

## A cannabis referendum starter kit:

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At the same time as the 2020 General Election, a binding referendum is to be held on the legalisation of cannabis for personal use. The referendum will consider both medicinal and recreational use of cannabis. The debate between pro- and anti- cannabis law reform has already begun in the media and this will only intensify over the coming months. It is important that people are well informed, understand the terms used in the debate, and consider as thoughtfully as possible the impact of any law changes on individuals and communities.

The purpose of this commentary is to explain terms that are frequently used and provide a foundation from which to consider the various perspectives put forward during the debate. An article to unpack the social context in which the law reform is being proposed will follow in another edition of the Nathaniel Report.

### Some history

Cannabis has been cultivated and used in a variety of ways throughout recorded history. The *Cannabis sativa* plant has been a source of fibre (hemp), oil, food and linctis. It has been used as a 'recreational' drug in a dried plant form (commonly called marijuana), in a resin (hash or hashish), and in an oil (hash oil) form.<sup>1</sup>

Cannabis is known by other terms including: marijuana; pot, weed; dope; grass; mull; dak; hash; smoke; buds; skunk; cabbage; ganja; reefer; and Mary-Jane. Dried cannabis rolled into a cigarette to be smoked is known as a 'joint'.

Of the several hundred chemical compounds in the cannabis plant, two are the most well-known: Delta-9-tetrahydrocannabinol, known as **THC**; and Cannabidiol, known as **CBD**. THC and CBD are known as 'cannabinoids'; chemical compounds that were first isolated from the *Cannabis sativa* plant. THC is a psychoactive compound in cannabis. A substance is said to be

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<sup>1</sup> <https://www.drugfoundation.org.nz/info/drug-index/cannabis/>

psychoactive if it affects a person in a way that changes perception, mood, consciousness, cognition or actions. CBD is non-psychoactive. The potency of cannabis and its ability to produce a 'high' depends on the concentration of THC.

Historically, plants grown for 'recreational' purposes have been selected for their higher THC content. However, the levels of THC present in cannabis have increased significantly over recent decades. A joint of cannabis in the 1970s contained approximately 1-2% THC. In current times, a regular joint is 20-25% THC. Put another way, the average joint of the 1970s contained roughly 5 to 10 milligrams of THC, while a single joint today can contain 100 milligrams of THC.<sup>2</sup>

The concentration of THC is higher in resin than in the dried plant, and higher still in hash oil.

Hemp is also a cultivar of *Cannabis sativa*. Hemp was known and used by people across the middle latitudes of Europe and Asia from 5,000 BC,<sup>3</sup> and has long been used as a fibre for industrial purposes. In Egypt it was used as rope when building the pyramids, and it formed the fabric on which the Guttenberg Bible and the Magna Carta were printed. Hemp is currently grown in NZ under permit for fibre, hemp/hemp seed oil, and hemp seed food products.<sup>4</sup> Hemp is very low in THC, containing less than 0.3% (measured in the dried flowering tops), and is non-psychoactive.

## Some science

In 1964, Israeli organic chemists Raphael Mechoulam, Yehiel Gaoni and their team, isolated the structure of THC. Identifying the CBD molecule followed shortly afterward.

It was discovered that THC and CBD had the ability to bind molecularly with certain receptors distributed throughout the body. The two types of cannabinoid receptors identified to date are known as CB1 (cannabinoid 1) and CB2 (cannabinoid 2).

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<sup>2</sup> Berenson, A. (2019). *Tell your children the truth about marijuana, mental illness and violence*. New York: Free Press, p.40-41

<sup>3</sup> Barber, Elizabeth Wayland. (1992). *Prehistoric Textiles: The Development of Cloth in the Neolithic and Bronze Ages with Special Reference to the Aegean*. Princeton University Press. p. 36.

<sup>4</sup> NZ Govt Press Release: *Hemp seed can now be sold as food*. Nov 6 2018.

<http://www.scoop.co.nz/stories/BU1811/S00149/hemp-seed-can-now-be-sold-as-food.htm>

Scientists wondered why there were specific receptors within our bodies for this type of molecule. If our bodies have the receptors, perhaps we produce these molecules ourselves – and indeed we do. In 1992, Mechoulam and his team identified a molecule that is secreted naturally within the human body: Anandamide.

Anandamide was the first **endocannabinoid** identified. Endo meaning 'within' and cannabinoid because it was received by the same system of receptors as the cannabinoid THC from the cannabis plant.

Another endogenous (naturally and spontaneously occurring) cannabinoid in our bodies, 2-arachidonylglycerol (2 AG) was identified in 1993. 2AG exerts similar effects to Cannabidiol (CBD).

The identification of cannabinoid receptors and endocannabinoid molecules triggered an exponential growth of scientific studies, which led to the identification of a wider system of intercellular communication within our bodies, known as the **Endocannabinoid System** (ECS).

