Mephedrone

The Use of Mephedrone (M-cat, Meow) in Middlesbrough

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Executive Summary

Mephedrone: the use of m-cat (Meow) in Middlesbrough

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'Legal highs' are drugs which are not controlled under the 1971 Misuse of Drugs Act nor licensed for legal use. Mephedrone is a semi-synthetic 'legal high' manufactured from cathinone, the active ingredient of the African shrub khat, and a natural analogue of the stimulant drug amphetamine (speed/wiz). Mephedrone is a white powder, and its full chemical name is 4-methylmethcathinone (4MMC). It is known to users as meph and m-cat, and is sold by headshops (in cities and on the internet) as plant food under the trade name Meow.

In December 2009 Lifeline Publications & Research was commissioned to investigate mephedrone use in Middlesbrough, and to produce a publication for local users. This research incorporated a literature review, interviews with drugs workers, and focus groups with 10 users of mephedrone (nine men and one woman, mostly young adults). All participants were regular users of drugs - notably alcohol, cannabis and amphetamine, but also cocaine and ecstasy. All had begun using mephedrone one to three months ago, and most were aware that it was 'legal'. About half had been obtaining mephedrone from internet companies (£10 per gram), and half from drug dealers in nightclubs (£15 per gram). All agreed that mephedrone had quickly become very popular in Middlesbrough, and was mainly used in nightclubs and parties. Since sniffing it caused painful 'nose burns', most had switched to swallowing it. The typical amount of mephedrone consumed over an evening/night was about 0.5 to one gram, usually taken in doses (keys) of 100-200 mg every hour or two. Weekend use was the norm, though some participants were near-daily users. Most participants reported 'mixing' alcohol and/or cannabis with mephedrone, either to heighten the effects or ameliorate the come-down.

The effects of mephedrone were regarded as both stimulant (like speed) and hallucinogenic (like ecstasy or LSD). The full effects of one dose lasted around two to four hours. The main physical effects of mephedrone were reported to be nose-bleeds, dilated pupils, blurred vision, dry mouth/thirst, hot flushes, fast/erratic heart-beats, muscular tension in the jaw and limbs, and shrunken genitals (men only). The main mental effects were initial 'head rushes', followed by euphoria, boundless energy, talkativeness, and time distortions – with heavier users also reporting visual hallucinations. The main residual effect was insomnia. The after-effects were similar to speed come-downs, involving fatigue, dizziness, and low mood. Most users regarded mephedrone's effects as superior to those of cocaine and ecstasy. Few harmful consequences of mephedrone use were reported, though participants had all been using for less than three months. No participants felt they were dependent, though most reported cravings and some were using nearly every day. Some participants reported skin-rashes, insomnia and/or amnesia following mephedrone use, though none reported needing any medical or other help.

It is concluded that, on the basis of our current knowledge, the following harm-reduction advice should be given to mephedrone users: use occasionally (less than weekly); use moderately (no more than 0.5g per session); swallow rather than sniff the powder; use at home, but if using in nightclubs stay close to friends; avoid mixing it with alcohol, stimulants or prescribed medicines; buy it from headshops/internet rather than drug dealers; and avoid mephedrone if you have health problems (particularly mental disorders or heart problems). The main message is: look after your friends, and they will look after you.

1. Introduction

'Legal highs' are drugs which are neither controlled by the 1971 Misuse of Drugs Act (MoDA), nor licensed for legal use (like alcohol and tobacco). Such drugs are legal to use and possess, and legal to supply as long as they are sold for purposes other than human consumption. If they are sold or advertised as drugs, they become subject to the 1968 Medicines Act – which has a maximum sentence of two years imprisonment for unauthorised supply. The leaves and stems of the shrub khat (qat) are traditionally chewed for their stimulant effects in East Africa and the Middle East, and are used as a natural 'legal high' by some communities in Britain. The active ingredients of khat are cathinone and cathine, stimulant drugs classified as keto-amphetamines. Over the past decade, enterprising 'legal high' producers have manufactured several semi-synthetic stimulants from cathinone, the most well-known of which is mephedrone (Meyer et al. 2009; Appendix 1). The full chemical name of mephedrone is 4-methylmethcathinone (4MMC), known to users as m-cat or meph, and sold from headshops under the trade name of Meow (or Miaow). It is not controlled in the UK, though is prohibited in Scandinavian countries and Israel. Though research has just begun, the effects of mephedrone have been reported to resemble those of both speed (stimulant amphetamines) and ecstasy (hallucinogenic amphetamines). The nature and extent of its harmful consequences has also not yet been researched. At the time of writing, there was just one published report of mephedrone poisoning in the UK (Wood et al. 2009), and just one death linked to mephedrone reported by the mass media in Britain – a young man who committed suicide allegedly due to post-mephedrone depression (The Sun, 8th December 2009).

In December 2009, Lifeline Publications & Research was commissioned by Safer Middlesbrough Partnership to conduct some research into mephedrone, and to produce a publication for local users of mephedrone. This document reports the methods and findings of this research.

2. Research methods

Overview. The research had three components: a review of the available literature, interviews with drug agency staff, and focus groups with mephedrone users in Middlesbrough. At the start of December 2009, the Manager of Lifeline Middlesbrough contacted the Director of Communications (Mike Linnell) at Lifeline Publications & Research, to make arrangements for research into local mephedrone use to be conducted. Staff at the agency then began asking service users who used mephedrone if they or any of their associates would be willing to participate in a focus group. The single criterion for inclusion was that potential participants must have used or be using mephedrone. On Monday 14th December 2009, two senior members of Lifeline Publications & Research - Mike Linnell (ML) and Russell Newcombe (RN) - visited the premises of Lifeline Middlesbrough to conduct short unstructured interviews with two members of staff, and focus groups with mephedrone users.

