

This is the peer reviewed version of the following article:

Barratt, M., & Lenton, S. (2017). 'Drugs and the internet' in Alison Ritter, Trevor King and Nicole Lee (ed.) *Drug Use in Australian Society*, Oxford University Press, Melbourne, Australia, pp. 102-123.

[The published version of this book is available here.](#)

This article may be used for non-commercial purposes in accordance with Oxford University Press' [Author Reuse and Self-Archiving policy](#).

© 2017. This manuscript version is made available under the CC-BY-NC-ND 4.0 license <http://creativecommons.org/licenses/by-nc-nd/4.0/>

Chapter 11

Drugs and the internet

Monica J. Barratt & Simon Lenton

Brief overview

1. In this chapter we review how drug patterns, practices and policies are changing within internet-saturated societies. Our discussion considers both established illicit drugs and new psychoactive substances.
2. We introduce new concepts that assist us to rethink how the internet is understood in the drugs field; for example, internet technologies as 'tools', 'places' and 'ways of being'.
3. Drug practices are shaped by internet technologies, and our responses to drug problems are shaped by internet technologies. Both aspects – drug practices and responses to them – need to be considered in light of the possibilities that the internet-saturated age provides, as well as the possible challenges.
4. We describe drug market innovations shaped by the use of internet technologies through two case studies: anonymous drug marketplaces, known as cryptomarkets, and new psychoactive substances.
5. We analyse policy responses, focusing on three areas: regulation of new psychoactive substances, internet content regulation and online participatory engagement.
6. The chapter concludes with a consideration of the implications of contemporary networked societies for understanding drug use and health.

Key terms and concepts

Networked / internet-saturated societies

Convergence of online and offline networks, place and worlds

Cryptomarkets and the hidden web

New psychoactive substances

Online participatory engagement

Internet content regulation

Introduction

The internet is now firmly established across the world as an indispensable part of everyday life. The uptake of specific information and communication technologies differs between countries but nevertheless, for many of us, the internet has grown to become an essential part of our daily existence. It facilitates and enables activities that are simply taken for granted. Internationally, concerns about the ‘dangers’ of freely circulating drug information on the internet were first raised in the 1990s, following increased availability of web content and uptake of home internet access. For example, a *New York Times* article painted an alarming picture:

...teenagers need only retreat to their rooms, boot up the computer and click on a cartoon bumblebee named Buzzy to be whisked on line, through a graphic called Bong Canyon, to a mail-order house in Los Angeles that promises the scoop on ‘legal highs’, ‘growing hallucinogens’, ‘cannabis alchemy’, ‘cooking with cannabis’, and other ‘trippy, phat, groovy things’.(Wren, 1997)

Andrew Refshauge (1996), the then Deputy Premier of New South Wales, stated that ‘a range of home recipes, which are available on the ‘Net, are dangerous and irresponsible, and are easily accessible by young people. Chemists take years to learn the skill, yet those on the internet tell our young people that anyone can make an illicit drug’. Similarly, Jenkins (1999) warned that ‘the internet has revolutionised the world of synthetic drugs, although the new environment is scarcely familiar to either media people or anti-drug authorities’. In the 2000s, Australian mainstream media regularly reported on the sharing of drug related information and the availability of drugs and drug recipes through the internet. Over this time, local media focused on drug users sharing tips about how to best avoid arrest at festivals, sharing locations of drug-detection dogs and testing stations for drug-driving, and discussing the content and purity of particular brands of ecstasy pills, all facilitated by the relative anonymity facilitated by internet technologies.

Alongside the concerns expressed by media and politicians, academics began writing commentaries and conducting research into how people who use drugs were employing the internet. In the early 2000s, the internet was described as a medium through which information about illicit drugs could be easily disseminated and as a force driving demand for illicit drugs (Klee, 2001). Research also implicated the internet as a pathway for supply of pharmaceutical and emerging or novel drugs, and as a new and more sophisticated communication method used by international criminal organisations. At the same time that the internet was understood to be fuelling drug demand and supply, it was also being used to reduce demand and harms. For example, a growing body of evidence supported its use in the delivery of interventions and treatments to people experiencing drug problems who may not otherwise be reached by conventional therapies (as discussed in [Chapter X](#)). Academic research has also confirmed the popularity of the internet as an information source in general and, specifically, in relation to sensitive topics such as illicit drugs (e.g., Gamma, Jerome, Liechti, & Sumnall, 2005). In the Australian context, the connection between the internet and drugs was recognised in the National Drug Strategy (NDS) 2010–2015. The NDS, which guides policy and research in Australia, nominated the internet as an emerging issue of

importance in drug policy, as both a threat to the control of drug supply and an opportunity to deliver credible information and efficacious treatment to Australians experiencing drug problems.

Between 2013 and 2015, almost all (98%) Australians aged between 15 and 34 years – who are the most likely to report the use of illicit drugs – were current internet users (Australian Bureau of Statistics, 2016; Australian Institute of Health and Welfare, 2014). In this context, and given the attention the issue has received in media, research and policy discussions, it is important that the intersection between drugs and the internet be closely examined.

Overview of internet technologies

There are numerous ways of categorising internet technologies. First, they can be understood on a continuum between public and private. The website of a news service would likely be understood as public, and a conversation conducted over email between two individuals would likely be understood as private. However, between these extremes are grey areas, such as whether people who post to a public site with a small user base fully intend their posts to be read and reproduced by community outsiders. For example, images of intoxicated young people shared between friendship networks online may also be available to employers, regardless of the initial intended audience, potentially contributing to loss of employment. Second, internet technologies are often categorised as **asynchronous** (not in ‘real time’) or **synchronous** (in ‘real time’). For example, an email exchange is considered asynchronous, whereas online chat is synchronous. Importantly, these distinctions do not necessarily have the same characteristics as their traditional offline counterparts; for example, a synchronous online chat may persist as a textual record that is permanently available to a public audience whereas a synchronous offline chat in a private setting is essentially ‘off the record’. Archives of online communication between people who use drugs facilitate monitoring of new drug trends while also posing increased risk to participants if their identities are not adequately masked. Third, internet technologies can be classified as textual or audio-visual. Early internet technologies largely consisted of only textual data, whereas in the 2010s, audio-visual data are an increasingly normal part of online interactions. For example, the immersive graphical world of *Second Life* is an example of an audio-visual internet technology, where it is possible to consume ‘virtual drugs’ (Johnson, 2010, p. 217).

A fourth distinction has been made by commentators who describe Web 1.0 and **Web 2.0**. Web 1.0 is defined as a model where people published websites broadcasting their ideas to a largely passive audience, while in Web 2.0, the web becomes social and interactive: more of a two-way or multi-way conversation than simply a publication platform. Alongside the Web 2.0 concept came the introduction of social network sites or social media (Facebook, Twitter, YouTube) where people construct profiles in a bounded system, articulate a list of people with whom they are connected (‘friends’, ‘followers’), and view the list of connections of others in the system (boyd & Ellison, 2008). For example, YouTube has been used to share and discuss videos of hallucinogenic ‘trips’ on *Salvia divinorum* (Lange,

Daniel, Homer, Reed, & Clapp, 2010). The Web 1.0 and 2.0 distinction has been critiqued as a simplification that ignores the interactive nature of the early internet (Baym, 2011). For example, **online forums** – also known as internet forums, bulletin boards, web forums or discussion forums – are interactive conversational media that first appeared through web browsers in the 1990s, long before the emergence of ‘Web 2.0’ and ‘social media’. Online forums continue to be popular among people who wish to discuss drugs on the public internet while remaining relatively anonymous, compared with comparatively newer social media (e.g. Facebook) where content is more often linked with ‘real life’ identities (see Barratt, 2011).

