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# Safe Storage of Firearms

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# Objectives

- Compare epidemiology data of firearm injury nationally and in Arkansas over the past four years.
- Identify key findings from twelve firearm safe storage focus groups conducted in the study.
- Discuss existing and proposed prevention strategies.

# Seven children and teens (age 19 or under) are killed with guns in the U.S. on an average day.

Research shows that nearly two million American children live in homes with guns that are not stored responsibly, as defined by the American Academy of Pediatrics:

*locked and unloaded, stored separately from ammunition.*

# Epidemiology

- Americans own nearly 310 million firearms, including 65 million handguns
- About 40% of U.S. homes with children have a firearm (Schuster et.al., 2000)
- Arkansas homes with guns—58.3% (Okoro et.al., 2005)
- About 2 million children in the U.S. live in a home with a loaded and unlocked gun (Okoro et.al., 2005)
- Costs: \$18.9B (2003-2010) for 252,181 patients over 1.8M days of hospitalization. (Lee et.al., Presented at APHA 141<sup>st</sup> Meeting, 2013)

## FACT



Children of different ages experience firearm injury and death for different reasons.

62% of firearm deaths are suicides, while 90% of suicide attempts involve firearms.



# FIREARM SAFETY FACTS AND MYTHS

## MYTH



My child doesn't know that we have a gun and/or would not handle the gun.



Almost 3/4 of children living in households with guns knew where they were stored.

Source: Sandberg M, Wang NE. Pragmatic Firearm Advocacy for Pediatricians. *Hospital Pediatrics*. 2017;7(6):361-363; DOI: 10.1542/hpeds.2017-0038  
Link: [hospitalpediatrics.org/content/7/6/361](http://hospitalpediatrics.org/content/7/6/361)

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Arkansas  
Children's

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# 10 Leading Causes of Injury Deaths by Age Group Highlighting Violence-Related Injury Deaths, United States – 2016

Age Groups

Rank	<1	1-4	5-9	10-14	15-24
1	Unintentional Suffocation 1,023	Unintentional Drowning 425	Unintentional MV Traffic 384	Unintentional MV Traffic 455	Unintentional MV Traffic 7,037
2	<b>Homicide Unspecified 132</b>	Unintentional MV Traffic 334	Unintentional Drowning 147	<b>Suicide Suffocation 247</b>	Unintentional Poisoning 4,997
3	Unintentional MV Traffic 88	Unintentional Suffocation 118	Unintentional Fire/Burn 78	<b>Suicide Firearm 160</b>	<b>Homicide Firearm 4,553</b>
4	<b>Homicide Other Spec., Classifiable 63</b>	<b>Homicide Unspecified 114</b>	<b>Homicide Firearm 68</b>	Unintentional Drowning 103	<b>Suicide Firearm 2,683</b>
5	Unintentional Suffocation 60	Unintentional Fire/Burn 107	Unintentional Suffocation 35	<b>Homicide Firearm 95</b>	<b>Suicide Suffocation 2,100</b>
6	Undetermined Unspecified 38	Unintentional Pedestrian, Other 82	Unintentional Other Land Transport 24	Unintentional Other Land Transport 64	Unintentional Drowning 530
7	Unintentional Drowning 38	<b>Homicide Firearm 64</b>	Unintentional Pedestrian, Other 18	Unintentional Fire/Burn 52	<b>Suicide Poisoning 426</b>
8	<b>Homicide Suffocation 19</b>	<b>Homicide Other Spec., Classifiable 64</b>	<b>Unintentional Firearm 16</b>	Unintentional Suffocation 39	<b>Homicide Cut/Pierce 340</b>
9	Adverse Effects 18	<b>Unintentional Firearm 34</b>	Unintentional Struck by or Against 15	Unintentional Poisoning 28	Undetermined Poisoning 289
10	Unintentional Natural/Environment 18	Unintentional Poisoning 34	Unintentional Other Transport 14	<b>Unintentional Firearm 23</b>	Unintentional Fall 199

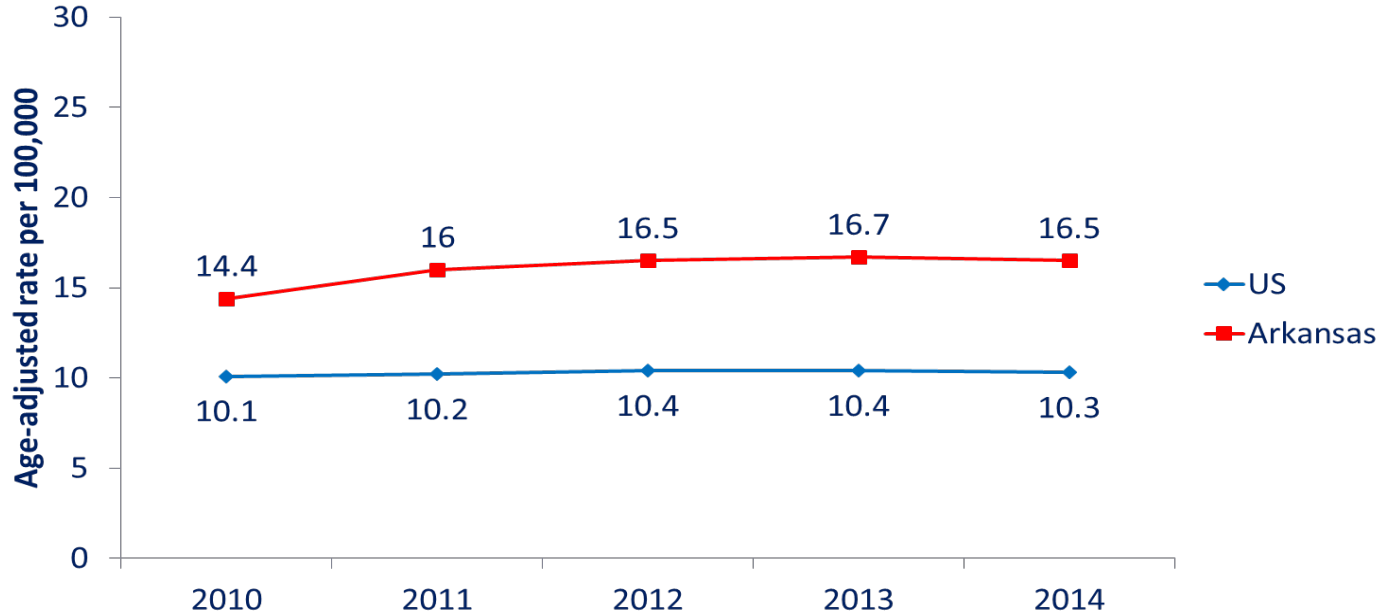
Data Source: National Center for Health Statistics (NCHS), National Vital Statistics System.

Produced by: National Center for Injury Prevention and Control, CDC using WISQARS™.