Focus groups. For practical reasons (time constraints and the staggered times of arrival of research participants) three focus groups were conducted: one with six participants, and two with two participants each – making a total of 10 mephedrone users. Each focus group was conducted in a private room at Lifeline Middlesbrough, and began with an introduction from ML, who explained the purpose of the research (to produce a publication for mephedrone users); who we were; and that participation was voluntary, confidential and anonymous.

Using a pre-structured list of topics (Appendix 2), ML prompted participants to give information about mephedrone use by them and their associates, and RN kept a written record of their responses (as well as making some verbal prompts). Most participants made useful contributions to the discussions, and only two were relatively quiet (P3 and P9). At the end of each session, participants were asked if they had any questions, thanked for their help, and given £20 each for their assistance. Each focus group lasted between 45 and 60 minutes.

Participants. All 10 participants were residents of Middlesbrough, and over 18 years of age. The participants within each focus group were friends and/or associates (with one exception). Initial discussions revealed that all participants were poly-drug users, and were mainly users of three recreational drugs: cannabis (especially skunk), alcohol and amphetamine sulphate (speed or wiz). Most participants also mentioned being users of cocaine (sniff) and ecstasy (pills) in the past, but generally indicated that they had ceased or reduced their use of these two popular drugs because their quality (purity) had dropped so much over the last

few years (confirmed by analyses of drugs seized by the police, e.g. Home Office 2009). This partly explains their increased interest in 'legal highs' such as keto-amphetamines. Many participants also mentioned use of ketamine, and some mentioned use of other hallucinogens (e.g. LSD, magic mushrooms) - but none indicated any use of heroin or crack. For instance, P2 stated that "we don't touch smack, but I've got a mate who does, and I'm OK with that as long as he does it away from me".

The first focus group incorporated six participants (P1 to P6) – all were males, and five were aged from their late teens to early 20s (one, a gym-using businessman, was in his late 20s). This group were largely unemployed, and generally reported using mephedrone and other recreational drugs while in nightclubs and parties. The second focus group comprised two participants (P7 and P8): a white man in his 50s and a white woman in her 40s. These two participants could be described as 'psychonauts' - that is, long-term dedicated users of hallucinogens and other drugs, with an intellectual interest in their chemistry and effects. For instance, these participants were aware of the Shulgins' research into the chemistry and effects of phenethlyamines - the broader class of drugs to which mephedrone belongs (see: PIKHAL – Shulgin & Shulgin 1991). A member of staff was also present during this focus group (the participants had no objections). The third focus group included two participants (P9 and P10), both of whom were white males in their early to mid-20s, and moderate weekend users of recreational drugs (e.g. using Sunday to recover from Friday/Saturday night partying, in order to have recovered in time for work on Monday). In summary, as checks with agency staff confirmed, the focus group participants were a fairly representative sample of the main groups of local recreational drug users, the main exception being the lack of women participants. Staff had also arranged for one injector of mephedrone to participate in the focus groups, but unfortunately this person failed to arrive.

Recording and reporting. Participants' responses were prompted using a pre-structured list of topics, designed to exhaustively cover the relevant information. The verbal responses were recorded by writing rather than tape-recorder (which could have inhibited honest responding and compromised our guarantees of confidentiality). As in any group discussion, there was a degree of mumbling and meshing which meant that some responses were not recorded. Similarly, the strong accents and local slang of some participants also led to the loss of a small amount of information – though clarification was usually sought in such circumstances. In the Findings section, no distinctions are made between the individual focus groups except when necessary. To indicate the extent of agreement on particular issues, the following quantifiers are used: all (10), most (7 to 9), around half (4 to 6), some (1 to 3), and none. 'All or most' will also be referred to as 'general agreement' or 'consensus'. The best and most useful responses of participants are quoted verbatim, including any slang or expletives. In order to assist the reader, a glossary of slang terms is presented in Appendix 3. Information provided by the interviews with two drug agency staff has been integrated into the Findings section (though is clearly indicated). Lastly, the findings are organised under a series of headings derived from a conceptual model of harm reduction (Newcombe 1992, 2009).

3. Findings

The responses of focus group participants are presented and summarised under five broad sub-sections: context, consumption, effects, consequences, and interventions. Several sub-headings are also used within each of these five main sub-sections (see Appendix 2).

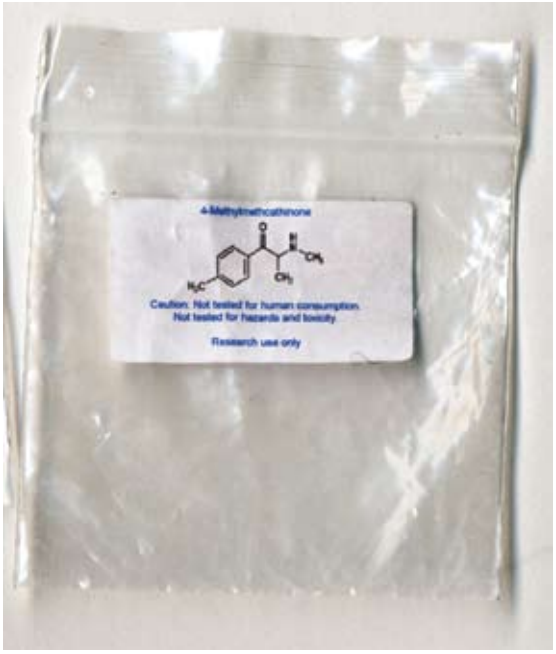
3.1 Context of mephedrone use

Awareness and knowledge. Most participants had become aware of mephedrone over 2009 through coverage in the mass media and on the internet (there are no headshops in Middlesbrough). However, few knew anything about the chemical nature and origins of mephedrone - with the exception of the two psychonauts (P7 and P8) mentioned in the previous section, and P10 who had discovered on the internet that it was derived from "some African plant". When told by ML that mephedrone was a semi-synthetic drug made from cathinone, the stimulant in khat, most participants indicated awareness of khat – though some had no knowledge of it. Most participants were also aware of the standard name mephedrone, though none knew its full chemical name. Two names were clearly the most common – the slang-name m-cat and the trade-name Meow - though other names which were commonly used were the standard name mephedrone, and the abbreviation meph. P1 also referred to it as mad-dog, while P9 and P10 said that they knew it by the name of white magic too. Lastly, most participants expressed their belief that

mephedrone was legal (not controlled by MoDA), though some followed such declarations with a question to the researchers ("isn't it?"), and around half appeared aware that the government was considering banning it. For instance: "I've been told that it's legal" (P2); "I've heard it's going to be illegal soon" (P1); and "I want to get a load of m-cat before it gets banned" (P8).

