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## **Oral Communications**

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## WEDINOS: initial findings on the who, where and what of new psychoactive substance use

D. Acreman<sup>1</sup>, M. Gagol<sup>2</sup>, A. Hutchings<sup>2</sup>, A. Westwell<sup>3</sup>, M. Lyons<sup>1</sup>, J. Smith<sup>1</sup>

<sup>1</sup>Health Protection, Public Health Wales, Temple of Peace & Health, Cardiff, United Kingdom; <sup>2</sup>Cardiff Toxicology Laboratories, University Hospital Llandough, Cardiff, United Kingdom; <sup>3</sup>Cardiff School of Pharmacy and Pharmaceutical Studies, Cardiff University, Cardiff, United Kingdom

**Background:** WEDINOS (Welsh Emerging Drugs and Identification of Novel Substances) provides direct access to testing and dissemination of information to reduce harms related to new psychoactive substance (NPS) use. Individuals may submit samples for testing alongside an 'effects record' comprising basic demographic data, history of use, expected effects from the particular sample submitted and description of the unexpected/adverse effects experienced following consumption.

**Methods:** samples may be submitted anonymously via health / support services including substance misuse services, pharmacies and emergency departments using the WEDINOS 'sample and effects packs'. Alternatively, individuals may download the 'effects record' from the website [www.wedinos.org](http://www.wedinos.org) and submit the sample via the postal service (not including known controlled substances). Test results and 'effects record' data are collated and findings disseminated back via the website and quarterly bulletin.

**Results:** in the first four months, 171 samples of NPS were submitted and tested, 70% complete with 'effects record'. 84% of sample providers were male, and mean age of 31 years (range 14 – 48 years) covering six of the seven Health Board areas. 94 unique substances were identified, either in isolation or combination. Overall 16% were synthetic cannabinoids and 31% analysed as cathinones / amphetamine-like compounds. Of those purchased as 'legal highs', 27% contained controlled drugs including Class A drugs e.g. Para-chloroamphetamine, 5-Meo-DiPT, 2C-E.

**Conclusions:** providing direct access submission of samples and self-report 'effects records' allowing capture of reliable evidence based local and national trend data and targeting of specific subpopulations of NPS users for relevant pragmatic harm reduction interventions.

## Designer Drugs, Synthetic Cannabinoids and the US Federal Analog Act

DM. Benjamin

Northeastern University, Boston, United States of America

The term "designer drug" was coined in the 1980s to refer to recreational drugs that were not listed in the Controlled Substances Act (CSA) of 1970. Without an appropriate law, the US government was powerless to prosecute distributors and users, and dangerous drug use continued. Initially, redesign work focused on the fentanyl or meperidine (pethidine) molecules, but by the mid-1980s, Ecstasy (MDMA) became popular and it soon became the prototype for designer drug status. Federal laws were rapidly passed to give the Drug Enforcement Agency (DEA) the power to emergency schedule non-listed chemicals and Ecstasy became the first drug to be scheduled under the Emergency-Scheduling legislation.

Synthesis of "unscheduled" drugs for illegal distribution proliferated, and in order to prosecute distributors, in 1986 the US government passed the Federal Analog Act which allowed any chemical "substantially similar" to a controlled substance listed in Schedule I or II of the CSA to be treated as if it also were listed in those schedules, but only if intended for human consumption. The law provided definitions for controlled substance analogues based on (1) chemical structure, (2) psychopharmacologic effect, and/or (3) the capacity of the body to metabolize the analogue to a drug already listed in the CSA.

Since 2005, attention has been focused on "Synthetic Cannabinoids." These compounds bear little chemical resemblance to tetrahydrocannabinol (THC) and are comprised most commonly of indole derivatives which more closely resemble LSD and DMT in chemical structure than THC. Adverse effects are frequent and fatalities are common.

## NPS and harm reduction: the peer to peer strategies

V. Benso, L. Meignen

*Technoplus/TREND/SWAPS/ASUD/Psychonaut.com/Not For Human, France*

The specificities of NPS (diversity, difficulty to reach the consumers, quickness of renewal, ignorance of long term effects...), will impose professionals to invent new ways of working. Now in France NPS field is not yet specifically invest by professional harm reduction. The only ones specific actions are coming from the users themselves. But it doesn't mean they are not interesting, on the contrary, these actions are often promising and innovating. For example on the website safe or scam, NPS users share their information about online NPS shops. With the smartphone Erowid application you can have a serious information source about most of the NPS always in your pocket. But the most important harm reduction work on NPS is done voluntarily by users themselves on forums who are virtual equivalent of support groups. Another promising action is the online outreach as it is done by the association Not For Human.

## Neurocognitive impairment, structural brain alterations and psychopathology in chronic cannabis users

G. Bersani, G. Manuali

*Department of Medico-Surgical Sciences and Biotechnologies, Faculty of Pharmacy and Medicine, "Sapienza" University of Rome, Italy*

Several studies evidenced different patterns of neuropsychological impairment in chronic cannabis users. Memory and attention deficit are more frequently reported, but also other dysfunctional areas are described, such as that of executive functions. Cognitive deficit may appear associated to affective state alterations, such as the reduction of motivational drive in the so called amotivational syndrome. Impairment in executive functions domain have been more frequently observed in patients who developed psychotic symptoms, even if in these cases an exact differentiation from primarily psychotic patients may be difficult. These functional and clinic features are in a not yet well defined relationship to brain structural abnormalities, reported in several studies, but the results are not yet homogeneous and some time contraddictory. Reduction of both white matter and grey matter are reported, as well as volume reduction of specific brain regions, such as in prefrontal cortex, temporomedial lobe, cerebellum. Both functional deficit and clinical outcome, as well as structural alterations, are related to the early age of onset of the cannabis assumption. This can be of support to a neurodevelopmental model of the alterations induced by the use of cannabis, whose possible effect may be to cause brain morphofunctional alterations when assumed in specific periods of cerebral development and maturation and to interact with other genetic and non-genetic risk factors for psychosis and other mental disorders.



## Is it putty or is it monosodium glutamate?

IS. Blagbrough

*Department of Pharmacy and Pharmacology, University of Bath, Bath, United Kingdom*

**Introduction:** analytical science allows the rapid and accurate determination of cutting agents found in drugs of abuse. These common adulterants can be more dangerous than the illicit drug themselves or they can be less dangerous to the point of being innocuous, but costly.

**Materials and Methods:** crack cocaine seized by the police in Swindon UK, and amnesty bin samples provided from a Bristol UK nightclub (2013) through the Avon and Somerset Police were analysed in detail using a wide range of spectroscopy, spectrometry, and calorimetry. **Results and Discussion:** the data show that the major adulterants were phenacetin, benzocaine, and glucose. A few samples were found to contain such an adulterant or cutting agent alone, e.g. creatine, sugar, or benzocaine. Benzocaine, a topical anaesthetic, can mimic the numbing effect of cocaine and might possibly be sold as cocaine. All the flephedrone samples were also diluted (cut) with benzocaine. Of the mephedrone samples, 9 out of 13 were cut with easily accessible monosodium glutamate (MSG). The total lack of solubility and its appearance gave us to suspect that one sample was putty.

**Conclusions:** different street samples of illicit drugs show markedly different purity. Ketamine was the most pure, so pure that it is synthesized, rather than a medicine formulated with excipients.

**Acknowledgments:** we thank the University of Bath, The Wellcome Trust, The Said Foundation, and the Government of Saudi Arabia for financial support, and the Swindon Police and the Avon and Somerset Constabulary for the collection and provision of the amnesty bin.

