



CAREC Road Safety and Sustainable Mobility Course

February 2024

Risk Factor: Impairment

Dave Cliff, GRSP

Drinking and Driving

“Reducing BAC levels leads to reductions in alcohol-related crashes, injuries and deaths.”

Mann et al, 2001



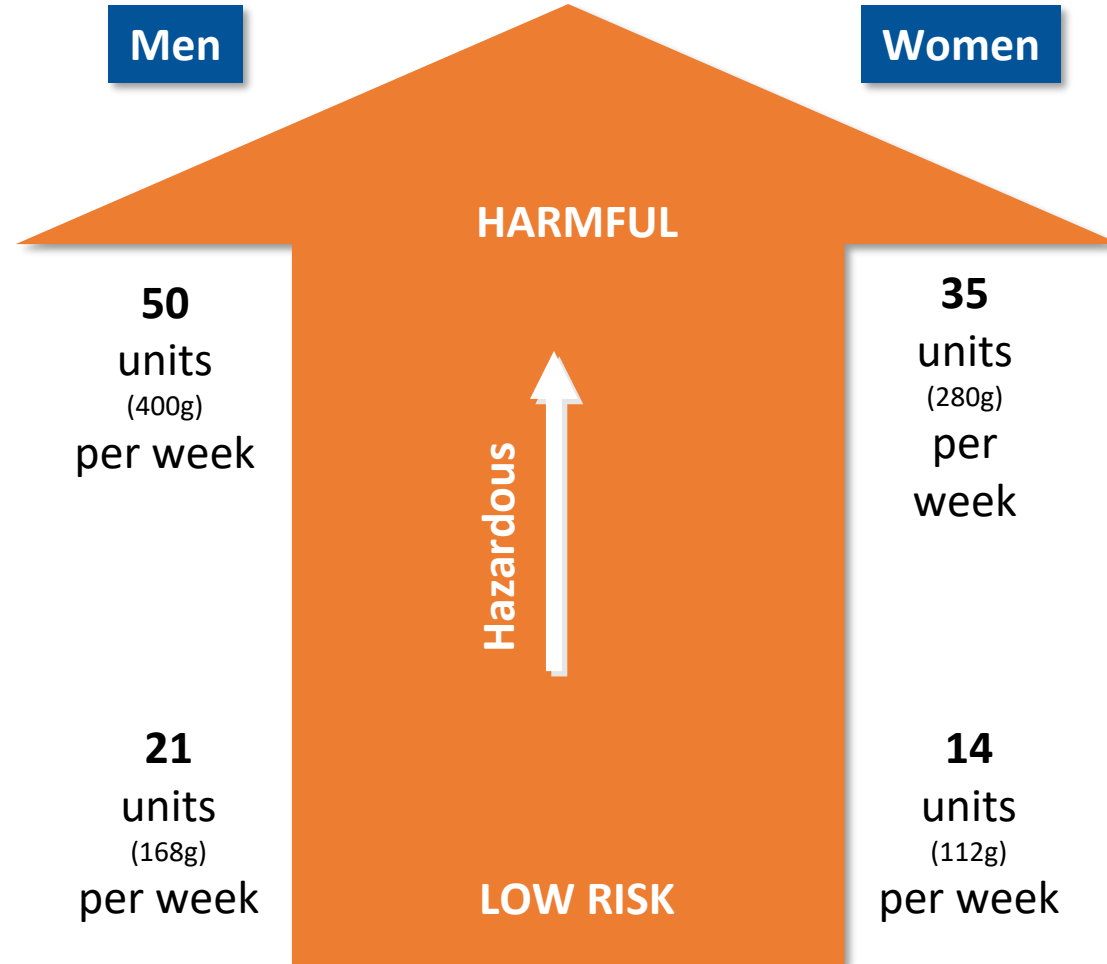
What is a Standard Drink or Unit?

Comparison of Standard Drinks



* NSW, WA, ACT - Middy; VIC, QLD, TAS - Pot; NT - Handie; SA - Schooner

Alcohol Consumption and the Risk of Physical Harm



How Alcohol Affects the Brain

- Alcohol has toxic effects.
- Alcohol consumption alters the functioning of the body and results in impairment.

Impairment leads to:

- poor judgement,
 - increased reaction time,
 - lowered vigilance and
 - decreased ability to see clearly
- These effects increase the likelihood of involvement in a road traffic crash.



