The Health & Social Effects of Nonmedical Cannabis Use

The State of Knowledge: Knowns & Unknowns

Department of Mental Health & Substance Abuse
WHO HQ Geneva

World Health Organization

What are UN Conventions on Drugs (narcotics, psychotropic substances)?

- The modern era of international drug control is governed by three cornerstone conventions:

1. The Single Convention on Narcotic Drugs, 1961
2. The Convention on Psychotropic Substances, 1971
3. The Convention against Illicit Traffic in Narcotic Drugs and Psychotropic Substances, 1988

- These conventions form the basis of the international control measures designed to ensure psychoactive drugs are not trafficked or diverted to illegal channels, but are available for medical and scientific purposes.

Who are the UN entities working on this issue ?

- Commission on Narcotic Drugs (CND) – a UN organ with 53 Member States and governing body for UNODC.
- UN Office on Drugs and Crime (UNODC) – mandated to assist Member States on issues related to illicit drugs and crime.
- WHO – only treaty body mandated under the conventions to assess medical and scientific properties of psychoactive substances and make recommendations on whether they should be placed under international control or not.
- International Narcotics Control Board (INCB) – the quasi-judicial monitoring body for the international drug control conventions.
- Others (e.g. UNAIDS, UNDP)

Background to UNGASS on WDP

1998 — Political Declaration "Guiding Principles of Drug Demand Reduction and Measures to Enhance International Cooperation to Counter the World Drug Problem

2009 — Political Declaration and Plan of Action on International Cooperation towards an Integrated and Balanced Strategy to Counter the World Drug Problem with target date set at 2019

2012 — The UN General Assembly decided to convene in early 2016 a special session on the world drug problem to review the progress and challenges.

2014 — High Level Review of implementation by Member States of the Political Declaration and Plan of Action

2016 — UN General Assembly Special Session on the World Drug Problem, 19-21 April 2016

2019 — UN General Assembly Special Session on the World Drug Problem 2019

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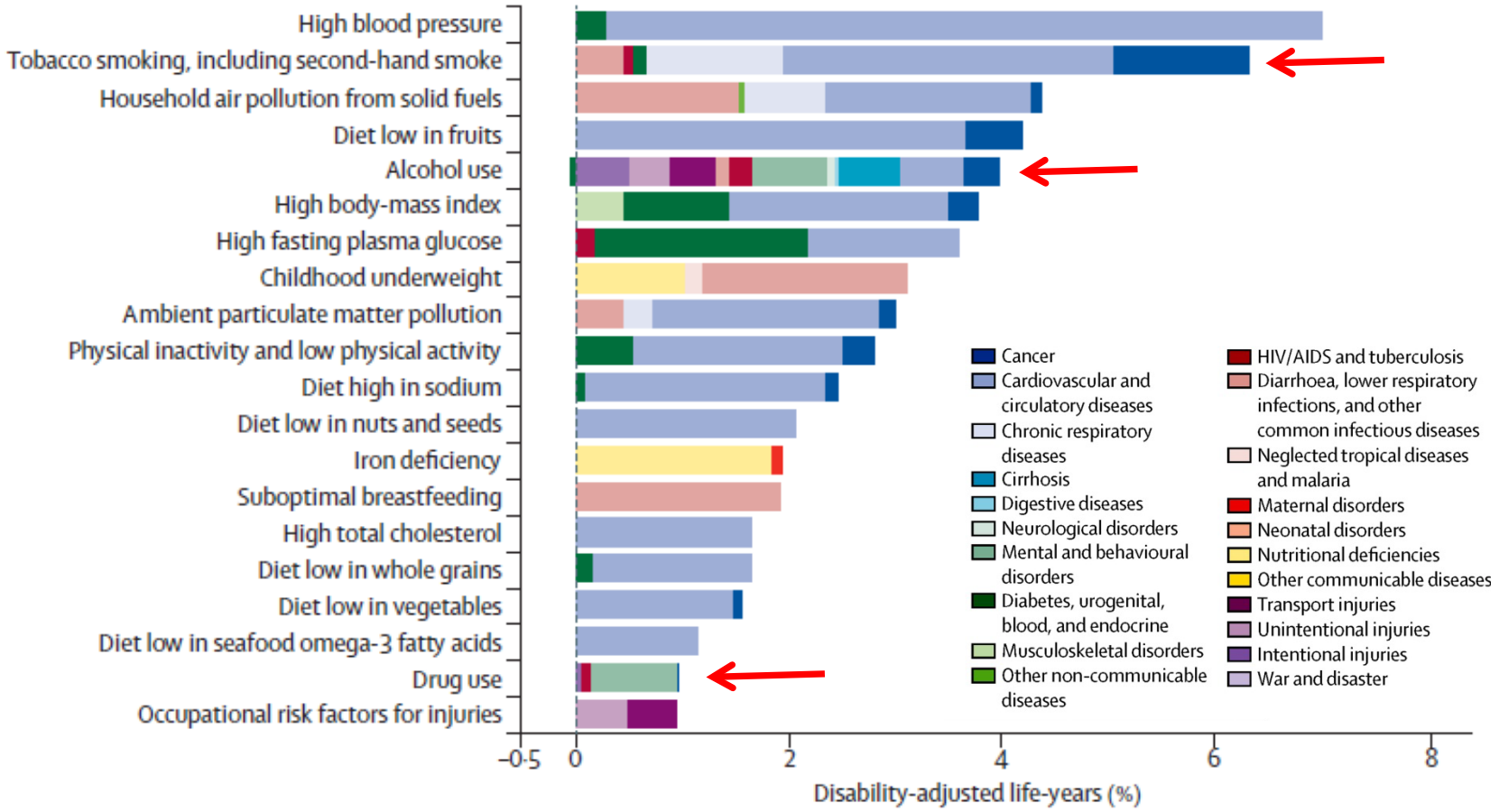
Psychoactive substance use in the world

- Alcohol: ~1.9 billion people aged 15+ (consumed alcoholic beverages in the last 12 months (~35% of the world population aged 15-64) (estimates for 2012; WHO, 2014)
  - 7.2% of men and 1.3% of women aged 15+ - with alcohol use disorders
- Tobacco: ~ 1.1 billion people are current tobacco smokers (estimates for 2012, WHO, 2014)
- Illicit drugs: ~ 246 million people (~5% of the world population aged 15-64), had used an illicit drug at least once in the previous year (estimates for 2013, UNODC, 2015)
  - "Problematic drug use" (drug use disorders) ~ 27 million (0.5% of the world population from 16 million to 39 million people.