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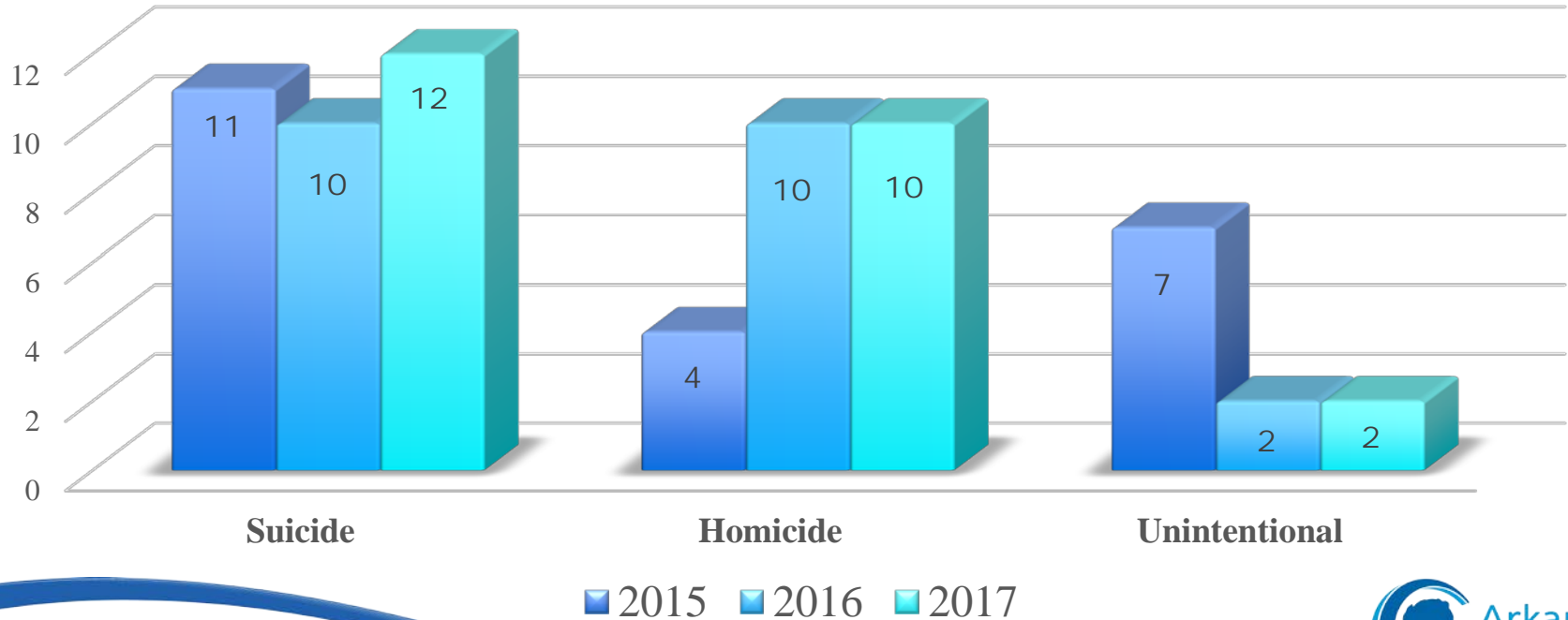
# Firearm-related Deaths Arkansas vs. U.S., All Ages, 2010-2014



Source: CDC WISQARS, 2016

# Children deaths by firearm in Arkansas

68 deaths in three years under Age 18



Source: Arkansas Infant Child Death  
Review database, 2015-2017.



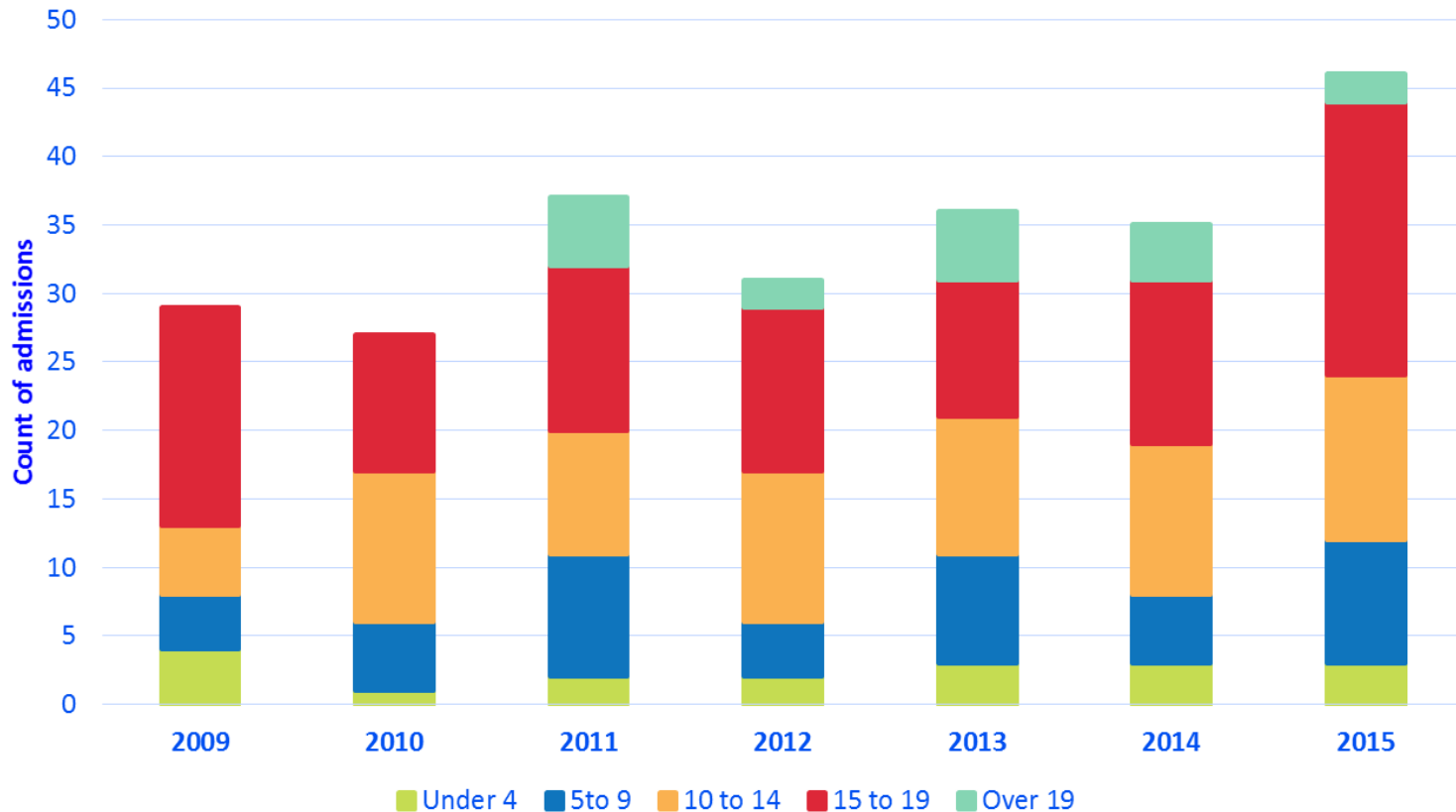
# Children deaths by firearm in Arkansas

Source: Arkansas Infant Child Death Review database, 2015-2017.

Suicide		2015
		2016
		2017
Homicide		2015
		2016
		2017
Unintentional		2015
		2016
		2017

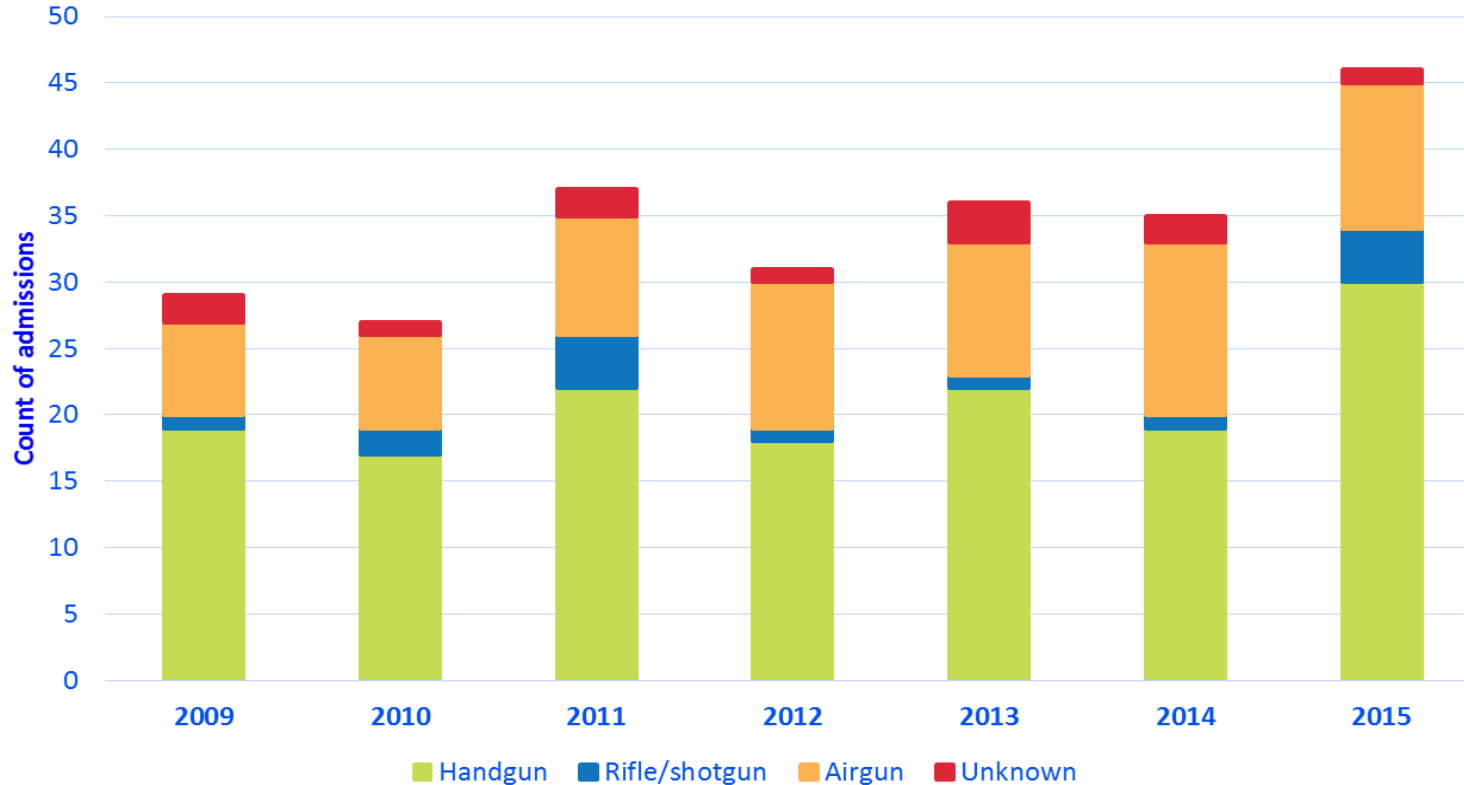
## Firearm Related Trauma Admissions Arkansas Children's Hospital by Age Group, 2009-2015

