LETHAL HIGHS
ABUSE OF NOVEL DESIGNER DRUGS
AND POLICY INTERVENTIONS

Policy Report
March 2019

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# TABLE OF CONTENTS

- Executive Summary  2
- Introduction  3
- Novel Designer Drugs  4
  - Synthetic Cannabinoids  4
  - Synthetic Cathinones  6
- Policy Interventions  8
  - Customs Detection  9
  - Mail Screening  10
  - A Comprehensive Ban  10
  - Public Messaging  11
  - International Cooperation  12
- Conclusion  12
- About the Authors  13
- About the Science and Technology Studies Programme  13
- About the S. Rajaratnam School of International Studies  13
EXECUTIVE SUMMARY

The abuse of novel designer drugs is on the rise. Deadlier than conventional plant-based street drugs, these synthetic psychoactive substances are manufactured and trafficked in such a way as to avoid easy detection. Each year, novel designer drugs cause thousands of deaths globally. Synthetic cannabinoids and synthetic cathinones are two of the most commonly abused novel designer drugs, and their rapid proliferation calls for swift policy intervention. Possible countermeasures against these drugs include deploying new detection technologies, closing loopholes in the mail system, banning designer drugs outright, warning the public of their dangers and strengthening international cooperation.
INTRODUCTION

Since 2009, the abuse of novel designer drugs has been on the rise. Two of the most widely reported ones — synthetic cannabinoids and synthetic cathinones — constituted 54 per cent of the total number of new psychoactive substances reported to the United Nations Office of Drugs and Crime or UNODC in 2014 (see Figure 1).

Coupled with the growing use of marijuana in the West and an increasingly liberal attitude among the young in Asia towards drug use, it has become more important than ever for drug enforcement agencies to keep a lookout for synthetic cannabinoids and synthetic cathinones.\(^1\)\(^2\)

Stopping these highly addictive substances will not be easy as they are manufactured and trafficked in a manner that avoids easy detection. Still, curbing their proliferation is not impossible and this policy report offers five possible countermeasures.

Figure 1: Significant increases in new psychoactive substances reported


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1 See, for example, Basu, Tanya, “Marijuana Use in America Has Doubled in the Past Decade, Study Says,” *Time*, October 22, 2015, time.com/4082683/us-marijuana-use-increase/

NOVEL DESIGNER DRUGS

The last decade has seen an exponential increase in novel designer drug use in the West. Shedding light on what these man-made psychoactive substances are, the following sub-sections take a closer look at synthetic cannabinoids and synthetic cathinones.

**Synthetic Cannabinoids**

Synthetic cannabinoids refer to a class of lab-concocted drugs that reproduce the mind-altering effects of tetrahydrocannabinol or THC — the main psychoactive compound found in marijuana. Known colloquially as “robot weed” or “fake weed” because of their synthetic nature, these psychoactive drugs essentially constitute either dry sage or damiana leaves sprayed with synthetic versions of THC such as JWH-018. They are then packaged into small sachets for sale to drug users (see Figure 2). To evade the attention of authorities, they are often marketed and sold as incense blend or fragrance enhancers and labelled “not for human consumption”. Still, buyers know very well that when smoked, they produce a euphoric sensation very similar to that from smoking marijuana.

*Figure 2: Potent “robot weed” comes in small packages*


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JWH-018, the main psychoactive compound found in synthetic cannabinoids, was first developed in 1993 by Dr. John William Huffman at Clemson University as a research chemical to help identify cannabinoid receptors in the brain. Like THC, JWH-018 binds to those same receptors to give the equivalent psychoactive effects of marijuana. Soon after Huffman had published the method for synthesising JWH-018, rogue chemists began reproducing the psychoactive compound in underground drug labs for sale or their own use.⁵

