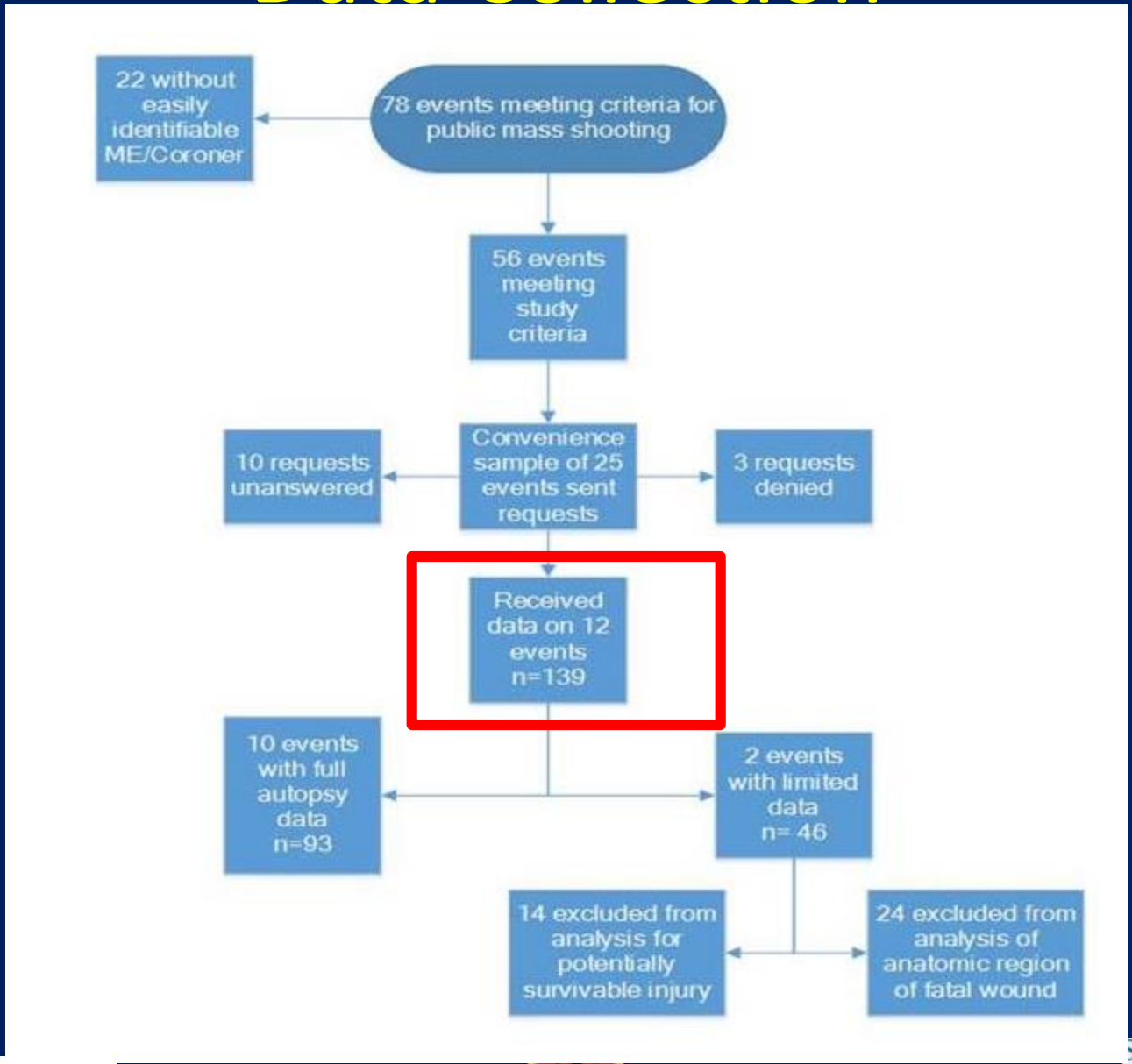
- Civilian patterns of wounding and causes of fatality differ significantly from military-associated woundings
- Strategies developed to rescue wounded following military combat-associated woundings may not be as effective in the civilian setting

