SUMMARY OF THE REPORT ALCOHOL AND SOCIETY 2024

Alcohol and the Brain

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Excecutive summary

- Ethanol, the active ingredient in alcoholic beverages, has widespread negative impacts on the human brain. Ethanol affects most structures within the brain, causes many types of short- and long-term brain impairments, and leads to a variety of neurological and non-neurological problems across all age groups.
- Alcohol (as ethanol) easily crosses the blood-brain barrier, reaching all structures in the brain. Alcohol is poisonous to brain cells.
- From youth through to old age, alcohol use can cause:
  (i) acute or immediate impairment due to the presence of alcohol in the bloodstream which influences a range of behavioural/performance skills and increases risk of injury, e.g. road crashes, violence, falls;
  (ii) longer-term cognitive deficits that emerge as cumulative effects presenting as decision-making difficulty among younger people, learning disabilities and poor educational performance, and forgetfulness or dementia among older drinkers;
  (iii) emergence of alcohol dependence where increasing regularity and quantity of use sets in place processes that may progress towards difficulty controlling intake despite negative social or other consequences.
- Fetal alcohol exposure can cause permanent structural and functional brain changes and result in life-long learning, behavioural and health problems for the child. No safe level of alcohol use during pregnancy has been identified.
- Significant brain development continues throughout adolescence and young adulthood with key brain regions highly susceptible to adverse effects of alcohol, particularly "binge drinking" (drinking to the point of intoxication, with high blood alcohol concentrations [BACs]). High BACs increase impulsivity and the risk of injuries in violence; in the case of traumatic brain injury the damage is permanent and the effects lifelong. Binge drinking among adolescents is also a major risk factor for dementia later in life.
- Heavy drinking is an important risk factor for depression and suicide.
- For the ageing brain, alcohol use – particularly that above low levels – is a key risk factor for three neurological or neurologically-mediated conditions that are often lethal or otherwise disabling: dementia, stroke and falls. The more one drinks in life, the less brain matter exists later in life. Alcohol consumption can cause high blood pressure, which is the major risk factor for stroke. Alcohol can act independently or interact with a variety of medications that can lead to increased drowsiness, gait instability, and fall risk.
- Many of these conditions can be improved by reducing or stopping drinking. While some of the alcohol-related harms are irreversible e.g. FASD and some of the traumatic brain injuries it is important to recognize that much of the brain harms are reversible (e.g. alcohol dependence).
- Reducing alcohol consumption (both total consumption as well as binge drinking) is arguably the most important modifiable way to promote cognitive and neurological health and prevent or reduce brain harms.
- This can be achieved through effective alcohol control policies (e.g. policies to raise the price and reduce the availability of alcohol), health care screening and treatment resources including medications to treat alcohol dependence, and individual-level information and behaviour change informed by drinking guidelines.

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