The endocannabinoid system is distributed throughout the body, including the brain, central nervous system, the immune system, the gastrointestinal tract, bone and skin. Maintaining the complex balance – the homeostasis – between the different functions of the body, the ECS regulates our body temperature and the pH level within our body. The ECS controls motor co-ordination, is involved in pain control, sleep cycles, appetite, working memory, fertility and pregnancy.

The ECS does *not* develop through exposure to cannabis; it exists throughout our lives and is involved in our pre- and post- natal development. The ECS is vital in brain development including synaptogenesis – the formation of the synapses in the neurons of the brain and central nervous system. It also plays a significant part in synaptic pruning, which occurs at two foundational times in our life: early childhood and adolescence.

Identification of the Endocannabinoid System helps explain how cannabis affects systems in the human body, but cannabis is not why the Endocannabinoid System exists. It is now known that all vertebrates and invertebrates including the humble sea-squirt that evolved over 600 million years ago, have an endocannabinoid system.<sup>5</sup>

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<sup>5</sup> <https://medium.com/randy-s-club/7-things-you-probably-didnt-know-about-the-endocannabinoid-system-35e264c802bc>

The word 'cannabinoids' now refers to every chemical substance - regardless of its origin or structure - that unites with cannabinoid receptors in the ECS, and has similar effects to those produced by the plant *Cannabis Sativa L.*<sup>6</sup>

Cannabinoids are differentiated by their source. Those that are plant based are termed **Phytocannabinoids**. Compounds developed in the laboratory are termed **Synthetic cannabinoids**. There is still a great deal to be learned and understood about the ECS and how it is affected by endocannabinoids, phytocannabinoids and synthetic cannabinoids.

## Current legal situation of cannabis

Cannabis is the **most widely used illegal drug in New Zealand** and the fourth most widely used recreational drug after caffeine, alcohol and tobacco.

New Zealanders are among the highest users of illegal drugs in the world, and according to the United Nations 2012 Drug Report<sup>7</sup> top the list for cannabis use. Statistics for Oceania (predominantly Australia and New Zealand) show cannabis use between 9.1 and 14.6 per cent of people, compared with 2.8 to 4.5 per cent globally.<sup>8</sup> The longitudinal Christchurch Study reports that in their cohort of over 1000 people born in 1977 in Christchurch, 80% have tried cannabis at least once.<sup>9</sup>

Cannabis use in New Zealand is governed by the **Misuse of Drugs Act 1975**. The Misuse of Drugs Act 1975 and subsequent amendments classify a wide range of controlled and illegal drugs according to the level of risk of harm they pose to people who misuse them. Cannabis oil and hashish are classified as Class B drugs and are deemed to pose a "high risk of harm". Cannabis seed and cannabis plant are classified as Class C drugs, deemed "moderate risk of harm". **Under this Act, unauthorised possession of any amount of cannabis for any purpose is illegal.**

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<sup>6</sup> <https://www.fundacion-canna.es/en/cannabinoids>

<sup>7</sup> Kiwis World's Top Cannabis Smokers. NZ Herald June 2012

[https://www.nzherald.co.nz/nz/news/article.cfm?c\\_id=1&objectid=10815874](https://www.nzherald.co.nz/nz/news/article.cfm?c_id=1&objectid=10815874)

<sup>8</sup> United Nations Office on Drugs and Crime - World Drug Report 2012 <http://www.unodc.org/unodc/en/data-and-analysis/WDR-2012.html>

<sup>9</sup> Boden J. Cannabis- what's the harm? Christchurch Health and Development Study  
<https://vimeo.com/272146311>

**The Misuse of Drugs (Medicinal Cannabis) Amendment Bill**<sup>10</sup> was passed into law on December 11<sup>th</sup> 2018.

With the passing of this Bill, cannabis can now be used by patients who are terminally ill or in palliation – that is, patients who are seriously ill, where the focus of treatment is on improving their quality of life.

In addition, the Misuse of Drugs (Medicinal Cannabis) Amendment Bill now makes non-psychoactive cannabis-derived products available as they are no longer classified as controlled drugs.<sup>11</sup> The law fully decriminalises cannabidiol (CBD) products, and allows medicinal cannabis products to be manufactured in New Zealand. Under this new legislation it is the Governor-General who establishes regulatory standards for cannabis products. Medicinal cannabis products are not subsidised and come at a significant cost to a patient when prescribed.<sup>12</sup>

It will take until the end of 2019 for the new regulations established by the Misuse of Drugs (Medicinal Cannabis) Amendment Bill 2018 to be rolled out. Meanwhile, a statutory defence for terminally ill and palliation patients to possess and use cannabis took effect immediately.

It is generally accepted that the usage rate of ‘recreational’ cannabis in New Zealand is high. Accordingly, the possession of cannabis in small quantities may often not be prosecuted. Instead, in some cases, first offences may result in a formal warning and confiscation by police. Such depenalisation approximates decriminalisation.

**Decriminalisation** would involve removing the criminal penalties for possession, whilst having a sliding scale in terms of personal limits, potential civil penalties, and health referrals.

