

Alcohol and Crash Risk

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Agenda

1. How alcohol is absorbed
2. Measurement: drink size and Blood Alcohol Concentration (BAC)
3. Specific effects of alcohol and degree of impairment
4. Alcohol impairment and driving risks
5. BAC Limits: History and Impact
6. Addressing frequently asked questions and concerns about 0.05 BAC
7. Conclusion and Q & A

Reviewing the Physiology of Alcohol

Ingestion

- Typically by drinking
- Can be smoked or “vaped”

Absorption

- Faster with carbonation (soda, champagne)
- Faster on an empty stomach

Intoxication

- Bloodstream to all organs including the brain
- Similar concentration in all organs except liver

Metabolism

- 90% of alcohol processed by the liver
- Not impacted by gender, body size/type

Excretion

- What is not processed by liver is excreted in urine, sweat, and breath

Alcohol effects and intoxication

- Depresses the central nervous system (CNS)
- Interferes with brain's communication pathways
- Impairs balance, coordination, and visual perception
- Reduces alertness, judgment, inhibitions



Standard Drink Size



12 ounces
5% ABV beer



8 ounces
7% ABV malt liquor



5 ounces
12% ABV wine



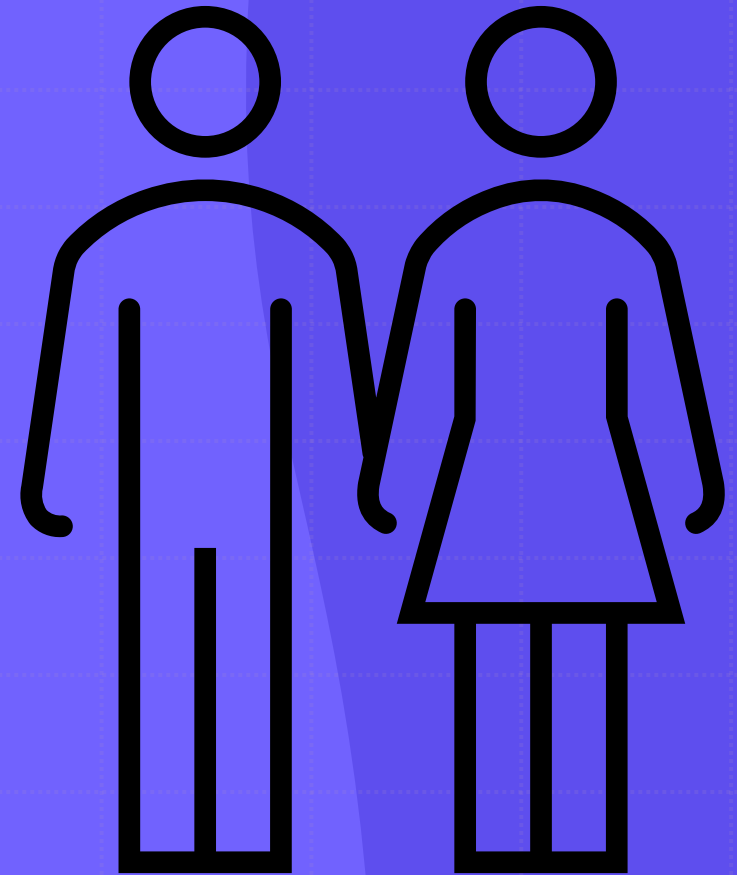
1.5 ounces
40% (80 proof) ABV
distilled spirits | (examples:
gin, rum,
vodka, whiskey)

ABV = Alcohol by Volume

Blood Alcohol Concentration (BAC)

One standard drink in one hour on an empty stomach results in a blood alcohol concentration (BAC) of:

- 0.03 BAC for an average woman
- 0.02 BAC for an average man



**Blood Alcohol
Concentration
(BAC)**

Typical Effects

Predictable Effects on Driving

.02

- Some loss of judgment
- Relaxation
- Slight body warmth
- Altered mood

- *Decline in visual functions (rapid tracking of a moving target)*
- *Decline in ability to perform two tasks at the same time (divided attention)*

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.05

- Impaired judgment
- Release of inhibition
- Decreased small-muscle control (e.g., eye focus)
- Exaggerated behavior
- Usually good feeling
- Lowered alertness

