



JOHNS HOPKINS
M E D I C I N E

Suicide and Access to Lethal Means

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Objectives:

Review the epidemiology of firearm suicide

Illustrate the importance of lethal means access in suicide risk

Discuss the value of counseling patients on firearm access

(Bonus Objective) Forcing the issue: Extreme Risk Protection Orders

Disclosures: None

Leading Causes of Death in US, by Age Group

Rank	10-14 years	15-19 years	20-29 years	30-39 years	40-49 years	50-59 years
1	Unintentional Injuries	Unintentional Injuries	Unintentional Injuries	Unintentional Injuries	Unintentional Injuries	Malignant Neoplasms
2	Suicide	Suicide	Suicide	Suicide	Malignant Neoplasms	Heart Disease
3	Malignant Neoplasms	Homicide	Homicide	Malignant Neoplasms	Heart Disease	Unintentional Injuries
4	Congenital Malformations	Malignant Neoplasms	Malignant Neoplasms	Heart Disease	Suicide	Liver Disease
5	Homicide	Heart Disease	Heart Disease	Homicide	Liver Disease	Chronic Lower Respiratory Ds
6	Heart Disease	Congenital Malformations	Diabetes Mellitus	Liver Disease	Diabetes Mellitus	Diabetes Mellitus
7	Chronic Lower Respiratory Ds	Chronic Lower Respiratory Ds	Congenital Malformations	Diabetes Mellitus	Cerebro-Vascular	Suicide
8	Cerebro-Vascular	Cerebro-Vascular	Complicated pregnancy	Cerebro-Vascular	Homicide	Cerebro-Vascular

2018:

- **48,344 Suicides**
- **16,214 Homicides**

Suicide is the Overall
10th Leading Cause of
Death in US

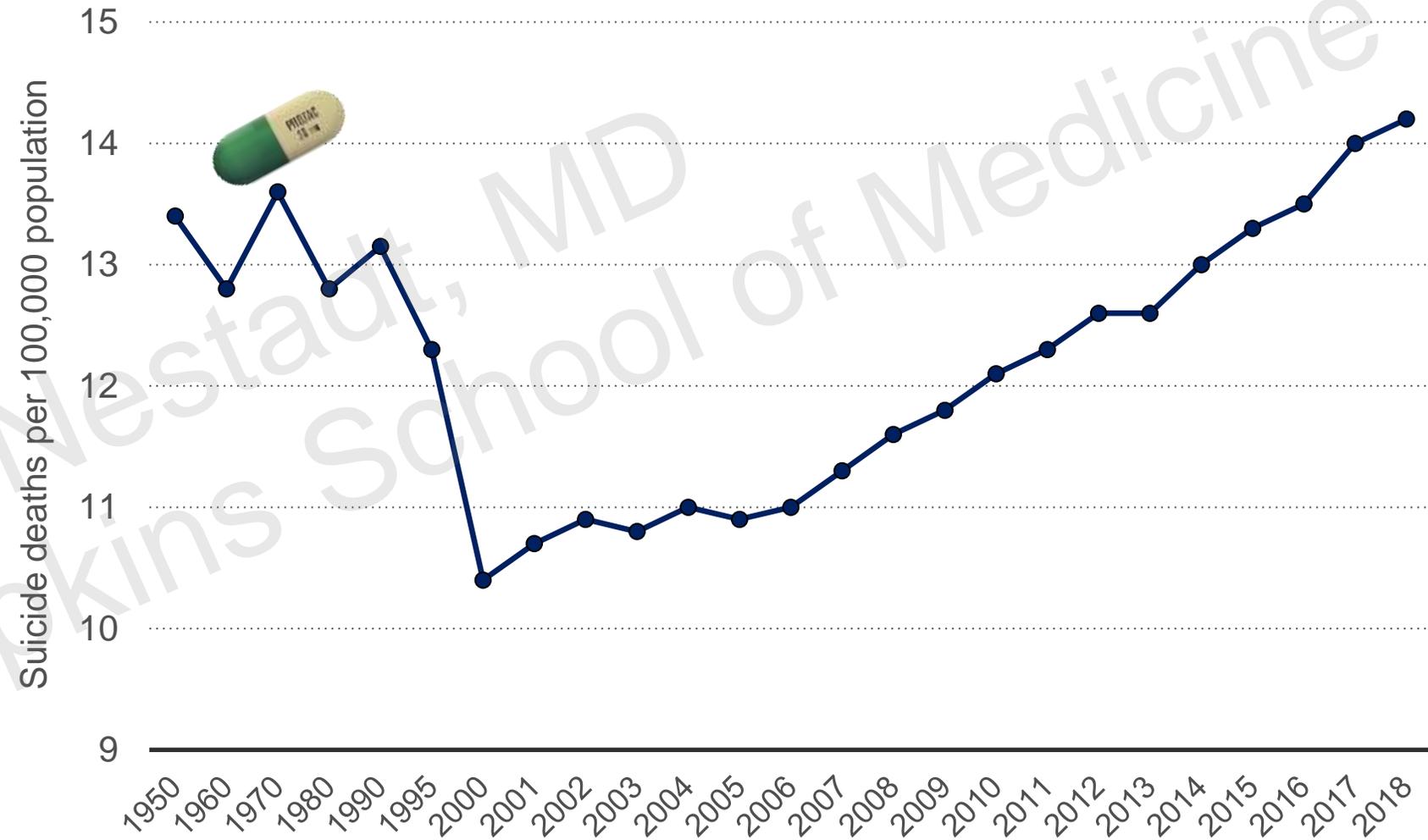
2nd most common cause
of death for **Young
Americans**

Suicide Deaths are Common and Increasing

Annual US Suicide Rate:

14.2 per 100K (2018)

Rates have been **climbing** throughout the 21st century



Suicide is a Behavior

It is a choice which emerges from a variety of environmental and personal factors

- ▶ Some chronic, some acute
- ▶ Some **fixed**, some **modifiable**

Many important factors are immutable

- ▶ Family history of suicide
- ▶ Male sex, white race
- ▶ Terminal illness, etc.

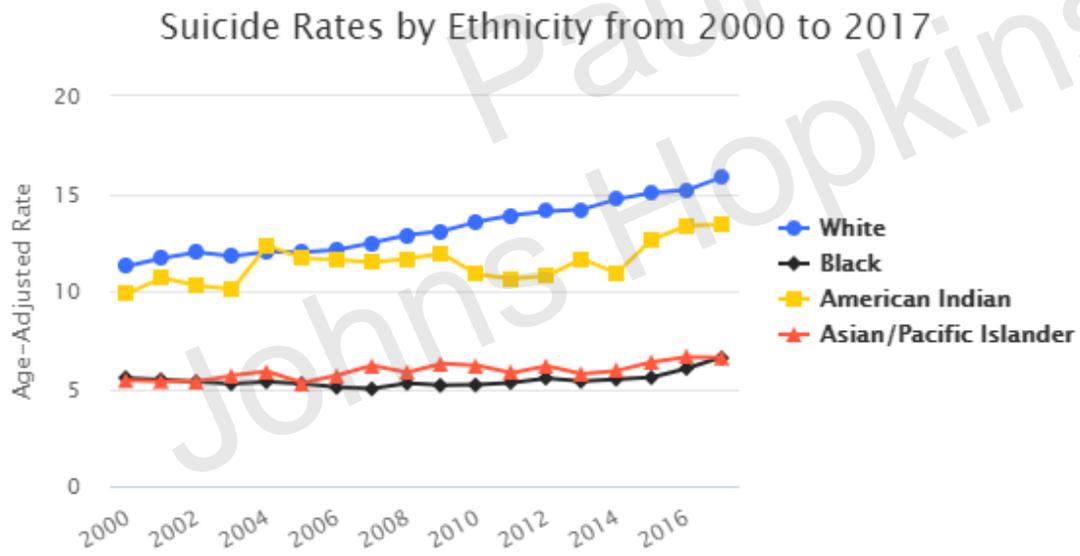
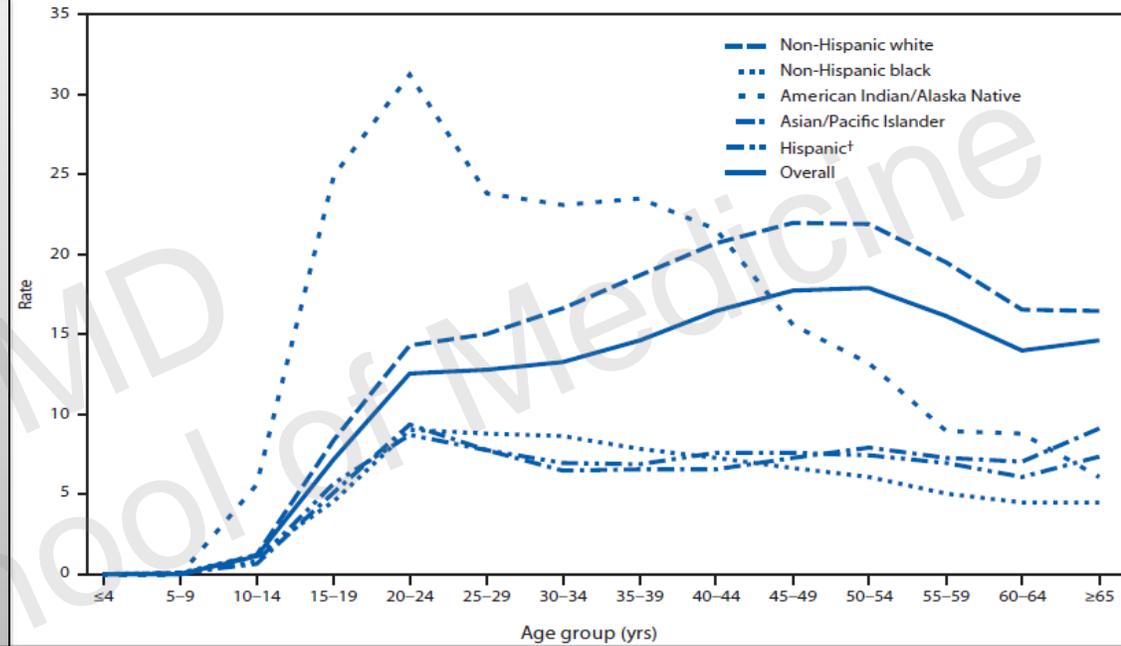
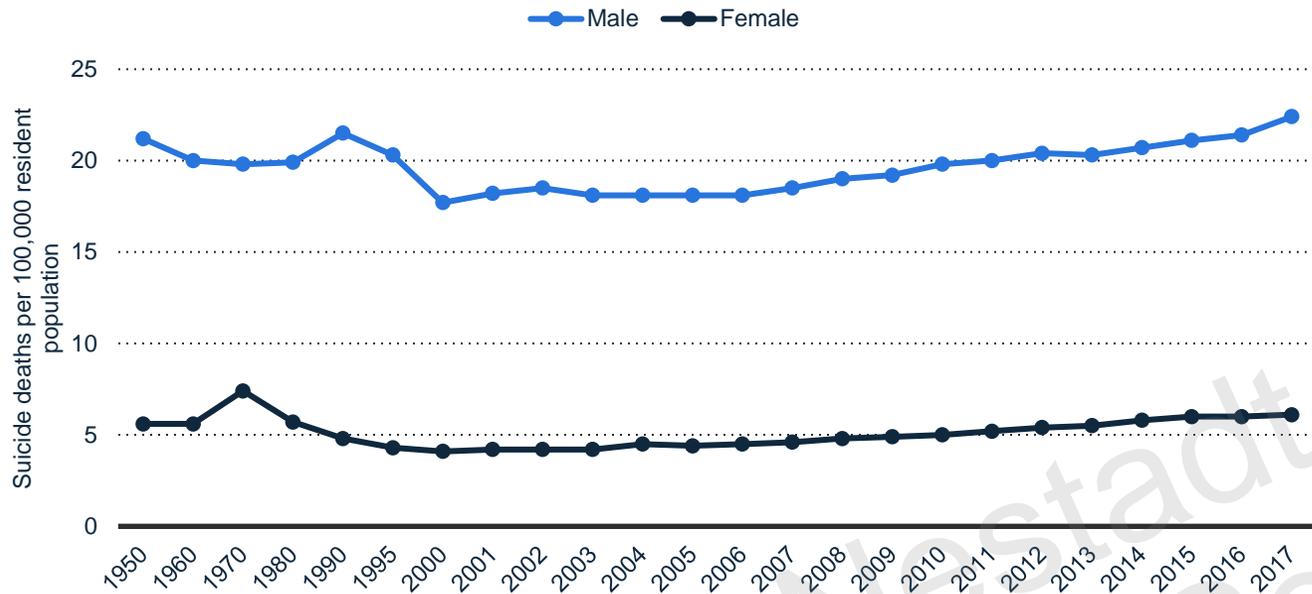
Other important factors can be addressed

- ▶ Social isolation, Poverty
- ▶ **Access to lethal means**
- ▶ **Mental Illness**

- **Psychiatric disorders** are among the most **significant** modifiable risk factors

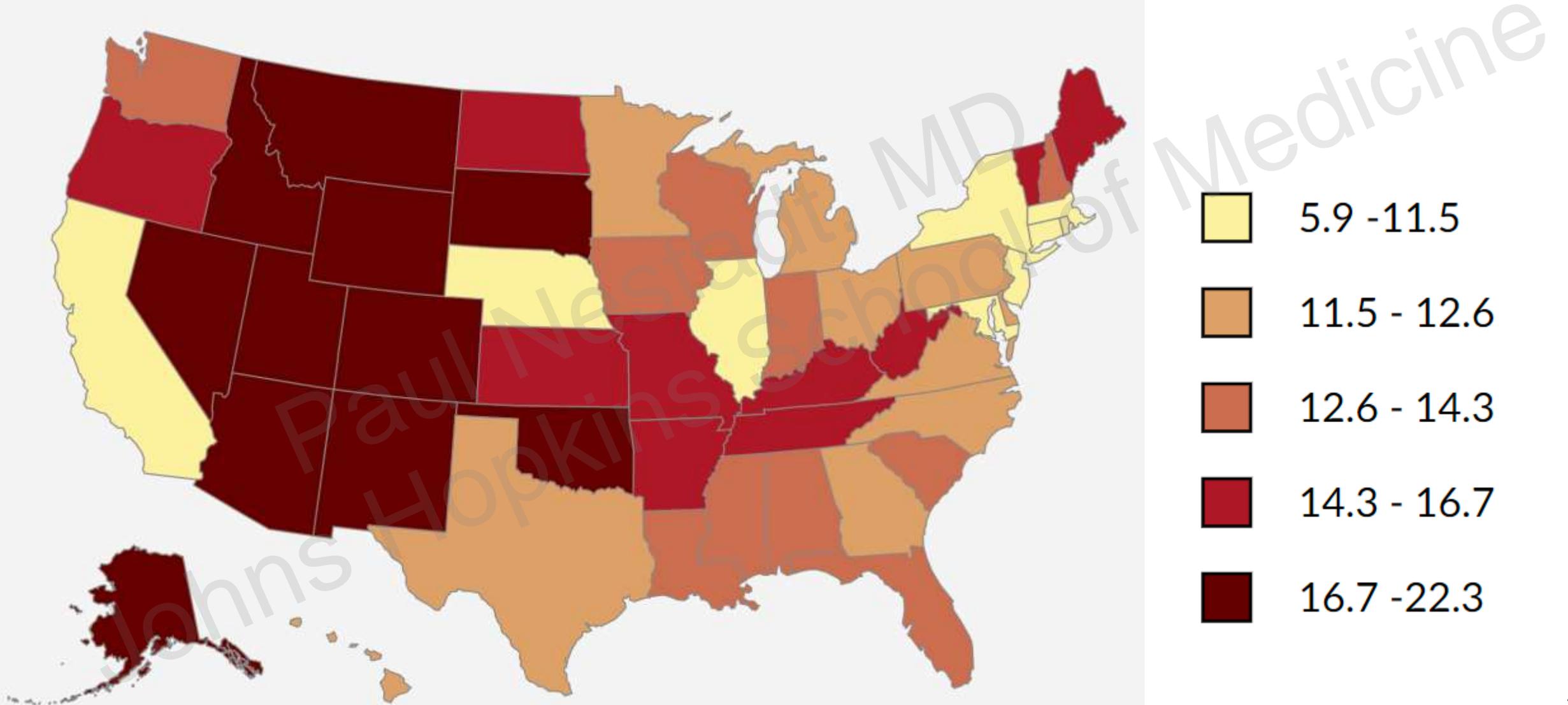


Suicide in The United States



- Completed suicides are predominantly male (78%)
- Caucasians complete suicide at almost triple the rate of African Americans
- Rate peaks around age 50 and ages 80+
 - African Americans & AI/AN peak suicide rate at age 20