Disease burden attributable to different risk factors in 2010 (Lim et al, *Lancet*, 2012; 380: 2224-60)



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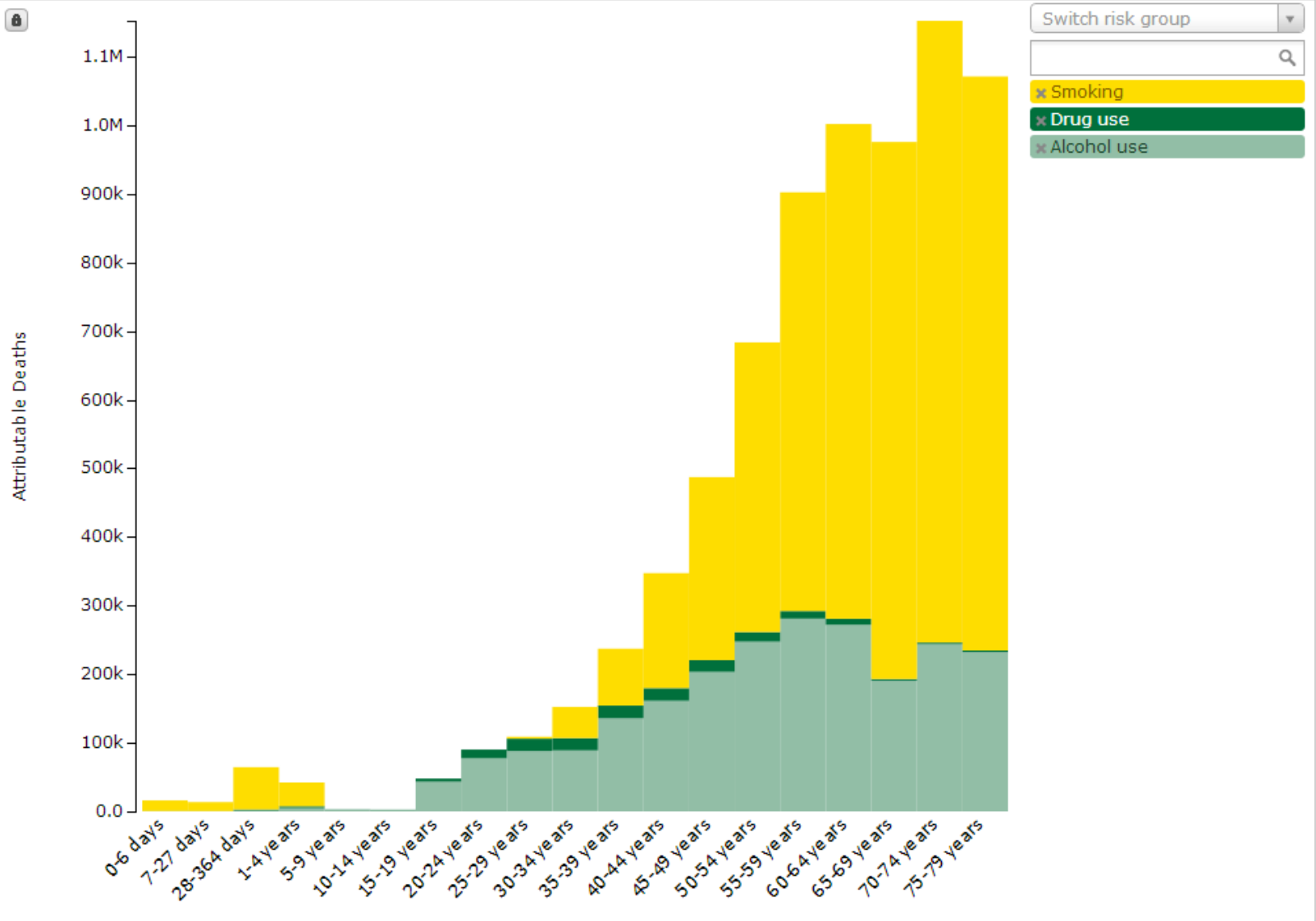
IHME | GHDx

