Synthetic cannabinoids:

Report prepared for the Expert Advisory Committee on Drugs

Prepared by the Ministry of Health

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CONTENTS

[1.0 SUMMARY 4](#_Toc509487277)

[1.1 Purpose 4](#_Toc509487278)

[1.2 Substances 4](#_Toc509487279)

[2.0 SUBSTANCE IDENTIFICATION AND CHEMISTRY 4](#_Toc509487280)

[2.1 Identification 4](#_Toc509487281)

[2.2 Similarities to other substances 4](#_Toc509487282)

[2.3 Methods and ease of manufacturing 5](#_Toc509487283)

[3.0 RISK OF HARM 6](#_Toc509487284)

[3.1 Likelihood evidence of abuse including such matters as the prevalence of the drug, levels of consumption, drug seizure trends, and the potential appeal to vulnerable populations 6](#_Toc509487285)

[Table 1: New Zealand Police and Customs Service seizures for synthetic cannabinoids 6](#_Toc509487286)

[Breakdown of seizures per year 6](#_Toc509487287)

[5F-ADB 6](#_Toc509487288)

[UR-144 7](#_Toc509487289)

[5F-PB-22 7](#_Toc509487290)

[MDMB-CHMICA 7](#_Toc509487291)

[XLR-11 7](#_Toc509487292)

[JWH-018 7](#_Toc509487293)

[AM-2201 8](#_Toc509487294)

[AMB-FUBINACA 8](#_Toc509487295)

[AB-FUBINACA 8](#_Toc509487296)

[3.2 Specific Effects 8](#_Toc509487297)

[3.2.1 Toxicology 8](#_Toc509487298)

[3.2.2 Psychoactivity 8](#_Toc509487299)

[3.2.3 Pharmacology 8](#_Toc509487300)

[3.3 Risks to Public Health 8](#_Toc509487301)

[3.4 Therapeutic Value 9](#_Toc509487302)

[3.5 Potential to Cause Death 9](#_Toc509487303)

[3.6 Potential for Dependence 9](#_Toc509487304)

[4.0 CLASSIFICATION 10](#_Toc509487305)

[4.1 Classification and Regulation in New Zealand (past and present) 10](#_Toc509487306)

[4.2 International Classification and Experience in Other Jurisdictions 10](#_Toc509487307)

[Australia 10](#_Toc509487308)

[Canada 11](#_Toc509487309)

[United Kingdom 11](#_Toc509487310)

[Table 2: United Nations Classification 12](#_Toc509487311)

[New Zealand obligations under the UN Conventions 12](#_Toc509487312)

[5.0 OTHER RELEVANT INFORMATION 14](#_Toc509487313)

[5.1 Dosage/ EC50 and proposed amount for the presumption of supply 14](#_Toc509487314)

[Table 3: Potency, anecdotal dosage and proposed quantities for presumption of supply 15](#_Toc509487315)

[5.2 Background and history of use in New Zealand 17](#_Toc509487316)

[Previous Temporary Class Drug Notices 18](#_Toc509487317)

[Interim Approvals 19](#_Toc509487318)

[Neither Temporary Class Drug Notices nor Interim Approvals 20](#_Toc509487319)

[Table 5: Summary of historical classification in New Zealand 20](#_Toc509487320)

[5.3 Anticipated future trends 20](#_Toc509487321)

[6.0 CLASSIFICATION OPTIONS 21](#_Toc509487322)

[Table 6: Comparison of Penalties 22](#_Toc509487323)

[7.0 FUTURE ACTIONS 22](#_Toc509487324)

[8.0 REFERENCES 23](#_Toc509487325)

# SUMMARY

## Purpose

This paper provides information on specific synthetic cannabinoids reported to be in New Zealand and options for scheduling them under the Misuse of Drugs Act. Where available, specific information on the individual substances that has been prepared by the World Health Organization (WHO) will be provided alongside this paper. A separate paper has been provided on the substances AMB-FUBINACA and AB-FUBINACA as these have not been reviewed by the WHO.

The synthetic cannabinoids are being considered following a spate of deaths across New Zealand in 2017 following synthetic cannabinoid use. A handful of synthetic cannabinoids have also been scheduled under the United Nations Convention on Psychotropic Substances 1971, meaning they must be considered for scheduling in New Zealand to meet our international obligations for the control of these substances.

## Substances

The synthetic cannabinoids to be considered by the Expert Advisory Committee on Drugs (the Committee) are:

* 5F-ADB (WHO report attached)
* UR-144 (WHO report attached)
* 5F-PB-22 (WHO report attached)
* MDMB-CHMICA (WHO report attached)
* 5F-AKB-48 (WHO report attached)
* XLR-11 (WHO report attached)
* JWH-018 (WHO report attached)
* AM-2201 (WHO report attached)
* AMB-FUBINACA (Ministry of Health prepared report attached)
* AB-FUBINACA (Ministry of Health prepared report attached).

# SUBSTANCE IDENTIFICATION AND CHEMISTRY

## 2.1 Identification

Identification information can be found in the attached reports.

## 2.2 Similarities to other substances

Synthetic cannabinoids are substances which activate the CB1 and CB2 cannabinoid receptors. These receptors are the same ones that are activated by Δ9‑tetrahydrocannabinol (THC), the major psychoactive component of cannabis. Activation of the CB1 receptor is responsible for the psychoactivity of cannabis and the synthetic cannabinoids. In general, synthetic cannabinoids have a much stronger affinity for the CB1 receptor when compared to THC (Banister et al 2016). This makes the effects of synthetic cannabis much stronger than the effects of natural cannabis.

