

# **Preventing Alcohol-Related Suicide: Implications of the International Evidence for Policies, Programs & Research**

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As required by the Alcohol Policy 19 Conference, we have signed a disclosure statement and note the following conflict(s) of interest:

**We have no conflicts of  
interest to declare**

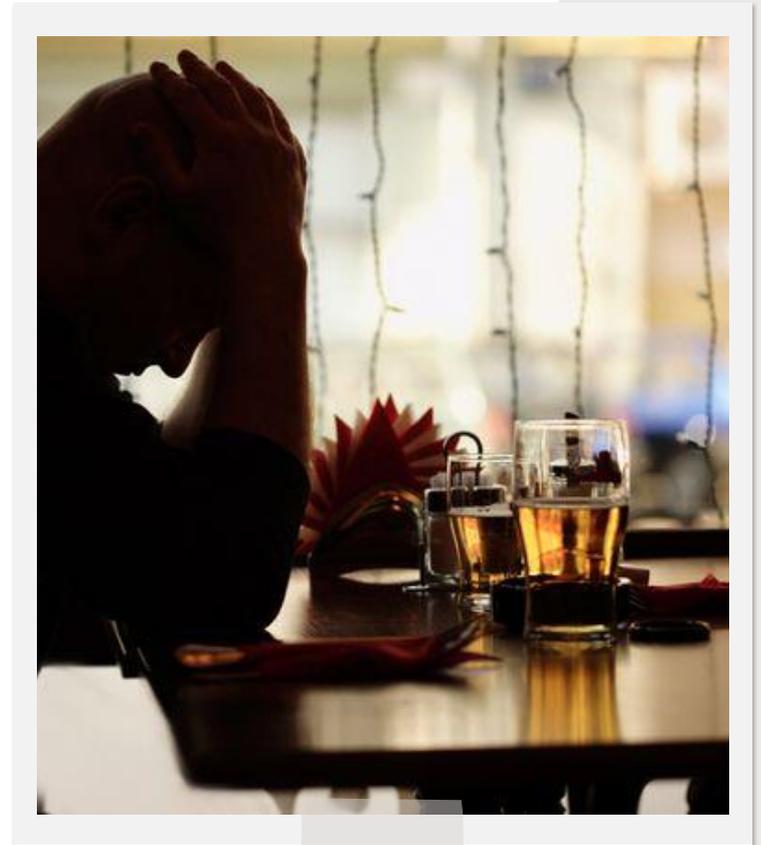


**Evidence to Action: Building a Framework for Change**  
**September 14-16, 2022 Arlington, VA**

# Why study alcohol-related suicide?

- At least 1/3 of suicide decedents are alcohol positive at death
- Many have elevated BAC and/or history of alcohol dependence
- Alcohol is associated with other risk factors for suicide attempts or deaths
- However, suicide prevention strategies give modest attention to alcohol

[Kaplan et al. 2015; Giesbrecht et al. 2017; Orpana et al 2020]



# How is alcohol related to suicide?

- Alcohol may be a means of suicide through alcoholic poisoning
  - Includes overdose in combination with other drugs
- The stimulating effects of alcohol may be associated with impulsivity, disinhibition, or aggression
- Alcohol use may be associated with mental illness and thus contribute to suicide

[Orpana et al. 2020; WHO 2014]



Image source:

<https://www.hcamag.com/au/specialisation/employment-law/is-it-time-to-review-our-drug-alcohol-policy/145361>