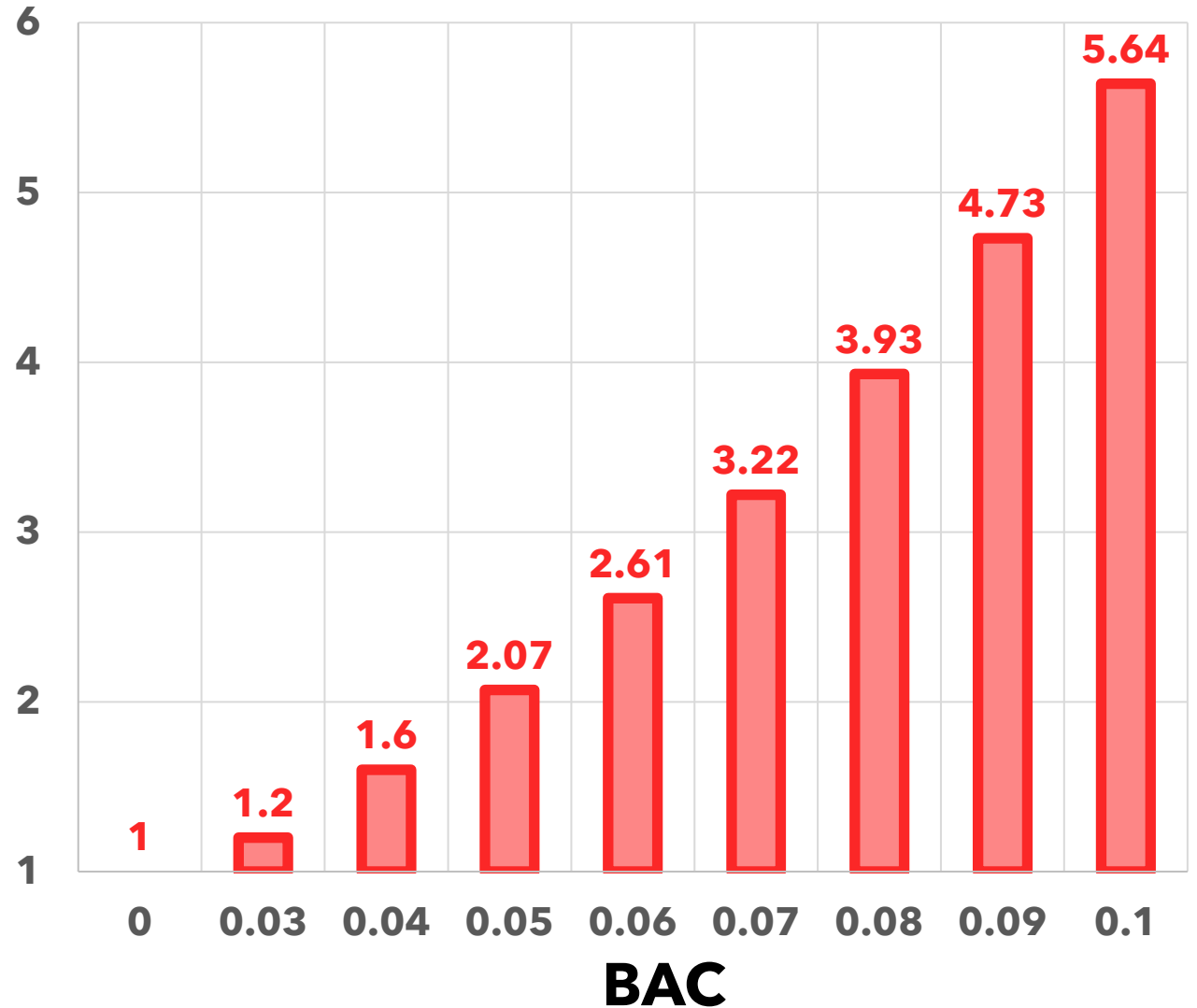
- *Reduced coordination*
- *Reduced ability to track moving objects*
- *Difficulty steering*
- *Reduced response to emergency driving situations*

Blood Alcohol Concentration (BAC)	Typical Effects	Predictable Effects on Driving
.02	<ul style="list-style-type: none"> • Some loss of judgment • Relaxation • Slight body warmth • Altered mood 	<ul style="list-style-type: none"> • <i>Decline in visual functions (rapid tracking of a moving target)</i> • <i>Decline in ability to perform two tasks at the same time (divided attention)</i>
.05	<ul style="list-style-type: none"> • Impaired judgment • Release of inhibition • Decreased small-muscle control (e.g., eye focus) • Exaggerated behavior • Usually good feeling • Lowered alertness 	<ul style="list-style-type: none"> • <i>Reduced coordination</i> • <i>Reduced ability to track moving objects</i> • <i>Difficulty steering</i> • <i>Reduced response to emergency driving situations</i>
.08	<ul style="list-style-type: none"> • Muscle coordination becomes poor (e.g., balance, speech, vision, reaction time, and hearing) • Harder to detect danger • Impaired judgment, self-control, reasoning, and memory 	<ul style="list-style-type: none"> • <i>Speed control</i> • <i>Impaired perception</i> • <i>Reduced information processing capability (e.g., signal detection, visual search)</i> • <i>Concentration</i> • <i>Short-term memory loss</i>

