MIND MEDICINE AUSTRALIA

Psilocybin

By Drug Science and Mind Medicine Australia

Part 1 - History and Law

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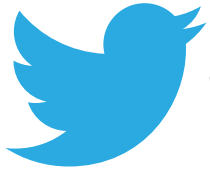
Drug Science was formed by a committee of scientists with a passionate belief that the pursuit of knowledge should remain free of all political and commercial interest.

Founded in 2010 by Professor David Nutt, following his removal from his post as Chair of the Advisory Council on the Misuse of Drugs, Drug Science is the only completely independent, science-led drugs charity, uniquely bringing together leading drugs experts from a wide range of specialisms to carry out ground-breaking research into drug harms and effects.

The Drug Science mission is to provide an evidence base free from political or commercial influence, creating the foundation for sensible and effective drug laws. Equipping the public, media and policy makers with the knowledge and resources to enact positive change.

Drug Science want to see a world where drug control is rational and evidence-based; where drug use is better informed and drug users are understood; where drugs are used to heal not harm



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Mind Medicine Australia is seeking to establish safe and effective psychedelic-assisted treatments for mental illness in Australia. As a registered charity (DGR-1 status), Mind Medicine Australia are supporting clinical research and working towards regulatory-approved and evidence-based psychedelic-assisted therapies. Mind medicine Australia operate as a nexus between medical practitioners, academia, government, regulatory bodies, philanthropists, and other partners.

Mind Medicine Australia is focused specifically on the clinical application of medicinal psilocybin and medicinal MDMA for certain mental illnesses. They do not advocate for recreational use of psychedelics, MDMA, or any other prohibited substances, nor do they advocate for any changes to the law with respect to recreational use. Their focus is wholly clinical.

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What is Psilocybin?

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Psilocybin is an indole alkaloid, chemically similar to the neurotransmitter **serotonin** (5-HT)

Psilocybin occurs naturally in up to 100 species of mushrooms belonging to the genus Psilocybe.

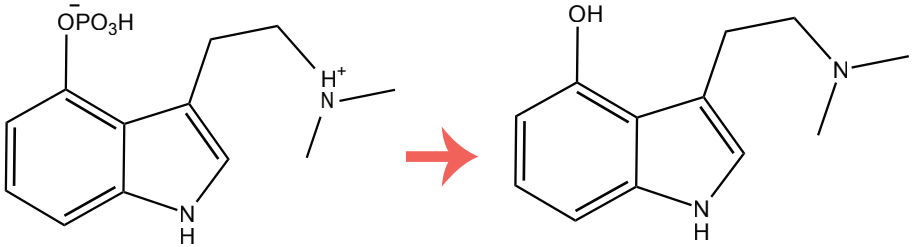
Psilocybe mushrooms occur widely in natural habitats, but some species are also amenable to cultivation

Psilocybin can also be synthesised chemically, or via biochemical synthesis, both in vivo and in vitro

Psilocybin is easily converted both chemically and biochemically to the simpler compound, psilocin.

Pharmacologically, psilocybin is a prodrug of psilocin

Psilocin acts to stimulate (is an agonist of) the **5-HT2A** receptor



Psilocybin

Psilocin

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Psilocybin History

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The psychotropic effects of Psilocybe mushrooms were largely unknown in the West until the 1950s, despite evidence that they had a long history of indigenous use in Central and South America, and possibly other parts of the world.

Psilocybe mexicana mushrooms were introduced to the West by investment banker and amateur mycologist, **R. Gordon Wasson**, in 1957.

A sample of Psilocybe mexicana was provided by Wasson to **Dr Albert Hofmann** (creator of LSD) at Sandoz Laboratories in 1958. Hofmann extracted, purified, identified and characterised the principal psychoactive chemical constituents, psilocin (the active drug) and psilocybin (its prodrug).

Hofmann developed a procedure for the chemical synthesis of psilocybin.

The psychoactive effects were noted by Hofmann to be similar to those of LSD; he and his colleagues surmised that psilocybin could be useful as an adjunct to psychotherapy in certain applications.

Consequently, Sandoz produced and commercialised the compound as "**Indocybin**".