Two more trends in internet technologies that have implications for drug practices have emerged in recent years: mobile internet technologies and the use of drug **cryptomarkets**. First, the rise of mobile internet technologies (e.g. smart phone technologies) has facilitated the integration of geo-location services into phone applications. Using geo-location, the user can tailor services and information to meet their needs, based on their current physical location. Such technologies also make it easier for law enforcement and others to track down a person and potentially identify them. The use of geo-location through mobile internet technologies makes it more difficult to remain anonymous online and may negate some of the benefits of internet technologies for people using illicit drugs who wish to remain hidden. At the same time, geo-location features can be valuable for people who use drugs who may be able to access services and information tailored to their location using their mobile device. They may also be used to connect buyers and sellers at specific locations. Second, the **hidden web** (also known as the **darknet**) is a part of the internet that is not indexed by conventional search engines and is only accessed by specialised browsers that anonymise the **IP address** of the internet user. The most commonly used anonymity network is the **Tor** network, but I2P is also used. The development of encryption technologies has enabled the building of online marketplaces known as **cryptomarkets**. A cryptomarket is ‘a marketplace that hosts multiple sellers or ‘vendors’, provides participants with anonymity via its location on the hidden web and use of cryptocurrencies for payment, and aggregates and displays customer feedback ratings and comments’ (Barratt & Aldridge, 2016). Cryptomarkets make it possible to trade illegal drugs across international borders.

The way we differentiate between online and offline worlds has also evolved. In the 1990s it was generally understood that online worlds were separate from offline worlds; that is, people constructed online identities that were different from their real-life identities and communicated with networks of people that did not overlap with their real-life social networks. In the 2000s, and especially in the 2010s, the ubiquity of internet technologies in everyday life has contributed to the convergence of information between various media types and between the ‘online’ and ‘offline’. With the advent of mobile internet technology, there is no need to ‘go offline’ and therefore there is little sense in ‘going online’: as one is always both online and offline at the same time, the distinction becomes increasingly irrelevant. Despite this trend towards convergence, there are good reasons to keep online and offline activities separate in specific contexts; for example, when talking about drugs in a public online forum using a pseudonym that is not connected with one’s real-life identity (Barratt,

2011). Maintaining a truly anonymous alter-ego, however, is becoming more and more difficult due to increased use of social media tools that mandate use of real names and singular identities to enhance profit-making through targeted advertising.

Theorising internet and drugs

We need to broaden our understanding of the internet if we are to comprehend the multiple ways that the internet intersects with drugs. Markham's (2003) three metaphors of the internet provide a broader framework with which to conceptualise the internet: as a tool, a place and a way of being. As a tool, the internet can be understood as an extension of our capacities, enabling us to get things done more quickly and more efficiently. As a place, the internet offers a location where we can spend time interacting with other people. This social space or cyberspace is constituted and mediated through online interactions. As a way of being, the internet is incorporated into the fabric of everyday life, rather than being a tool or place that is outside of or separate from normality. Understanding the internet as a way of being moves the analytic focus from the internet itself to how people live their lives in an internet-saturated world.

To illustrate these three metaphors of the internet, we compare and contrast a typical government anti-drug campaign website, a typical drug user run online forum and a typical dance-music promoter's Facebook page. Typical anti-drug campaign websites are built to be information tools; that is, it is expected that stakeholders (parents, people who use drugs, and drug workers) will use the information available on the website to help them make decisions about drugs. Generally, anti-drug campaign websites are not interactive and cannot be edited by users. In contrast, drug user run forums operate as both information tools and online places where people spend time interacting. While some people only use these forums to gather information, the interaction of online forum participants is critical for the site's functionality and longevity. Due to the hidden nature of illicit drug use, typical drug user sites are designed for users to remain anonymous, and so the site is portrayed as a separate or alternative online place that is disconnected from 'real life'. In contrast to drug forums, dance-music promoter's Facebook pages (where drugs are also occasionally discussed) also function as information tools and online places, but they are more heavily integrated with everyday life. For example, these pages typically contain discussions about upcoming club nights or festivals which encourage individuals to meet up with each other. The Facebook platform encourages the use of real names, although some continue to resist this site policy (Haimson & Hoffmann, 2016). New friendship, information and drug supply networks can be forged through these events. It is difficult to operate drug-focused forums in this manner due to the legal and social risks associated with revealing one's drug use. Open drug discussion is generally prohibited by dance-music promoter pages, although some may still occur in less moderated social media settings.

If we only consider the internet as a tool, the importance and meanings of interactivity in alternative online places are ignored. Similarly, if we assume that online activities are separate from offline activity, the flows of information (e.g. drug related knowledge and

practice) and goods (e.g. drug supply networks) from online to offline and back again are ignored. Applying the metaphors of internet as a tool, place and way of being offers a more expansive view of drug practices in internet-saturated societies and our responses to them.

Intersecting internet and drugs

There are two distinct questions that can help us articulate and understand the intersection between drugs and internet technologies. The first is to ask how drug practices are shaped by internet technologies. The second is to consider how our responses to drug problems are shaped by internet technologies. Much of the work in this field so far focuses on the second question with little reference to the first. For example, email surveys and interviews were first reported as a tool in drugs research by Coomber (1997) in his study of drug dealers recruited and surveyed online. In the past decade, the use of online surveying in the drugs field has been popular (Miller & S nderlund, 2010), and internet technologies have been frequently used to recruit people who use drugs to participate in research (Barratt & Lenton, 2010). Data on the public web have been used to monitor new drug trends (e.g., Ledberg, 2015). The internet has been instrumental as a medium through which novel treatments for drug problems have been delivered (see **Chapter X**). These examples all pertain to the use of internet technologies as tools by researchers and clinicians to better understand drug patterns and provide delivery of drug treatments and interventions. However, in order to understand how our responses to drug issues can be enhanced by internet technologies, we also need to understand how internet technologies are utilised by people who use drugs.

How are drug practices shaped by internet technologies?

How do people involved in drug use and supply utilise internet technologies, and how do these practices shape supply of, demand for and harm from drugs? Most research and commentary on these questions suffers from two constraints: (a) it focuses upon the challenges, but not the opportunities, of drug use in an **internet-saturated** context, and (b) it conceptualises the internet solely as a tool. To more comprehensively understand how drug practices are shaped through internet technologies, we need to address these constraints on our thinking.

The challenges or problems associated with internet use by people who use drugs have been well-documented. They include:

- sales of drugs through websites and within online environments (e.g. pharmaceuticals, **new psychoactive substances**, cryptomarkets)
- the use of internet technologies by organised crime to increase sophistication of their operations
- increased access to information about the manufacture of illegal drugs

- increased access to positive accounts of drug use which may increase demand
- use of the internet as an advertising medium which is less regulated than traditional media
- the difficulty of verifying information available online which may be inaccurate and could result in increased harms if acted upon.