## 2.3 Methods and ease of manufacturing

In New Zealand synthetic cannabinoids are generally imported. The imported synthetic cannabinoids are dissolved in solvent and sprayed on to plant material (such as peppermint or damiana). The solvent is then evaporated before the plant material is sold as synthetic cannabis. This process is relatively simple which makes synthetic cannabis easy to produce.

It is important to note the risks in this process as it is unclear whether the number of deaths that have been seen in New Zealand are due to the synthetic cannabinoids or the manufacturing processes for synthetic cannabis, which are uncontrolled and can result in inconsistent, poor quality and unsafe batches of product.

In 2016, there was a group of synthetic cannabinoid intoxications referred to as a “zombie outbreak” in New York. One package of product with several aliquots of synthetic cannabis was obtained and the aliquots were analysed. The synthetic cannabinoid AMB-FUBINACA was identified and the concentration in each aliquot ranged from 14.2 to 25.2 mg/g with a mean concentration of 16.0 mg/g noted (Adams et al 2017).

In December 2017, ESR produced a report on synthetic cannabinoid samples found and tested in New Zealand between May and December 2017. They stated that AMB-FUBINACA was the synthetic cannabinoid detected most frequently and reported concentrations of AMB-FUBINACA on plant material from 7 to 417 mg/g. They further noted that 75% of the samples analysed had concentrations above the mean 16 mg/g noted in the New York outbreak and that 10% of the samples had more than 10 times this strength (ESR 2017).

It is possible that it is the variability in manufacturing of synthetic cannabis and the resulting high concentration of synthetic cannabinoids in samples that is leading to the risk to public health more than the potency of these synthetic cannabinoids.

Some other risks associated with this manufacturing method include:

* the possibility of low-grade solvents which contain other contaminants being used in the synthesis
* pesticides and other substances being present on the plant material used, and
* mould being present on the plant material used.

# 3.0 RISK OF HARM

## 3.1 Likelihood or evidence of abuse including such matters as the prevalence of the drug, levels of consumption, drug seizure trends, and the potential appeal to vulnerable populations

Synthetic cannabinoids are available throughout New Zealand. Seizure data and media reports on addicted individuals and hospitalisations indicate that synthetic cannabinoids are highly addictive and easily accessible throughout New Zealand. As synthetic cannabinoids are very potent and relatively cheap to buy, synthetic cannabis is relatively cheap to produce. This means that, as well as being easily accessible, synthetic cannabinoids are cheaper to buy than natural cannabis, and this makes them potentially appealing to vulnerable populations such as young, poor and homeless populations.

The WHO Questionnaire for Review of Psychoactive Substances for 5F-ADB, MDMB-CHMICA, 5F-AKB-48 and XLR-11 (attached to this report) listed specific subpopulations known to misuse the substance. Overall, these populations included the homeless, prisoners, cannabis users, young people, schools, known drug consumers and party-goers.

### Table 1: New Zealand Police and Customs Service seizures for synthetic cannabinoids

|  |  |  |
| --- | --- | --- |
| **Substance** | **Number of seizures (total 2013-2017)** | **Total quantity seized** |
| **Powder** | **Leaf** | **Liquid** |
| 5F-ADB  | 35 | 919.7 g  | - | 14 mL |
| UR-144 | 3 | 7.08 g  | 1 g  | - |
| 5F-PB-22 | 23 | 21862.1 g | - | - |
| MDMB-CHMICA | 3 | 6.9 g | 29 g | - |
| 5F-AKB-48 | 0 | - | - | - |
| XLR-11 | 6 | 1229.8 g | - | - |
| JWH-018 | 7 | 1548 g | - | - |
| AM-2201 | 8 | 817.34 g | - | - |
| AMB-FUBINACA | 28 | 8444.1 g | - | - |
| AB-FUBINACA | 21 | 81358.3 g + 10 pills | - | - |

Note: Data includes “suspected” substances which have only been analysed using field tests. “Leaf” means plant material containing synthetic cannabinoids (ie, synthetic cannabis).

### Breakdown of seizures per year

### 5F-ADB

|  |  |  |
| --- | --- | --- |
| **Year** | **Number of seizures**  | **Total quantity seized** |
| **Powder** | **Leaf** | **Liquid** |
| 2013 | 0 | - | - | - |
| 2014 | 0 | - | - | - |
| 2015 | 0 | - | - | - |
| 2016 | 24 | 783.9 g  | - | 14 mL |
| 2017 | 11 | 135.8 g  | - | - |

### UR-144

|  |  |  |
| --- | --- | --- |
| **Year** | **Number of seizures**  | **Total quantity seized** |
| **Powder** | **Leaf** | **Liquid** |
| 2013 | 2 | 4 g  | 1 g  | - |
| 2014 | 0 | - | - | - |
| 2015 | 0 | - | - | - |
| 2016 | 1 | 3.08 g  | - | - |
| 2017 | 0 | - | - | - |

### 5F-PB-22

|  |  |  |
| --- | --- | --- |
| **Year** | **Number of seizures**  | **Total quantity seized** |
| **Powder** | **Leaf** | **Liquid** |
| 2013 | 3 | 1012.5 g  | - | - |
| 2014 | 1 | 10240 g | - | - |
| 2015 | 12 | 232.1 g | - | - |
| 2016 | 7 | 10377.5 g | - | - |
| 2017 | 0 | - | - | - |

### MDMB-CHMICA

|  |  |  |
| --- | --- | --- |
| **Year** | **Number of seizures**  | **Total quantity seized** |
| **Powder** | **Leaf** | **Liquid** |
| 2013 | 0 | - | - | - |
| 2014 | 0 | - | - | - |
| 2015 | 1 | 5 g | - | - |
| 2016 | 2 | 1.9 g | 29 g | - |
| 2017 | 0 | - | - | - |

Note that MDMB-CHMICA has previously been sold under the name MMB-CHMINACA so actual seizures for this substance will likely be higher than the numbers reported here.