Like marijuana, synthetic cannabinoids are highly addictive and can lead to dependency after a brief period of use. However, synthetic cannabinoids are far more potent than marijuana — up to 100 times stronger in some cases — delivering an intoxication more powerful and sustained than the botanical drug.⁶ A study by a group of researchers has even found that synthetic cannabinoid users are 30 times more likely to overdose and require medical attention than marijuana users.⁷ Other side effects include paranoia, seizure, organ failure and even death.⁸ Furthermore, because the chemical compositions of these synthetic drugs are constantly modified to circumvent government bans, it is impossible to fully understand the full range of health effects that synthetic cannabinoids have on users.⁹

Even so, synthetic cannabinoids continued to be popular among users as they were legal, accessible and affordable. When the authorities subsequently sought to ban these psychoactive substances, drug syndicates simply altered their chemical compositions slightly to come up with new variants that are completely unregulated. For instance, when JWH-018 was banned in the United Kingdom in 2010, drug syndicates simply turned to other legal chemical compounds such as JWH-398 and HU-210 to continue production. Complicating government efforts at supply reduction, synthetic

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cannabinoids continue to be available on the Internet after their sale at bricks-and-mortar stores like smoke shops and convenience stores was banned.\(^\text{10}\)

A matter that ought to be of concern for drug enforcement agencies in this region is that rogue labs in Asia are believed to be the biggest suppliers of synthetic cannabinoids.\(^\text{11}\) But shutting down these illicit drug labs is almost impossible since many of them are legitimate outfits secretly producing synthetic cannabinoids on the side. Moreover, with an average street price of US$5 (S$6.85) a sachet, the drug is easily affordable for young people.\(^\text{12}\)

### Synthetic Cathinones

Synthetic cathinones belong to a family of lab-produced psychoactive drugs that mimic the drug-like effects of cocaine and methamphetamine — albeit at a fraction of their street prices. Synthetic cathinones are chemically related to cathinone, a stimulant found in Khat, which is a plant found in East Africa and southern Arabia that produces a stimulant effect when chewed.\(^\text{13}\) Yet, there is nothing organic about synthetic cathinones as they are synthesised by underground drug labs using chemicals.\(^\text{15}\)

Although known as “bath salts”, these dangerous drugs are, in fact, foul smelling and usually take the form of a white crystalline powder (see Figure 3). Highly addictive, synthetic cathinones, when consumed, can cause severe hallucinations, violent behaviour, paranoia and even death.\(^\text{16}\)

Chemically, synthetic cathinones contain components of cocaine as well as methamphetamine. Hence, they can release dopamine into the brain (as in the case of methamphetamine) while inhibiting its reuptake (as in the case of cocaine). This combination results in a greater concentration of the “feel

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\(^{10}\) Ibid.


\(^{13}\) Cathinone is an amphetamine-like compound found in Khat and chewing the leaves of Khat causes a reduction in appetite along with euphoria and excitement.


good” chemical in the brain. Simply put, using synthetic cathinones is like consuming methamphetamine and cocaine together. This also explains why the effects of synthetic cathinones are so potent and long lasting, with users reporting that they were unable to control their thoughts and actions after taking the drug. Also known as “$5 insanity”, synthetic cathinones have been blamed for several zombie-like attacks in which intoxicated users of a synthetic cathinone called “flakka” violently attacked innocent victims, even chewing off their faces in some cases.

Synthetic cathinones are popular among recreational drug users in the West for several reasons. Like synthetic cannabinoids, synthetic cathinones are marketed as substitutes for more expensive street drugs. It is easy to see why drug users are switching to synthetic cathinones or, at least, including them in their drug use repertoire: a gram of cocaine in the West is priced from US$62 (S$85) to US$80 (S$110) while a dose of flakka costs only US$3 (S$4.10) to US$5 (S$6.85). Synthetic cathinones also appeal

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18 Scaccia, op. cit.
19 Ibid.
20 UNODC, op. cit.
to users because they are misperceived to be less harmful than cocaine. But the truth is that they can be ten times stronger than cocaine. In fact, synthetic cathinones are so potent that they can cause irreparable damage to our dopaminergic and serotonergic systems — those aspects of the brain that modulate cognitive function and behaviour.21 22