While it is important to acknowledge these challenges, there are also numerous opportunities that arise from the use of internet technologies by drug users. The internet enables increased access to people and information not otherwise easily accessible, and can also provide a **moderated** environment in the case of many internet discussion forums. Drug user expertise can be more easily shared for the purposes of harm reduction. The internet also enables increased resilience through facilitating the construction of supportive online places. For example, the internet facilitates the creation of alternative online places where people who use drugs can avoid the stigma of identifying as a drug user while still being able to engage and connect with other like-minded people.

How are our responses to drug practices shaped by internet technologies?

How do people involved in responding to drug use and supply utilise internet technologies, and how do these practices shape supply of, demand for and harm from drugs? In contrast to the bias towards the challenges arising from internet use by drug users, this larger literature around the use of internet technologies by people who work in the drugs field generally focuses upon the opportunities. These include: increased capacity to access hard-to-reach populations through internet methodologies for research, interventions, and treatment; the use of internet technologies to deliver treatment and interventions which increases the reach of response to drug problems; increased ability to monitor drug trends through accessing public online drug discussions, leading to more responsive interventions and policies; increased capacity to enforce drug supply laws through monitoring and increased sharing of information between organisations; and enhanced workforce capacity. There are also a number of challenges from the sector's embrace of internet technologies. First, older people and people from lower socio-economic backgrounds are still less likely to be as engaged with internet technologies as people who are younger and from higher socio-economic backgrounds, meaning that online interventions will not be suitable for all populations of drug users. Second, researchers, workers and policy-makers may use internet technologies to respond to drug problems without adequate cultural and technical competence, which may do more harm than good. Third, the increased capacity to monitor new drug trends may lead to increased legislation against new drugs, prompting manufacturers to release more new drugs in an escalating cycle which may ultimately increase harm (this unintended negative consequence is discussed further later in this chapter). Finally, a major challenge is the pace at which technologies change. By the time the sector has become familiar with a new technology and is able to use it effectively, newer technologies may be favoured by the target group of the research, intervention or treatment.

A critical area of work that is often missing in this field is integration of work addressing how the internet has affected drug using practices with work addressing how our responses to drug practices are shaped by the internet. If people who use drugs are already interacting in specific online settings, we should consider meeting them where they are and, through examining their current use of the technology, learn what they may need and why. We expand upon this idea of online participatory engagement later in this chapter.

Drug market innovations driven by internet technologies

The increased use of internet technologies both arises from and facilitates increased globalisation and market innovation. While drug markets still have their local characteristics, there are now many more points of demand into and supply out of local markets. Internet and encryption technologies facilitate the use of apparently anonymous transactions that may further reduce the risks associated with online drug purchases. The internet is also used to share drug manufacturing methods, problem-solve issues and promote precursor chemicals and the end products – new synthetic drugs. The speed at which new psychoactive substances are emerging in the current environment illustrates this point. The ‘designer drug’ trend is not new; manufacturers have been developing and marketing legal alternatives to illegal drugs since the early 1980s: drugs similar to fentanyl in the early 1980s, ring-substituted phenethylamines (e.g. MDMA) in the late 1980s, tryptamines in the 1990s, piperazines in the early 2000s and cathinones and synthetic cannabinoids in the late 2000s (Griffiths, Sedefov, Gallegos, & Lopez, 2010). However, as organic chemical synthesis has become less expensive and accessing markets for new products has become easier, the global nature of these markets has meant that manufacturers can exploit opportunities in less regulated countries to continue their business.

We explore two drug market innovations that have been driven by new internet technologies. First, we describe drug cryptomarkets, including the rise and fall of Silk Road. Second, we describe recent trends in new psychoactive substances (NPS), and demonstrate why it is important to understand both intentional and unintentional use of NPS.

Drug cryptomarkets

One example of the use of the internet in drug market innovation is the phenomenon of drug cryptomarkets. Cryptomarkets facilitate relatively anonymous peer-to-peer trade of goods and services, including psychoactive substances. They are accessible only to people who are using anonymising software, usually Tor. Tor uses encryption, which aims to make it impossible for anyone to trace the internet user’s IP address. Cryptomarket users must also be able to obtain and use cryptocurrencies, the most popular being **Bitcoin**. In addition to accessing an anonymising browser and cryptocurrencies, a would-be buyer also needs the URL of the marketplace, a vendor willing to ship to their location and sell to them based on their buyer statistics, and an address where the package containing the drug can be sent. While for a novice with limited experience this process may initially seem daunting, the

expanding body of research on cryptomarkets demonstrates that for many, cryptomarket drug trading is effective and is preferred to in-person trading. In a global sample, the most common reasons for purchasing from cryptomarkets were wider range, better quality, greater convenience and the use of vendor rating systems (Barratt, Ferris, & Winstock, 2014).

The front page of a cryptomarket looks a lot like the websites Amazon or eBay. Drugs are available for sale, grouped by effect profile or chemical structure (e.g. ecstasy, cannabis, dissociatives, psychedelics, opioids, stimulants, benzodiazepines and other). Buyers rate vendors and provide comments about the quality of their products, how fast they ship, and their level of professionalism and discretion. Trust in vendors is built on reputation. Cryptomarket traders use anonymous internet currencies, or cryptocurrencies, like Bitcoin. These decentralised international currencies operate through peer-to-peer technologies. Cryptomarkets are international in scope, attracting buyers and vendors worldwide. Australian drug users and vendors are utilising cryptomarkets in order to bring overseas-manufactured drugs into Australia through the postal system and to sell drugs from within Australia to other Australian buyers. Recent analysis of the now defunct cryptomarket Agora found that Australians had the highest rate of cryptomarket vendors per capita than any other nation (Van Buskirk, Naicker, Roxburgh, Bruno, & Burns, 2016).

The original cryptomarket, Silk Road, launched in February 2011, was first publicised in June 2011, and expanded rapidly until the arrest of its founder by the FBI in October 2013. Despite representing a challenge and shock to the cryptomarket ecosystem, the FBI seizure of Silk Road's servers and funds did not lead to the end of cryptomarket trading (Van Buskirk, Roxburgh, Farrell, & Burns, 2014). New markets have emerged and continue to rise and fall, despite challenges from both law enforcement pressure, hacking by competitor markets, and exit scams, where market owners disappear without warning, taking all available funds from vendors and buyers whose transactions were not yet finalised. While there are no reliable Australian prevalence estimates of drug cryptomarket use, monitoring of sentinel groups indicates that buying drugs from cryptomarkets is still a minority activity (e.g., 9% of Australian regular ecstasy users in 2014 reported obtaining drugs through cryptomarkets, van Buskirk et al., 2016). The volatility of the cryptomarket ecosystem, and the barriers to entry, which include installing and using Tor, buying and using Bitcoins in a secure way, and the risk of fraud (receiving a non-psychoactive or fake product), or arrest upon delivery, may deter the majority of would-be users. However, among those who are not deterred, cryptomarkets offer a revolution in drug access. Compared to buying from dealers or friends in-person, cryptomarket buyers were less likely to report receiving drugs of low purity, adulterated drugs, or being a victim of assault, but they were more likely to report loss of money due to volatile currency exchanges and market scams, and having to pay for the product before receiving it (Barratt, Ferris, & Winstock, 2016).