### XLR-11

|  |  |  |
| --- | --- | --- |
| **Year** | **Number of seizures**  | **Total quantity seized** |
| **Powder** | **Leaf** | **Liquid** |
| 2013 | 4 | 1130 g | - | - |
| 2014 | 2 | 99.8 g | - | - |
| 2015 | 0 | - | - | - |
| 2016 | 0 | - | - | - |
| 2017 | 0 | - | - | - |

### JWH-018

|  |  |  |
| --- | --- | --- |
| **Year** | **Number of seizures**  | **Total quantity seized** |
| **Powder** | **Leaf** | **Liquid** |
| 2013 | 7 | 1548 g | - | - |
| 2014 | 0 | - | - | - |
| 2015 | 0 | - | - | - |
| 2016 | 0 | - | - | - |
| 2017 | 0 | - | - | - |

### AM-2201

|  |  |  |
| --- | --- | --- |
| **Year** | **Number of seizures**  | **Total quantity seized** |
| **Powder** | **Leaf** | **Liquid** |
| 2013 | 7 | 816 g | - | - |
| 2014 | 0 | - | - | - |
| 2015 | 0 | - | - | - |
| 2016 | 1 | 1.34 g | - | - |
| 2017 | 0 | - | - | - |

### AMB-FUBINACA

|  |  |  |
| --- | --- | --- |
| **Year** | **Number of seizures**  | **Total quantity seized** |
| **Powder** | **Leaf** | **Liquid** |
| 2013 | 0 | - | - | - |
| 2014 | 0 | - | - | - |
| 2015 | 0 | - | - | - |
| 2016 | 14 | 4144.8 g | - | - |
| 2017 | 14 | 4299.3 g | - | - |

### AB-FUBINACA

|  |  |  |
| --- | --- | --- |
| **Year** | **Number of seizures**  | **Total quantity seized** |
| **Powder** | **Leaf** | **Liquid** |
| 2013 | 1 | 1990 g | - | - |
| 2014 | 8 | 78029.2 g | - | - |
| 2015 | 4 | 71.5 g + 10 pills | - | - |
| 2016 | 8 | 1267.6 g | - | - |
| 2017 | 0 | - | - | - |

## 3.2 Specific Effects

### 3.2.1 Toxicology

Toxicology information can be found in the attached reports.

### 3.**2.2 Psychoactivity**

Psychoactivity information can be found in the attached reports.

### 3.2.3 Pharmacology

Pharmacology information can be found in the attached reports.

## 3.3 Risks to Public Health

There are many reports in the New Zealand media where synthetic cannabinoid use has resulted in the safety of others being risked. Most notable are several cases where children were endangered when synthetic cannabis was used. One such case occurred in Rotorua where an eight week old baby and five year old child were found in a house with an unconscious man and a woman who was swaying, slurring and holding her eight week old baby. The woman was convicted of two charges of ill treatment of a child (Stuff 2018).[[1]](#footnote-1)

Another case involved the death of a baby who was left in a hot car while his mother, father and grandmother smoked synthetic cannabis; all three were convicted of manslaughter.[[2]](#footnote-2),[[3]](#footnote-3) Another case again involved the poisoning of three children aged 5, 8 and 14 with synthetic cannabinoids in their dinner. It was unclear how the synthetic cannabinoids had entered the children’s dinner. No charges had been laid at the time of the article.[[4]](#footnote-4)

## 3.4 Therapeutic Value

Although the original synthetic cannabinoids were chemically synthesised for research purposes into psychosis or as analgesics, there have been no currently accepted therapeutic uses of these synthetic cannabinoids. Any therapeutic value information can be found in the attached reports.

## 3.5 Potential to Cause Death

In New Zealand, synthetic cannabinoids have been linked to a number of deaths. The current total is estimated to be thirty deaths from 1 June 2017 to 5 February 2018. In September 2017, it was reported that the majority of ESR testing done in association with the deaths reported in the media found the synthetic cannabinoid AMB-FUBINACA.

International information on the potential for synthetic cannabinoids to cause death can be found in the attached reports.

## 3.6 Potential for Dependence

There is little to no scientific evidence for the dependence potential of synthetic cannabinoids. However, anecdotally, it has been repeatedly reported in the New Zealand media that some users experience a very strong dependence on synthetic cannabinoids.[[5]](#footnote-5),[[6]](#footnote-6)

Additional information on the potential for dependence of synthetic cannabinoids can be found in the attached reports.

# 4.0 CLASSIFICATION

## 4.1 Classification and Regulation in New Zealand (past and present)

All of the synthetic cannabinoids that are being considered at this meeting are considered capable of inducing a psychoactive effect.

Under section 9 of the Psychoactive Substances Act 2013, a psychoactive substance is defined as a substance, mixture, preparation, article, device, or thing that is capable of inducing a *psychoactive effect* (by any means) in an individual who uses the psychoactive substance.

However, a psychoactive substance does not include:

* a controlled drug specified or described in Schedule 1, 2, or 3 of the Misuse of Drugs Act 1975
* a precursor substance specified or described in Schedule 4 of the Misuse of Drugs Act 1975
* a medicine within the meaning of section 3 of the Medicines Act 1981 or a related product within the meaning of section 94 of that Act
* a herbal remedy (within the meaning of section 2(1) of the Medicines Act 1981)
* a dietary supplement (within the meaning of regulation 2A of the Dietary Supplements Regulations 1985)
* anything that is ordinarily used or represented for use as food or drink for human beings
* any alcohol, unless the alcohol contains a psychoactive substance as defined in subsection (1) or (2) that is not alcohol
* any tobacco product (within the meaning of section 2(1) of the Smoke-free Environments Act 1990), unless the tobacco product contains a psychoactive substance as defined in subsection (1) or (2) that is not tobacco
* a substance, mixture, preparation, article, device, or thing that is, or that is of a kind that is, or belongs to a class that is, declared by the Governor-General by Order in Council made under section 99 not to be a psychoactive substance for the purposes of the Act.