Origins of use. There was a consensus that mephedrone use had emerged in Middlesbrough over the past six months, and most agreed that it had rapidly become popular in over the previous three months (September to December 2009): "everyone round here knows what it is now, and loads are doing it" (P6). Most participants indicated that their interest in trying mephedrone was sparked by the experiences of friends about two or three months earlier: "a friend of mine had gone dancing on m-cat, and told me that he was right off his head on it – so we got some, I loved it, and we've never looked back" (P8). The most recent users of mephedrone were P1 and P5, who stated that they had first tried it about a month ago.

Mephedrone products and market. All participants described mephedrone as a white powder. Agency staff provided the researchers with the packaging from one sample of mephedrone which had been given to them by a service user, who indicated that it originated from an internet company. It was a square transparent plastic seal-bag, with a white sticker on it displaying the following information: "4-methylmethcathinone. Not tested for human consumption. Not tested for hazards and toxicity. Research use only". The sticker also displayed the chemical diagram of mephedrone. In addition, mephedrone was also on sale from headshops in Manchester and Liverpool, and packaging from a Manchester product was found to be labelled "Meow – novelty plant feeder. Not for human consumption. Water in well after application. Ingredients: ketones (luvbubbles.com)". Lastly, in the third focus group, P10 suddenly produced a bag of mephedrone from his pocket (similar to the first bag, but unlabeled), and offered it to the researchers, who visually examined and smelt it. It was a white powder which smelt strongly of solvents-like chemicals.



All participants in the first focus group reported obtaining their supplies of mephedrone from drug dealers (who sold other drugs such as amphetamine, cocaine and ecstasy), or from friends who had done so: "we didn't know you could buy it on the net" (P2). This contrasted with the four participants in the second and third focus groups, who mainly obtained their supplies from the internet. Indeed, both of the drugs workers interviewed stated that "dealers are now selling meph in clubs – some of the clubs are even selling it themselves – as plant food - though the licensing authorities are likely to clamp down on this".

Participants reported that mephedrone was mainly sold in gram-bags, at the price of £10 to £15 per gram/bag - typically £10 when purchased from the internet, and £15 when bought from drug dealers (whether bags actually weighed one gram is not known). P1 and P2 also mentioned that some dealers were selling it at two bags for £25 – now a common practice among dealers of many drugs. Most participants also stated that given that mephedrone was generally high-purity and that several doses could be had from one gram/bag, its price was fairly cheap, particularly when compared with the price of standard deals of other popular drugs - notably cocaine (£25-£40 per gram) or skunk-cannabis (£20-£30 for an 'eighth' – typically about 2.5 grams). As P4 stated: "like other drugs, m-cat is cheaper than a night on alcohol now". However, about half of participants suspected that dealers or suppliers were adulterating mephedrone powder with other substances to increase their profits: "some of them are cutting it with smelly chemicals – it's not sugar, it's too bitter" (P2); "I know a guy who has been cutting it" (P6); "I don't think it was pure, it smelt like it had solvents and other chemicals in it" (P7); and "different batches could be cut with various things, which would explain the different effects you get" (P10).

Checks were also made during the same week on the price of Meow sold from a Manchester headshop. The product was a white powder inside a red capsule (weighing about 250mg), contained within a plastic seal-bag, which had a colourful label headed Meow (see above). The sales assistant commented that this was "enough to keep at least one plant well-fed for two or three hours". One such dose cost £9, two cost £16 (£8 each), and four cost £28 (£7 each).

Prevalence of use. Asked about how common mephedrone use was in Middlesbrough, the clear consensus was that "everyone is doing it" – presumably meaning most or all of the local recreational drug users and/or clubbers. Though users appeared to be largely young adults (16-29s), comments by participants suggested that the age-range of local mephedrone users stretched from the early teens to the late 50s, with more male than female users (as with most kinds of drug use).

3.2 Consumption of mephedrone

Reasons for use. Reasons for using drugs can be divided into three chronological types: reasons for starting use, reasons for continuing use, and reasons for ceasing (or reducing) use. The reasons given for using mephedrone were similar to those given by users of recreational drugs in other research. In short, the reasons for starting to use mephedrone included curiosity, liking the effects of drugs, and having nothing else to do. The reasons for continuing to use mephedrone included pleasure (wanting to repeat a desirable fun experience), and developing a habit (craving and dependence). The reasons for ceasing or reducing use were not explored in depth (none of the participants had yet reached this stage), though some users mentioned tolerance to the effects and concerns about possible health damage.

Settings of use. The main settings of use were nightclubs and parties (most participants in first and third focus groups) followed by people's homes (P1, P6, P7 and P8).

Methods of use. Mephedrone powder was usually sniffed or swallowed. Sniffing mainly took the forms of 'keying it': sticking a key into the bag of powder, piling up some powder on the thin end of the key, and then holding the key under a nostril and sniffing vigorously. 'Keying' seemed particularly common in clubs and public places, when there was a need to take the drug quickly before 'bouncers' or other officials noticed. The traditional method for sniffing drugs - chopping the powder up on a mirror (or other flat shiny surface), and 'snorting' lines of it up the nose with a tube (such as a rolled-up bank-note) – was not explicitly mentioned by any participants. Only one participant (P4) stated that he washed his nose out with water after sniffing mephedrone – with some commenting that they would not do this "in case it wasted any" (P5).