GBD Cause Patterns

Share

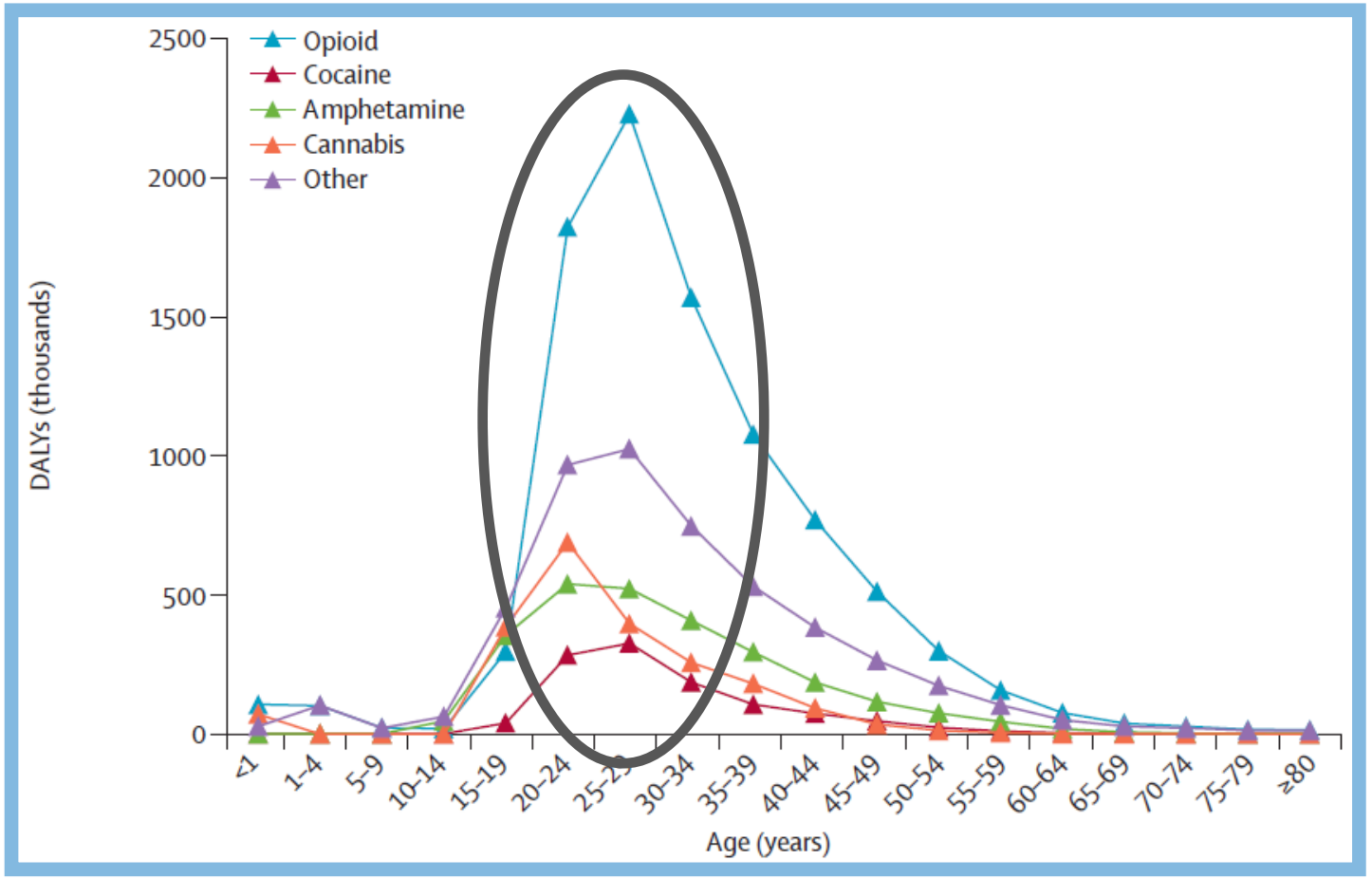
Causes | Risks | Both | Male | Female | # | Rate | % | Deaths | Global | 2010

Total (All Causes)



Age | Location | Year | Sex | Sort By: Default | Size

Disease burden attributable to drug use disorders by age
(Degenhardt et al, 2013)



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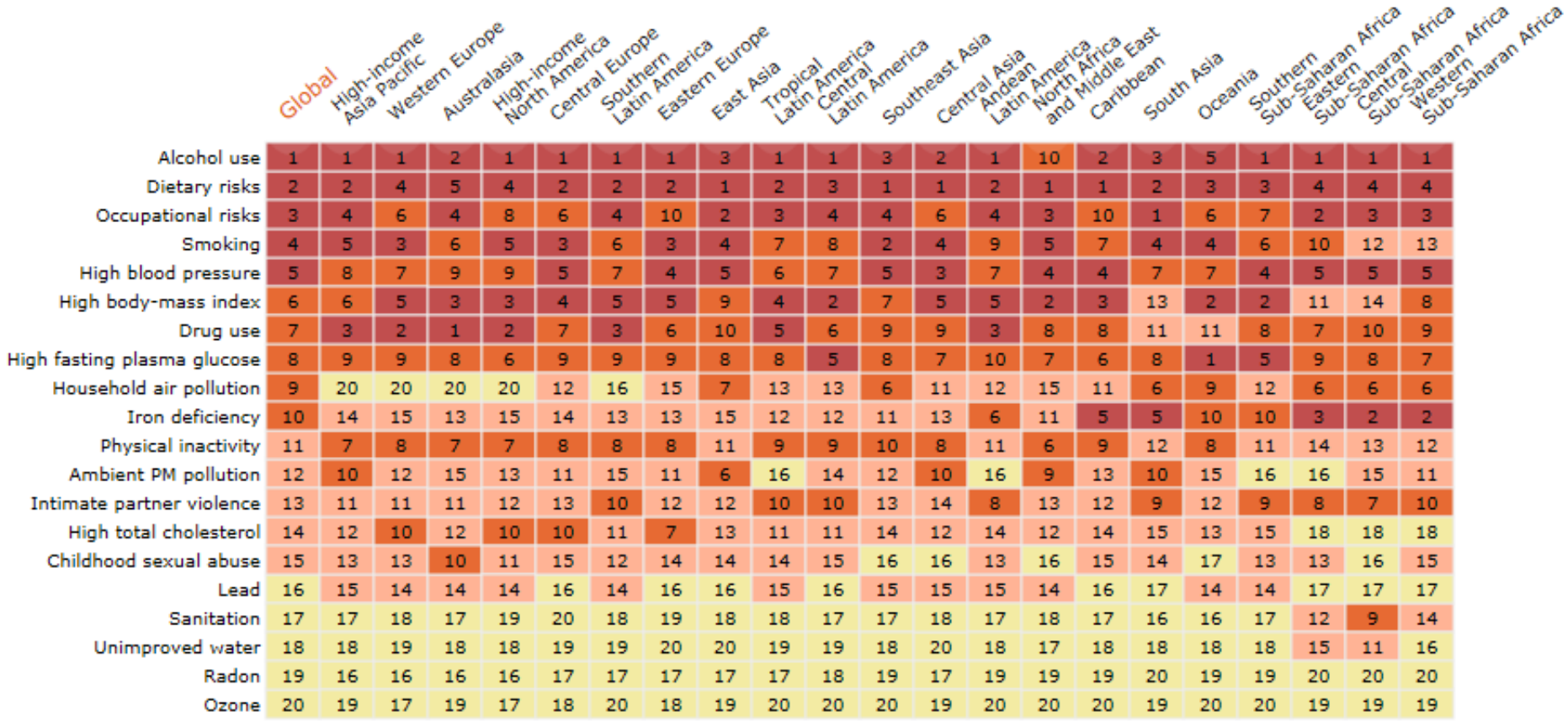
Global burden of disease attributable to risk factors for the age group 15 to 49 years old (Source: IHME, 2015)