## 4.2 International Classification and Experience in Other Jurisdictions

### Australia

In Australia, **synthetic cannabinomimetics** are listed as prohibited substances in Schedule 9 of the Poisons Standard. Schedule 9 prohibited substances are *substances which may be abused or misused, the manufacture, possession, sale or use of which should be prohibited by law except when required for medical or scientific research, or for analytical, teaching or training purposes with approval of Commonwealth and/or State or Territory Health Authorities.*

Other substances listed in Schedule 9 of the Australian Poisons Standard are:

* cannabis
* methcathinone
* heroin
* tetrahydrocannabinols
* JWH-018

### Canada

In Schedule II of Canada’s Controlled Drugs and Substances Act the following synthetic cannabinoids are specifically listed.

* UR-144
* 5F-PB-22
* 5F-AKB-48
* XLR-11 (listed as 5F-UR-144)
* JWH-018
* AM-2201
* AB-FUBINACA

The remaining substances are captured by the descriptions of synthetic cannabinoids in Schedule II of Canada’s Controlled Drugs and Substances Act. These are:

* 5F-ADB
* MDMB-CHMICA
* AMB-FUBINACA.

Other substances in Schedule II of Canada’s Controlled Drugs and Substances Act include:

* Cannabis
* Cannabis resin
* Cannabidiol
* Tetrahydrocannabinol

### United Kingdom

JWH-018 is specifically listed in Part II of Schedule 2 of the UK Misuse of Drugs Act 1971 as a Class B controlled drug. The remaining substances being considered in this submission are likely to also be Class B controlled drugs as described by the following wording in the UK Misuse of Drugs Act.

*any compound (not being clonitazene, etonitazene, acemetacin, atorvastatin, bazedoxifene, indometacin, losartan, olmesartan, proglumetacin, telmisartan, viminol, zafirlukast or a compound for the time being specified in sub-paragraph (c) above) structurally related to 1-pentyl-3-(1-naphthoyl)indole (JWH-018), in that the four sub-structures, that is to say the indole ring, the pentyl substituent, the methanone linking group and the naphthyl ring, are linked together in a similar manner, whether or not any of the sub-structures have been modified, and whether or not substituted in any of the linked sub-structures with one or more univalent substituents and, where any of the sub-structures have been modified, the modifications of the sub-structures are limited to any of the following, that is to say—*

1. *replacement of the indole ring with indane, indene, indazole, pyrrole, pyrazole, imidazole, benzimidazole, pyrrolo[2,3-b]pyridine, pyrrolo[3,2-c]pyridine or pyrazolo[3,4‑b]pyridine;*
2. *replacement of the pentyl substituent with alkyl, alkenyl, benzyl, cycloalkylmethyl, cycloalkylethyl, (N-methylpiperidin-2-yl)methyl, 2-(4-morpholinyl)ethyl or (tetrahydropyran-4-yl)methyl;*
3. *replacement of the methanone linking group with an ethanone, carboxamide, carboxylate, methylene bridge or methine group;*
4. *replacement of the 1-naphthyl ring with 2-naphthyl, phenyl, benzyl, adamantyl, cycloalkyl, cycloalkylmethyl, cycloalkylethyl, bicyclo[2.2.1]heptanyl, 1,2,3,4-tetrahydronaphthyl, quinolinyl, isoquinolinyl, 1-amino-1-oxopropan-2-yl, 1‑hydroxy-1-oxopropan-2-yl, piperidinyl, morpholinyl, pyrrolidinyl, tetrahydropyranyl or piperazinyl.*

Other Class B controlled drugs in the UK Misuse of Drugs Act 1971 are:

* amphetamine
* cannabis and cannabis resin
* codeine
* methylphenidate

### Table 2: United Nations Classification

|  |  |
| --- | --- |
| **Substance** | **Classification under UN Conventions** |
| 5F-ADB  | To be included in Schedule II, of the UN Convention on Psychotropic Substances 1971 (the 1971 Convention) |
| UR-144 | To be included in Schedule II of the 1971 Convention |
| 5F-PB-22 | To be included in Schedule II of the 1971 Convention |
| MDMB-CHMICA | In Schedule II of the 1971 Convention |
| 5F-AKB-48 | In Schedule II of the 1971 Convention |
| XLR-11 | In Schedule II of the 1971 Convention |
| JWH-018 | In Schedule II of the 1971 Convention |
| AM-2201 | In Schedule II of the 1971 Convention |
| AMB-FUBINACA | Has not been considered by the ECDD or CND |
| AB-FUBINACA | Has not been considered by the ECDD or CND  |

### New Zealand obligations under the UN Conventions

As part of complying with obligations for substances in Schedule II of the UN Convention on Psychotropic Substances, New Zealand must:

* limit the manufacture, export, import, distribution and stocks of, trade in, and use and possession of, substances to medical and scientific purposes
* require that the manufacture of, trade (including export and import trade) in, and distribution of substances be under licence or other similar control measure with the exception of persons duly authorized to perform and while performing therapeutic or scientific functions.
* require that substances be supplied or dispensed for use by individuals pursuant to medical prescription only, except when individuals may lawfully obtain, use, dispense or administer such substances in the duly authorized exercise of therapeutic or scientific functions
* Require manufacturers, wholesale distributors, exporters, importers, retail distributors, institutions for hospitalization and care and scientific institutions to keep records showing details of the quantities manufactured and, for each acquisition and disposal, details of the quantity, date, supplier and recipient.
* provide a separate import or export authorisation for each import or export of a substance whether it consists of one or more substances. Before issuing an export authorization New Zealand must also require an import authorization, issued by the competent authority of the importing country or region certifying that the importation of the substance is approved. For importations, when the importation has been effected, the New Zealand Government shall return the export authorization with an endorsement certifying the amount actually imported, to the Government of the exporting country or region
* Comply with the obligations if a country prohibits or places restrictions on the import into its country or into one of its regions of one or more substances.
* maintain a system of inspection of manufacturers, exporters, importers, and wholesale and retail distributors of psychotropic substances and of medical and scientific institutions which use such substances.
* Submit to the INCB annual statistical reports on:
	+ quantities manufactured, exported to and imported from each country or region
	+ stocks held by manufacturers
	+ quantities used in the manufacture of specified exempt preparations, and
	+ quantities used for industrial purposes.
* Subject to its constitutional limitations, each State party shall treat as a punishable offence, when committed intentionally, any action contrary to a law or regulation adopted in pursuance of its obligations under the 1971 Convention

The obligation to require institutions for hospitalisation and care to keep records showing details of the quantities manufactured and, for each acquisition and disposal, details of the quantity, date, supplier and recipient will not be met for substances in Schedule 3 (Class C) of the Misuse of Drugs Act 1975. These record keeping requirements should be met for substances controlled under Schedules 1 and 2 of the Misuse of Drugs Act and substances controlled under the Psychoactive Substances Act 2013.

Currently, the requirements for import and export for substances in Schedule II of the UN Conventions on Psychotropic Substances 1971 are not met by the Psychoactive Substances Act 2013. These requirements would only be met for substances controlled under Schedules 1, 2 or 3 of the Misuse of Drugs Act 1975 (excluding substances listed in Part 6 of Schedule 3).

The reporting requirements for substances used for industrial purposes cannot be met for substances controlled under the Psychoactive Substances Act as substances are only controlled under this Act when they are for the primary purpose of inducing a psychoactive effect. Substances controlled under the Misuse of Drugs Act would only meet the INCB reporting requirements when scheduled in Schedule 1 or 2, or parts 2 or 3 of Schedule 3.

# 5.0 OTHER RELEVANT INFORMATION

## 5.1 Dosage/ EC50 and proposed amount for the presumption of supply

Currently, the default level at and over which controlled drugs are presumed to be for supply in the Misuse of Drugs Act is 56 grams. Suggested dosages identified in the WHO critical review reports indicate that a presumption of supply of 56 g would allow an extremely high number of dosages to be held before a supply penalty would apply. For the least potent substance in this series, UR-144, if it were used at its suggested maximum dosage of 20 mg, 56 g would be equivalent to 2800 doses and for the most potent substance in this series, 5F-ADB, if it were used at its suggested dosage of 0.05 mg, 56 g would be equivalent to 1120000. Therefore, a lower level for the presumption of supply could be considered.

The table below shows measured EC50[[7]](#footnote-7)values and compares this to anecdotal dosage information. The ranking of potency based on the EC50 values appears to roughly correlate to the anecdotal dosages. The anecdotal dosages have then been used to propose a level at and over which the substances could be presumed to be for supply.

Generally, the current presumption of supply levels in the Misuse of Drugs Act are for quantities at and over 100 doses or 25 doses of a substance. Given the prevalence and apparent risk of harm of the synthetic cannabinoids in New Zealand, it would be reasonable to propose a presumption of supply at and over 25 doses.

### Table 3: Potency, anecdotal dosage and proposed quantities for presumption of supply

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Substance** | **EC50 at CB1 receptor[[8]](#footnote-8)**  | **EC50 at CB1 receptor[[9]](#footnote-9)**  | **EC50 at CB1 receptor[[10]](#footnote-10)** | **Anecdotal dosage[[11]](#footnote-11) (mg)** | **Supply** **100x (max) (mg)** | **Supply****25x****(max)****(mg)** | **Supply on plant material 25x****(max)****(mg)** |
| 5F-ADB  |  |  | 0.59 nM | 0.050  | 5  | 1.25 | 78.125 |
| UR-144 | 421 nM |  |  | 2.5-20  | 2000  | 500 | 31250 |
| 5F-PB-22 | 2.8 nM |  |  | 1-8  | 800  | 200 | 12500 |
| MDMB-CHMICA |  |  | 10 nM | 0.1-15  | 1500  | 375 | 23437.5 |
| 5F-AKB-48 |  |  |  | 1-2  | 200  | 50 | 3125 |
| XLR-11 | 98 nM |  |  | None reported | N/A | N/A | N/A |
| JWH-018 | 102 nM | 18 nM  |  | 2-5  | 500  | 125 | 7812.5 |
| AM-2201 | 38 nM |  |  | 0.25-2  | 200  | 50 | 3125 |
| AMB-FUBINACA |  |  | 2.0 nM | From 0.007  | From 0.7  | From 0.175 | 10.9375 |
| AB-FUBINACA |  | 1.8 nM |  | 0.25-3  | 300  | 75 | 4687.5 |

*Note that the EC50 values can vary depending on the test performed and even between the same test performed at different times (as shown by the two JWH-018 measurements). These have been provided to allow comparative potency to be considered.*

The recommended dosage of substances in the table above are all based on anecdotal information. This means that the recommended dosages could be incorrect or could vary according to individuals. For this reason it may be reasonable to apply one presumption of supply limit for all of the synthetic cannabinoids considered here. If this were to be used, then the median level of supply for 25 doses of substance (from the table above) could be used; this would be 75 mg.