Swallowing took one of two forms: 'bombing' (wrapping a dose of powder in a paper wrap and 'necking' it) or drinking (mixing the powder into a beverage, and drinking it quickly) [see also: stages of effects]. Many participants, particularly those in the first focus group, reported switching from sniffing to swallowing mephedrone, mainly because of its painful effects on the nasal membranes [see: physical effects]. Other participants agreed with the painful nature of sniffing mephedrone, but continued using by the nasal route because they eventually got used to the 'nose-burn' and because the effects came on quicker: "the first sniff was real harsh, but after that your nose gets used to it and it don't feel so rough ... and it comes on in five minutes" (P9).

Lastly, some participants had tried rubbing the powder into their gums, though this was not common. None of the 10 participants had heard of anyone trying to inject or smoke mephedrone, and they made it clear that they did not regard injecting as a good idea: "if it burns your nose, imagine what it would do to your veins" (P5). Also, as noted earlier, agency staff had arranged for an injector of

mephedrone to attend the focus group sessions, but he had failed to arrive.

Amounts used. Many participants stated that when they first tried mephedrone it was effective in fairly small doses: "about 50p to a quid's worth" (P9) – equivalent to about 50 to 75 mg. But with regular use – even within the first session – the amounts used soon escalated. For instance: "I now get about eight keys per gram" (P10), and "we usually get about five or six keys from a bag" (P5) – roughly equivalent to about 125-200 mg per dose. Most of the participants in the first focus group reported doing at least a whole bag each in a session - usually an evening/night at a club/party – taking another dose every one to two hours. By contrast, the two participants in the third focus group were more moderate users, with the amount used in a session depending on how long they stayed out at the weekend: "half a gram would keep me going for about four or five hours – then I would either take some more if I was staying out, or else stop there and go home ... there's no point in taking more after a half-gram to gram because it doesn't make you go any higher, it just goes on for longer" (P10). At the other extreme, P6 reported that he once used four grams over one night, and "had to chew 12 packs of bubblies to stop my teeth grinding away". Similarly, the two participants in the second focus group reported a recent 'legendary' session "in which we ended up doing 10 grams between us over three days, with no sleep" (P8).

Frequency of use. All participants began as experimental occasional users of mephedrone, but most had quickly progressed to regular recreational use, with weekend use being the norm. However, P7 and P8 reported that they had been using on a near-daily basis for the past six weeks. In addition, some participants reported having friends and associates who had become daily users (see: Dependence).

Mixing with other drugs. As noted earlier, all participants were poly-drug users – meaning that they had a repertoire of recreational drugs which they used for different purposes and in different settings. But it also became clear that most participants were multi-drug users – meaning that they used two or more drugs during the same session (evening/night/day) of drug use. The most common drugs 'mixed' with (used in the same session as) mephedrone, mentioned by most participants were alcohol and skunk-cannabis – with some participants mentioning ecstasy and ketamine (P1, P2). Other drugs were used to heighten the effects during the main stage of intoxication, and to assist with the less pleasant residual and come-down effects (see below). For instance, P7 and P8, who gave the detailed account of a 3-day binge in which they used 10 grams of mephedrone, stated they also consumed "about £100 worth of alcohol over the three days" (P8); while P1 commented that "if you smoke skunk with m-cat, it gives you head-rushes and takes you right up". Participants generally agreed with the observation of P3 that "when you drink alcohol with m-cat, you don't seem to get drunk" – for instance, "it's best not to bother with alcohol on it" (P10). But some participants used alcohol or other drugs to help them cope with the 'come-down' from mephedrone. For instance, P6 "sat and drank four cans of beer to straighten me up".

3.3 Effects of mephedrone

Physical effects. The initial physical effects of mephedrone were related to methods of administration. Most participants reported nose-burns and nose-bleeds when it was sniffed, and sore or bleeding gums when it was rubbed on the gums inside the mouth: "it burns your nose real bad, makes your eyes stream with water, until you can't see properly" (P6); "the back of your nose fills up with snotty gunk and blood, and is scabbed afterwards" (P3); "after the nose-burns, I tried rubbing it on my gums, but that was horrible too, made them real sore" (P2). As noted above, these painful effects on the nasal or mouth membranes led many users to switch to swallowing mephedrone, which had no or far fewer negative effects.

As the effects 'came on', physical effects were the most common, along with 'head rushes' (see below). These physical effects often continued into the main stage of effects, and included fully dilated pupils, rapid eye-movements, blurred vision, dry mouth, hot flushes, fast/erratic heart-beats, and muscular tension in the face and limbs – including trismus and bruxism (jaw-clenching and teeth-grinding). These are all common effects of the amphetamine group of drugs, both stimulant and hallucinogenic. For instance, regarding blurred vision, P5 commented that "it makes your eyes go fuzzy, it seems like tunnel vision – clear in the middle but fuzzy round the edges"; while P8 stated that "your eyes keep jumping from side to side". Regarding muscular tension, P10 stated (while demonstrating his point with both hands) that "my hands starting clenching up, over and over, like a cat flexing its claws – and I thought 'that's why they call it meow meow'". Regarding temperature changes, P9 commented that "you

get cold in places, but feel hot and sweaty in other parts – and your heart beats faster but not regular ... you can smell the stuff on your sweat and on people who've had it". Similarly, P8 stated that "my urine and vomit stank of the meph chemical".

Most participants noted that their appetite was suppressed, but at least half mentioned that they felt thirsty for much of the time. Three participants also mentioned experiencing nausea and vomiting (P1, P5 and P8) – though all three had "barfed" after combining mephedrone with other drugs - notably skunk and/or alcohol.