Suicide rates by state -- United States, 2001-2018

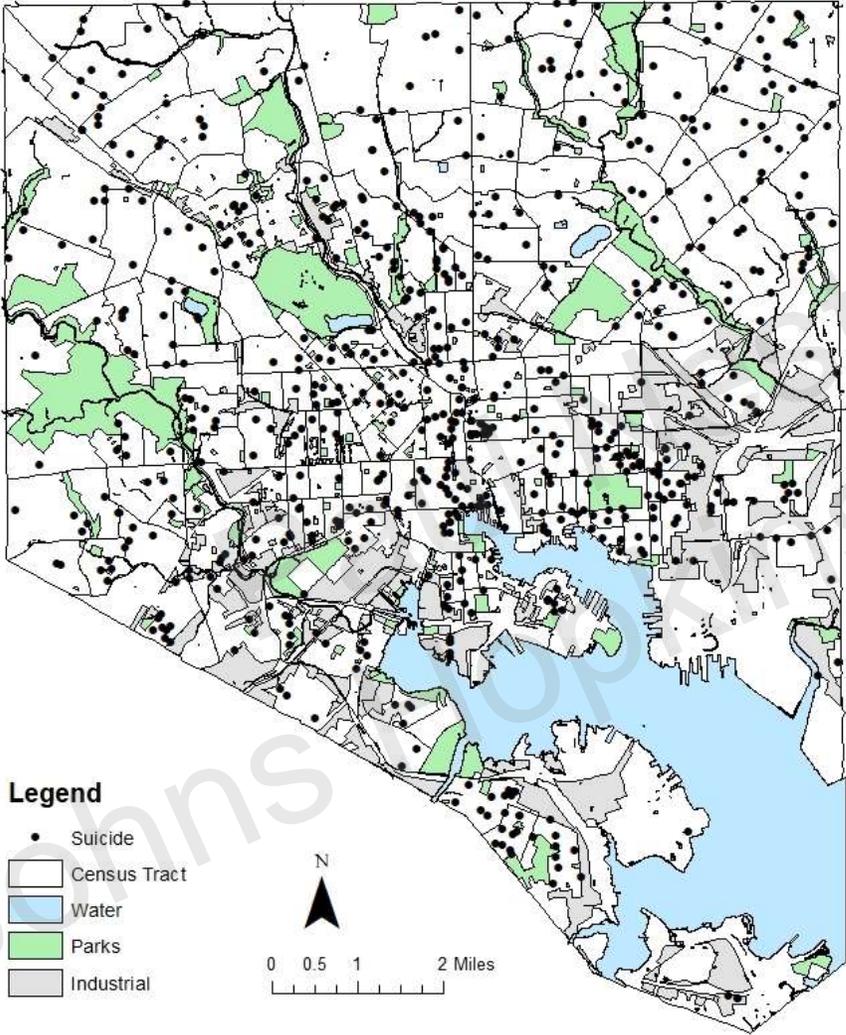


Suicide rates by county-- Maryland, 1999-2016

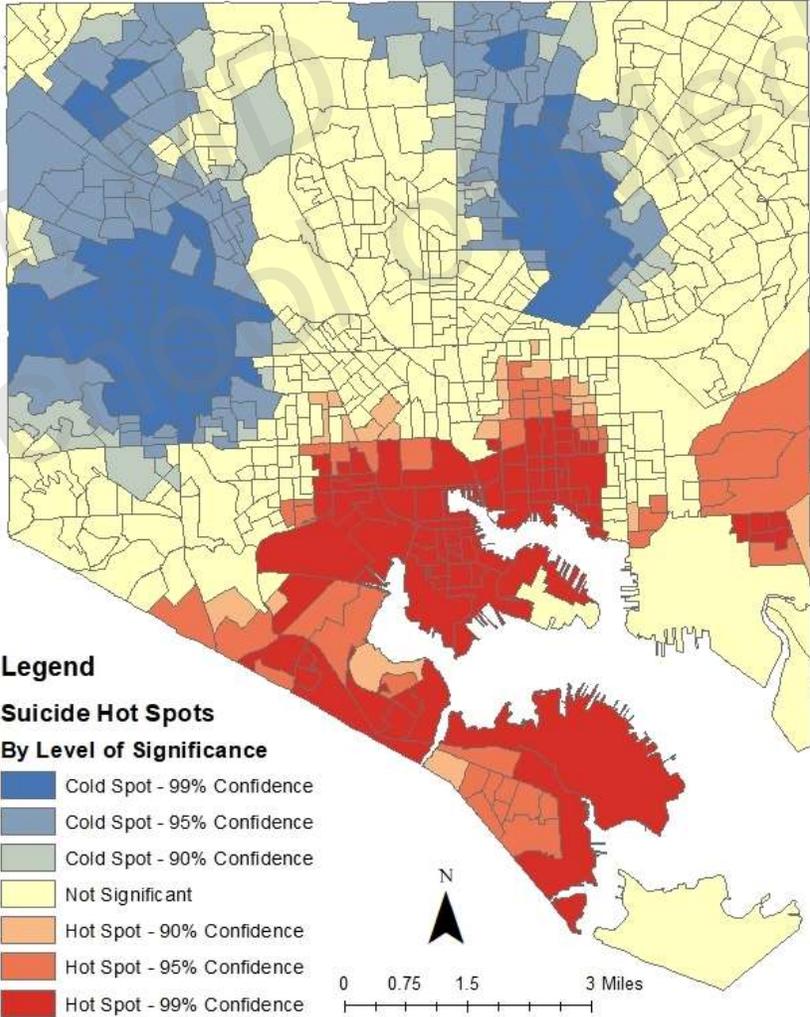


Baltimore Suicides, by location and rate, 2003-2017

Suicides in Baltimore City, 2003-2017



Suicide Clustering, Baltimore 2003-2017
Hot Spots and Cold Spots, Getis-Ord Gi



Suicide Attempts in the United States

Despite the suicide death rate being so high, its still **much smaller than the suicide attempt rate**

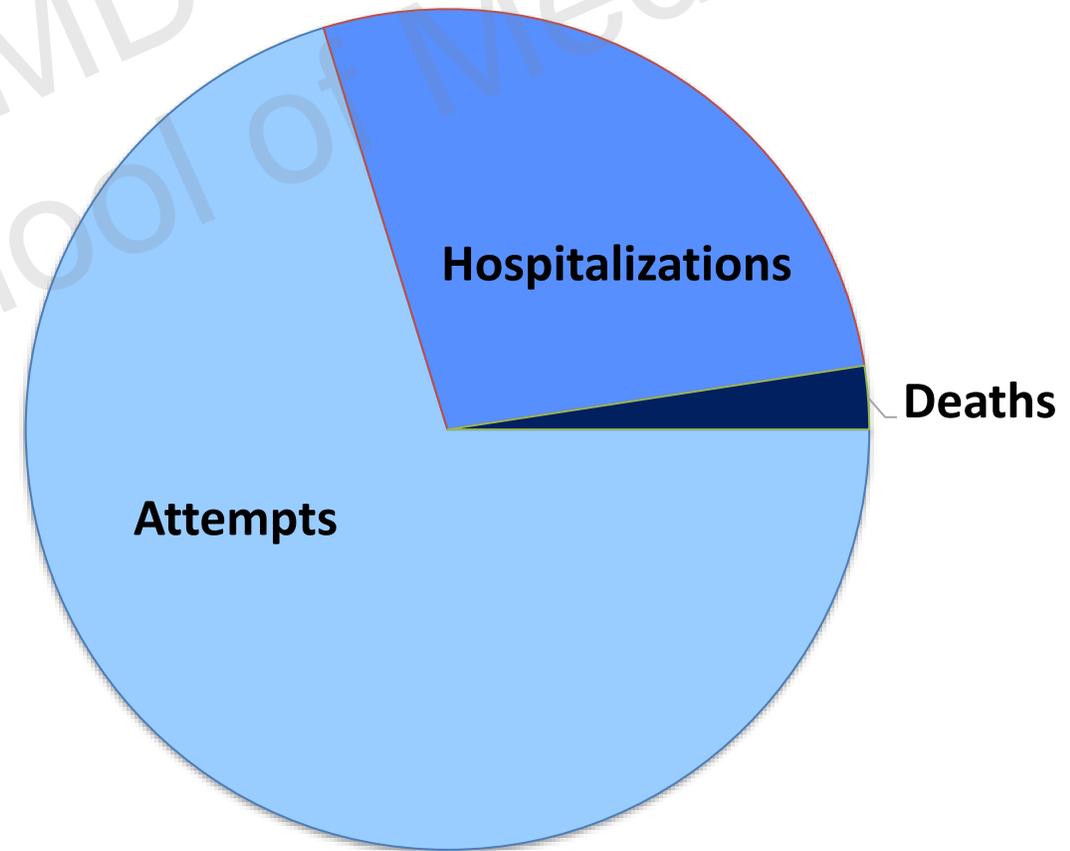
In Past Year:	High Schoolers	Adults
Seriously Considered	17.0%	3.9%
Made Plan	13.6%	1.1%
Attempted	7.4%	0.6%
Required Medical Attention	2.4%	---
Completed	0.008%	0.014%

Source: AFSP, CDC, and National Survey of Drug Use and Mental Health (2016), YRBS (2017)

Suicide Attempts in the United States

- Estimated **1.4M adults attempt suicide annually**
- About **0.5M adults** are **admitted to the hospital** for suicide attempts each year
- About **48,000 die** by suicide each year
- **Females** have **higher** suicide **attempt** rate
- **Males** have **3.5x** the suicide **death** rate
- **Why?**
 - **Clue:** difference shrinks in **physicians**

Suicide Attempts and Mortality



With all of these attempts, how do so many survive?

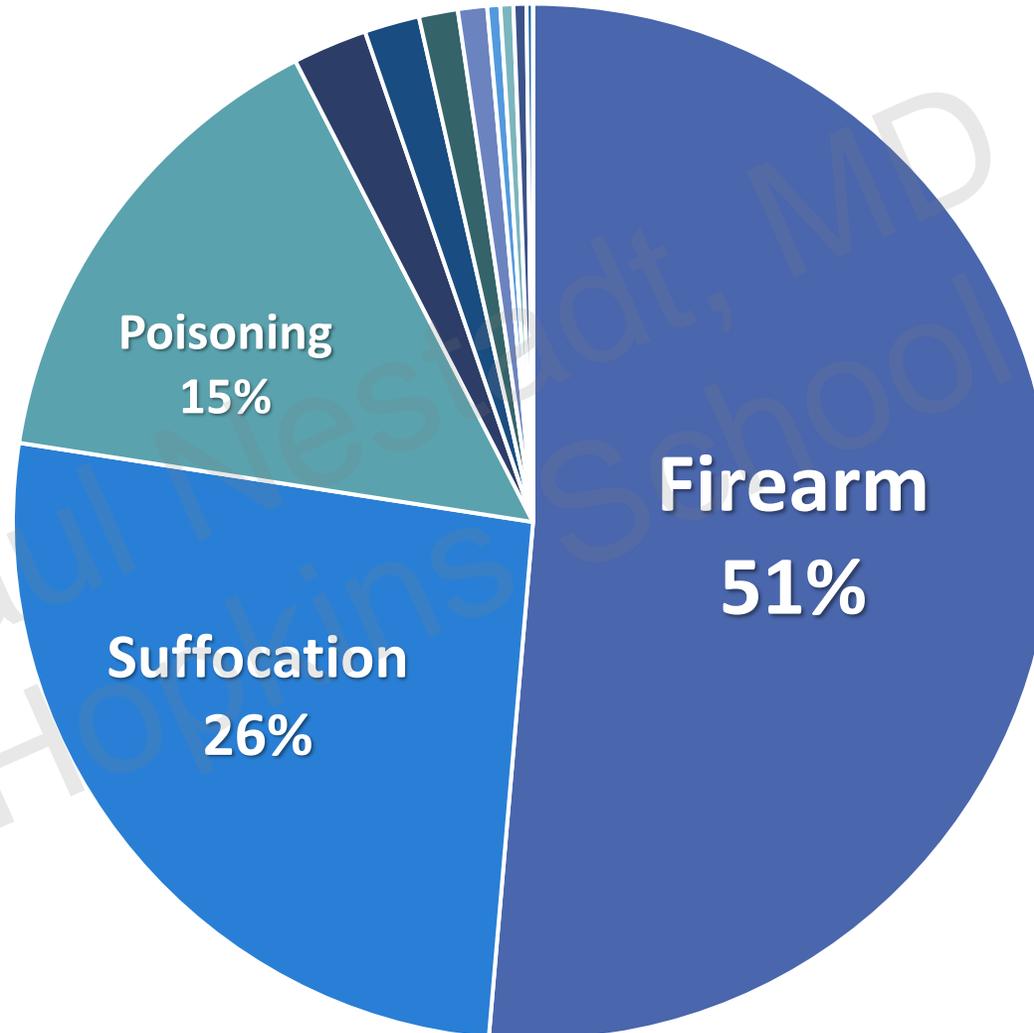
- In general, suicide **attempts** have a relatively **low fatality rate**
- If a **firearm** is used in a suicide attempt, it will **usually be fatal**
- **Men tend to use guns**, as opposed to women who tend to overdose

Method (2001)	Fatal	Nonfatal	% Fatal
Firearm	16,869	2,980	85%
Suffocation	6,198	2,761	69%
Poisoning/OD	5,191	215,814	2%
Fall	651	1434	31%
Cut/pierce	458	62,817	1%
Other	1,109	35,089	3%
Unspecified	146	2097	7%
Total	30,622	322,991	9%

Suicide Methods in The United States

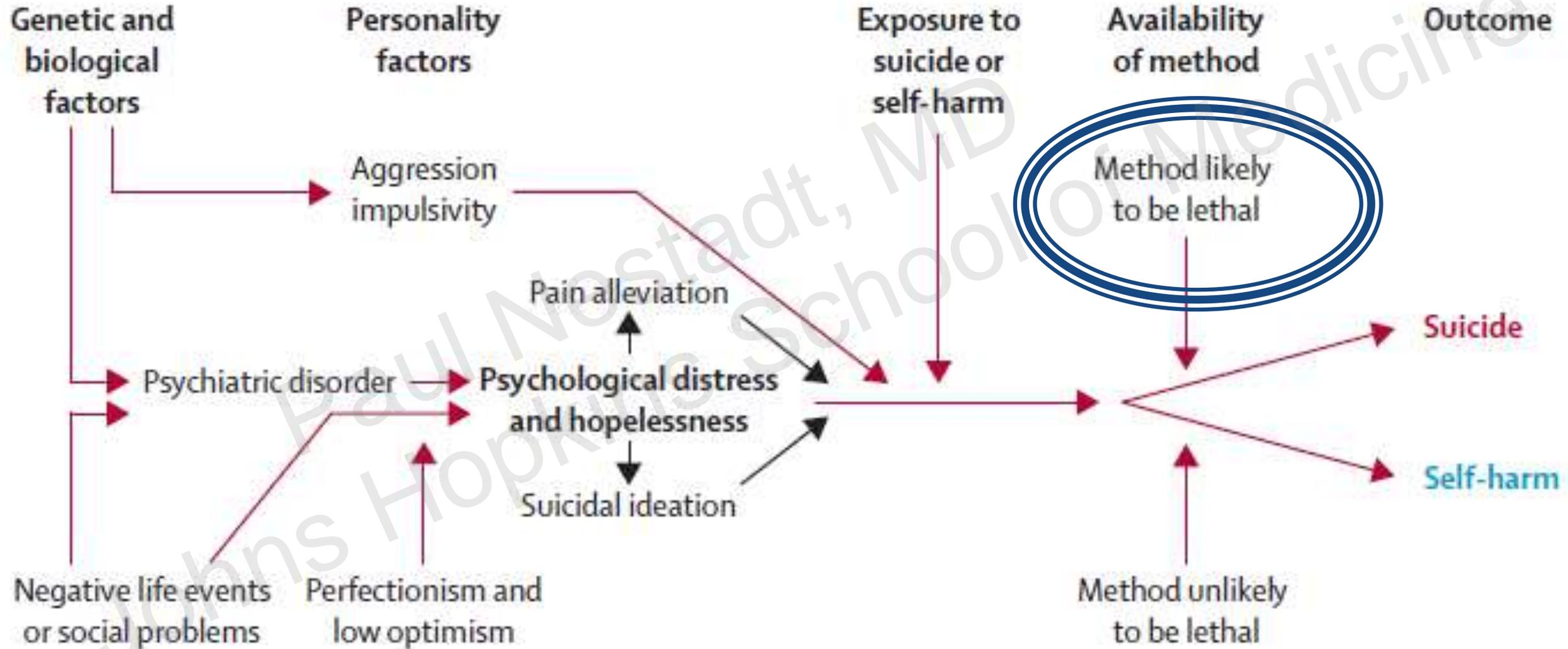
5-6% of suicide attempts use guns.

