Treating Violence like a Contagious Disease:
Gun Violence: What do we know?
What can Physicians do?

Dr. Rex Archer, MD, MPH, Director of Health
WORLDVIEW

AXIS OF POWER/INFLUENCE

Nonviolent Persuasion

AXIS OF POWER/INFLUENCE

Normalcy of Civilization*

*History/Cultural Norms, Political/Military/Industrial Economic Complex

Retributive Justice (Punishment)

AXIS OF JUSTICE

Contributeive/Distributive And Restorative (Social) Justice

AXIS OF JUSTICE

**Values, Religious Wisdom, or Philosophy

Radicality Of God**

AXIS OF JUSTICE

Mental Models
WHAT CREATES HEALTH? what are the Determinants of Health?

- Genes and Biology: 10%
- Physical Environment: 10%
- Clinical Care: 10%
- Health Behaviors: 30%
- Social and Economic Factors: 40%

### Estimated Deaths Attributable to Social Factors

<table>
<thead>
<tr>
<th>Factor</th>
<th>U.S.*</th>
<th>KCMO**</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than High School graduation</td>
<td>245,000</td>
<td>~90-160</td>
</tr>
<tr>
<td>Racial segregation</td>
<td>176,000</td>
<td>~395-560</td>
</tr>
<tr>
<td>Low social support</td>
<td>162,000</td>
<td>~203-230</td>
</tr>
<tr>
<td>Individual level poverty</td>
<td>133,000</td>
<td>~218-240</td>
</tr>
<tr>
<td>Income inequality</td>
<td>119,000</td>
<td>~148-220</td>
</tr>
<tr>
<td>Community level poverty</td>
<td>39,000</td>
<td>~108-350</td>
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~40% of annual KCMO deaths (33-50%)

Total U.S.*: 1,163***
Total KCMO**: 1,760***

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*Galea, et al., American Journal of Public Health August 2011, Vol 101 no. 8

**Very Conservative estimate for Kansas City, MO based on Galea, et al.

***Very Conservative estimates that assume factors are not
Punishment theory

Everything theory
The everything theory

dysfunctional communities
poverty
poor schools
family & mental disorders
racism
absent fathers
broken homes
lead exposure
and more...
SCIENTIFIC APPROACH

New Understanding

1. Violence behaves like a contagious disease (epidemic)

2. Treating violence like an epidemic gets results in communities
plague

typhus

leprosy

smallpox

cholera

yellow fever
<table>
<thead>
<tr>
<th>Old View</th>
<th>Healthier View</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bad People</td>
<td>Learned Behavior</td>
</tr>
<tr>
<td>Enemies</td>
<td>Negative Norms</td>
</tr>
<tr>
<td>Isolated Incidents</td>
<td>Contagious Process</td>
</tr>
<tr>
<td>Punishment</td>
<td>Disease Control</td>
</tr>
<tr>
<td>Intractable</td>
<td>Solvable</td>
</tr>
</tbody>
</table>
STOPPING EPIDEMICS

1. Interrupt transmission
2. Prevent future spread
3. Change group norms
Exposure

TB

Source: Mullins et al. 2004; Devries et al. 2011
Exposure

Violence

TRANSMISSION
OF VIOLENCE

Source: Mullins et al. 2004; Devries et al. 2011
African American Youth With Poverty, Crowding, Same Housing Projects

The predictor of violence is

High Exposure to Violence
Spano, Rivera, & Bolland 2010
Cholera in Bangladesh, 1983-2003

Ruiz-Moreno, 2009
Violence in Chicago, 2010
First Suspected Case
Registration, Rain
Cholera in Somalia (Gannet), 1988

Cases
Deaths

March
April

21 22 23 24 25 26 27 28 29 30 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30
Violence in Rwanda (Kibuye), 1994
Spread of Violence, WWI
June 28, 1913 - Assassination of Archduke Franz Ferdinand in Sarajevo, Bosnia
Spread of Violence, WWI
July 28, 1914 - Austria-Hungary declares war on Serbia
Spread of Violence, WWI
July 29, 1914 - Russia enters war to aid Serbia and assert influence in the region
Spread of Violence, WWI
August 1, 1914 - Germany declares war on Russia and France mobilizes its troops
Spread of Violence, WWI
August 4, 1914 - Britain declares war on Germany
Spread of Violence, WWI