Mental effects. The mental effects were reported by most participants to start with the rapid onset of 'head rushes', similar to the onset of the effects of ecstasy (MDMA etc.). 'Head rushes' involved feelings of 'vibrating energy' passing through the skull and brain, combined with queasy feelings of pleasure and an inability to concentrate or visually focus on things – particularly when mephedrone was snorted (sniffed up the nose). Most users seemed to like the 'head rushes', though some were ambivalent: "it comes on real strong, and can make you feel disoriented" (P7).

But the main effects of mephedrone were reported to be intense feelings of euphoria and boundless energy, similar to the effects produced by cocaine, speed and ecstasy: "you feel on top of the world" (P2); "you tingle with energy from your head to your toes" (P9); and "you feel happy and friendly – but it's not like alcohol, you don't feel aggressive at all" (P4). Over half of participants also mentioned ecstasy-like feelings of friendliness and enhanced empathy. For instance: "you feel part of the crowd like on E – I was in this club on white magic and there were just 20 people in there, but it didn't matter, I felt buzzy and E-ish" (P10); "it's just totally euphoric, fabulous, to me it was like luvved-up E" (P8); "with moderate doses there are no negative feelings, you just feel peaceful and friendly" (P7).

Several participants commented that they were surprised at how intense and pleasant the effects of mephedrone were, and that the effects were clearly distinguishable from those of other recreational drugs. Some participants (P1 and P6) stated that they experienced different effects from mephedrone on different occasions – such variation is likely to have arisen from changes in set and setting (Zinberg 1984).

A variety of altered states of consciousness were also mentioned, from such vague descriptions as being "totally off your box" (P1) to more detailed and explicit accounts of specific hallucinations and delusions from heavier users. For instance, P7 and P8 gave several examples of bizarre experiences they had during their 3-day session on mephedrone, "bombing and sniffing it every couple of hours" (P7). One memorable example was recounted by P8: "I was staring at the pattern on the carpet in the centre of the room, and first some black smoke came up out of it, then I saw Michael Jackson float out of the smoke. I said to [P7] 'that can't be Michael Jackson, he's dead', and anyway I don't even like Michael Jackson – then I thought 'it's OK, I'm in District-9' – then I came right out of it, and felt shocked, real terrified ... I hope I see Elvis next time".

Indeed, the most frequent hallucinations these 'psychonauts' mentioned involved 'seeing' people in the room who were not there, "but who seemed as real as you do now sitting there" (P7); and "not knowing what room I was in – I kept jumping between different rooms, and thinking that I was in a field or some other place" (P8). As P8 continued, "we both kept thinking that lots of people were in the room with us ... on the third day, some towels and sheets on a table looked just like a strange woman holding a weird baby, which was breathing fast and deeply – it was horrible, truly sinister" (P8). Both of these participants also emphasised the overpowering nature of these trippy effects: "I had no idea what was real, and don't like being that out of control" (P8); "I wasn't sure if I was going to come back, I thought I might end up in St. Luke's [mental hospital]" (P7). Other hallucinations and delusions which occurred on the third day of their binge included "ghost phone-calls ... and when I decided to go round to see my son, I kept thinking that I would need a false passport" (P8). These full-blown 'true hallucinations' experienced by P7 and P8 were likely to have been a product of both high frequent doses of mephedrone combined with alcohol, and serious fatigue from staying awake for three days (they also stated that they knew other people who were 'into' bingeing on mephedrone to get the 'trippy' effects). However, when this possibility was suggested, P7 commented that "the first hallucination was a shady guy with a cap on, and with his hands on his head, but then suddenly he just wasn't there – and this was on the first night, so wasn't caused by lack of sleep or boozing".

Some participants also emphasised that they experienced major time distortions: "We went out about 9 o'clock, and I thought that just an hour or so had passed, then got told it was four in the morning"

(P3); "you lose all sense of time, five hours goes by so fast – boom, and it's gone" (P8). By contrast, P9 and P10, who used mephedrone more moderately, reported that they had not experienced any hallucinations beyond minor perceptual distortions such as 'tunnel vision' and 'tingly skin'.

As regards specific behaviours, over half of participants mentioned that they "just wanted to dance and dance" (P2), and that music sounded much better: "the music sounded heavenly" (P7); "you can really feel the music ... it's all about the music to me" (P10). Most participants also mentioned being very talkative, though many also confirmed that their speech and conversation degenerated into nonsense: "we lost the plot, and forgot what we were talking about" (P1), "I started talking total bollocks" (P5), and "I was talking non-stop, but a lot of it was shit" (P10).

When specifically prompted about the effects of mephedrone on sexual behaviour, most participants indicated that it had no aphrodisiac effects, though some felt it made them "feel a bit loved up, like ecstasy" (P9). The female participant also stated that "I think it could make you feel sexy with the right person" (P8). However, one sexual effect was reported by most participants: shrunken penis and testicles (called 'shrink-dick'). For instance: "I just could not get it up – the shrink-dick was worse than speed, and when I went to the toilet, it took me five minutes to get a piss going" (P7); "it was hard to get it up, but with one girl I managed to get a semi on" (P1).

Stages and duration of effects. The three stages of drug effects are: onset stage (as the drug comes on), main stage, and residual stage (as the drug wears off) – with the after-effects (usually the next day, after sleeping) usually referred to as the 'come-down'. When sniffed, the effects were reported to come on within 10 to 20 minutes, but when 'bombed' (swallowed in a paper wrap) or otherwise swallowed (usually after mixing into a drink) the effects took about 20 to 40 minutes to come on. There were notable differences in participants' views on how long the effects of mephedrone lasted, which were probably due to variations in consumption factors. For instance, the duration of effects was generally felt to be much longer when mephedrone was swallowed (about two to four hours) compared with when it was sniffed (about an hour to two hours). For example: "if you sniff one hit, it takes maybe half an hour coming up, and an hour for the main bit" (P1). Yet some participants reported effects lasting four to six hours from swallowing a single dose (e.g. P10). However, most participants reported using repeated doses in a single session (stacking), typically every 30 minutes to two hours, which meant that they remained in the onset and main stages of effects throughout the session – with a single session typically lasting six to 12 hours (an evening/night): "you buy a £15 deal at the start of the night – and if you use that up before the end, then you buy some more" (P2).

