

# **Public health successes stories that point the way to reducing the burden of firearm related death in the US**

Coal Gas: England

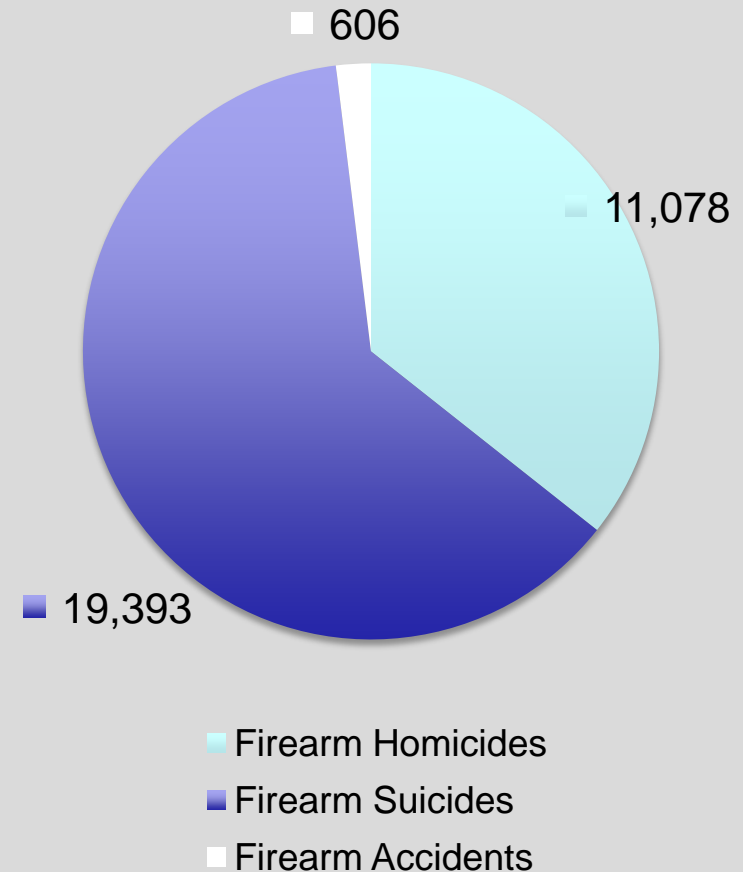
Pesticides: Sri Lanka, Samoa

Motor vehicles: US

## Compelling reasons to focus on suicide:

- 19k FS vs. 11k FH
- State to state variation in suicide rates is large and largely explained by disparities in firearm suicide rates
- The evidence linking the availability of firearms and suicide is even more compelling than that linking firearms and homicide
  - Dozen plus US case control and cohort studies: **ALL** find an association between **a firearm in the home and the risk of suicide for all household members, not only the gun owner.** Storage for children and young adults appears to matter too.
  - Ecologic studies consistent with individual level findings.