## Highs and lows: Exploratory study of ‘legal high’ use experiences and expectancies

U. Blaszkowski, AC. Moss, IP. Albery

*London South Bank University, London, United Kingdom*

Novel psychoactive substances, or ‘legal highs’, are a new group of mind-altering drugs which aim to resemble and simulate more traditional illicit drugs. Over the last decade, they have become a significant part of weekend polydrug use, yet little is known about their subjective effects or potential health risks associated with their use. The evidence to date suggests that several factors may contribute to the decision to use novel psychoactive substances, including exposure, curiosity and availability. However, these findings provide an incomplete picture of psychological processes behind decisions to use novel psychoactive substances, and fail to answer the fundamental question: “Why is it that only some people use novel psychoactive substances and others do not?” Drawing upon contemporary dual-process models in social and cognitive psychology, the current study aims to explore and identify expectancy effects of novel psychoactive substances. Therefore, this study has the potential to allow early detection of individuals misusing novel psychoactive substances, as well as provide significant impact to clinical practice.

## Legal Highs - do you want to be my guinea pig?

L. Both, C. Paulos, K. Duscherer

*CePT, Centre de Prévention des Toxicomanies, Luxembourg*

**Introduction:** since 2009, the emergence of novel psychoactive substances (NPS) or legal highs is getting a lot of attention by the media, as well as by local and international associations working in a drug related field. However, at least for the Grand Duchy of Luxembourg, no data about the propagation of these substances, their type of consumption or the associated health effects was available.

**Methods:** we approached so called recreational drug consumers at music events in Luxembourg during the summer of 2013. Visitors stating they had some experience with NPS were asked to participate in a semi-directive interview about their drug consumption habits. The participants were questioned among others about brand names, type of consumption, place of purchase, sought-after and side effects, as well as their motivations.

**Results:** among approximately 600 contacts, 33 persons (of which 4 women) aged between 16 and 34 years stated having consumed NPS in the past. Only 12 persons did so during the last 12 months. The most commonly described substance was a dried herb, analog to cannabis, which was smoked to achieve primarily a relaxation effect. Less than 20% claimed to have bought the NPS on the Internet.

**Conclusions:** while NPS are clearly available to recreational drug users in Luxembourg, and a certain proportion of the population has experimented with these novel substances, we did not gain the impression that NPS attracted in the last years a lot of regular consumers. If available, consumers prefer to stick to their old known drugs.

## From club to clinic. What every clinician needs to know about Novel Psychoactive Substances harms and treatment

O. Bowden-Jones

*Central and North West London NHS Foundation Trust, London, United Kingdom*

This session will focus on the harms caused by different NPS across a variety of clinical settings and the evidence base for treatment and other interventions. The session will conclude with practical advice for healthcare professionals in the management of problematic NPS use.

## The Body Brown: a single case study on Melanotan

R. Brennan, MC. Van Hout

*Waterford Institute of Technology, Ireland*

**Introduction:** in the Western world "being tanned" is often perceived as a hallmark of good health and beauty. This has generated a market for new synthetic tanning agents known as "melanotan". These agents are available as pre loaded syringe or nasal spray, and sourced online. Melanotan products mimic naturally occurring melanocyte-stimulating hormones (MSHs) which deepen the pigmentation of the skin (melanogenesis). Risks are evident in relation to

unregulated products with potential for contamination. At present, there is a distinct lack of research despite a growing, largely internet based market.

**Methods:** the researchers utilise the single case study method to explore and analyse one active user's experience of synthetic tanning product melanotan. This in depth holistic approach describes the case's subjective meanings attached to her perception of being tanned, sourcing routes for melanotan, motivation for use, injecting practices and outcomes experienced.

**Results:** the case is an exotic dancer who had used melanotan for two years and with no prior drug injecting experience. She did not identify with the "injecting drug user" profile. She was aware of some safe injecting practices. The possibility of contaminated tanning products was considered but did not deter her use. Increased self-confidence and feelings of attractiveness were reported as positive experiences of melanotan. No lasting or chronic negative outcomes were reported. The case described feelings of dependence on tanning agents and tolerance.

**Conclusion:** the study, whilst confined to the experience of one long term user illustrates the need for proactive health education and harm reduction initiatives amongst this group of synthetic tan injectors.

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## The analysis of new psychoactive substances - Five years of experiences

B. Byrska, D. Zuba

*Institute of Forensic Research (IFR), Krakow, Poland*

**Introduction:** new psychoactive substances (NPS) are psychoactive ingredients of 'legal highs', a wide range of products advertised as legal alternative to controlled drugs. The aim of this study was to compare the results of their identification and quantification in products analyzed in the IFR in the last 5 years.

**Methods:** sample preparation was usually simple: powders, tablets and capsules were homogenized, then dissolved in methanol and centrifuged, while herbal mixtures were prepared by ultrasonic-assisted extraction with ethanol. A variety of chromatographic and spectrometric methods, including GC-MS, HPLC-DAD, LC-QTOFMS, were applied.

**Results:** percentage share of NPS in illegal drug market is seen to rise. The number of NPS cases increased from 0.2 % in 2008 to almost 30% in 2013. In total, we identified 171 NPS from different classes, including cannabinoids (37), phenethylamines (34), cathinones (32) and tryptamines (21). First cathinones appeared on the Polish market in 2009 and have gained it very quickly. Nowadays, isomers and derivatives of cathinones banned in 2010 are the most popular, including 3-MMC, 3-FMC, pentedrone and  $\alpha$ -PVP. A number of hallucinogens, both tryptamines (e.g., 4-AcO-DiPT, 4-OH-MiPT, 5-MeO-AMT) and phenethylamines (e.g., 25C-NBOMe, 25E-NBOMe, 25I-NBMD), has appeared in the last two years. Recently, new chemical classes of synthetic cannabinoids have been also identified, including derivatives of UR-144 (XLR-11, A-834,735). Other popular substances were ethylphenidate and methoxetamine.

**Conclusions:** the study showed that the composition of 'legal highs' is highly variable and unpredictable. Great inconsistency in the composition could easily led to poisoning without the possibility of a clear identification of its cause.

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Oral Communications

## The importance of New Psychoactive Substances (NPS) in online drug markets: Analysis of "Silk Road 2.0"

F. Caudevilla

*Energy Control (ABD), Barcelona, Spain*

**Introduction:** online drug markets are becoming an alternative to traditional black markets for drug users with ac-

cess to Internet. Websites like Silk Road 2.0 (SR) provide them with the required infrastructure for anonymous transactions of drugs and pharmaceuticals. The objective of the study is to determine the importance of NPS to these new markets.

**Methods:** 12.357 products from the SR market offering were reviewed, from February 23rd to February 30th, 2013, specifically looking for NPS. Data collected referred to the class of the substance, the country of origin and the sales volume (number of transactions).

**Results:** in the studied period 1,085 products (15.08% share) of the total SR portfolio were classified as NPS. Most frequent ones were synthetic cannabinoids (253 products, in 37 different compounds), substituted phenethylamine derivatives (195 products, in 4 different compounds), cathinone derivatives (180 products, in 11 different compounds) and methoxetamine (67 products). At the same time, China (52.3%), Germany (13.2%) and United States (9.1%) were the leading sources of the merchandise.

None of these substances entered the sales top ten list, nevertheless. The total estimated volume share (in number of operations) for NPS substances barely reached 4% of Silk Road's, for the week.

**Conclusions:** the presence of NPS in online drug market is confirmed by the study. Nevertheless, most SR site-Users chose among more "traditional" drugs, such as cocaine, MDMA, amphetamine, cannabis, etc. Limitations and implications of these findings are discussed.