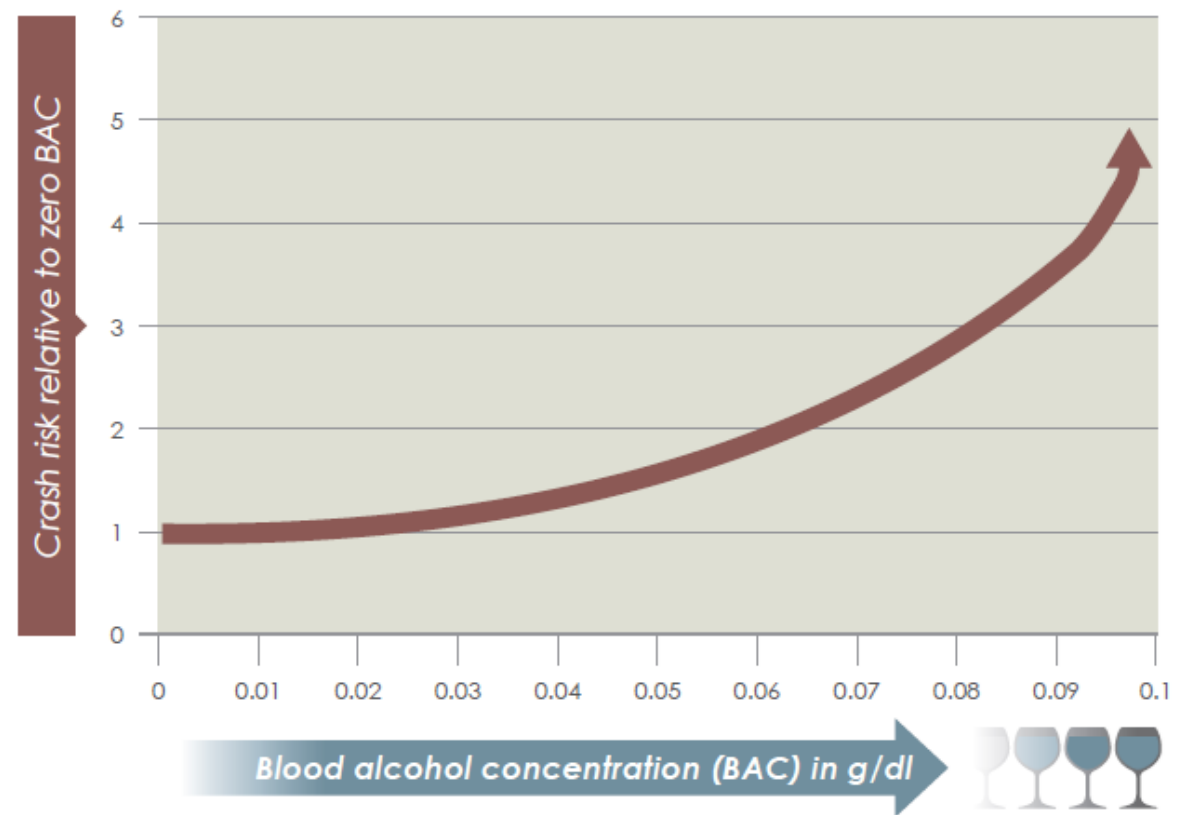
Measuring Alcohol

- **Blood alcohol content (BAC)** $\frac{g}{dl}$ denoted in g/dl.
- A BAC limit refers to the maximum amount of alcohol allowed in the bloodstream that is legally acceptable for a driver on the road.
- **Breath alcohol content (BrAC)** $\frac{g}{l}$ BrAC values have equivalent BAC values.