ACH Trauma Registry  
2016

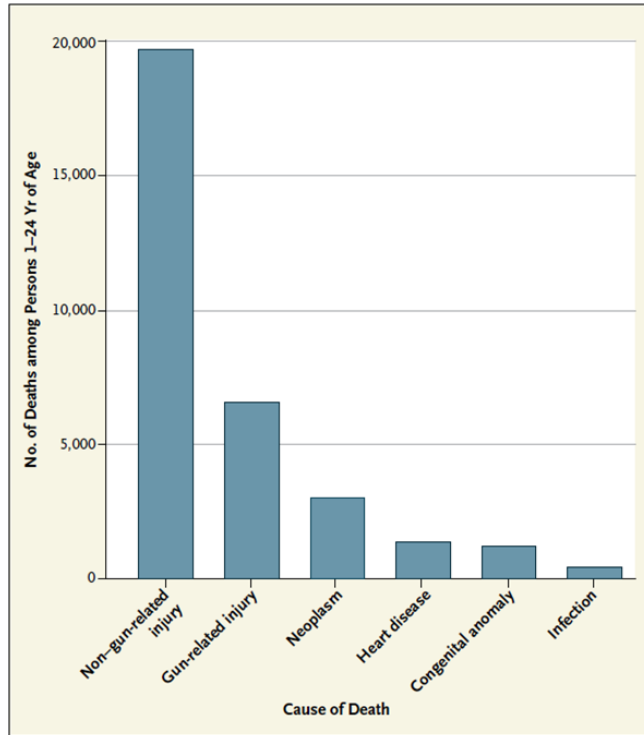


## Firearm Related Trauma Admissions Arkansas Children's Hospital by Firearm Type, 2009-2015

ACH Trauma Registry  
2016



# Research Gap



Causes of Death among Persons 1 to 24 Years of Age in the United States, 2010.  
Data are from the Centers for Disease Control and Prevention.

- Whatever our personal beliefs, we can't ignore this problem
- Finding common ground between groups with different views is key to making progress
- Research is required

# Firearm Research Funding

- 1993: Kellerman NEJM article published “Gun ownership as a risk factor for homicide in the home” <http://www.nejm.org/doi/full/10.1056/NEJM199310073291506>
- 1996: Omnibus funding bill included the Dickey amendment (Jay Dickey, R-AR) stating that no CDC funds could be used to “advocate or promote gun control”
- CDC budget for research in gun violence fell 96% to a total of \$100,000 (of a \$5.6B total)
- 2009: Branas article AJPB published on gun carrying and assault—NIAAA funding
- 2011: Dickey amendment made to NIH budget appropriation
- 2018: Omnibus funding bill contains one sentence stating CDC authority to research causes of gun violence, but no dedicated funding

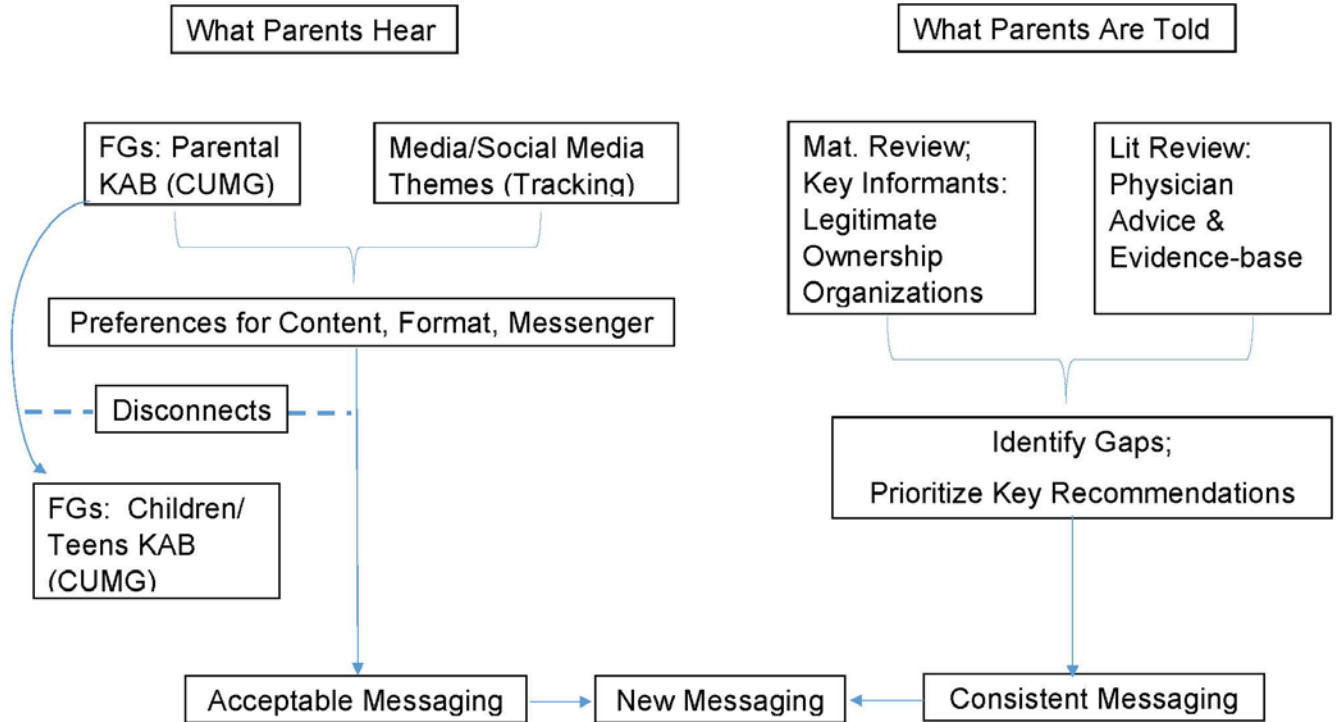
# Public Health Policy Opportunities

- Assault Weapon/High Capacity Magazine Bans
- Universal Background Checks
- Waiting Periods
- Licensing of Gun Owners and Purchasers
- Safe Storage Laws
- Locking Devices
- Design Safety for Handguns

# IPC Approach: Increase Safe Storage of Firearms

- Added staff capacity for intentional injury
- ANGELS guideline and PedsPLACE 2017
- Safe Storage of Firearms Task Force
- Literature review completed
- Intramural grant to support formative research
- Scan of existing programs ongoing
- Connect with other interested programs/organizations
- Tracking of media to better understand circumstances

