

without an established means of comparing different modes of administration.

IS 5 MG THE RIGHT LEVEL FOR STANDARD THC UNITS?

Freeman & Lorenzetti pose the question of whether 5 mg is the appropriate threshold for a standard THC unit. As the authors note, there are regulatory precedents in several US states for using 5 mg of THC as a standard 'serving size' for cannabis edibles, while other states and Canada use 10 mg of THC as a standard unit for serving size and packaging regulations. There is a compelling argument for a standard THC unit to be at, or below, the point of intoxication for most consumers [2]. For example, the amount of alcohol in a 'standard drink' is below the level that would induce intoxication or impairment for most consumers. A standard of 5 mg rather than 10 mg THC is more consistent with this principle and allows consumers to 'titrate' up to their desired level of consumption.

Overall, Freeman & Lorenzetti's proposal for a standard THC unit has considerable merit and represents an opportunity to harmonize the ways in which cannabis potency is reported across the increasing number of jurisdictions with legal cannabis markets

Declaration of interests

None.

Keywords Cannabis, health policy, marijuana, substance use, tetrahydrocannabinol, THC.

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MOVING FORWARDS WITH THE STANDARD THC UNIT

There is international support for a standard tetrahydrocannabinol (THC) unit, which could improve the precision with which we understand, regulate and communicate dose-related risks and benefits to consumers. Implementing the standard THC unit in legal recreational cannabis markets would represent an important step forward.

We appreciate the commentaries [1–4] which support our proposal for a standard THC unit [5] and raise insightful points for progressing with this initiative.

Chester *et al.* [1] outline the importance of experimental cannabinoid studies for informing the standard tetrahydrocannabinol (THC) unit. Our proposal for a 5-mg THC unit was informed by experimental studies showing that this low dose produces intoxication in infrequent users with minimal risk of adverse acute effects [5]. Moving forward, experimental cannabinoid studies can quantify dose-response effects of THC unit consumption on acute harms and benefits, such as driving performance [6]. Experimental studies should include a wide range of THC unit doses to capture real-world consumption and contrasting directions of effect at low and high doses [2].

Volkow & Weiss [3] and the NIDA Cannabis Policy Research Workgroup [7] highlight the value of a standard THC unit for advancing the understanding of the long-term effects of cannabis use. Large-scale longitudinal cohort studies (e.g. the Adolescent Brain Cognitive Development study) are now enhancing time-line follow-back methods using pictorial assessment of cannabis type and quantity [8]. Where available, legal cannabis products with known standard THC unit content could increase precision when estimating the long-term effects of cannabis use on brain, cognitive and mental health outcomes throughout the life-span.

Filbey [2] and Volkow & Weiss [3] suggest that standard units of dose could also be applied to medicinal use of cannabis and cannabinoids. We agree that this could be helpful for informing patients and clinicians if supported by robust scientific evidence. As the safety and efficacy of

cannabinoids for medicinal purposes differ from effects during recreational use, care would be needed when communicating relative risks and benefits among different populations.

As a priority, standard THC units should be implemented in legal recreational cannabis markets, such as those in Canada, Uruguay and some US states. As pointed out by Hammond [4], a standard THC unit would represent a considerable improvement to the status quo, despite differences in the time–course and effect profile of certain products [1]. Current dosing information for oral (mg THC) and inhaled (% THC) products are poorly understood by consumers [9] and are difficult to compare with each other. Listing the number of doses per package substantially improves consumer understanding [9] and fulfils the need for clearer dosing information [10].

In conclusion, a standard THC unit is necessary to advance and harmonize scientific research, product regulation and consumer understanding of cannabis use and its consequences. Implementing standard THC units in legal recreational cannabis markets would represent an important step towards this goal.

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Author contributions

Tom Freeman: Conceptualization-lead; writing-original draft-lead; writing-review & editing-equal. **Valentina Lorenzetti:** Conceptualization-supporting; writing-review & editing-equal.

Keywords Cannabis, dose harm, lower risk use, reduction, standard unit, measurement.

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