Those become half of all suicide deaths.



63% of firearm deaths are suicides.
Only 33% are homicides.

Pathway and Key Risk Factors for Self Harm and Suicide



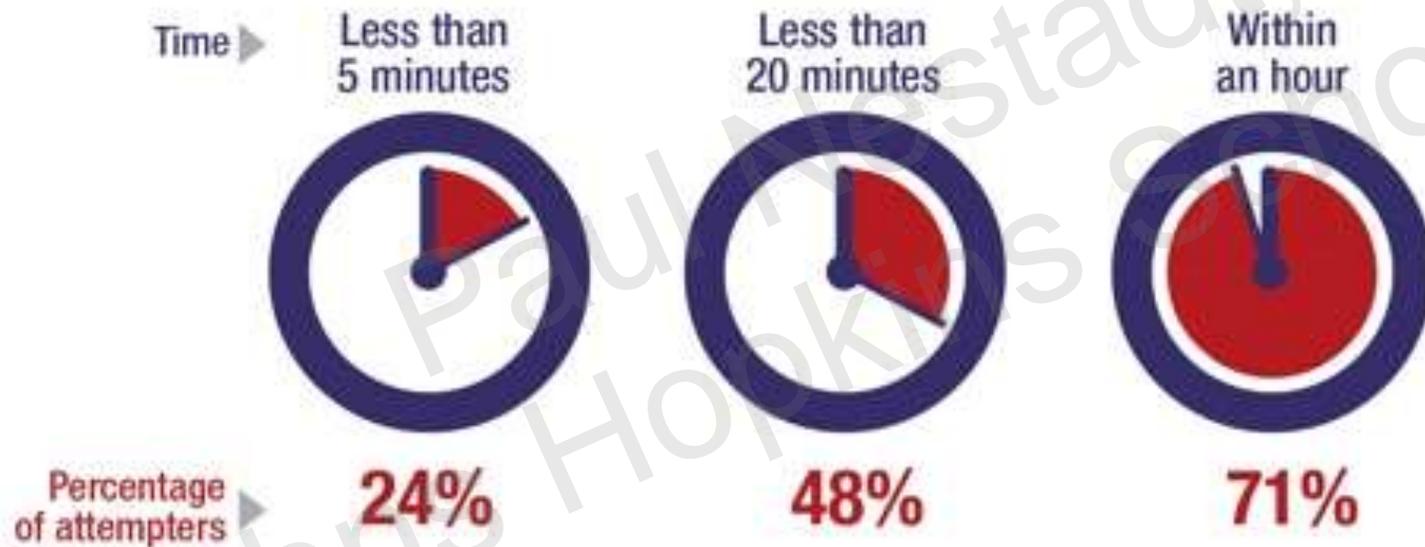


**The Choice of Method is a Consequence of
Method Availability**

Suicide Is A Powerful, But Brief Impulse

Simon (2001) interviewed 153 young high lethality suicide attempters and found that fully 87% of them had only decided to make the attempt within 24 hours of the attempt; and most had decided within the hour

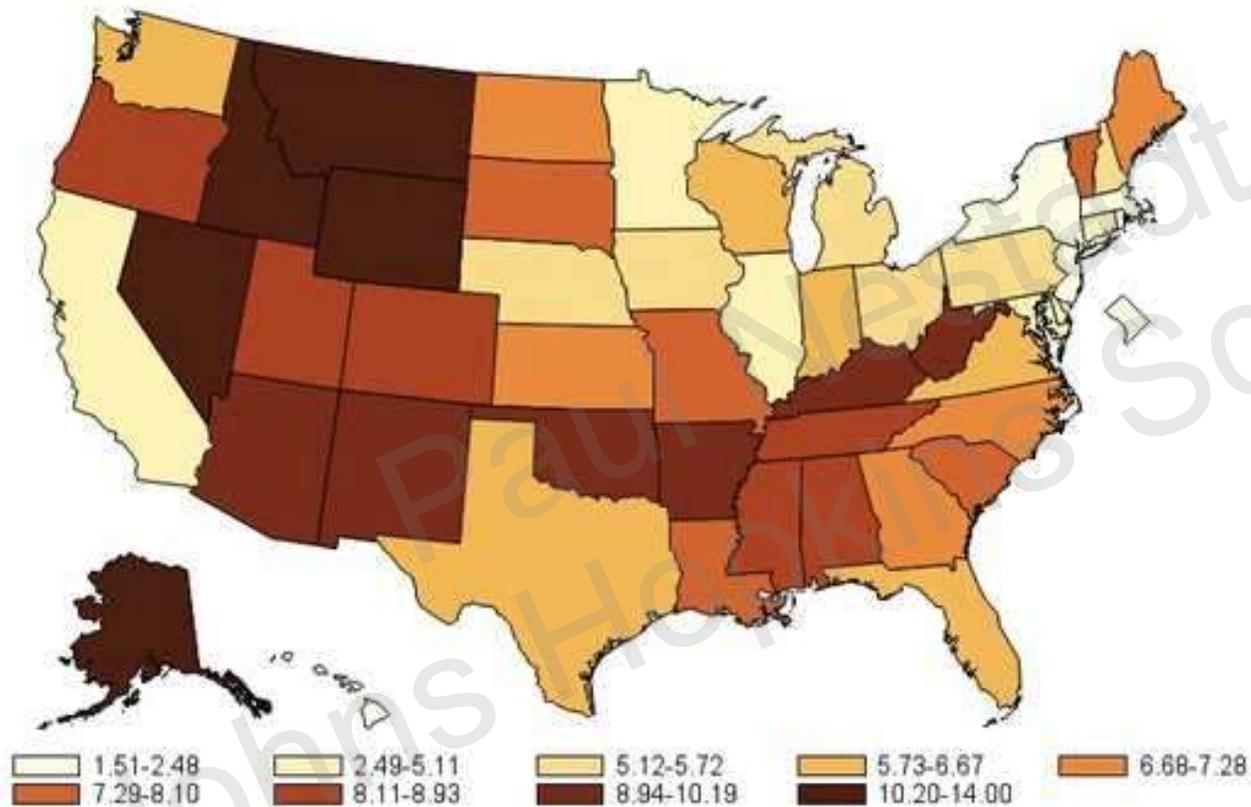
Time Elapsed between Decision and Suicide Attempt



If a lethal method of suicide isn't readily available, the impulse can pass and help can be sought

Firearm Suicide Rate By State

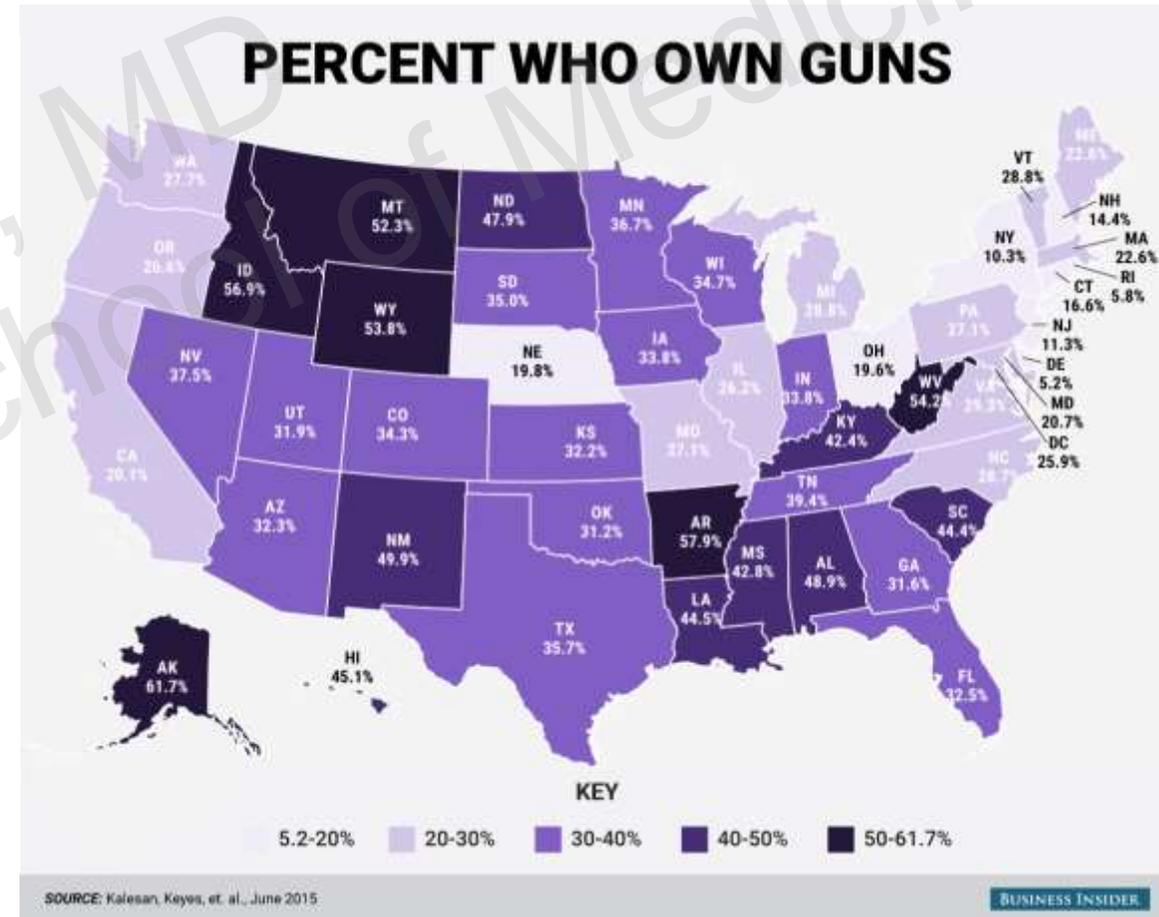
Who uses a gun for suicide?



CDC - WISQARS

NATIONAL MAP OF FIREARM SUICIDE RATES BY STATE - 2010

People who own guns.



SOURCE: Kalesan, Keyes, et. al., June 2015

BUSINESS INSIDER

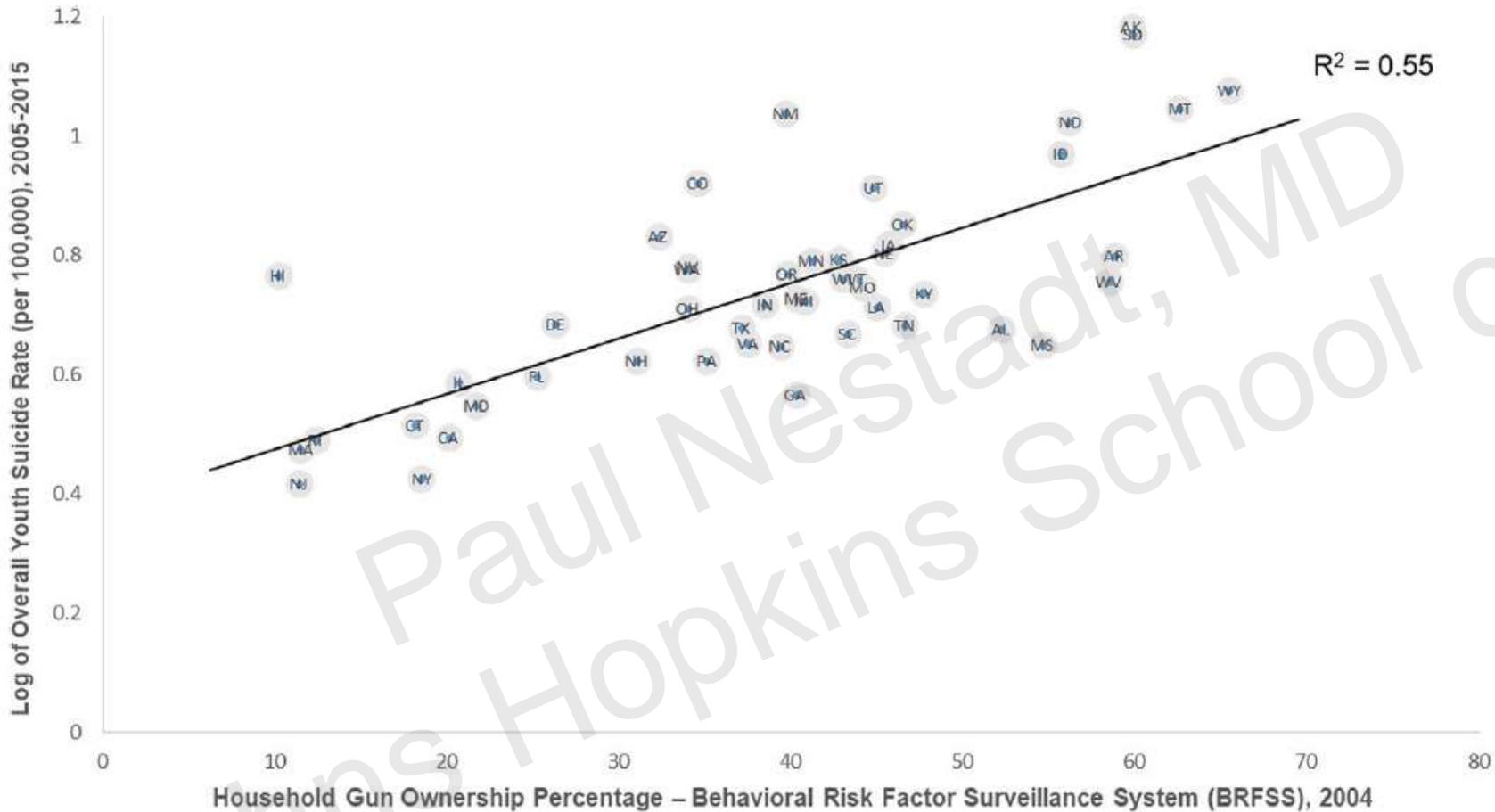
More Gun Access Has Repeatedly Been Shown To Increase Suicide

- ▶ **Individuals** with access to a firearm have **3.2x** the risk of suicide (Anglemyer, 2014)
- ▶ **Areas** with more guns have **50%** higher suicide rates (Miller, 2015)
 - ▶ **90%** higher rates in kids
 - ▶ Higher ratios in kids: fewer readily available methods, requiring transport
- ▶ In urban counties, there is a **1% increase in suicides** for **each additional** gun shop (Steelesmith, 2019)
- ▶ Soldiers who kept a loaded gun at home or carry off-duty have **4x odds of suicide** (Dempsey 2019)

Suicides in metropolitan statistical areas/divisions with the highest versus lowest gun ownership levels (BRFSS 2002–2004); mortality data WONDER 1999–2010

	High-gun MSA*	Low-gun MSA†	Ratio
Total population (person-years)	500 million	503 million	1.0
Proportion of households with firearms	34%	11%	3.2
Proportion of population living in city >1 million	12%	35%	0.3
Proportion of population living in city 500 000–1 million	14%	3%	4.1
Proportion of population living in city 200 000–500 000	8%	4%	2.4
Whole population			
Firearm suicide	32 081	13 545	2.4
Non-firearm suicide	25 623	25 485	1.0
Total suicide	57 704	39 030	1.5
Subpopulations			
Men			
Firearm suicide	27 546	12 060	2.3
Non-firearm suicide	17 722	18 149	1.0
Total suicide	45 268	30 209	1.5
Women			
Firearm suicide	4535	1485	3.1
Non-firearm suicide	7901	7336	1.1
Total suicide	12 436	8821	1.4
Children ages 0–17			
Firearm suicide	819	261	3.1
Non-firearm suicide	1008	705	1.4
Total suicide	1827	966	1.9

Household Gun Ownership and Youth Suicide Rates, By State



Knopov et al (2019) compared each state's household gun ownership proportion to its youth suicide rate (age 10-19), controlling for other risk factors and youth suicide attempts

In the multivariate model, they found for a **10% increase in household gun ownership**, the youth suicide rate **increased by 27%**

The Inevitability of Suicide (Substitution of Means?)