## Firearm Deaths in the US, 2010



# **The decomposition approach: what caused the injury?**

MVC fatality rate=Crash rate \* death per crash

# What caused the injury (suicide)?

Suicide mortality rate = Attempt rate \* death per attempt

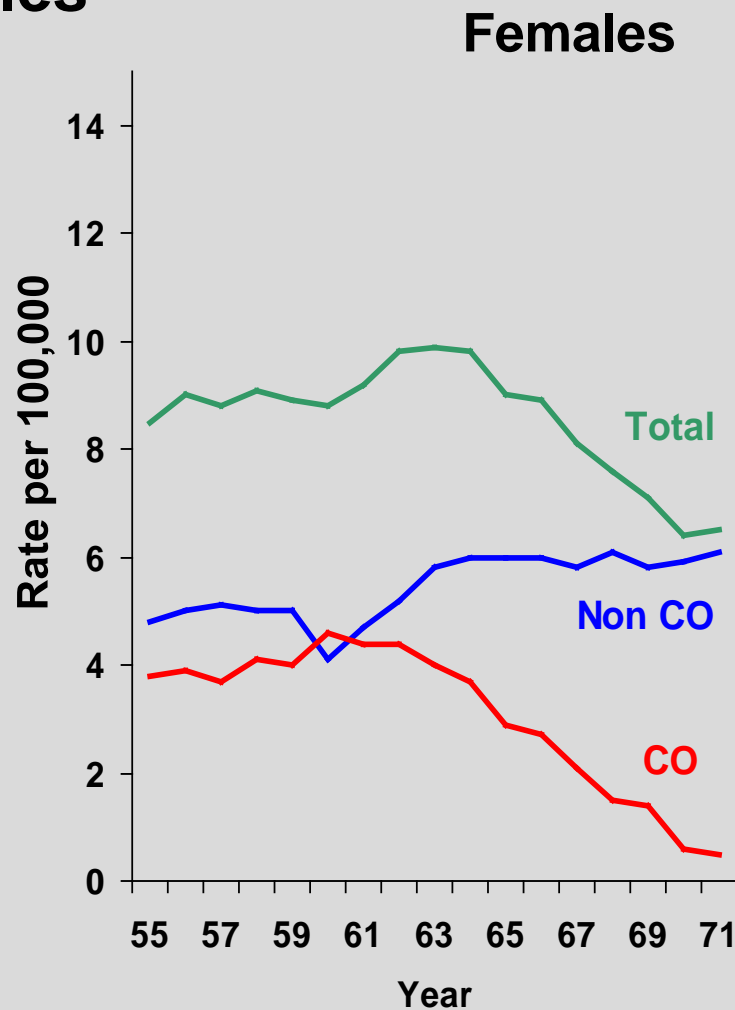
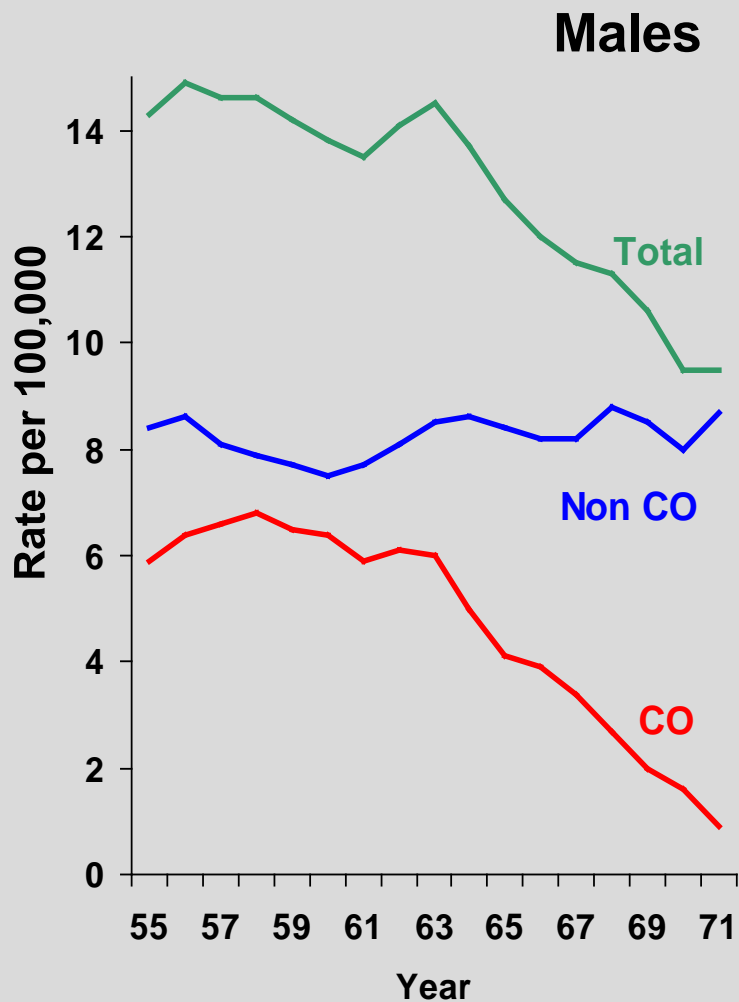
AND WHAT LARGELY DETERMINES DEATHS PER ATTEMPT  
(CFR),  
ARE THE METHODS USED IN ATTEMPTS