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## Oral Communications

# Patterns of Toxicity and potential for dependance associated with Camfetamine misuse

E. Cinosi<sup>1,2</sup>, R. Santacroce<sup>1,2</sup>, M. Lupi<sup>1</sup>, O. Corazza<sup>2</sup>, T. Acciavatti<sup>1</sup>, G. Martinotti<sup>1</sup>, M. di Giannantonio<sup>1</sup>

<sup>1</sup>Neuroscience and Imaging Department, Chair of Psychiatry, "G. d' Annunzio" University, Chieti, Italy; <sup>2</sup>University of Hertfordshire, Hatfield, United Kingdom

**Introduction:** Camfetamine is a stimulant drug that appears to be mostly unregulated across the EU. First reports about Camfetamine misuse appeared in May 2011.

**Methods:** data in scientific literature were integrated with a multilingual qualitative assessment of a range of online resources over the period of 32 months (May 2011- January 2014).

**Results:** Nmethyl3phenylnorbornan2amine (Camfetamine) may act as an indirect dopaminergic agonist in the central nervous system and may have mild-moderate opioid activity too. The significant promotional and distributional capacity of the Internet seems to play an important role in its market. Recreational misuse of Camfetamine seems nowadays to be limited to marginalized individuals with a history of recreational polydrug misuse. It is described to produce increased mental alertness, relaxation and, unlike many other stimulants, seems not to be associated with severe physical effects. Only little is known in terms of risk; one could argue about the possible risks associated with ingesting a drug which presents with a potential for dependence and the anecdotal report on injecting use. A valid cause for concern issued in our research may be its use in conjunction with other psychoactive substances.

**Conclusions:** it is here highlighted that more large-scale studies need to be carried out to confirm and better describe both the extent of Camfetamine misuse and possible psychotropic/adverse effects. It is here suggested that better international collaboration levels maybe needed to tackle the novel and fast growing phenomenon of novel psychoactive drugs availability from the web.

## Drugs and Alcohol: Spotlight on Substance Misuse Training

DA. Collins, L. Cajada, L. Fittipaldi, C. Clancy

Middlesex University, London, United Kingdom

**Introduction:** the emergence of new recreational drugs in the United Kingdom has raised awareness about the lack of current scientific research in this area. The increased prevalence of substance misuse and its connection to poor mental health is well established, and the lack of drug and alcohol awareness training in the health and social care curricula is evident. The aim of this research is to investigate health and social care undergraduate students' knowledge and perceptions about drugs and alcohol, including Novel Psychoactive Substances (NPSs) and Performance and Image Enhancing Drugs (PIED), in relation to their future professional roles.

**Methods:** the study will be conducted in two phases. Phase one will include a survey based on the validated instruments: SAAPPQ and SDDPPQ. The results will be analysed using SPSS. Phase two will include focus groups and the data will be analysed using Thematic Analysis. The participants will be students at Middlesex University, London, across four departments.

**Results:** the quantitative findings indicate that students are more motivated and confident working with service users who misuse alcohol than with those who misuse drugs. Students have average mean scores in relation to Role Security and positive attitudes in relation to Therapeutic Commitment. The results obtained in the qualitative analysis demonstrate that students have the need for more training in relation to drugs and alcohol issues, because they felt ill-prepared to work with clients with these issues, and that they require specialist training on NPSs and PIED.

**Conclusions:** this study highlights the need for a review of the current health and social care curricula in relation to drug and alcohol training. Additionally, the emergence of new herbal and synthetic psychoactive compounds is not currently included in the syllabus and educators must respond.

## Drugs on the Internet: a phenomenon out-of-control?

O. Corazza

University of Hertfordshire, Hatfield, United Kingdom

The rapid diffusion of a variety of novel psychoactive substance (NPS) often sold online as mystical incenses, bath salts, or others, has emerged as an increasingly prominent issue for the fields of drug policy, research and public health. The number of largely unregulated substances combined with the ability of the Internet to disseminate information quickly and act as an online marketplace, has led to unprecedented challenges for government organisations, health agencies, and substance misuse services. Despite increasing research, there remains a paucity of information available to professionals working in the field. As a result of the ReDNet project, a multi-side project funded by the European Commission, a number of technological solutions were developed to disseminate information on NPS. Based on these, an overview of current prevention and information services will be given, including HighWise, a new international platform for information exchange on NPS, which allows to acquire rapid knowledge and understanding of this emerging phenomenon.

## The evolution and characteristics of UK deaths involving GHB and its analogues

JM. Corkery, B. Loi, H. Claridge, C. Goodair, O. Corazza, S. Elliott, F. Schifano

National Programme on Substance Abuse Deaths, St George's University of London, London, United Kingdom; Centre for Clinical Practice, Safe Medicines and Drug Misuse Research Department of Pharmacy, University of Hertfordshire, Hatfield, United Kingdom; Neuroscience Institute, National Research Council of Italy, Section of Cagliari, Monserrato, Italy; Roar Forensics Ltd, Malvern Hills Science Park, Malvern, United Kingdom

**Introduction:** misuse of gamma hydroxybutyrate (GHB) and gamma butyrolactone (GBL) increased in Western countries from the early 1990s. The period since has seen a rising numbers of deaths. This presentation outlines the evolution and principal characteristics of United Kingdom (UK) fatalities.

**Methods:** analysis of trends and principal characteristics in such deaths using information mainly extracted from the National Programme on Substance Abuse Deaths database, which receives information voluntarily from coroners and other sources on drug-related deaths in the UK and the Islands. Relevant cases associated with use of GHB, GBL and 1,4- BD were identified by searching the database with the following terms - 'GHB', 'GBH', 'GBL', '1,4-BD', 'BDO', 'gamma hydroxybutyrate', 'gamma butyrolactone' and 'sodium oxybate'.

The exact number of GHB-related fatalities is unknown due to its endogenous nature and rapid elimination, limiting toxicological detection.

**Results:** by September 2013, 159 relevant fatalities were reported; rising from 1 in 1995 to peak at 25 in 2009. Principal characteristics: White; young (mean age: 32 years); male (82%); drug misuse history (70%). Most deaths (79%) were accidental or related to drug use, the remainder being (potential) suicides. GHB/GBL alone was implicated in 37% of cases. Commonest co-ingested substances were alcohol, diazepam, stimulants, opioids, and ketamine. Post mortem blood levels tend to be twice that of deaths involving GHB/GBL on its own compared with co-ingestion.

**Conclusions:** the data suggest a significant level of caution when ingesting GHB/GBL, particularly with CNS depressants and/or stimulants. Deaths still occur despite legal controls on GHB and its analogues.

## A national agency's response to new psychoactive substances

V. Craik, C. Kelly

Crew, Edinburgh, United Kingdom

Crew is an Edinburgh-based charity established in 1992, to provide informative and culturally credible information for users of drugs in Scotland. We do not condemn or condone the use of drugs but believe their use is a public health concern and that lives can be improved through education and support.

New psychoactive substances (NPSs or "legal highs") are substances which don't fall under current drug legislation and which can therefore be bought legally. However, they have not gone through clinical trials and despite their availability, some can have considerable negative health effects. Only a few years ago Crew dealt mainly with alcohol, cocaine, ecstasy and cannabis related issues. Now, in line with other services, our users are reporting increasing use of these new drugs, whose use can quickly become problematic.

This presentation discusses Crew's response to emerging NPSs at all levels, including development, practice and policy. We will present up to date statistics from users, related to their use of these drugs and put this into the context of our role as a national agency that gathers and disseminates drug trends information and provides education. Finally, we discuss teaching methods and outline the use of a new tool called 'the drugs wheel', which can aid understanding of new drugs by demonstrating how they are categorised.

We aim to provide an up to date picture of the current use and distribution of NPSs in Scotland and indicate how we provide education and support to reduce the harm caused by these substances.