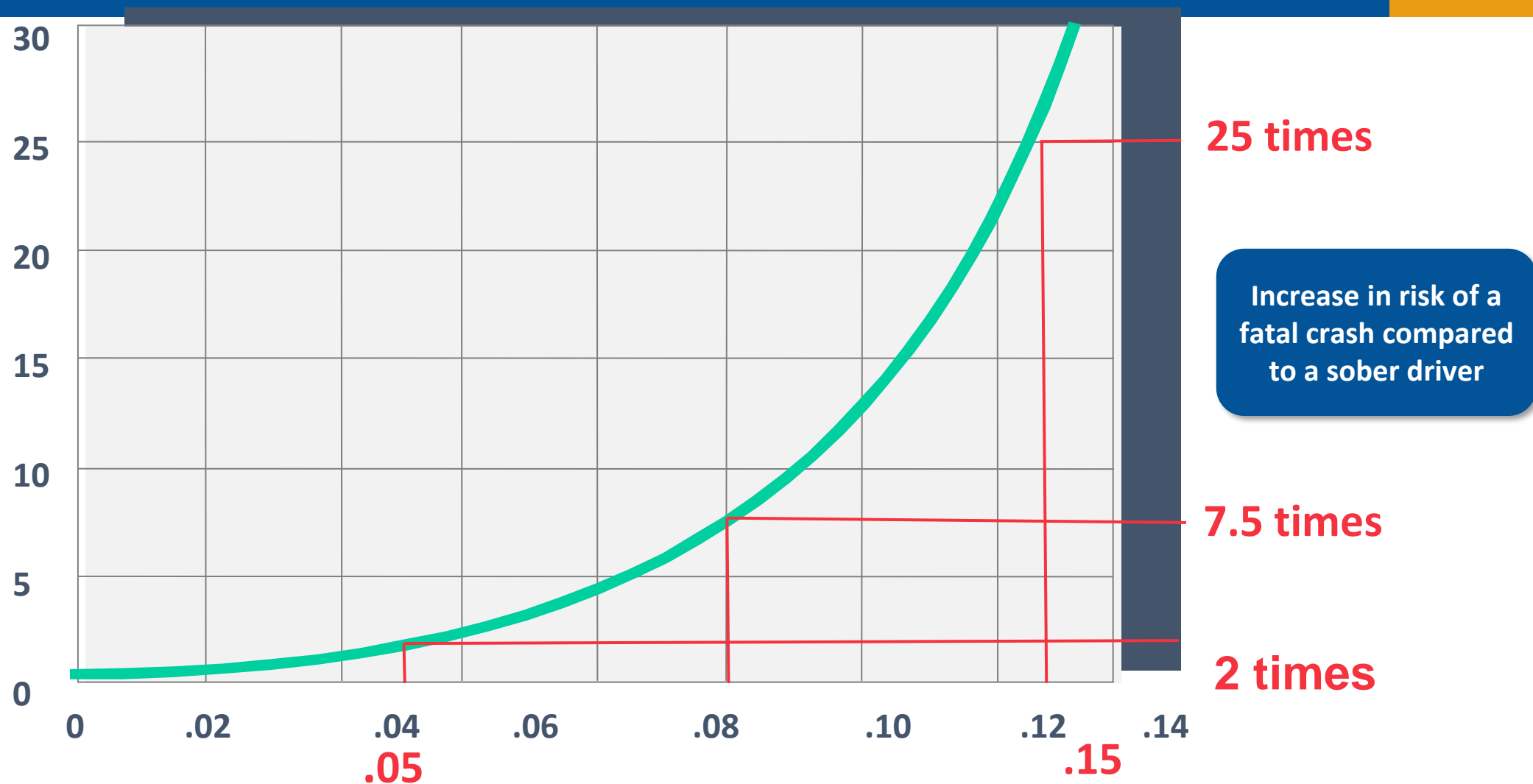


Risks Associated with Drinking and Driving

- The risk of a road traffic crash starts at low levels of BAC and increases significantly when the driver's BAC is $\geq 0.04\text{g/dl}$.
- Impairment by alcohol is not limited to vehicle drivers and passengers; pedestrians and cyclists are also impaired by alcohol.



The Influence of Alcohol on Driving



The Influence of Alcohol on Driving

Table 1: Relative risk of fatal crash by blood alcohol level by age

BAC	30+ years	20–29 years	15–19 years
0	1.0	3.0	5.3
30	2.9	8.7	15.0
50	5.8	17.5	30.3
80	16.5	50.2	86.6

The evidence strongly supports maximum permissible blood alcohol levels of .05% for drivers over 20 years

The table above shows that at 80mg of alcohol per 100ml of blood a driver is about sixteen times as likely to be involved in a fatal crash as the same driver with a zero blood alcohol level.