As noted above, the onset effects were mainly physical effects and sudden 'head rushes' – though P10 felt that mephedrone had a "smooth come-up". The main stage included most of the other common effects mentioned (see above), while most reported that the residual stage was characterised by feelings of fatigue and dizziness, and insomnia: "you just lay there in bed, waiting to fall asleep but staying wide awake – which is so boring" (P10). By contrast, P2 stated that he just kept taking hits of mephedrone until he ran out of drugs or money, and/or passed out: "I just fall asleep in the end, and I've pissed myself more than once".

The come-down, typically experienced on waking up after a session of mephedrone use, was generally regarded as similar to that brought on by use of speed or ecstasy – that is, usually consisting of fatigue, dysphoria, aches and pains, amnesia and an empty-headed feeling. For instance: "your head is just baffled, you keep forgetting what you are doing" (P1); "I feel shit afterwards – it's a big come-down" (P2); and "last time I couldn't move, I felt wiped out" (P6). Some physical after-effects seemed to be disliked more than others – including aching teeth and jaw muscles, mouth ulcers, and sore/bleeding noses. The duration and intensity of come-downs is related to such consumption factors as amounts used, duration of use, and methods of use. For instance, though most participants indicated come-downs lasting no longer than a day, the two participants who had embarked on a 3-day mephedrone-and-alcohol binge reported that "it was two or three days later before we came back to normal - I felt so fucking rough" (P7). By contrast, P9 and P10, who were more moderate users of mephedrone, indicated that the come-down was relatively mild: "coke gives you a wobbly head and dizzy feeling, but m-cat doesn't, there's no real come-down" (P10). Similarly, P7 commented that "meph doesn't have a dirty come-down like Es".

Evaluation of effects. When prompted, all participants reported liking the effects of mephedrone – "its drugs, isn't it?" (P10) - though

some clearly had mixed feelings, notably P8, who experienced "sinister hallucinations". Participants in the first focus group particularly liked taking regular doses every hour or two so that "you just keep coming up and up" (P6). There was a general consensus that the effects of mephedrone were similar to the effects of ecstasy and cocaine: "the effects are in the middle, between E and coke" (P9). Indeed, around half of participants explicitly stated that mephedrone's effects were superior to those of cocaine and ecstasy: "it's a top buzz, much better than the sniff and pills around right now" (P6); "these legal highs like meph are more powerful than illegal drugs" (P8); "it's more intense than cocaine, the come-down's not as bad, and coke gets to be a waste of time eventually – m-cat doesn't" (P10). P7 and P8 also made comparisons with the 'trippy' effects of LSD and ketamine: "it's similar to acid, but on LSD you know it's fantasy – m-cat is sinister, and you believe what you are hallucinating" (P7).

3.4 Consequences of mephedrone use

The consequences of drug use can be positive (benefits) and/or negative (harms). Given that this research is aimed at harm-reduction, the focus here is on health damage and social problems.

Dependence. Though most participants had become regular users of mephedrone, none explicitly indicated that they felt dependent on it or that they had become daily users – they more usually saw their regular use as the rational repetition of a pleasurable experience. Even so, though withdrawal symptoms were not reported, craving and tolerance were clearly evident in the experiences of most participants: "once it's in your head, you just want more and more" (P1); "it's real more-ish" (P7).

In addition, about half of participants stated that they knew several people who had developed a mephedrone 'habit' – as evidenced by consumption factors like daily use and heavy use; by psychological indicators like craving and tolerance; and by behavioural indicators like taking mephedrone to the exclusion of other activities, continuing regular use despite health problems like skin rashes, and being "off their heads all the time" (P1).

Health problems. The main damage to health reported by most participants included nose-bleeds (when mephedrone was sniffed), though some also mentioned skin rashes. For instance, P8 stated that her 3-day session on mephedrone resulted in a skin rash: "I eventually got this circle-like skin rash, raised lumps and bruises, which seemed to move round different parts of my body ... and my ankles were swollen up". Around half of participants also reported experiencing amnesia about sessions of mephedrone use – both forgetting what the experience was like, and forgetting things that had happened while intoxicated on mephedrone – though most did not seen very concerned about this after-effect.

Indeed, the consensus among participants was that mephedrone had few or no harmful effects on health compared with other popular recreational drugs: "apart from feeling smelly and not being able to sleep, I've had no problems with it" (P9).

Given that all participants had been using mephedrone for between one and three months only, it is perhaps to be expected that more serious health problems associated with regular and long-term drug use were hardly mentioned.

Social problems. Few participants mentioned social problems linked to mephedrone use, but, as just noted, they were all fairly new users, and longer-term use could bring about more problems of different kinds.

3.5 Interventions into mephedrone use

As noted above, all participants were fairly new users of mephedrone, which is one obvious reason why none had reported serious problems or seeking help for problems arising from mephedrone use. No participants reported that they or any of their associates had been to hospital after using mephedrone – though one of the drug agency staff commented that a paramedic associate had told her that they were seeing growing numbers of legal-high users in the casualty department. No participants reported any incidents involving the police.