**Does availability of method  
affect suicide rates?**

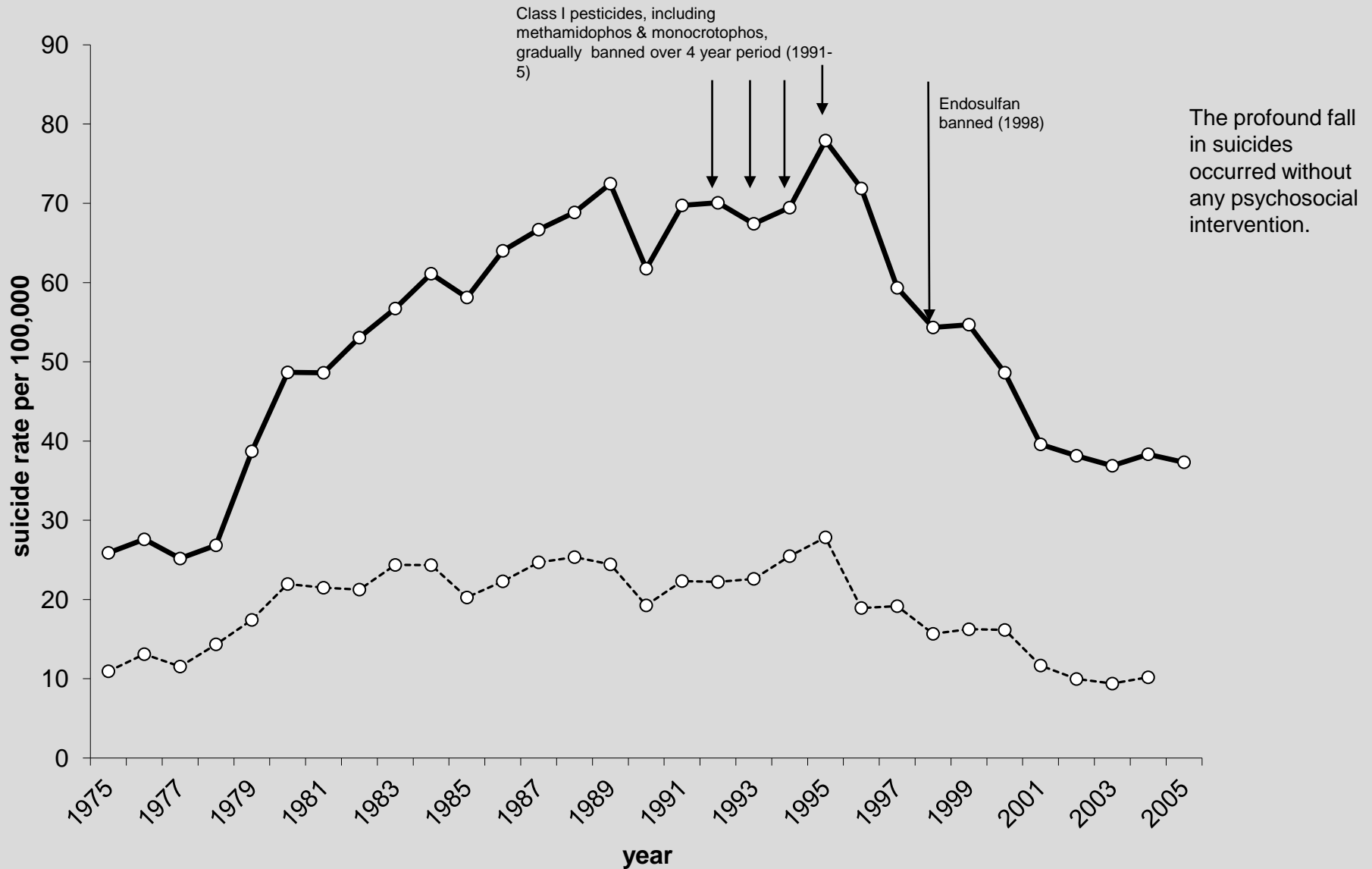
**YES,**  
Sometimes dramatically