# Conceptual Model for Safe Storage of Firearms Project Development





# Gun-related Injuries and Fatalities, Arkansas

## Gun-related Injuries and Fatalities in Arkansas from July 2015-July 2016

Date	Demographics	Location	Circumstances	Link to article
11/17/2015	2 year old male	Benton	Shot self in head with handgun while at home; fatality	<a href="http://www.arkansasmatters.com/news/local-news/police-benton-child-dead-after-being-shot">http://www.arkansasmatters.com/news/local-news/police-benton-child-dead-after-being-shot</a>
11/16/2015	16 year old male	Lockesburg	Unintentionally shot by his 12 year old brother while hunting unsupervised; fatality	<a href="http://www.thv11.com/news/local/16-year-old-killed-when-shot-in-arkansas-hunting-accident/29530253">http://www.thv11.com/news/local/16-year-old-killed-when-shot-in-arkansas-hunting-accident/29530253</a>
11/18/2015	6 year old, African American male	Little Rock	Unattended in car, shot self in head with Aunt's handgun; fatality	<a href="http://www.arktimes.com/ArkansasBlog/archives/2015/11/18/6-year-old-child-killed-by-gunshot-in-little-rock">http://www.arktimes.com/ArkansasBlog/archives/2015/11/18/6-year-old-child-killed-by-gunshot-in-little-rock</a>
1/13/2016	18 year old male	Camden	Three students examining a handgun in a car, a 17-year-old boy discharged the gun, striking an 18-year-old boy in his back. The older boy was taken to a local hospital, treated for non-life threatening injuries. The younger boy was arrested and charged	<a href="http://everytownresearch.org/NotAnAccident/#2006">http://everytownresearch.org/NotAnAccident/#2006</a>
6/6/2016	3 year old female	Little Rock	3 year old and 2 adults shot. 1 fatality; 3 year old severely injured.	<a href="http://www.thv11.com/news/local/police-investigating-homicide-at-little-rock-apartment-complex/234149411">http://www.thv11.com/news/local/police-investigating-homicide-at-little-rock-apartment-complex/234149411</a>
6/17/2016	2 year old male	Texarkana	Child found loaded .22 and shot himself in face. In critical condition as of last update.	<a href="http://www.gunviolencearchive.org/incident/583907">http://www.gunviolencearchive.org/incident/583907</a>
6/19/2016	11 year old	Woodruff County	Shot by mistake by family member, mistaken for intruder; seriously injured	<a href="http://www.arkansasonline.com/news/2016/jun/20/police-boy-11-shot-by-mistake-20160620-1/">http://www.arkansasonline.com/news/2016/jun/20/police-boy-11-shot-by-mistake-20160620-1/</a>
7/8/2016	18 months old	Beebe	Police responded to shooting in apartment; fatality	<a href="http://www.arkansasmatters.com/news/local-news/child-shot-in-beebe">http://www.arkansasmatters.com/news/local-news/child-shot-in-beebe</a>

# Safe Storage Campaigns – Not Rigorously Studied

Name	Type of Program	Evaluation Outcomes
Eddie Eagle Gun Safety Program	Just say No	Hardy et al. (1996) evaluated a similar program and in posttest found no difference between children's behavior toward firearms in both treated and control groups
Hands Without Guns	Peer-based education and outreach	Internal evaluation of the program (1999) reports that pre- and post-campaign surveys with a sample of 400 Washington, DC, students show that kids who could identify the program were less likely to carry guns than those who had never heard of the program.
Safe Alternatives and Violence Education (SAVE)	Skills-building	Arredono et al. (1999) demonstrate in pretest and posttest evaluations that recidivism rates declined at 2-year follow-up, but no comparison group was used.
Options, Choices, and Consequences (Cops and Docs)	Shock	Health Partners Research Foundation (1999) observes that program improves students' knowledge about guns but does not change attitudes and behaviors. Detailed information about this evaluation is not available.

# Safe Storage Campaigns – Not Rigorously Studied, Cont'd.

In a Flash	Shock	No evaluation of effectiveness.
Calling the Shots	Shock	Health Partners Research Foundation (1999), in randomized treatment and control groups 2 weeks before and after the program, found that levels of discomfort with aggression increased after program. No changes in behavior around firearms were found in this evaluation.
Child Development Community Policing (CD-CP) Program	Interrelated training and consultation focusing on sharing knowledge and developing ongoing collegial relationships between police and mental health workers.	No evaluation of effectiveness.
The Living Classroom Foundation	Shock	No evaluation of effectiveness.

# Safe Storage Campaigns – Rigorously Studied

Name	Type of Program	Evaluation Outcomes
Steps to Prevent Firearm Injury (STOP 2); Brady Center to Prevent Gun Violence	Physician-directed parent education	Oatis et al. (1999) demonstrate in a pre- and post-randomized trial that there was not a statistically significant drop in gun ownership or improvement in gun storage after a practice-based intervention aimed to promote these behaviors.
Straight Talk About Risks (STAR) Brady Center to Prevent Gun Violence	Skills-building	Using a randomized prospective study design with 600 students, the Education Development Center, Inc. (LeBrun et al., 1999) found STAR to be most effective for increasing gun safety knowledge and attitudes for children in grades 3-5 and only moderately effective for older children. Hardy (2002b) in a randomized control study (34 children ages 4 to 7) concludes that STAR-like programs are ineffective in deterring children's play with guns.
STOP 2, as studied by Carbone (2005) with added safe storage device provision	Counseling with safe storage device provision	Office-based safe storage counseling supported with written information and a free gunlock resulted in significant improvements in safe gun storage behaviors but did not affect removal of firearms from home.

# Safe Storage Campaigns – Rigorously Studied, Cont’d.

Grossman (2000)	Counseling without safe storage device provision	A single counseling session delivered during well-child visits combined with economic incentives to purchase safe storage devices did not lead to changes in household gun ownership or storage patterns.
Lok-it-up	Counseling without safe storage device provision	A broad, educational community-based safe firearm storage campaign combined with economic incentives to purchase lockboxes did not improve safe storage practices
Grossman (2012)	Safe storage device provision without counseling	Installation of free long gun cabinets supported with safe gun storage messages improved the safe storage of gun and ammunition among rural Alaskan households
Project Childsafe	Kits include a cable-style gun-locking device and a brochure (also available in Spanish) that discusses safe handling and secure storage guidelines to help deter access by unauthorized individuals.	Project ChildSafe is a program of the National Shooting Sports Foundation to promote firearms safety and education. Promote firearms safety through the distribution of safety education messages and free firearm safety kits to communities across the U.S.

# Title: Determining Barriers and Facilitators to Increasing Safe Storage of Guns in Homes with Children

PI: Mary E. Aitken, MD MPH

## Problem

- \* One in three homes with children in the US have firearms.
- \* 39% of these homes have firearms that are unlocked.
- \* Parents significantly underestimate children's knowledge of where a firearm is located and that a child has handled a firearm.
- \* Some children are strong enough to pull the trigger of a handgun by age 3.
- \* Adolescent suicide risk is strongly associated with firearm availability. 82% of youth who dies by firearm suicide used a gun owned by a family member.

## Benefits of Safe Storage Compliance

- \* Compliance with all four components of safe storage recommendations significantly reduces the risk of firearm-related injury, both unintentional and intentional

## Desired Results

- \* Increase in compliance with safe storage recommendations
- \* Decrease in the number gun-related injuries
- \* Decrease in gun-related morbidity and mortality

## Assumed Barriers for Safe Storage Compliance

- \* Parents overestimate their child's responsible gun ownership behaviors
- \* Parents do not have access to gun locks and/or safes for storage
- \* Strong political and cultural influences of gun ownership and use
- \* Concern for personal or property safety may increase open access to guns

## Influential Factors to Safe Storage to be Determined in Focus Groups

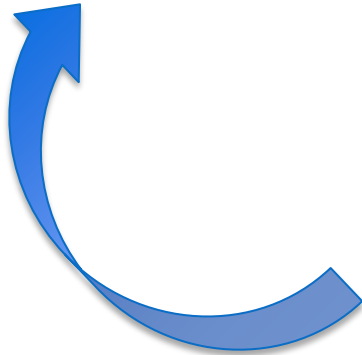
- \* Knowledge
- \* Beliefs
- \* Attitudes
- \* Perceptions
- \* Behaviors
- \* Safety products

## Strategies

- \* Conduct 10 focus groups, 8 – 10 participants per group from a minimum of 4 southern states
- \* Two groups per state by gender of parent
- \* Homes with firearms and children, ages 2 - 18
- \* Focus groups conducted by trained moderator following structured guide
- \* Transcription and coded analysis

