Synthetic cannabinoids: Report to the Expert Advisory Committee on Drugs

Prepared by the Ministry of Health

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SUMMARY

Purpose

Five synthetic cannabinoids are being presented to the Committee for consideration. Three of the synthetic cannabinoids (CUMYL-4CN-BINACA, ADB-FUBINACA and ADB-CHMINACA) have 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. Two additional synthetic cannabinoids (5F-MDMB-PICA and NM-2201) are also being presented for consideration due to their presence in New Zealand and the risk associated with them.

This paper provides information on specific synthetic cannabinoids and options for scheduling them under the Misuse of Drugs Act 1975. Reports on CUMYL-4CN-BINACA, ADB-FUBINACA and ADB-CHMINACA that have been prepared by the World Health Organization (WHO) will be provided alongside this paper. For 5F-MDMB-PICA and NM-2201, a separate paper prepared by the Ministry of Health is provided alongside this report.

In this paper, 'synthetic cannabis' refers to a dried herb or plant material sprayed with one or more synthetic cannabinoids, with the aim being to imitate the effects of Δ9-tetrahydrocannabinol (THC) in natural cannabis.

Substances

The synthetic cannabinoids to be considered by the Committee are:

- CUMYL-4CN-BINACA (WHO ECDD report attached)
- ADB-FUBINACA (WHO ECDD report attached)
- ADB-CHMINACA (WHO ECDD report attached)
- 5F-MDMB-PICA (Ministry of Health (MOH) prepared report attached)
- NM-2201 (MOH prepared report attached).

1.0 SUBSTANCE IDENTIFICATION AND CHEMISTRY

1.1 Identification

Identification information can be found in section one of the attached WHO ECDD report and section 2a of the attached MOH report.

1.2 Therapeutic Value

Although synthetic cannabinoids were originally chemically synthesised for the purpose of research into psychosis or as analgesics, there are currently no accepted therapeutic uses of these synthetic cannabinoids.

1.3 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 Δ^9-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.

Most new synthetic cannabinoids follow the same basic structure of an indole or indazole core with an ester, amide or ketone linker, a linked group (which is often a ring or amino acid derivative) and a side chain attached to the nitrogen of the indole or indazole core (Hess et al 2016; EMCDDA 2016).

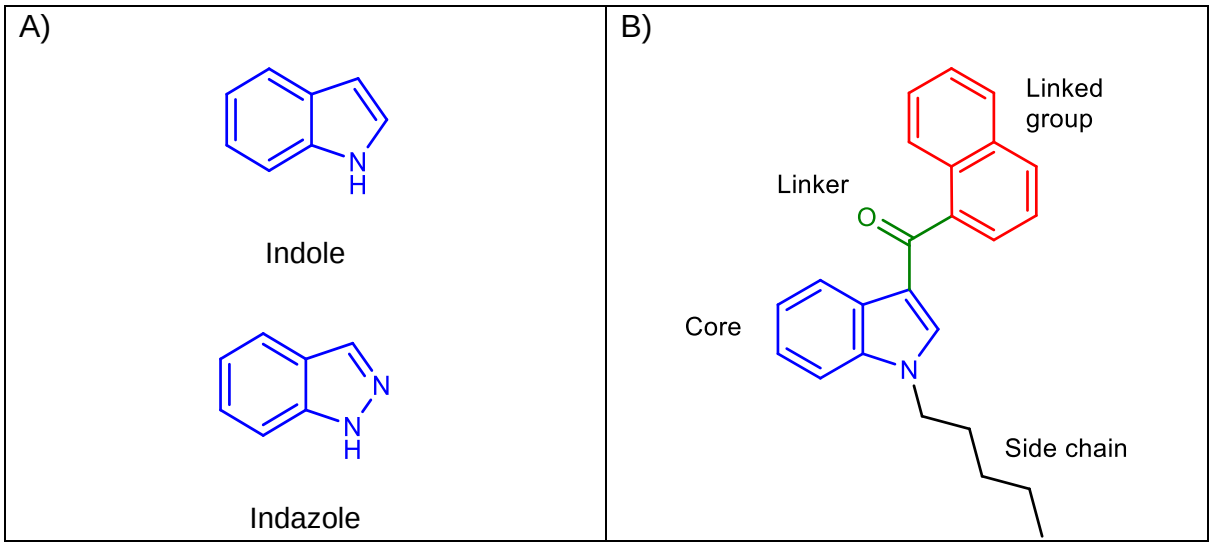

Figure 1: a) examples of indole and indazole structures B) example of synthetic cannabinoid structure.

1.4 Methods and ease of manufacturing

In New Zealand synthetic cannabinoids are generally imported in powder form. The imported synthetic cannabinoids are dissolved in a 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. 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. The manufacturing process which is uncontrolled can result in inconsistent, poor quality and unsafe batches of product.