All participants were interested in obtaining more information about mephedrone, particularly those in the first focus group, who had not obtained information from books and the internet, like the participants in the other two focus groups. Some mentioned that they had sought information and advice about using the drug from staff at Lifeline Middlesbrough. When prompted about what advice they would give to new users of mephedrone, several participants made comments, including:

P1: "make sure you have got your mates around you"

P2: "sniff it in keys, which helps you control how much you use and stick to your limits"

P4: "keep it to weekends – sleep it off on Sunday, so you can get to work on Monday"

P6: "If you're dancing on it you get real thirsty, and need to keep drinking water"

P7: "I've heard about all these kids with messed-up noses from sniffing it all night – they should be told that bombing it is safer"

P7: "I would advise no more than a sixth of a gram to start with – and no more than a gram over a whole night"

P8: "young people should be told to use it occasionally and in moderate amounts, at least until they get to know it – and they should not do it alone, so that they can check what's real with their mates"

P8: "it can make you black out, so women need to be careful"

P8: "people need to know that the police can still take it off you, saying that it could be an illegal white powder – and they would probably destroy it anyway, not give it you back"

P9: "people need to know about what it is and what it's side-effects are"

P10: "the more you take, the more chance there is of problems – moderation is the thing"

4. Conclusions

The conclusions of this report are based on a small sample using for a relatively short period of time, within those limitations we will focus on the core advice which users of mephedrone need to be given – both by drug agency staff, and in publications aimed at continuing users of this new drug. To summarise and organise this advice, the Risk CAMP-MAP model will be utilised (Newcombe 1992, 2009). This model categorises advice and information about safer drug use under seven comprehensive headings: context of use, amounts used, methods of use, patterns of use, mixing drugs, access to drugs, and the drug product itself. It also includes advice under the main 'harm' headings – notably health damage and socio-legal consequences.

Advice on drug use always starts with the same key point: if you want to avoid any risk or harm from using a drug, then do not start using it. However, given that research participants were clearly intent on continuing to use mephedrone, at least for the foreseeable future, we conclude that the following advice on safer use is the most salient and relevant information which can presently be given.

Context. The safest setting of use is in your own home or a friend's home. People who use in nightclubs, parties and other public places should make sure that they stay in close contact with their friends. As with other kinds of drug use, users of mephedrone should take it in their free time – not when working or studying, not when looking after children, and not when driving or operating machinery.

Amounts. More research is needed into the effective and lethal doses of mephedrone. At this point in time, the best advice is to start with small doses (no more than 100 mg), and not to exceed more than 200 mg in a single dose. Regular users should also avoid taking more than a gram in any 24-hour period – with half a gram being a much safer limit. 'Stacking' is very risky, and users should carefully monitor the amounts that they and their friends are consuming.

Methods. Swallowing mephedrone is the least risky method of administration – either in cigarette-paper wraps (bombs), or in soft drinks into which it has been mixed. People who decide to sniff mephedrone powder are advised to follow Lifeline's 'safer snorting' procedure – notably chopping the powder finely with a blade on a shiny hard surface (like a mirror), and sniffing the powder up the nose with a clean tube not used by anyone else (like a straw – but not a rolled-up bank-note, because these are covered in germs). After a session of snorting, users are also advised to wash out their noses by gently sniffing cold/warm water. Lastly, users are strongly advised not to inject mephedrone – but anyone who does should seek clean injecting equipment and advice from their local needle exchange services.

Patterns. The best advice to people who are going to use mephedrone is that they should use it as occasionally as possible – ideally no more than one or two sessions per month, but certainly no more than once a week (with weekends being preferable to weekdays).

Mixtures. It is advisable not to mix mephedrone with any other drugs – particularly alcohol or other stimulants (such as speed, ecstasy and cocaine). People on medication from their doctors should also avoid using mephedrone, or seek expert advice before proceeding.

Access & product. There are no totally safe sources of mephedrone, though it is arguably less likely to be adulterated with other substances when it is purchased from headshops (on the internet or in cities).

Health harms. There are several unpleasant short-term physical effects of mephedrone, and these can be reduced or avoided by adopting techniques employed by regular users of speed, ecstasy and cocaine. Most importantly, people who suffer from particular health problems or diseases are advised to avoid using mephedrone, or to keep their use light and infrequent – notably, mental health problems (such as depression or schizophrenia), blood pressure problems, and heart problems (such as arrhythmia). Also, stimulant and hallucinogenic drugs can interact badly with several kinds of medication, so it best to avoid using mephedrone if you are being prescribed medicines by your doctor (or at least seek advice from your local drug agency).

As regards minor and medium-level health problems, damage caused by jaw-clenching and teeth-grinding can be reduced by chewing sugar-free gum or sucking sugar-free sweets; dehydration can be tackled by drinking water or sports drinks at regular intervals (no more than about a half-pint an hour); and, since eye-pupils can become fully dilated on mephedrone, damage to the retina can be avoided by wearing sunglasses when in bright sunlight.
If you or your friends use drugs regularly, it is also advisable to learn first aid (such as the recovery position, and artificial resuscitation) – it may help you save someone's life one day. Whatever risks you take with your own health, always look after your mates – and they will hopefully look after you.

Socio-legal harms. The possession and use of mephedrone is not prohibited at present, but supply (whether freely given or sold) for human consumption is prosecutable under the Medicines Act (maximum penalty: two years imprisonment). Given that there are many illegal (controlled) white powders – notably amphetamine sulphate, cocaine, ecstasy powder, and ketamine – people caught carrying mephedrone by the police may be arrested and charged with possession of a controlled drug. These charges are likely to be dropped after the drug has been tested, though the seized mephedrone is unlikely to be returned.