# THE COAL GAS STORY (Kreitman, 1976)

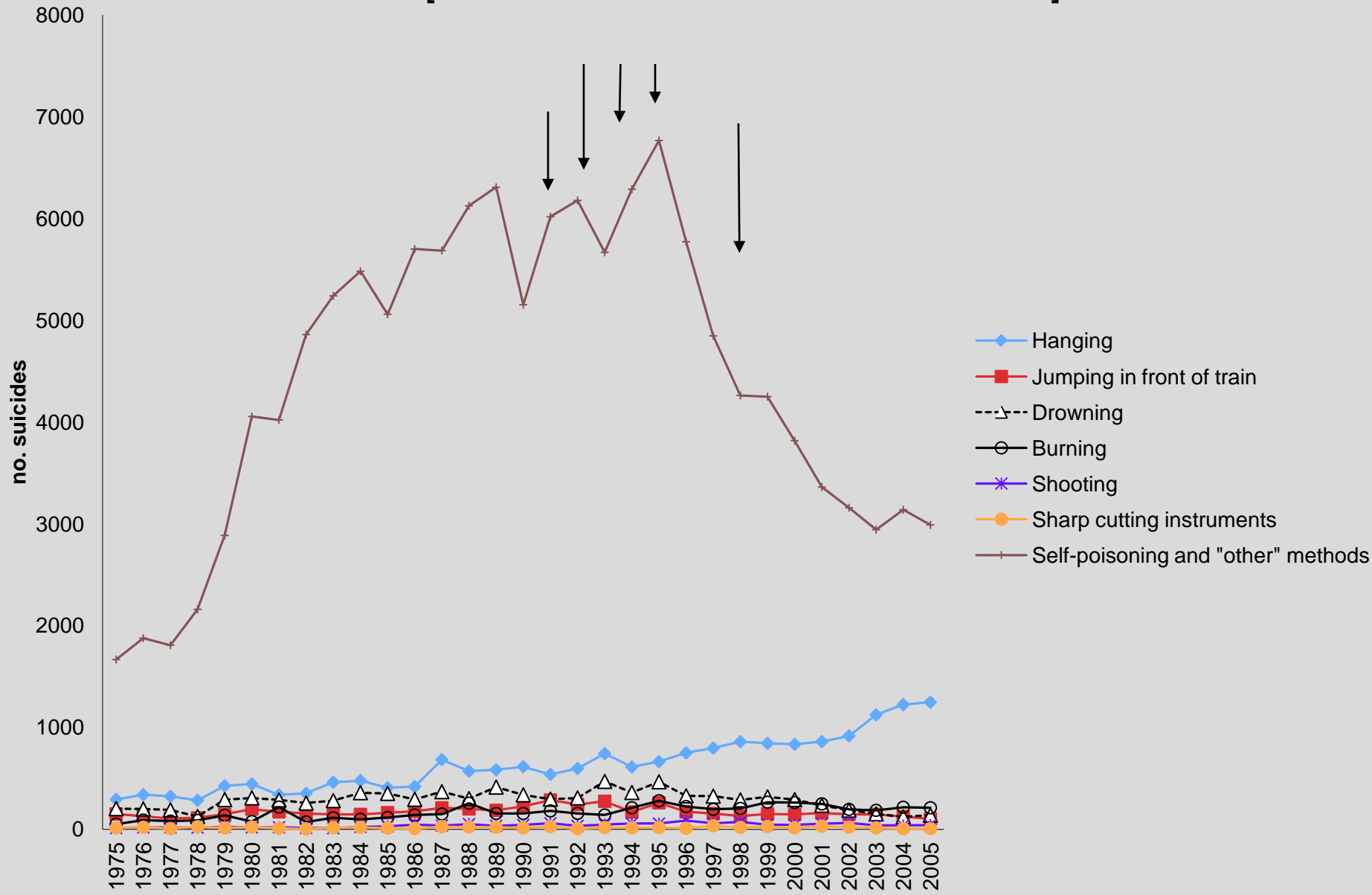
## Sex-specific suicide rates by mode of death: England & Wales