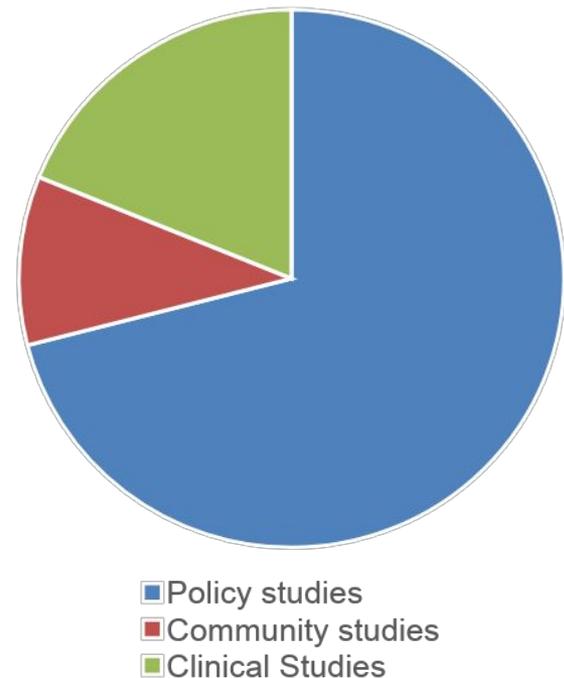
# Methods

- Conducted a rapid review of policies, prevention strategies and interventions to prevent alcohol-related suicide
- Inclusion Criteria
  - Original research
  - Written in English
  - Quantitative measure of **suicide deaths or attempts** as outcome
  - **Alcohol** is a component of the intervention, study population or outcome (as alcohol-related suicide deaths/attempts)

# Methods (cont'd)

- N=2,567 studies identified by database searches
- N=27 studies identified from reviews or reference lists
- N=402 articles underwent full-text review
- N=69 articles ultimately included
- Studies grouped by study type: Policy, Community or Clinical-based
- Policy studies (n=49) will be the focus of our discussion today

Study Categorization



# Alcohol Policy Interventions

- Alcohol campaigns & multiple interventions (16)
- Local restrictions on alcohol sales (4)
- Alcohol pricing & taxation (6)
- Physical availability of alcohol (11)
- Minimum legal drinking age & underage drinking policies (10)
- Modelling studies (2)

# Alcohol Campaigns: US based studies



## Policies associated with declines in suicide deaths:

- **1910-20:** Prohibition (Wasserman 1992)
- **1900-20:** Prohibition (Lewis & Marks, 2020)
  - Estimated reduction of 2.5 to 3.7 suicide deaths per 100,000
- **1976-99:** Various interventions – tax on beer, dry county, DUI laws (Markowitz et al. 2003)
- **1973:** State-variable restrictions on alcohol availability (Lester 1993)
- **2012-16:** Alcohol regulation including availability, taxation & mandatory server training (Choi et al. 2020)
  - Reduction in firearm-related suicide deaths

# USSR, Russia, Belarus, Estonia, Lithuania, Slovenia

## Policies associated with decline in suicide deaths:

- **Russia 1965-99:** Restrictive alcohol policy in USSR in 1985 during Perestroika (Nemtsov, 2003; Wasserman 1994, 1998)
- **Russia, 2000-10:** 2006 law regulating alcohol production that lead to higher retail prices (Pridemore et al. 2013)
  - 9.2% decrease in male suicide deaths
- **Belarus 1979-2007:** Anti-alcohol campaign of 1985-1988 (Razvodovsky 2007, 2009)
  - 54.2% decline in BAC positive suicide deaths
- **Estonia 1985:** Anti-alcohol campaign of 1985 (Vaarnik et al. 2007)
  - Decline in BAC positive suicide deaths; 39.2% for males; 41.4% for females

## Policies with no observed difference:

- **Slovenia 2003:** alcohol restrictions (Zupanc et al. 2013)
  - No change in BAC positive suicide deaths

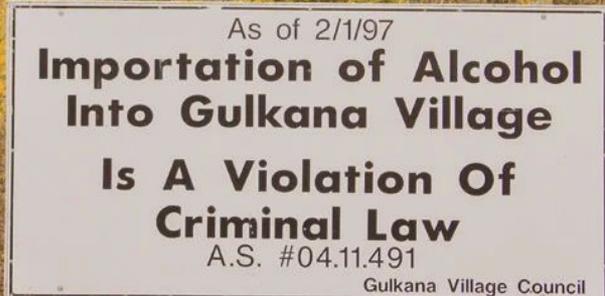
## Policies associated with an increase in suicide deaths;

- **Lithuania 2007-09:** multiple alcohol controls (Sauline et al. 2012)
  - Increase in YPLL due to suicide deaths among



Image source:  
<https://historyofyesterday.com/destroying-tradition-the-soviet-anti-alcohol-campaigns-e6fec177135d>

# Local Restrictions on Alcohol Sales



- **Alaska 1980-93:** Compared villages with different local options on access to alcohol; significant decrease in suicide deaths in villages adopting less restrictive controls “damp” compared with “wet” villages (Berman et al 2000)
- **Alaska 1991-2000:** Native American village level variation in local alcohol prohibition; no significant difference in rate of intentional self-arm in ‘wet’ vs. ‘dry’ villages (Wood & Gruenewald 2006)
- **Alaska 1980-2007:** Variation in local control including ‘dry’ status and local alcohol regulations; suicide death rates were higher in communities that prohibited alcohol importation, but not after controlling for other community factors (Berman 2014)
- **Alabama 1978-88:** Examined local prohibition in counties; ‘dry’ counties had significantly higher mean suicide death rate than ‘wet’ counties (Joubert 1994)

