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## Research paper

# The impact of the 2016 Psychoactive Substances Act on synthetic cannabinoid use within the homeless population: Markets, content and user harms



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## ABSTRACT

**Background:** On 26 May 2016, the UK introduced the Psychoactive Substances Act. The Act made it an offence to produce, supply, or offer to supply, any psychoactive substance likely to be used for its psychoactive effects. While a Home Office review of the Act in 2018 proclaimed that the Act had been successful in achieving its main goal of preventing the open sale of psychoactive substances, significantly, the review acknowledged that high levels of synthetic cannabinoid use remain amongst vulnerable user groups, in particular the homeless population.

**Methods:** The research adopted an innovative interdisciplinary approach drawing on sociology and chemistry. The sociological element involved 82 face-to-face qualitative semi-structured interviews with 37 homeless synthetic cannabinoid users, 45 stakeholders, and over 100 h of fieldwork observations. The chemical analysis element involved the testing (using Gas Chromatography-Mass Spectrometry) of 69 synthetic cannabinoid street samples obtained by a local police force.

**Results:** The introduction of the Act was associated with a number of significant changes to the synthetic cannabinoid market, including the integration of synthetic cannabinoids into the existing illicit street market, new dealers, the adoption of more targeted and aggressive supply practices, and variability in the content and potency of synthetic cannabinoids. Combined, these changes have increased the risk of harm to homeless users and homeless sector staff and resulted in a concomitant increase in the demand on emergency services.

**Conclusion:** The foreseen concerns that the Act would result in detrimental market changes and increased harms to vulnerable user groups have been manifested in the homeless population. The failure of the Act to reduce synthetic cannabinoid use within this group, combined with the increased risk of individual and societal harm, highlights the importance of reducing the demand for synthetic cannabinoids.

## Introduction

Over the last decade, there has been an unprecedented growth in new psychoactive substances (NPS), with the United Nations Office on Drugs and Crime recording over 800 individual NPS. Of these, synthetic cannabinoids constitute the largest category, accounting for 30 per cent of reported NPS (UNODC, 2018). The rapid emergence and sheer volume of NPS has made it difficult for existing drug control measures to keep pace (Chatwin, Measham, O'Brien, & Sumnall, 2017), prompting policy makers to act (Reuter & Pardo, 2017). This action has predominantly been in the form of prohibitive legislation, with a number of countries (including Australia, Austria, Finland, Ireland, New Zealand, Poland and Romania) implementing 'blanket bans' aimed at restricting

the supply and use of those NPS not already covered by existing legislation (UNODC, 2020).

In the UK, despite a general consensus that something needed to be done to tackle the harms caused by NPS, the All-Party Parliamentary Group for Drug Policy Reform (APPG DPR, 2013) expressed concerns that a blanket ban approach would drive the supply of NPS underground, thereby impacting on the quality and purity of these substances. Indeed, when the *Psychoactive Substances Bill* was published in April 2015, it drew criticism from drug policy think tanks and academics alike. For example, *Release and Transform* (2015:3) argued that a blanket ban would create a 'more risky illegal market' for established NPS products. Similarly, UK drug-policy experts predicted that any blanket ban would merge the 'markets for NPS and the more traditional illicit drugs' and displace the sale of NPS to street deal-

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ers ‘whose sales practices may increase harms’, thereby resulting in a concentration of harms amongst the ‘most vulnerable and disadvantaged groups’ (Stevens, Fortson, Measham, & Sumnall, 2015:1169). Notwithstanding these concerns, on 26th May 2016 the UK introduced the *Psychoactive Substances Act* (hereafter referred to as the PSA). The PSA made it an offence to produce, supply, or offer to supply, any psychoactive substance likely to be used for its psychoactive effects, regardless of the potential for harm (GOV.UK, 2016a). One of the main aims of the PSA was to prevent the sale of NPS in high street shops.

In its first six months, the PSA led to the prevention of NPS sales in over 300 UK outlets, with 31 headshops closed and nearly 500 arrests made (GOV.UK, 2016b). A Home Office (2018a) review of the PSA concluded that it had been successful in achieving its main goal of preventing the open sale of psychoactive substances, especially in high street shops (see also Reuter & Pardo, 2017), thereby resulting in a reduction in NPS use amongst the general population. However, significantly, the review also acknowledged ‘some areas of concern have remained or emerged since the Act, such as the supply of NPS by street dealers ... [and] continued high levels of synthetic cannabinoid use amongst the homeless’. (Home Office, 2018a:7). In an international review of evidence, the European Monitoring Centre for Drugs and Drug Addiction (EMCDDA) observed that whereas first-generation synthetic cannabinoids, which emerged at the end of the 2000s, were largely associated with recreational use, a more recent trend has seen a rise in their use in vulnerable groups, including drug treatment populations, homeless people and prisoners (EMCDDA, 2017). In the UK, the Government’s Advisory Council on the Misuse of Drugs (ACMD) review of synthetic cannabinoids similarly noted that while overall population use has declined, use is most prevalent in areas of high deprivation and is particularly common in the homeless population (ACMD, 2020). Furthermore, since the introduction of the PSA, national and international media have frequently drawn attention to ‘Spice epidemics’ in homeless populations in a number of major UK cities, of which Manchester is one (Alexandrescu, 2020; Breese, 2017; Doward, 2017; Economist, 2018; Hume, 2018; Malone, 2017; Perraudin, 2017; Thornton, 2018; Williams, 2017).