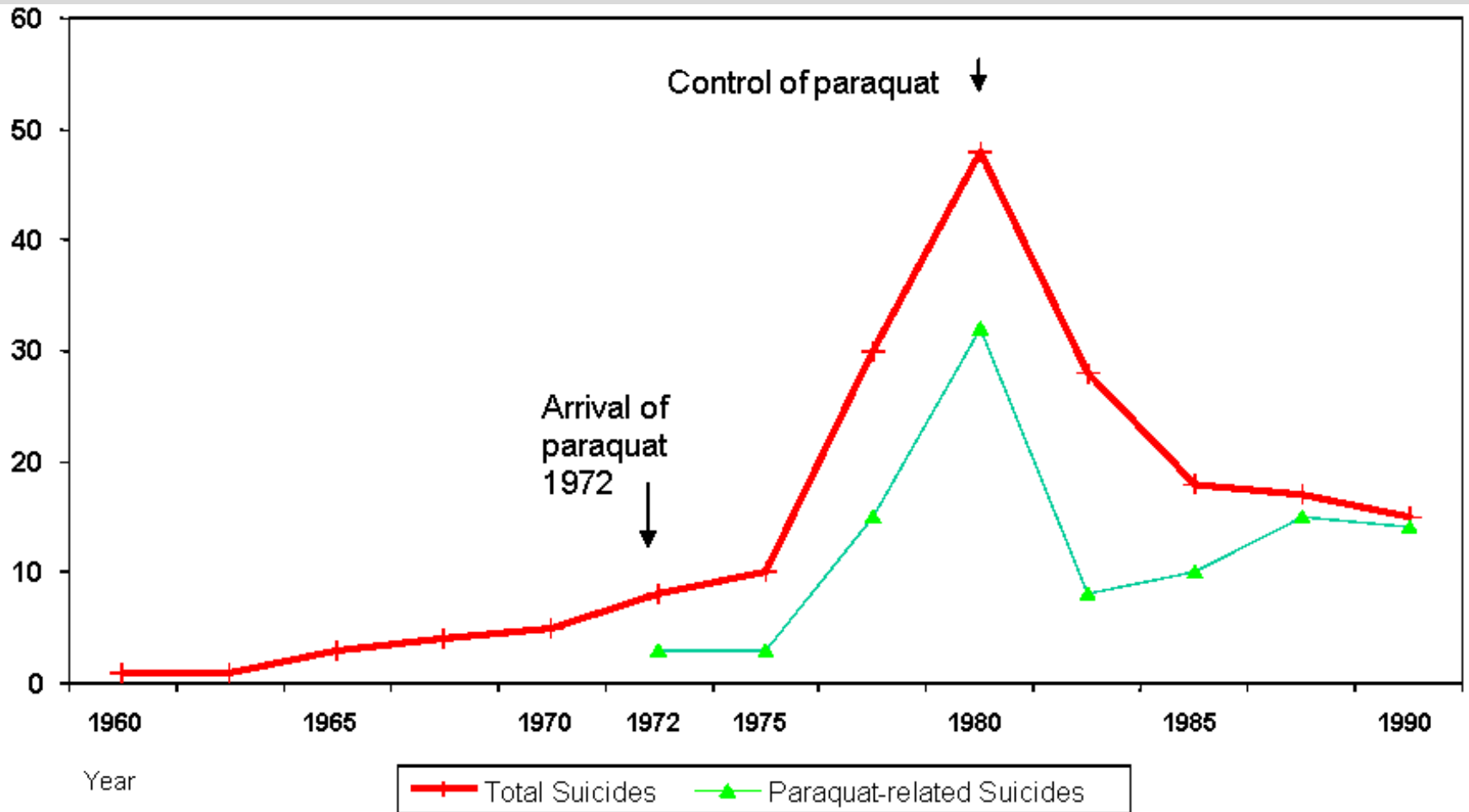
# Suicide rates in Sri Lanka, by gender & pesticide bans



# Suicide rates by means, Sri Lanka, documenting the rise of poisoning suicide by pesticides and the decline after serial bans on some of the most toxic, commonly used agents [with thanks to Michael Eddleston for the slides]







Number of overall suicides and paraquat-related suicides following introduction and control of paraquat sales, 1970-1988.  
Sources: Graphic from World Report on Violence and Health, WHO. Data from Bowles, 1995.