If we remove a lethal method, will attempters just find another way?

- Miller (2006) found that **74% of Americans** surveyed believed that all or most GG Bridge jumpers would have **found another way to complete suicide**, if thwarted
 - Gun ownership and smoking were greatest predictors of this belief
- Betz (2010) found that among **ED physicians and nurses**, **54%** believed similarly that if a firearm suicide decedent hadn't had a gun, most or all of them would have just **completed another way**

Is this true?

- Seiden (1978) checked on 515 GG Bridge jumpers who were restrained/ saved during an attempt and found that over a median f/u period of 26 years, **only 4.9% of them ended up completing** suicide (usually very soon after the failed attempt)
- Similarly, O'Donnell (1994) found that only **9.6%** of the 94 attempters who miraculously survived jumping in front of a London Tube train **reattempted and died** over a 10 year f/u period

What happens when a popular, lethal, convenient method of suicide is removed?

- In the UK, coal gas in ovens were high in Carbon Monoxide (CO) and was a top method of suicide
- Throughout the 60's and 70's, CO content in ovens were reduced
- Both CO suicides AND total suicides decreased concurrently (no replacement methods)

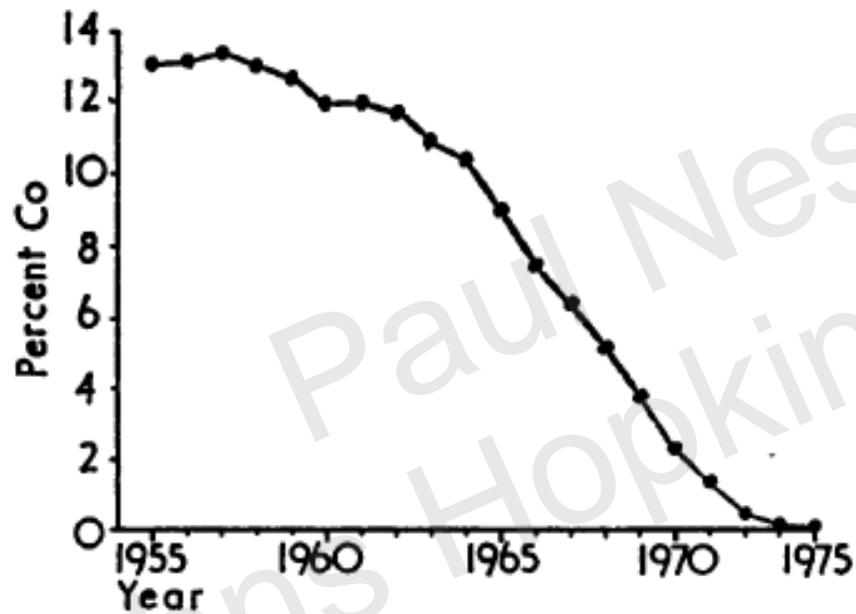


FIG. 3. Percentage of CO in domestic gas, United Kingdom 1955-74.

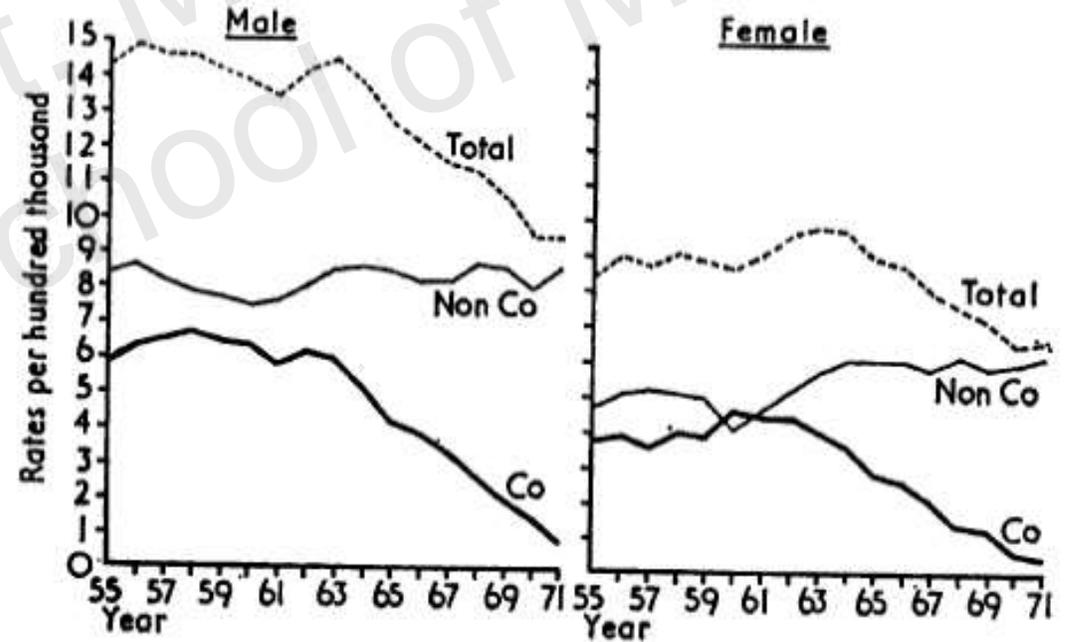
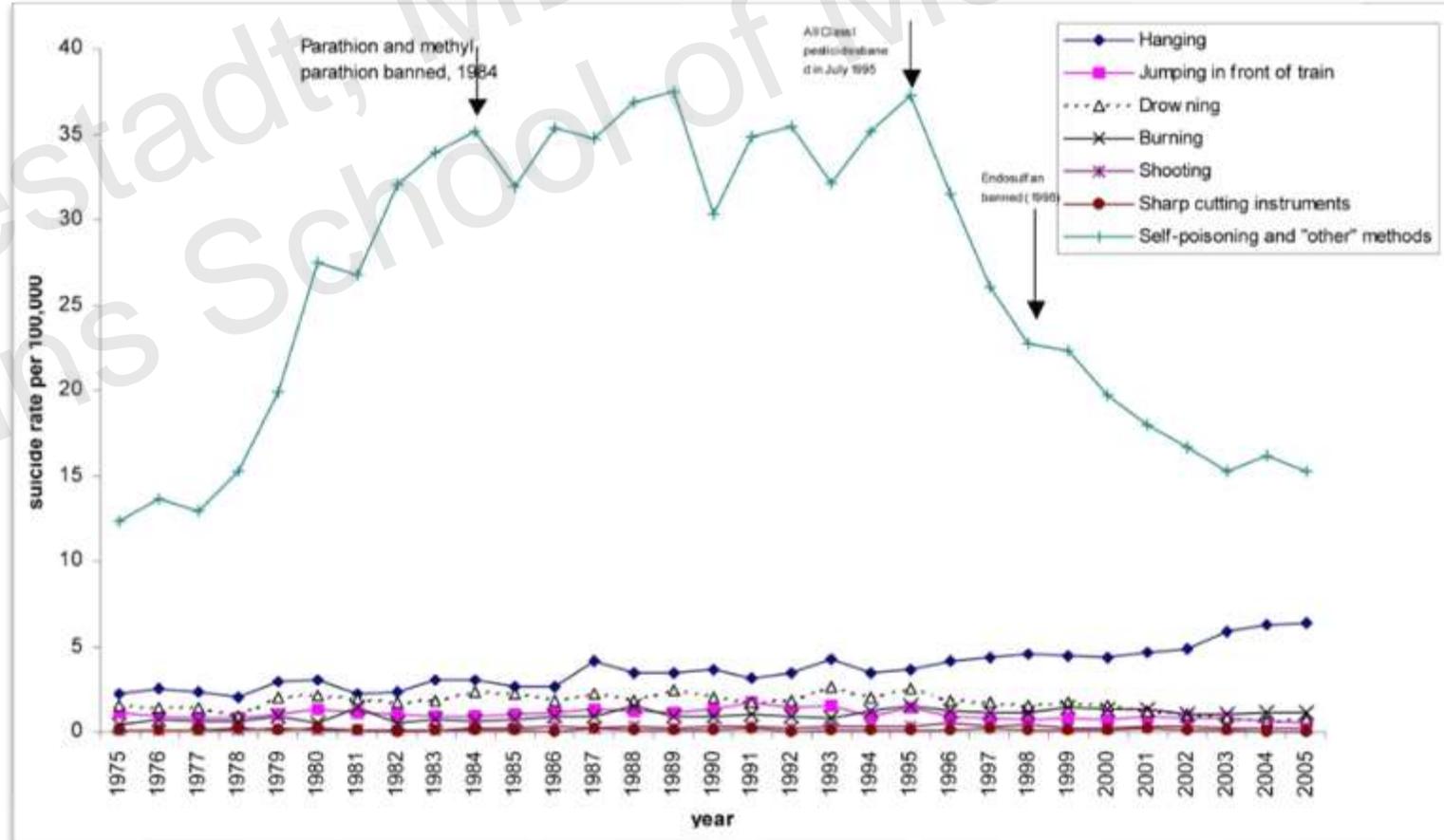


FIG. 4. England and Wales: sex-specific suicide rates by mode of death.

Other Examples of Restricting Access to Lethal Means

- The most common suicide method in **Sri Lanka** was ingesting **pesticides**, because they were always available and some of them were terribly lethal
- When the most lethal class of **pesticides were banned in 1995**, the suicide rate was cut **almost in half**
- Similarly, when regulations forced pharmacies to pack **paracetamol in blister packages**, reducing access, UK poisoning suicides **dropped by 22%**
- When **Israeli soldiers** were forbidden from **storing their guns at home on weekends**, their suicide rates **fell 40%**
 - 70% drop in weekend rates, no change in weekday rates



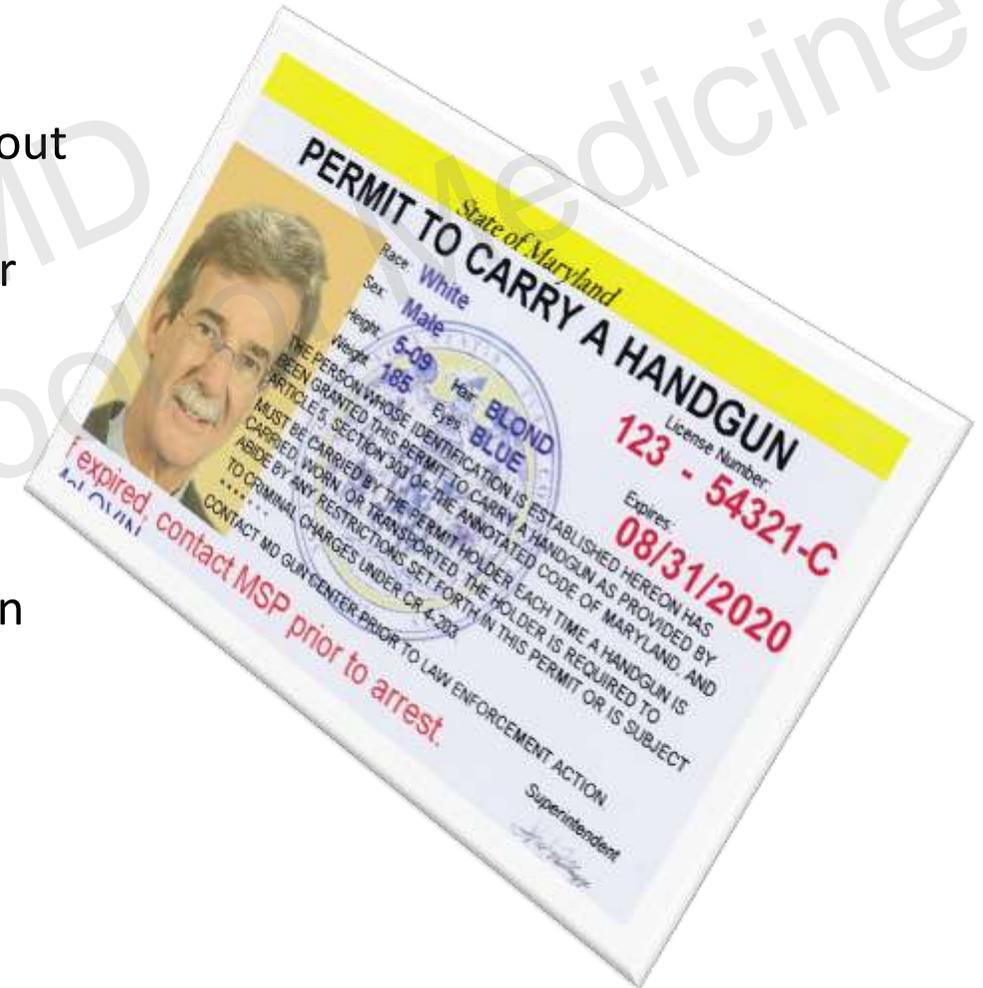
Regulations Which Reduce Gun Access Are Effective

- ▶ When DC began requiring **gun licensing in 1976**, firearm suicides **dropped 23%**, with no replacement (Loftin et al. 1991)
- ▶ Webster et al. (2004) found that **child access prevention laws**, requiring safe storage of firearms, decreased suicide rates among **14-17 year-olds by 8.3%**
- ▶ Anestis & Anestis (2015) found that state **laws that required guns to be stored locked, background checks, and restrictions to open carry** all individually decreased suicide rates.
- ▶ Kaufman et al. (2018) used a composite score to rate the stringency of firearm regulations for each state. They found that the **total suicide rate was decreased by 20% in states with more gun laws**, such as dealer regulation, background checks for private sales, permit to purchase, junk gun regs, reporting requirements, and restrictions in number of firearms sold at a time.

Regulations are Effective

- ▶ In **1995**, Connecticut enacted “**Permit-to-Purchase**” gun laws, increasing the wait time needed for a purchase and screening out certain ineligible individuals.
 - ▶ **CT firearm suicide rates dropped by 15%**, relative to similar states without the law, with no increase in suicide by other means (total decrease)
 - ▶ Gun homicides also decreased by 40%

- ▶ In **2007**, Missouri repealed their own “**Permit-to-Purchase**” gun laws.
 - ▶ **MS firearm suicide rates increased by 16%**, with only a 4% increase in non-firearm suicides
 - ▶ Gun homicides increased by 23%



Maryland as Laboratory

'America in Miniature'