	Global	High-income Asia Pacific	Western Europe	Australasia	High-income North America	Central Europe	Southern Latin America	Eastern Europe	East Asia	Tropical Latin America	Central Latin America	Southeast Asia	Central Asia	Andean Latin America	North Africa and Middle East	Caribbean	South Asia	Oceania	Southern Sub-Saharan Africa	Eastern Sub-Saharan Africa	Central Sub-Saharan Africa	Western Sub-Saharan Africa
Alcohol use	1	1	1	2	1	1	1	1	3	1	1	3	2	1	10	2	3	5	1	1	1	1
Dietary risks	2	2	4	5	4	2	2	2	1	2	3	1	1	2	1	1	2	3	3	4	4	4
Occupational risks	3	4	6	4	8	6	4	10	2	3	4	4	6	4	3	10	1	6	7	2	3	3
Smoking	4	5	3	6	5	3	6	3	4	7	8	2	4	9	5	7	4	4	6	10	12	13
High blood pressure	5	8	7	9	9	5	7	4	5	6	7	5	3	7	4	4	7	7	4	5	5	5
High body-mass index	6	6	5	3	3	4	5	5	9	4	2	7	5	5	2	3	13	2	2	11	14	8
Drug use	7	3	2	1	2	7	3	6	10	5	6	9	9	3	8	8	11	11	8	7	10	9
High fasting plasma glucose	8	9	9	8	6	9	9	9	8	8	5	8	7	10	7	6	8	1	5	9	8	7
Household air pollution	9	20	20	20	20	12	16	15	7	13	13	6	11	12	15	11	6	9	12	6	6	6
Iron deficiency	10	14	15	13	15	14	13	13	15	12	12	11	13	6	11	5	5	10	10	3	2	2
Physical inactivity	11	7	8	7	7	8	8	8	11	9	9	10	8	11	6	9	12	8	11	14	13	12
Ambient PM pollution	12	10	12	15	13	11	15	11	6	16	14	12	10	16	9	13	10	15	16	16	15	11
Intimate partner violence	13	11	11	11	12	13	10	12	12	10	10	13	14	8	13	12	9	12	9	8	7	10
High total cholesterol	14	12	10	12	10	10	11	7	13	11	11	14	12	14	12	14	15	13	15	18	18	18
Childhood sexual abuse	15	13	13	10	11	15	12	14	14	14	15	16	16	13	16	15	14	17	13	13	16	15
Lead	16	15	14	14	14	16	14	16	16	15	16	15	15	15	14	16	17	14	14	17	17	17
Sanitation	17	17	18	17	19	20	18	19	18	18	17	17	18	17	18	17	16	16	17	12	9	14
Unimproved water	18	18	19	18	18	19	19	20	20	19	19	18	20	18	17	18	18	18	18	15	11	16
Radon	19	16	16	16	16	17	17	17	17	17	18	19	17	19	19	19	20	19	19	20	20	20
Ozone	20	19	17	19	17	18	20	18	19	20	20	20	19	20	20	20	19	20	20	19	19	19

Source: IHME

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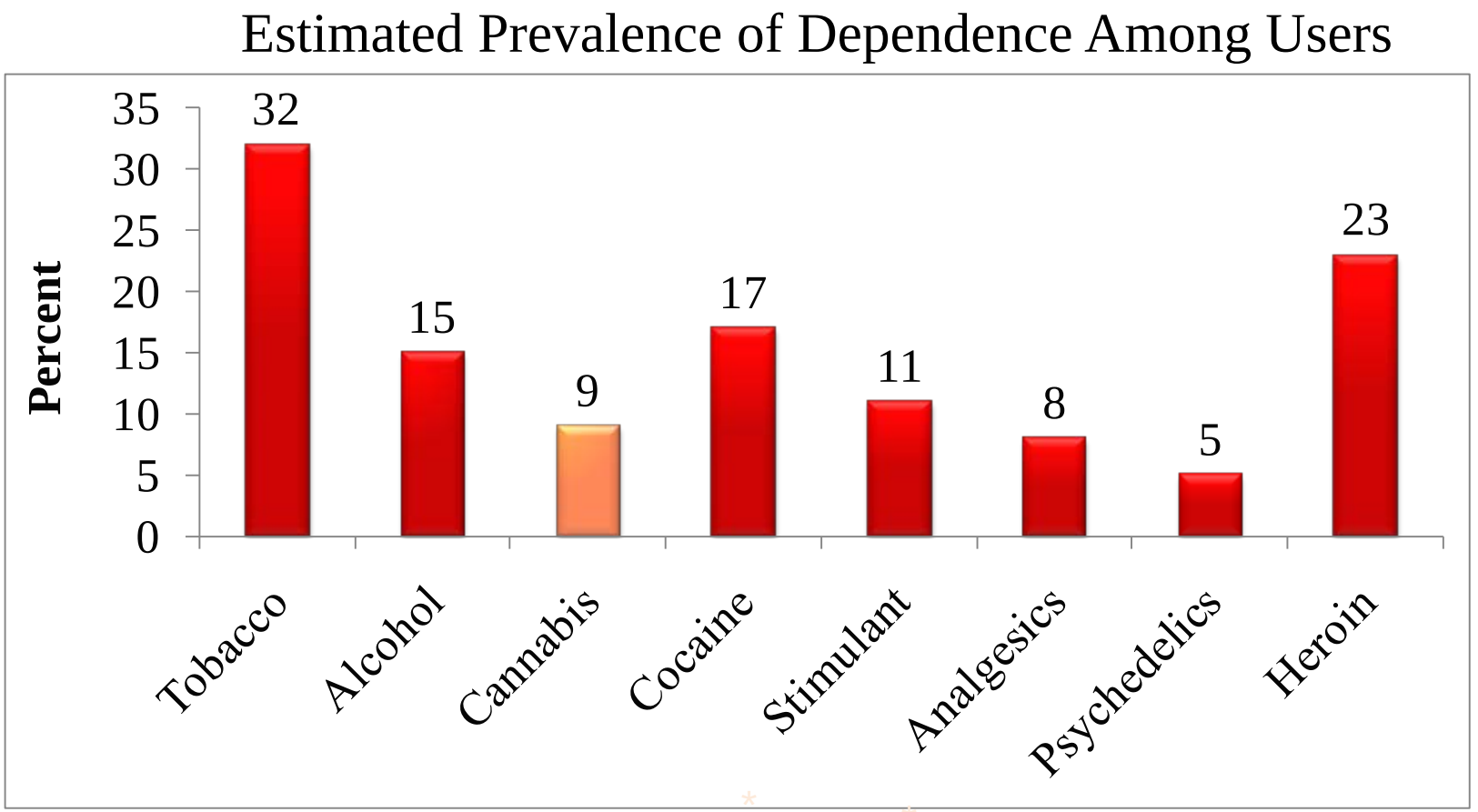
Dependence potential of different psychoactive substances (Anthony JC et al, 1994)



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Policy implications?