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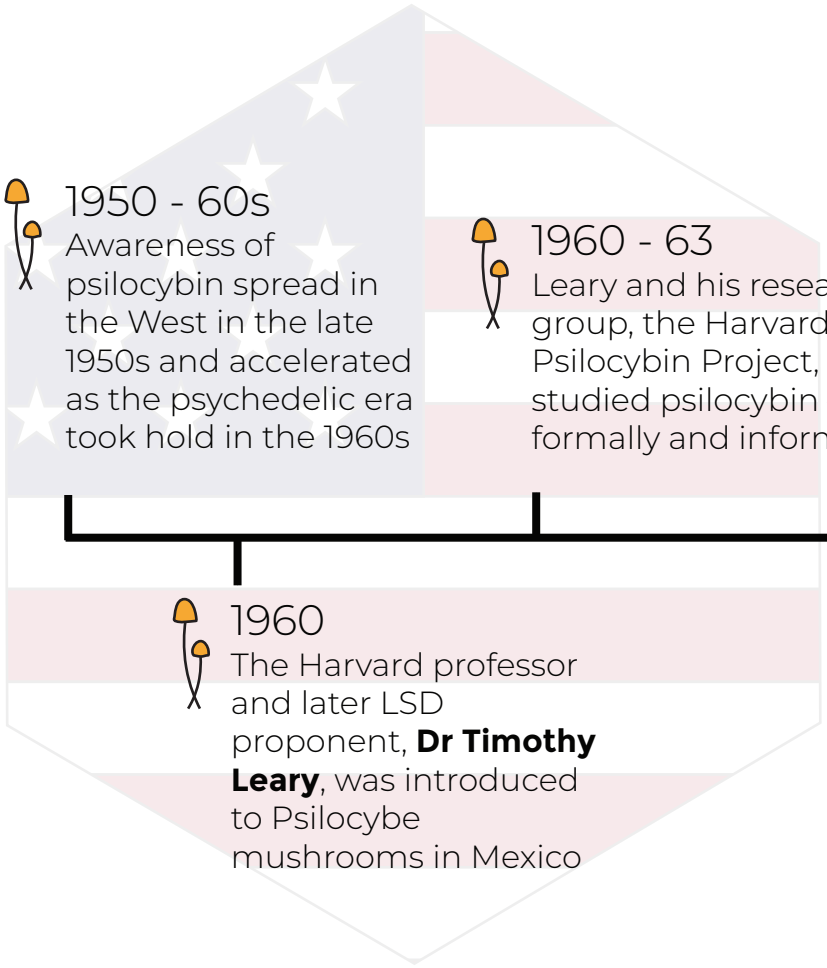
History of Psilocybin Use in the USA



1950 - 60s
Awareness of psilocybin spread in the West in the late 1950s and accelerated as the psychedelic era took hold in the 1960s

1960 - 63
Leary and his research group, the Harvard Psilocybin Project, studied psilocybin – both formally and informally

1971
Psilocybin, along with many other psychedelic compounds, was scheduled through the **UN Convention on Psychotropic Substances**

1960
The Harvard professor and later LSD proponent, **Dr Timothy Leary**, was introduced to Psilocybe mushrooms in Mexico

Psilocybin saw relatively limited therapeutic use in the USA, as interest in the therapeutic applications of LSD was already established

Use of Psilocybe mushrooms went underground and continued largely recreationally, but possibly also therapeutically, to the present day

History of Psilocybin Use in the UK and Australia

Awareness of psychedelics, including psilocybin, spread from the USA to Canada, the UK, Europe and Australasia during the 1960s.

Despite being illegal, endemic psilocybe mushroom species were ingested in non-clinical contexts across the West.

To this day, mushroom truffles (the subterranean part of a mushroom), are legal in the Netherlands.

Psilocybe semilanceata is endemic in the UK and northern Europe

Psilocybe semilanceata is probably an introduced species in Australasia

Psilocybe subaeruginosa is native to Australasia

Psilocybe cubensis was probably introduced to Australia with the arrival of domestic cattle

Why was Psilocybin Banned?