In addition to these concerns, the past decade has seen an increase in homelessness in the UK, as well as in many parts of the world, with increases reported in a third of the 37 OECD countries (Organisation for Economic Cooperation & Development, 2020). There is growing concern about the use of synthetic cannabinoids within the homeless population in several countries (ACMD, 2019, 2020; Ellsworth, 2019; EMCDDA, 2017; Gray, Ralphs, & Williams, 2021; Joseph, Manseau, Lalane, Rajparia, & Lewis, 2017, 2019; Manseau et al., 2017). Gray et al. (2021) have outlined several physical and mental health harms that homeless users directly attributed to the effects of synthetic cannabinoid use. Ellsworth (2019) highlighted how the rapid intoxication and incapacitation associated with these substances rendered homeless people physically vulnerable to crime, particularly theft of money and drugs from other homeless drug users and those who supply drugs. Higgins and colleagues have also noted an increased risk of sexual assault experienced by homeless women who were under the influence of synthetic cannabinoids (Higgins, O’Neill, & O’Hara, 2019).

This article contributes to this small body of literature in addressing outstanding questions about the impact of the PSA on markets, and the harms associated with synthetic cannabinoid use within the homeless population. For instance, what impact has the PSA had on the merging of the synthetic cannabinoids market into the existing street market for illicit drugs? What effect has it had on the content and potency of synthetic cannabinoids? Has it increased the risk of harms to these vulnerable users? Our study is the first in-depth empirical research to investigate the effectiveness of blanket bans in addressing the problematic use of synthetic cannabinoids within vulnerable groups.

## Methodology

### Research context

Manchester’s Community Safety Partnership Board commissioned the research on which this article is based. Both the university research and ethics governance committee, and Manchester City Council’s research governance committee, granted ethical approval for the research. The research took place between January and November 2017. The overarching aim of the research was to explore the impact of the PSA on the availability and use of synthetic cannabinoids within Manchester’s homeless population and the impact of the PSA on the content and potency of synthetic cannabinoids. This focus emerged from our 2016 research into NPS use in Manchester (Gray et al., 2021; Ralphs & Gray, 2018; Ralphs, Gray, & Norton, 2016) which found that synthetic cannabinoids were the most prevalent NPS, particularly within the homeless population. At the time, frontline homeless workers estimated that between 80 and 95 per cent of homeless people they were working with in the city<sup>1</sup> were using synthetic cannabinoids (Gray et al., 2021). Our observations in city centre headshops<sup>2</sup> found that over 90 per cent of all NPS sold were synthetic cannabinoids, thus leading to the conclusion that synthetic cannabinoids would be the NPS most likely to crossover into the illicit street market post-PSA (Gray & Ralphs, 2016; Ralphs et al., 2016).

### Qualitative research participants

The qualitative findings presented in this article draw on 82 face-to-face interviews undertaken with 37 homeless synthetic cannabinoid users and 45 stakeholders that support, work with, and/or regularly engage with this population. For the purposes of the research, we used the term homeless to include both street homeless, and those non-street homeless who were leading a street-based lifestyle at the time (e.g. spending large portions of their day in Manchester city centre, primarily to obtain money – through begging and acquisitive crime – to purchase substances that they then used in public places around the city centre). Hence, in addition to street homeless, participants included those living in a range of temporary accommodation (including hostels, night shelters, supported accommodation, probation bail hostels, and approved probation premises following release from custody). Many of these non-street homeless participants had recent experience of being street homeless.

Using a purposive sampling approach, homeless synthetic cannabinoid users were accessed through a range of local services who acted as gatekeepers (Hammersley & Atkinson, 1983), identifying suitable people for interview (in terms of both knowledge and experience of synthetic cannabinoids, and ability to fully consent). Homeless interviewees were aged between 19 and 63 years (average age 35), and the majority ( $n = 32$ ) were male. All were white British. This demographic profile is consistent with both the local and national homeless population that is predominantly male, white, and aged between 25 and 55 (Ministry of Housing, Communities, & Local Government, 2018). The 45

<sup>1</sup> At the time of the study, the official rough sleeping count in Manchester was 94 (HM Government, 2017). However, obtaining accurate rough sleeper counts are acknowledged to be challenging (Ministry of Housing, Communities and Local Government, 2018) and are widely thought to under-report levels of rough sleeping. Research conducted by national homeless charity Shelter estimated that there were over 3,500 homeless people in Manchester with official statistics of 3,433 people living in temporary accommodation (Shelter, 2017). Similar to rough sleeper figures, this data is likely to be an underestimation, as it does not account for the vast numbers of people living in unsupported temporary accommodation and sofa surfing in the city (Brennan, 2018).

<sup>2</sup> Headshops are retail outlets that specialise in drugs paraphernalia typically used for the consumption of cannabis and tobacco, and items related to cannabis culture, as well as other substances and related countercultures.

stakeholder interviews included a mixture of front line and senior staff from the supported accommodation sector, substance use treatment services, city centre police officers, mental health dual diagnosis nurses, a homeless medical practice, probation approved premises and bail hostels, homeless day centres, and homeless outreach workers.

#### Qualitative data collection

All interviews were conducted face-to-face and digitally recorded. Most homeless interviews were undertaken on the premises of local homeless services or supported accommodation providers with a small number of interviews taking place on the streets during the observational research. The user interview schedule was semi-structured and focused on the impact of the PSA on availability, price, and content. The semi-structured interview schedule for stakeholders also addressed the impact of the PSA on their services and staff. The interviews ranged in length from 25 to 120 min.

Interview data was supplemented with over one hundred hours of observations during 45 separate fieldwork trips. This consisted of observations at homeless day centres and city centre soup kitchens, and accompanying a number of different homeless services on street outreach. During the outreach work, the research team spoke to homeless and beggars in an informal ad hoc manner, leading to increased levels of trust within the target population. These observations and conversations were voice recorded as fieldnotes at the end of each fieldwork session. They continually informed the focus of the interviews with users and stakeholders and helped to corroborate the interview data. For example, it was common to witness homeless users heavily intoxicated and in need of emergency assistance, and to see Spice dealers targeting beggars and rough sleepers, issues often discussed in interviews.