October 29, 1914 - Turkey enters war in aid of Germany
Spread of Violence, WWI
April 15, 1915 - Romania enters the war
Spread of Violence, WWI
May 23, 1915 - Italy enters the war
Spread of Violence: WWI
June 28, 1914 – November 11, 1918 - Countries directly involved

Countries directly involved:
- United States
- Canada
- Japan
- Brazil
- Australia
- India
- South Africa
- British Empire
- Belgium
- German Empire
- Russia
- France
- Austria-Hungary
- Romania
- Italy
- Serbia
- Bulgaria
- Greece
- Ottoman Empire

Map showing the spread of violence during WWI with countries highlighted in red or blue to indicate involvement.
Spread of Violence, WWI
June 28, 1914 – November 11, 1918

15 – 20 million people dead
Public Health Framework

Treating Violence like a communicable, contagious disease
Transmission Across Syndromes

Community Violence

O

P, V, O → Community Violence
V, O → Family Violence (IPV and child)
P, V → Suicide

Note: Perpetration for males and females, higher risk for males;
Barkin et al. 2001; Hanson et al. 2006
Transmission Across Syndromes

Ethnic/political violence (war)

O, V, (P)

P

P

P

V

Community Violence

Intimate Partner Violence

Child Abuse Violence

Intimate Partner Violence

Note: Studies included analysis of post WWII, Vietnam War, and religio-political violence (Israel/Palestine)

MEANS OF TRANSMISSION

VIOLENCE TRANSMISSION
Observing
Witnessing
Trauma

BRAIN PROCESSING
Cortical
Dopamine/Pain centers
Limbic
You may have to be the frontal lobe of your friend
Seeing Violence through a Public Health Lens

Contagion of Violence

FORUM ON GLOBAL VIOLENCE PREVENTION

WORKSHOP SUMMARY

INSTITUTE OF MEDICINE AND NATIONAL RESEARCH COUNCIL OF THE NATIONAL ACADEMIES
Behavior: Formation

Modeling:
• Imitation
• Start of infectivity of behaviors

Trial and error:
• Intentional or unintentional
• Consequences
  - Physical
  - Social
• Prediction in future action
New Strategies

• Water and sanitation
  – Hand washing

• Sexual behavior change
  – Immunization

• Impregnated bed nets
  – Mosquito control
New Methods

Early detection

Case finding and therapy

New categories of workers

New systems for disease control
New Language

Exposure

behavior

susceptible

transmission

contagious

social pressure

trauma interruption

behavior change

norm change

G. Slutkin, 2010
How Are Epidemics Reversed?

1. INTERRUPT TRANSMISSION

2. BEHAVIOR CHANGE

3. CHANGE COMMUNITY NORMS
Interrupt Transmission: Anger

Image: Neil Slade
Changing Individual and Group Behaviors

**Messengers**
- Outreach workers
- Violence interrupters
- Hospital responders
- Program managers
- Peers
- Family members
- Community members
- Faith leaders
- Doctors
- Police
- Champions

**The 3 Variables**
- Social Norms
- Risk Factors
- Alternatives to Violence

**Behavioral Outcome**
- No Shooting
HEALTH PROBLEM

*Scientifically effective*

20 replications;

3 independent evaluations

*Less violence – 30-70% drops*

Safer neighborhoods
Guns and Kids
Evidence Supporting Physician Counseling on Firearms.
What Else We Know

- Parents are receptive of discussion of risk of guns during pediatric visits (Webster DW, Pediatrics 1992;89:908-14)

Child-focused Education
Does it Work?

- Gun Safety Programs
  - Ineffective for injury reduction among adults
  - No effect on safe storage
  - No effect on youth accessing for self harm

- Gun Avoidance Programs
  - Examples: Eddie Eagle (NRA), STOP (AAP)
  - A single, small evaluation demonstrates no effect on pre-schoolers
  - No effect on youth accessing for self harm.