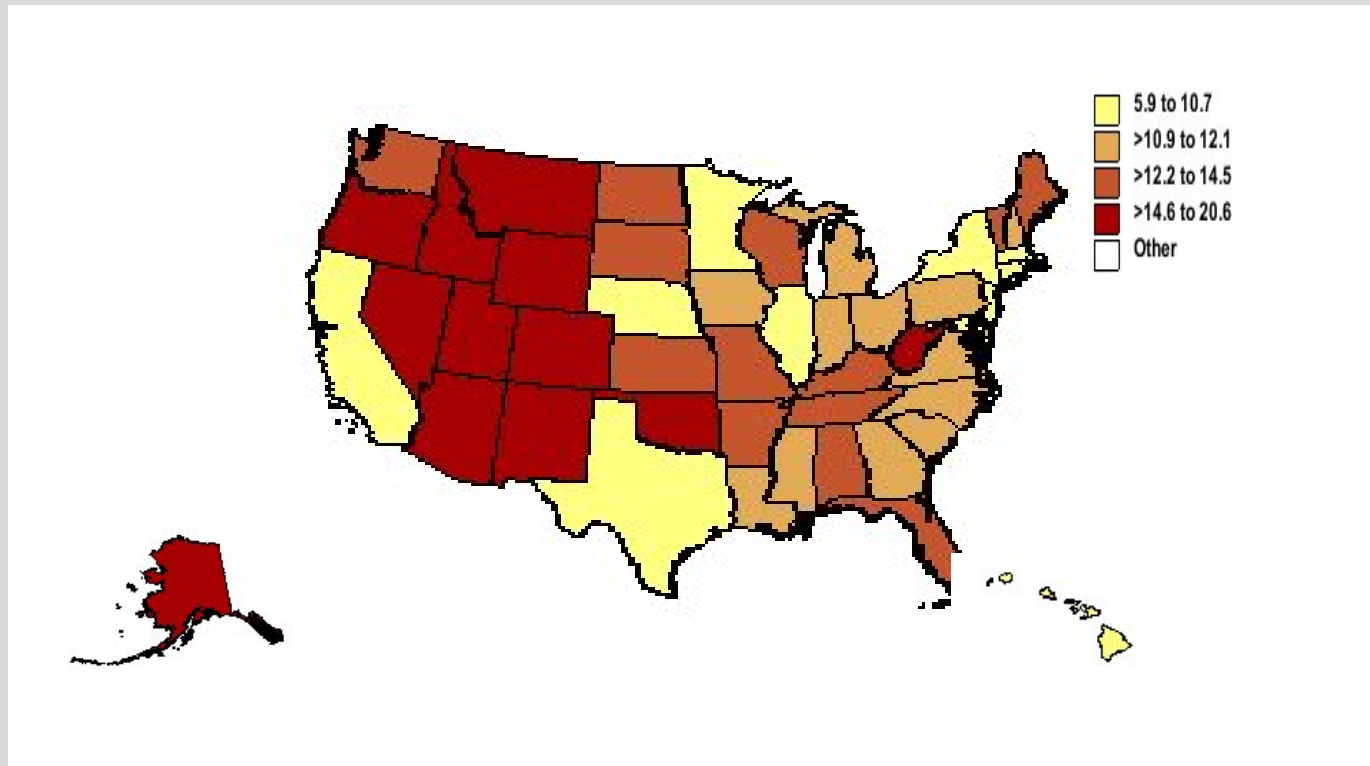
# What about the US?

Firearms, like coal gas in the UK and pesticides in Sri Lanka, are highly lethal and commonly used:

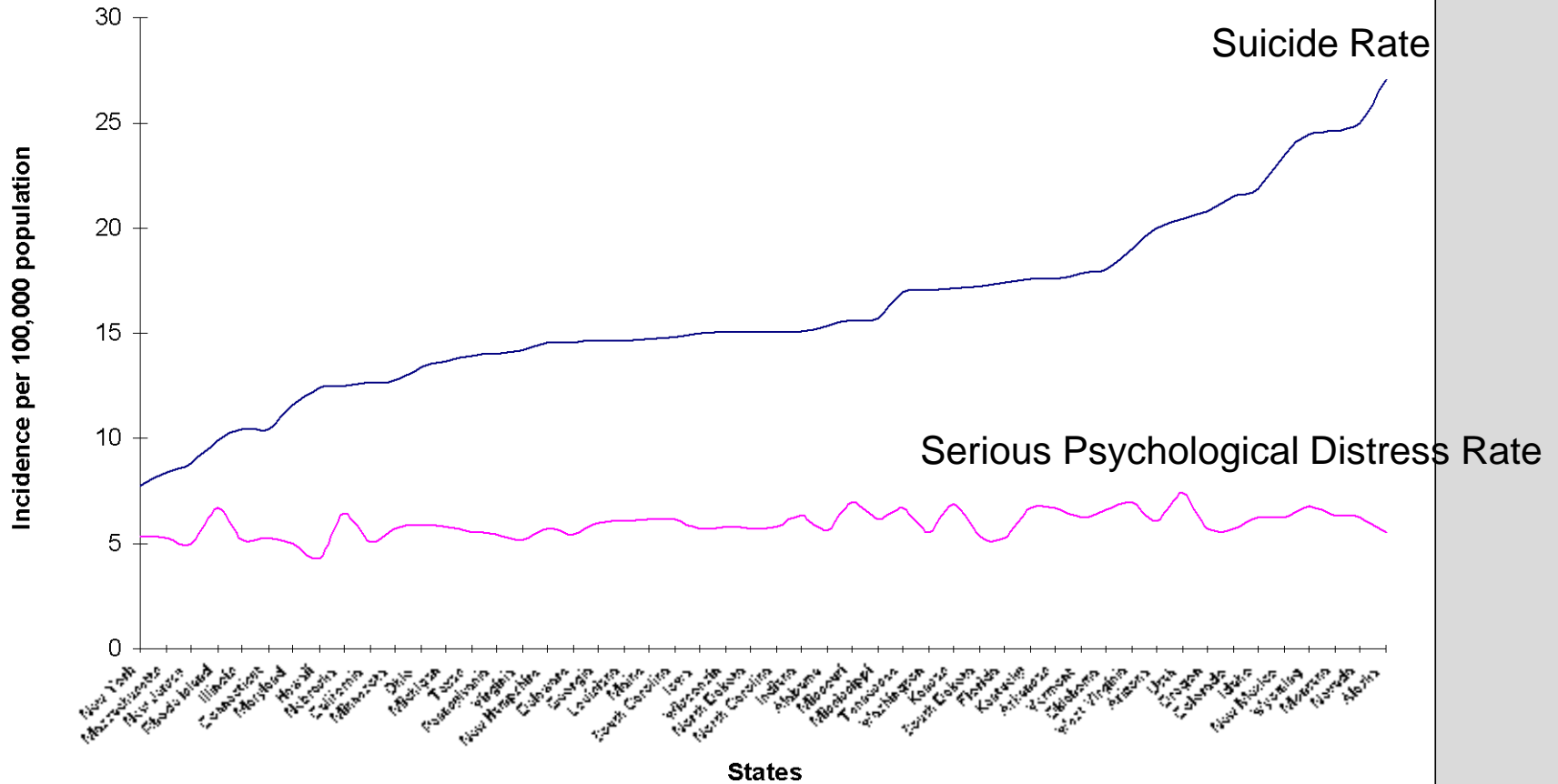
- 50% of all US suicides are firearm suicides

And access to firearms drives firearm and overall suicide rates

CDC WONDER Online Database, Compressed Mortality File 1999-2010. Suicides per 100,000 population



**Incidence (per 100,000 population) of Suicide and Serious Psychological Distress across the 50 U.S. States (2003-2004).**



Serious Psychological Distress in Past Year, Annual Incidence Based on 2003 and 2004 NSDUH data. See <http://www.oas.samhsa.gov/2k4State/ch6.htm>  
 Suicide data from WISQARS

# Suicide Rate 1994 – 1998 per 100,000

State	Households with Firearms (%)	Overall	Firearm	Non-Firearm
ME	45%	13.5	7.9	5.6
VT	48%	12.3	7.9	4.4
NH	33%	12.1	6.8	5.3
CT	21%	8.9	3.7	5.2
RI	16%	8.3	3.0	5.3
MA	14%	8.2	2.4	5.8
NJ	12%	7.3	2.4	4.9

Source: Miller et al., J Trauma, 2004.

Suicide deaths in states with the highest vs. lowest gun ownership levels (BRFSS 2004),  
Mortality data WISQARS 1999-2007

	High-Gun States*	Low-Gun States**	Ratio
<b>Aggregate population of adults, 2001-2007</b>	356 million	358 million	1.0
<b>Proportion of households with firearms</b>	1/2	1/6	3.3
<b>Percentage of adult population reporting depression (SI), past 12 months (NSDUH 2008-2009)</b>	3.7% (6.6%)	3.7%(6.5%)	1.0
<b><u>Women</u></b>			
<i>Firearm Suicide</i>	4148	563	7.4
<i>Non-Firearm Suicide</i>	4633	4575	1.0
<i>Total Suicide</i>	8781	5138	1.7
<b><u>Men</u></b>			
<i>Firearm Suicide</i>	26314	7163	3.7
<i>Non-Firearm Suicide</i>	11592	12377	0.9
<i>Total Suicide</i>	37906	19540	1.9
<b><u>Children 5-14 year olds</u></b>			
<i>Firearm Suicide</i>	166	15	11.1
<i>Non-Firearm Suicide</i>	225	154	1.5
<i>Total Suicide</i>	391	169	2.3