## Potential Outcomes

- \* Novel educational products
- \* Novel dissemination strategies

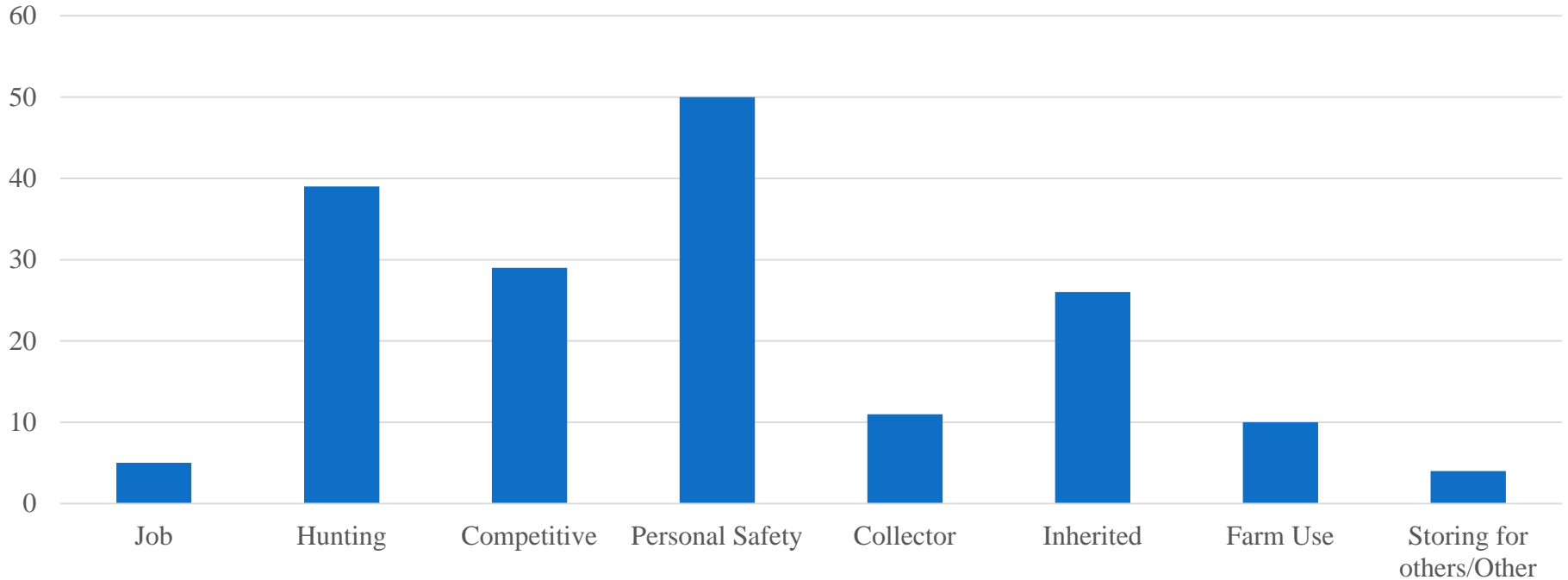


# Focus Groups

- 87 participants (57 adults, 30 youth)
- 8 parent/4 teens groups
- Caucasian (82.8%), African American (13.8%), Other (3.4%)
- Arkansas, Tennessee, Alabama
- Health Belief Model used to frame moderator guide
- Dinner and gift cards as incentives

# Survey results – parents only

## Reasons for having guns in the home



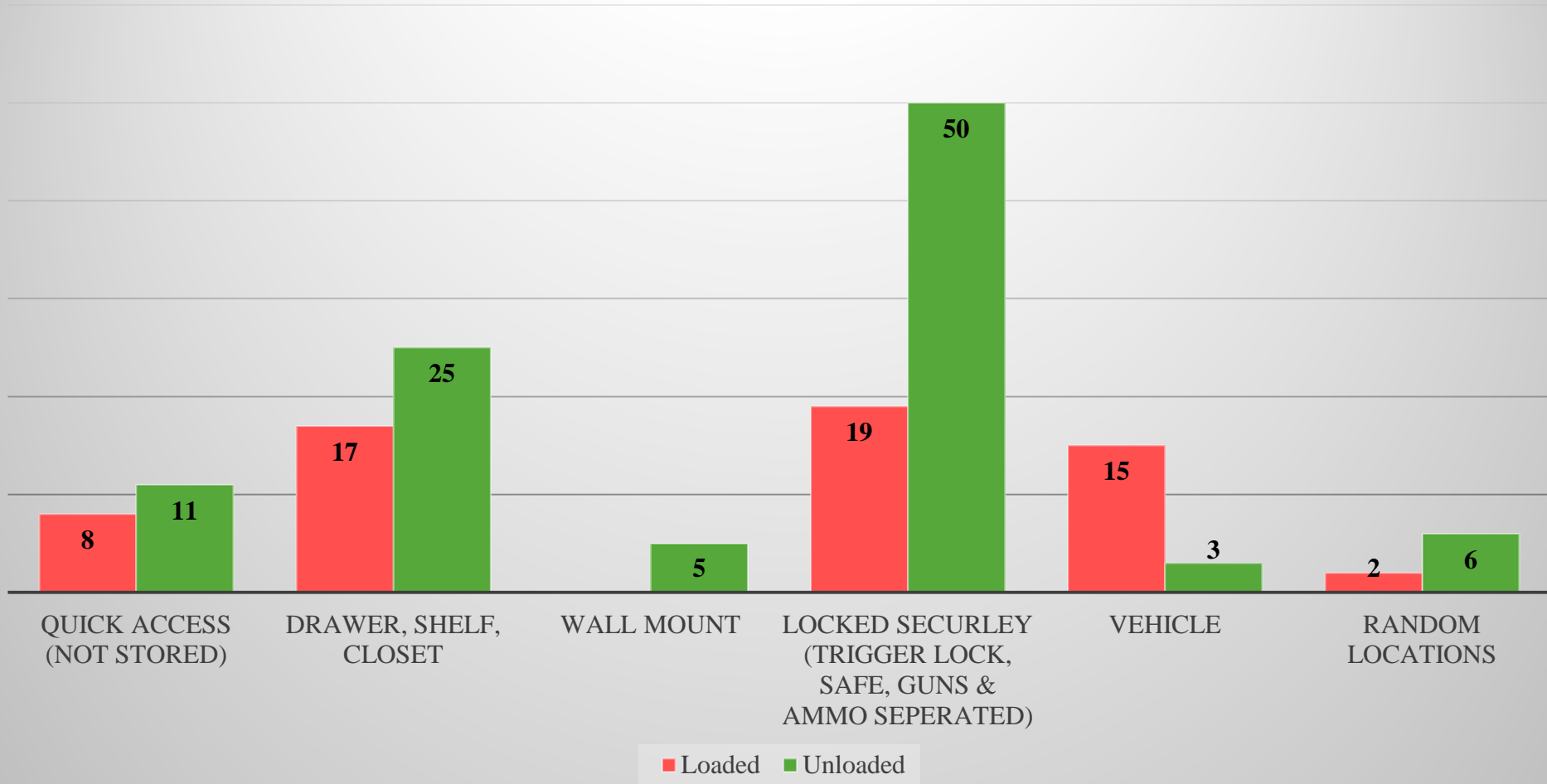
■ Participant could select multiple reasons