Unparalleled Statewide Medical Examiner System

Representative Urban-Rural Spectrum

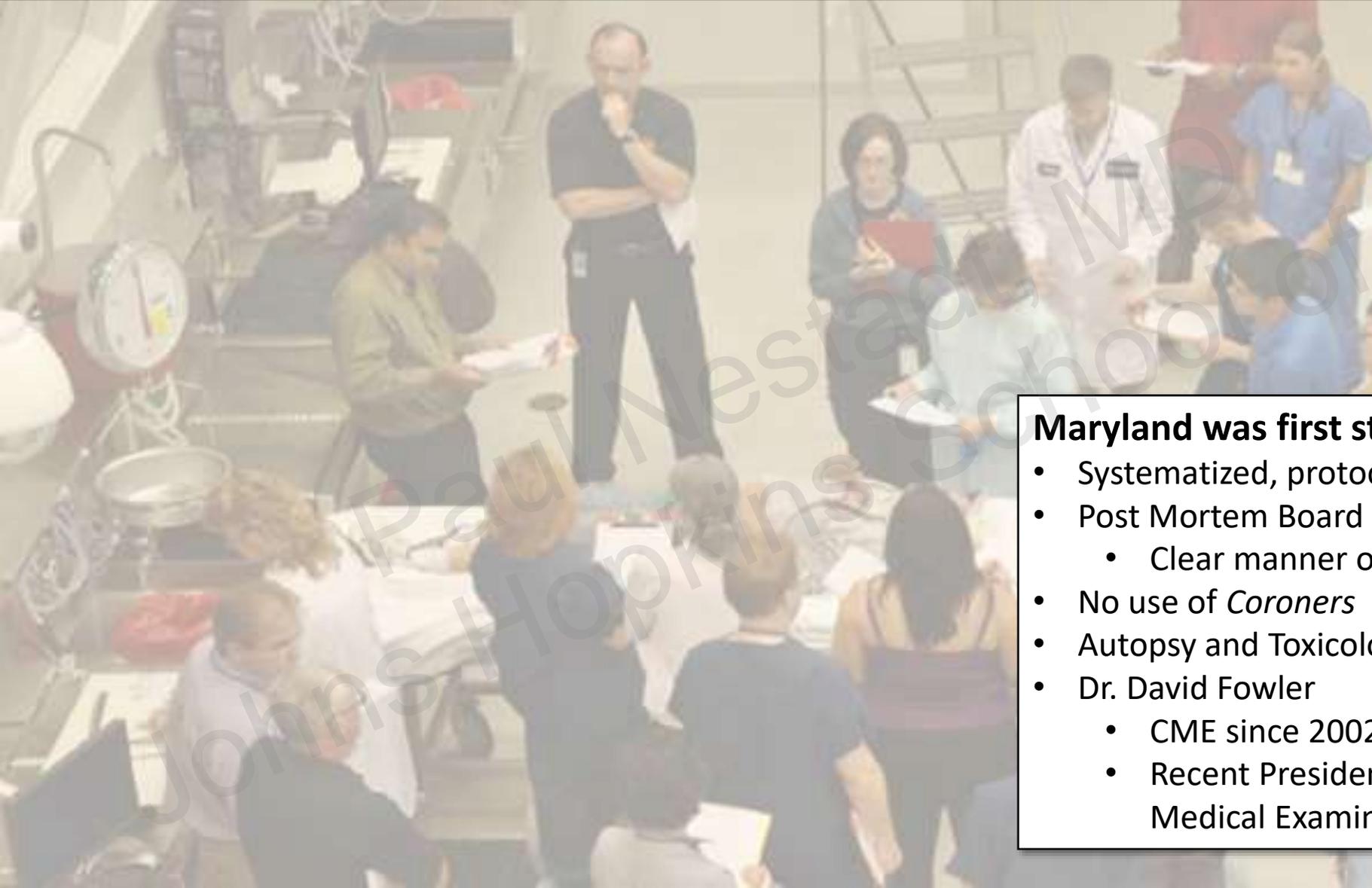
Relatively Uniform Access to Care

Partnerships for Psych Autopsies

Balanced Firearm Policies



The Maryland Sample: Medical Examiner Determined



Maryland was first statewide ME system (1939)

- Systematized, protocol-driven diagnostic organization
- Post Mortem Board
 - Clear manner of death determinations
- No use of *Coroners*
- Autopsy and Toxicology on all decedents
- Dr. David Fowler
 - CME since 2002
 - Recent President of National Association of Medical Examiners



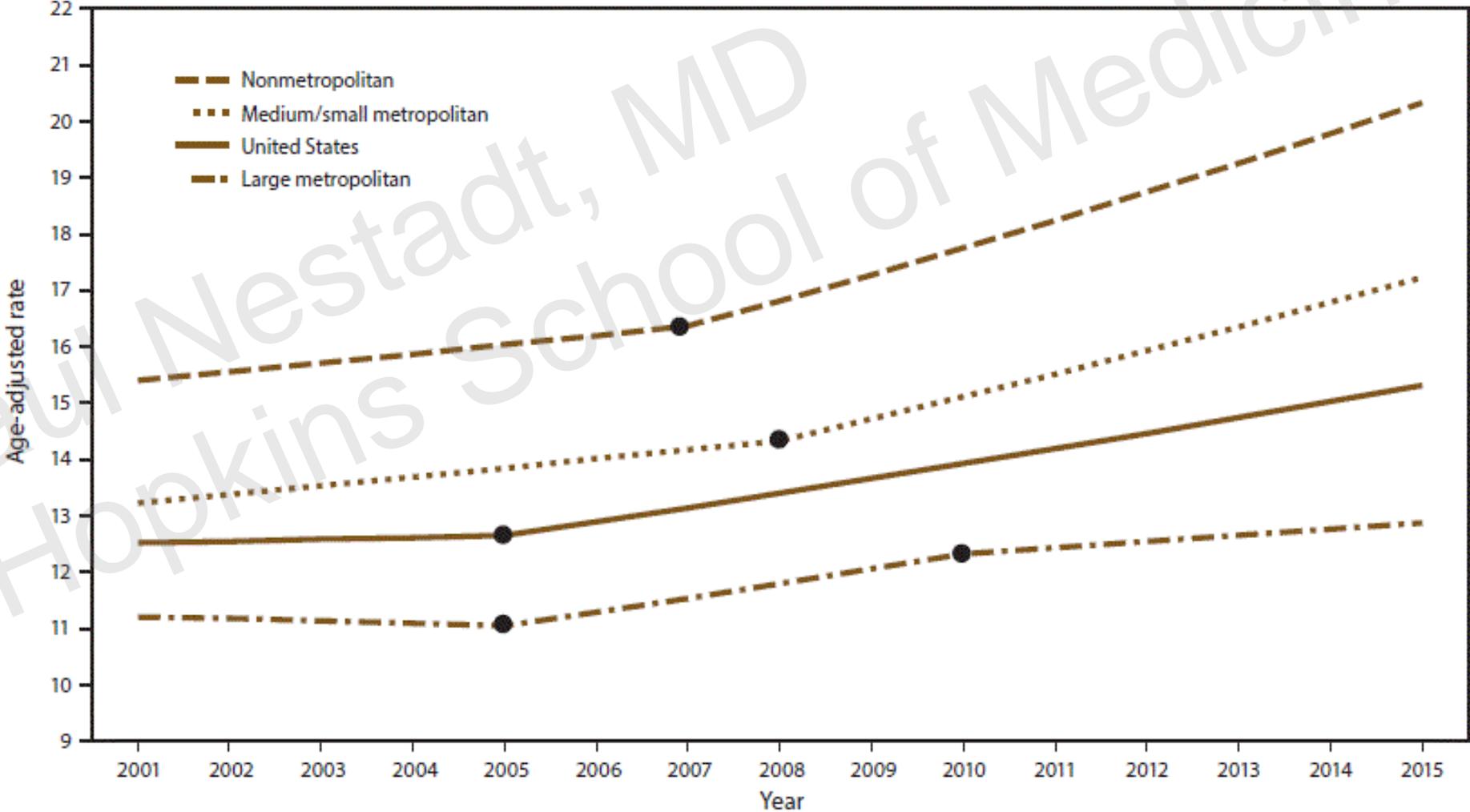
Rural Suicide

Rural Suicide Rates are Higher and Rising Faster than Urban Rates

US Suicide rates, by county urbanization level (2001–2015)

Rural Rate:
19.7 per 100K

Central Urban:
12.7 per 100K



Urban-Rural Differences: Many Hypotheses

- ▶ **Less access to MH services**
- ▶ **More social isolation**
- ▶ **Culture of stigma**
- ▶ **Economic disparities**
- ▶ **Prevalence of Firearms**

Maryland Firearm and Non-Firearm Suicide Rates by Urbanicity

6,196 Suicides

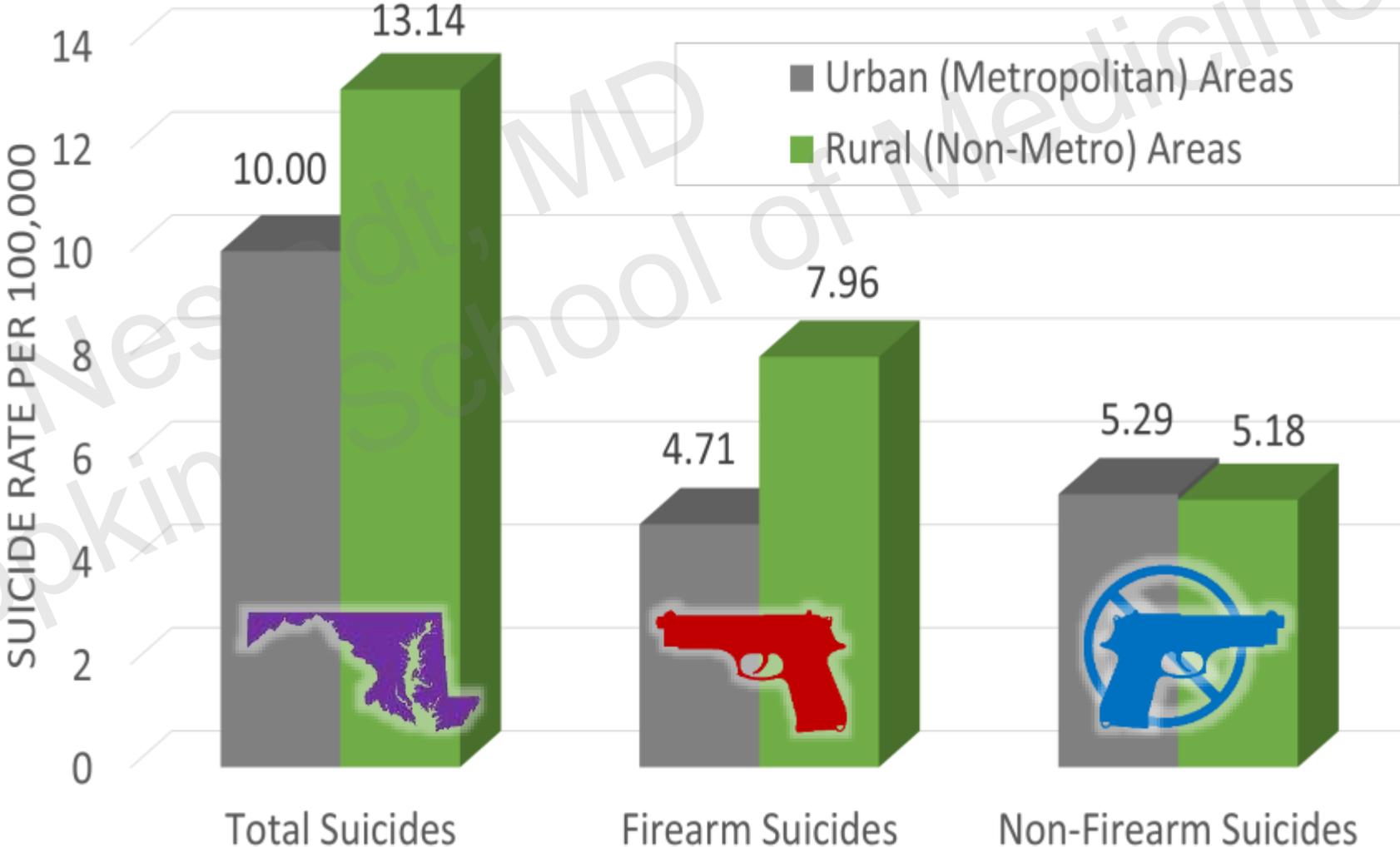
(2003-2015)



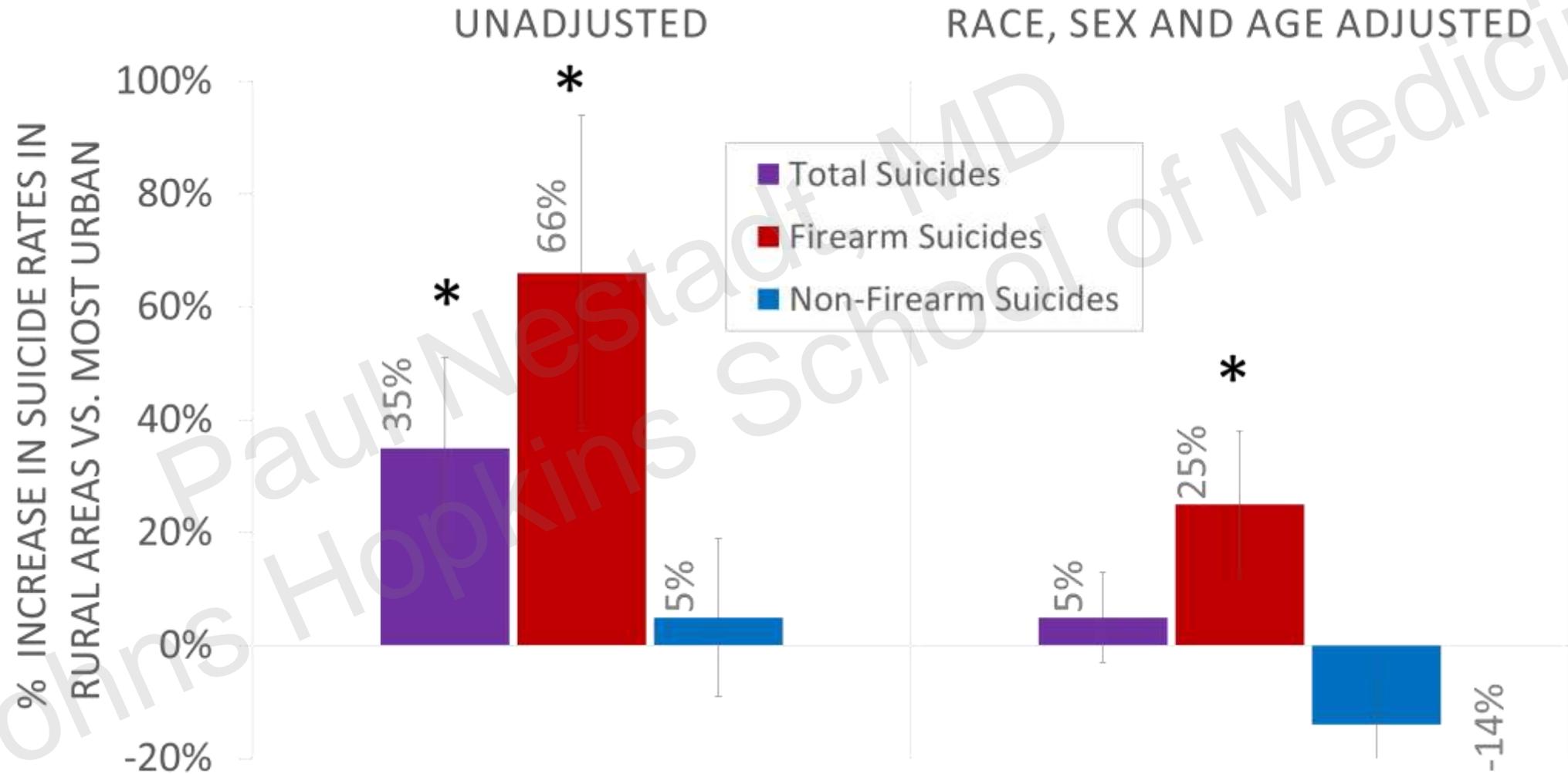
2,947



3,249

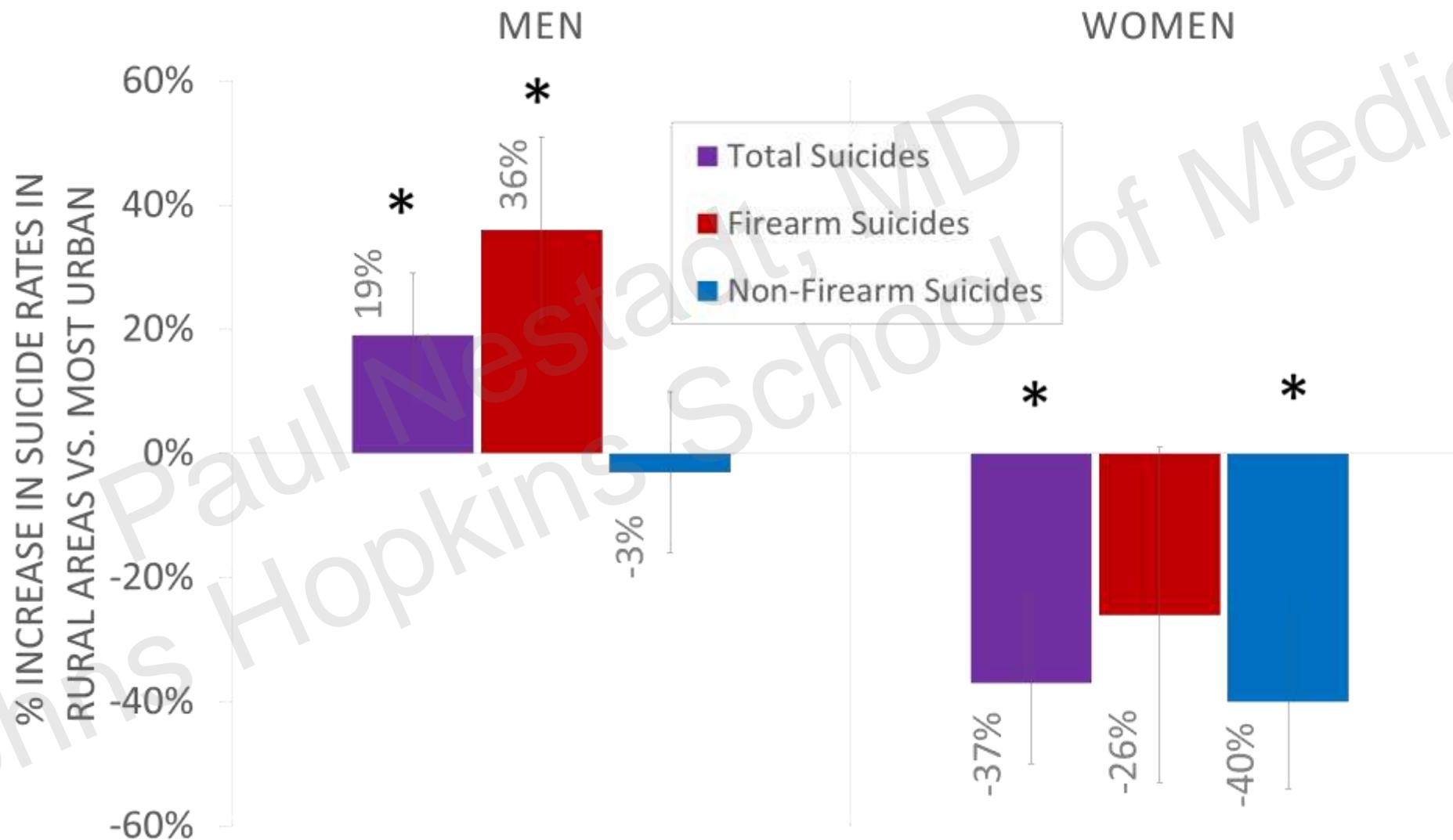


Percent Increase in Suicide Rates In Rural vs. Most Urban Counties (Taken from Incidence Rate Ratios)