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Psilocybin was banned globally primarily for political reasons

CLICK HERE TO WATCH DR ROBIN CARHART-HARRIS TALK ABOUT WHY PSYCHEDELICS WERE BANNED

Psilocybin is a “classical psychedelic”, grouped with LSD and other psychedelic compounds in the 1960s and classified globally as a drug of abuse

Psychedelics were associated in the 1960s with the counter-culture movement and were seen by the government and other authorities as representing a destabilising influence, hence a threat to the established cultural norms of the time

Ostensibly, psilocybin and other psychedelics were controlled on the basis of risks to physical and mental health. However, there was minimal evidence at the time to support such assertions, and in fact a significant amount of anecdotal evidence – some of which, such as the “strychnine myth”, persists to this day - was fabricated by authorities and their affiliates in support of prohibition

The majority of clinical research into psychedelics between 1970 and 2000 was directed towards establishing or supporting the “pathological paradigm” of psychedelic and other illicit drug use

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The Intervening Years

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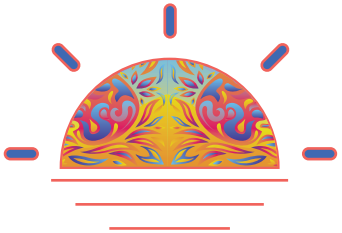
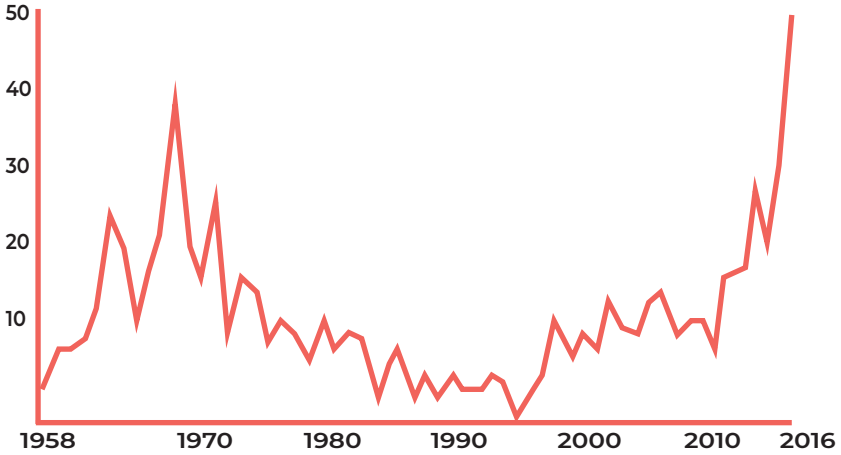


After psychedelics were made illegal in the late early 1970s, research almost stopped

Little or no published human research into psilocybin was conducted between 1970 and 1990. The small number of published papers were primarily review and commentary articles, or reported on animal studies



Number of scientific articles published per year about psilocybin (adapted from Beckley Foundation)

In the 1990s, research began again slowly due to the work of some determined scientists

In 1991, **Dr Rick Strassman** recommenced clinical research into classical psychedelics with his Phase 1 studies of N,N-dimethyltryptamine (DMT) and psilocybin in healthy volunteers

The **Heffter Institute** was established by researchers **David Nichols** PhD, **Charles Grob** MD, **Dennis McKenna** PhD, and colleagues in 1993, to "promote research of the highest scientific quality with classic hallucinogens and related compounds (sometimes called psychedelics)

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The Drug Science Renaissance - Psilocybin

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CLICK HERE TO WATCH A VIDEO ON THE THERAPEUTIC USE OF PSILOCYBIN

1990s

The Heffter Institute began funding human safety studies at Harbor-UCLA and Johns Hopkins University

1996

The first FDA-approved, double-blind, placebo-controlled US Phase I dose-response safety study of MDMA was published by Charles Grob MD, working with **MAPS**

2001

Phase 1 clinical trial of psilocybin in healthy volunteers commenced

2009

Phase 2 randomised-controlled clinical trials of psilocybin-assisted therapy for anxiety and depression in terminal cancer patients commenced

2010s

- First human imaging studies of psilocybin at Imperial College in collaboration with the Beckley Foundation

Phase 2 open-label clinical trials of psilocybin-assisted therapy:

- for treatment-resistant depression at Imperial College London
- for OCD
- for nicotine dependence at Johns Hopkins University
- for alcohol dependence at University of New Mexico
- for anorexia nervosa at Johns Hopkins University

Phase 2 trials, sponsored by **Usona Institute** and **Compass Pathways Ltd**, are underway in the USA and Europe studying psilocybin-assisted therapy for the treatment of depression. These studies are approved by FDA and EMA with Breakthrough Therapy status, potentially resulting in FDA and EMA approval of psilocybin-assisted therapy for clinical implementation in the USA and the European Union