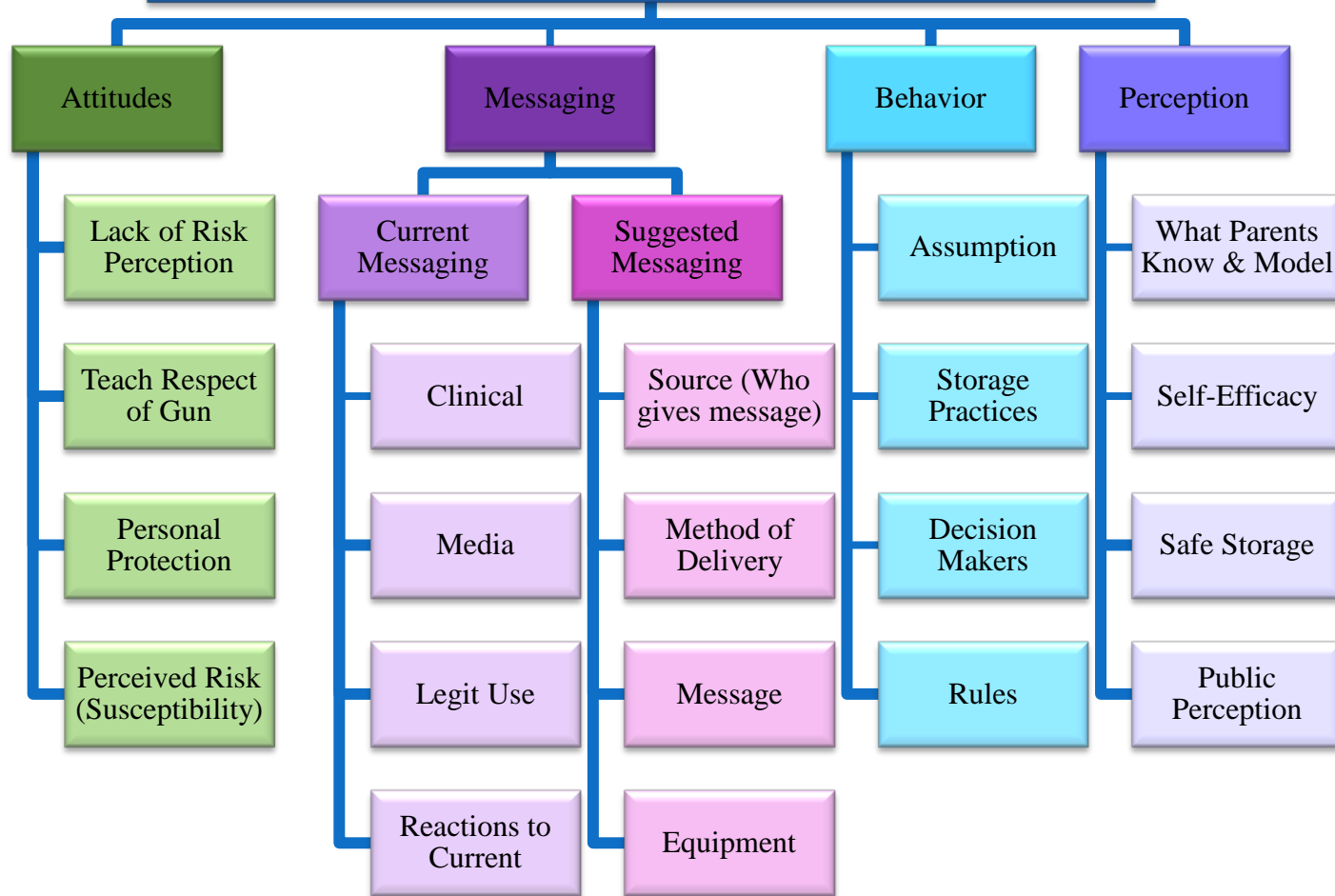
# Estimated number of guns by type

- Hand guns (pistols, revolvers, derringers, etc.)
  - 83% had 5 or less
  - 9% had 6 or more
- Muzzle loaders and/or air guns
  - 60% had 5 or less
  - 4% had 6 or more
- Long Guns (rifles, shotguns, etc.)
  - 42% had 5 or less
  - 27% had 6-10
  - 10% had 11 or more

# Survey Results - How Guns Are Stored



# Firearm Focus Group Themes



# Attitudes

## Lack of Risk Perception

- ~ Parent confident kid knows how to handle gun safely.
- ~ Parent confident kids understand and will obey gun rules.
- ~ Kids confident in safe handling of guns.
- ~ Kids confident they can keep at risk friend safe from their guns.
- ~ Loaded gun is safe as long as parent is around.
- ~ Other things more dangerous than guns. Suicide will happen regardless of means available, will hide alcohol and pills but not guns.

## Teach Respect of Gun

- ~ Idea that teaching respect of guns will remove the need for safe storage.
- ~ Teaching kids from an early age is best.

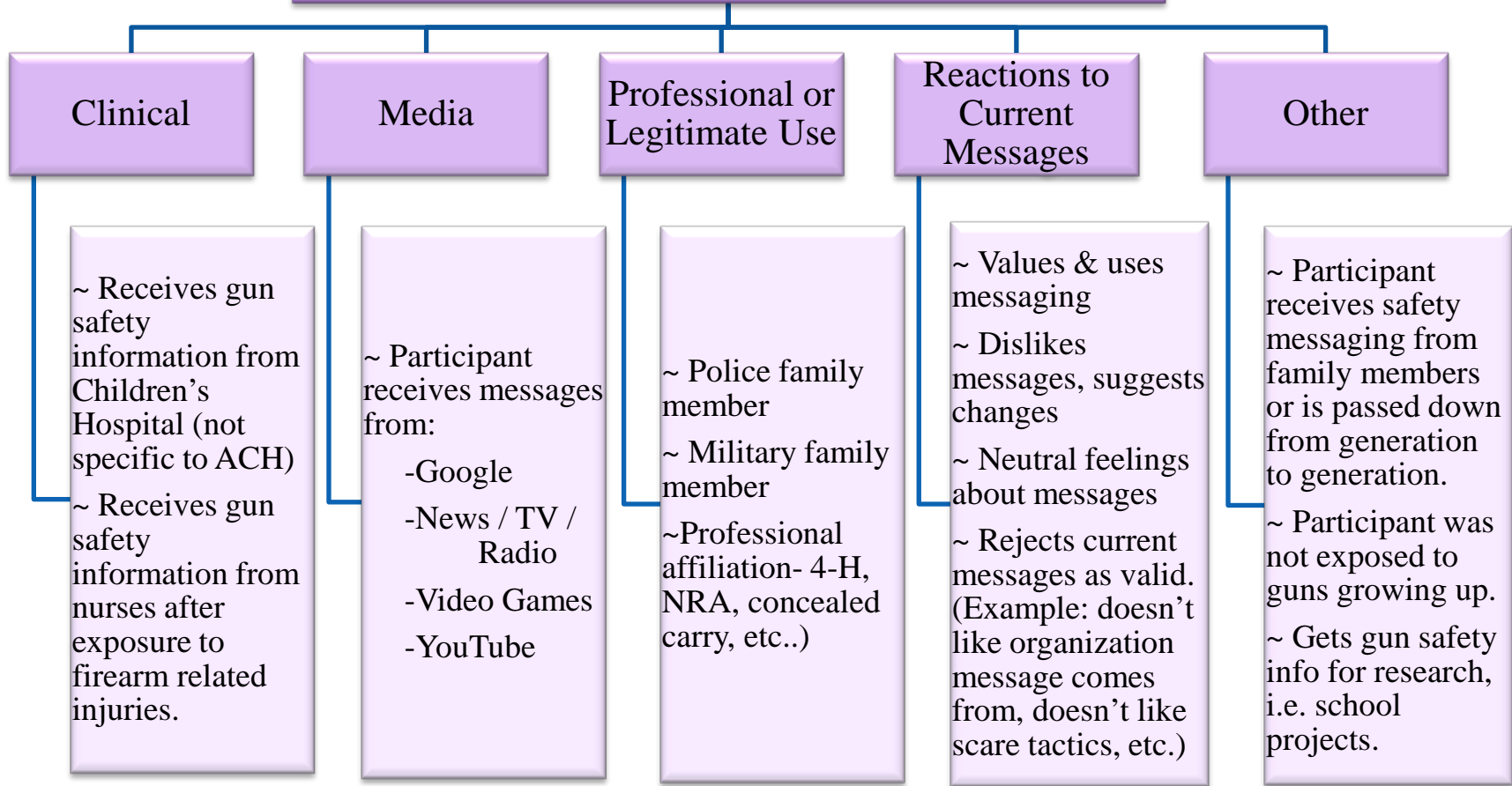
## Purpose of Owning

- ~ Kids need guns in emergencies, should be kept loaded and assessable in case of emergency.
- ~ Hunting guns (long guns) should be locked up, personal protection guns (pistols) should be kept out.
- ~ Idea that kids can be in charge of hunting guns.

## Perceived Risk (Susceptibility)

- ~ Any means necessary regardless of safe storage.
- ~ Belief that media incites kids to mess with guns, influences and/or peer pressure.
- ~ Worried other kids influence their kid negatively/ other kid may not know safety rules.
- ~ Parent doesn't want kid to associate with guns at all/ parent fears guns.
- ~ Kid fears punishment if caught handling or looking at guns.
- ~ Kids fear gun going off if touched, unsure if loaded, unsure if it is a toy.