The Only Study on CMSE*

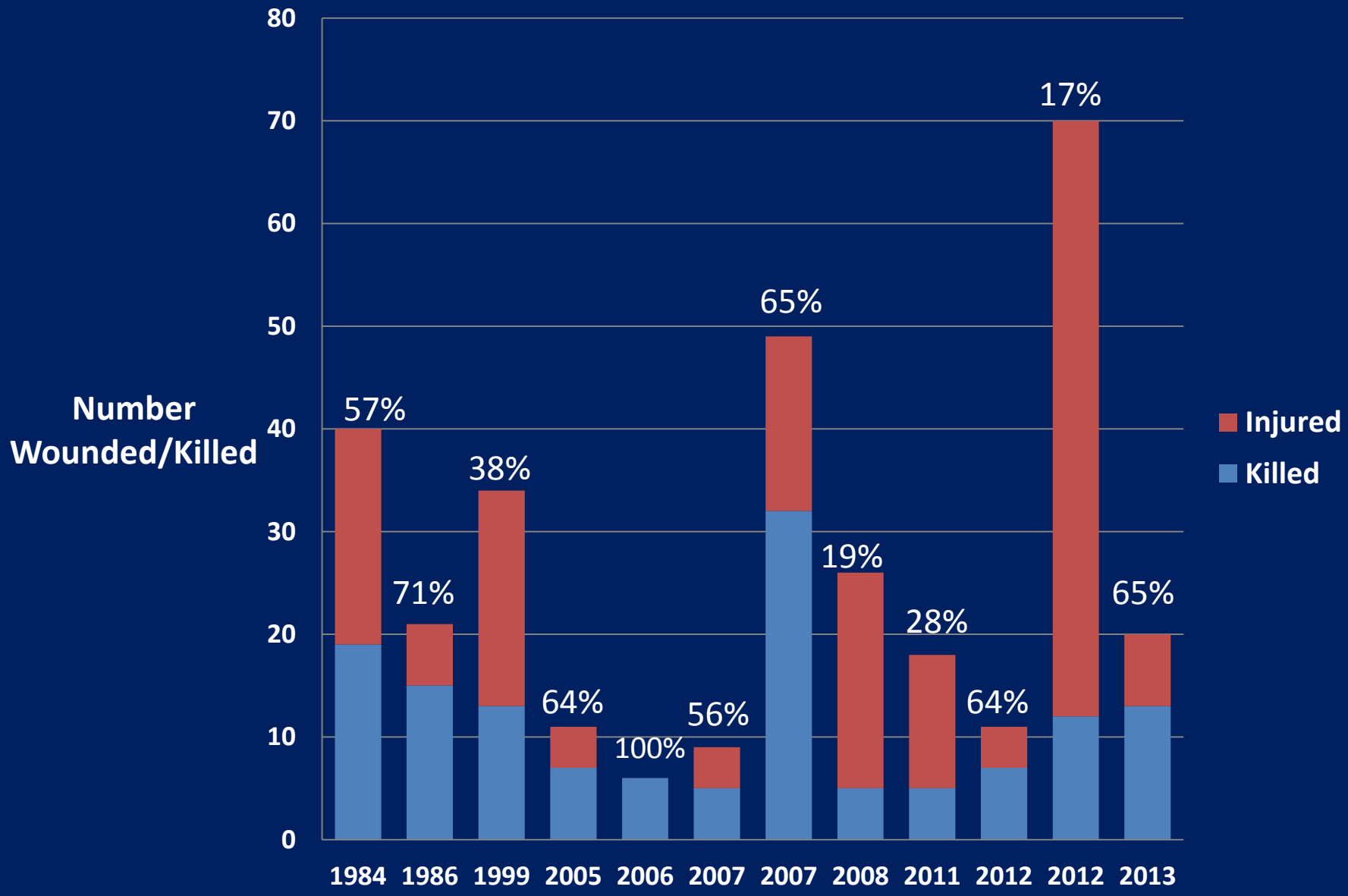
- Civilian Mass Shooting Event**
  - 1. Occurs in public place
  - 2. Involves 4 or more deaths, not including shooter
  - 3. Gunmen who select victims indiscriminately
  - 4. Shooting is not a means to an end (e.g. robbery)

*Smith, et al. Journal of Trauma Acute Care Surg 2016; 81:86-92
**FBI and Congressional Research Office Definition