## Some effects of cannabis use

Half of all New Zealanders with a drug dependence issue were already dependent by the time they were 19 years old, indicating that serious drug

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<sup>10</sup> Misuse of Drugs (Medicinal Cannabis) Amendment Bill

<http://www.legislation.govt.nz/bill/government/2017/0012/latest/DLM7518707.html>

<sup>11</sup> Misuse of Drugs (Medicinal Cannabis) Amendment Act, Dec 2018, NZ Ministry of Health.

<https://www.health.govt.nz/our-work/regulation-health-and-disability-system/medicines-control/medicinal-cannabis/misuse-drugs-medicinal-cannabis-amendment-act>

<sup>12</sup> Personal correspondence from a South Island based General Practitioner.

use starts early.<sup>13</sup> A recent survey shows that the most common age of first drug use in New Zealand is between 15 and 17 years of age but more startling is the fact that almost one in five drug users were 14 years or younger when they first tried drugs.<sup>14</sup>

Two longitudinal studies carried out in New Zealand where study participants have been examined from birth onwards, have produced internationally recognised data on cannabis use. **The Dunedin Multidisciplinary Health and Development Study**<sup>15</sup> is following 1,037 Dunedin individuals since their birth in 1972/1973. Regular users of cannabis within this cohort have shown impairment of everyday cognitive function, and a greater decline in IQ and memory loss compared with other participants. Impairment is concentrated among adolescent-onset cannabis users, with more persistent use associated with greater decline. Another project in this study has shown a significant increased risk of schizophrenia in later life for teenagers who use cannabis, especially for a vulnerable minority of teenagers with a predisposition to developing schizophrenia.<sup>16</sup> Quitting or reducing cannabis use did not fully restore brain functioning among adolescent-onset cannabis users.<sup>17</sup> The researchers suggest that cannabis has a neurotoxic effect in the adolescent developing brain.<sup>18</sup>

**The Christchurch Health and Development study**<sup>19</sup> is following the health, education and life progress of a group of 1,265 people born in the urban region of Christchurch during mid-1977. Eighty percent of the study cohort have tried cannabis at least once, although only a small number use regularly or heavily.<sup>20</sup> One research paper from this study looked specifically at the young people between the ages of 15 – 25yrs.<sup>21</sup> The study concluded that regular or heavy cannabis use was associated with harms to the user including: an increase in amotivational syndrome

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<sup>13</sup> New Zealand Drug Foundation (2017) <https://www.drugfoundation.org.nz/matters-of-substance/october-2017/the-right-message/>

<sup>14</sup> [http://riskgroup.co.nz/Drug\\_Dogs/Schools.html](http://riskgroup.co.nz/Drug_Dogs/Schools.html)

<sup>15</sup> The Dunedin Multidisciplinary Health and Development Study. <https://dunedinstudy.otago.ac.nz/>

<sup>16</sup> Cannabis use 'trigger for schizophrenia'. New Zealand Herald 20 Feb 2019.

[https://www.nzherald.co.nz/technology/news/article.cfm?c\\_id=5&objectid=10116853](https://www.nzherald.co.nz/technology/news/article.cfm?c_id=5&objectid=10116853)

<sup>17</sup> Meier et al 2012, PNAS 109 (40) Persistent cannabis users show neuropsychological decline from childhood to midlife. <https://www.scribd.com/document/280247224/Meier-2012-PNAS-Persistent-Cannabis-Use>

<sup>18</sup> A neurotoxin is a natural or sythetic substance that causes damage to the central and/or periferal nervous system.

<sup>19</sup>The Christchurch Health and Development study

<https://www.otago.ac.nz/christchurch/research/healthdevelopment/>

<sup>20</sup> Boden J. Cannabis: what you need to know 2018

<https://www.otago.ac.nz/otagomagazine/issue47/opinion/otago696401.html>

<sup>21</sup>Fergusson, David; Joseph M. Boden; L. John Horwood (April 2006). "Cannabis use and other illicit drug use: Testing the cannabis gateway hypothesis". *Addiction*. 101 (4): 556–569. doi:10.1111/j.1360-0443.2005.01322.x. PMID 16548935

(educational failure, employment problems, welfare dependence); the precursor to use of other illicit drugs; and the increased risk of developing psychotic symptoms. Adolescent onset and heavier users were deemed most at risk.

## Considerations

The conversation around cannabis law reform is scientifically, legally and socially complex. Scientifically, there is still a good deal to learn and understand about the potential harms and benefits of cannabis-based products. Greater understanding of the endocannabinoid system and research on endocannabinoids and how they interact, is required. We need to know more about phytocannabinoids – the myriad of cannabinoids including THC and CBD that are plant based – including their properties, their possible therapeutic applications and their long-term safety of use. Research in these areas is currently being undertaken, and academically, the field of cannabinoid research generates some 10 000 articles per annum globally.<sup>22</sup>

It is important that people thoughtfully engage with the different facets of the cannabis law reform debate in order to take an informed stance in the referendum. Our next article will raise some issues around the social complexity of cannabis law reform.

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<sup>22</sup> Bab, I. (2011). British Journal of Pharmacology August 163(7), 1327-1328.  
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3165944/>