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Minimum legal drinking age – an underrated alcohol control policy

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Topics of this presentation

- Basics: definition of MLDA, MLPA; and the current situation in different jurisdictions
- Reasons for establishing MLPA
- Short term health effects of MLPA
- Long-term health effects of MLPA
- Enforcement is key
- Summary of take home points

Basics: definition of MLDA, MLPA, and the current situation in different jurisdictions

Legally, in most jurisdictions we do not have laws about a minimum age for drinking (this would be overseen by parents), but we do have laws about purchasing alcohol by adolescents in different situations (often, on-premise vs. off-premise purchasing)

Distinction Minimum Legal Drinking Age (MLDA) vs. Minimum Legal Purchasing Age (MLPA)

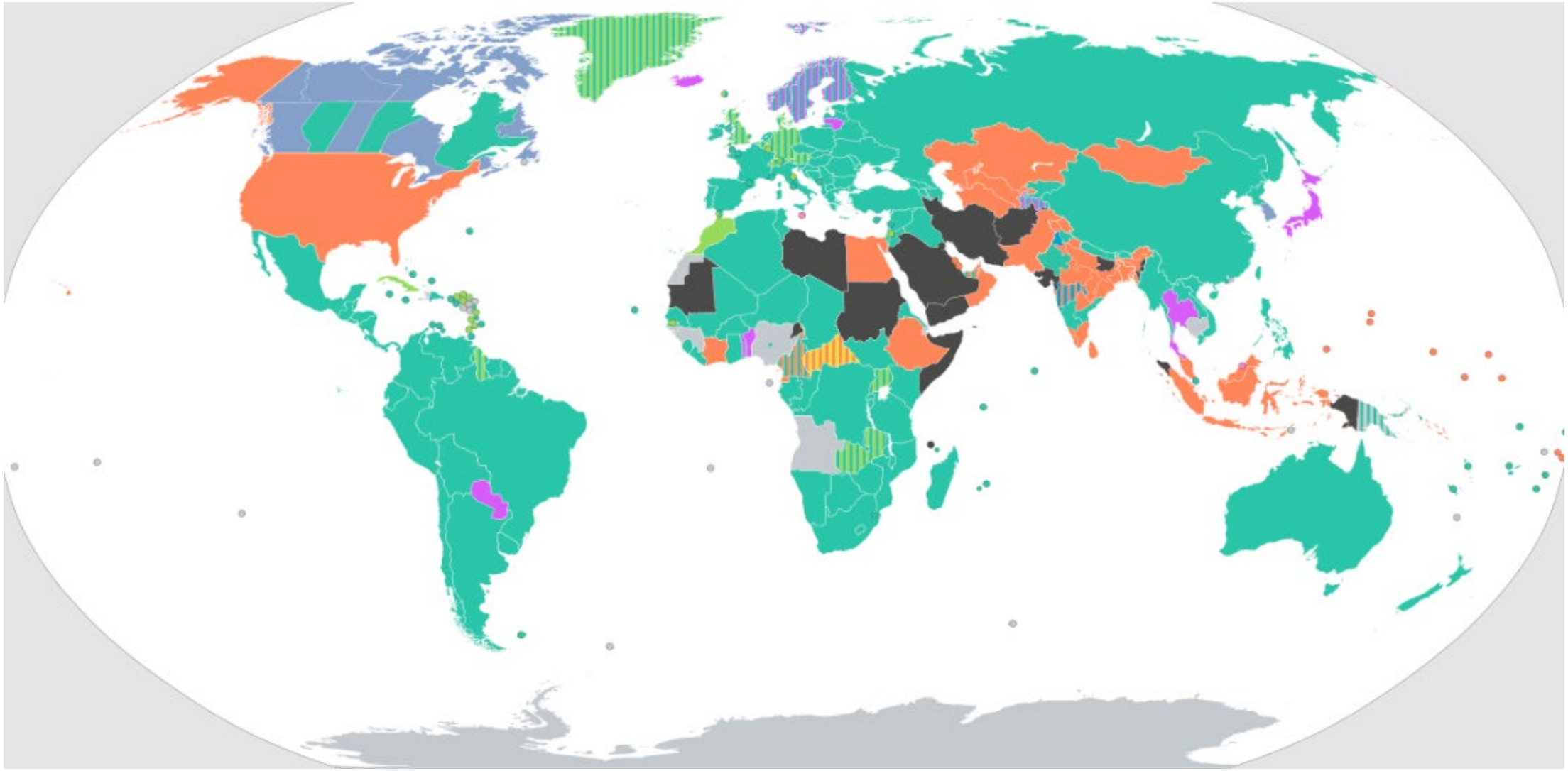
- Some countries do legally make this distinction, others do not.
- In publications, both are often used synonymously.
- Especially in the US (from the CDC website; https://www.cdc.gov/alcohol/fact-sheets/minimum-legal-drinking-age.htm):

> ***A Minimum Legal Drinking Age (MLDA) of 21 saves lives and protects health***
> *Minimum Legal Drinking Age (MLDA) laws specify the legal age when an individual can purchase alcoholic beverages. The MLDA in the United States is 21 years. However, prior to the enactment of the National Minimum Drinking Age Act of 1984, the legal age when alcohol could be purchased varied from state to state.*

The situation in Canada

In Canada, it is illegal to purchase liquor for a minor.