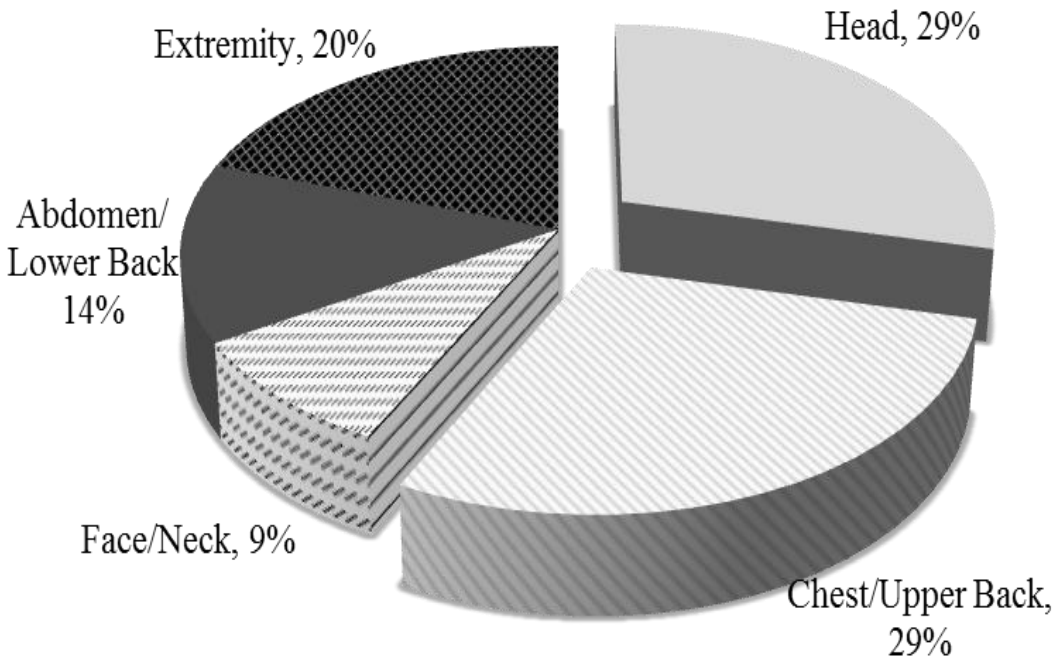
Data Collection



Number of Persons Killed/Injured by Event



Distribution of all wounds by anatomic location (n=297)



56% of victims (78/139) had wounds in multiple anatomic regions.

Military v Civilian Fatal Wounds

Figure 1: Site of Fatal Injury in Combat Personnel[6]

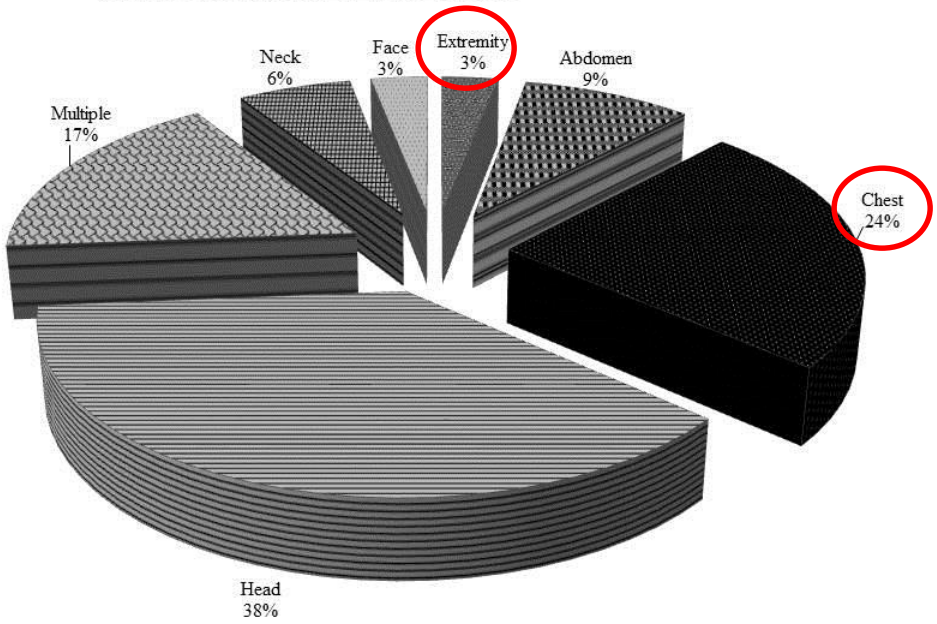
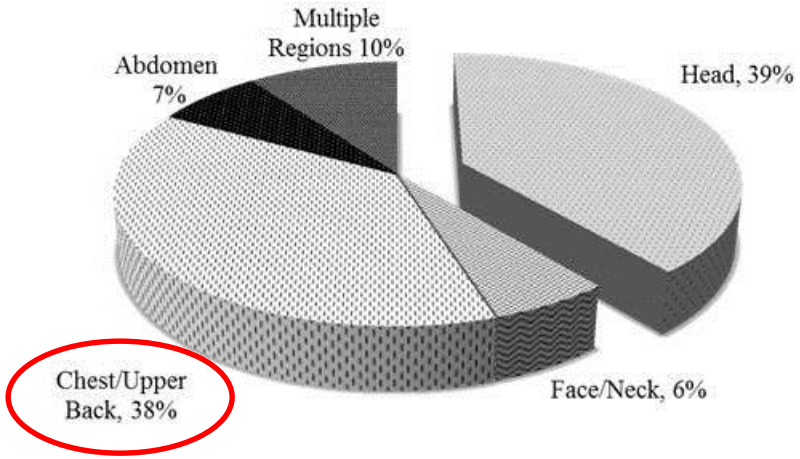


Figure 4: Distribution of Fatal Wounds by Anatomic Location (n=115)