BAC and Crash Risk

National Highway Traffic Safety Administration, 2016

Crash Risk*



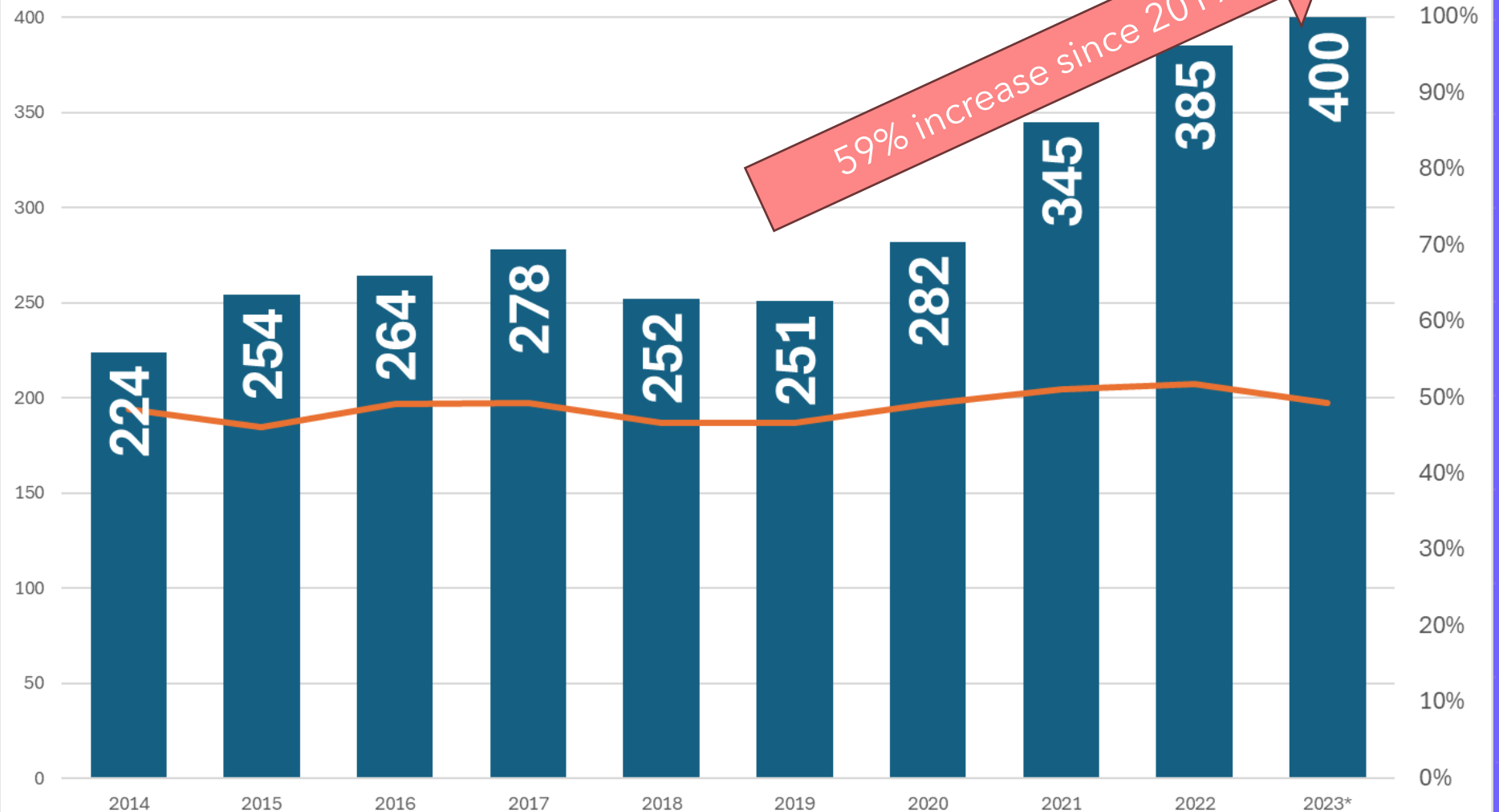
*Adjusted to account for other factors that increase crash risk, e.g. males and younger drivers have higher crash rates compared to females and older drivers.