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Gummy Bears

$14

Fulfill your sweet tooth and medicate efficiently with Edipur
delicious Gummy Bears. This explosion of taste will leave yo
back for more gummy goodness, and the tart sugary coating
any cannabis taste.

This and all Edipure products are highly rated on Leafly.

Comes in two sizes:

100mg THC – 10 individually infused 10mg pieces

What is the scientific report about?

- It is about nonmedical use of cannabis – not medical use.
- It is about the health and social effects of cannabis use.
- It present the current knowledge on a very broad impact on health; “what we know”.
- It presents the priority areas for future research; where we lack sufficient knowledge.

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How was it developed?

- A broad range of scientists, medical doctors, experts provided background papers; their area of expertise.
- An expert meeting to discuss and review the evidence.
- A smaller drafting group and three main editors.
- External reviewers.
- The report is the outcome of 2 years of work.

What does it cover?

- Cannabis substance profile and its health impact.
- Neurobiology of cannabis use.
- Short-term effects of cannabis.
- Mental health and psychosocial outcomes of long-term cannabis use.
- Long-term cannabis use and noncommunicable diseases.

What does it cover?

- Prevention (interventions targeting families, school settings, vulnerable groups).
- Treatment of disorders (therapies, management of acute cannabis intoxication and withdrawal, relapse prevention.

How have we judged the evidence?

- **First requirement – evidence of an association between cannabis use and the health outcome**, can be from animal studies, human laboratory studies, case-control studies and prospective longitudinal epidemiological studies etc. Consistency of evidence - increase confidence in the existence of an association.

- **Second requirement**: Evidence that makes reverse causation an implausible explanation of the association. To rule out that cannabis use is a consequence of the health outcome rather than the cause of it.

How have we judged the evidence?

- **Third requirement**: Most difficult, To assess evidence that the association is not explained by other uncontrolled or unmeasured factors (as cannabis users are likely to use other drugs, and of the differ from non-users in risk-taking etc.).

- **Fourth requirement:** A causal relationship between cannabis use and the health outcome is biologically plausible

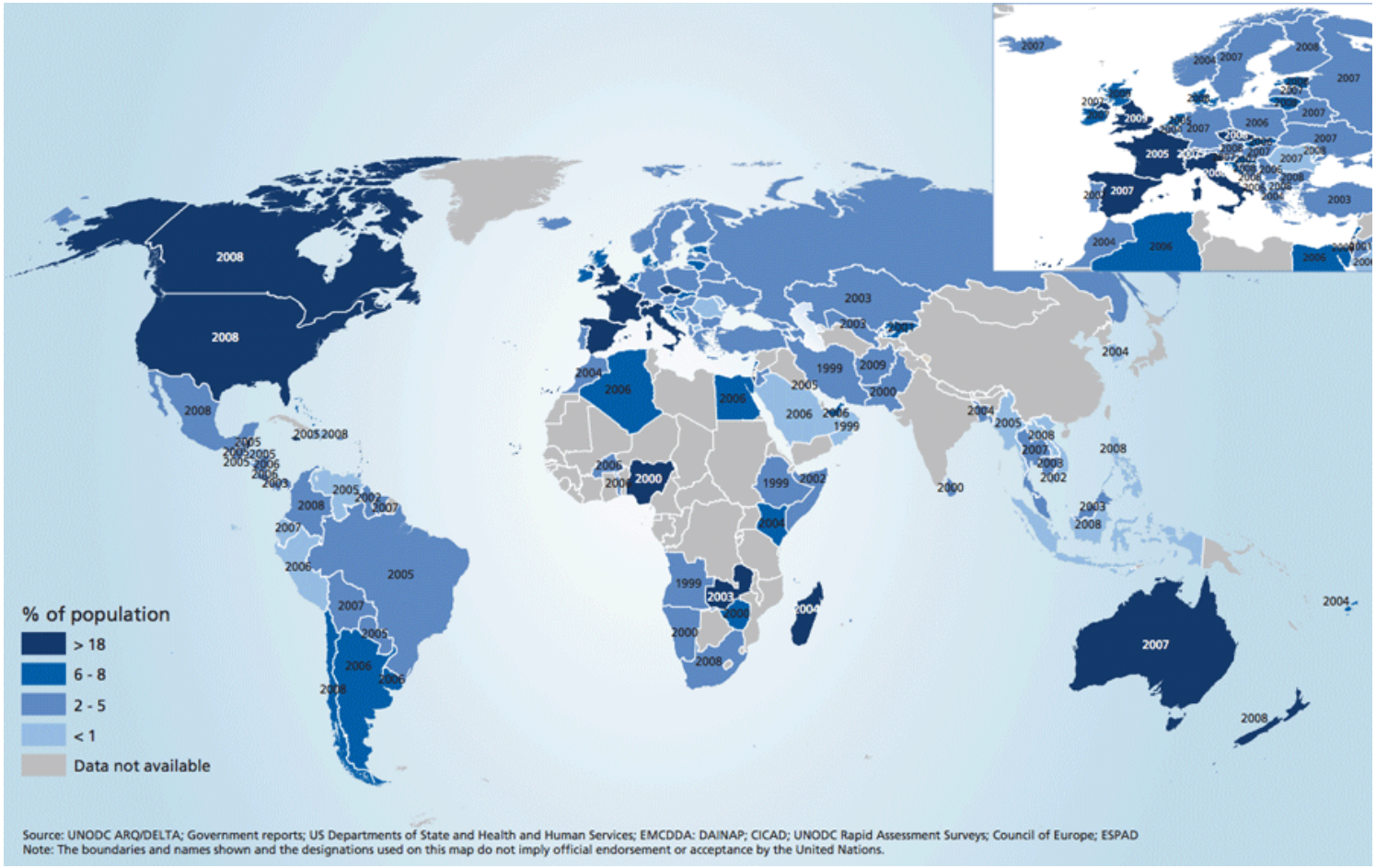
- Other factors that may support a causal interpretation include strength of the association, dose–response relationships, specificity of the association and reversibility of the effect after removal of the drug**.**

How have we defined the harms to health?