## Establishing the pattern of acute toxicity associated with novel psychoactive substances

**P. Dargan**

*Guy's and St Thomas' NHS Foundation Trust, London, United Kingdom*

There has been a significant increase in the availability and use of a wide range of different novel psychoactive substances in the last few years. There is currently no systematic system in Europe to collect data on the acute toxicity associated with these substances. This talk will discuss the potential data sources that can be used and the pattern of acute toxicity that has been established for novel psychoactive substances over the last 3-5 years. Whilst most drugs have a similar acute toxicity profile to established recreational drugs, more recently some drugs and/or drug classes have been shown to be associated with additional and unexpected toxicity (e.g. cerebellar toxicity associated with methoxetamine and prolonged neuropsychiatric effects associated with the piperidols).

## The Online Availability of Prescription Drugs: The interesting case of Codeine

**P. Deluca<sup>1</sup>, MC. Van Hout<sup>2</sup>**

*<sup>1</sup>King's College, London, United Kingdom; <sup>2</sup>Waterford Institute of Technology, Ireland*

**Introduction:** Abuse of controlled prescription -POM (and over the counter -OTC) opioid analgesic drugs now exceeds abuse of all illegal drugs combined, except marijuana, and has emerged over the last two decades as a global health problem. Codeine is the most commonly consumed opiate worldwide. Codeine products are normally prescribed but can also be purchased OTC; and are widely available over the Internet. Codeine based products have abuse potential and associated adverse health consequences. The research aims to conduct an Internet monitoring exercise and surveying (online) individuals.

The research has been funded by the EC's FP7 - grant agreement 611736.

**Methods:** Online social media, the dark web and the wider Internet are being regularly monitored and analysed for information on Codeine with the aim of identifying trends in use, endorsement of specific products and online purchase options.

**Results:** The Internet appears to be a prime source of information for misusers interested in tampering with drug/formulations. A plethora of websites provide users with advice, tips, procedures and specific recipes on drug/formulation tampering.

Recreational codeine users frequently attempt to purify codeine formulations by removing paracetamol and other ingredients, through Cold Water Extraction thereby circumventing potential toxicity from these substances. Detail is also provided on home chemistry using codeine to produce opiate injectable solutions. Online marketing and sale of codeine products is also widespread and takes advantage of all online technologies.

**Conclusions:** Internet monitoring is an important source of information to understand and describe any POM or OCT misuse.

## Educating young people: encouraging appropriate tv programs on drugs

**M. di Giannantonio**

*Department of Neuroscience and Imaging, University "G.d'Annunzio", Chieti, Italy*

Currently, there are almost 400 millions of connected television sets worldwide: the number is more than doubled since 2011, and it is expected to overpass 700 millions in 2018. US citizens have an average television viewing time of almost 5 hours per day; Italians follow closely with slightly more than 4 hours per day. Over the years, television has assumed a role of growing significance in daily life, and educational functions are not a secondary aspect. People, especially young, learn through a wide range of modalities, and modern education should be willing to use as many different learning supports as possible. Drug abuse is one of the key threats for society, involving mostly the youngest fraction of the population, which is more prone to experiment and engage in risky behaviours. Presently, by the time of high school graduation, American children will have spent more time watching television than they have in the classroom. Considering all of the above, using television programmes to spread reliable and up-to-date information on drugs may be an opportunity not to be wasted. The use of an appropriate language and non-moralistic attitude, together with a positive emphasis on self-empowerment and confidence, may be the most successful way to transmit the message to the wide public offered by television.

## The art and science of combining medications

**A. Fagiolini**

*School of Medicine, University of Siena, Italy*

Psychotropic drugs are often used together to treat mental illnesses and/or in combination with medications prescribed to treat comorbid illnesses. The effect of a combination may simply be the sum of the effects and side effects of the combined medications. However, a combination may also result in an increase or a decrease in the action of either substance, generating new beneficial or adverse effects that are not normally associated with either drug.

Beneficial, adverse or neutral results depend on the pharmacodynamic and pharmacokinetic properties of the combined medications. Pharmacodynamics is the branch of pharmacology that studies the effects and modes of action of drugs upon the body. In other words, pharmacodynamics explores what a drug does to the body. Pharmacokinetics includes the study of the mechanisms of absorption and distribution of an administered drug, the rate at which a drug action begins and the duration of the effect, the chemical changes of the substance in the body (e.g. by enzymes) and the effects and routes of excretion of the metabolites of the drug. In other words, pharmacokinetics explores what the body does to the drug.

This presentation will review the pharmacokinetic and pharmacodynamic interactions of medications used in psychiatric disorders in general and in mood disorders in particular.



## Pharmacokinetics and pharmacodynamics of mephedrone in humans

M. Farré<sup>1</sup>, E. Papaseit<sup>1</sup>, C. Perez-Maña<sup>1,2</sup>, S. Yubero-Lahoz<sup>1</sup>, M. Pujadas<sup>1</sup>, F. Fonsesa<sup>1</sup>, R. de la Torre<sup>1</sup>

<sup>1</sup>Human Pharmacology Unit. Hospital del Mar Medical Research Institute-IMIM; <sup>2</sup>Parc de Salut MAR, Universitat Autònoma de Barcelona and Universitat Pompeu Fabra, Barcelona, Spain

**Introduction:** mephedrone is a “Novel Psychoactive Substance”. There are not experimental data of the pharmacological effects or pharmacokinetics of mephedrone in humans. A pilot study was carried-out to evaluate the human pharmacology of mephedrone in humans. In a previous work we presented the pharmacological effects of mephedrone. In this abstract we present the results of pharmacokinetics and its effects on serotonin (5-HT) release.

**Methods:** nine healthy male, recreational users of psychostimulants, participated in three different experimental sessions. They received single oral doses of mephedrone (n= 3, 50 mg, 100 mg and placebo; n=3, 150 mg, 200 mg and placebo; and n=3, 150 mg, 200 mg and 100 mg of MDMA). Drugs were administered double-blind, and randomised. Study variables included: vital signs, subjective effects, blood samples for pharmacokinetics and for 5-HT concentrations.

**Results:** plasma concentrations increased by the dose, but showing a great variability. Peak concentrations after 150 mg and 200 mg were 123±33ng/ml and 173±94 ng/ml, respectively. T<sub>max</sub> were observed 1h after administration. Mean elimination half-life was 2-3 hours. Mephedrone 150 mg and 200 mg increased basal 5-HT blood concentrations 6- and 10 fold, respectively.

**Conclusion:** mephedrone plasma concentrations are related to its pharmacological effects. Elimination half-life is lower than other amphetamines and the substance produce an increased in serotonin that correlates with plasma concentrations.

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## New psychoactive substances and the EU Early Warning System: chemistry matters

A. Gallegos

EMCDDA, Lisbon, Portugal

The Early Warning System on new drugs (EWS) has been operating in the European Union for more than fifteen years. The EWS is a real time vehicle for the exchange of information on new psychoactive substances that may pose public health and social threats.

Over the past few years Europe has seen an unprecedented growth in the number, type and availability of new psychoactive substances. In 2013, for the fifth consecutive year, a record number of 81 substances were detected for the first time in Europe via the EWS. This represents the largest number of substances ever reported in a single year – more than two thirds of the total number of substances monitored through the system has been identified in the last four years. Due to the diverse nature of substances detected, the classification of new drugs into five traditional drug families (phenethylamines, tryptamines, piperazines, cathinones and cannabinoids) has been recently revisited.