Buying drugs online is certainly not new. Reports of internet-facilitated drug sales date as far back as 1971 (Markoff, 2005), and it was well known in the early 2000s that newer synthetic drugs, many of which were not yet 'scheduled' (added to the relevant schedule of legislation such as the Misuse of Drugs Acts where prohibited drugs are listed), were available for sale as **research chemicals** that were misleadingly described as 'not for human

consumption'. The difference between these online drug sales and the cryptomarket phenomenon is the use of encrypted electronic currencies that make it possible to purchase the drugs without the transaction being traced, and the use of anonymising networks which apparently mask the identities and locations of both buyers and vendors. These two characteristics of drug cryptomarkets increase their attractiveness to drug market participants and make it more difficult for law enforcement to disrupt. As far as can be publicly ascertained, arrests and takedowns related to cryptomarkets have occurred through traditional policing methods, rather than solely through digital tracking.

New psychoactive substances

The second market innovation that has been driven in large part by internet technologies is the emergence of new psychoactive substances (NPS). NPS are drugs that do not fall under international drug controls, but which may still pose a threat to public health. These drugs have also been described as 'designer drugs', 'synthetic drugs', 'analogues', 'legal highs', or 'novel', or 'emerging' drugs or substances. While such 'new' drugs have been emerging for many decades now, the pace of their emergence has exponentially increased over the last 10 years. Internet technologies have played multiple roles in facilitating this trend. In the periods where NPS remain legal in particular countries, they are often sold through websites which can link source and consumer countries with ease. The global diffusion of information about NPS is facilitated through online networks and communities. Trip reports, describing both positive and negative experiences with new drugs, are easily shared and found through these online networks.

Although large numbers of NPS have been detected through global drug trend monitoring systems (644 according to the United Nations Office on Drugs and Crime, 2016), most NPS only briefly enter markets and are replaced quickly by new substances. NPS may be particularly attractive to certain segments of the population. For example, NPS may attract interest for workers who are regularly tested for the presence of better-known illicit drugs, or other groups who routinely undergo drug screening, such as parolees and motor vehicle drivers. In instances where better-known illicit drug supply has been disrupted, the demand for NPS as substitutes may increase. There is also a smaller subgroup of 'psychonauts' who make up some of the demand for NPS: they are interested in consuming novel compounds to test and document their effects. But, by and large, market conditions and policy settings, including perceptions that NPS are better value for money, more convenient to purchase, are not detected in drug tests and are legal, appear to drive trends in NPS use. Internet technologies feed into these drivers by directly enabling increased availability and indirectly facilitating the diffusion of information about effect profiles and market conditions.

The true extent of NPS use and harms can be difficult to determine. The National Drug Strategy Household Survey 2013 found that 1.2% of Australian adults reported use of synthetic cannabis products and 0.4% reported use of other 'new and emerging psychoactive substances' in the last 12 months (Australian Bureau of Statistics, 2016). Aside from intentional use, as reported in surveys, there is also evidence to suggest that NPS are used as adulterants: that is, NPS are misrepresented as better-known illicit drugs (see Box 1),

resulting in unintentional use. The extent of adulteration of illicit drugs with NPS in Australia is unknown. In order to determine the nature and extent of the difference between expected and actual drug contents, it is necessary to ask people who use drugs to describe the expected or advertised substance and submit a sample for forensic testing. This kind of information is collected in the Netherlands through their Drug Information Monitoring System, which incorporates a testing service for consumers (Brunt & Niesink, 2011). In the Netherlands, NPS were more likely to be submitted as adulterants in 2009-2010, during the worldwide MDMA shortage, but that by 2012-2013, NPS were more often submitted for testing as the expected substance (Hondebrink, Nugteren-van Lonkhuyzen, Van Der Gouwe, & Brunt, 2015). While Australia does not currently collect this kind of information, we can infer levels of adulteration from other data sources. For example, Thai et al. (2016) tested waste water samples in Queensland for mephedrone and methylone between 2011 and 2013: while mephedrone was not detected, methylone was detected in 45% of samples. As there is no evidence to support the intentional use of methylone from other data sources, the best explanation is that drugs thought to contain MDMA actually contain the NPS methylone.

NBOMe drugs as adulterants to LSD or MDMA

NBOMe is an abbreviation for N-methoxybenzyl. While NBOMe is often referred to as a drug, it's not a singular drug but a series of drugs that contain an N-methoxybenzyl group. The most common NBOMes that are used recreationally are extensions of the 2C family of phenethylamine psychedelics that were discovered by Dr Alexander Shulgin. Some phenethylamines, such as 2C-B, became popular in the 1990s as a substitute for MDMA (commonly referred to as ecstasy). The 2C-B NBOMe derivative is 25B-NBOMe. Other common NBOMes include 25I-NBOMe and 25C-NBOMe.

In 2010, the first anecdotal evidence of human use of NBOMe drugs began to emerge as people on online drug discussion boards (e.g., psychonauts: interested in experimenting with NPS) started posting their experiences of taking the drug. The effects have been reported by users to be more similar to LSD than MDMA and active at very low doses. A dose of MDMA, for example, is 125mg, whereas people reported that some of the NBOMes were active at 50µg or 0.05mg. This high potency increases the likelihood of individuals overdosing on NBOMe drugs. In 2013, NBOMe doses of up to 1200µg were available through the cryptomarket Silk Road for sale to Australians. One such dose could represent 6 times the estimated effective dose of 200µg (Caldicott, Bright, & Barratt, 2013).

In 2013, the deaths of three Australian teenagers were linked to the consumption of an NBOMe drug: one died after experiencing respiratory and heart problems, while the other two jumped off balconies during psychotic episodes. It appears that all three young men had consumed an LSD-like substance, suspected to be an NBOMe drug, after no LSD was found in their bodies following toxicological examination. In 2016, an Australian man travelling through Brazil insufflated (snorted) what was believed to be MDMA, then suffered a severe and prolonged psychotic episode. He was found dead some days later. Again, in this case, it has been alleged that the drug he took was actually an NBOMe derivative.

Prior to 2012, NBOME drugs were not listed on Australia's drug control schedules and were therefore classed as NPS. Even at this stage, it is likely that they would have been considered illegal due to their structural similarity to the prohibited 2C family (see discussion of analogue laws, next section). Between 2012 and 2014, NBOME drugs were added to all state and territory drug schedules, and therefore are now considered prohibited drugs. Despite their prohibition, the misrepresentation of NBOME is likely to continue due to the significant profits that can be made from buying NBOME and on-selling it as LSD or MDMA. This misrepresentation can have tragic effects, as unwitting users may experience strong and unexpected hallucinations from ingesting a comparatively high dose of an NBOME drug. For more detailed discussion, see Bright & Barratt (2013).

Policy responses

In this section we review and evaluate three policy responses to the challenges and opportunities that result from the intersection of drugs and the internet. First, we continue the discussion around the regulation of new psychoactive drugs. Second, we discuss the problem of **internet content regulation** in relation to drug websites that contain detailed instructions on drug related practices. Third, we describe the opportunities of online participatory engagement with drug user communities and stakeholders.