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Social Impact of the War on Drugs

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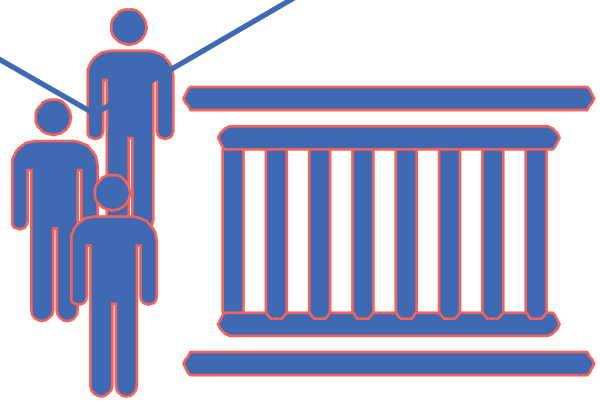
increases in associated **crime**, **social dislocation**, **mental illness** & **comorbidity**

Increased incarceration rates, particularly in USA, UK, Europe and Australia

Diversion of resources to law enforcement and prison-industrial complex

Effects on developing **economies** through economic exploitation & supply reduction efforts

Establishment & sustenance of global **illicit drug trade**, cartels & paramilitary organisations



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Scientific & Healthcare Impact of the War on Drugs

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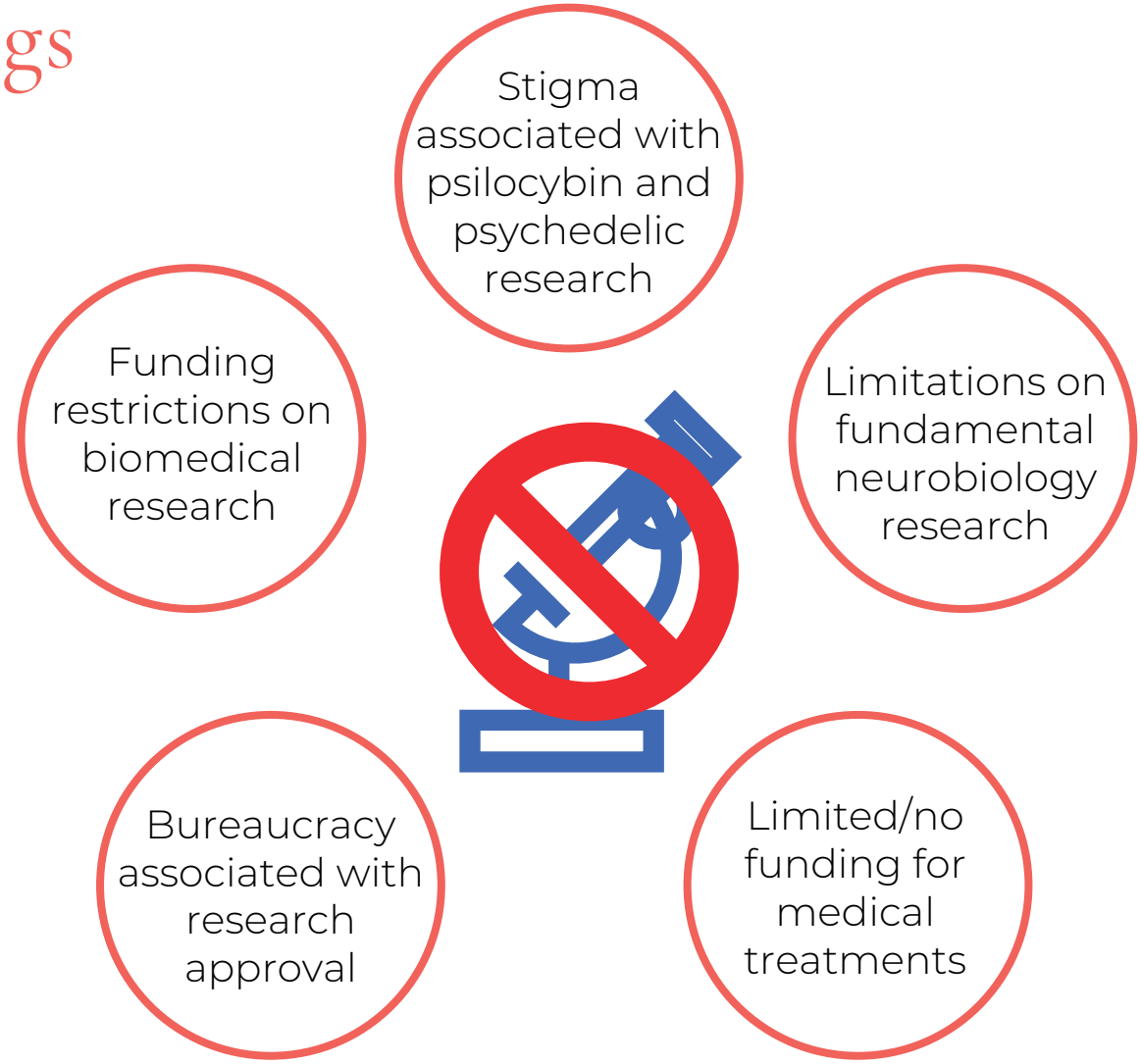