The speed at which new psychoactive substances appear and the way they can be distributed challenges the established procedures for monitoring, responding to and controlling the use of new psychoactive substances. Furthermore, the toxicity of those substances is largely unknown; recently, the EMCDDA has assessed the risks posed by AH-7921 (a synthetic opioid), 25I-NBOMe (a potent hallucinogenic phenethylamine sold as LSD), methoxetamine (an arylcyclohexylamine advertised as a ‘bladder friendly’ alternative to and sold as ketamine) and MDPV (a ring-substituted synthetic cathinone).

New substances from diverse chemical groups emerging rapidly and being sold in combination with and as a replacement of other drugs pose challenges to forensics and toxicologists, law enforcement authorities, health-care providers and policy makers and call for a joined-up strategy at global level.

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Oral Communications

## Have NPS become an integral part of the EU drug market?

P. Griffiths, R. Sedefov  
EMCDDA, Lisbon, Portugal

Until about a decade ago, most of the new psychoactive substances in Europe were aiming to become the next ecstasy. These 'designer drugs' were typically sold directly on the illicit market and produced in illicit production facilities. To some degree, this continues to be the case; most recently new amphetamine and fentanyl derivatives were detected in illicit production laboratories within the EU.

However, the emergence of 'legal highs' in Europe, beginning with BZP and methylone in mid-2000's, and followed by mephedrone, marked a fundamental shift in the drug market. Now many new psychoactive substances are produced in bulk outside of Europe and imported into the European Union, where they are processed, packaged and sold on the growing 'legal highs' market. These developments have been fuelled by globalisation and technological advancement, which have also allowed a more open market to develop. This includes advertisement and sale through the Internet and 'bricks and mortar' head shops.

Overall, these developments have played a role in the dramatic increase in the number, type and availability of new psychoactive substances in Europe. We are now seeing a broad range of stimulants, cannabinoids and even opioids. Not surprisingly these developments have also led to a growing number of serious harms being reported. In the first half of 2014 four substances have been risk assessed by the EMCDDA – a synthetic opioid similar in effect to morphine (AH-7921), a potent hallucinogen (25I-NBOMe), a stimulant with cocaine like effects (MDPV) and a substance sold as a 'bladder friendly' alternative to ketamine (methoxetamine).

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Oral Communications

## Breaking worse: The emergence of krokodil (desomorphine) and excessive injuries among people who inject drugs in Eurasia

JP. Grund<sup>1</sup>, A. Latypov<sup>2</sup>, M. Harris<sup>2</sup>

<sup>1</sup>Addiction Research Center, Utrecht, The Netherlands; <sup>2</sup>Department of Addictology, <sup>1</sup>st Faculty of Medicine, Prague, Czech Republic

**Background:** krokodil, a homemade injectable opioid, is associated with excessive harms. In 2011, at least 100,000 and around 20,000 people in Russia and the Ukraine respectively were estimated to have injected krokodil. We present the existing information on the production and use of krokodil within the context of the Eurasian recent social history.

**Methods:** literature and media research. Survey data from HIV prevention and treatment NGOs, regional experts and NGO representatives consulted.

**Results:** krokodil production emerged in an atypical homemade drug production and injecting risk environment that predates the fall of communism. Made from codeine in rudimentary home-laboratories, krokodil may include various opioid alkaloids besides desomorphine and, unfortunately, high concentrations of processing chemicals, responsible for serious localized and systemic injuries. Ties between the medical and criminal justice establishments, stigma and medical maltreatment are thwarting PWID seeking medical help.

**Conclusion:** a comprehensive response to krokodil-type drugs and associated harms should focus on the substance itself and its rudimentary production methods, on the on-going syndemic of drug injecting, HIV, HCV, TB and STIs in the region and the recent upheavals in local and international heroin supply. The feasibility of harm reduction strategies for people who inject krokodil may depend more on political will than on the practical implementation of interventions. The legal status of opioid substitution treatment in Russia is a point in case.

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Oral Communications

## Emergence of Illicit Methadone Injection among People Who Inject Drugs in St. Petersburg, Russia

R. Heimer<sup>1</sup>, R. Barbour<sup>1</sup>, A. Lyubimova<sup>2</sup>, OS. Levina<sup>2</sup>

<sup>1</sup>Yale University School of Public Health, New Haven, CT, United States of America; <sup>2</sup>NGO Stellit, St. Petersburg, Russian Federation

**Introduction:** in Russia, an estimated 2 million people inject drugs, most opioids, and 83,000 PWID reside in the St. Petersburg. We have conducted surveys of PWID approximately every other year since 2000. We compared surveys completed in 2013 and 2010 to explore the use of methadone, which cannot be legally obtained in Russia and its use for substitution therapy is prohibited.

**Methods:** we used respondent driven sampling to recruit participants who were tested for HIV and interviewed to determine sociodemographics, drug use history, practices, and emerging trends, HIV risks and prevalence, access to care, and residence to the nearest intersection. Spatial data from 2013 were analyzed to identify clustering of drug use practices and HIV prevalence.

**Results:** heroin remains the drug of choice, but compared with information collected in prior surveys, methadone is now the second most frequent drug injected. Of the 811 participants, 641 (79.0%) reported injecting heroin and 407 (50.2%) reported injecting methadone in the 30 days prior to interview. In contrast, on the 2010 survey, only 20 (4.9%) reported injecting methadone. "Krokodil" use was uncommon -- only 3 people reported injecting it in 2013 and 1 in 2010. Spatial analysis suggests that methadone injection, like heroin injection, is not clustered in certain city districts. HIV prevalence was significantly lower among those injecting methadone most often (48.3%) compared to those injecting heroin most often (60.0%).

**Conclusion:** despite any legal means of methadone access in St. Petersburg, its availability in the city has recently become widespread.

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Oral Communications

## Social Learning Theory and Initiation into Salvia Divinorum Use

BC. Kelly<sup>1</sup>, D. Perrone<sup>2</sup>

<sup>1</sup>Purdue University, California, United States of America; <sup>2</sup>California State University-Long Beach, California, United States of America

**Introduction:** studies have shown that peers influence initiation into illicit substances. One theoretical foundation to explain the peer-drug initiation relationship is Social Learning Theory. While this theory has been widely applied to explain initiation into illicit drug use, this theory has not been considered with legally available psychoactives. Salvia divinorum is an intense but short acting hallucinogen legally available for purchase in many states within the U.S. Drugs such as salvia divinorum have piqued the interest of young people looking for novel or alternative highs.

**Methods:** based on interviews of 50 young adult users of salvia divinorum from four U.S. states, this paper examines the patterns and processes by which young people initiate into the use of salvia divinorum.

**Results:** the social and psychological contexts underlying these initiation experiences both cohere and contradict social learning theory in various ways. Salvia divinorum users stress how friends, expectations, peer's experiences, and personal experiences with salvia's effects influenced initiation and continued use.

**Conclusions:** the initiation experiences of young people using salvia divinorum have implications for understanding how peers and drug effects influence onset of legal high use more broadly. Thus, initiation decisions regarding a legally available novel psychoactive drug has implications for the application of this theory to substance use more generally.

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Oral Communications

## Studies on binding affinities of newly emerging synthetic cannabinoids at the cannabinoid CB1 and CB2 receptors

R. Kikura-Hanajiri, N. Uchiyama, T. Hakamatsuka  
*National Institute of Health Sciences, Tokyo, Japan*

**Introduction:** to avoid a cat-and-mouse game, a generic scheduling for designating naphthoylindole-type synthetic cannabinoids, having particular substituents, was introduced into the "Designated Substances" in Japan. However, the distribution of new types of synthetic cannabinoids, such as carboxyamides and quinolinyl carboxylates, dramatically increased in 2013. In this study, the binding affinities of these newly emerging compounds at the cannabinoid CB1 and CB2 receptors were evaluated.