Until recently, synthetic cathinones could be purchased over the counter in many convenience stores, adult bookstores and tobacco shops in the West.23 They continue to be available over the Internet today after bricks-and-mortar shops were banned from selling them. Like synthetic cannabinoids, the drug syndicates manufacturing them constantly modify their chemical compositions to keep them unregulated. As soon as a brand of synthetic cathinone is scheduled as a controlled substance by the authorities, drug syndicates would alter its chemical composition slightly to create a new drug that is perfectly legal. As it takes time to schedule that new drug, a window thus emerges for it to be sold openly.24

Another reason recreational drug users are switching to synthetic cathinones is their belief that traces of these drugs would not show up in standard urinalysis and blood screening tests. Indeed, there is some evidence that synthetic cathinones cannot be detected by certain field tests and drug-sniffing dogs.25 Consequently, synthetic cathinones have become particularly appealing to people who must undergo regular drug testing as part of their profession (e.g., military personnel, government employees, professional athletes and parolees).26

POLICY INTERVENTIONS

The increased use of novel designer drugs has prompted government actions. In 2017, a US government–appointed commission on combating

21 Scaccia, op. cit.
24 Scaccia, op. cit.
drug addiction made recommendations such as the detection and interdiction of illicit drugs entering the country, strengthening law enforcement against drug-related criminal networks, and public education campaigns on drug abuse.\textsuperscript{27} The European Union has similar policies and a mechanism to swiftly assess and ban new psychoactive substances detected in the drugs market.\textsuperscript{28} Drawing from such policy interventions, we have identified five countermeasures that can be adopted to curb the rapid proliferation of synthetic cannabinoids and synthetic cathinones. These are depicted in Figure 4.

\begin{center}
\textbf{Figure 4: Possible Countermeasures against Synthetic Cannabinoids and Synthetic Cathinones}
\end{center}

\begin{figure}[h]
\centering
\includegraphics[width=0.5\textwidth]{figure4}
\caption{Possible Countermeasures against Synthetic Cannabinoids and Synthetic Cathinones}
\end{figure}

\textbf{Customs detection}

In the fight against novel designer drugs, intensifying customs screening at all ports of entry is vitally important. And because some standard screening tests may no longer be effective, on-site screening for novel designer drugs


at customs checkpoints will require new detection equipment. State-of-the-art spectrometry technologies will allow customs officials to analyse and identify suspected narcotics without directly handling them, reducing the risk of contamination and exposure.\textsuperscript{29} Obviously, field testing methods that call for direct handling of suspected designer drugs should also be reviewed. One possibility is that they can be aligned with the protocols for the handling of hazardous substances. To prevent accidental poisoning, it is also vital that customs officials receive comprehensive training to protect them from different types of designer drugs.\textsuperscript{30}

**Mail screening**

Novel designer drugs are being shipped in very small packages to avoid detection by customs officials. Often labelled as industrial products, these packages are typically subjected to less stringent checks.\textsuperscript{31} Novel designer drugs can also be purchased anonymously online.\textsuperscript{32} To stop their trafficking, it is necessary to close the mail order loophole. The US government has passed a sweeping measure to close this loophole. Known as the Synthetics Trafficking and Overdose Prevention (STOP) Act, it requires senders of packages to the United States to provide electronic data on their packages (e.g., origin, destination, and content) to US Customs in advance.\textsuperscript{33} Even if the sender were to provide false information, the use of advanced data analytics makes it possible to detect suspicious packages and block their delivery.\textsuperscript{34}

**A comprehensive ban**

An outright ban on all designer drugs will effectively outlaw them before they even appear and put an end to the legal loopholes that drug syndicates

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\textsuperscript{32} UNODC, op. cit.