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Current Legal Status of Psilocybin

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UN Convention on Psychotropic Substances (1971)

- Psilocybin is explicitly included in the Convention
- However *Article 32, paragraph 4* allows for States to make a reservation noting an exemption for plants growing wild which contain psychotropic substances from among those in Schedule I and which are traditionally used by certain small, clearly determined groups in magical or religious rites.
- However, the official Commentary on the Convention on Psychotropic Substances makes it clear that psychedelic plants (and indeed any plants) were not included in the original Schedules and are not covered at all by the Convention. This includes ... "beverages" made from psilocybin mushrooms. The purpose of *Article 32, paragraph 4* was to allow States to "make a reservation assuring them the right to permit the continuation of the traditional use in question" in the case that plants were in the future added to Schedule I.
- Currently, no plants or plant products are included in the Schedules of the 1971 Convention.

National schedules

US Schedule 1

UK Schedule 1

Australia Schedule 9

All of these Schedules explicitly specify no medical use, high abuse potential and high risk when used in clinical setting

Research permitted with requisite ethics approvals, with both state and national permits

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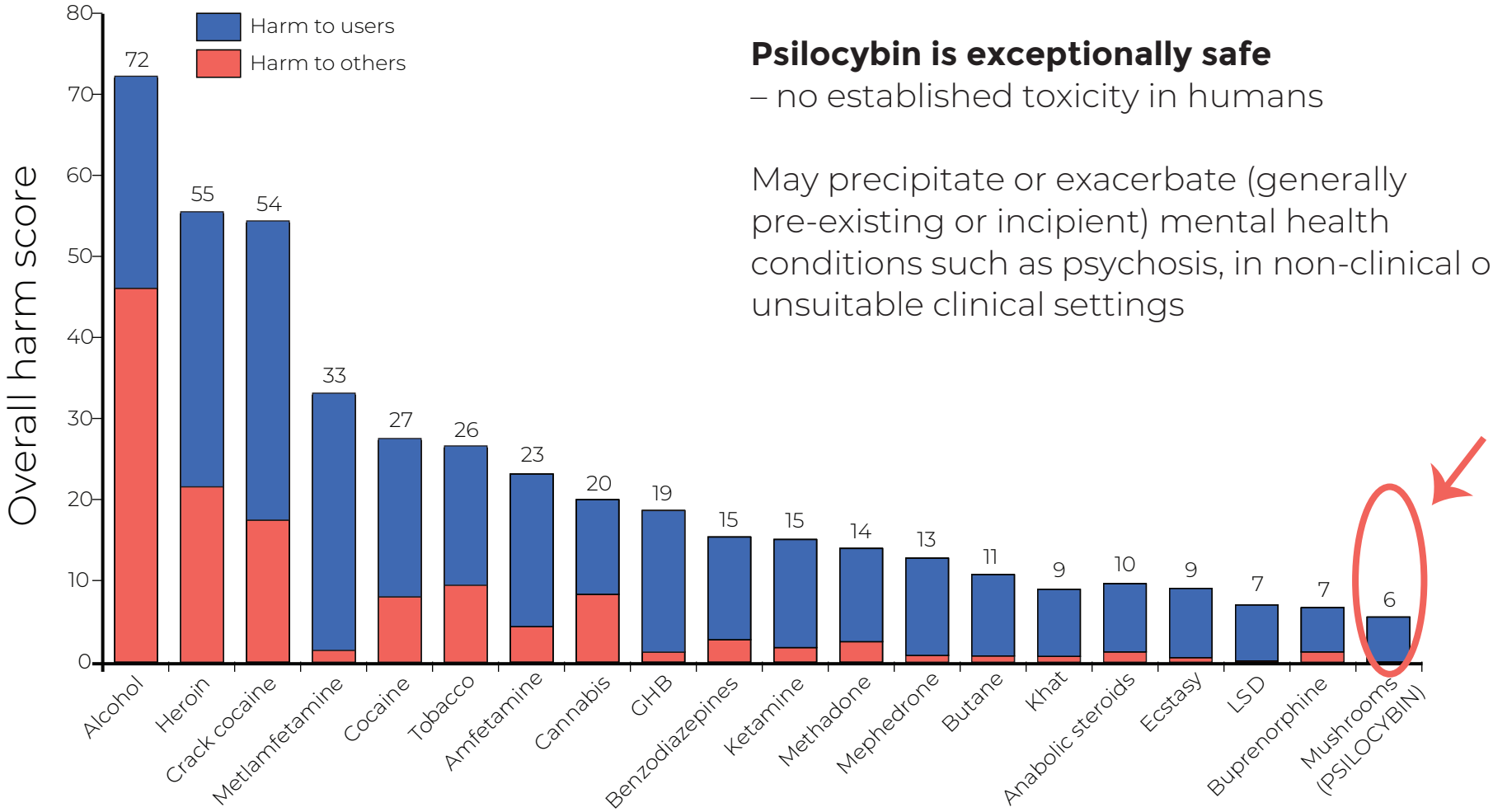
Potential Harms of Psilocybin