# Alcohol Pricing and Taxation

- **Denmark 1916-17:** increase in alcohol taxation associated with decline in suicide deaths by 19% and 56% where “alcohol abuse” was recorded (Skog 1993)
- **Russia 2000-15:** mean retail price of vodka increased 6.7 fold; male suicide death rate decreased by a factor of 2.3, and for females by factor of 1.9 (Razvodovsky 2019)
- **USA 1982-88:** alcohol pricing had a significant negative association with suicide deaths (Sloan et al 1994)
- **USA 1995-2004:** taxes on wine, but not taxes on beer or spirits, were associated with decreased suicide mortality (Son & Topyan 2011)
- **Switzerland 1964-94:** Increase in taxes on alcohol significantly and positively related to male suicide rate (Yamasaki et al. 2005)



# Physical Availability: USA-based research

- **USA 1974:** suicide death rates were strongly and positively correlated with alcohol consumption, but the effect of alcohol availability itself was non-significant (Lester 1995)
- **Six states where wine retail alcohol monopolies were removed:** 4 states had an increase and 2 had a decrease in suicide death rates (Lester 1999b)
- **California 1995-2000;** densities of local bars and off-premise outlets positively associated with suicide deaths, but local restaurant density had a negative association (Johnson et al. 2009)
- **New Mexico 1990-2004:** liquor outlet density significant and positive associated with suicide death rates (Escobedo & Oriz 2002)
- **14 States 2003-11:** on & off-premise alcohol outlet density positively associated with BAC positive suicide deaths (Giesbrecht et al. 2015 )
- **Philadelphia 2003-06:** No significant relationship between alcohol outlet density and intentional self-inflicted gun injuries or deaths (Branas et al. 2011)

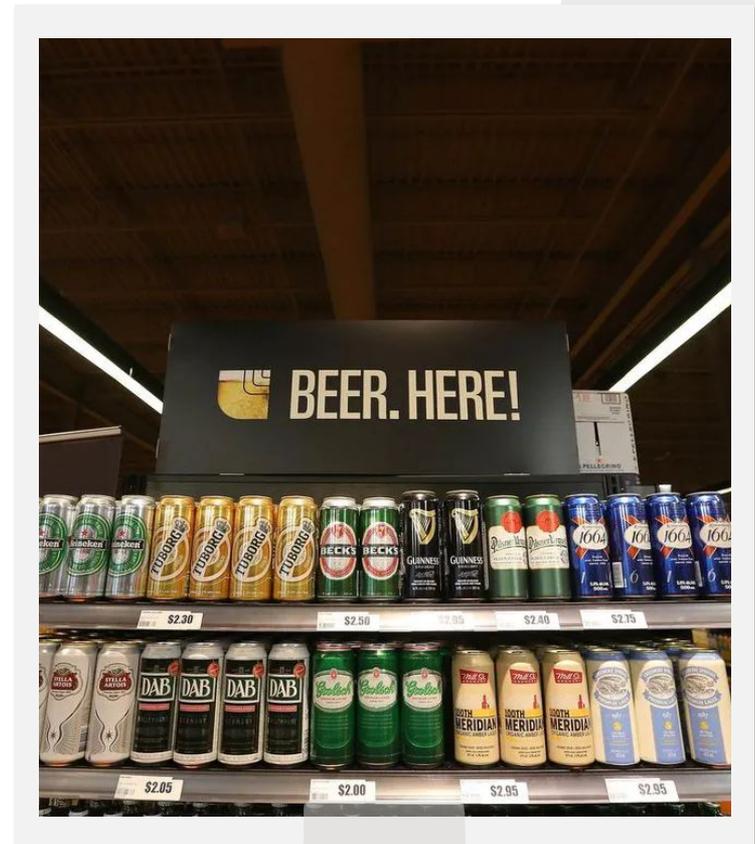


Image source:  
<https://www.thestar.com/opinion/contributors/2019/06/06/corner-store-booze-is-bad-for-our-health-and-our-budget.html>