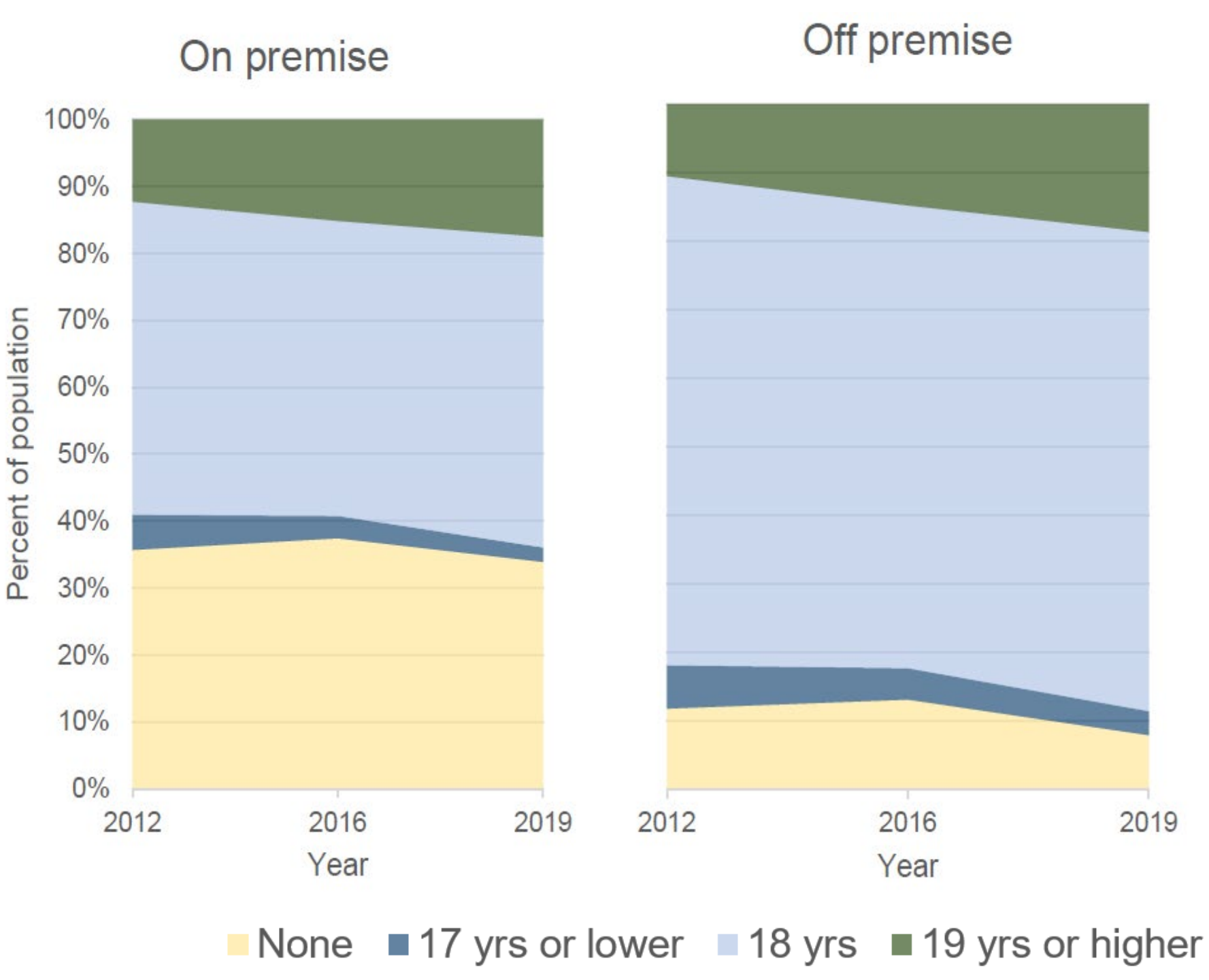
When it comes to serving minors, every province sets its own rules. In Ontario, the Liquor Licence Act states that people under the age of 19 can consume alcohol only if it is supplied to them by their parent or legal guardian and it is consumed in their presence.