Questions

- Could the dead have survived if:
  - 1. EMS arrived within 10 minutes
  - 2. Arrival to trauma center within 1 hour

Preventable Deaths

TABLE 2. Wounding Pattern in Patients Deemed to Have Had Potentially Survivable Injuries

Anatomic Region	Number of Wounds	Weapon
Face/Neck/Chest	2	Shotgun
Neck/Chest	3	Shotgun
Face/Neck/Chest	2	Shotgun
Chest/Upper back	2	Handgun
Face/Chest	5	Shotgun
Chest/Back/Abdomen	5	Handgun
Chest	3	Handgun
Chest	1	Handgun
Face	1	Handgun

Preventable death rate = 7%, majority due to isolated chest without PTX or cardiac injury

Case Fatality Rate

- Military = 10% (OIF/OEF)
  - Farther distance
  - Body armor
  - More ready access to health care
  - 24% of wounds are potentially survivable*
- Civilian = 45%
  - Closer range
  - Exposed/unprotected
  - EMS delay to transport
  - 7% of wounds are potentially survivable

*Eastridge, et al. J Trauma Acute Care Surg. 2012; 73:S431-437

Weaknesses

- We only collected 21% of all events
  - Need much better research ability
- We did not include people who lived
  - Maybe tourniquets kept these people alive but tourniquets were not in vogue until 2012

So The Point Is…..

- 1. Tourniquets have less of a role than anticipated in preventing fatality
  - Still important, just not the only thing!!
- 2. All causes of preventable death should be addressed, not just bleeding
  - Bleeding, Airway, Chest injury
- 3. Rapid extrication of victims may represent a better strategy overall and needs to be studied

Key Tenets of TECC (Tactical Emergency Casualty Care)

- Based on TCCC and adapted to civilian environment
- Engage First Care Providers are members of the health care team
  - Akin to bystander CPR
- Hot (Direct) v Warm (Indirect) Threat Zones and early penetration/extraction

TECC

- Direct Threat (Hot Zone)
  - Ongoing threat to life for rescuers and wounded
  - Active shooter, fire, building collapse
- Indirect Threat (Warm Zone)
  - Possibility of harm is less than the acuity of injury but not zero
  - Active shooter not present but not neutralized, cover obtained in area of collapse

Tactical Emergency Casualty Care Provider Knowledge and Skills Matrix

Current as of June 2016

Provider Level	911 Interface	Basic Bleeding Control	Tourniquets+	Lifts, Moves, and Carries	Pressure Bandages w/ packing	Hemostatic Agents	Basic Airway Maneuvers	Nasal Airway	Supra-glottic Airway	Surgical Airway
First Care Provider	X	X	X	X	X	X*	X			
First Responder with a duty to act		X	X	X	X	X*	X	X**		
EMR/EMT		X	X	X	X	X*	***	***	***	
Advanced EMT		X	X	X	X	X*	***	***	***	
Paramedic		X	X	X	X	X*	***	***	***	X**
First Receivers		X	X	X	X	X	***	***	X	X

+ Manufactured preferred; improvised only if manufactured unavailable

* Only if available and, if applicable, approved for use by local/state medical regulations and/or agency medical director

** Only with proper training, appropriate scope of practice and protocol, and medical director approval

*** Considered standard knowledge for this level of provider

Tactical Emergency Casualty Care
Provider Knowledge and Skills Matrix

Current as of June 2016

Provider Level	Basic Management of Torso Wounds	Needle Thoracentesis	Hypothermia Prevention	Body Positioning	Multimodal Pain Management	Damage Control Resuscitation	Other TECC Considerations
First Care Provider	X		X	X			
First Responder with a duty to act	X		X	X			
EMR/EMT	***		X	***			X
Advanced EMT	***	X**	X	***	X**	X**	X
Paramedic	***	X	X	***	X**	X**	X
First Receivers	***	X	X	***	X	X	X

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We Need More Data and Much Less Emotion……

TABLE 1. Active Shooter Events Included

Location	Year	Number of Persons Killed/ Wounded
San Ysidro McDonalds, San Diego, CA	1984	19/21
Edmond Post Office, Edmond, OK	1986	15/6
Columbine High School, CO	1999	13/21
Living Church of God, Brookfield, WI	2005	7/4
Post Office, Goleta, CA	2006	6/0
Trolley Square Mall, Omaha, NE	2007	5/4
Virginia Tech University, Blacksburg, VA	2007	32/17
Northern Illinois University	2008	5/21
Safeway Parking Lot, Tucson, AZ	2011	5/13
Sikh Temple, Oak Creek, WI	2012	7/4
Century 16 Theater, Aurora, CO	2012	12/58
Washington Navy Yard, DC	2013	13/7

Questions?

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