#### Qualitative data analysis

All the interviews were transcribed verbatim and together with fieldwork notes, were imported into NVivo10, a qualitative data analysis software package (QSR, 2019). The analysis was undertaken thematically (Braun & Clarke, 2006), with a single structured coding system created for user and stakeholder interview transcripts and fieldnote observations (Bazeley & Jackson, 2013). The system comprised a hybrid of both inductive (from the interviews and fieldnotes) and deductive (from the research questions) codes (Fereday & Muir-Cochrane, 2006). Authors one and two undertook the analysis independently, and the themes that iteratively arose were crosschecked, discussed, and agreed upon (Neale, Allen, & Coombes, 2005).

#### Chemical analysis

A memorandum of understanding between Greater Manchester Police (GMP) and Manchester Metropolitan University allows for non-evidential seized substances (e.g. small amounts seized as personal use) to be submitted for testing. Between 21st February 2017 and 23rd November 2017, 69 suspected synthetic cannabinoid samples were seized by GMP and tested by the Manchester Drug Analysis & Knowledge Exchange (MANDRAKE) partnership.<sup>3</sup> Each of the reported tested samples (see Fig. 1) represents a single seizure. These samples were obtained direct from users in situations where the police attended as part of an emergency response to an adverse effect or public order incident,

<sup>3</sup> In February 2017, Manchester Metropolitan University and Greater Manchester Police established MANDRAKE, a unique and innovative partnership to facilitate rapid, robust and cost effective chemical analysis and knowledge exchange for harm reduction and intelligence sharing within the Greater Manchester Region. MANDRAKE is a fixed Home Office licenced resource. The licence, issued to the Department from 2015, allows the possession, supply and production of controlled drugs (Schedules 1 – 5) under the Misuse of Drugs Act (1971) and Misuse of Drugs Regulations (2001).

or where they encountered somebody collapsed or in a catatonic state during city centre patrols. Typically, these samples would be a joint that had been partially smoked, sometimes taken from the hand of the user in a catatonic state, or a snap bag of suspected synthetic cannabinoids found on the person. All samples were homogenised and analysed in triplicate using Gas Chromatography-Mass Spectrometry (GC-MS). Reference materials for the principle cannabinoids in each sample were synthesised in-house using adaptations of previously described procedures (Antonides, Cannart et al., 2019). The GC-MS parameters have been previously reported (Antonides, Brignall et al., 2019). Concentrations are provided as an average concentration (mg/g) over the three replicated tests (see Fig. 1).

## Results

### From high street retail shops to street dealers

In line with the Home Office (2018a) review of the PSA, the research found that the PSA has been successful in achieving its central objective of removing the sale of NPS from retail shops on Manchester's highstreets. In doing so, it has narrowed the range of NPS to synthetic cannabinoids, and the demographic of user, from a wider population including young people that were using NPS prior to the PSA, to predominantly the homeless population in the city (Blackman & Bradley, 2017; Ralphs et al., 2016). This was evident from our regular fieldwork observations in city centre public places and commented upon in all of the interviews with emergency services and outreach workers.

*'We've seen a transition from ... what we called the 'Spice tourists' that came in [to Manchester pre-PSA] ... to almost all of it [post-PSA] being consumed by people who live on the streets'.*

(Police Officer)

*Before [the PSA], when it was in the shops, everyone was buying it. Now it's gone to the streets it's just the homeless doing it. So [now] the headlines [and] the images [in the media], it's cemented Spice and homelessness: 'dirty Spice heads', 'lowest of the low'!*

(Outreach Engagement Worker, Young Homeless)

The most popular type of NPS that were purchased in city centre headshops prior to the PSA – synthetic cannabinoids – remain easily accessible and widely used within Manchester's homeless population (Gray et al., 2021; Ralphs et al., 2016). This supports the Home Office's (2018a) finding that high levels of synthetic cannabinoid use persist amongst the homeless population post-PSA. It was unanimously reported in all 82 stakeholder and homeless synthetic cannabinoid user interviews, that availability and access had increased amongst this demographic.

*'[Synthetic cannabinoids are] more available now than it ever has been, it's just so freely out there'.*

(Supported Housing Worker)

*'You only have to stand still [in the city centre area] with a bag on your back for two minutes now [since the PSA] and you'll be offered Spice [synthetic cannabinoids]. Last Sunday, when I was waiting for my mate, ... in five minutes I got offered it four or five times'.*

(Male, 40s, occasional user, soup kitchen)

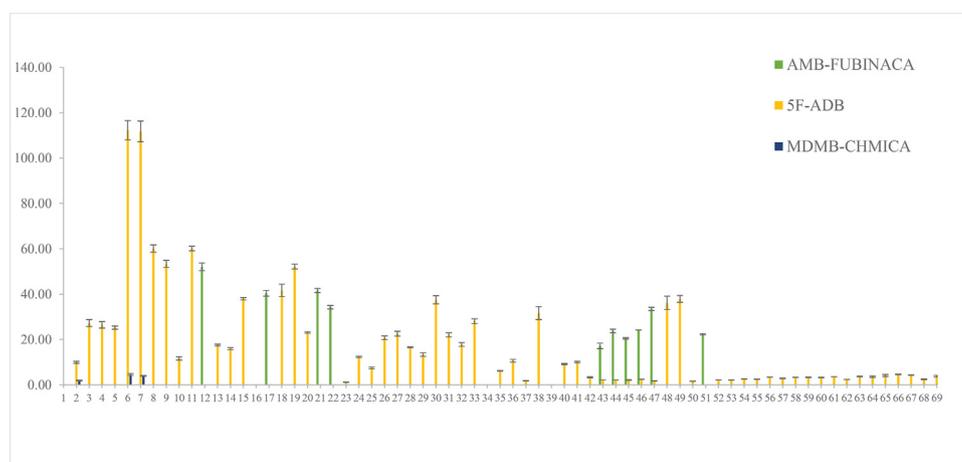
*'The ban [PSA] hasn't changed anything. ... It's not stopping people from taking it [synthetic cannabinoids], you know what I mean, not at all. It's just changed where people get it from'.*