We have looked at the severity of the effects do to:

- The properties of the substance itself.
- The form and mode of administration used.
- The characteristics of the person taking the substance.
- The social context in which it is taken.

About the
Global Prevalence of Use



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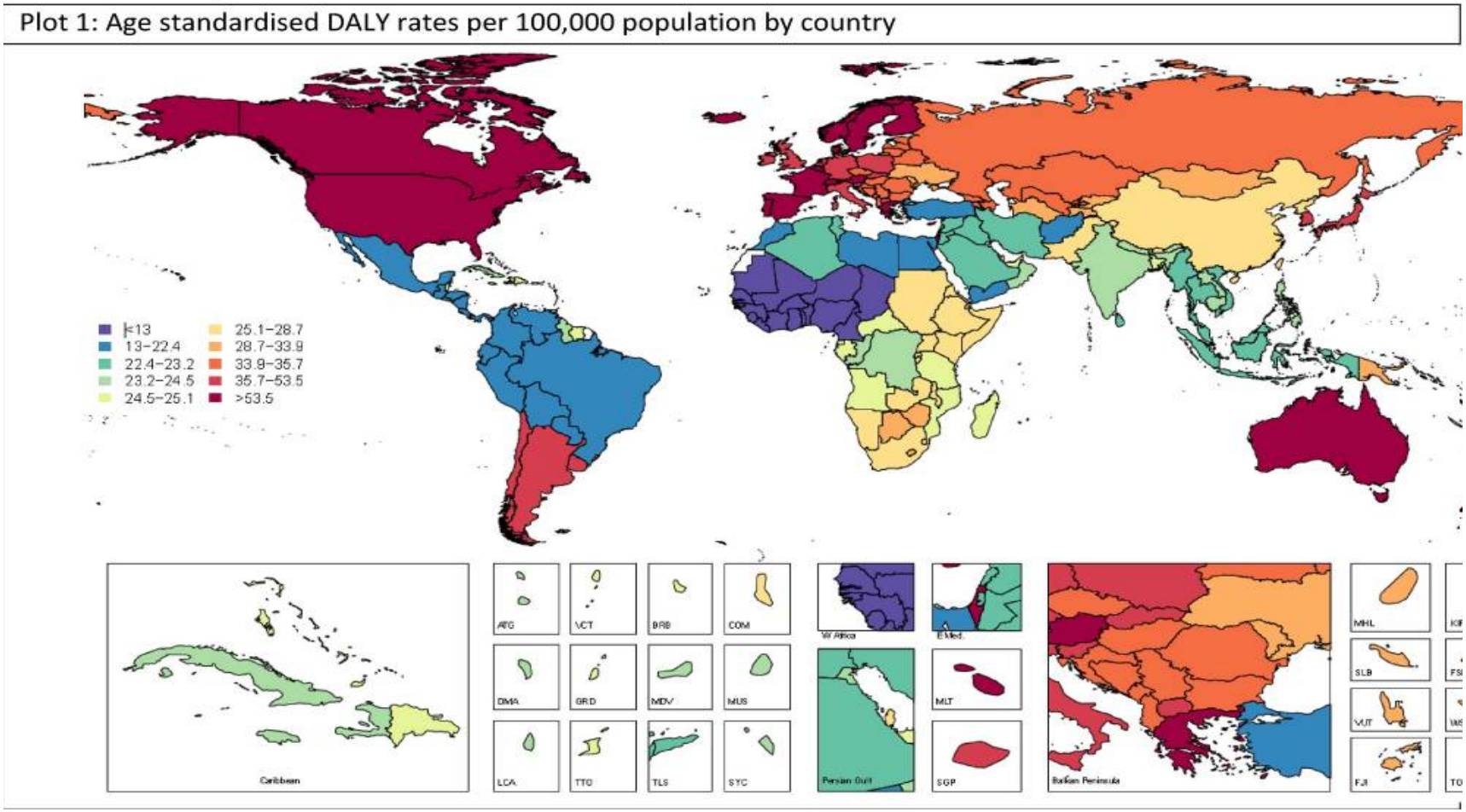
About
Cannabis Dependence

Country-level DALYs per 100,000 population for cannabis dependence, age-standardised, for 2010.



Degenhardt L, Ferrari AJ, Calabria B, Hall WD, Norman RE, McGrath J, Flaxman AD, Engell RE, Freedman GD, Whiteford HA, Vos T. (2013) The Global Epidemiology and Contribution of Cannabis Use and Dependence to the Global Burden of Disease> Results from the GBD 2010 Study. PLoS One 8(10); e76635 doi:10.1371/journal.pone.0076635

Treatment trends

- Cannabis use the main reason for people seeking substance abuse treatment (second after alcohol) globally.
- Persons seeking treatment for cannabis use disorders and associated conditions have increased since the 1990s in most parts of the world.
- 110 000 enrolling in specialized drug treatment in EU reported cannabis as primary drug.
- Young age 15 to 24 years.

About the sativa plant
(more can be found in the report)

We know that:

- The cannabis sativa plants contains approximately 104 different cannabinoids, 9-tetrahydrocannabinol (THC) is the primary psychoactive compound.
- There has been an upward trend in the mean THC content in the USA and Europe and an downward trend of CBD the non psychoactive compound.

What do we know about the neurobiology of cannabis use?