Minimum legal age to purchase alcohol by country: Prohibited 25 or older 25 (supervised drinking/fermented alcoholic beverages from the age of 21) 21 21 (supervised drinking/fermented alcoholic beverages from the age of 18) 20 20 (supervised drinking/fermented alcoholic beverages from the age of 18) 19 18 18 (supervised drinking/fermented alcoholic beverages from the age of 16) 17 16 15 or younger No regulation/no age set

Global population coverage for minimum age limits for beer sales by year, premise type, and percent of countries

(n=126 countries reporting for on-premise and 124 for off-premise)



So the trend (outside of Ontario and Canada) is to increase MLPA – which countries are doing this?

- The trend is seen in low- and middle-income countries as well as in high-income countries.
- Examples of countries that established or increased MLPA for beer for off-premise sales between 2012 and 2019:
  established: Burundi, Ghana, Italy, Lao PDR, Rwanda, Syrian Arab Republic
  increased: Antigua & Barbuda, Egypt, Ethiopia, Kazakhstan, Lithuania, Malaysia, Netherlands, Portugal, Saint Vincent & Grenadines, Spain, Sweden, Turkmenistan (about half to 20/21 or to 18)

Information from the WHO's upcoming *Global Status Report on Alcohol and Health*

Reasons for establishing MLPA

Health and social consequences

Why do countries and other jurisdictions choose to establish MLPAs?

- Health reasons (will be developed in the remainder of the presentation)
  - Development of the human brain (alcohol affects the brain of adolescents; the human brain is still maturing until the 20s, alcohol can have a negative effect on memory and long-term capacity)
  - Alcohol's effect on short-time health outcomes (injury, STD)
  - Alcohol's effect on long-time health outcomes via long-term habit forming
- Social consequences