have been exploiting to keep supplying them. With such a ban in place, the authorities will no longer have to ban each newly modified drug as it appears, sending a clear message that there is no such thing as a “legal” alternative to illegal drugs. In May 2016, England and Wales imposed a blanket ban on the production, supply and trade of designer drugs.\textsuperscript{35} Known as the Psychoactive Substances Act, it gives police new powers to enforce the ban and imposes up to seven years of imprisonment for offenders.\textsuperscript{36} In the United States, the Federal Analogue Act (1986) allows a designer drug to be scheduled as a controlled substance if it is shown to be substantially similar to a scheduled controlled substance. Likewise, the Synthetic Drug Abuse Prevention Act (2012) permanently places 26 types of synthetic cannabinoids into the most restrictive category of the Controlled Substances Act while the Protecting Our Youth from Dangerous Synthetic Drugs Act (2015) establishes an interagency committee with the power to swiftly schedule and update the federal list of banned synthetic substances.\textsuperscript{37}

**Public messaging**

Although the long-term side effects of novel designer drugs are unknown, users continue to perceive them as safe. To correct such misconceptions, the US government launched public awareness campaigns with catchy slogans like “Synthetics Kills”, “Fake Weed + U = Zombie” and “Don’t Roll the Dice on Spice”.\textsuperscript{38} Taking a whole-of-society approach, public messaging campaigns can be crafted to engage the public — and not just the young and vulnerable groups — since parents, teachers, employers, community leaders and healthcare providers can help spot and report drug use. Such campaigns can also address glamourised portrayals of drug use by “soft” media sources that inaccurately create a positive image of drug use. A similar advertising strategy was used by the tobacco industry in the past to sell cigarettes.\textsuperscript{39}


\textsuperscript{39} Wong, op. cit.; Bates, Clive, and Andy Rowell, “Tobacco Explained...The truth about the tobacco industry...in its own words,” *WHO Tobacco Control Papers*, University of California, San Francisco, 1999, cloudfront.escholarship.org/dist/prd/content/qt9fp6566b/qt9fp6566b.pdf?t=krrnga
International cooperation

Designer drugs abuse will not stop unless the countries where they are manufactured act to curb their availability. While easier said than done, there are signs that this is happening. For example, at the request of the US government, China has banned the domestic production and sale of a list of synthetic drugs including flakka.\(^\text{40}\) Collaboration among countries (at times, through international organisations like the United Nations) presents greater opportunities for accomplishing more than what a single country can achieve. When necessary, it allows like-minded countries and stakeholders to share information as well as pool resources and expertise on key aspects of the designer drug problem, such as what a specific drug type and its mode of trafficking are.

CONCLUSION

This policy report looked at synthetic cannabinoids and synthetic cathinones, two novel designer drugs that have a major impact on public health and security today. Addiction to these potent man-made substances is chronic, difficult to treat, and associated with high rates of morbidity and mortality. Their trafficking is often linked to other criminal activities. To curb their proliferation, this report identified five countermeasures. While there may be others, these practical solutions could be the first step towards protecting Singapore society from the deleterious effects of novel designer drugs.

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ABOUT THE SCIENCE AND TECHNOLOGY STUDIES PROGRAMME

The Science and Technology Studies Programme (STSP) in the Office of the Executive Deputy Chairman, RSIS, focuses on how emerging science and technology trends impact homefront security and the larger public policy arena. Supported by the Office of the Chief Science and Technology Officer (OCSTO) in the Singapore Ministry of Home Affairs (MHA), the STSP produces upstream insights into global and regional developments in the science and technology field. It also carries out strategic engagements with global thought leaders, practitioners and academics, including through the holding of public lectures and seminars, to share knowledge and best practices on a broad spectrum of issues in the science and technology domain.

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The **S. Rajaratnam School of International Studies (RSIS)** is a think tank and professional graduate school of international affairs at the Nanyang Technological University, Singapore. An autonomous school, RSIS’ mission is to be a leading research and graduate teaching institution in strategic and international affairs in the Asia Pacific. With the core functions of research, graduate education and networking, it produces cutting-edge research on Asia Pacific Security, Multilateralism and Regionalism, Conflict Studies, Non-traditional Security, Cybersecurity, Maritime Security and Terrorism Studies.