- CB1 receptors (which respond to THC) are widely distributed in the brain, including areas that control attention, decision-making, motivation and memory.
- These receptors modulate the effects of a variety of other neurotransmitter systems.
- Short-term and long-term cannabis use down-regulates these receptors in ways that may explain the short-term and long-term effects of cannabis on working memory, planning and decision-making, response speed, accuracy and latency motivation, motor coordination, mood and cognition.
- the extent to which neurobiological changes and especially cognitive impairments are reversible in heavy cannabis users;

What do we need to know more about know about the neurobiology of cannabis use?

- the duration of acute impairments produced by cannabis (the length of time after using cannabis that psychomotor and cognitive performance are impaired);
- the possible results of longitudinal studies combining epidemiological and neuroimaging methods to study the effects of cannabis use on brain functioning;
- the possible replicability of neuroimaging studies of cannabis users by using standardized imaging methods, better statistical analyses and larger samples;
- whether genetics explain the observation that persons who score higher on sensation-seeking, aggression and antisocial behaviour have increased risks of cannabis-use disorder?

What do we know about the epidemiology of cannabis use and cannabis dependence?

- Cannabis is the most widely used illicit drug globally. In 2013, an estimated 181.8 million people aged 15–64 years used cannabis for nonmedical purposes globally (uncertainty estimates 128.5–232.1 million).
- Cannabis use appears to be more common in developed countries than in developing countries, although we lack good data on prevalence of use in the latter.
- Young people often use cannabis, with the mid-teens being the age of first use in many developed countries.
- There has been an upward trend in the mean THC content of all confiscated cannabis preparations in the USA and some European countries.
- Cannabis dependence exists and is a cluster of behavioural, cognitive and physiological phenomena that develop after repeated cannabis use. There are some indications that the prevalence of cannabis dependence increased worldwide between 2001 and 2010.
- There is a major demand for addiction treatment systems for cannabis-use disorders in many high-income countries and in some low- and middle-income ones.

What do we need to know more about the epidemiology of cannabis use and cannabis dependence?

- the THC content of cannabis products used by most cannabis users in different countries;
- the typical dose of THC received by regular cannabis users, and whether users titrate their dose of THC when using more potent cannabis products;
- whether increased rates of treatment-seeking are influenced by higher THC content in cannabis, whether cannabis products with higher THC content affect the adverse health effects of cannabis use, and whether increased THC content has been accompanied by a reduction in the CBD content of cannabis products;
- the prevalence of use in many low- and middle-income countries;
- the extent to which household and school surveys reach all cannabis users;
- global data on the prevalence of harmful patterns of cannabis use;
- the prevalence of changing routes of cannabis administration (e.g. use of vaporisers and edible cannabis products);
- the global prevalence of heavy cannabis use and cannabis-use disorders.

What do we know about the short-term effects of cannabis use?

- The most obvious short-term health effect of cannabis is intoxication marked by disturbances in the level of consciousness, cognition, perception, affect or behaviour, and other psychophysiological functions and responses.
- A minority of first-time cannabis users become very anxious, have panic attacks, experience hallucinations and vomit. These symptoms may be sufficiently distressing to prompt affected users to seek medical care.
- Acute use impairs driving and contributes to an increased risk of traffic injuries.
- There is some evidence that cannabis use can trigger coronary events. Recent case reports and case series suggest that cannabis smoking may increase CVD risk in younger cannabis smokers who are otherwise at relatively low risk.

What do we know about the long-term effects of regular cannabis use?

- Regular cannabis users can develop dependence on the drug. The risk may be around 1 in 10 among those who ever use cannabis, 1 in 6 among adolescent users, and 1 in 3 among daily users.
- Withdrawal syndrome is well documented in cannabis dependence.
- Growing evidence reveals that regular, heavy cannabis use during adolescence is associated with more severe and persistent negative outcomes than use during adulthood.
- In a number of prospective studies there is a consistent dose–response relationship between cannabis use in adolescence and the risk of developing psychotic symptoms or schizophrenia.
- The association between cannabis use and psychosis or schizophrenia has been recognized for over two decades in at least four ways:
  - Cannabis produces a full range of transient schizophrenia-like positive, negative and cognitive symptoms in some healthy individuals.
  - In those harbouring a psychotic disorder, cannabis may exacerbate symptoms, trigger relapse and have negative consequences on the course of the illness
  - With heavy cannabis use, susceptible individuals in the general population develop a psychotic illness which is associated with age of onset of use, strength of THC in the cannabis, frequency of use and duration of use.
  - Cannabis use is associated with lowering the age of onset of schizophrenia It is likely that cannabis exposure is a "component cause" that interacts with other factors to precipitate schizophrenia or a psychotic disorder, but is neither necessary nor sufficient to do so alone.

What do we know about the long-term effects of regular cannabis use?

- Long-term cannabis smoking produces symptoms of chronic and acute bronchitis, as well as microscopic injury to bronchial lining cells, but it does not appear to produce COPD.
- Long-term heavy cannabis smoking can potentially trigger myocardial infarctions and strokes in young cannabis users.
- Smoking a mix of cannabis and tobacco may increase the risk of cancer and other respiratory diseases but it has been difficult to decide whether cannabis smokers have a higher risk, over and above that of tobacco smokers.
- There is suggestive evidence that testicular cancer is linked to cannabis smoking and this potential link should be investigated further.

What do we need to know more about the health consequences cannabis use?