Percent Increase in Suicide Rates In Rural vs. Most Urban Counties

(Stratified by Sex, adjusted for Race and Age)



Conclusions

- ▶ **Higher suicide rates in rural areas** are limited to **firearm** suicides and do not exist for non-firearm suicides
 - ▶ Is this due to **availability** of firearms? Current county level firearm prevalence data is unavailable in MD, but studies have shown more firearms in rural areas
- ▶ **Social factors**, such as stigma, are **not needed** to explain the rate difference, as the **difference vanishes after removing the firearm factor**



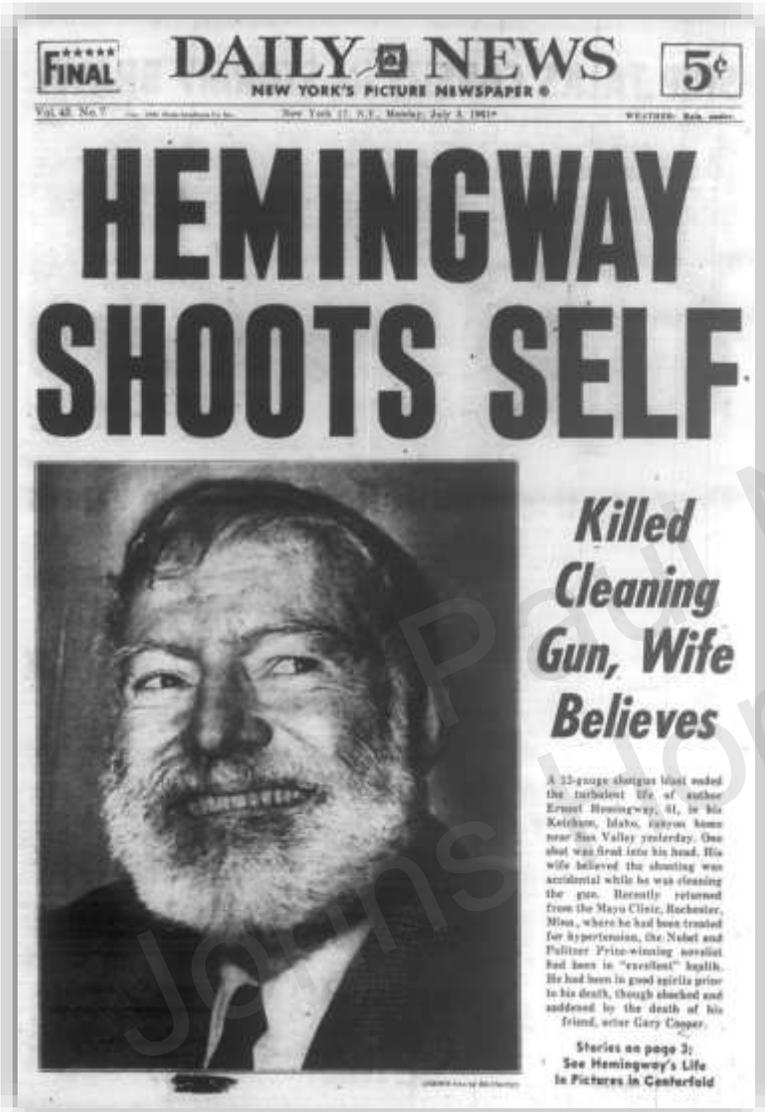
Conclusions, con't

- ▶ The **rural predominance of suicide**, and particularly firearm suicide, is much more pronounced in **men**
- ▶ **Female** suicide rates are **higher in urban settings**, regardless of means
 - ▶ Possibly the male preference for firearms drives this interaction
- ▶ **Suicide attempt rate data** for these counties would be helpful but is by its nature somewhat **unreliable** even when available



Long Guns

Very little research has been done on gun type in suicide



- ▶ **80% of gun homicides** and 90% of nonfatal gunshots use **handguns**
 - ▶ **Limited research** on gun type in **suicide**
- ▶ **Federally**, the laws around long gun access are much **looser than** those for **handguns**
 - ▶ It is up to **individual states** to close this gap
- ▶ Hanlon (2019) reviewed gun types in 13 states (2005-2015) and found **27% of gun suicides used long guns**
- ▶ Need for state level investigation to **guide state firearm policies**

Long guns sales are less regulated than handgun sales

Maryland presents a unique concern:

- ▶ **Tighter handgun restrictions** than federally required
 - ▶ Background checks, permits, waiting period required even in private sale
 - ▶ **Increased minimum age** of possession 18→21
- ▶ **HOWEVER, long gun** access laws maintain **relaxed federal minimum**
 - ▶ Can be purchased without checks, permits, or waits through private sale
 - ▶ **NO minimum age** to possess
- ▶ As many **suicides are impulsive**, the rapid **availability of long guns**, especially to MD **youth and in rural areas**, make them a **unique concern**

Best Youth Guns: Choosing a Firearm for Your Child

JANUARY 24, 2017 2 COMMENTS

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[Review+Video]: Sig's newest P365 model...the SAS

Choosing the best gun for your child is about more than models and brand names. It is about setting your child on the path and way of life.



Grandpa with Grandkid and Gun

- ▶ **March 2019:** Maryland failed to pass a bill that would have closed the ‘long gun loophole’
 - ▶ Opponents pointed to the rarity of long guns in homicides and the lack of evidence for suicide use
- ▶ **This study utilizes firearm data extracted from police narratives of all Maryland gun suicides and other manners of death, to directly answer this point**
- ▶ Compared proportions of long gun suicides across demographics, rurality and alcohol use, as well as the **impact of hunting season**
- ▶ As legislation may distinguish between long gun type, we also examine use patterns in **rifles vs. shotguns**

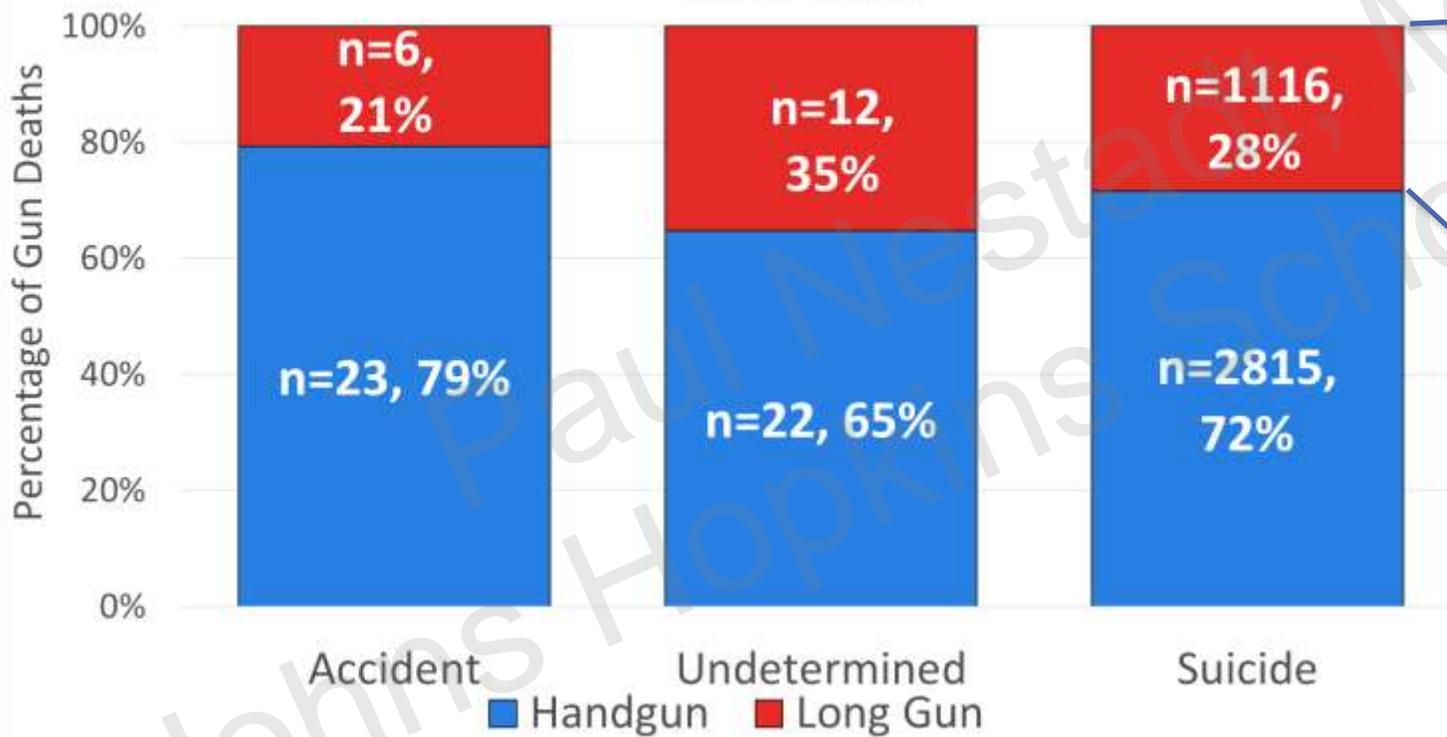


Methods

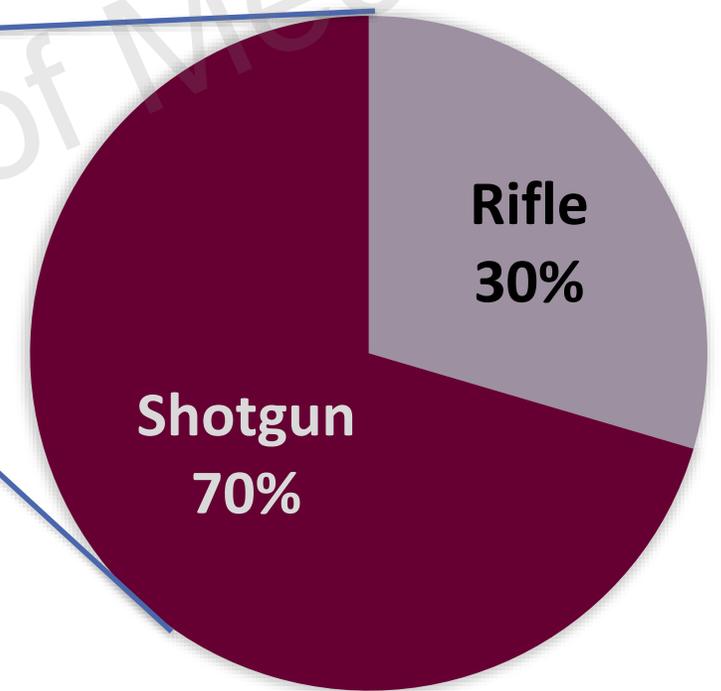
- ▶ We partnered with the Office of the Chief Medical Examiner of Maryland to obtain information on all **3,994** non-homicide gun deaths in MD, 2003-2018
 - ▶ **3,931 suicides, 29 accidents, 34 deaths of undetermined manner**
- ▶ Demographics, toxicology, and police and ME reports were extracted
- ▶ **Police narratives** included gun type in all but 46 unclear cases, of which 45 were resolved by review of the autopsy report and 1 was a mislabeled hanging
- ▶ **Hunting season** operationalized as weeks 49-50 each year, the busiest legal season (*Dept Natural Resources*)

Results: Gun Type by Manner

Proportion of Gun Deaths by Gun Type and Manner, 2003-2018



LONG GUN TYPE



Results: Characteristics

- ▶ Doubled odds of long gun use in **males** and **whites**
- ▶ **Increasing rurality** and **younger age** both strongly associated with **increasing proportion** of long guns
- ▶ Long gun use associated with **alcohol intoxication**
- ▶ During **hunting season**, firearm decedents were **no more likely** to have used a long gun
- ▶ However, **rifle** use **was** associated with hunting season
($X^2(1)=4.15, p=0.04$)

Characteristics of Maryland Firearm Suicides 2003-2018, with Unadjusted Odds Ratios