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Appendix 1: Cathinone and its derivatives

Cathinone and cathine are natural stimulant drugs found in the leaves and stems of the African shrub khat (Catha edulis). Cathinone can be extracted and chemically altered to make semi-synthetic drugs, most of which are analogues (chemical relatives) of the various mainstream stimulant and hallucinogenic amphetamines. As a group, these cathinone-based drugs are called **keto-amphetamines**. Keto-amphetamines can also be made totally synthetically, starting by synthesizing cathinone from alpha-bromopropiophenone (easily made from propiophenone). The Shulgins have identified many keto-amphetamines in their book PIKHAL, and the most well-known dozen are charted below:

The four types of name for cathinone-based drugs

Standard	Chemical (ACRONYM)	Slang names	Trade names	Legal status	Amphet. analogue
cathine	demethylpseudoephedrine (DPE)	[in khat]		C3	ephedrine
cathinone	beta-ketoamphetamine (KA)	[in khat]		C1	amphetamine
ephedrone	methcathinone (MC)	cat, goob		B1	metham-phetamine
mephedrone	methylmethcathinone (4MMC)	m-cat, meph	Meow/Miaow	U	4MMA~
methedrone	methoxymethcathinone (PMMC)	dolley		U	PMMA#
methylone	methylenedioxymeth-cathinone (MDMC)	M1	Explosion, Ease	U	MDMA
ethylone	methylenedioxyethyl-cathinone (MDEC)			U	MDEA
buphedrone	ethylmethcathinone (EMC)			U	EMA ^
flephedrone	fluoromethcathinone (4FMC)			U	4FMA*
ethpropion	ethylcathinone (EC)			U	ethylam-phetamine
diethylpropion	diethylcathinone (DEC)		Tenuate	C3	diethylam-phetamine
dimepropion	dimethylcathinone (DMC)			U	dimethylam-phetamine

Key to chart

Trade names: the names given to prescription drugs by pharmaceutical companies (e.g. Tenuate), or the names given to 'legal highs' by headshops in cities or on the internet (e.g. Meow, Explosion)
Legal status: 1971 Misuse of Drugs Act: Class (A/B/C) & Schedule (1 to 5) [U = unclassified]
Amphet(amine) analogue: nearest chemical cousin based on amphetamine instead of cathinone
~ 4MMA: 4-methylmethamphetamine (stimulant)
# PMMA: paramethoxymethamphetamine (hallucin.)
^ EMA: ethylmethamphetamine (stimulant) *
4FMA: fluoromethamphetamine (stimulant)
MDMA and MDEA are two of the main drugs found in ecstasy tablets (along with MDA).
Ethylamphetamine, diethylamphetamine and dimethylamphetamine all have minor stimulant effects.

Notes on chemical names

The full chemical names of drugs contain numbers too, but there is a convention to exclude these. Drugs often contain hydrocarbons (chemicals made up of hydrogen and carbon atoms), and chemists have short terms to indicate different types and groups of hydrocarbons - for instance: 'methyl' and 'ethyl' (alkyl group), and 'methylene' and 'ethylene' (alkene group). It should also be noted that:

methyl is often shortened to 'meth' or 'me'
ethyl is often shortened to 'eth' or 'et'
'Oxy' refers to oxygen atoms, and so 'methoxy' contains hydrogen, carbon and oxygen atoms.

In 1932 the American Medical Association coined 'amphetamine' from its full chemical name: alpha-methyl-phen-ethyl-amine (first letter of first and second terms, first two letters of third and fourth terms, and all of the fifth term). 'Methyl', 'ethyl' and 'phen(yl)' are hydrocarbons, while 'amine' refers to a more complex combination of nitrogen and hydrocarbons (eg, aryl or alkyl groups).

Another convention for giving chemical names to cathinone-based drugs is to (a) change 'cathinone' to 'amphetamine', and (b) prefix the chemical name with 'keto' – for instance, 'methcathinone' can also be called 'ketomethamphetamine'. This is because cathinone differs from amphetamine only by having a ketone oxygen atom on the beta position of the molecule's side-chain . Hence, the chemical formula of amphetamine is $C_9H_{13}N$, while the formula of cathinone is $C_9H_{11}NO$.

The plethora of similar-sounding names for cathinone-related drugs is made even more confusing by the similarity of these names to existing drugs – notably ephedrine (minor legal stimulant), methedrine (trade name for class A stimulant methamphetamine), and methadone (class A opiate used in subsitute prescribing to heroin addicts).

Appendix 2: Topics for covering in mephedrone focus groups

5 domains: Context, Consumption, Effects, Consequences, interventions

Context of use
Origins: time of first use, how heard about
Slang names for drug
Products: types, appearance (look/taste/smell)
Market: price, purity, packaging, availability (sources/ dealing methods)
Prevalence of use: scale, trends, profile of users

Consumption
Reasons for use
Settings of use
Methods of preparation & administration
Amounts used – per session & per period
Frequency & duration of use
Drugs mixed with in same session (during & after)

Effects
Physical effects: notably breathing, heart-rate, muscles, temperature, digestion, eyes/face
Mental effects: cognition, emotion, perception, motivation
Behaviour: coordination, sexual, sleep, driving, etc.
Stages: onset, main & residual effects; after-effects (come-down?); duration of effects
Best & worst effects – and evaluation (like or dislike?)
Comparisons with other drugs (which ones is it like?)

Consequences
Dependence (craving, tolerance, withdrawals)
Health problems
Social problems
Any other problems

Interventions
Police incidents
Hospitalizations
Help from agencies

Appendix 3: Glossary of slang terms used by focus group participants in Middlesbrough

bombing	swallowing a dose (hit) of a powdered drug in a wrap of cigarette paper
buzz	the positive, desirable effects of a drug (notably euphoria)
come-down	the after-effects of a session of drug use (esp. fatigue and low mood)
E	ecstasy (MDMA etc.)
K/ket	ketamine powder
keying	sniffing a dose of a powdered drug (from the thin end of a house/car key)
pills	ecstasy tablets (MDMA etc.)
skunk	potent herbal cannabis (usually strong-smelling seedless buds/flowers)
sniff	cocaine hydrochloride powder
stacking	taking repeated doses of a drug during a session in order to stay in the onset and main stages of effects (i,e. to avoid coming down until the end of the session)
weed	cannabis (a.k.a. smoke, spliff, bud, skunk, hash, etc.)