(Female, late 20s, homeless)

*'So people who are already Spice addicts come here ... and find it's plentiful. And it's cheap. And it's available'.*

(Male, late-20s, rough sleeper)

This displacement onto the streets was anticipated at both a national (Release & Transform, 2015; Stevens et al., 2015) and local level. Our



**Fig. 1.** Concentration (mg/g) (with error range) of synthetic cannabinoids identified in seized samples ( $n = 69$ ) (21st February 2017 – 23rd November 2017).

previous study on NPS use in Manchester leading up the 2016 *Psychoactive Substances Act* reported a widespread consensus amongst users and stakeholders that once high street outlets closed, synthetic cannabinoids would become just another illicit street drug (Gray & Ralphs, 2016; Ralphs et al., 2016).

#### The evolution of the local drug market

Prior to the introduction of the PSA, the synthetic cannabinoid market was clearly separated from the traditional illicit drug market. Since the PSA, the markets have merged with many heroin and crack dealers now reportedly supplying synthetic cannabinoids.

*‘We have now seen it [synthetic cannabinoids] become more embedded [since the PSA] where they [dealers] will sell pretty much anything. ... We have come across people who have got Spice [synthetic cannabinoids], heroin [and] crack and are selling them all’.*

(Police Officer)

*‘They [heroin and crack dealers] know they’re losing out on money if they don’t sell Spice [synthetic cannabinoids], because somebody else will’.*

(Outreach Worker)

The creation of ‘one-stop-shop’ suppliers who sell synthetic cannabinoids, heroin, and crack cocaine, was flagged by five (three substance use treatment and two homeless outreach) interviewees as a concern related to increasing the likelihood of users switching between substances. Of particular concern is the potential for young homeless users – who in our previous research (Ralphs et al., 2016) were noted to be using synthetic cannabinoids rather than traditional drugs – to be introduced to heroin and crack.

*‘It’s like inevitable that some of them ... younger homeless lads ... are going to get drawn into smack [heroin] and crack, ... and that means you’ve got a new generation of drug injectors eventually if they want to stop smoking it, and that’s a worry because they had tailed off’.*

(Needle Exchange Harm Reduction Worker)

There was some evidence that this has happened amongst young homeless people in the city. As one of the main providers of accommodation for 16 to 25-year olds with experience of homelessness reported:

*‘Some of the young people ... have been actively using Spice for however long, [but now] we’ve seen them move onto using heroin. ... There was a girl that we know that started using crack. She never used it on the [housing] project, but she came back a couple of times after being found out in the community using it [crack] and she had previously been using Spice. This was in about August, so not too long after the ban came in’.*

(Young Person’s Housing Project Manager)

In addition to a merging of the synthetic cannabinoid market into the traditional street market for heroin and crack, the market for synthetic cannabinoids post-PSA has been associated with the emergence of younger dealers who only supply synthetic cannabinoids. They were frequently referred to in both our informal conversations during fieldwork and formal interviews with stakeholders and the homeless population.

*‘There is a new, younger group of lads selling it now. Loads of them, especially in [public space]. It’s full of them in and around there’.*

(Female, late-20s, homeless)

*‘There are loads of new younger dealers out there now that just sell it. They swarm all over you in [a public space]. “Spice! Spice! Spice!” They’re everywhere these kids since the shops stopped selling it. Like fuck-ing flies!’*

(Male, early-40s, rough sleeper)

These new younger dealers adopted a much more direct and targeted approach than traditional crack and heroin dealers. During fieldwork observations, it was common to see young dealers on mountain bikes approach and sell to beggars and to homeless people sat in city centre public spaces. The fact that ‘Spice users’ rarely had to move from their location to obtain synthetic cannabinoids was stated in almost all of the stakeholder and homeless interviews.

*‘Before [the PSA] it was certain shops that would sell it [synthetic cannabinoids] and you would [have to physically] go to the shops. But it seems like [since the PSA] it’s even more readily available. Someone can just cycle up to you or walk past you and deliver it to you as you’re sat there’.*

(Rough Sleepers Team)

*‘It’s more available than ever now. I don’t even have to move off my [begging] spot no more. They [dealers] just serve it [synthetic cannabinoids] up wherever you’re sat’.*

(Male, late-20s, rough sleeper)

All the frontline staff working directly in the city centre that we interviewed commented on the unique nature of the street market for Spice that had developed since the PSA. They described it as more visible and accessible, targeted, and aggressive in nature compared to the heroin and crack market.