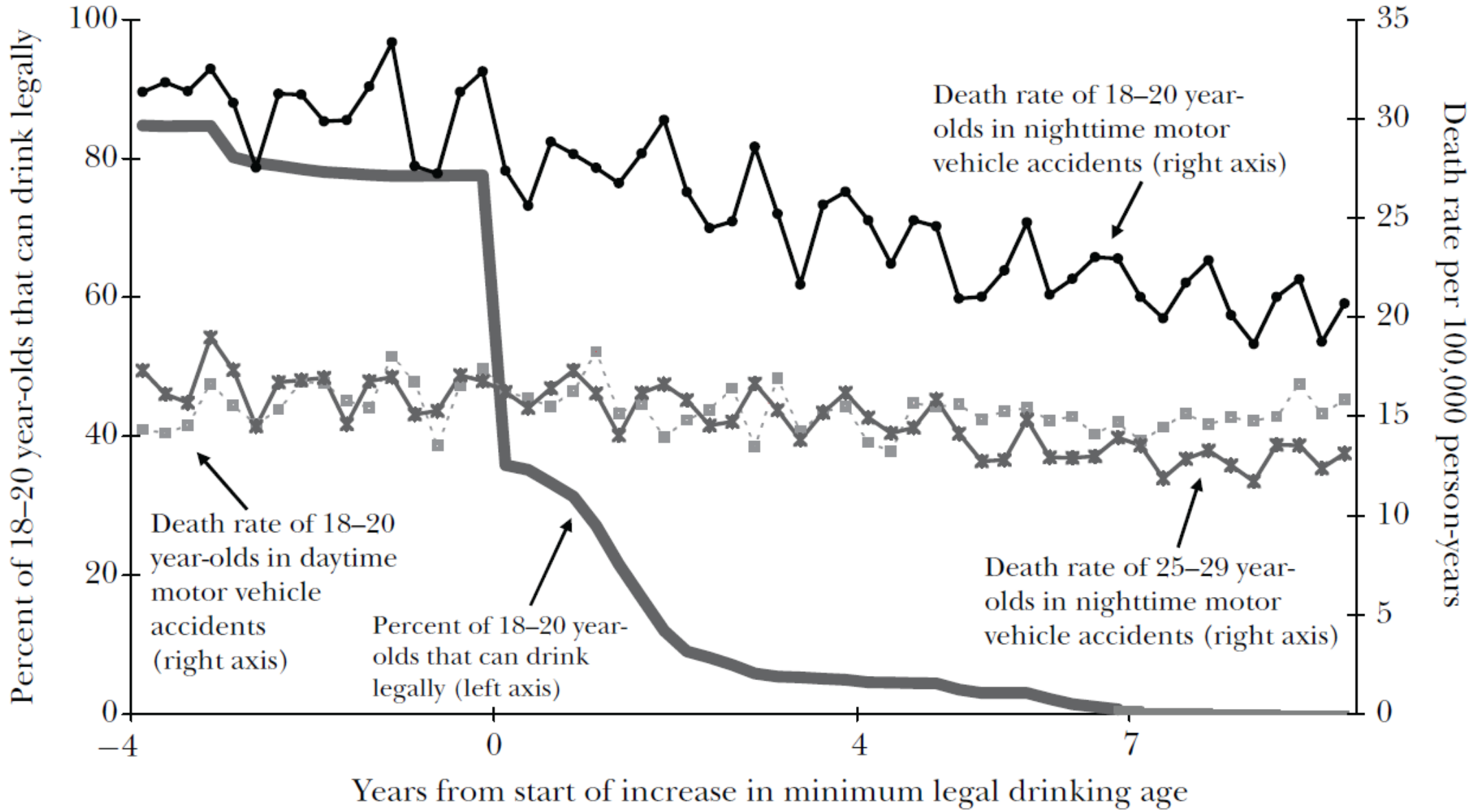
Short-term health effects of MLPA

Traffic injury and fatalities and STD as examples

US changes to 21 years as MLDA – the classic evaluations with traffic injury and fatalities (summary of Carpenter & Dobkin, 2011)

- In 1984, when R. Regan threatened to withdraw federal subsidies for highways from all states if they did not change their MLDA, all states with MLDAs < 21 changed their laws to 21 years eventually, but at different time points.
- This allowed for evaluations of the law using interrupted time-series methodology, whereby the change in one state where the MLDA has changed can be compared to all other states where it has not changed.
- It can also be used as a continuous variable, where the % of all people 18-20 who still have legal access to alcohol can be compared with changes in single nighttime crashes, the most important indicator impacted by alcohol use.

Analysis of Carpenter & Dobkin, 2011 (39 states)



Carpenter & Dobkin, 2011, cont. (regression estimates with SD)

All are mortality rates per 100,000

	Deaths due to all causes	*Internal causes*	*Suicide*	*Motor vehicle accident*	*Homicide*	*Alcohol*	*Other external*
Effect of proportion of 18–20 year-olds legal to drink on mortality rates of 15–17 year-olds	2.33 [1.61]	0.65 [0.56]	0.37 [0.35]	1.35* [0.76]	0.28 [0.62]	–0.03 [0.06]	–0.29 [0.44]
Average mortality rate 15–17 year-olds	42.7	11.0	4.0	16.0	4.4	0.1	7.2
Effect of proportion of 18–20 year-olds legal to drink on mortality rates of 18–20 year-olds	**7.76 [4.92]**	**1.64* [0.97]**	**1.29*** [0.47]**	**4.15** [2.07]**	**–0.75 [2.31]**	**–0.03 [0.07]**	**1.46* [0.83]**
Average mortality rate 18–20 year-olds	**112.6**	**22.5**	**12.8**	**45.5**	**16.3**	**0.3**	**16.2**

Effects on sexually transmitted disease

Den Daas et al. (2019). Evaluating the impact of health reforms in the Netherlands: Assessing the impact of an alcohol ban on sexually transmitted infections in national surveillance data, **Health Policy**; doi:10.1016/j.healthpol.2019.07.017