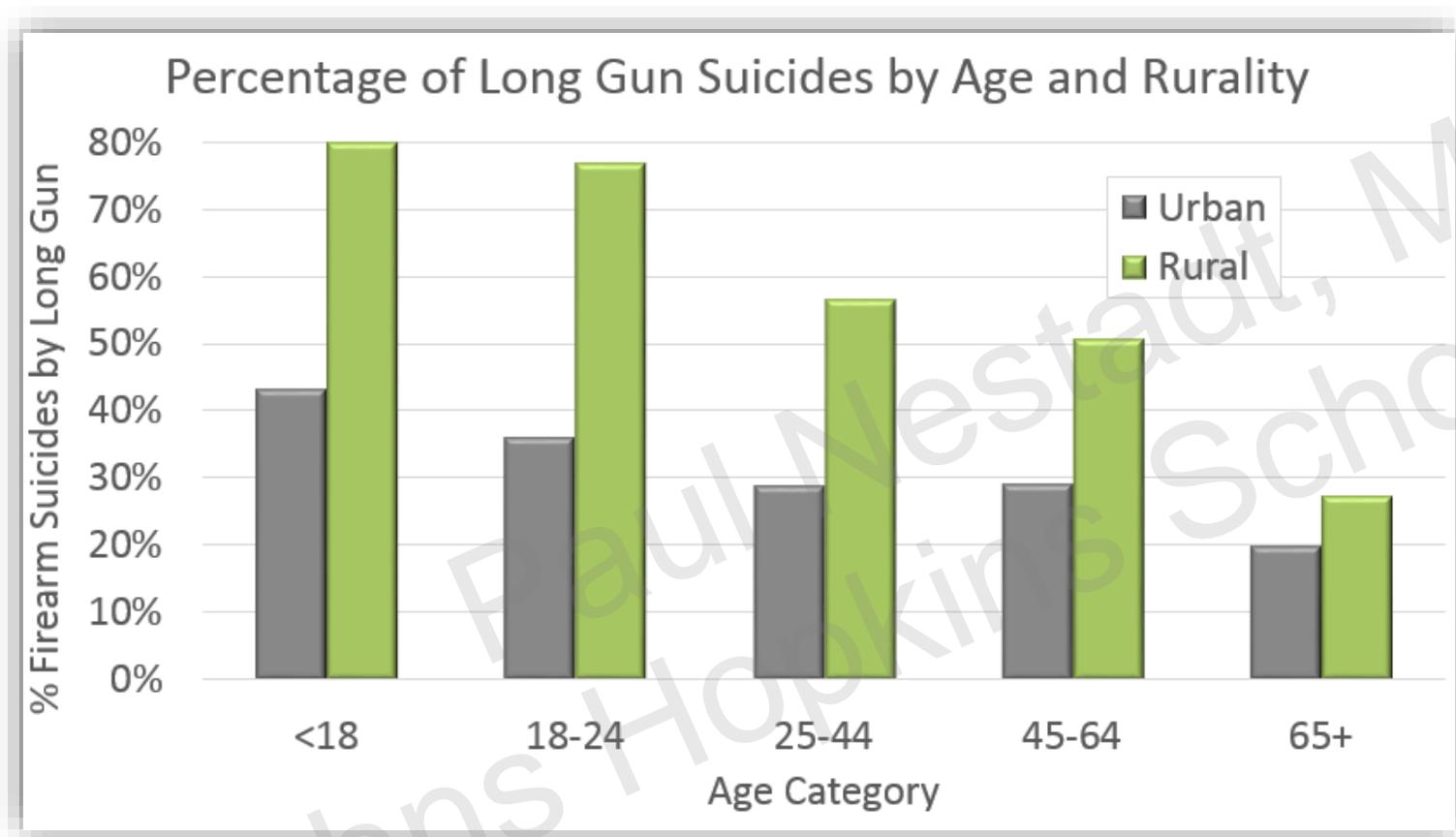
Variables	Handgun n= 2,815 (row %)	Long Gun n=1,116 (row %)	Odds Ratio	95% CI	p
Sex*					
Female	347 (84.8%)	62 (15.2%)	ref	-	-
Male	2,468 (70.1%)	1,054 (29.9%)	2.39	1.81 - 3.16	< .001
Race*					
Non-White	589 (83.4%)	117 (16.6%)	ref	-	-
White	2,226 (69.0%)	999 (30.1%)	2.26	1.83 - 2.79	< .001
Age (years)*					
<18	46 (55.4%)	37 (44.6%)	ref	-	-
18-24	222 (62.9%)	131 (37.1%)	.73	.45 - 1.19	.209
25-44	749 (70.9%)	308 (29.1%)	.51	.33 - .80	.004
45-64	1,002 (69.5%)	439 (30.5%)	.54	.35 - .85	.008
65+	796 (79.8%)	201 (20.2%)	.31	.20 - .50	< .001
NCHS Rurality*					
Urban (1)	233 (83.2%)	47 (16.8%)	ref	-	-
2	1,986 (72.6%)	750 (27.4%)	1.87	1.35 - 2.59	< .001
3	206 (65.6%)	108 (34.4%)	2.60	1.76 - 3.84	< .001
4	130 (64.4%)	72 (35.6%)	2.75	1.79 - 4.20	< .001
5	46 (56.1%)	36 (43.9%)	3.88	2.27 - 6.64	< .001
Rural (6)	46 (48.4%)	49 (51.6%)	5.28	3.17 - 8.79	< .001
Alcohol (> .08%)*	578 (68.0%)	272 (32.0%)	1.21	1.03 - 1.43	.022
Season					
Non-Hunting	2,720 (71.7%)	1,074 (28.3%)	ref	-	-
Hunting Season	95 (69.3%)	1,116 (28.4%)	1.12	.77 - 1.62	.549

Results: Testing the Rurality Association

Stepwise Logistic Regression Analysis with Odds for Predictors of Long Gun Use Among Firearm Suicides

Variable	Model 1			Model 2			Model 3		
	OR	95% CI	p	OR	95% CI	p	OR	95% CI	p
NCHS Rurality									
Large metro (1)	<i>ref</i>	-	-	<i>ref</i>	-	-	<i>ref</i>	-	-
Large fringe metro (2)	1.87**	1.35 - 2.59	<.001	1.61*	1.15 - 2.25	.005	1.49*	1.06 - 2.09	.021
Medium metro (3)	2.60**	1.76 - 3.84	<.001	2.20**	1.47 - 3.30	<.001	2.03**	1.34 - 3.07	<.001
Small metro (4)	2.75**	1.79 - 4.20	<.001	2.00*	1.29 - 3.12	.002	1.89*	1.21 - 2.95	.005
Micropolitan (5)	3.88**	2.27 - 6.64	<.001	3.27**	1.88 - 5.70	<.001	3.00**	1.70 - 5.30	<.001
Noncore (6)	5.28**	3.17 - 8.79	<.001	4.22**	2.49 - 7.15	<.001	3.74**	2.19 - 6.40	<.001
Male				2.68**	2.00 - 3.59	<.001	2.93**	2.16 - 3.97	<.001
White				2.54**	2.01 - 3.21	<.001	2.56**	2.02 - 3.26	<.001
Age (y)				.98**	.98 - .99	<.001	.98**	.98 - .99	<.001
Alcohol > .08%							.98	.82 - 1.17	.834
Hunting Season							1.18	.79 - 1.77	.423

Results: Interaction between Age and Rurality



- ▶ Stratifying by rurality highlights the increasing proportion of long guns used with decreasing age
- ▶ In logistic regression, a significant interaction was found between rural status and age category
- ▶ **The association of long gun use with age is stronger in rural areas**

Conclusions

- ▶ Long guns are used in a **large proportion (28%) of Maryland firearm suicides**, as well as accidents (21%) and deaths of undetermined manner (35%)
 - ▶ May reflect weak legal barriers to access, more costly to store safely, or cultural familiarity
- ▶ Among firearm suicides, long gun use is **more prevalent in rural areas, younger decedents, men, whites, and associated with alcohol intoxication**
 - ▶ Among kids, **45% use long guns in firearm suicide**
 - ▶ In **rural** areas, **80% of kids** use them
- ▶ May be explained by greater long gun ownership in rural areas, legality of long guns at young ages, difficulty safely storing or hiding them from children
- ▶ **For rifles**, the most common deer hunting weapon, the proportion of use in suicides is **60% higher during deer hunting season**
 - ▶ This is a time that rifles are out of storage, being given as gifts, being used recreationally and generally are **more accessible**



Implications



- ▶ Long guns should **not be exempted** from the laws in place to prevent handgun mortality
- ▶ Clinicians asking about firearm access and safe storage must specifically query on long guns, which **may not be considered dangerous by rural patients**
 - ▶ Similar to asking about OTC and supplements when taking a medication history
- ▶ Future studies may examine:
 - ▶ Does regulating long gun access **reduce youth suicide**?
 - ▶ How were long guns **accessed** for suicide? Recent purchase, family heirloom, unsafe storage?
 - ▶ Do **changes in legislation** which bring long gun safeguards in line with handguns reduce youth suicide rates?

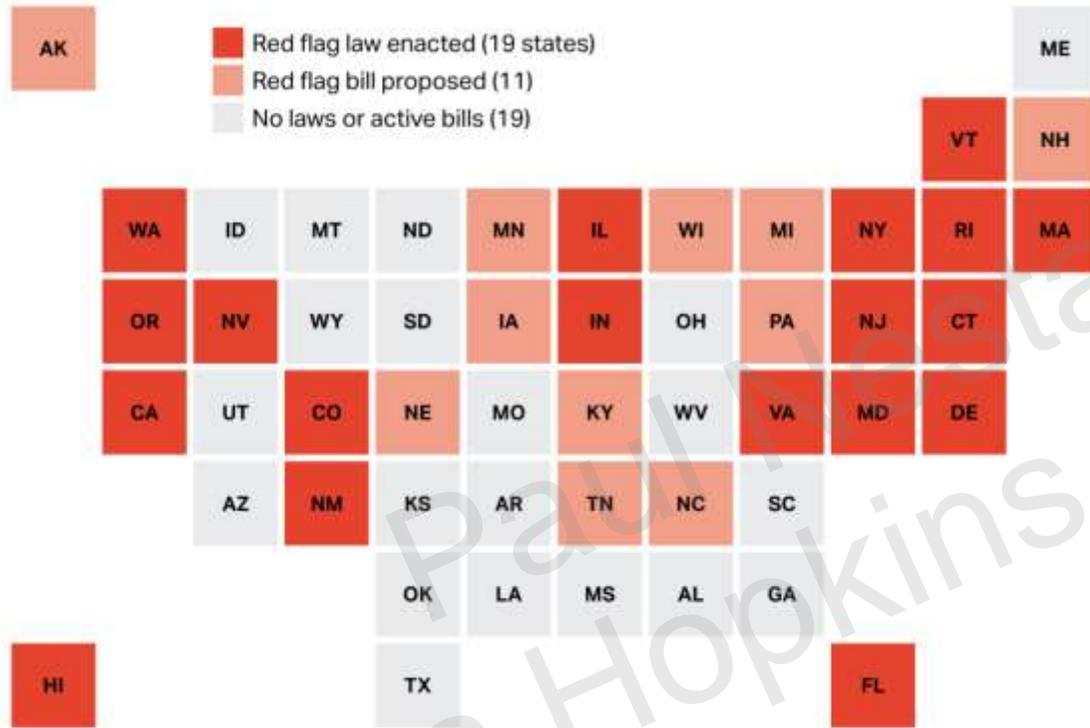


Red Flag Laws

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Exciting Progress: Red Flag Laws

Status of State 'Red Flag' Laws



Source: State legislatures. Interactive: Daniel Nass.

- ▶ **“Red Flag”** Laws allow police or family members to petition a court to remove temporarily firearms from individuals deemed a risk to themselves or others
- ▶ CT Passed the first “risk warrant” in 1999 and other states followed, with the largest increase after Parkland in 2018
- ▶ **October 2018: Maryland’s Red Flag law went into effect: the Extreme Risk Protective Order (ERPO)**

Extreme Risk Protection Order (ERPO) is Effective

- ▶ Swanson et al (2017) found that the CT's version of the law **saved one life for every 10.6 guns seized**
- ▶ Kivisto & Phalen (2018) used a synthetic control model to estimate that IN's law **reduced firearm suicides by 7.5% over 10 years, without an increase in suicides by other means**
- ▶ Though most prevented deaths are suicides, Wintemute (2019) reviewed 159 available ERPO records over a two year period in CA and identified **21 instances of the ERPO successfully stopping a mass shooting**

Table 2. Estimated Suicide Prevention Effect of Connecticut's Gun Removal Policy

	Suicide outcomes for actual gun removal cases		Counterfactual (hypothetical) data assuming no gun removal		Estimated policy effect	
	Attempts	Fatalities	Attempts	Fatalities	Number of averted suicides	Number needed to remove
Firearm	7	6	101	88		
Other means	135	15	41	5		
Total	142	21	142	93	72	10.6

Maryland's Extreme Risk Protection Order (ERPO)

- ▶ Maryland is the first state to allow clinicians to file these orders
 - ▶ (DC joined in May & Hawaii to follow)
- ▶ Much remains to be worked out, as far as liability, application, and effectiveness
- ▶ <http://mdcourts.gov/district/ERPO>



Maryland ERPO Basics



- ▶ Can be filed by family, cohabitant, romantic partner, police, or **clinician** (physician, psychologist, mental health worker, state health officer)
 - ▶ EP can be filed simultaneously
 - ▶ **Filing requires the petitioner to go to hearing**
- ▶ Respondent must pose an **immediate and present danger** to self or others by being armed
- ▶ The order results in police **removing any guns** and prevents the **purchase of new guns**
- ▶ Once filed, a judge can issue **a temporary order** without the respondent present at hearing
 - ▶ A final hearing is held **within 7 days**, at which the order can be extended up to **1 year** and later extended a **further 6 months** if warranted

Maryland ERPO Pearls



- ▶ Can be filed against guardians of a **child in crisis**, if it is an adult's gun in the house
- ▶ Illegal guns will not be returned (**and are a qualifying reason for ERPO alone**)
- ▶ Clinicians cannot be sued for filing; **May be sued for NOT filing**
- ▶ Avoids problems with having **family take guns**, which **may be illegal** in MD and leaves family on the hook for deciding when to return them
- ▶ Does **not** stop respondent from buying a **long gun** from a private dealer (no BG check)

ERPOs Filed by County, 10/1/18 - 8/31/20

County	Census	ERPOs	ERPO rate per 100,000
Allegany	71,615	26	36.3
Anne Arundel	573,235	337	58.8
Baltimore City	611,648	76	12.4
Baltimore Co	832,468	287	34.5
Calvert	91,502	23	25.1
Caroline	33,193	4	12.1
Carroll	167,781	93	55.4
Cecil	102,746	43	41.9
Charles	159,700	80	50.1
Dorchester	32,162	14	43.5
Frederick	252,022	61	24.2
Garrett	29,233	21	71.8
Harford	252,160	111	44.0
Howard	321,113	43	13.4
Kent	19,384	3	15.5
Montgomery	1,058,810	153	14.5
Prince George's	912,756	175	19.2
Queen Anne's	49,770	33	66.3
St. Mary's	112,667	48	42.6
Somerset	25,918	21	81.0
Talbot	37,103	10	27.0
Washington	150,578	52	34.5
Wicomico	102,923	38	36.9
Worcester	51,690	15	29.0
TOTAL	6,052,177	1,767	29.2

CURRENT DISPOSITION STATUS



- ▶ **1,767 ERPOs** were filed in the first 23 months
- ▶ Comparatively, California filed <200 in the first two years, despite 6-7x MD's population
- ▶ Highest rates of ERPO's were in **rural or semi-rural counties**
- ▶ Despite our unique ability for **clinicians** to file, **~1%** of ERPOs have been filed by clinicians

Why are physicians not using this tool?

- ▶ Survey of **92 Hopkins Docs** in June 2019
 - ▶ **One** (psych) had filed an ERPO
 - ▶ Most had barely heard of it

- ▶ After a brief description, **92%** reported they saw patients appropriate for ERPO at **least a few times per year**
 - ▶ **60%** reported being **likely to file** on a qualifying patient

- ▶ **Barriers** were reported as **time** for paperwork, and threat to therapeutic **alliance**

How familiar are you with Extreme Risk Protection Orders?	ED	Peds	Psych	Total	
	n=26 (%)	n=16 (%)	n=50 (%)	n=92 (%)	
	Very familiar	2 (7.7)	0 (0)	2 (4.0)	4 (4.3)
	Somewhat familiar	1 (3.8)	0 (0)	5 (10)	6 (6.5)
	A little familiar	3 (11.5)	3 (18.8)	10 (20)	16 (17.4)
Not at all familiar	20 (76.9)	13 (81.3)	33 (66)	66 (71.7)	

What can be done to increase utilization?

- ▶ Most felt that **training, consultation, and remote hearings** would help
- ▶ **87%** reported that a **coordinator** to complete and follow through with the petition would be helpful
- ▶ Such a model currently **exists for child abuse consults**

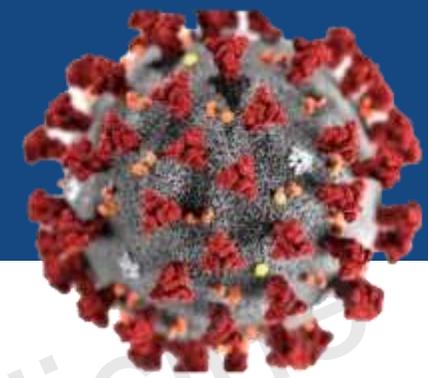
What tools would help you file an ERPO petition?