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.

Internationally, synthetic cannabinoids are manufactured into liquids that can be vaped (Breitbarth et al 2018). This trend may be seen in NZ in the near future.

2.0 RISK OF HARM

2.1 Likelihood or evidence of abuse

Seizure data indicates that synthetic cannabinoids are available 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 cannabis is cheaper to buy than natural cannabis, and this makes it potentially appealing to vulnerable populations such as young, poor and homeless populations.

The WHO Review of the synthetic cannabinoids CUMYL-4CN-BINACA, ADB-FUBINACA and ADB-CHMINICA (see attached WHO ECDD reports) 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	Year	Number of seizures	Total quantity seized (Powder)
CUMYL-4CN-BINACA	2017	-	-
	2018	-	-
	2019	-	-
ADB-FUBINACA	2017	4	246 g
	2018	-	-
	2019	-	-
ADB-CHMINACA	2017	-	-
	2018	-	-
	2019	-	-
5F-MDMB-PICA	2017	2	1018 g
	2018	7	294
	2019	4	506
NM-2201	2014	1	2 g
	2015	-	-
	2016	1	19 g
	2017	1	53 g
	2018	-	-
	2019	-	-

Note: Data includes “suspected” substances which have only been analysed using field tests. The data above is provided by the New Zealand Police.

2.2 Specific Effects

2.2.1 Toxicology

Toxicology information can be found in section five of the attached WHO ECDD reports and section 3b of the attached MOH report.

2.2.2 Pharmacology

Pharmacology information can be found in section four of the attached WHO ECDD reports and section 3b of the attached MOH report.

2.3 Risks to Public Health

The use of synthetic cannabinoids poses a risk to both the individual user and the wider public. Synthetic cannabinoids are potent substances therefore only a small amount is necessary to cause an effect. Due to the ad hoc manufacturing process with poor quality control used when making synthetic cannabis, there is a risk of toxic effects including overdose. This combined with the dependence potential of these substances results in significant risks for users[1].

While overdoses by individuals are common, internationally there have been a number of overdose clusters due to synthetic cannabinoids. In December 2015, 25-30 people in Ocala, Florida were taken to local hospitals following episodes of violence, fighting and experiencing seizures. Local laboratory analysis confirmed drug evidence seized from the overdose cluster as NM-2201[2].

Impairment by the substances can also result in risks to the user and the wider public. In Taranaki it was identified that the driver of a car that caused a crash killing 7 people including two children, in June 2018, had taken synthetic cannabis prior to driving[3]. The Coroner concluded that the driver was impaired due to use of synthetic cannabis and that this was a major cause of the crash.

2.4 Potential to Cause Death

In New Zealand, the Coroner has confirmed that 24 people have died directly as a result of using synthetic cannabis since June 2017 and a further 50 cases where it appears to have been responsible[4]. ESR has detected ADB-FUBINACA in two cases and 5F-MDMB-PICA has been identified in 7 cases reported to the coroner between May 2017 and May 2019 (ESR, 2019 attached). International information on the potential for synthetic cannabinoids to cause death can be found in section six of the attached WHO ECDD reports.

2.5 Physical or Psychological Dependence

The evidence on the potential of dependence to synthetic cannabinoids are limited. There are increasing reports of a withdrawal syndrome in humans (Curren et al 2016; Nacca et al 2013; Macfarlane and Christie 2015) as well as in animal studies demonstrating the development of dependence in rats (Aceto et al 2001). However, anecdotally, it has been repeatedly reported in the New Zealand media that some users experience a very strong dependence on synthetic cannabinoids[5,6.]

Additional information on the potential for dependence of synthetic cannabinoids can be found in section 7 of the attached WHO ECDD reports.

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[1] "Watching our mates drop dead': New Zealand's synthetic cannabis crisis' *The Guardian* 23 October 2018

[2] 'Schedules of Controlled Substances: Temporary Placement of NM2201, 5F-AB-PINACA, 4-CN-CUMYL-BUTINACA, MMB-CHMICA and 5F-CUMYL-P7AICA Into Schedule' United States of America Federal Register, 30 May 2018, 15(104): 24696-24701

[3] 'Drugged driver blamed for Waverley crash that killed seven' *Stuff* 28 June 2019

[4] 'Four deadly synthetic cannabinoids identified' *Radio New Zealand* 11 September 2019

[5] 'Synthetic cannabis 'worse than meth' according to addiction specialist'. *NZ Herald* 27 July 2017.

[6] 'Synthetic cannabis - a fatal addiction. The short life and tragic death of Calum Jones'. *NZ Herald*.15

3.0 CLASSIFICATION

3.1 Classification and Regulation in New Zealand

CUMYL-4CN-BINACA, ADB-FUBINACA, ADB-CHMINICA are not scheduled under the Medicines Act 1981 or the Misuse of Drugs Act 1975.