# Physical Availability: Other Settings



- **Sweden, 1973-81:** medium strength beer taxed as strong beer and no longer allowed for sale in grocery stores; non-significant trend for suicide attempts to stop increasing (Ramstedt 2002)
- **Iceland, 1984-94:** strong beer permitted, with decline in spirits consumption; significant decline in overall and female suicide deaths (Lester 1999a)
- **Alberta 1976-99:** three stages of privatization of liquor outlets; significant increase in suicide death rates (Zalcman & Mann 2009)
- **Lima, Peru 2005-08:** Reduction in hours of alcohol sale in one district; non-significant decline in suicide deaths compared to district where there was no reduction in hours (Malaga et al. 2012)
- **Australia, Canada & US 2011:** State/provincial level variation in alcohol outlet density; not significantly associated with suicide deaths (Wilkins et al. 2019)

Image source:  
<https://sciblogs.co.nz/the-dismal-science/2016/11/06/alcohol-availability-theory-inventories/>



## MLDA & other underage drinking laws

- **Canada, US. and Japan:** research examined what happens when a cohort crossed minimum legal drinking age threshold; significant increase in deaths from suicide detected (Callaghan et al 2013a, 2013b; Jones 1992; Carpenter & Dobkin 2009, 2011; Matsubayashi & Yokshikawa, 2018)
- **US, 1970-90:** States with MLDA of 18 had significantly higher suicide death rate among 18-20 year-olds than states with 21-year MLDA (Birkmayer & Hemenway, 1999)
- **US 1990-2004:** Being exposed to lower MLDA associated with significant 12% increase in risk of suicide death among women and borderline significant decrease risk for men (Grucza et al. 2012)
- **US, 1981-98:** State-variation in adoption of zero tolerance DUI laws for those under age 21; significant decline in male suicide deaths aged 15-17 and 18-20 (Carpenter 2004)
- **Five US states, 1990-2010:** no significant increases in self-inflicted injuries in relation to MLDA (Carpenter & Dobkin 2017)

# Modeling Studies

- **Sweden and Norway:** Modelled partial or complete elimination of national alcohol retail monopolies, as well low to substantial drops in alcohol prices (Holder et al. 1995 )
  - In Sweden, there was a projected an increase in 9% to 57% of suicide deaths among men and 7% to 37% for women.
  - In Norway the projected increase in suicide deaths was 10% to 57% for men, and 6% to 23% for women
- **Sweden:** The effects of two scenarios were projected. (Norström et al. 2010)
  - The first scenario involved replacing the present retail monopoly with private stores that primarily sell alcohol. The second involved making alcohol available in grocery stores.
  - Under the conditions of the first scenario, there was a projected 15.0% increase for men and 11.9% increase for women in suicide deaths. Under the second scenario, there was a projected 36.3% increase for men, and 28.1% for women in suicide deaths.