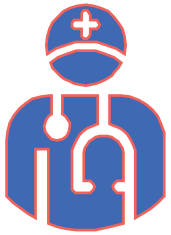
Psilocybin is exceptionally safe
– no established toxicity in humans

May precipitate or exacerbate (generally pre-existing or incipient) mental health conditions such as psychosis, in non-clinical or unsuitable clinical settings

Nutt, D. Lancet 2007; 369: 1047– 53

What does this mean for doctors?

What is preventing doctors from considering psilocybin-assisted therapies?

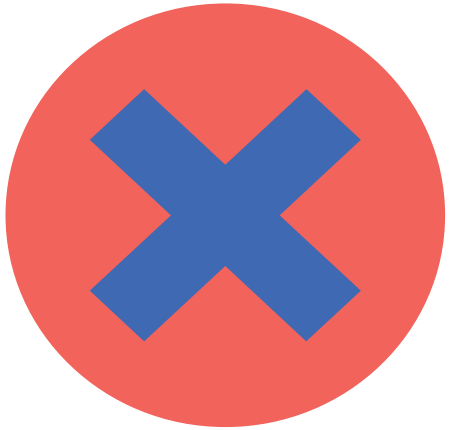


- Lack of evidence base - many doctors do not feel comfortable prescribing something with which they have little or no experience, and which does not have the structured data from randomised controlled trials that is expected today
- Lack of public health system support
- Stigma

Why isn't there a compelling evidence base for psilocybin-assisted therapies?

- Research has been curtailed for over 30 years
- Drug schedules
- Lack of research funding
- Stigma
- Lack of recognition regarding the limitations of other existing therapies

What does this mean for patients?



Limited forms of therapies are currently available for mood disorders with no real breakthroughs in recent decades

Patients are increasingly requesting psilocybin-assisted therapy for depression, anxiety etc. but are unable to receive it

Neither prescribing nor dispensing are allowed at present

Patients are dependent on the black market and underground therapy community - often overseas

The Role of the Medical Student

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As future doctors, **it is important that medical students be aware of the benefits and potential harms of psilocybin**. This will enable future doctors to provide patients with necessary information and help support them in their decisions about their treatment plan.

Medical students will also be in a position to help **make real change to policy** by helping to gather patient data and help provide unbiased information about the benefits and potential harms of psilocybin.

Where can you find out more?

- drugscience.org.uk
- Drug Science psilocybin podcast episode
- Drugs, without the hot air, *David Nutt*
- Drug Science Students Society

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