CUMYL-4CN-BINACA, ADB-FUBINACA and ADB-CHMINICA are likely to be captured under the Psychoactive Substances Act 2013, when used for the primary purpose of inducing a psychoactive effect. The Psychoactive Substances Act is intended to control substances with a low risk of harm.

The analogue status of CUMYL-4CN-BINACA, ADB-FUBINACA, ADB-CHMINICA under the Misuse of Drugs Act is currently under assessment.

3.2 International Classification

3.2.1 Australia

Synthetic cannabinomimetics are listed as prohibited substances in Schedule 9 of the Poisons Standard.

3.2.2 Canada

The substances in this submission are likely to be captured by Schedule II of Canada's Controlled Drugs and Substances Act which includes the description "Synthetic cannabinoid receptor type 1 agonists, their salts, derivatives, isomers, and salts of derivatives and isomers"

3.2.3 United Kingdom

The substances being considered in this submission may be captured as Class B controlled drugs under the UK Misuse of Drugs Act 1971 by a description of a broad range of synthetic cannabinoids.

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

- amphetamine
- cannabis and cannabis resin
- codeine
- methylphenidate

3.3 United Nations Classification

Substance	Classification under UN Conventions
CUMYL-4CN-BINACA	In Schedule II of the 1971 Convention
ADB-FUBINACA	In Schedule II of the 1971 Convention
ADB-CHMINACA	In Schedule II of the 1971 Convention
5F-MDMB-PICA	Has not been considered by the ECDD or CND
NM-2201	Has not been considered by the ECDD or CND

4.0 OTHER RELEVANT INFORMATION

4.1 Anticipated future trends

Synthetic cannabinoid use in New Zealand is expected to continue and the numbers of people using synthetic cannabinoids may rise. Synthetic cannabis is particularly appealing to vulnerable populations as it is 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.

4.2 Presumption of supply

In the April 2018 report to the Committee on synthetic cannabinoids, it was proposed that a presumption of supply amount be set for synthetic cannabinoids based on the potency and the anecdotal dosage of the substances. Problems with this approach included relying on anecdotal evidence to determine what a “typical dose” was and a number of other assumptions that needed to be made for proposing a practical presumption of supply for “synthetic cannabis”.

After discussion with the National Drug Intelligence Bureau, it is proposed that the presumption of supply for synthetic cannabinoids align with cannabis.

The presumption of supply for cannabis plant is 28 g or 100 cigarettes containing the drug. We propose that the same amount of plant material containing the synthetic cannabinoids are also presumed to be for supply; that is, an amount at and over

28 grams

Since those who are supplying synthetic cannabis will likely need to hold an amount of the pure substance, it is also reasonable to set a presumption of supply for the pure substance.

Given that the cannabinoids are full CB1 receptor agonists, compared to THC which is a partial CB1 receptor agonist, an alternative approach (and more practical from a Police perspective) would be to set the presumption of supply amount for the pure substances at the same level as that set for tetrahydrocannabinols (250 mg). We are aware that the synthetic cannabinoids generally have a stronger effect than THC at the CB1 receptors, however, given the fairly low presumption of supply level for tetrahydrocannabinols, we consider the amount to be appropriate and practical. For these reasons we propose that the amount of the synthetic cannabinoids (except when contained in plant material) are presumed to be for supply at and over

250 mg, whether or not contained in a substance, preparation, or mixture

A presumption of supply of 28 g of plant material containing the synthetic cannabinoids and 250 mg of synthetic cannabinoids (except when contained in plant material) was previously considered and recommended by the EACD for the synthetic cannabinoids; 5F-ADB and AMB-FUBINACA. However this recommendation was not accepted and the default presumption of supply amount of 56 g was applied.

4.3 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, 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 also 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 Psychoactive Substances 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. The Psychoactive Substances Act establishes an Authority to ensure that products meet adequate safety requirements before they can be distributed in New Zealand.

In the establishment phase of the regime, between July 2013 and November 2014, 47 products which were already available on the local market three months prior to commencement of the Act were given interim approval. The Psychoactive Substances Amendment Act 2014 revoked all interim product approvals, resulting in a recall of all products. To date, no psychoactive substance or product has been approved by the Authority. Removing products from the shelves has resulted in unregulated, illicit use of synthetic cannabinoids.

5.0 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 4.2 and 5.1 of this report for discussion and options proposed for the presumption of supply.

In order to meet our obligations under the UN Conventions, the substances in this paper would need to be placed in either Schedule 1 (Class A) or Schedule 2 (Class B) of the Misuse of Drugs Act 1975.

New Zealand would not meet international obligations if the status quo (controlled as Class C controlled drug analogues or controlled by the Psychoactive Substance Act), were retained or if the substances were scheduled as Class C controlled drugs.