Effective Interventions to ↓ drink-driving



Key Elements in a Good Drink Drive Law

- Specify BAC or BrAC **limits**
 - ≤ 0.05 g/dl for the population at large
 - ≤ 0.02 g/dl for young or novice drivers and commercial drivers because they have a higher risk
- Specify an age below which the purchase or public consumption of alcoholic beverages is illegal.
- Specify **penalties**: Fines, Driver Licence Disqualification, Vehicle impoundment, Jail
- Specify **enforcement** (allows random breath testing 'anywhere and anytime')
- Set minimum **age** for legal purchase or drinking of alcohol

Alcohol Interlocks

- It is a breathalyzer for an individual's vehicle.
- It requires the driver to blow into a mouthpiece on the device before starting the vehicle.
- Uses:
 - Commercial drivers
 - Prevent recidivism



Raising Awareness



Global Drink Driving Enforcement Practice

The only truly reliable measure of the minimum impact of alcohol affected driving on crash fatalities is to measure –

The number of drivers fatally injured and found to have a Blood Alcohol Content (B.A.C.) over .05



Homel's Principles – Preventing Drink Driving

Drink drive enforcement will be most effective if it follows these principles:

- Highly visible
- Rigorously enforced
- Sustained
- Well-publicised

Other key requirements

- Random and unpredictable times and locations.
- Focused on key risk times (*i.e. high alcohol hours – time and days of the week when alcohol-impaired driving peaks*).



Highly Visible

As many drivers as possible must be exposed to highly visible random/compulsory breath testing.

The metropolitan and rural enforcement approaches vary considerably:

- Metropolitan relies on volume of drivers tested
- Rural relies on random and unpredictable testing (*'bush telegraphs'* can operate to warn drivers of police activity)



Rigorous Enforcement

The credibility of the campaign must be maintained

NO ONE CAN AVOID TESTING

‘Clear and unambiguous policies.’

Drink Driving Enforcement – High Alcohol Hours

Alcohol related fatal/injury crashes					Greater than average (91)		
2008-12	Mon	Tue	Wed	Thu	Fri	Sat	Sun
12:00-1:59 am	64	48	80	124	161	319	327
2:00-3:59 am	31	32	54	68	130	256	295
4:00-5:59 am	22	15	34	48	62	180	215
6:00-7:59 am	19	15	22	35	45	104	132
8:00-9:59 am	15	17	12	22	26	45	51
10:00-11:59 am	10	12	22	23	20	41	37
12:00-1:59 pm	21	19	25	28	30	50	55
2:00-3:59 pm	33	47	43	46	57	80	66
4:00-5:59 pm	38	76	84	94	104	108	103
6:00-7:59 pm	73	86	108	101	182	183	135
8:00-9:59 pm	69	103	134	161	229	256	131
10:00-11:59 pm	65	121	158	200	291	299	96
Total	460	591	776	950	1337	1921	1643

Sustained

For the general public to change *behaviour*, it is essential the programme is *ongoing*!

We ran a campaign for a month...

that problem was solved

WRONG!



Well-Publicised

- There must be 'ongoing publicity' to highlight the enforcement activity (*greatly enhances enforcement impact*)
- Media releases in local newspapers support the enforcement approach
- The campaign must reach all 'cultures' and age groups in the community that are at risk!
- Professionalism of the Police Operation
- *"I never forgot being breath tested. It was like driving through a movie set."*

THE THEATRE OF ROAD POLICING



Good Practice Enforcement Guidelines from Deterrence Theory Research

- Road policing is most effective when it is unpredictable, unavoidable and appears to operate 'everywhere'
- Road policing operations need to be:
 - *Conducted in an intensive and sustained manner (to increase the public's perceived risk of detection)*
 - *As random in nature as possible (to maintain unpredictability)*
 - *Utilise both highly visible operations (to promote general deterrence) and targeted operations (to reduce punishment avoidance)*
 - *Supported by mass media and public education campaigns (to reinforce general deterrence, anywhere, any time, any body)*

Drugs and Driving

“Between 8 and 33% of fatally injured drivers have consumed a psychoactive drug, many in combination with alcohol.”



WHO Drug & Driving Policy Brief, 2016

Definition and Types of Drugs

- A drug = psychoactive drug ☐ substance that affects mental processes (consciousness, mood or thinking).
- Three types of psychoactive drugs relevant to road traffic injury risk.

