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The iCannToolkit: a tool to embrace measurement of medicinal and non-medicinal cannabis use across licit, illicit and cross-cultural settings

The iCannToolkit is a first important step to systematically gather evidence regarding the health effects of contemporary medical and non-medical cannabis use—over time, among licit and illicit settings, cultures and age groups—in order to inform policy development and to raise awareness concerning cannabis use-related risks and benefits.

We welcome the commentaries [1–3] which endorse our proposal to standardize the assessment of cannabis use and make important considerations for the universal use of the iCannToolkit throughout research, treatment and public health settings.

Volkow & Weiss [1] highlight that the use of the toolkit has important implications for the standardized measurement of exposure to medicinal cannabis, the use of which is increasing internationally. The iCannToolkit is intended to be applicable to measuring non-medical and medical cannabis use in regulated and illicit markets. The items from the first layer will need to be validated (and, if necessary, adapted) to reliably cover medical and non-medical use throughout nations and jurisdictions. The second and third layers enable the characterization of different modes of use and biologically confirmed cannabinoid exposure. We believe that the iCannToolkit can be a useful tool for gathering data to profile and compare the risks and benefits of exposure to medical and non-medical cannabis. This can help us to understand how the legalization of medical and non-medical use affects retail products that are developed and consumed, their health impacts on users and impacts upon the criminal justice system.

Jesseman [2] suggests that the iCannToolkit is a first step to gathering systematic evidence to inform a public health approach to cannabis regulation, and creates a foundation for research collaboration,

data-sharing and coordination. As illustrated by the two Canadian epidemiological surveys, measurements of cannabis are often incomparable due to inconsistent items on cannabis exposure. Integrating items of the iCannToolkit into current and new surveys can help to map changes in the risks and benefits of diverse modes of cannabis use. International collaborations using harmonized tools will enable the evaluation of natural experiments resulting from diverging policy approaches and help to understand the health consequences of legal cannabis retail and rapid changes in its legal status internationally. Such quality evidence is needed to inform decisions by jurisdictions about which policies to adopt if they make changes to the legal status of cannabis.

Kuhns & Kroon [3] outline important regional and cross-cultural differences in many features of cannabis use: potency, legislation, cultural costumes, mode of use, cannabinoid content, tobacco use and different labels for the same product and inter-individual differences in bioavailability. These were acknowledged by Volkow & Weiss and in our previous work [4, 5]. We agree that there are important cross-cultural variations in use. We also agree that international validation of enhanced time-line follow-back methods are needed to ensure comparability of data collected in different world regions in which cannabis potency, products and use patterns may differ.

Cannabis products and use practices have also changed substantially over time. This means that evidence from older cohorts may be less relevant in assessing the health effects of contemporary cannabis use. It also means that there will be a need to periodically adapt and update tools such as the iCannToolkit over time, in different world regions and to school students and adolescents. Harnessing the iCannToolkit to assess the 5-mg standard Δ^9 -tetrahydrocannabinol (THC) unit (recommended by Freeman &

Lorenzetti [5] and the National Institute on Drug Abuse (NIDA) [6] may enable us to measure the typical quantity of cannabis exposure across world regions, time and age groups. Research within the iCannToolkit framework can also help to determine whether and how to weight the standard THC unit among types of cannabis products and/or routes of administration.

In conclusion, the iCannToolkit offers an important first step towards harmonization of data based on expert consensus. In order to maximize its value, further work will be needed to implement and validate this framework in different international contexts and over time, as new cannabis products emerge and use practices change. Support from funders and other organizations (e.g. scientific societies, academia) will play a key role in progressing the consensus. The iCannToolkit could prove particularly useful in tracking rapid changes in cannabis products, policies and/or regulation and markets (e.g. Canada, United States, Germany, Swiss pilot study) and changes in health risks and benefits. The ultimate goal should be to help cannabis users to make informed decisions about their cannabis use, inform policy development and identify patterns of use that pose a risk to users.

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DECLARATION OF INTERESTS

A.G. received funding from Novartis for work outside this area (a phase III cocaine trial). A.E. has received speaker a honorarium from GW Pharmaceuticals. A.W. is the founder of the Global Drug Survey. C.H. became a full-time employee of GW Pharmaceuticals after the consensus meeting. D.H. has served as a paid expert witness on behalf of public health authorities in Canada in response to legal challenges from the cannabis industry. H.L. has received honoraria and travel grants from Janssen and Lundbeck. J.B. has received unrestricted research funding to study smoking cessation from companies who manufacture smoking cessation medications (Pfizer and J&J). R.V. receives consulting fees for Canopy Health Innovations and Syqe Medical Ltd, and is on the Scientific Advisory Board for MyMD Pharmaceuticals and Artiam Bio Inc. V.C. has consulted for Janssen. V.L., W.H., T.P.F., E.W., T.G., W.L., A.C.C., J.P.C., R.L.P., M.v.L., K.P., P.G., M.A.E., S.H.G., J.M. and C.M. have no competing interests to declare.

AUTHOR CONTRIBUTIONS

Valentina Lorenzetti: Conceptualization; first draft, completion of final draft for submission. **Chandni Hindocha:** revisions of manuscript. **Kat Petrilli:** revisions of manuscript. **Paul Griffiths:** revisions of manuscript. **Jamie Brown:** revisions of manuscript. **Álvaro Castillo-Carniglia:** revisions of manuscript. **Jonathan Caulkins:** revisions of manuscript. **Amir Englund:** revisions of manuscript. **Mahamoud El Sohly:** revisions of manuscript. **Suzanne Gage:** revisions of manuscript. **Teodora Groshkova:** revisions of manuscript. **Antoni Gual:** revisions of manuscript. **David Hammond:** revisions of manuscript. **Will Lawn:** revisions of manuscript. **Hugo López-Pelayo:** revisions of manuscript. **Jakob Manthey:** revisions of manuscript. **Claire Mokrysz:** revisions of manuscript. **Rosalie Liccardo Pacula:** revisions of manuscript. **Margriet van Laar:** revisions of manuscript. **Ryan Vandrey:** revisions of manuscript. **Elle Wadsworth:** revisions of manuscript. **Adam Winstock:** revisions of manuscript. **Wayne Hall:** revisions of manuscript. **H. Valerie Curran:** revisions of manuscript. **Tom Freeman:** Conceptualisation; revision of first and later drafts.

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