**Methods:** The evaluation of the IC50 values of 24 synthetic cannabinoids, which had not yet had their pharmacological activities reported, was based on the competitive interaction between [3H] CP-55,940 and an analyte for the human cannabinoid CB1 and CB2 receptors binding sites.

**Results:** it was shown that most of the recent emerging synthetic cannabinoids have high CB1/CB2 receptor binding affinities. Among the 24 compounds, the binding affinities of 5-Fluoro PB-22, 5-fluoro NNE1 and BB-22 at the CB1 receptor were the highest. The N-fluoroalkyl analogs of an indole moiety have much higher affinities than N-alkyl compounds (e.g. 5-fluoro PB-22/PB-22 and 5-fluoro NNE1/NNE1). The binding affinities of carboxamide-type compounds also showed higher than those of carbonyl-type compounds (e.g. NNE1/JWH-018 and AB-001/APICA). On the other hand, the indazole analogs of an indole moiety have slightly lower affinities than indole-type compounds (e.g. APINACA/APICA and NNE1 indazole analog/NNE1).

**Conclusions:** although the binding affinities at the CB1 receptor do not directly reveal each neuro-pharmacological activity, there is potential health damage. To avoid health problems and abuse caused by newly emerging psychoactive substances, we have to continuously monitor the distribution of these substances.

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Oral Communications

## The UNODC Early Warning Advisory on NPS – new trends

S. Levissianos  
*United Nations Office on Drugs and Crime (UNODC), Wien, Austria*

In 2013, the Commission on Narcotic Drugs adopted resolution 56/4 entitled "Enhancing international cooperation in the identification and reporting of new psychoactive substances", recognizing that the establishment of a global early warning system could benefit Member States' understanding in responding to the complex and changing market for new psychoactive substances. As a result, the UNODC Early Warning Advisory (EWA, [www.unodc.org/NPS](http://www.unodc.org/NPS)) was launched in June 2013. The EWA aims to monitor, analyse and report trends on NPS, as a basis for effective evidence-based policy responses. It also serves as a repository for information/data on these substances and as a plat-

form for providing technical assistance to Member States. Up to July 2012, 70 Member States and Territories reported to UNODC the identification of 251 substances. By October 2013, the implementation of the EWA has produced tangible results allowing the identification of over 350 substances reported by 89 Member States and Territories including national drug testing laboratories. The five substances most frequently reported over the period July 2012 to October 2013 were all synthetic cannabinoids. Four of these substances are new derivatives of existing synthetic cannabinoids, whose chemical structures have been slightly modified to produce new substances.

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## Oral Communications

# Using biomarkers in wastewater to monitor community drug use

**J. Malcolm, JA. Reid, Baz-Lomba, R. Yeonsuk, KV. Thomas**  
*Norwegian Institute for Water Research (NIVA), Norway*

Data obtained from the analysis of wastewater from large-scale sewage treatment plants has been successfully applied to study trends in the use of classical illicit drugs such as cocaine, but the dynamic nature of the new psychoactive substances (NPS) market presents a unique set of challenges to epidemiologists. In an attempt to overcome some of the challenges, this paper presents a framework whereby a collection of tools and alternative data-sources can be used to support the design and implementation of wastewater-based studies on NPS use. Within this framework the most likely and most suitable biomarkers for a given NPS are predicted via in-silico metabolism, biotransformation and sorption models. Subsequent detection and confirmation of the biomarkers in samples of wastewater are addressed via high-resolution mass spectrometry (HRMS).

The proposed framework is applied to a set of test substances including synthetic cannabinoids and cathinones. In general, the in-silico models predict that transformation via N-dealkylation and hydroxylation is likely for these compounds, and that adsorption is expected to be significant for cannabinoids in wastewater. Screening via HRMS is discussed with examples from the literature, and common-fragment searching and mass-defect filtering are successfully performed on test samples such that spectral noise is removed to leave only the information that is most likely to be related to the NPS biomarkers. HRMS screening is also applied to a set of pissoir-sourced wastewater samples and a total of 48 pharmaceuticals and drugs including 1-(2- methoxyphenyl) piperazine (oMeOPP) are identified.

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## Oral Communications

# Novel Psychoactive Substances: a comparison among psychoses

**G. Martinotti**  
*Department of Neuroscience and Imaging, University "G.d'Annunzio", Chieti, Italy*

The distinction between a substance-induced psychosis and a primary psychotic disorder that co-occurs with the use of drugs or alcohol is critical for both the understanding of the illness and the planning of an adequate treatment. Patients with a history of psychoactive substances use disorder may demonstrate acute psychotic symptoms as an independent functional disorder, as a direct effect of substance abuse, or as a combination of both. Epidemiology data highlight that lifetime comorbidity with substance use disorder has been observed in a third to nearly half of the patients admitted for a first psychotic episode. Given the above, a differential diagnosis between a primary and a substance-induced psychosis is crucial, yet there have been few studies and evaluation focusing on the differences between these two diagnostic entities. Although psychotic states with differing etiologies may be phenomenologically similar, some researches evidenced peculiar characteristics that may help clinicians discriminating between the diagnoses. Older age of onset, visual hallucinations, higher prevalence of suicidal thoughts, comorbid personality disorders, aggressive behaviour are most common among patients with substance-induced psychosis; on the other hand,

a younger age of onset, higher scores on positive symptoms scale, less insight, altered thought processes, bizarre delusions are instead more typically present in schizophrenic patients. The development of new predictive models may be a relevant aid to guide a more accurate diagnosis at first treatment.

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Oral Communications

## Perspectives on the rise and fall of psychoactive drugs: generational forgetting, risk, availability, and substitution of drugs

JC. Maxwell

*The University of Texas at Austin, Austin, United States of America*

**Introduction:** the varieties of novel psychoactive substances are changing rapidly and the attitudes towards some of these drugs provide an opportunity to consider theories about the use of new drugs.

**Methods:** data from DEA's National Forensic Laboratory Information System and the Monitoring the Future Surveys will demonstrate changes in patterns of use and attitudes toward use.

**Results:** twelfth graders in 2012 had higher prevalence of use of cannabis and synthetic marijuana than their older cohorts. By 2013, attitudes towards the harmfulness of some of these drugs had changed. At the same time, forensic laboratories report increasing numbers of phenethylamines, psilocin/psilocybin, and tryptamines submitted for identification, along with decreases in MDMA and cannabis. Patterns of substituting one drug for another are appearing, and the varieties of synthetic cannabis and as nthetic cathinones changed. The synthetic cannabinoid formula changed from the JWH versions in 2010 to XRL formula in 2013, and the proportion of methylone as a cathinone increased each year from 2010 to 2013.

**Conclusions:** because of the newness of the synthetic drugs and recent resurgence of drugs used by earlier generation, there is a need to use appropriate public health and forensic data in combination with the latest research findings to educate potential users about the effects and potential problems in the use of these drugs.

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Oral Communications

## Prohibited substances in sports: emphasis on counterfeit and illegal drugs of abuse

I. Mazzoni, S.J. Robertson, O. Rabin

*World Anti-Doping Agency, Montreal, Canada*

The World Anti-Doping Agency (WADA) was established as an international independent agency to combat doping in sports in all its forms. Its key activities include scientific research, education, development of anti-doping capacities, and monitoring of the World Anti-Doping Code (Code) – the document harmonizing anti-doping policies in sports and countries around the world.

The Code works in conjunction with five International Standards aiming at bringing harmonization among anti-doping organizations. A key International Standards is the List of Prohibited Substances and Methods (the List). The List determines the substances and methods prohibited in sports in- and out-of-competition.