Why it is important to make a travel plan before drinking

- *The Mellanby Effect*: As alcohol levels are rising, awareness of impairment is greater; while alcohol levels are falling, awareness is lower
- This effect occurs when the body has adjusted to the effects of alcohol ("homeostasis"), making impairment less noticeable even though BAC is high
- Even though drivers might *feel* more sober, their driving may be just as impaired

Sober Driving and Traffic Safety

Washington Traffic Fatalities Involving an Impaired Driver and Percentage of Total, 2014-2023 (2023 is preliminary)



Half of fatal crashes involve an impaired driver.

Alcohol is the most common drug involved in fatal crashes.

What is a *per se* limit for DUI?

Driving Under the Influence (DUI) is prohibited on Washington roads. A person has is guilty of DUI if:

- The person drives a vehicle within this state while *under the influence of intoxicating liquor, cannabis, or any drug*.
- The person is presumed to be impaired if the person has, within two hours after driving, an alcohol concentration of 0.08 [current *per se* limit] or higher as shown by analysis of the person's breath or blood.

RCW 46.61.502

Are lower BAC limits a new idea?

History

Norway adopted the first *per se* BAC limit in 1936: *0.05 percent*

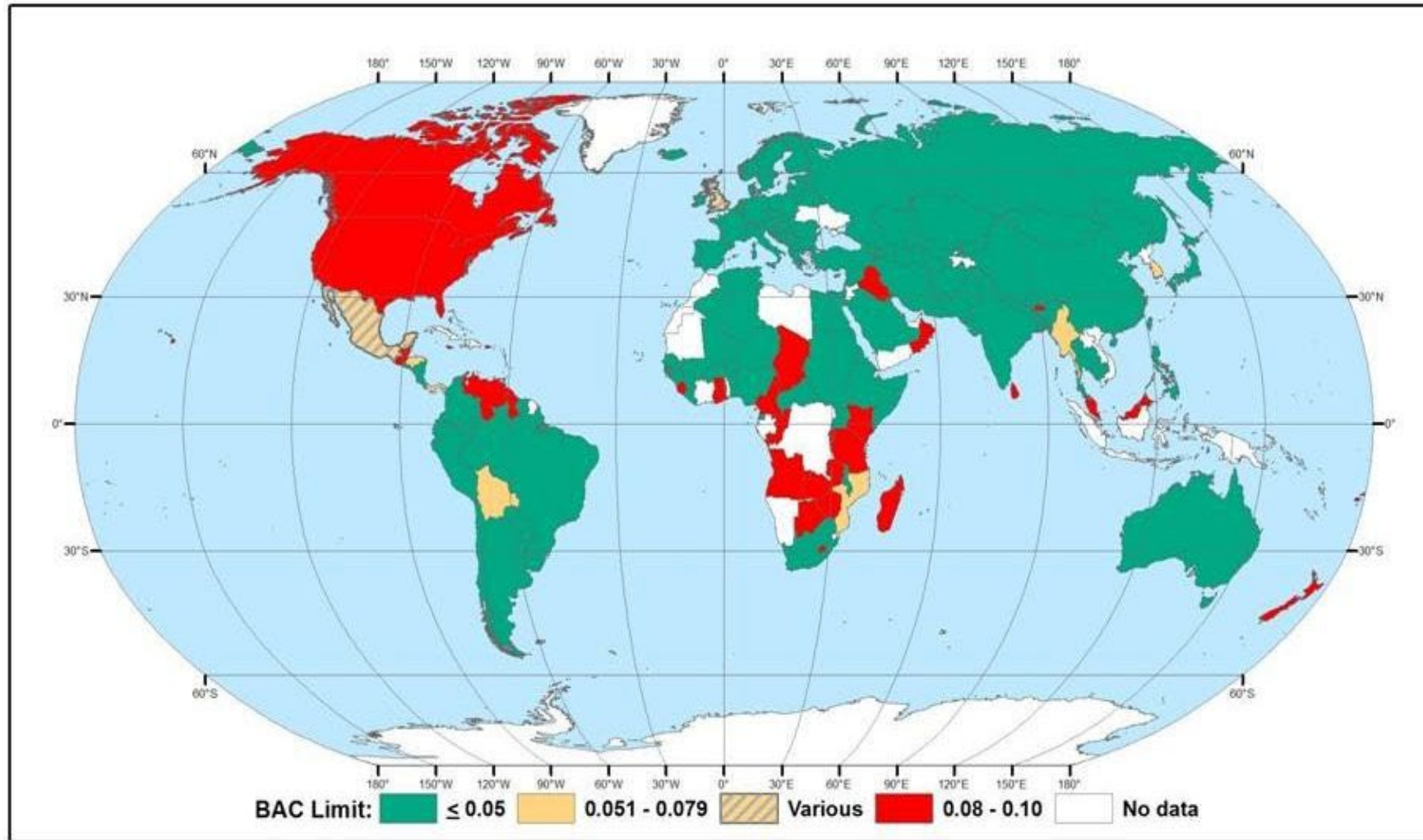
Many other countries adopted *per se* limits of 0.05 in the 1960s - 1990s.