*‘The specific area [for Spice dealing] we know that the market there is more aggressive, and it happens openly. I can see a lot of homeless people just sitting there and people giving them Spice, giving it to them directly in front of passers-by. You wouldn’t see someone shotting [dealing] heroin on the street in the same way’.*

(Service Manager, Young Person’s Substance Use Service)

*'People have always scored up [area on the outskirts of city centre]. They wouldn't score in [the city's Central Business District] for gear [heroin], the dealers wouldn't risk it. The Spice dealers are all in town, but the gear, heroin and crack [dealers], they wouldn't go into town, they'd make people come outside'.*

(Substance Treatment Worker)

*'From my understanding, the dealing of Spice is very different. ... It's more aggressive I would say, the way that the dealers are approaching the customers. In my experience, we didn't see that with other drug use, so I didn't see that with heroin dealers or things like that, it was more friends or people that they were dealing in a very secretive way. None of it was quite so open'.*

(Young Person's Substance Use Service City Centre Worker)

In addition to this new more targeted and open drugs sales approach, it was noted by the police how some synthetic cannabinoid dealers are carrying unprecedented amounts of drugs on them.

*'There was one occasion where we stopped a dealer ... and he had 270 snap-bags [of synthetic cannabinoids] on him, which is something we'd never have seen with cannabis'.*

(Police Officer)

The police reported several other Spice dealers caught in possession of 100 or more snap bags of synthetic cannabinoids. All police officers we interviewed and spoke to informally, commented on how the carrying of such large quantities was unique to synthetic cannabinoids and was unprecedented for street dealers of drugs such as heroin, crack, or cannabis. In addition to police reports, several outreach workers, homeless day centre staff and homeless people that we interviewed or spoke to informally reported Spice dealers routinely carrying large amounts.

*'These young lads dealing it [Spice] now. They get their Spice from their main guy in bulk, in big bags and then bag it into 100 snap bags to sell each day. They're killing it!'*

Male, late-30s, city centre beggar)

*'They each get 100 bags a day to sell ... So, they all want to get rid and make their profit, so you walk into [city centre area] and 'bam', two, three, four of them rushing over, fighting over selling it to you!'*

(Male, late-40s, city centre rough sleeper)

This reasons for this atypical carrying of large amounts of drugs are unclear and in the absence of Spice dealer insights, we can only speculate. It may be that this is indicative of how much demand there was for this drug or linked to the low cost to purchase in bulk or a perception that policing would be less of a priority compared to crack or heroin.

#### *Blanket ban cold comfort for homeless synthetic cannabinoid users*

Prior to the introduction of the PSA, concerns were raised that a merging of the synthetic cannabinoid market into the illicit street market would displace the sale of synthetic cannabinoids to street dealers 'whose sales practices may increase harms' (Stevens et al., 2015:1169). Our earlier research found that violence associated with the purchase of synthetic cannabinoids from high street shops was not a concern (Gray et al., 2021; Ralphs et al., 2016). However, in line with other research on the violence and volatility associated with illicit drug markets (Caulkins & Reuter, 2009; Latkin, Yang, Tobin, & German, 2013; Salinas, 2018; Taylor, 2007), our interviewees reported that the new dealers who emerged post PSA and who dealt only in synthetic cannabinoids were particularly aggressive and violent in their dealing practices in comparison to dealers of traditional illegal drugs. Most homeless people and several outreach workers we interviewed reported assaults, including stabbings, that were directly attributed to the shift in sales of synthetic cannabinoids from high street shops to street dealers.

*'There were two stabbings over Spice immediately after the ban, one guy brought an ounce, then was followed, robbed and stabbed'.*

(Male, mid-40s, rough sleeper)

A third of the homeless interviewees also reported unscrupulous sale practices associated with the sales of synthetic cannabinoids.

*[Interviewer] What impact do you think the ban has had? 'It's easier to get but people are getting beat up by drug dealers, they're getting ripped off. [Interviewer] Really? How are they getting ripped off? You can go to a Spice dealer and if you give them the money they decide if they want to give you it. Sometimes they don't, sometimes they'll give you the drugs, do you know what I mean? Or they'll say they're selling it and they'll just walk away with your money. And there's nothing you can do about it'.*

(Female, late-20, rough sleeper)

*'These kids was doing it [selling Spice] at this park but then they got greedy, and greedy and they started serving people and then robbing it back of them, and you realise how dangerous this is getting'.*

(Male, mid-30s, rough sleeper)

This increased exposure to drug supply related violence and dubious selling practices was highlighted in all but three of the 37 homeless interviews and in almost half of the 45 interviews with stakeholders.

*'A guy got stabbed up in his tent last week. A dealer laid on an ounce [28 g] [of Spice]. He sold it and didn't have the money ready so he [the dealer] sent a young lad, only a 15, 16-year-old, to stab him up in his tent'.*

(Young Persons Homeless Outreach Worker)

The 'laying on'<sup>4</sup> of synthetic cannabinoids and subsequent drug debts, often settled through violence, did not occur prior to the PSA when these substances were purchased through high street shops. It was often noted that the selling and laying on of drugs in large quantities to the city centre homeless population was a new phenomenon that only occurred in relation to Spice.

*'The Spice now, it's £5 a bag [approx. 0.5 g per snap bag]. But now the dealers offer it for 40 or 50 pound an ounce [28 g]'.*

(Male, early-30s, rough sleeper)

Furthermore, it was discussed how the competition for business around the city centre resulted in synthetic cannabinoids dealers being particularly hostile towards users who switched suppliers; thereby increasing the risks associated with the purchase of synthetic cannabinoids compared to pre-PSA high street shop selling.

*'He [synthetic cannabinoid user] got a bag off a different dealer round the corner. When his [usual] dealer found out he rode past on his bike and [pepper] sprayed him up'.*

(Male, early-20s, rough sleeper)

*'We had a young person going to the city centre to buy from their normal dealer. Someone else [a new dealer] gave Spice to her. ... When that happened, the old dealer told her, "Why did you buy from him and not from me as agreed?" and he assaulted her, ending up with her in the hospital'.*

(Young Persons Substance Misuse Service Manager)

<sup>4</sup> The supply of drugs to a user who does not have the money to pay with the understanding they will pay for the drugs at a later time/date.