The doping substances covered by the List include classical and novel chemical and peptidic drugs (e.g. anabolic agents; growth factors; beta-2-agonists; diuretics; stimulants; narcotics; glucocorticosteroids). Many of these are legitimate medicines while others are counterfeited products sold through the internet. Designer drugs like anabolic steroids and stimulants occupy a prominent role in the List as well. In recent years, there has been a significant increase in the number of doping cases with stimulants related to amphetamines and cathinones as well as new synthetic cannabinoids. The detection of new drugs present a challenge for doping control, as methods have to be con-

stantly adapted to detect drugs newly coming into the market. In an effort to anticipate doping trends, WADA is developing an intelligence-based approach, aiming at identifying and purchasing designer drugs as well as counterfeited products to identify their chemical structures and to assess their quality and purity with the objective to facilitate their identification and detection.

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## Oral Communications

# An epidemiological study on Novel Psychoactive Substances and impact on mental health

**A. Metastasio**

*Norfolk and Suffolk NHS Foundation Trust, Ipswich, United Kingdom*

**Introduction:** novel psychoactive substances are an emerging health problem. Very little is known of the substances used and the effects on the population. Despite the established psychotropic effects of these compounds there are no major studies regarding the epidemiology and the effects of these compounds in people with mental illnesses. We decided to consider this lack of information in the clinical service we are working. Our service (Access and Assessment Team) is the first point of contact of patients referred by GPs or other clinician for a psychiatric assessment. The catchment area is the entire county of Suffolk

**Methods:** the first step was to obtain some data regarding the use of legal highs in the patients referred to our service. For this reason we devised a simple questionnaire that can be used in the triage or in the assessment phase (figure 1). We started using this questionnaire in January 2014. Patients that answered affirmatively for legal highs use were discussed by the team with the Consultant Psychiatrist and the Pharmacist. A in-house system of information that was shared with the other clinicians, the GPs and the other stake holders.

**Results:** at the moment among the patients screened one admitted using "Dolly" a compound that appears to be mephedrone and cause paranoid psychosis. Other individuals admitted using different compounds but could not specify the kind. 3 individuals admitted buying hormones online for gender reassignment purposes.

**Conclusions:** our survey showed that, despite the growing attention to novel psychoactive substances, the extent of their use and the effect on individual with mental illness, remains "terra incognita". It is also matter of concern the fact that some individuals were also buying online (following protocols available on the internet) hormones used for a DIY gender change. This is of particular concern because these are compounds potentially dangerous that can have severe and long lasting effects on health. It is also necessary to have a multidisciplinary approach, involving other professionals and joining with other team or project, to gather the necessary informations (e.g. joining SMAIL or accessing the database from the Rednet project). Also it is necessary, sometimes, contact specialists or "superspecialist" in order to have the necessary information to for an appropriate clinical management.

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## Oral Communications

# New Measures for Harm Reduction

**L. Móró**

*Faculty of Social Sciences, University of Turku, Turku, Finland*

The rapid emergence of novel psychoactive substances (NPS) has significantly reshaped the global drug scene, and induced fundamental changes in markets, policies, and subcultures. To understand the still-ongoing NPS phenomenon, studies must characterise its few similarities and many differences compared to traditional drugs, and explain the terminology and appeal of new drugs. These recent changes pose new challenges also for drug-related harm reduction work. From the drug users' perspectives, NPS-related harms are derived from set and setting. Hence, I go through an eight-item list of these harms: drug misidentification, mixtures, naming, (over)dosing, interactions, scams, legal consequences, and psychosocial risks. This list has been compiled by analysing scientific literature, observing drug discussion groups, monitoring warnings about drug-related emergencies, and following legislative changes. In

my paper, I describe some currently operating NPS harm reduction measures and best-practices – drug checking services, public databases, and information dissemination – with European case examples, including also drug user self-help activities. Moreover, I discuss harm reduction at parties/festivals, market force involvement, public media regulation, consumer protection of NPS users, and promotion of a “smarter” drug user culture. The conclusion that logically follows from the above analyses (of NPS-related harms, harm reduction best-practices, and needed policies) is that the lifecycles of drugs cannot be stopped by force, but their courses may be partially affected by carefully chosen policies and interventions. For the long-term goal of establishing evidence-based and integrated psychoactive substance policies that also reduce use related harm, changes are urgently needed.

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Oral Communications

## Preventing NPS from Reaching Consumer Markets

**M. Nice**

*Secretariat of the International Narcotics Control Board*

New psychoactive substances (NPS) are substances of abuse, either in a pure form or a preparation, that are not controlled under either the 1961 Convention on Narcotic Drugs or the 1971 Convention on Psychotropic Substances, but which may pose a public health threat. NPS, in particular synthetic substances, share the following key characteristics that translate into the specific challenges to control both domestically and internationally, such as: a potentially unlimited number of substances; little or no documented medical, scientific or industrial usefulness; and their availability from ‘commercial sources’ via online purchase. Since 2009 more than 350 such substances of abuse have been reported to the United Nations by Governments, quickly outpacing substances under international control. Until NPS are added to the international control mechanism, the international community can take practical immediate steps to prevent non-scheduled new psychoactive substances from reaching consumer markets. The presentation discusses an operational approach to address the challenges posed by NPS.

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Oral Communications

## Changing Patterns of Drug Use in Georgia – a Case of Krokodil

**D. Otiashvili, I. Kirtadze**

*Addiction Research Center, Alternative Georgia, Tbilisi, Georgia*

In Georgia heroine and buprenorphine injection epidemics of late 1990s-early 2000 were followed by the widespread use of home-produced injection preparations. In 2011-2012 desomorphine (Krokodil) and home-made ATS (Vint and Jeff) were the principal drugs of injection, with a significant proportion of PWID using both preparations. In 2013 the last month prevalence of Krokodil injection was 72% and the prevalence of stimulants injection was 25% in a sample of 1330 participants of needle/syringe programs.

Strong increases in home-made drug injection followed the reduced availability of heroin and other “traditional” opioids. Intensive policing of heroin and opioid markets resulted in PWID switching to alternatives, which require less involvement in illegal drug markets and are remarkably cheaper - \$5-7 per single dose of Vint, Jef or Krokodil, compared to \$50-100 per single dose of heroine or buprenorphine. Switching to homemade drugs is associated with increased risk of BBV infections and serious physical harm and neurological and psychiatric complications.

Restrictive drug policy and limiting access to particular drugs were seen as solutions to Georgia’s drug problem. But its addiction treatment system was largely unprepared for the changing drug use trends that followed the disappearance of heroine and buprenorphine and often failed in meeting the needs of their patients. Researchers and service providers must engage in policy dialogue and advocate for relevant systemic reforms in order to ensure that policies, program planning and resource allocations are adequate, and responsive to ever changing drug scenes and needs of people affected by substance use and dependence.



## “(New) Glocal Syndemics: the ‘M-cat’ tale”

D. Papanti<sup>1</sup>, JP. Grund<sup>3</sup>, G. Francesconi<sup>4</sup>, L. Orsolini<sup>4</sup>, F.Schifano<sup>2</sup>

<sup>1</sup>University of Trieste, Psychiatry Residency School, Trieste, Italy; <sup>2</sup>University of Hertfordshire, Hatfield, United Kingdom; <sup>3</sup>Addiction Research Center, Utrecht, The Netherlands, <sup>4</sup>University of Marche Region, Ancona, Italy

**Introduction:** mephedrone ('M-cat') is a designer cathinone substitute obtained by the methylation of methcathinone ('Cat'). 'Cat' is a homemade liquid injectable stimulant obtained from pseudoephedrine, widely used in Russia and Eastern European Countries. Both are short-acting stimulants. In the Western hemisphere a self-limited 'Cat' outbreak was described in Michigan in 1995, having many similarities to the contemporary upsurge in Mephedrone injecting.