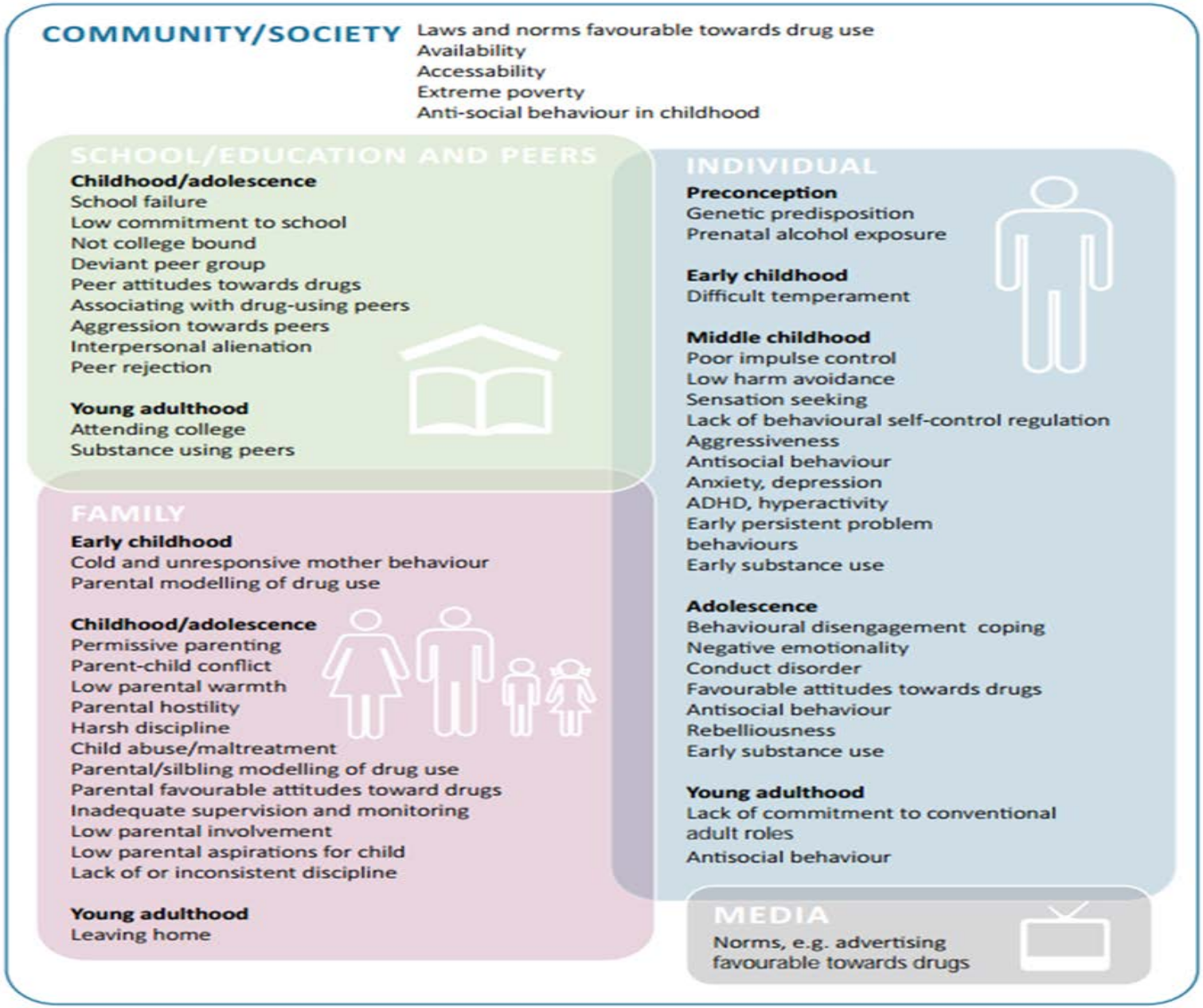
- case-control studies on the effects of cannabis use on motor vehicle accidents, and the relationship between cannabis use and other types of injury;
- how tolerance to cannabis in regular users affects the ability to drive;
- the triggering effects of cannabis on coronary heart events, especially myocardial infarction;
- the effects of cannabis use during pregnancy or conception through investigations using better methods of assessing cannabis use;
- the effects of regular long-term cannabis use on various cancer risks, specifically
- upper aerodigestive tract cancers, while taking into account the effects of concomitant alcohol and tobacco use,
- respiratory cancers that better control for the effects of tobacco smoking,
- head and neck cancers that stratify for HPV status;
- in countries with a high prevalence of cannabis use, the link between cannabis smoking and CVD in young adults, specifically

What do we need to know more about the health consequences cannabis use?

- cardiac syndromes and infarctions,
- strokes and cerebral ischaemic events;
- the potentially causal effects of long-term cannabis use on the risks of mental disorders, specifically
  - psychoses and particularly schizophrenia
  - major depression and bipolar disorders
  - anxiety disorders;
  - the effects of acute and regular cannabis use on suicide ideation, suicide attempts and death by suicide, while examining dose–response relations and controlling for other drug use.

What do we know about prevention and treatment?

- Evidence-based preventive interventions should cover the whole prevention chain from universal and selective to indicated prevention.
- Comprehensive family prevention that involves training for parents, children and the family collectively is found to be effective in reducing both lifetime cannabis use and past-year use in adolescents.
- Life skills programmes that combine both a social competence curriculum and social influence approaches are shown to reduce cannabis use at 12-month follow-up and beyond.
- Interactive social programmes targeting vulnerable young people is found to be effective in reducing past-month cannabis use.



Drug use is a developmental, multi-causal process influenced by the interplay of many risk and protective factors from different developmental contexts. The more distinct the risk factor, the greater the likelihood of drug use. In contrast, protective factors buffer the impact of risk factors.

What do we know about prevention and treatment?

- A single-session brief psychological intervention of 30–45 minutes increases the chances of cannabis cessation if people are not dependent on cannabis.
- Many people with cannabis-use disorders cease cannabis use without treatment.
- For people who are dependent on cannabis, family interventions are effective for adolescents, and CBT, MET and PPS are effective in adults.

What do we need to know more about prevention and treatment?

- the effect of preventive programmes for children of cannabis-affected families (as a result of more longitudinal research);
- how best to scale up prevention, targeting persons of different age groups and in different settings;
- what works in indicated prevention.
- the effectiveness and cost-effectiveness of screening and brief interventions for hazardous and harmful cannabis use, including in educational settings;
- the effectiveness and cost-effectiveness of mobile telephone and Internet-based interventions for cannabis-use disorders;
- the effectiveness and cost-effectiveness of family interventions for cannabis-use disorders;
- potential effective pharmacotherapy for cannabis-use disorders.

Ensure healthy lives and promote well-being for all at all ages

3.5 Strengthen the prevention and treatment of substance abuse, including narcotic drug abuse and harmful use of alcohol

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Thank you.

The report on the nonmedical use of cannabis can be found at,

- www.who.int/substance_abuse