### Impact on homeless services

All but one<sup>5</sup> of the 16 homeless and supported accommodation organisations in this sector that we interviewed reported how the new illegal market for synthetic cannabinoids was negatively impacting on the services they provide.

*'The [name] centre, 12 months ago [before the introduction of the PSA], was a reasonably stable and protected environment for threatened and vulnerable people. Now, it is a hot bed of fighting, antagonism and danger'.*

(Homeless Day Centre Volunteer, ex-homeless and Spice user)

They reported increased incidents related to the dealing of synthetic cannabinoids in and around homeless day centres, hostels and supported accommodation premises since the PSA.

*'The last few months [since the Act] have been a nightmare. . . . the increased concerns around dealing on the actual premises itself and then other people coming into the building like unsavoury characters coming into the building more, and then the extra robberies. So, it's a combination of things you know. It's all linked to Spice'.*

(Young Person's Homeless Housing Project Manager)

Eight of the 45 stakeholder interviewees discussed how, since the PSA, synthetic cannabinoid dealers hanging around popular city centre homeless day centres and places where homeless people congregate was impacting on the safety of day centre users and staff working in the homeless sector:

*'We had some Spice dealers who were hanging around the corner and then they were attacking people who were walking past'.*

(Homeless Day Centre Staff)

Some outreach workers were becoming worried about their safety:

*'Outreach staff are now getting concerned about doing the outreach . . . Staff are worried that dealers might think we are working with the police. Think about it: we do the same outreach in the same places the same days and time each week. Some staff are genuinely fearful about being followed home and attacked by Spice dealers. It's a real concern for our outreach staff in particular'.*

(Young Person's Homeless Outreach Worker)

*'[A local supported housing outreach service] have been told not to approach the young group of Spice users on [city centre street], because of the risk that Spice dealers are with them'.*

(Substance Use Service Outreach Worker)

On three occasions when we accompanied homeless outreach workers on city centre patrols we were followed by young dealers who were trying to listen in on the conversations we were having with homeless people. On another two occasions when we sat talking to homeless people, young dealers on bikes approached asking if everything was OK and then left. This prompted those who had been happy to talk to us for several minutes to quickly gather up their belongings and leave.

### Increase in Spice related incidents and the impact on emergency services

One of the main aims of our current interdisciplinary research was to identify the impact of the PSA on the content and potency of synthetic cannabinoids in the city post-PSA. Our qualitative research found a common narrative running through all the interviews that the strength of synthetic cannabinoids had increased since the PSA

<sup>5</sup> The exception was one homeless day centre manager whose premises was located directly opposite a shop that previously sold synthetic cannabinoids. Its close proximity to this shop meant that it had previously experienced a high number of incidents connected to people buying from the shop and then using immediately before entering the premises.

and that potency was more variable. Throughout the research period, the effects on users was highly visible in the city centre and widely reported by interviewees. At the time, these spikes in highly visible synthetic cannabinoid-related emergencies led to stigmatising media headlines attributed to homeless users, including 'Spice Zombies' and 'Walking Dead' (Alexandrescu, 2020; Doward, 2017; Malone, 2017; Williams, 2017). These perceived changes to content were invariably noted to have emerged since the PSA and resultant shift to the street market.

*'What we've seen [post-PSA] is a frequent change in the [content of the] cannabinoids, which has had various [negative] effects. [For example] we've seen more people collapsing'.*

(Police Officer)

*'The potency, it really varies now. . . . There's so many different reactions now, and for people to have a seizure or a collapse after just one drag suggests to me that the potency is quite different to what it was previously [prior to the PSA]'.*

(Supported Housing Manager)

*'There's a few kids out in town, they make their own. . . . But this is what people were dropping down like flies with after they used it. Because he'd made his own Spice, and he must have sprayed it like hundreds of times and made it too strong, people were passing out after one drag and that. . . . It's very dangerous because the person who makes it, he hasn't got a clue what he's doing basically'.*

(Male, late-30s, rough sleeper)

It was common for interviewees to report increases in emergency callouts since the PSA was introduced.

*'I'd say the number of calls that we've had regarding it [Spice], . . . if we go May 2016 [when the PSA was introduced] to May 2017, there's been more than the previous twelve months'.*

(City Centre Police Officer)

*'You had a dozen ambulances, . . . going backwards and forwards, ferrying Spice people [synthetic cannabinoid users] to the hospital to be treated. . . . I counted five ambulances in one spot'.*

(Homeless Outreach Volunteer, ex-homeless Spice user)

The increased pressure on emergency responders was consistently noted by police and other stakeholders.

*'The collapses are the things that have the biggest impact and where we spend a lot of our time. . . . Because you can spend one, two hours with somebody waiting for the ambulance service to turn up. . . . So that's where we're seeing the biggest drain on resources and the biggest time spent'.*

(City Centre Police Officer)

*'Who do you think, on a weekly basis, that an ambulance member will report they deal with right now? Who do you think the problem will be? Spice, it's clear! Everyone I see who's messed up on the streets and has got an ambulance person with them is using Spice. . . . The waste of resources is immense'.*

(Homeless Outreach Worker)

*'It seems to have got worse in the last four months or so. It's always been here but we haven't had the kind of accidents that we've had'.*

(Supported Accommodation Manager)

This increase in synthetic cannabinoid related ambulance callouts has been mirrored in both the West Midlands and South Western ambulance services (Marsh, 2018; Robinson, 2018). Our findings also echo those of Grigg et al. (2020). Their analysis of ambulance attendee data in Australia found that prohibitive legislation aimed at restricting the supply and use of synthetic cannabinoids resulted in an increased severity of harms to users, culminating in a greater number of people requiring transporting to hospital. However, as the following chemical analysis section illustrates, these more harmful effects and increased number of

emergency callouts may have occurred regardless of the PSA due to the emergence of more potent third generation synthetic cannabinoids.

