

**INQUIRY INTO THE ROAD TRANSPORT AMENDMENT
(MEDICINAL CANNABIS-EXEMPTIONS FROM OFFENCES) BILL 2021.**

HEARING: Thursday 16th June 2022

RESPONSES TO SUPPLEMENTARY QUESTIONS

1. Can you provide a table comparing the THC content of a recreational dose of cannabis vs. an average medicinal dose of cannabis?

Most patients consume 'prescription THC' via oral ingestion (e.g., in oils, capsules and/or sprays) [1]. An observational study of N = 620 Australian patients prescribed oral THC products between JAN 2020 and JAN 2021 found that **individuals aged <65 years used an average of 14.9 mg THC per day while those aged ≥65 years used an average of 11.3 mg THC per day** to treat a wide range of conditions (e.g., chronic cancer and non-cancer pain, insomnia) [2]. (The dose 'range' (or spread) was not reported). We are not aware of any other published studies quantifying the 'average medicinal dose' of THC (in Australia or elsewhere). However, recent consensus-based recommendations on how to administer medicinal cannabis do indicate that **doses >40 mg THC per day are rarely required** [3].

Most recreational cannabis users consume THC via inhalation (e.g., smoking or vapourisation). This is significant as it makes 'dose' more difficult to quantify – or that 'smoking topography' (e.g., intake volume, duration, and flow) can influence the amount of THC consumed. Indeed, studies that standardise topography (i.e., instruct participants to inhale their assigned treatment in a controlled manner) tend to report moderate intoxication (e.g., 'stoned' ratings of ~70–80 out of 100) at doses of ~15 mg [4, 5]. Whereas those that do not sometimes find that participants can 'tolerate', and will voluntarily 'consume', much higher doses (e.g., >50 mg THC) [6, 7]. In addition, we note that the amount of THC an individual consumes will likely depend on their sensitivity to its effects (with regular users demonstrating greater tolerance than non-regular users [8]).

2. Can you clarify the difference between the 40% increase in driving crash risk for individuals intoxicated from a recreational dose of THC and an individual on a medicinal dose of THC?

As noted above ('Point 1'), there is no 'standard' medicinal or recreational dose of THC. Studies investigating the relationship between 'dose' and 'crash risk' are also lacking.

The most recent and authoritative meta-analyses in the field suggest that cannabis-positive drivers (*in general*) are between ~1.1–1.4 times more likely to become crash-involved than other drivers [9].

The relative likelihood of a medicinal cannabis user becoming crash-involved is unknown (has not been investigated). However, patients typically use oral rather than inhaled THC and seek symptom relief rather than intoxication. They also tend to use cannabis on a daily

basis which is likely to produce tolerance to its impairing effects. The alleviation of clinical symptoms that are themselves, impairing (e.g., pain) may even aid driving in patients.

3. Can you provide a table comparing the driving crash risk for individuals on a recreational dose of THC, a medicinal dose of THC and other common drugs or activities that increase road crash risks, i.e., the increased crash risk of driving a motorcycle?

As noted above (Points 1 and 2), there is no ‘standard’ medicinal or recreational dose of THC and the likelihood of a medicinal cannabis user becoming crash-involved is unknown.

The following table was duplicated from Arkell *et al.* [9]:

Table 1. Crash risk and crash culpability estimates for different drug classes		
Drug class	Crash risk estimate	Crash culpability estimate
Alcohol (BAC = 0.02)	1.03–1.19 ^{18,46}	1.36 ¹⁸
Alcohol (BAC = 0.05)	1.38–1.75 ^{18,46}	2.19 ¹⁸
Alcohol (BAC = 0.08)	2.69–2.92 ^{18,46}	3.63 ¹⁸
Cannabis	1.11–1.42 ^{15,16,47–49}	1.20–1.42 ^{15,16,47}
Antidepressants	1.35–1.40 ^{48,50}	N/A
Antihistamines	1.12 ⁴⁸	N/A
Benzodiazepines and Z-hypnotics	1.17–2.30 ^{48,51}	1.41 ⁵¹
Opiates	1.68–2.29 ^{48,52}	1.47 ⁵²
<i>BAC, blood alcohol concentration; N/A, not available</i>		

Reference List:

1. MacPhail, S.L., M.A. Bedoya-Pérez, R. Cohen, V. Kotsirilos, I.S. McGregor, and E.A. Cairns, *Medicinal Cannabis Prescribing in Australia: An Analysis of Trends Over the First Five Years*. Frontiers in pharmacology, 2022. **13**.
2. Kalaba, M., A. Vickery, T. Ernenwein, P. Washer, and M. Feldner, *Real-world evidence describing Australian medicinal cannabis patients*, in *The 29th Annual International Cannabinoid Research Society's Symposium on the Cannabinoids*. 2021.
3. Bhaskar, A., A. Bell, M. Boivin, W. Briques, M. Brown, H. Clarke, et al., *Consensus recommendations on dosing and administration of medical cannabis to treat chronic pain: results of a modified Delphi process*. Journal of Cannabis Research, 2021. **3**(1): p. 22.
4. Arkell, T.R., F. Vinckenbosch, R.C. Kevin, E.L. Theunissen, I.S. McGregor, and J.G. Ramaekers, *Effect of Cannabidiol and Δ 9-Tetrahydrocannabinol on Driving Performance: A Randomized Clinical Trial*. JAMA, 2020. **324**(21): p. 2177-2186.
5. Arkell, T.R., N. Lintzeris, R.C. Kevin, J.G. Ramaekers, R. Vandrey, C. Irwin, et al., *Cannabidiol (CBD) content in vaporized cannabis does not prevent tetrahydrocannabinol (THC)-induced impairment of driving and cognition*. Psychopharmacology (Berl), 2019. **236**(9): p. 2713-2724.
6. Brands, B., R.E. Mann, C.M. Wickens, B. Sproule, G. Stoduto, G.S. Sayer, et al., *Acute and residual effects of smoked cannabis: Impact on driving speed and lateral control, heart rate, and self-reported drug effects*. Drug Alcohol Depend, 2019. **205**: p. 107641.
7. Marcotte, T.D., A. Umlauf, D.J. Grelotti, E.G. Sones, P.M. Sobolesky, B.E. Smith, et al., *Driving Performance and Cannabis Users' Perception of Safety: A Randomized Clinical Trial*. JAMA Psychiatry, 2022. **79**(3): p. 201-209.
8. McCartney, D., T.R. Arkell, C. Irwin, and I.S. McGregor, *Determining the magnitude and duration of acute Δ 9-tetrahydrocannabinol (Δ 9-THC)-induced driving and cognitive impairment: A systematic and meta-analytic review*. Neuroscience & Biobehavioral Reviews, 2021. **126**: p. 175-193.
9. Arkell, T.R., D. McCartney, and I.S. McGregor, *Medical cannabis and driving*. Vol. 50. 2021: Royal Australian College of General Practitioners. 357–362.