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Hardy. J Dev Behav Pediatr. 2002;23(2):71-76
American Academy of Pediatrics
Firearm Injury Prevention Policy 2012

- Pediatricians, as part of their anticipatory guidance with families should inquire about guns in the home and offer most effective child protection strategies

  - Best: Guns kept out of the environment of children

  - Good: Guns in the home should be stored safely: guns separate from ammo, both locked.
American Academy of Pediatrics
Firearm Injury Prevention Policy 2012

- Regulations of guns
  - Child access prevention laws
  - Regulation of manufacture, sales. Waiting periods, closure of gun show loophole, background checks
  - Restoration of assault weapons ban
- Research in firearm injuries, including public health surveillance
- Continued physician education
Child Injury Prevention =
*Layers of Protection*

<table>
<thead>
<tr>
<th>Pool Drowning</th>
<th>Gun Death</th>
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</thead>
<tbody>
<tr>
<td>Pool fencing</td>
<td>Gun Lock</td>
</tr>
<tr>
<td>Supervision</td>
<td>Supervision</td>
</tr>
<tr>
<td>Teach child</td>
<td>Teach child</td>
</tr>
</tbody>
</table>
A Perfect Storm

- Curious Child*
- Unsecured gun
- Supervision Lapse

* or depressed/impulsive teen
What Can You Do?: Provider

• ASK your families and advise to: keep guns in the home safety secured: unloaded, locked, ammo locked separately; no access to key by kids

• Encourage families to talk to their family, friends, neighbors about the danger of unsecured guns.

• For children with behavioral or mental health issues of concern: advise removal guns from home. This is SAFETY planning!
When Providers Ask about Gun Access

% Reporting they almost always ask

- Pt suicidal in past mo., not now: 16%
- Suicidal today, no plan: 22%
- Suicidal today, non-gun plan: 21%
- Suicidal today, gun plan: 64%

Anonymous survey completed by nurses & physicians at 8 EDs (2010/11). Item prompt says, “I ask if there are firearms at home…” and poses patient scenarios. Response categories are “Almost always,” “Often,” “Sometimes,” “Hardly ever.”

Are we trying hard enough?

Psychiatrists’ Practices and Perceptions Regarding Anticipatory Guidance on Firearms

Adult psychiatrists in Ohio Mail Survey

- 45% had never thought seriously about discussing firearm safety issues with patients

- < 1/3 believed anticipatory guidance would result in fewer firearms in patients’ homes

- 21% provide AG to suicidal patients

Is it Okay for Doctors to Ask Patients about Firearms?

Marian E. Betz, MD, MPH; Deborah Azrael, PhD; Catherine Barber, MPA; and Matthew Miller, MD, ScD

What Can You Do? Parent

• Keep guns in the home safety secured: unloaded, locked, ammo locked separately; no access to key by kids
• Talk to your family, friends, neighbors about the danger of unsecured guns.
• If you have a family member at home whose state of mind worries you, remove guns from home. Seek mental health for safety planning
• ASK adults about guns in homes where your child visits.
The Final Bill

– Restricted physicians from asking about guns unless “relevant to the medical care or safety of the patient.”

– Allowed patients to report physicians, nurses, and other medical professionals to the Florida Board of Medicine for “harassment”

– Restricted information about firearm ownership into the patient’s medical record if it is not “relevant to the patient’s medical care or safety.”
The Final Bill

- Exceptions
  - Patient’s safety is at risk
  - Psychiatrists and other mental health providers
Passage Imminent

- AAP Connected FPS with Brady Center
- Ropes & Gray agreed to take case pro bono
- Lawsuit filed a week after bill signed
Legal Challenge Timeline

2012

• June 2: Gov. Scott signs bill into law
• June 6: FPS, FL Chapters of AAFP and ACP, along with 6 physicians file suit in federal court
• July 13: Judge hears formal arguments in case
• September 14: Judge Marcia G. Cooke grants preliminary injunction

2014

• July 25: 11th Circuit court upholds the law
Injunction blocking enforcement stands, pending hearing by full court
After Newtown, Sales Boom for Kids' Body Armor

By Tim Murphy | Tue Dec. 18, 2012 9:24 AM PST 192
Role of Pediatricians

Focus on the CHILD, not the Gun
Every parent knows.....