Highlights

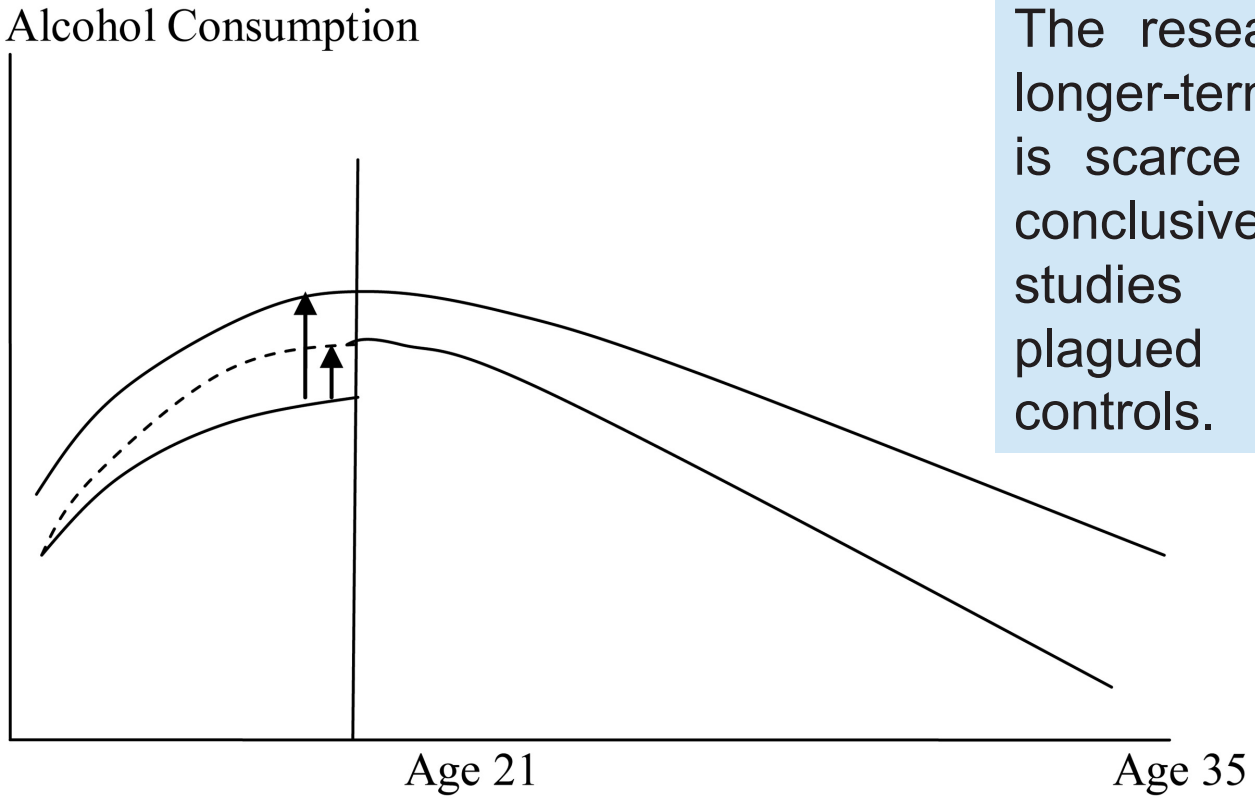
- Regulations to improve population health can have a broader impact than intended.
- Evaluating secondary outcomes of reforms with surveillance data is difficult.
- Health reforms possibly reduced chlamydia, but only in people subject to the drinking-age regulations.
- Changed STI rates could be due to changes in policy, for individuals, or both.

Carpenter & Dobkin, 2015

Carpenter C, Dobkin C. The Minimum Legal Drinking Age and Crime. Rev Econ Stat. 2015 May;97(2):521-524. doi: 10.1162/REST_a_00489.

Carpenter & Dobkin, 2015 used variation from the minimum legal drinking age to estimate the causal effect of access to alcohol on crime. Using a census of arrests in California and a regression discontinuity design, they found that individuals just over age 21 are 5.9% more likely to be arrested than individuals just under 21. This increase is mostly due to assaults, alcohol-related offenses, and nuisance crimes. These results suggest that policies that restrict access to alcohol have the potential to substantially reduce crime.

Long-term health effects of MLPA



The research evidence on longer-term consequences is scarce and mostly non-conclusive, and the few studies available are plagued with insufficient controls.

Figure 1. Long-term effects of reducing the minimum legal drinking age from 21 to 18

Robert Kaestner, et al. *Long-Term Effects of Minimum Legal Drinking Age Laws on Adult Alcohol Use and Driving Fatalities. The Journal of Law and Economics* 2011 54:325-363.
DOI: 10.1086/658486

The most controlled study: Luukkonen et al., 2023

Luukkonen J, Tarkiainen L, Martikainen P, Remes H. Minimum legal drinking age and alcohol-attributable morbidity and mortality by age 63 years: a register-based cohort study based on alcohol reform. *Lancet Public Health* 2023; **8:** e339–46.

Luukkonen and colleagues (2023) conducted a register-based. national cohort studv to assessed alcohol-attributable morbiditv and mortalitv of cohorts born in 1944-54 in Finland. Data were from the 1970 census. the Care Register for Healthcare (maintained bv the Finnish Institute of Health and Welfare). and the Cause-of-Death Register (maintained bv Statistics Finland). As MLDA was lowered from 21 vears to 18 vears in 1969. these cohorts were effectivelv allowed to buv alcohol from different ages (18-21 vears). The authors used survival analvsis to compare their alcohol-attributable mortality and hospitalizations with a 36-year follow-up.

Their key result indicated that, for both men and women, the probability of alcohol-attributable morbidity and mortality was lower in cohorts who had an MLDA of 21 years than in those who had an MLDA of 18 years.

For alcohol-attributable morbiditv in those aged 21 vears when the reform took place. HR was 0·89 (95% CI 0·86-0·93) for men and 0·87 (0·81-0·94) for women versus those aged 17 vears. For alcohol-attributable mortalitv. HR was 0·86 (0·79-0·93) for men and 0·78 (0·66-0·92) for women aged 21 vears when the reform took place. The outcomes of the later-born 1952-54 cohorts did not differ from the 1951 cohort.