	ED n=26 (%)	Peds n=16 (%)	Psych n=50 (%)	Total n=92 (%)
Training on ERPO	22 (84.6%)	16 (100%)	41 (82%)	79 (85.9%)
Consult with legal expert	19 (73.1%)	10 (62.5%)	30 (60%)	59 (64.1%)
Trained coordinator to complete and follow through the petition	25 (96.2%)	15 (93.8%)	40 (80%)	80 (87%)
Remote court hearings (i.e. by phone)	21 (80.8%)	8 (50%)	39 (78%)	68 (73.9%)
Other	3 (11.5%)	1 (6.3%)	2 (4%)	6 (6.5%)

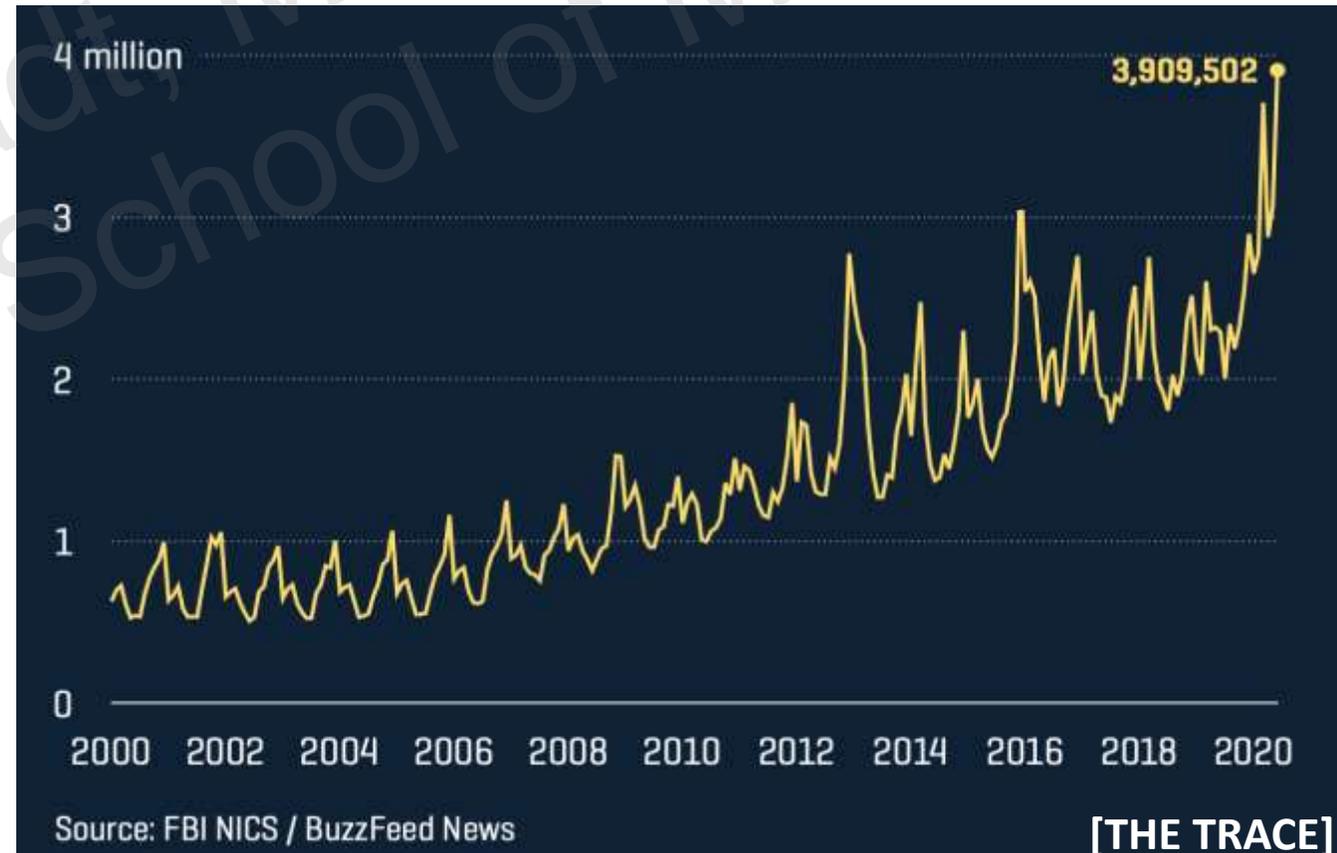


Gun Sales during COVID

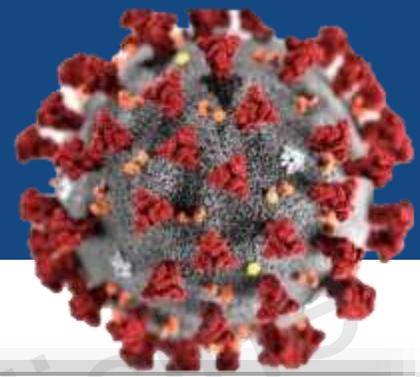
Firearm Sales Rocket in 2020



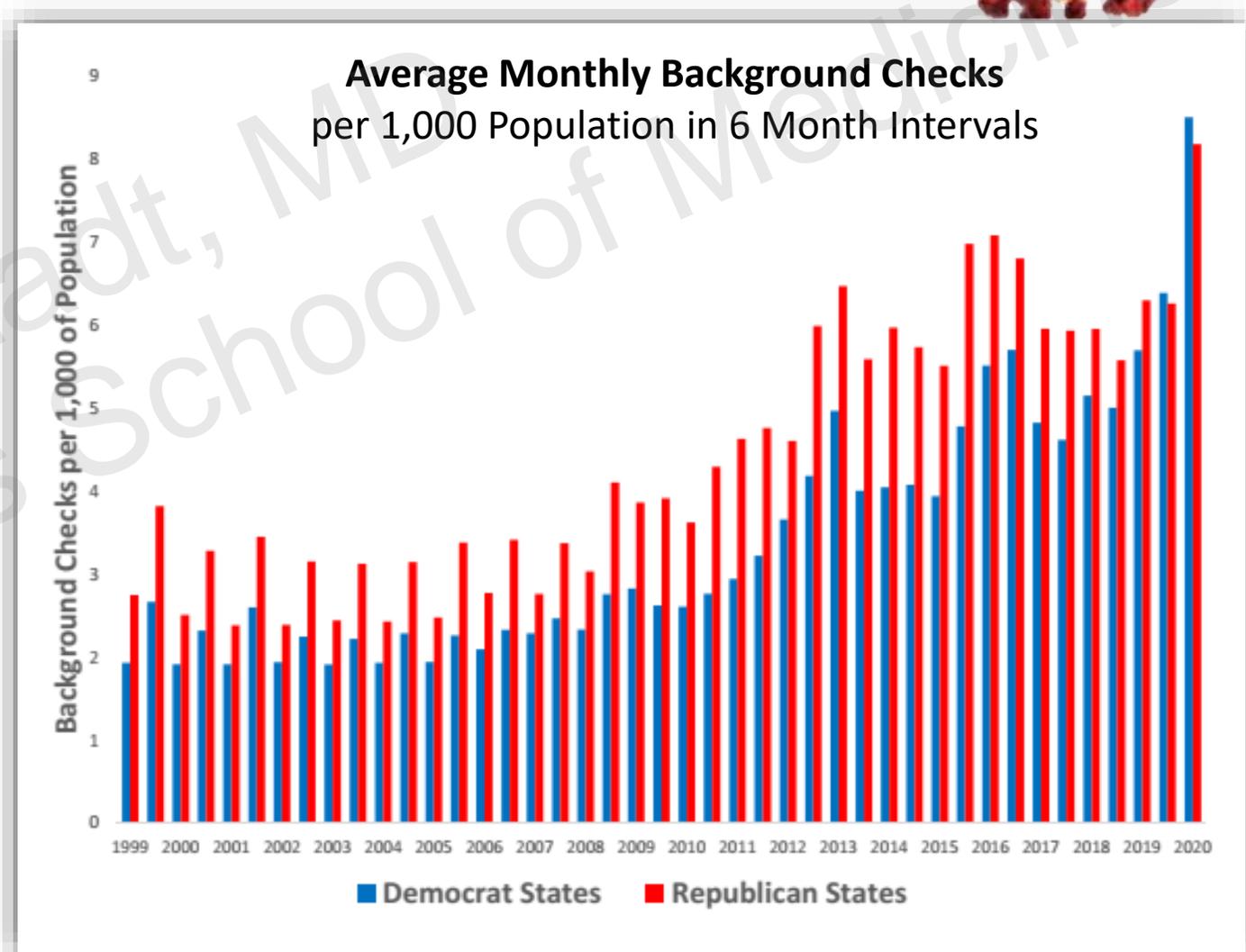
- ▶ The pandemic **increases risk of suicide** via impact on the economy, isolation, fear, Loss of supports, access to care, grief, job loss, etc.
 - ▶ Concurrently, there has been a **large spike in firearm purchases** in the context of COVID-19
- ▶ March saw the second highest number of new firearm purchases since data recorded (**41% increase** compared to '19)
- ▶ **June broke that record**
- ▶ July & August had >50% increases over '19
- ▶ 40-67% of these are to **new gun owners**



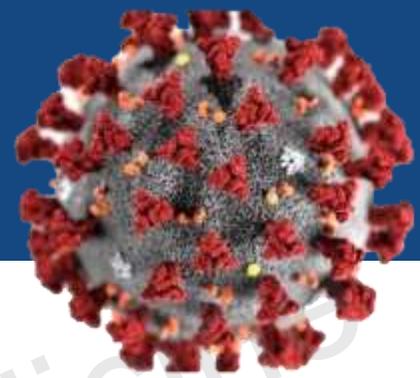
2020 Spike: New Gun Owners



- ▶ Historically, sales spikes have been from **policy changes**
 - ▶ Those tend to be gun owners increasing their collection
- ▶ 2020 spike is largely **new gun owners**, across the political spectrum
 - ▶ Bought for protection, not policy
- ▶ Increase is most dramatic in **blue states**



COVID Era Gun Owners



- ▶ Lyons et al. surveyed pandemic purchasers who were new gun owners
 - ▶ Half had never had any firearm safety training of any kind



- ▶ 42% reported at least one gun stored unlocked
- ▶ **53% reported kids in the house**
- ▶ 33% had a household member with mood d/o
- ▶ 11% had a household member with dementia

- ▶ 15% had been laid off due to the pandemic
- ▶ **38% reported their mental health had gotten a little or a lot worse in the past month**

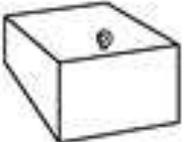
Firearm Safety



- ▶ During a **mental health crisis** in the household, it is **doubly important** to remove the weapon from the house
- ▶ Throughout **at risk** periods, guns must be **removed**, pills **locked up**, and depending on a risk assessment, the patient taken to an **emergency room**
- ▶ **Families** play a large role in enacting these plans, including **holding/ locking away weapons and medications.**

Safe Storage Options

Retain Possession

Option	Description	Notes
Cable lock 	Key or combination; usable on most firearms. Cost: \$10-\$50	Can be cut; Must install according to directions (not through trigger) and keep key or combination away from at-risk persons
Trigger lock 	Key or combination; blocks trigger but doesn't prevent loading. Cost: \$10-\$50	Must not use on loaded gun (could still fire), must keep key or combination away from at-risk persons; not usable on lever-action guns
Lock box 	Key, combination, keypad or biometrics; smaller than safe. Cost: \$25-\$350	Firearm can be stored loaded or unloaded, must keep key or combination away from at-risk persons; may require batteries
Safe 	Key, combination, or biometric identification. Cost: \$200-\$2,500	Most secure option if multiple guns (especially long guns)
Disassembled gun 	Ensures gun cannot be fired but requires gun knowledge	Not always practical; may lose parts
"Smart" gun 	Biometric identification ensures only owner can fire	Does not protect against owner suicide; cannot be retrofitted

Providers should discuss safe storage of firearms in a non-judgmental way, similar to the discussions around other safety issues such as bicycle helmets, child safety locks, and impaired driving.

Transfer Possession	With a family member or friend	State laws vary widely concerning allowable storage and transfer regulations	May be most feasible option for out-of-home storage (especially with family), depending on state laws	
			In most states, allowed but not required	May not be appealing to some patients
		In most states, allowed but not required	Not all stores or ranges store firearms	

Action Items

- ▶ Clinicians must **screen for access to lethal means** (guns, medications, etc)
 - ▶ It is **never** illegal to ask
- ▶ **Gun owning patients** should be aware of the **risk to themselves** and family members
 - ▶ They are far **more likely** to turn the **gun on themselves** than to use it for protection
- ▶ Firearms should always be **stored locked** away, **separately** from locked **ammunition**
- ▶ Guns can **temporarily be stored** at police stations, shooting ranges, gun stores, or in **some states**, with a friend or relative
 - ▶ In extreme situations, **Extreme Risk Protection Orders** can be filed

TABLE 2. Frequency of lethal means assessment in suicide ideation and behavior groups determined by NLP query.

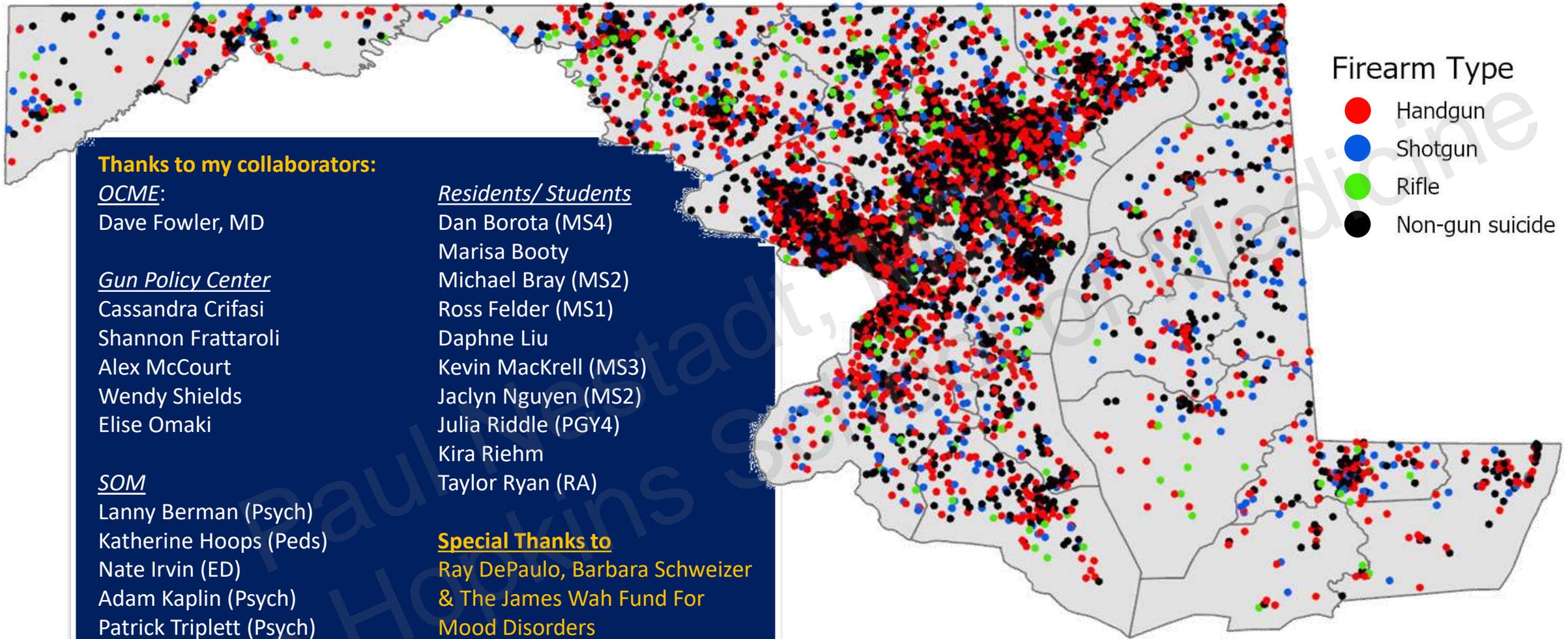
Positive hit on NLP query	Raw estimate (%)	Adjusted for query accuracy (%)	Adjustment for E-Code accuracy of 76%	Simulated 95% confidence interval
Firearm: Suicide behavior (E-Code) group	35.32	30.34	35.8%	33.4–38.2%
Firearm: PHQ-9 – suicide item endorsed	36.42	31.2	N/A*	30.6 – 31.9%
Medication: Suicide behavior (E-Code) group	30.66	26.73	35.1%	29.72–40.56%
Medication: PHQ-9 – suicide item endorsed	23.82	22.6	N/A*	21.9–23.5%

Boggs 2020

Summary

- ▶ Suicide is a **leading cause of death**, rates are **rising**, and it is **preventable**
- ▶ Suicide can be **an impulsive act**, and people use what they have
 - ▶ If attempters live, they have a **chance to get help**
- ▶ If what they have is **very lethal and accessible**, they are likely to **die in the attempt**
- ▶ In some places those lethal means have been **coal ovens, pesticides, or paracetamol**. In the **US**, the most available and lethal means are **guns**
 - ▶ **In rural areas**, where firearm suicide is most prevalent, **long guns** play a larger role
- ▶ **Screening** for firearm access, **regulating** access to firearms, **requiring safe storage**, and generally **decreasing firearm prevalence** will likely save lives

Maryland Suicide Completion by Firearm Type, 2003 - 2018



@paulnstadt



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