# Messaging (Current Messaging)



# Messaging (Suggested Messages)

## Source (Who gives message)

- ~ Gender specific delivery. (ex. Female instructor for female class may be more effective.)
- ~ Gun store should educate before selling.
- ~ Must come from credible.
- ~ Messages should come from: ACH, gun safety courses, insurance companies, police, fire department, military, NRA, Game & Fish, schools, women's safety courses, YouTube, etc.
- ~ Have messaging from numerous sources to reach the most places.

## Method of Delivery

- ~ Majority opposed to physician asking questions about storage.
- ~ Messaging needs to be age specific.
- ~ Message needs to appeal to demographics
- ~ Suggested methods: blogs, commercials, event at gun store, handouts, safety fairs, social media, waiting room poster/video, live demonstration.
- ~ Hunter's Ed online (some think its good for basic safety messages, some say should be in person/hands on class)
- ~ Desires message to be listed in bullet style.
- ~ Incorporate gun safety in overall home safety messages.
- ~ Message should have an emotional or positive tone to it.

## Message

- ~ Message should cover multiple guns in home.
- ~ Educate parents 1<sup>st</sup>; Kids second. (May take generations to be effective)
- ~ Ask other parents about storage.
- ~ Pragmatic Messaging
  - Assume always Loaded
  - Respect Guns
- ~ Toy Gun Issues
  - Used as 1<sup>st</sup> teaching tool
  - Looks too real/ change toys
- ~ Teens need closer monitoring.
- ~ Use real stories of gun accidents.
- ~ Keep guns and ammo separated.

## Equipment

- ~ Discounts/Coupons on gun safes
- ~ Participant thinks the design of safes should be improved (shape, weight, décor, portability)
- ~ Use more safes in homes.
- ~ Technology on storage is important for quick access.

# Behavior

## Assumption

~ Assumption that all guns in their area have guns.

~ Assumes all guns are loaded/ teaches kid to assume all guns are loaded.

## Use & Storage Practices

~ Plans to change storage practices after focus group.

~ Wide cultural variety of gun uses that influence storage practices. (i.e. for hunting, personal protection, professional, sport, inherited.)

~ Guns throughout the home are loaded/unloaded and stored behind doors, under beds, etc.

~ Strongly desires technology on storage equipment/ uses biometric storage equipment.

~ Parents hide guns from kids, kids confess to knowing where they are and how to access them/ some find accidentally.

~ States that kids have access to their own hunting weapons, but kids are careless and don't put them away properly.

## Decision Makers

~ Person in the home most comfortable with guns makes the decisions about the use and storage.

~ Male decision maker

~ Female decision maker

~ Makes decisions mutually

## Rules

~ Parents do or do not ask other parents about their rules of storage when allowing children to visit.

~ Parents have specific rules when others are visiting the home.

~ Don't touch rule applies in majority of homes- kids are not always educated on safe use or storage.

~ Parents wait to educate kids when they show an interest in guns.

~ Kids do or do not know rules in other's home

# Perception

## What Parents Know & Model

~ Belief that parents don't educate or have strict enough rules.

~ Participant believes hiding or no education will cause curiosity.

~ Parents should model safe use, then there will be no need to lock.

~ Kids may be too young to learn about safety- teaching too young may encourage more curiosity.

## Self-Efficacy

~ Accidents happen regardless of storage.

~ Gun locks are a nuisance.

~ Unsure of what age is appropriate to start education.

## Safe Storage

### Benefits:

~ Protected from fire, theft, water damage if locked up.

~ Teaching kids may spread to others, other generations, and/or remove curiosity.

~ Storage = peace of mind.

~ Don't worry about visitors when safely stored.

~ Can keep impulsive behavior risks down.

### Barriers:

~ Can't get gun fast enough for protection if locked or unloaded.

~ Not enough space for storage equipment.

~ Technology will prevent quick access.

## Public Perception

~ Cost is an issue for safe storage. Some believe it to be a barrier/ some believe it is not, that you can be just as safe with inexpensive equipment.

~ Political issues cause unsafe issues, (i.e. gun's fault vs. parents fault debate)

~ Media portrays gun issues wrong or exaggerated.