\*Louisiana, Utah, Oklahoma, Iowa, Tennessee, Kentucky, Alabama, Mississippi, Idaho, North Dakota, West Virginia, Arkansas, Alaska, South Dakota, Montana, Wyoming; \*\*Hawaii, New Jersey, Massachusetts, Rhode Island, Connecticut, New York; \*\*\*ALL Data are from 1999-2007 because cell counts were suppressed beginning in 2008. From Miller M, Azrael D, Hemenway D. *Firearms and Violent Death in the United States. In Reducing Gun Violence in America: Informing Policy with Evidence and Analysis.* Johns Hopkins University Press. 2715 North Charles Street, Baltimore, MD. 2013

The central concepts and empirical realities from success stories in reducing MV fatality rates in the US and non-gun suicide rates in the UK, Sri Lanka, and Samoa:

Suicide rates (i.e., suicide mortality) rates can be dramatically decreased WITHOUT necessarily affecting rates of underlying mental illness or even suicidal behavior,

Changes in the environment – in the physical and legislative environment, in social norms, and in the characteristics of the physical agent of death – all have a role to play in decreasing *mortality* rates

Centralized mechanisms (e.g., those used to ban toxic pesticides in Sri Lanka) are unlikely to significantly reduce exposure to household firearms in the US.

Rather, interventions most likely to affect population level exposure will do so through a *multifaceted approach* that includes efforts to:

- FOSTER INFORMED HOUSEHOLD DECISION MAKING ABOUT WHETHER (AND UNDER WHAT CONDITIONS) TO KEEP A GUN IN THE HOME, AND IF SO, HOW TO SAFELY STORE GUNS
- SHIFT SOCIAL NORMS (E.G., FRIENDS DON'T LET FRIENDS DRIVE DRUNK)
- DEVELOP AND FACILITATE ADOPTION OF TECHNOLOGICAL ADVANCES IN FIREARM SAFETY (E.G., PERSONALIZED FIREARMS)
- ENACT LEGISLATIVE INITIATIVES (E.G., CT LAW THAT ALLOWS FOR THE TIMELY AND GENERALLY TEMPORARY REMOVAL OF FIREARMS FROM PEOPLE POSING IMMINENT RISK TO THEMSELVES OR OTHERS)



# Let a thousand flowers bloom

**Rather than narrowly specify specific projects researchers can propose, foster researcher initiated proposals**

With this in mind, what *broadly* conceived research opportunities should the CDC support over the next 3-5 years?

1. Foundational research:

- A. What factors govern method choice in addition to the ready availability (i.e., physical availability) of the means at hand (e.g., “cognitive availability”)
  - ✓ When a suicidal person’s access to a lethal method is blocked, what determines the method used, if any, in an attempt?
  - ✓ What role, if any, do online resources and social networks play in method choice and the method-specific CFR?
- B. How do gun storage practices affect suicide risk for adults?
- C. What factors drive secular changes among sub populations, e.g., young African American male suicides

# Let a thousand flowers bloom

## 2. Cognitive Behavioral Research:

- A. Better understand how people weigh the risks and benefits of keeping a gun in the home (and about different storage practices)
  
- A. Based on A, what messages, presented by whom, and in what context help people minimize risk associated with household firearms?

## 3. Intervention Research:

- A. Conduct rigorous studies of the impact of lethal means counseling on household decision making re gun ownership and storage practices

## 4. Translation/Dissemination Research:

- A. Institutionalize effective practices in standard clinical care among medical and behavioral health providers, and among other “gatekeepers” who fall outside the formal health system

# Let a thousand flowers bloom

Structural changes within the CDC that could help:

- Insulate the CDC from political pressure
- Increase the CDC's internal capacity to conduct and superintend excellent firearms research
- Leverage existing data systems (e.g., BRFSS, NSDUH, Mortality follow back-survey) to supply the basic information researchers require to adequately study firearm violence
- Create a funding stream that provides practical levels of support for young, promising scientists to pursue a career in firearm-related research
- Provide leadership in creating a more capacious suicide prevention paradigm:
  - ✓  $SR = SAR * CFR$