Responses to new psychoactive substances

Griffiths et al. (2010) describe the emergence of and response to NPS as 'an excellent case study of how the globally connected world in which we now live is challenging existing models of drug control' (p. 953). The global prohibition of better-known drugs (cannabis, MDMA, amphetamines, cocaine, heroin) and the subsequent banning of specific psychoactive substances used in the production of NPS produce a particular context within which NPS vendors operate. It can be argued that prohibition itself fuels demand for legal substitute drugs. The banning of these substitutes has resulted in unsafe vendor practices such as labelling products 'not for human consumption' or as 'incense' in order to circumvent laws applying to products sold as medicines or foodstuffs (Griffiths, et al., 2010). Despite such policies potentially contributing to harm, in a context of prohibition, it is consistent to consider prohibition of NPS that appear to induce similar side-effects and adverse events in some users. Consequently, most Western countries, including Australia, have banned a range of NPS, individually or as structural or functional 'groups', and some countries have enacted 'blanket bans' on any substance that produces a psychoactive effect.

Australia's legislative response to the emergence of synthetic cannabis products provides an instructive example. In 2011, they were sold in head shops, adult shops, 'legal high' stores, tobacconists and through websites across the country. In April 2011, radio and tabloid newspapers first began reporting on their use in West Australian mine sites: workers were using the products as a substitute for cannabis in order to evade workplace drug testing regimes applied to cannabis. Mainstream media attention to synthetic cannabis products increased and, in June 2011, Western Australia became the first state to schedule a selection of synthetic cannabis compounds. By August 2011, all Australian states and territories had

either scheduled or announced their intention to schedule various synthetic cannabis products and compounds, and the national Therapeutic Goods Administration (TGA) included eight synthetic cannabis compounds on their Poisons Standard, making their possession a federal offence. Analogue and derivative clauses in both state and federal drug laws in Australia also applied. In some cases, any compound that could be classified as a derivative of the scheduled compounds was also captured under the new laws.

Despite this quick response, manufacturers rapidly produced alternative blends, claimed to contain unscheduled synthetic cannabis compounds, and consequently marketed as ‘legal’ in the affected Australian states and territories. Furthermore, Google Trends data showed that media attention to synthetic cannabis resulted in clear spikes in related internet searching, suggesting a relationship between media coverage and increased interest in this new drug category among the general population (Bright, Bishop, Kane, Marsh, & Barratt, 2013). In May 2012, the TGA enacted new laws prohibiting all major categories of synthetic cannabis, as well as any products marketed in a way to suggest that their effects mimicked those of any other prohibited substances, even if the chemicals were dissimilar (not analogues). These laws were followed in 2013 by Commonwealth consumer protection legislation which prohibited the sale of a list of specific brand names of products associated with synthetic cannabis and other NPS. Most recently, in response to continued use and availability of these products, a federal prohibition was enacted in 2015 on the importation of all substances that have a ‘psychoactive effect’ that are not otherwise regulated. Other Australian jurisdictions have enforced similar ‘blanket bans’, including NSW, WA and SA. In the case of NSW, the supply, manufacture and advertisement of any substance deemed to be psychoactive that is not on the list of exemptions is prohibited, while personal use and possession offences still only apply to NPS that are listed in the schedules.

Can we say anything yet about the effectiveness or otherwise of the blanket ban policies? The Irish ban on all psychoactive substance occurred in 2010, but there are only a few measureable outcomes available to evaluate the Irish experience. A major problem that the legislation sought to address was the open sale of NPS through ‘high street shops’. Immediately following the implementation of the blanket ban in Ireland, most shops voluntarily closed their doors (Kavanagh & Power, 2014). Nevertheless, some surveys of Irish populations indicate that self-reported use of NPS is still high compared with other European countries (Reuter & Pardo, 2017). Under a blanket ban, NPS that are still in demand are likely to be supplied through websites based in other countries and through in-person dealer networks. It is an open question how policies that move markets from shopfronts to websites and dealer networks actually affect drug harms. Some argue that shopfronts have better controls on product quality and limiting sales to adults, but shopfronts are also likely to confer a level of legitimacy or safety onto their products (Reuter & Pardo, 2017). However, consumers moving from shopfront access to in-person dealer networks may access a wider range of drugs and may also encounter higher levels of market-related violence. More time will be needed to model the macro effects of blanket ban policies on drug-related harms in Australia.

On a more macro level, it is possible that drug prohibition itself may be undermined by the effect of internet technologies on drug market structures. First, prohibition is undermined because it is relatively easy for producers to circumvent the system by introducing new, as yet unscheduled, psychoactive substances in response to bans (although ‘blanket bans’ may overcome this problem). Second, traditional models of prohibition that rely upon large criminal organisations for drug supply are undermined by smaller-scale sellers entering the marketplace with NPS, increasing overall availability of drugs and decreasing prices. The success or otherwise of attempts to prohibit NPS in the context of continued worldwide demand for intoxicating substances raises the question of the appropriateness of alternative regulatory models. These include medical prescription, state-owned drug dispensaries or tightly regulated commercial supply, each of which requires careful consideration as to how such models may reduce the harm to communities, families and individuals from NPS.

Another way of responding to the potential risks of new drugs is to implement drug monitoring systems that are designed specifically to detect drug adulteration and variations in purity in a timely fashion. It is clear that NPS are entering drug markets as adulterants in drugs sold as other substances (e.g., NBOMe in ‘LSD’ tabs) in Australia, as they are worldwide (see Box). In this context, consumers of these drugs either use unreliable sources of information or do not even seek information about drug content and purity, and therefore appropriate dosage. Drug checking or testing services identify the composition of drugs which are confidentially and voluntarily submitted, and provide this information back to the service user. Testing services may be on-site services at festivals or club events (e.g., Portugal: Martins, Valente, & Pires, 2015) or off-site ‘fixed’ services (e.g., Netherlands: Brunt & Niesink, 2011). The pharmacological content of drugs and the discrepancy between expected and actual content (i.e., adulteration levels) feeds into calls for wider monitoring systems to enhance the utility of the whole system that is aimed at preventing drug related harms and intervening to avert public health disasters. The implementation of drug checking services integrated into drug monitoring systems in Australia has been hampered by concerns about civil liability, the legitimisation of drug use, and its use by dealers as a quality control service (Butterfield, Barratt, Ezard, & Day, 2016). However, international experiences with drug checking, and Australian experiences with supervised injecting centres and needle and syringe exchange services, show that similar concerns that are often raised regarding harm reduction services can be resolved. It may take more drastic events to force new approaches with NPS. An NPS may cause a major public health threat if it proves to be highly successful in the market or if it is, in fact, a dangerous failure (Reuter & Pardo, 2017). Identifying and responding to instances of intentional and unintentional NPS use that cause particular harms in a timely fashion requires access to consumer-level information that can be provided through drug checking services.

Internet content regulation

The internet is often understood as a democracy-building technology that offers voiceless people the chance to be heard in a public arena. Yet, around the world, nation states are attempting to implement greater regulation of internet content. Drug related content is one domain that has been historically targeted by governments for censorship, both in traditional

publication formats (e.g. books and films) and the internet. The internet has facilitated the sharing of detailed drug related information and alternative drug policy options by people who are able to remain relatively anonymous. The regulation of media content may seem irrelevant to the interactions between these drug users and activists, except that many of these interactions now take place online and are available as published content that is subject to regulation. Depending on how authorities categorise these materials, they may be subject to censorship due to their potential to instruct in or incite criminal activity.