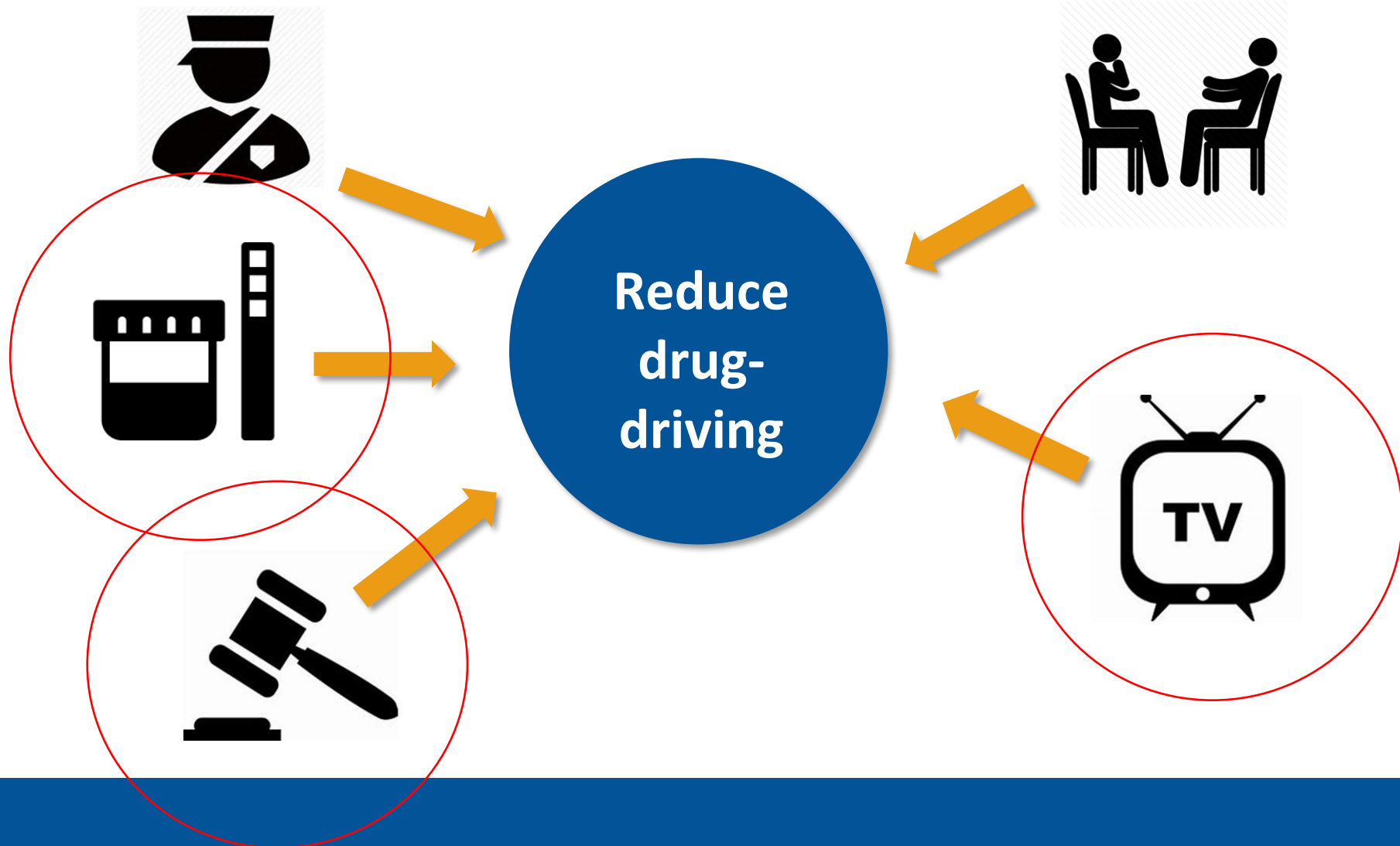


Psychoactive Drugs and Road Traffic Injury (RTI) Risk

- Affect the **functioning of the brain** and may lead to impaired driving by:
 - delaying reaction time and information processing;
 - reducing perceptual-motor coordination and motor performance; and
 - reducing attention, road tracking and vehicle control.
- The risk of getting involved in a road traffic crash varies **depending on the psychoactive drug** used.
 - The risk of a fatal crash occurring among those who have used amphetamines is about five times higher than those persons who have not used them.

Drugs are often used in combination with alcohol

Effective Interventions to Reduce Drug-Driving



Drug Laws



Three types of legal frameworks exist in countries:

1. The first are **zero tolerance laws** that make it unlawful to drive with any amount of specified drugs in the body.
1. The second are **impairment laws** that make it unlawful to drive when the ability to drive has become impaired following drug use, often described as being “under the influence”.
1. The third are **per se laws** that make it unlawful to drive with amounts of specified drugs that exceed the maximum set concentration.

Testing

- Sources:
 - saliva
 - urine
 - blood
- Sites
 - Roadside
 - Hospital ER
- Reason
 - Enforcement
 - Monitoring prevalence



Thank You!