Option 1: **Status Quo. Decline to specifically schedule CUMYL-4CN-BINACA, ADB FUBINACA, ADB-CHMINACA, 5F-MDMB-PICA and/or NM-2201 under The Misuse of Drugs Act.**

Currently, CUMYL-4CN-BINACA, ADB FUBINACA, ADB-CHMINACA, 5F-MDMB-PICA are controlled as either control drug analogues under Schedule 3 of the Misuse of Drugs Act or under the Psychoactive Substances Act.

Control under Schedule 3 of the Misuse of Drugs Act and the Psychoactive Substances Act will mean that New Zealand will not comply with some obligations under the United Nations Conventions on Psychotropic Substances 1971.

Option 2: Schedule CUMYL-4CN-BINACA, ADB FUBINACA, ADB-CHMINACA, 5F-MDMB-PICA and/or NM-2201 as Class A controlled drugs under the Misuse of Drugs Act 1975

Substances posing a very high risk of harm to individuals or society that are highly addictive and liable to abuse, or are easily convertible into drugs that are similarly addictive and liable to abuse. These substances generally have very little to no therapeutic value.

If the Committee considers that CUMYL-4CN-BINACA, ADB FUBINACA, ADB-CHMINACA, 5F-MDMB-PICA and/or NM-2201 have a very high risk of harm, they can recommend scheduling in Schedule 1 as Class A controlled drugs.

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

Scheduling these synthetic cannabinoids as Class A controlled drugs is in line with previous recommendations (such as 5F-ADB and AMB-FUBINACA).

Option 3: Schedule CUMYL-4CN-BINACA, ADB FUBINACA, ADB-CHMINACA, 5F-MDMB-PICA and/or NM-2201 as Class B controlled drugs under the Misuse of Drugs Act 1975

Substances posing a high risk of harm to individuals or society that can be highly addictive and liable to abuse, or are easily convertible into drugs that are similarly addictive and liable to abuse. These substances can have little to moderate therapeutic use.

If the Committee considers that CUMYL-4CN-BINACA, ADB FUBINACA, ADB-CHMINACA, 5F-MDMB-PICA and/or NM-2201 have a high risk of harm they can recommend scheduling them in Schedule 2 as Class B controlled drugs. Schedule 2 has three parts. 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 will mean that New Zealand will comply with their obligations under the United Nations Conventions on on Psychotropic Substances 1971.

Scheduling these synthetic cannabinoids as Class A controlled drugs is in line with previous recommendations (such as JWH-018, AM-2201 and AB-FUBINACA).

Option 4: Schedule CUMYL-4CN-BINACA, ADB FUBINACA, ADB-CHMINACA, 5F-MDMB-PICA and/or NM-2201 as Class C controlled drugs under the Misuse of Drugs Act 1975

Substances posing a moderate risk of harm to individuals or society and a moderate to high risk of abuse and dependency, or are easily convertible into drugs that are similarly addictive and liable to abuse. These substances can have little to great therapeautic use.

If the Committee considers that CUMYL-4CN-BINACA, ADB FUBINACA, ADB-CHMINACA, 5F-MDMB-PICA and/or NM-2201 have a moderate risk of

harm they can recommend scheduling them in Schedule 3 as a Class C controlled drug.

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

Depending on which part of Schedule 3 the Committee decides to control these substances, New Zealand will not comply with some of their obligations under the United Nations Conventions on Psychotropic Substances 1971.

Comparison of Penalties

	Schedule 1 Class A Drugs	Schedule 2 Class B Drugs	Schedule 3 Class 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

5.1 Presumption for supply

Option 1: Status Quo

No presumption of supply is set, meaning the default amount of 56 grams is applied.

Option 2:

The following presumptions of supply are proposed for the following synthetic cannabinoids:

- CUMYL-4CN-BINACA
- ADB-FUBINACA
- ADB-CHMINACA
- 5F-MDMB-PICA
- NM-2201

The controlled drugs listed in the first column are presumed to be for supply at and over the amount, level, or quantity listed in the second column.

CUMYL-4CN-BINACA, ADB FUBINACA, ADB-CHMINACA, 5F-MDMB-PICA, NM-2201 (except when contained on plant material)	250 milligrams, whether or not contained in a substance, preparation, or mixture
Plant material containing CUMYL-4CN-BINACA, ADB-FUBINACA, ADB-CHMINACA, 5F-MDMB-PICA, NM-2201	28 grams

6.0 FUTURE ACTIONS

Following the Committee's recommendation, 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 schedule the specified synthetic cannabinoids under the Misuse of Drugs Act, a Cabinet paper will be prepared for Cabinet to agree to action the recommendation. The Secretariat may also consult with stakeholders on the recommendation prior to progressing it to Cabinet.

9.0 REFERENCES

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