It is also important to consider how a presumption of supply limit will be applied. When it is for the pure substance, wording such as the following could be appropriate.

1. 75 milligrams or 25 flakes, tablets, capsules, or other drug forms each containing some quantity of the drug.

or

1. 75 milligrams, whether or not contained in a substance, preparation, or mixture

If the first set of wording were proposed, then a specific limit for presumption of supply of the substance when applied to plant material would also be preferable. In Schedule 5 of the Misuse of Drugs Act, plant material is generally treated as cigarettes, eg, for cannabis preparations, the quantity defined as being for supply is at or above 5 g or 100 cigarettes containing the drug, and for cannabis plant, the quantity defined as being for supply is at or above 28 g or 100 cigarettes containing the drug. However, without defining the size of a cigarette, this is not practical for determining if synthetic cannabis plant material is for supply when it is not rolled into a cigarette as the weight of the plant material could cause amounts for individual use to fall into the quantities specified for supply. Most synthetic cannabis plant material is confiscated as loose dried plant material and not as a cigarette so the presumption of supply is better suited to weight of plant material.

If we take the mean concentration of AMB-FUBINACA which appeared in the samples in New York (referred to in the “methods and ease of manufacturing” section) of 16.0 mg/g and consider that one dose of AMB-FUBINACA is 0.007 mg (taken from the maximum anecdotal dosage in the table above). At a concentration of 16.0 mg/g, 0.007 mg of AMB-FUBINACA would require 0.4375 mg of plant material. For 25 doses this would be roughly 11 mg and for 100 doses this would be roughly 44 mg.

As AMB-FUBINACA appears to be one of the more potent substances considered in this report, it may be more appropriate to set a presumption of supply level in line with the substance with a median potency and therefore the median maximal dose (AB-FUBINACA). As we currently do not have a known concentration for AB-FUBINACA on plant material the mean concentration of AMB-FUBINACA which appeared in the samples in New York will be used again for these calculations (16.0 mg/g). One maximum dose of AB-FUBINACA is 3 mg (taken from the maximum anecdotal dosage in the table above). At a concentration of 16.0 mg/g, 3 mg of AB-FUBINACA would require 187.5 mg of plant material. For 25 doses this would be roughly 4688 mg (4.688 g) and for 100 doses this would be roughly 18750 mg (18.750 g).

Following the median maximum value, it would be reasonable to set the level of supply for a synthetic cannabinoid applied to plant material at 5 g. This could allow wording such as the following.

*75 milligrams or 25 flakes, tablets, capsules, or other drug forms each containing some quantity of the drug or 5 grams of plant material when substance has been applied to plant material*.

**Proposed options** (exact wording to be determined when changes to legislation are drafted):

1. 75 milligrams or 25 flakes, tablets, capsules, or other drug forms each containing some quantity of the drug or 5 grams of plant material when substance has been applied to plant material.
2. 75 milligrams, whether or not contained in a substance, preparation, or mixture.

## 5.2 Background and history of use in New Zealand

In New Zealand, prior to commencement of the Psychoactive Substances Act 2013, psychoactive substances including synthetic cannabinoids were unregulated. Psychoactive products had been sold in shops for about 10 years however their popularity increased significantly in 2010 when they began to be sold from dairies. By mid-2013, there were an estimated 300 psychoactive products being sold from an estimated 4000 premises.

Between August 2011 and July 2013 the Minister of Health issued a number of Temporary Class Drug Notices under the Misuse of Drugs Act 1975 (Temporary Class Drug Notice), banning 35 substances and 50 products from sale. This had the effect of imposing 12 month temporary bans on the supply and sale of a number of psychoactive substances, including synthetic cannabinoid substances and products.

Temporary Class Drug Notices were a holding measure until the Psychoactive Substances Act 2013 took effect. The number of synthetic cannabinoid products available in New Zealand had escalated, as had the number and variety of new products on the market containing them. There had been a corresponding increase in adverse effects reported to the Centre for Adverse Reactions Monitoring, National Poisons Centre and the Alcohol Drug Helpline associated with their use, resulting in increased public concern.

The Psychoactive Substances Act came into force on 18 July 2013. The purpose of the Act is to regulate the availability of psychoactive substances in New Zealand to protect the health of, and minimise harm to, the individuals who use these substances. It set up a system of pre-market approval for psychoactive products by requiring that applicants demonstrate that the products pose no more than a low risk of harm to the individuals who use them, and by placing restrictions on how and to whom they can be sold. The requirements closely resemble the pre-market approval regime for medicines.

The Psychoactive Substances Act establishes an Authority to ensure that products meet adequate safety requirements before they can be distributed in New Zealand. The Authority approves products and grants licences to importers, researchers, manufacturers, wholesalers and retailers. In the establishment phase of the regime, between July 2013 and November 2014, a number of importers, manufacturers, wholesalers and retailers were granted interim licences. Forty seven products which were already available on the local market 3 months prior to commencement of the Act were given interim approval.

Of the 47 products given interim approval in the establishment phase of the Act, eleven products were subsequently removed from sale, on safety grounds following reports of severe adverse effects received by the National Poisons Centre.

These reports included case histories of users who had suffered collapse, vomiting, rapid heart rate, low blood pressure requiring resuscitation and reports of severe withdrawal effects of anxiety, nausea and vomiting when attempting to stop use of this substance. These product withdrawals occurred prior to 8 May 2014 when all approvals were revoked with amendment to the Act.