#### Forensic content analysis

Prior to the PSA, concerns were raised that a shift to the illicit street market would negatively affect the content of synthetic cannabinoids (Stevens et al., 2015). In our previous study, we raised the same issue (Ralphs et al., 2016). We therefore recommended the commissioning of forensic analysis to gather intelligence through the testing of 'street Spice' to ascertain the content and chemical composition. To facilitate this, in February 2017, Manchester Metropolitan University and Greater Manchester Police established MANDRAKE. This initiative facilitates the testing of synthetic cannabinoids and other substances seized on the street.

While we did not have any local testing data of synthetic cannabinoids pre-PSA, a small number of users and stakeholders reported that synthetic cannabinoid users were familiar with shop purchased brands and their effects. However, post-PSA, the synthetic cannabinoids available on the illicit street market in Manchester were being sold in clear snap bags with no branding or product information, resulting in users being unaware of the synthetic cannabinoids they were using.

*'[Pre-PSA] some young people would choose specific brands that they knew weren't as strong ... like Vertex and Happy Joker. ... If they'd had a bad reaction to one [brand] they'd get a different one [next time]. ... Now they've got no idea what's going to happen when they take it.'*

(Young Persons Housing Project Worker)

With no local pre-PSA testing to confirm the consistency of products purchased through high street shops we cannot validate these claims. Furthermore, evidence suggests that variability in product content was commonplace in the UK synthetic cannabinoid market prior to the transition to the street market (DrugWise, 2016; Home Office, 2018b; WEDINOS, 2015).

Our chemical analysis revealed that, between 21st February 2017 and 23rd November 2017, there were only three different synthetic cannabinoids present in 69 samples that were seized by the police and analysed by MANDRAKE. These were AMB-FUBINACA, 5F-ADB (aka 5F-MDMB-PINACA) and MDMB-CHMICA (see Fig. 1). One of these - 5F-ADB (detected in 60/69 analysed samples) – dominated the market, albeit with a large variability in concentration. The national synthetic cannabinoid market prior to the introduction of the PSA was characterised by a larger number of 'branded' products with a wide variety of constituent compounds. In the year leading up to the introduction of the PSA, the UK Forensic Early Warning System (FEWS) annual report for the period (April 2015 – March 2016) presented data from police seizures. Twelve synthetic cannabinoids were identified, with 5F-AKB48, 5F-PB-22 and MDMB-CHMICA the most prevalent (Home Office, 2018b). The reduction in the number of different synthetic cannabinoids we found on sale locally in Manchester is reflective of the international picture. In recent years, there has been a noticeable decrease in the number of new synthetic cannabinoids appearing on the global market. In Europe for example, the EMCDDA report that an average of 27 cannabinoids appeared each year in Europe between 2011 and 2015. However, since 2016 the number has dropped by almost two-thirds to around 10 (EMCDDA, 2020).

Chemical analysis identified variation in both content and potency. Fifty-eight of the samples contained just one type of synthetic cannabinoid. However, in eight of the samples (samples 2, 6, 7, 43, 44, 45, 46 and 47) two were identified. Whether this was intentional or because of cross-contamination during manufacture is not known. Three of the samples (samples 16, 34 and 39) were inert plant matter containing no synthetic cannabinoids. While the synthetic cannabinoids were consistent, Fig. 1 illustrates a wide variation in the proportion of the sample that contained active synthetic cannabinoids. For example, concentrations ranged from 1.25 mg/g (sample 23) to 116.83 mg/g (sample 6).

There is evidence that these third generation synthetic cannabinoids that we have identified and that have come to dominate the UK market, such as AMB-FUBINACA, are more potent agonists at CB1 receptors than those previously encountered (Banister et al., 2016). They have been linked to a number of spikes in deaths and emergency incidents in several countries including America, Japan, New Zealand and Russia (Law, Schier, Martin, Chang, & Wolkin, 2015; New York Times, 2016; New Zealand Drug Foundation, 2017; Shanks, Clark, & Behonick, 2016; Shevyrin et al., 2015), leading to their control under the Misuse of Drugs Act 1971 as Class B substances on the 14th December 2016. Therefore, it is probable that regardless of the PSA, these more potent third generation synthetic cannabinoids and the increased number of reported harms and emergency incidents would have materialised to some extent, making it difficult to confidently attribute changes in the harms and emergency incidents of these substances specifically to the PSA (Home Office, 2018a).

However, the forensic analysis and partnership with local police which includes information on weight-for-weight content has better informed frontline services of the reasons why spikes in incidents have happened. A clear example of this occurred in April 2017 (see Fig. 1, samples 6 and 7) when the local North West Ambulance Service received 58 call-outs during a single 24-hour period (Perraudin, 2017; Williams, 2017).

*'There were around 22 incidents, and that was literally on one day. I think there was over fifty over the weekend. ... With the [chemical] testing we've done ... we've been able to identify that was down to a manufacturing blip where the content weight for weight had gone up to something like 17 to 18 percent ... where the usual range is between 1 and 2 percent.'*

(Police Officer)

The analysis of the synthetic cannabinoids on sale locally enabled us to identify that when content rose above the usual two percent or less, spikes in incidents were likely to occur. Increased emergency call-outs coincided with analysed samples at four percent and in here the case of the spike discussed above in April 2017, that led to an international media focus on the city that included stigmatising images of homeless users and 'Zombie Spice' headlines; the content rose to sixteen percent.