Long-term effects of lowering the MLDA Luukkonen et al., 2023

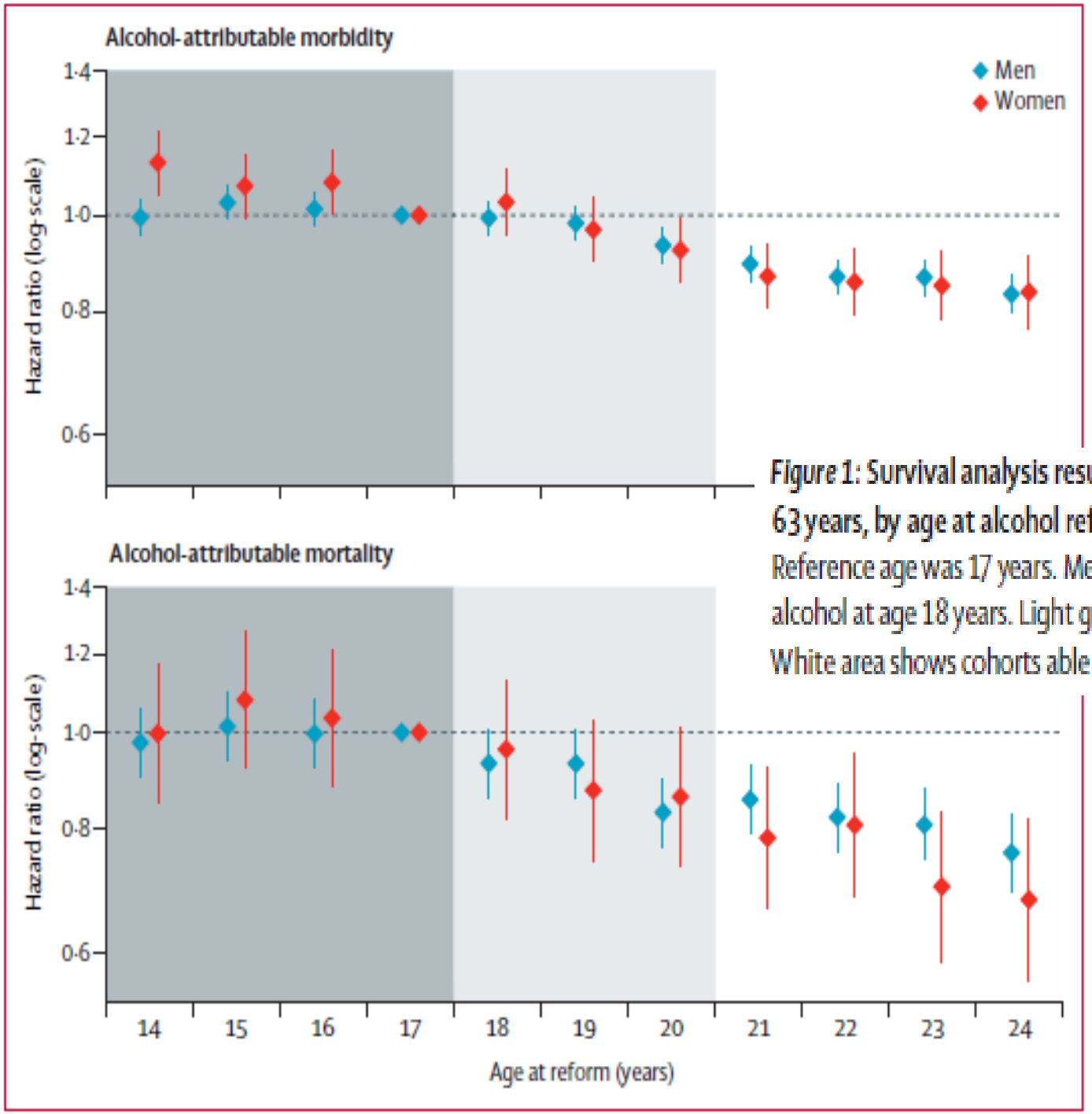


Figure 1: Survival analysis results for alcohol-attributable morbidity and mortality between ages 27 years and 63 years, by age at alcohol reform (Jan 1, 1969)

Reference age was 17 years. Men and women were modelled separately. Dark grey area shows cohorts able to buy alcohol at age 18 years. Light grey area shows cohorts able to buy alcohol between ages 18 years and 21 years. White area shows cohorts able to buy alcohol at age 21 years.

Enforcement is key

Any law is only as good as enforcement. This will deal with best practices on how to enforce MLDA or MLPA. It will also deal with internet shopping which is one of the biggest threats to enforcement.