The Psychoactive Substances Amendment Act 2014 (the Amendment Act) revoked all interim product approvals as well as interim wholesale and retail licences, resulting in a recall of all products. The Amendment Act also introduced a restriction on using trials that involve animal testing to support a product approval application.

On 3 November 2014 the Psychoactive Substances Regulations 2014 came into force. This allows for product approval applications and licence applications to import, research, manufacture, and sell unapproved psychoactive substances to be made to the Authority. To date, no psychoactive substance or product has been approved by the Authority.

### Previous Temporary Class Drug Notices

UR-144 was controlled under a Temporary Class Drug Notice:

* effective 6 April 2012, New Zealand Gazette, 29 March 2012, 37: 1105
* renewed 7 April 2013, New Zealand Gazette, 4 April 2013, 39: 1187.

5F-AKB-48 (or APINACA 5-fluoropentyl analog or 5F-APINACA) was controlled under a Temporary Class Drug Notice:

* effective 9 May 2013, New Zealand Gazette, 2 May 2013, 48:1456

XLR-11 was controlled under a Temporary Class Drug Notice:

* effective 13 July 2012, New Zealand Gazette, 5 July 2012, 79:2160
* renewed 14 July 2013, New Zealand Gazette, 11 July 2013, 88:2354.

JWH-018 was controlled under a Temporary Class Drug Notice:

* effective 16 August 2011, New Zealand Gazette, 9 August 2011, 122: 3365
* renewed 17 August 2012, New Zealand Gazette, 9 August 2012, 94: 2589.

AM-2201 was controlled under a Temporary Class Drug Notice:

* effective 16 August 2011, New Zealand Gazette, 9 August 2011, 122: 3365
* renewed 17 August 2012, New Zealand Gazette, 9 August 2012, 94: 2589.

The Temporary Class Drug Notices for the above substances were repealed on 18 July 2013, by section 110(1) of the Act (2013 No 53). These synthetic cannabinoids were not given interim approval upon commencement of the Act.

### Interim Approvals

Forty-seven products were given interim approval in the establishment phase of the Psychoactive Substances Act.

Eight of these 47 products contained 5F-PB-22. One of the 11 products with interim approval that was subsequently removed from sale on safety grounds following reports of severe adverse effects contained 5F-PB-22.

The table below lists those products containing 5F-PB-22 and the date when the respective product approval was revoked.

| **Application Number**  | **Product Name**  | **Psychoactive substance\***  | **Approval revoked****2014** |
| --- | --- | --- | --- |
| P0024  | Illusion Connoisseur  | PB22-5F  | 8 May  |
| P0025  | Illusion Massif  | PB22-5F  | 8 May  |
| P0033  | DC-3 Purple  | 5F-PB-22  | 8 May  |
| P0034  | Puff Southern Lights  | PB22-5F  | 8 May  |
| P0041  | Tai High Purple Passion  | PB22-5F  | 8 May  |
| P0047  | WTF  | PB22-5F  | 1 May  |
| P0049  | Mind Trip  | PB-22, 5F-PB-22  | 8 May  |
| P0050  | Kush Pink  | Pb 22, pb 22-5f  | 8 May  |

Of the products given interim approval in the establishment phase of the Psychoactive Substances Act, nine products contained AB-FUBINACA. Four of the 11 products with interim approval that were subsequently removed from sale on safety grounds contained AB-FUBINACA.

Adverse effects reported for products containing AB-FUBINACA included two cases of hospitalisation (one occurring after the individual suffered multiple seizures), and two medically significant events.

The table below lists those products containing AB-FUBINACA and the date when the respective product approval was revoked.

| **Application Number**  | **Product Name**  | **Approval revoked****2014** |
| --- | --- | --- |
| P0005  | Apocalypse  | 1 May  |
| P0006  | Outbreak  | 1 May  |
| P0026  | Illusion Peak  | 8 May  |
| P0028  | Amsterdam Havana Special  | 8 May  |
| P0031  | Blueberry Crush | 1 May  |
| P0044  | Tai High Bubble Berry  | 8 May  |
| P0046  | Master Kush  | 8 May  |
| P0051  | Lemon Grass  | 1 May  |
| P0052  | Choco Haze  | 8 May  |

### Neither Temporary Class Drug Notices nor Interim Approvals

As 5F-ADB is a relatively new substance in New Zealand, no Temporary Class Drug Notices or interim product approvals were issued.

As MDMB-CHMICA and AMB-FUBINACA were first detected in 2014, they have not been the subject of Temporary Class Drug Notices or interim product approvals issued under the Psychoactive Substances Act.

### Table 5: Summary of historical classification in New Zealand

|  |  |
| --- | --- |
| **Substance** | **Historical classification in NZ** |
| 5F-ADB  | Neither Temporary Class Drug Notices nor Interim Approval |
| UR-144 | Temporary Class Drug Notice |
| 5F-PB-22 | Interim Approval |
| MDMB-CHMICA | Neither Temporary Class Drug Notices nor Interim Approval |
| 5F-AKB-48 | Temporary Class Drug Notice |
| XLR-11 | Temporary Class Drug Notice |
| JWH-018 | Temporary Class Drug Notice |
| AM-2201 | Temporary Class Drug Notice |
| AMB-FUBINACA | Neither Temporary Class Drug Notices nor Interim Approval |
| AB-FUBINACA | Interim Approval  |

## 5.3 Anticipated future trends

Synthetic cannabinoid use in New Zealand is expected to continue and the numbers of people using synthetic cannabinoids may rise. Synthetic cannabinoids are particularly appealing to vulnerable populations as they are cheap to buy and can have very strong effects, this is unlikely to change in the future. The addictive nature of synthetic cannabinoids makes it very hard for some users to quit using “synthetic cannabis” without a medical intervention. Information currently available on the synthetic cannabinoids (including anecdotal information) indicates that synthetic cannabinoids are more harmful than the Class C1 controlled drug cannabis.