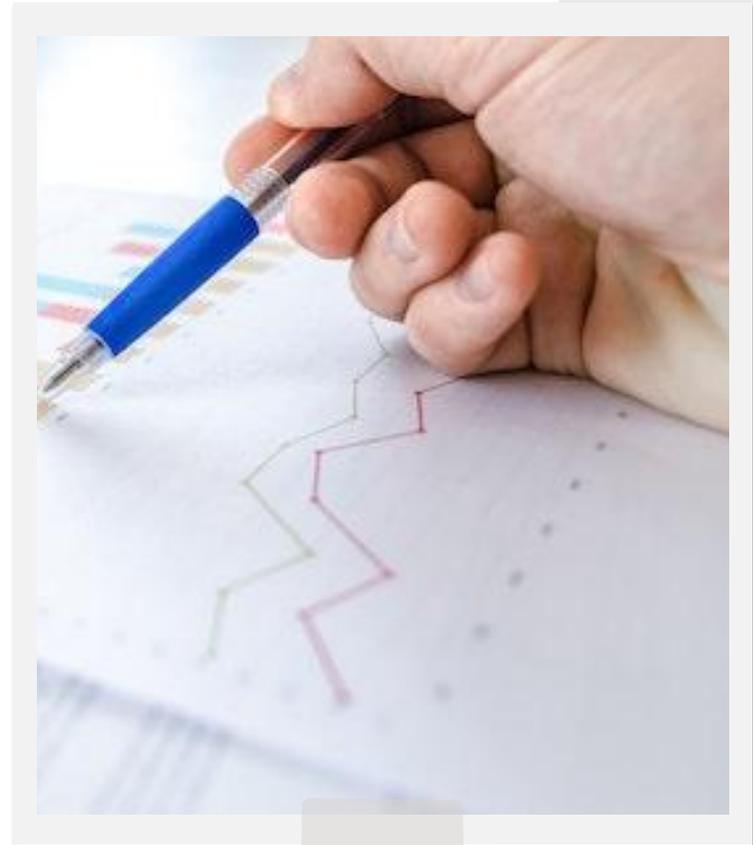


Image source: <http://www.nephjc.com/news/modelling>

# Results from Clinical and Community-Base d Studies

- Community-based interventions
  - Multi-factorial interventions were most effective, however, analysis of the evidence for suicide prevention is limited due to suicide deaths and attempts being a relatively rare outcome
- Clinical interventions
  - Interventions directly targeting the relationship between alcohol and suicide (vs interventions primarily targeting suicidality or alcohol use in isolation) showed the most effectiveness



Image source:  
<https://www.verywellmind.com/signs-and-symptoms-of-alcoholism-66520>



# Conclusions & Implications

- There is substantial and significant evidence that most alcohol policies and certain clinical and community interventions are associated with a reduction in suicide deaths.
  - With evidence over several decades and from several countries
  - Only a minority of studies conducted in the past 30 years did not report this relationship
    - Exception: Local alcohol restrictions in particular appear to lack effectiveness in preventing suicide
- Future work would benefit from additional randomized controlled trials in clinical settings and natural experiments or quasi-experimental designs examining the impact of alcohol policies.

Image source:  
<https://www.akc.org/clubs-delegates/government-relations/government-relations-blogs/2015-legislative-issues-trends-bond-care-bills-unfairly-target-disadvantaged/>

# Conclusions & Implications (cont'd)

- Future work should include biological data on alcohol presence in order assess how the clinical intervention or population level alcohol policy is associated with acute use of alcohol at the time of suicide death
- Alcohol use is a significant contributor to suicide attempts and deaths
  - Suicide prevention programs need to pay attention to this risk factor
  - Alcohol screening and treatment programs need to be aware of suicide as possible risk among their clients
- Evidence-based alcohol policies, such pricing, controls on physical access, can reduce many harms and risks, including suicide



Image source:

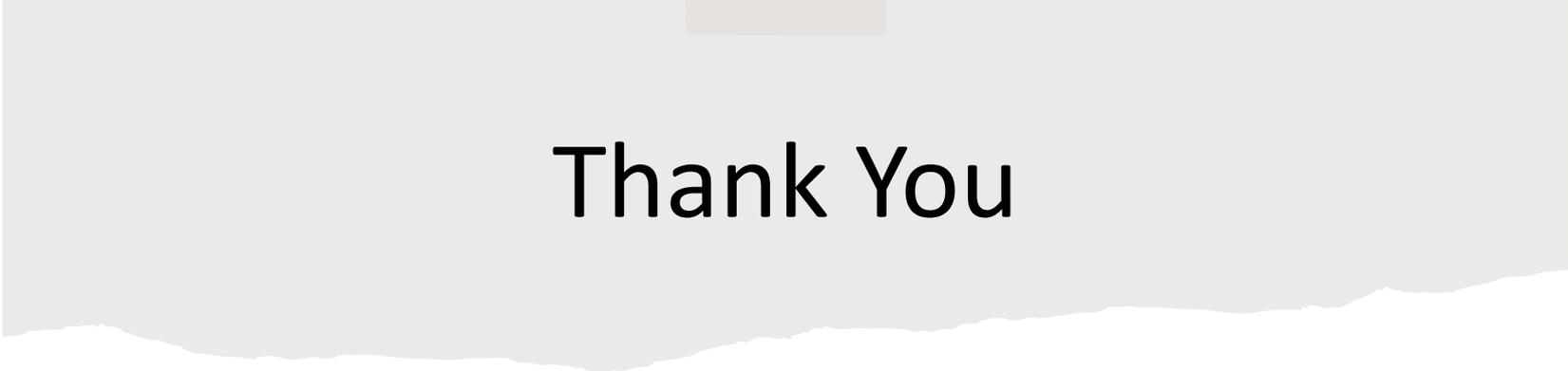
<https://www.graymaine.org/home/home/news/proclamation-september-2021-s-national-suicide-prevention-action-month>

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This presentation is based on a paper that has been  
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*Drugs: Education, Prevention & Policy*



Thank You

We would be happy to take  
any questions