Enforcement considerations

- The better the enforcement, the bigger the effects of the policy
- However, even without full enforcement (example US), MLPA has positive effects
- The biggest threat at this point are internet sales, where control of MLPA is much harder.
- Monopolies have been shown to result in better enforcement, even for internet sales.
- How can public health measure degree of enforcement: mystery-shopping studies

A case study from Lithuania on enforcement

Study PI: Laura Miščikienė

Health Research Institute, Faculty of Public Health, LSMU

Background and aim

Alcohol Control Law of the Republic of Lithuania:

When there is doubt that a person is under 25 years of age, the seller must request that the person purchasing alcoholic beverages provides an identity document.

The aim of our study was to evaluate the level of compliance with existing regulations on age verification in Lithuania.

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A mystery-shopping study to test enforcement of minimum legal purchasing age in Lithuania in 2022

Laura Miščikienė [1,2], Alexander Tran[3], Janina Petkevičienė[1,4], Jürgen Rehm [3,5,6,7,8,9,10,11], Justina Vaitkevičiūtė[1], Lukas Galkus[1], Shannon Lange[3,5,6] and Mindaugas Štelemėkas[1,4]

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Source. Miščikienė L, Tran A, Petkevičienė J, Rehm J, Vaitkevičiūtė J, Galkus L, Lange S, Štelemėkas M. A mystery-shopping study to test enforcement of minimum legal purchasing age in Lithuania in 2022. Eur J Public Health. 2023 Apr 1;33(2):317-322. doi: 10.1093/eurpub/ckad027. PMID: 36840664; PMCID: PMC10066479.

Methods

- The mystery-shopping study involved attempts by young, but legally eligible (20–24 years old), customers to purchase alcohol, and observing whether staff requested ID prior to completing the sale.
- Although the mystery shoppers were of legal age, they needed to appear young enough to trigger a request for ID.
- Visits for which the store personnel refused to sell alcohol without presentation of valid ID were coded as ‘fail’, while visits for which store personnel were willing to sell were coded as ‘success’.