# 6.0 CLASSIFICATION OPTIONS

Note that, although the synthetic cannabinoids are being considered together, if the Committee considers that they have different risks of harm, different scheduling recommendations can be applied to each substance considered. The same applies for recommending a presumption of supply, different levels can be set if the Committee considers this appropriate. See **Section 5** of this report for discussion and options proposed for the presumption of supply.

**Option 1: Status Quo – the synthetic cannabinoids continue to be controlled under the Psychoactive Substances Act 2013**

If synthetic cannabinoids remain unscheduled under the Misuse of Drugs Act 1975 they can still be captured under the Psychoactive Substance Act 2013 when used for the primary purpose of inducing a psychoactive effect. Penalties for the misuse of synthetic cannabinoids (listed in the table below) will be controlled in line with substances that have a low risk of harm.

Control under the Psychoactive Substances Act will mean that New Zealand will continue not complying with their obligations under the United Nations Conventions on Psychotropic Substances 1971.

**Option 2: Scheduled as Class A controlled drugs under the Misuse of Drugs Act 1975**

If the Committee considers that the synthetic cannabinoids have a very high risk of harm, in line with substances such as methamphetamine and cocaine, they can recommend scheduling them in Schedule 1 as Class A controlled drugs.

Control under Schedule 1 of the Misuse of Drugs Act 1975 will allow New Zealand to comply with their obligations under the United Nations Conventions on Psychotropic Substances 1971.

**Option 3: Scheduled as Class B controlled drugs under the Misuse of Drugs Act 1975**

If the Committee considers that the synthetic cannabinoids have a high risk of harm they can recommend scheduling them in Schedule 2 as Class B controlled drugs. Schedule 2 has three parts, substances such as MDMA and THC are listed in Part 1, substances such as pseudoephedrine and pyrovalerone are listed in Part 2 and substances such as oxycodone, pethidine and thebaine are listed in Part 3. For a full breakdown of the differences in control between these parts of Schedule 2, please see the EACD Guidelines.

Control under Schedule 2 of the Misuse of Drugs Act 1975 will allow New Zealand to comply with their obligations under the United Nations Conventions on Psychotropic Substances 1971.

**Option 4: Scheduled as Class C controlled drugs under the Misuse of Drugs Act 1975**

If the Committee considers that the synthetic cannabinoids have a moderate risk of harm they can recommend scheduling them in Schedule 3 as Class C controlled drugs.

Schedule 3 has seven parts:

* substances such as cannabis, coca leaf and BZP are listed in Part 1
* codeine, dihydrocodeine and proxyphene are listed in Part 2 with some exceptions
* substances such as nicocodine, ethylmorphine and propiram are listed in Part 3
* substances such as ketamine and derivatives of barbituric acid are listed in Part 4
* benzodiazepines and lefetamine are listed in Part 5
* preparations of various controlled drugs are listed in Part 6
* examples of controlled drug analogues are listed in Part 7.

For a full breakdown of the differences in control between these parts of Schedule 3, please see the EACD Guidelines.

Control under Schedule 3 of the Misuse of Drugs Act 1975 will mean that New Zealand will continue not complying with their obligations under the United Nations Conventions on Psychotropic Substances 1971.

### **Table 6: Comparison of Penalties**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Schedule 1Class A Drugs** | **Schedule 2Class B Drugs** | **Schedule 3Class C Drugs** | **Psychoactive Substances Act**  |
| **Importation, manufacture, or supply** | Life imprisonment (subject to presumption of supply) | Up to 14 years imprisonment (subject to presumption of supply) | Up to 8 years imprisonment | Up to 2 years imprisonment (for individuals) or a fine not exceeding $500,00 (for a body corporate) |
| **Conspiracy to commit an offence** | Up to 14 Years imprisonment | Up to 10 years imprisonment | Up to 7 years imprisonment | N/A |
| **Possession** | Up to 6 months imprisonment or $1,000 fine or both | Up to 3 months imprisonment or $500 fine or both | Up to 3 months imprisonment or $500 fine or both | A fine not exceeding $500 |

# 7.0 FUTURE ACTIONS

If the recommendation is to schedule the synthetic cannabinoids under the Misuse of Drugs Act, a letter to the Minister of Health from the Chair informing him of the Committee’s recommendation will be needed. The Secretariat will present the letter to the Minister of Health along with advice from the Ministry of Health on the scheduling recommendation. If the Minister agrees to the Committee’s recommendation, a Cabinet paper will be prepared for Cabinet to agree to action the Committee’s recommendation. The Secretariat may also consult with stakeholders on the Committee’s recommendation prior to progressing their recommendation to Cabinet.

If the decision is to keep the status quo, no action will be required.

# 8.0 REFERENCES

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7. EC50 is the concentration of a drug that gives a response halfway between the base line and maximum. EC50 is measured in nanomolar units, abbreviated as nM. [↑](#footnote-ref-7)
8. Banister et al 2015a [↑](#footnote-ref-8)
9. Banister et al 2015b [↑](#footnote-ref-9)
10. Banister et al 2016 [↑](#footnote-ref-10)
11. Figures taken from WHO ECDD reports appended to this report – these figures are anecdotal and unverified. Figures for the dosage of AMB-FUBINACA and AB-FUBINACA are taken from the Reddit Research Chemicals and Tripsit websites respectively – these figures are also anecdotal and unverified. [↑](#footnote-ref-11)