It just takes a minute.
Additional Resources

- AAP Policy Statement: Firearm-Related Injuries Affecting the Pediatric Population
  - [AAP Policy Statement: Firearm-Related Injuries Affecting the Pediatric Population](http://aappolicy.aappublications.org/cgi/content/full/pediatrics;105/4/888)

- “Censorship of the Patient-Physician Relationship” *JAMA* ([“Censorship of the Patient-Physician Relationship” *JAMA*](http://jama.ama-assn.org/content/306/10/1131.full))

- “Counseling About Firearms: Proposed Legislation is a Threat to Physicians and Their Patients” *Pediatrics* ([“Counseling About Firearms: Proposed Legislation is a Threat to Physicians and Their Patients” *Pediatrics*](http://pediatrics.aappublications.org/cgi/content/full/118/5/2168))

- AAP Connected Kids ([AAP Connected Kids](www.aap.org/ConnectedKids/default.htm))
References


Your Nationally Accredited . . .

City of Kansas City, Missouri
Health Department

QUESTIONS/COMMENTS?
SCENARIO 3: Sea Change for Health Equity

- New social contract fueled by demographic & attitude changes
- Emergency preparedness, with enhanced resilience
- Support for fairness & health equity
- Helping vulnerable populations
- Prevention

Support Social Movements
- Partner with Community
- Funding $/
- PHA
- Big Data Analysis
- Quality Assurance
- Facilitating Community Transformation

Public Health Programs Show Effective, Positive ROI
- Public Health Funding Streams:
  - Prevention fund
  - 2% medical services tax fund for public health & prevention
  - Increased state & local funding

Community Centered Health Homes
- CHIEF HEALTH STRATEGIST
- National Public Health Enterprise (consistent services, accounting, comparability)
- Health in All Policies (HiAP)
- We're here for you and connecting you with other communities

Success of Health Care Reform
- Partner with Business
- Personal Health Data

Gamification
- My Health
- Environmental Justice
- Social Justice
- Health Equity
- Near universal health care

Effective use of technology
Life expectancy by zip code, Kansas City, MO 2010-2014

<table>
<thead>
<tr>
<th>Life expectancy (year)</th>
<th>Nonwhite %</th>
<th>Below poverty %</th>
<th>Median family income ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>81-83 years</td>
<td>16.2</td>
<td>5.8</td>
<td>97,382</td>
</tr>
<tr>
<td>73-79 years</td>
<td>34.7</td>
<td>10.6</td>
<td>59,701</td>
</tr>
<tr>
<td>70-72 years</td>
<td>83.6</td>
<td>37.5</td>
<td>30,470</td>
</tr>
</tbody>
</table>

*Too small population to calculate life expectancy*

Check out YouTube: tale of two zip codes

https://www.youtube.com/watch?v=DUfccUJoZhE
Leading Causes/Symptoms Crude Mortality Rates in Two Areas, KCMO 2008-2012 (Root Causes underlie all of these)

- **6** zipcodes include zip code 64109, 64126, 64127, 64128, 64130, and 64132, which are the shortest life expectancy.
- **11** zipcodes include zip code 64112, 64113, 64116, 64118, 64151, 64152, 64153, 64154, 64156, 64157, and 64158, which are the longest life expectancy.
Death rate by education among persons 25 - 34 years KCMO 2009 - 2013

- Less than high school: 352.6 per 100,000 population
- High school: 256.2 per 100,000 population
- Some college: 70.2 per 100,000 population
- Graduate +: 20.0 per 100,000 population
Hennekens’ Criteria

• Is there a valid statistical association?
  – Chance
  – Bias
  – Confounding

• Can this valid association be causal?
  – Strong association
  – Biologic credibility
  – Consistency with other studies
  – Time sequence/Temporality
  – Dose-response
When is an association causal?

- Types of causal relationships
  
  (i) necessary and sufficient
  
  (ii) necessary but not sufficient
  
  (iii) sufficient but not necessary
  
  (iv) neither sufficient nor necessary
Themes of the Dominant Worldview (US) Narrative (primary motivation - fear of other)

- Boot Straps Individualism
- Science is suspect
- Education is for job training
- Structural Discrimination is a thing of the Past
- Small Government
- Free Market Solutions

(Primary Motivation: Fear of the Other)
Themes of the Alternate Worldview Narrative (compassion for the other/no other)

- Individuals need support
- Science is essential
- Education is for critical thinking & Citizenship
- Structural inequities are still present
- Government Solutions
- Free Market Checks & Balances