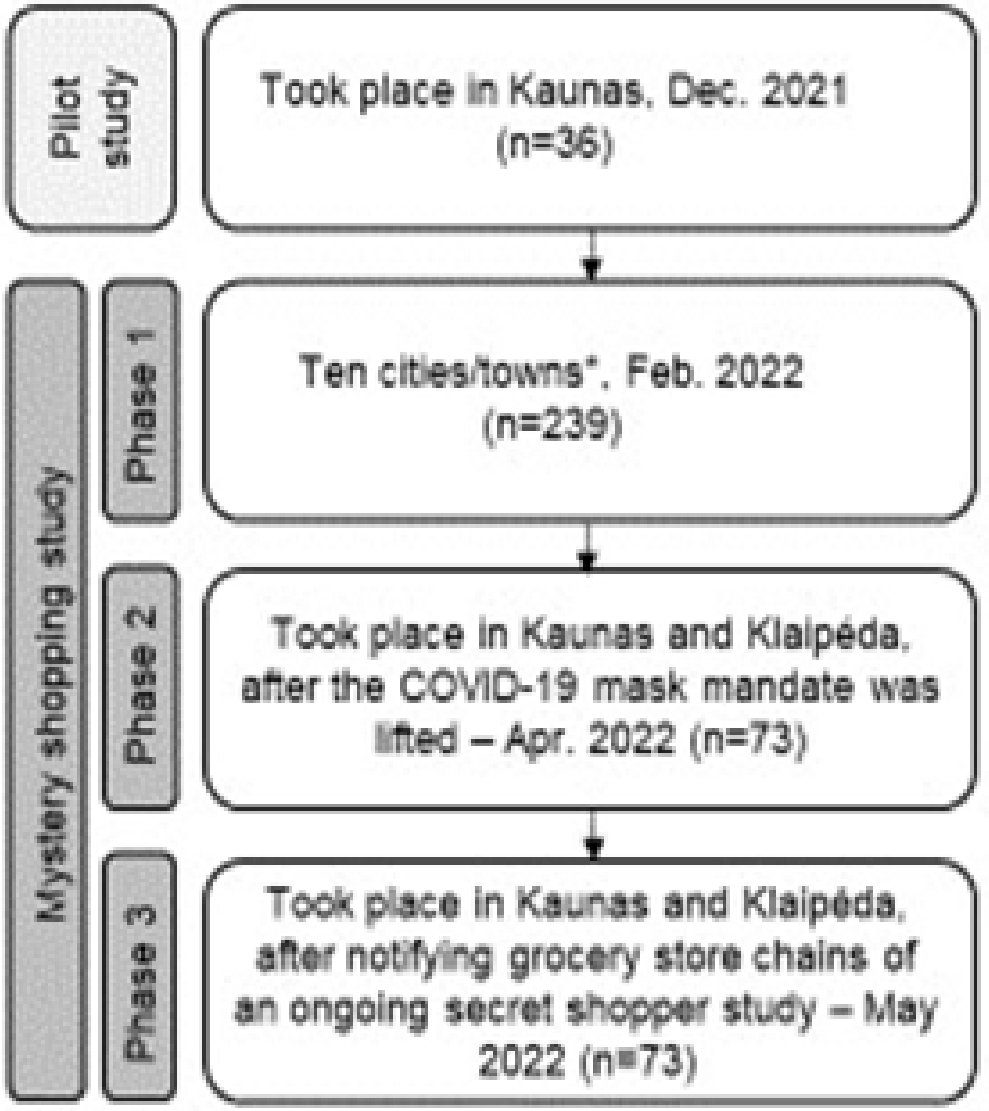

Figure 1. Experimental study phases
*Vilnius, Kaunas, Klaipėda, Šiauliai, Marijampolė, Panevėžys, Alytus, Utena, Telšiai, Tauragė

Results

In total, in 43.5% of the purchase attempts, the store staff did not ask the mystery shoppers for their IDs. Out of all attempts, 44.8% were considered to be successful.

	Successful attempt			Unsuccessful attempt			Total
	N	**%**	**95% CI**	**N**	**%**	**95% CI**	**n (%)**
Did store personnel ask for ID?							
Yes	5	3.7	1.2 to 8.4	130	96.3	91.6 to 98.8	135 (100)
No	102	98.1	93.2 to 99.8	2	1.9	0.2 to 6.8	104 (100)
Total	107	44.8	38.4 to 51.3	132	55.2	48.7 to 61.6	239 (100)
Chi-squared (χ^2) test	*p<0.001*						
Did the store personnel ask the age of the mystery shopper?							
Yes	2	10.5	1.3 to 33.1	17	89.5	66.9 to 98.7	19 (100)
No	105	47.7	41.0 to 54.5	115	52.3	45.5 to 59.0	220 (100)
Chi-squared (χ^2) test	*p=0.002*						
Time of the day							
Until 17 h	84	45.2	37.9 to 52.6	102	54.8	47.4 to 62.1	186 (100)
17 h and later	23	43.4	29.8 to 57.7	30	56.6	42.3 to 70.2	53 (100)
Chi-squared (χ^2) test	*p=0.820*						
Weekday							
Workday	58	39.5	31.5 to 47.8	89	60.5	52.2 to 68.5	147 (100)
Weekend	49	53.3	42.6 to 63.7	43	46.7	36.3 to 57.4	92 (100)
Chi-squared (χ^2) test	*p=0.037*						
Customers in line behind mystery shopper							
0	45	54.9*	43.5 to 65.9	37	45.1*	34.1 to 56.5	82 (100)
1	27	40.3	28.5 to 53.0	40	59.7	47.0 to 71.5	67 (100)
2	13	29.5	16.8 to 45.2	31	70.5	54.8 to 83.2	44 (100)
3 and more	22	47.8	32.9 to 63.1	24	52.2	36.9 to 67.1	46 (100)
Chi-squared (χ^2) test	*p=0.042* ** Z-test with Bonferroni correction, significant difference between 0 customers in line behind mystery shopper and 2 customers in line behind mystery shopper (p<0.05)*						

Results cont.

There was no significant difference found between the three different phases of this study

	Successful attempt			Unsuccessful attempt			Total
	N	**%**	**95% CI**	**N**	**%**	**95% CI**	**n (%)**
Research phase							
Phase 1 (main phase, using data from Klaipėda and Kaunas only)**	30	41.1	29.7 to 53.2	43	58.9	46.8 to 70.3	73 (100)
Phase 2 (without masks, in Klaipėda and Kaunas)	35	47.9	36.1 to 60.0	38	52.1	40.0 to 63.9	73 (100)
Phase 3 (after notification intervention, in Klaipėda and Kaunas)	32	43.8	32.2 to 55.9	41	56.2	44.1 to 67.8	73 (100)
***Chi-squared (χ^2) test*	*p=0.704*						

Distribution of successful and unsuccessful attempts to buy alcohol by research phases (%)

Summary for Lithuania

- The current approach when legal requirement is not led by clear enforcing strategies by the state, may be not sufficient and additional action in needed to increase compliance.

- More comprehensive engagement with the store personel is needed.

Summary of key take-home points

- MLDA or MLPA is used in the majority of countries
- Main reasons for its introduction are concerns regarding brain damage in adolescents, but MLDA/MLPA has shown short-term health effects on traffic injuries and fatalities and STDs; long-term health effects on all alcohol-attributable morbidity and mortality, and effects on social consequences.
- Even though MLDA/MLPA has shown effects in situations where enforcement has gaps (example: US), stronger enforcement will increase the effectiveness of these laws.
- Enforcement can be measured by mystery-shopping studies.
- Ethical considerations should be taken into consideration in addition to health consequences!