Under current Australian law, online content can be **refused classification**. Lumby et al. (2009) list the types of content, which includes ‘instruction on drug use’. The definition of refused classification in the *Classification (Publications, Films and Computer Games) Act 1995* (Cth) is broad and relies on an evaluation of whether the material would ‘offend against the standards of morality, decency and propriety generally accepted by reasonable adults’. Media that ‘depict, express or otherwise deal with matters of... drug misuse or addiction’ and/or ‘promote, incite or instruct in matters of crime’ may be refused classification, subject to the extent to which they would ‘offend reasonable adults’. These laws indicate that print publications, films, games and online content deemed to instruct in or promote drug use can be currently banned in Australia.

Harm reduction websites, partly funded by government, provide instruction in drug use for the purposes of reducing drug related harms; for example, hrvic.org.au and aivl.org.au. If members of the public complained about these websites, and the Australian Communications and Media Authority (ACMA) deemed their content to be ‘offensive to reasonable adults’, such Australian-based sites could be issued with take-down notices under existing law. Although the federal government has not yet targeted websites that provide instruction in drug use, local websites ‘set up by a community organisation to promote harm minimisation in recreational drug use’ and an online ‘university newspaper which include[s] an article about smoking marijuana’ could technically be refused classification under the current system (Lumby, et al., 2009).

In 2009, the Australian government proposed legislation mandating that Internet Service Providers (ISPs) block all websites hosting refused classification content (Bennett Moses, 2010). According to the ACMA, refused classification content includes ‘child abuse and child sexual abuse material, depictions of bestiality, material containing excessive violence or sexual violence, *detailed instruction in crime, violence or drug use*, and/or material that advocates the doing of a terrorist act’ (2011, emphasis added). Presently, online content that is brought to the attention of the ACMA can be refused classification, but only websites hosted in Australia can be issued with a notice forcing them to shut down. Website owners can easily bypass these laws by hosting their websites in other less restrictive countries. Under the proposed legislation, ISPs would be required to block all websites that meet the definition of refused classification (Bennett Moses, 2010).

Numerous popular international drug websites would likely have been refused classification under the proposed Australian internet filtering policy. Pillreports.net contains information about the content and purity of pills sold as ecstasy, as well as stories from users

about their experiences, and interaction between users that could be classified as instructional or promotional. Drug harm reduction websites, including Erowid.org and Bluelight.org, contain explicit instructional materials, including instructions developed by drug users about the most effective and safest ways to consume drugs, and personal narratives detailing drug experiences designed to assist and educate other drug users. If the proposed ISP-level filtering system had been adopted using the current definition of refused classification, these sites could have been added to the blacklist.

Such action could have negative consequences. Instructional drug discussion and information is likely to move from public to private channels of communication. Most Australians will have limited or no access to archives of peer-generated drug information, anonymous social support, official rules and social norms that regulate discussion, and wide and varied voices not otherwise accessible through real-world networks. Furthermore, blocking websites where people discuss drug use will hamper efforts to monitor drug users in order to produce interventions that are responsive to new drug trends. This action will also remove the possibility of engaging with online communities to produce better public health outcomes.

In 2010, the government delayed introducing the legislation to enable mandatory ISP-level filtering of refused classification content until the scope of refused classification content was reviewed by the Australian Law Reform Commission (ALRC). In February 2012, the ALRC (2012) completed its review of the National Classification Scheme, including within its investigation a consideration of the scope of refused classification. In our submission to the ALRC review, we argued for consideration of drug related content from a public health perspective and showed how online drug discussion engaged in for the purpose of reducing the risks of drug use would be blocked under the proposed filtering policy. The ALRC commissioned a pilot study into community attitudes towards media content and found that content depicting drug use was rated the least offensive by community participants. The ALRC recommends that the scope of refused classification of content that ‘promotes, incites or instructs in matters of crime’ be confined to ‘serious crime’ and that the category ‘detailed instruction in the use of proscribed drugs’ be reviewed altogether. Should the refused classification category remain and if the ISP-level internet filter were implemented, they recommended that only content classified into the more serious categories of actual child sex abuse and actual sexual violence be filtered. At the time of writing (2016), the ISP-level internet filter policy had been abandoned, and there has not yet been a government response to the recommendations to reduce the scope of the definition of refused classification.

The aborted attempt to regulate internet content in Australia illustrates the potential unforeseen intersections between internet policy and drug policy. The classification of books, television and cinema was based on a model where a classification board could read or view the material and make a judgment as to its suitability for specific audiences. Internet content cannot be accurately conceptualised as a one-way communication tool and is therefore much more difficult to classify. In general, attempts to regulate the public internet may result in increased use of private networks and the hidden web. Such a trend of increased secrecy is likely to make it more difficult to monitor new drug trends and to engage with drug users

online. This policy intersection is one example of how a well-intended policy in one area may have unforeseen negative consequences in another.

Online participatory engagement

The internet facilitates connections between people. Specifically, the ability to use a **pseudonym** and therefore remain relatively anonymous also allows communication about sensitive topics without concern for such admissions to be linked with and have negative social and legal repercussions. This capacity represents an opportunity for drug researchers to engage in online participatory engagement with people who use drugs. While the internet has been used extensively for recruitment and surveying drug users, online facilitation of consumer involvement and partnership in research has yet to be fully realised.

Over recent decades, alternative ways of conceptualising the relationship between researcher and participant have emerged. Wider and more meaningful participant involvement or ‘consumer participation’ in health and medical research has been advocated in Australia and elsewhere. However, meaningful participant involvement in drugs research requires that participants publicly identify themselves as current or former drug users and have access to sufficient support and resources to enable participation. These pre-conditions act as barriers for people who use illegal drugs who desire greater input into research. Although there are challenges to meaningfully engaging drug users in research, the importance of doing so has been emphasised by peak bodies in the drugs sector.

One of the benefits of using the internet for research is how online communication can positively influence the researcher–participant relationship. Lack of physical presence and separate physical settings reduce the researcher’s level of control and power, potentially leading to a more balanced power relationship between researcher and participant. Furthermore, the lack of physical presence makes it easier for the participant to withdraw or opt out. Online discussion groups provide this opportunity where participants can ‘talk back’ at their convenience without revealing their full identity. Researchers posting a request for participation to an online group are not only advertising their project, but also inviting an online dialogue with the group.

Health researchers, mainly targeting online support groups to attract users with specific health problems, have reflected on the opportunities and challenges of accessing and engaging with research participants through online discussion groups (Mendelson, 2007). Their experiences demonstrate the importance of successfully engaging with website moderators or gatekeepers. Without this support, messages are more likely to be viewed as intrusive or as ‘spam’, resulting either in deletion or being ignored or dismissed. It is critical, therefore, to form partnerships with online community leaders by not only asking their permission to post the request, but eliciting their feedback and support as well. Establishing trust with the forum leaders, and subsequently the forum users, involves the researcher demonstrating both technical and cultural competence within the online setting.