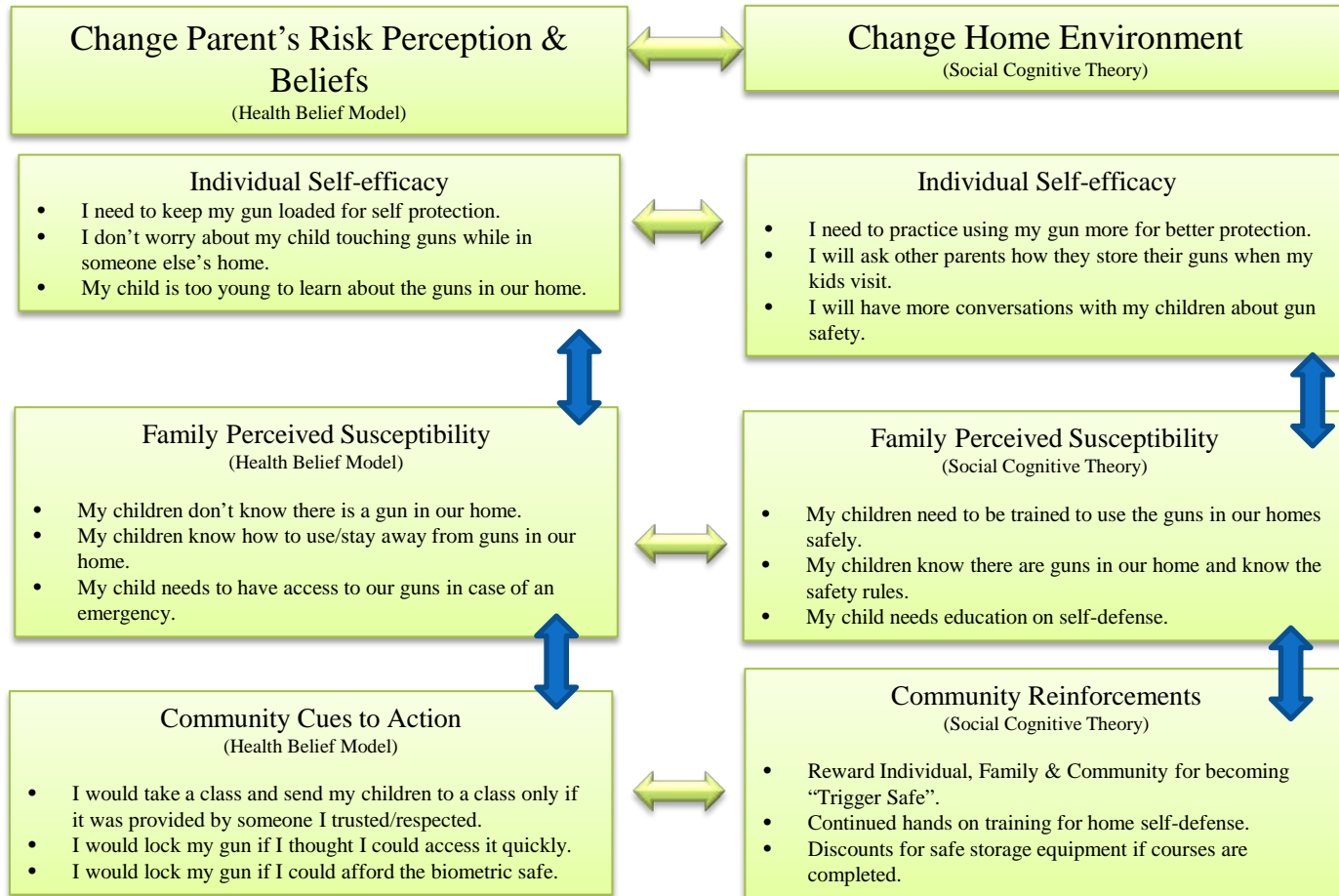


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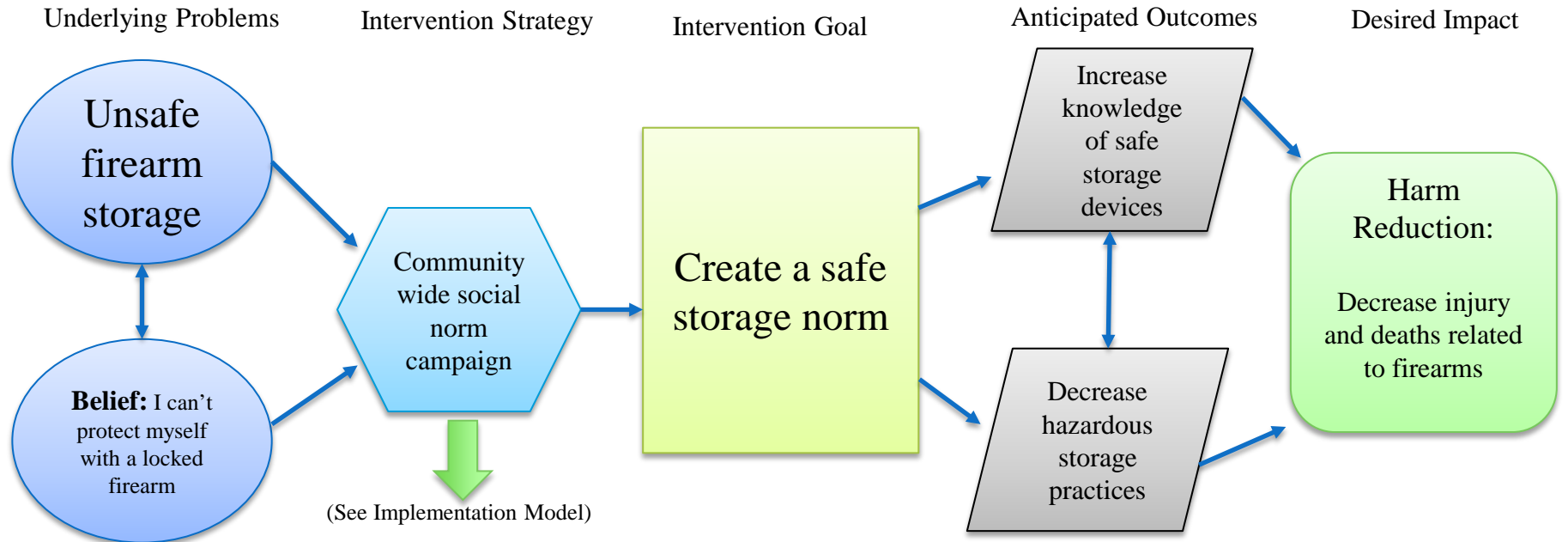
# Community Program Development



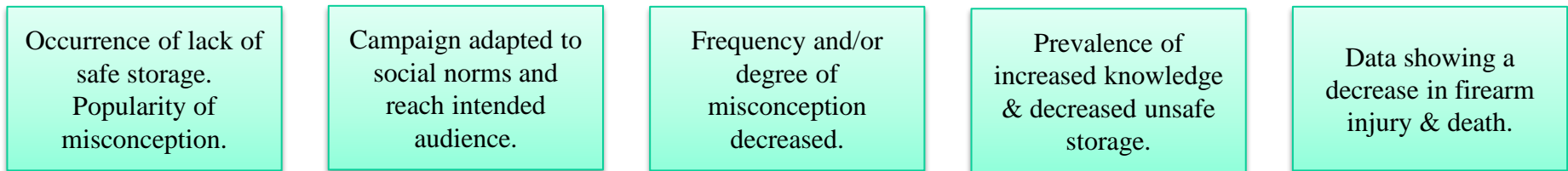
# Trigger Safe Communities Change Theory with Multi-level Interventions



# Logic of Social Norms Intervention

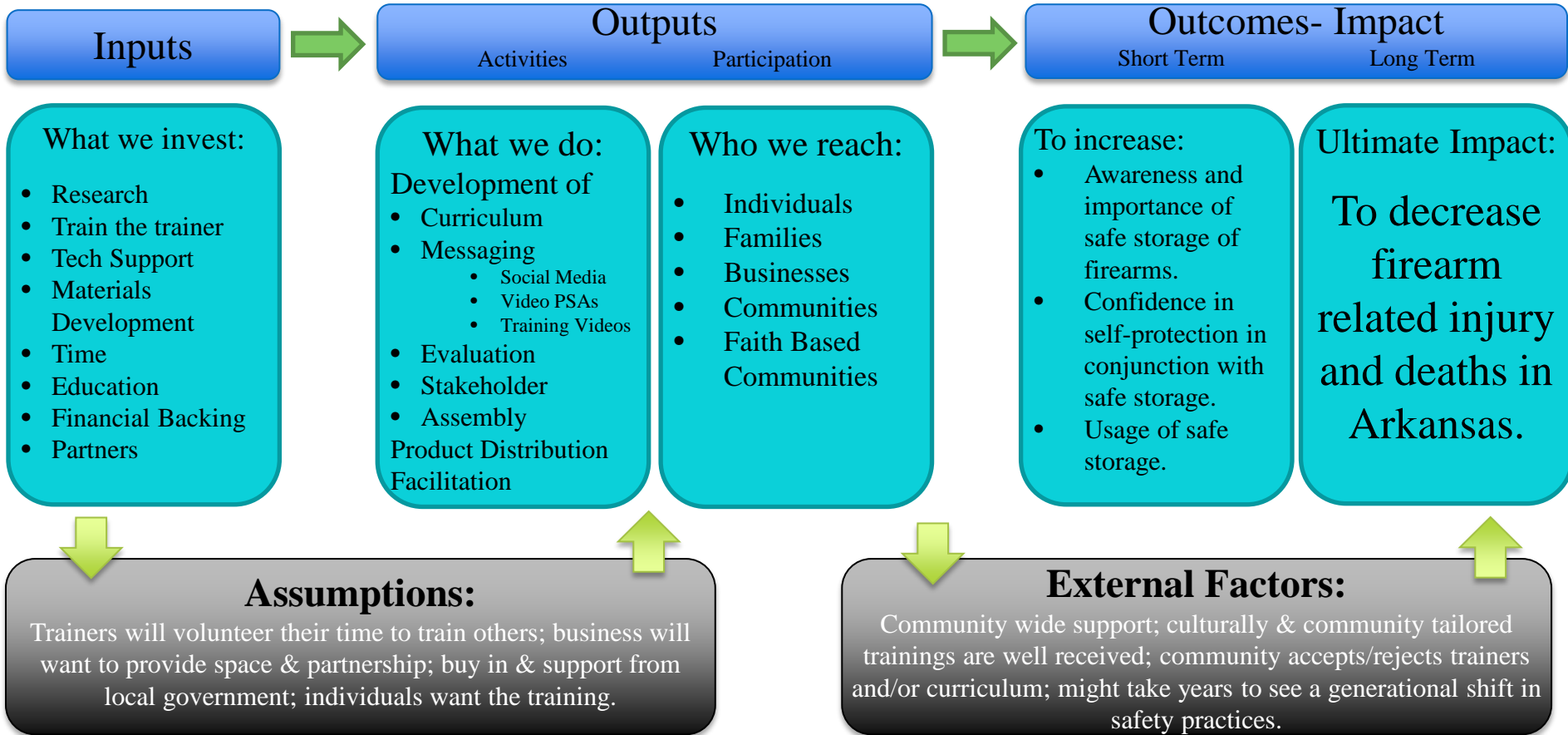


## Evidence Needed



# Community Wide Social Norm Movement Implementation Model

Program Vision: (Long term impact) – Prevent childhood injury due to unsafe storage of firearms.



# Tiered Approach to Trigger Safe Communities Program

## 1. Education

1. Awareness 101 courses
  - Adults Course – IPC Creates curriculum with designated group.
  - Children’s Course- Partnership with 4-H ~ Project Childsafe
2. Home Defense Course for adults – IPC Creates Curriculum- If course is taken participant leaves with trigger locks and biometric safe.
3. Faith-Based Communities Training

2. Train the Trainers- Local law enforcement, military, gun shop owners, etc. would train in their own communities.

3. Businesses- Can become a “Trigger Safe Business” by partnering with the program and providing training, event location, discounts on safe storage devices, etc..

4. Communities- Can become a “Trigger Safe Community” by hosting annual safety education events, sponsoring, encouraging local government to participate, etc.



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