#### Discussion

Our research clearly illustrates how the PSA has triggered several significant detrimental changes to the local synthetic cannabinoid market. These include the integration of synthetic cannabinoids into the existing illicit street market and the adoption of more targeted, aggressive dealer practices. These findings align with the concerns of drug policy reformists, who warn that legislating against substances will inevitably 'create market opportunities for illicit suppliers', while at the same time creating or exacerbating drug-related harms (Rolles, 2009:10). They also highlight the increased harms inherent in street markets that often impact on the most vulnerable groups that are a product of prohibition policies aimed to reduce harm. Hence we conclude that these documented market changes, resulting from the PSA, have increased the risk of harm to the homeless population; findings that are clearly at odds with the aim of current UK prohibition drug policy to 'protect the most vulnerable' in society (Brown & Wincup, 2019; HM Government, 2017).

This article has highlighted that, despite the PSA reducing NPS use within the general population, the use of synthetic cannabinoids within the homeless population in Manchester has continued unabated (Gray et al., 2021). The research has also highlighted the continuing impact these substances have on frontline services in the homeless sector and on emergency services. While acknowledging the challenges of transferability of these findings from one English city to other UK metropolitan areas, similar problems have subsequently become evident via media reports in cities across England and Wales including: Birmingham, Bristol, Cambridge, Cardiff, Doncaster, Grimsby, Hull,

Leeds, Lincoln, Newcastle, Nottingham, Sheffield, Plymouth and Wrexham (Alexandrescu, 2020; Breese, 2017; Economist, 2018; Hume, 2018; Thornton, 2018). Moreover, in August 2018, these spikes in synthetic cannabinoid-related emergency callouts, and increases in Spice dealing, led to 20 Police and Crime Commissioners from across England and Wales signing an open letter to the Home Office referring to synthetic cannabinoids as ‘an urgent public health issue that is growing in size and demand upon public services and currently disproportionately upon policing’, highlighting the ‘devastating effects’ of synthetic cannabinoids on ‘users ... communities and emergency services’ and the ‘woefully inadequate’ government response (Jones, 2018:1).

It is important to remember that the harms associated with the PSA were foreseen (All-Party Parliamentary Group for Drug Policy Reform, 2013; Release & Transform, 2015; Stevens et al., 2015). Drawing on the international evidence, there was a high likelihood that the introduction of a blanket ban would simply shift the sale of synthetic cannabinoids from the high street to the illicit street market; as was the case in Poland and Ireland (Bujalski, Dąbrowska, & Wieczorek, 2017; European Commission, 2014; McVeigh, 2015). The reason for this shift is largely a result of the entrenched use of synthetic cannabinoids within the homeless population; primarily because of the functional purpose they serve, and the associated dependency (Gray et al., 2021; Ralphs, Williams, Askew, & Norton, 2017). Bearing in mind the failure of the PSA to reduce synthetic cannabinoid use within the homeless population (ACMD, 2019, 2020; Home Office, 2018a), and the resulting increased risk of individual and societal harm described in this article, this raises the challenge to policymakers of how to respond to the continued use of synthetic cannabinoids within vulnerable groups; an issue that has been identified as a ‘major global public health concern’ (Alum & Keating, 2019:297). Our findings suggest that continued high levels of use in the homeless population beyond the introduction of the PSA is in part connected to the widespread availability of these substances, and points to the continued importance of supply reduction and international drug control. However, as we have argued elsewhere (Gray et al., 2021; Ralphs & Gray, 2017, 2018), we believe that policymakers should concentrate on reducing the demand for synthetic cannabinoids, alongside existing efforts to restrict supply. For example, demand could be tackled by ensuring that medically supervised community detox and in-patient rehabilitation are appropriately funded, alongside treatment services that have the capability to address the co-existence of mental health problems and substance use. This would, in our view, provide an effective solution to the harms associated with synthetic cannabinoid use within homeless populations (Gray et al., 2021). The regulation of cannabis and/or increased access to heroin assisted treatment are alternative legislative options that may further reduce existing demand.

Alam and Keating (2019) assert that the chemical analysis of synthetic cannabinoids is pivotal to developing an improved understanding of this continually evolving category of NPS. While we agree, we would further argue that there are significant benefits to conducting interdisciplinary research in this field. Our research illustrates the benefits of combining chemistry and social science. The ability to identify the types and concentration of synthetic cannabinoids that are being used locally, alongside the voices and experiences of often marginalised user groups, is integral to the development of effective evidenced-based responses. For example, in the case of Manchester, this research has resulted in a series of timely warnings that have alerted both practitioners and users to particularly potent local strains of synthetic cannabinoids.

In addition to this call for further interdisciplinary research in this area, these findings have implications for future research agendas. We acknowledge that this article is based on research within the homeless population in one city in the UK. It would be beneficial to conduct studies of the impact of similar blanket legislation aimed at reducing the availability of NPS and the harms associated with their use in other countries. This should include looking beyond the homeless population, and where applicable, at other types of NPS. Our research suggests that the prohibition of these formerly ‘legal highs’ has created a new younger

type of drug dealer with different dealing practices. Our lack of focus on drug dealers means that it remains unclear why this was the case. For example, this might have been due to a perception that the selling of NPS is less of a police priority and so dealers are less likely to be caught by the police. Our research design and epistemology also prioritized the experience of homeless synthetic cannabinoid users and frontline workers. As a result, the research did not focus on official datasets on, for example, hospital admissions, emergency callouts and police incident logs. We propose that future research should attempt to strengthen this evidence base by incorporating official data sources and the voices of drug dealers to consolidate and corroborate the narratives of substance users and stakeholders.

## Declarations of Interest

None.

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