Our study of online drug discussion (Barratt & Lenton, 2010) was an experiment in using the internet for participatory engagement. We approached forum leaders as gatekeepers

of each online community and liaised with them to determine what kind of participation each group was interested in. Important issues negotiated with forum leaders included whether we could advertise our survey on their website, where was the most appropriate place to post the notice, whether they were prepared to offer extra support, how we were to feed research findings back to participants, and how we were to either acknowledge or anonymise their participation as a group. If forum leaders agreed to support the study by hosting a discussion at their site, we then spent time in public discussions with members of each community, responding to any questions and concerns that individuals expressed. What was most revealing about this process was the wide variety of responses we received from the 40 groups we approached. Often, decisions around process and ethics are decided prior to engagement with participant groups, in the planning of studies, based on ethical principles or standard practices. In contrast, we found that the capacity for online communication and engagement with participant groups facilitated negotiation of terms of participation with each group individually, that each group had different needs, and that researchers need to ensure they ask people directly how they would prefer to engage in research rather than assuming such preferences can be predicted by researchers (see Barratt & Lenton, 2010).

This collaborative work was extended in our recent project focused on small-scale cannabis cultivators (Barratt et al., 2015). In this project, we engaged with an Australian online community of cannabis cultivators at an earlier point in the research process than in our aforementioned study of online drug discussion. In a 6-month lead-up to the survey launch date, we introduced ourselves within this online group, described our research role, provided publications from previous research, and described the aims of the study we hoped to conduct with their support. This engagement included a face-to-face meet-up between us and the leaders of this online community at a cannabis activist event. Such preliminary work was necessary to build trust between us and the community. We presented a draft of our survey to the community and were invited into a private online chat session with the community leaders. During this session, a grower stated that he could not see a good reason to complete the survey as it would simply ‘fill in unknown gaps for authorities’, presumably leading to harsher treatment of cannabis growers like himself. As this view was shared by other growers during piloting, the team decided to include the following statement in the survey: ‘The general community typically has a very unrealistic view about people who grow cannabis. We want you to help set the record straight by completing this questionnaire.’ Other significant changes were made to the survey following engagement with the community, and we successfully recruited over 500 growers with their support. Subsequently, we engaged with mainstream media when presenting our findings, and during these instances, we described the diversity of people who cultivated cannabis in Australia according to our emerging data. In this way, our research involved an ongoing online dialogue between research participants and researchers (see Barratt, et al., 2015).

Summary

In this chapter, we have canvassed both the challenges and opportunities for drug research, policy and practice in a context of increased internet saturation. Drug use, patterns, practices and harms in this evolving context are affected by increased information sharing, and

increased interactivity and connectivity between people. We have seen how the internet is not only a tool, but also can be seen as a place where people interact. Increasingly, online sites or places are integrated with offline or everyday sites or places (such as within social network sites, especially Facebook). Such integration threatens one of the most important advantages of online discussion, which is critical for its use in online drug discussion, perceived anonymity. Attempts to regulate internet content may result in public drug discussion moving into private spaces where it can no longer be monitored. The cycle of new psychoactive drugs being marketed and then banned is fuelled by online technologies and globalisation more broadly. The existence of cryptomarkets is only possible through a confluence of online and encryption technologies. New psychoactive drugs and cryptomarkets both challenge the overarching model of drug prohibition, which may be unlikely to effectively deal with either of these phenomena. New regulatory models may be required to have some impact upon these markets, if we wish to reduce the harms of these products. On a positive note, the use of public online communication platforms by drug users may facilitate consumer involvement and engagement, something less developed in the drugs field when compared to other fields such as mental health.

It is difficult to predict how the internet will be used in new ways which may have implications for drug practices. What we can say is that there are likely to be new internet technologies that evolve rapidly and dynamically. Like drugs, the internet is here to stay. We need to learn to live with and embrace our enhanced interactivity and capacities to produce and reproduce information so that we can make the most of the opportunities and better respond to the challenges that the internet poses for reducing drug related harm.

Food for thought...

Some consider cryptomarkets to be a form of protest against states deciding what their citizens can and cannot imbibe to alter cognitive, behaviour and mood. Do you agree?

The latest legislative response to the proliferation of new psychoactive substances is to enact generic legislation that prohibits all substances deemed to be psychoactive (otherwise known as a 'blanket ban'). Can you think of some of the possible consequences of a blanket ban, including benefits and harms experienced by people who use drugs, and in terms of the drug marketplace?

Hello Sunday Morning is a social media based community that helps support people who commit to taking a break from drinking alcohol. How might a campaign like HSM be adapted to support people wishing to take breaks from the use of other drugs?

Further reading

Barratt, M. J., & Aldridge, J. (2016). Everything you always wanted to know about drug cryptomarkets* (*but were afraid to ask) [Editorial]. *International Journal of Drug Policy, In press*

Brandt, S. D., King, L. A., & Evans-Brown, M. (2014). The new drug phenomenon. *Drug Testing and Analysis, 6*, 587–597.

- Butterfield, R. J., Barratt, M. J., Ezard, N., & Day, R. O. (2016). Drug checking to improve monitoring of new psychoactive substances in Australia. *Medical Journal of Australia*, 204(4), 144–145.
- Griffiths, P., Sedefov, R., Gallegos, A., & Lopez, D. (2010). How globalization and market innovation challenge how we think about and respond to drug use: ‘Spice’ a case study. *Addiction*, 105, 951–953.
- Reuter, P., & Pardo, B. (2016). Can new psychoactive substances be regulated effectively? An assessment of the British Psychoactive Substances Bill. *Addiction*, *In Press*. doi: 10.1111/add.13439
- Rosino, M., & Linders, A. (2015). Howard Becker in hyperspace: Social learning in an on-line drug community. *Deviant Behavior*, 36, 725–739.
- Walsh, C. (2011). Drugs, the Internet and change. *Journal of Psychoactive Drugs*, 43, 55-63.

Useful websites

Annette Markham. Social media, methods, and ethics: <http://markham.internetinquiry.org>

Bluelight international message board: <http://bluelight.org>

Pill reports – Ecstasy test results database: <http://pillreports.net>

Erowid: documenting the complex relationships between humans and psychoactives: <http://www.erowid.org>