By the mid 2010s, 75% of countries (home to 84% of the Earth's population) had adopted BAC limits of 0.05 or lower

The BAC limit for commercial drivers (CDL) in the U.S.: 0.04

The BAC limit for drivers under 21 in WA: 0.00

The green countries have a BAC of 0.05 or lower:



Countries that have *not* adopted BAC limits of 0.05 or lower include:

Iraq
Libya
Angola
Congo
Bolivia
Venezuela
Greenland
England
Canada
U.S.A. (exc. Utah)

Most people know drinking and driving is dangerous and don't do it

- Most people believe it is unsafe to drive after consuming 2-3 drinks (various public opinion surveys)
- 78 percent of Washington respondents said they don't drive after consuming two or more drinks of alcohol (WTSC, 2018)
- Over 94 percent of Washington respondents said they have not driven under the influence of alcohol in the previous 12 months (WTSC, 2023 statewide survey, N = 10,964)

Countries with lower BACs have fewer fatalities

International studies have found, *on average*:

1. 9.2 percent fewer fatal DUI crashes with a reduction from 0.10 to 0.08 BAC
2. An additional 11.1 percent reduction in fatal crashes with a reduction from 0.08 to 0.05 BAC
3. A 5 percent reduction in non-fatal crashes
4. No significant reduction in alcohol consumption

Voas, Robert B., Torres, Pedro, Romano, E., & Lacey, John H. (2012). Alcohol-related risk of driver fatalities: An update using 2007 data. *Journal of Studies on Alcohol and Drugs*, 73(3), 341-350.

Separating Drinking from Driving Reduces Fatalities (We can reduce fatalities without reducing consumption.)

Country/State	Fatality Rate per 1,000,000	BAC Limit (adult)	Alcohol Consumption (annual liters/person)
USA	129	0.08	8.93
Washington	94.5	0.08	8.59
Portugal	63	0.05	10.37
France	49	0.05	11.44
Austria	41	0.05	11.9
Germany	34	0.05	10.56
Finland	34	0.05	8.23
Spain	36	0.05	10.72
Ireland	31	0.05	10.91

2022 data: Traficom Finland

Other impacts of a change from
0.08 to 0.05 percent BAC?

Why a BAC change is *unlikely* to increase arrests

Law enforcement stops a driver for specific infractions and/or behavioral signs of impairment. An arrest will not result without specific evidence of impairment (see below).

The decision to arrest is based upon observed driving deficiencies, interaction with the driver, and the Standard Field Sobriety Test (SFST)

If the investigation, including SFST, does not indicate driver impairment, law enforcement does not test the driver's BAC.

If impairment is determined, preliminary breath tests are used to confirm the officer's arrest decision (for alcohol impairment).

Post arrest, evidentiary breath test is taken (or blood if other drugs are suspected)

The primary impacts of 0.05 laws are:



Education - helping drivers better understand the risks of drinking before driving



Prevention - encouraging drivers to plan alternatives: sober drivers, taxis, rideshare, hotel, etc.



Broad deterrence - for some individuals, the possibility of negative consequences (e.g., arrest) provide additional incentive/deterrence

Will the change impact drivers above 0.08?

International research: lower BAC limits provide a broad deterrence effect across BAC levels

Lower BAC limit encourages drivers to decide between drinking or driving before judgement is impaired

Crashes involving drivers 0.05 to 0.15+ percent BAC *decreased* more than 22% one year after Utah adopted 0.05 limit. (Thomas et al., 2022)

Bottom line

If people wait until after they have consumed multiple drinks to decide if they are too impaired to drive, their ability to judge is itself impaired.

Conclusion: why 0.05 has become the most common BAC standard in the world

1. Thousands of lives are saved every year
2. The average person cannot safely drive at a BAC of 0.05 or higher (risk of crash is more than double), and most people don't
3. Encourages people to plan ahead if they intend to drink, arrange a safe way to get home, or stay put
4. There are no documented harmful effects on the hospitality industry. Everyone benefits from fewer deaths and injuries.
5. Impact is preventative: result is fewer impaired drivers on the road.