Reference list

- Australian Bureau of Statistics. (2016). *8146.0 - Household Use of Information Technology, Australia, 2014-15*. Canberra: Author.
- Australian Communications and Media Authority (ACMA). (2011). *Online regulation*. Canberra: Commonwealth of Australia.
- Australian Institute of Health and Welfare. (2014). *2013 National Drug Strategy Household Survey. Detailed report*. Canberra: Author.
- Australian Law Reform Commission. (2012). *Classification - Content regulation and convergent media. Final report* (ALRC Report No. 118). Canberra: Commonwealth of Australia.
- Barratt, M. J. (2011). Discussing illicit drugs in public internet forums: Visibility, stigma, and pseudonymity. In J. Kjeldskov & J. Paay (Eds.), *C&T '11. Proceedings of the Fifth International Conference on Communities and Technologies, Brisbane, Australia* (pp. 159-168). New York, NY: ACM.
- Barratt, M. J., & Aldridge, J. (2016). Everything you always wanted to know about drug cryptomarkets* (*but were afraid to ask) [Editorial]. *International Journal of Drug Policy*, *35*, 1-6.
- Barratt, M. J., Ferris, J. A., & Winstock, A. R. (2014). Use of Silk Road, the online drug marketplace, in the UK, Australia and the USA. *Addiction*, *109*(5), 774-783.
- Barratt, M. J., Ferris, J. A., & Winstock, A. R. (2016). Safer scoring? Cryptomarkets, social supply and drug market violence. *International Journal of Drug Policy*, *35*, 24-31.
- Barratt, M. J., & Lenton, S. (2010). Beyond recruitment? Participatory online research with people who use drugs. *International Journal of Internet Research Ethics*, *3*, 69-86.
- Barratt, M. J., Potter, G. R., Wouters, M., Wilkins, C., Werse, B., Perälä, J., Pedersen, M. M., Nguyen, H., Malm, A., Lenton, S., Korf, D., Klein, A., Heyde, J., Hakkarainen, P., Frank, V. A., Decorte, T., Bouchard, M., & Blok, T. (2015). Lessons from conducting trans-national Internet-mediated participatory research with hidden populations of cannabis cultivators. *International Journal of Drug Policy*, *26*, 238-249.
- Baym, N. K. (2011). Social Networks 2.0. In M. Consalvo & C. Ess (Eds.), *The handbook of internet studies* (pp. 384-405). Boston: Wiley-Blackwell.
- Bennett Moses, L. (2010). Creating parallels in the regulation of content: Moving from offline to online. *University of New South Wales Law Journal Forum*, *16*(1), 95-108.
- boyd, d. m., & Ellison, N. B. (2008). Social network sites: Definition, history, and scholarship. *Journal of Computer-Mediated Communication*, *13*, 210-230.
- Bright, S., & Barratt, M. (2013, August 23). Explainer: what is NBOMe? *The Conversation*. Retrieved from <https://theconversation.com/explainer-what-is-nbome-16950>
- Bright, S. J., Bishop, B., Kane, R., Marsh, A., & Barratt, M. J. (2013). Kronic hysteria: Exploring the intersection between Australian synthetic cannabis legislation, the media, and drug-related harm. *International Journal of Drug Policy*, *24*, 231-237.
- Brunt, T. M., & Niesink, R. J. M. (2011). The Drug Information and Monitoring System (DIMS) in the Netherlands: Implementation, results, and international comparison. *Drug Testing and Analysis*, *3*(9), 621-634.
- Butterfield, R. J., Barratt, M. J., Ezard, N., & Day, R. O. (2016). Drug checking to improve monitoring of new psychoactive substances in Australia. *Medical Journal of Australia*, *204*(4), 144-145.
- Caldicott, D. G., Bright, S. J., & Barratt, M. J. (2013). NBOMe - a very different kettle of fish. *Medical Journal of Australia*, *199*(5), 322-323.
- Coomber, R. (1997). Using the Internet for survey research. *Sociological Research Online*, *2*(2).
- Gamma, A., Jerome, L., Liechti, M. E., & Sumnall, H. R. (2005). Is ecstasy perceived to be safe? A critical survey. *Drug and Alcohol Dependence*, *77*, 185-193.
- Griffiths, P., Sedefov, R., Gallegos, A., & Lopez, D. (2010). How globalization and market innovation challenge how we think about and respond to drug use: 'Spice' a case study. *Addiction*, *105*, 951-953.

- Haimson, O. L., & Hoffmann, A. L. (2016). Constructing and enforcing "authentic" identity online: Facebook, real names, and non-normative identities. *First Monday*, 21(6).
- Hondebrink, L., Nugteren-van Lonkhuyzen, J. J., Van Der Gouwe, D., & Brunt, T. M. (2015). Monitoring new psychoactive substances (NPS) in The Netherlands: Data from the drug market and the Poisons Information Centre. *Drug and Alcohol Dependence*, 147, 109-115.
- Jenkins, P. (1999). *Synthetic panics: The symbolic politics of designer drugs*. New York, NY: University Press.
- Johnson, P. (2010). *Second Life, media, and the other society*. New York: Peter Lang.
- Kavanagh, P. V., & Power, J. D. (2014). New psychoactive substances legislation in Ireland – Perspectives from academia. *Drug Testing and Analysis*, 6(7-8), 884-891.
- Klee, H. (2001). Amphetamine use: Crystal gazing into the new millennium. Part One - what is driving the demand? *Journal of Substance Use*, 6, 22-35.
- Lange, J. E., Daniel, J., Homer, K., Reed, M. B., & Clapp, J. D. (2010). Salvia divinorum: Effects and use among YouTube users. *Drug and Alcohol Dependence*, 108, 138-140.
- Ledberg, A. (2015). The interest in eight new psychoactive substances before and after scheduling. *Drug and Alcohol Dependence*, 152, 73-78.
- Lumby, C., Green, L., & Hartley, J. (2009). *Untangling the net: The scope of content caught by mandatory internet filtering*: University of NSW, Edith Cowan University and the CCI ARC Centre of Excellence for Creative Industries and Innovation.
- Markham, A. N. (2003, October). *Metaphors reflecting and shaping the reality of the Internet: Tool, place, way of being*. Paper presented at the Association of Internet Researchers Conference, Montreal, Canada.
- Markoff, J. (2005). *What the dormouse said: How the 60s counterculture shaped the personal computer industry*. London: Penguin Books.
- Martins, D., Valente, H., & Pires, C. (2015). CHECK!NG: A última fronteira para a Redução de Riscos em contextos festivos [CHECK!NG: The last frontier for Harm Reduction in party settings]. *Saúde e Sociedade [Health & Society]*, 24(2), 646-660.
- Mendelson, C. (2007). Recruiting participants for research from online communities. *Computers, Informatics, Nursing*, 25, 317-323.
- Miller, P. G., & Sønderslund, A. L. (2010). Using the internet to research hidden populations of illicit drug users: A review. *Addiction*, 105, 1557-1567.
- Refshauge, A. (1996, October 24). Drug harm minimisation. *Parliament of New South Wales, Question without notice*.
- Reuter, P., & Pardo, B. (2017). Can new psychoactive substances be regulated effectively? An assessment of the British Psychoactive Substances Bill. *Addiction*, 112, 25-31.
- Thai, P. K., Lai, F. Y., Edirisinghe, M., Hall, W., Bruno, R., O'Brien, J. W., Prichard, J., Kirkbride, K. P., & Mueller, J. F. (2016). Monitoring temporal changes in use of two cathinones in a large urban catchment in Queensland, Australia. *Science of the Total Environment*, 545-546, 250-255.
- United Nations Office on Drugs and Crime. (2016). *2016 World Drug Report*. Vienna: United Nations.
- Van Buskirk, J., Naicker, S., Roxburgh, A., Bruno, R., & Burns, L. (2016). Who sells what? Country specific differences in substance availability on the Agora dark net marketplace. *International Journal of Drug Policy*, 35, 16-23.
- van Buskirk, J., Roxburgh, A., Bruno, R., Naicker, S., Lenton, S., Sutherland, R., Whittaker, E., Sindicich, N., Matthews, A., Butler, K., & Burns, L. (2016). Characterising dark net marketplace purchasers in a sample of regular psychostimulant users. *International Journal of Drug Policy*, 35, 32-37.
- Van Buskirk, J., Roxburgh, A., Farrell, M., & Burns, L. (2014). The closure of the Silk Road: what has this meant for online drug trading? *Addiction*, 109(4), 517-518.
- Wren, C. S. (1997, June 20). A seductive drug culture flourishes on Internet. *New York Times*, pp. A1, A9. Retrieved from <http://www.efc.ca/pages/media/nytimes.20jun97.html>