**Methods:** we collected the available evidence on both established home-made and injectable NPS from the peer-reviewed and gray literature, including reports by drug services agencies and NGOs. Our analysis is focused on the macro-risk environment of these two closely related substances, countries macro-settings and on the influence of new drug-markets in the development of epidemics.

**Results:** both the cross-border diffusion of 'Cat' in US and 'M-cat' in Eastern Europe suggests the increasing interaction between global drug markets and local experiences, towards a truly Glocal phenomenon, with important consequences for drug epidemiology.

The 'Cat' placement in schedule 1 by US in the 90's and the lack of a global internet market at that time were an obstacle to the diffusion of 'Cat' misuse in western countries; low-quality heroin, ready-availability and quasi-legal status of 'm-cat', relative lack in substitution treatment offer and 'austerity' regime, favoured the settlement of mephedrone as a well-established drug in Eastern Europe twenty years later, and the switch to injectable cathinones in people who injected opiates, with the fastening/triggering of HIV/HBV/HCV/TBC syndemics.

**Conclusion:** we identified a glocal pattern in stimulants misuse in Eastern Europe furtherly impacting the ongoing syndemic of drug-injecting, HIV and HCV. 'M-cat' intravenous use is associated to an increase of the average injections number/day, related medical complications, re-use and sharing of syringes/injecting paraphernalia and associated with social exclusion.

## Central Nervous System stimulant drugs: why they are damaging to recreational users

A. Parrott

*Department of Psychology, Swansea University, Swansea, United Kingdom*

**Aims:** CNS stimulant drugs seem to promise much – greater alertness, feelings of euphoria, and faster cognition. But do they actually deliver any real gains? This review will focus on why the regular use of stimulant drugs causes far more problems than benefits.

**Methods:** this review will describe the mood, cognitive and neurohormonal effects of CNS stimulants drugs, when taken recreationally. The main focus will be empirical data on nicotine and Ecstasy/MDMA. This will be complemented by findings from amphetamine, methamphetamine, cocaine, khat, and the Novel Psychoactive Substance mephedrone (m-cat).

**Results:** CNS stimulant drugs cause mood fluctuation. Recreationally they are used to engender acute mood gains, but in-between these moods deteriorate to sub-baseline values. Hence CNS stimulants make humans feel moody and irritable. Prospective studies show that cigarette smokers become more stressed after taking-up smoking, while they become less stressed and happier after quitting. Prospective studies show that Ecstasy/MDMA use leads to higher depression, while quitting leads to reduced depression. With reference to potential cognitive gains, these need to be balanced against lower performance when off-drug. Hence CNS stimulant drugs cause cognitive vacillation, which adds further to their dependency potential (beware of supposed 'smart' drugs!). CNS stimulants also cause sympathomimetic over-activation, impair the HPA axis, reduce homeostatic stability, and lead to greater psychiatric distress. They can also damage the developing foetus. Chronic tolerance, and deteriorating cost-benefit ratios over time, will al-

so be debated. These neuropsychobiological deficits are well documented in heavy dependent users, but early signs of damage also occur in novice-moderate users. Finally, any novel psychoactive stimulant will produce similar forms of neuropsychobiological damage. Hence no novel stimulant drug should be mislabelled as 'low harm'.

**Conclusions:** stimulant drugs are often miss-perceived by young people as short-cuts to pleasure. The psychobiological reality is of moodiness, impaired well-being, reduced immunocompetence, and greater psychiatric distress. Furthermore the more they use - the worse they can become. The negative cost-ratio for all CNS stimulant drugs should be a core focus for health education packages.

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Oral Communications

## Behavioral Pharmacology of Newer Synthetic Drugs – The United States

TM. Penders, J. Lee

East Carolina University, Greenville, NC, United States of America

**Introduction:** over the past five years there has been an emergence and expansion of drugs targeted at recreational users globally and specifically in the United States by means of novel promotion relying on deception and frequently relying on the use of the Internet.

While a multitude of molecules have been identified in case reports by clinicians and law enforcement in the United States the largest burden has been associated with the use of two general categories of substances; the synthetic cathinones or "bath salts" products and the synthetic cannabinoids referred to commonly as "spice." There have been significant regional differences in the distribution of these drugs each with varying pharmacological profiles.

**Methods:** reviews of published reports and documented observations at hospitals in Eastern North Carolina, USA.

**Results:** a spectrum of behavioral pharmacological reactions has been defined for both the synthetic cathinones and synthetic cannabinoids. Discussion of variation between commonly used molecules. Treatment guidance discussed.

**Conclusions:** the explosion of novel drugs of abuse in the US has resulted in a variety of morbidities that are a challenge to early diagnosis and effective intervention to psychiatric and emergency physicians.

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Oral Communications

## Psyclone or Psy-clones? Caught in the middle of the drug "Clone Wars"

R. Santacroce<sup>1,2</sup>, O. Corazza<sup>2</sup>, G. Martinotti<sup>1</sup>, FS. Bersani<sup>3</sup>, G. Valeriani<sup>3</sup>, M. Di Giannantonio<sup>1</sup>

<sup>1</sup>Department of Neuroscience and Imaging, University "G.d'Annunzio", Chieti, Italy; <sup>2</sup>School of Life and Medical Science, University of Hertfordshire, Hatfield, United Kingdom; <sup>3</sup>Department of Neurology and Psychiatry, Sapienza University of Rome, Rome, Italy

**Introduction:** the urge to collect information on a new drug called "Psyclone" has emerged after the media reported the death of a 38-year-old man in Bolton (UK). The fatality appeared to be consequence of smoking a psychoactive product named Psyclone, although no specific death cause has been ascertained.

**Methods:** from October to December 2013, qualitative search of the web has been carried out in English and Italian, using keywords as "Psyclone", "Psyclone legal high", "Psyclone incense" "Psyclone research chemical" on Google search engine. Specific searches took place in the database provided by The Global Public Health Intelligence Network (GPHIN).

**Results:** our research highlighted the existence of two psychoactive products for sale on the Internet, sharing the same name but with different contents and packaging. The herbal blend labelled Psyclone contains two synthetic cannabinoids: AKB-48 and 5f-PB-22. Users of the drug refer fast, intense and prolonged effects, which include euphoria, relaxation, visual hallucinations and extreme tiredness. The second Psyclone contains 50% ethylphenidate, 30% caffeine and 20% li-

docaine. Users report euphoria, boosted energy, extreme feelings of wellbeing, but also altered perception of time, numbness of body parts, insomnia, anxiety, alternate perception of reality and a long-lasting hangover.

**Conclusions:** providing information on what is inside new psychoactive compounds allows the understanding of the potential threats they may determine, considering their being cheap and just “a click away” from every home. Web-monitoring activities are therefore a first-line tool to quicker and better understand the new trends of substance misuse and to generate up-to-date data.

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## Oral Communications

# Use of Novel Psychoactive Substances and the risk of psychopathological disturbances

**F. Schifano**

*School of Life and Medical Sciences, University of Hertfordshire, Hatfield, United Kingdom*

During this presentation, the different NPS categories which are being considered particularly popular in the EU will be commented. This will include: the PIA/phenethylamines/MDMA-like drugs; some of the more recent PIA derivatives (e.g. NBOMe; indanes; benzofurans); the synthetic cannabimimetics; the cathinone derivatives; the most recent synthetic opiate/opioids; the synthetic cocaine substitutes; the classical and most recent tryptamine derivatives; the most recent psychedelic phenethylamines (e.g. DMAA); the GHB-like drugs; the PCP-like drugs: the piperazine derivatives; the most popular herbs/plants/fungi; the most frequently misused medicinal products (e.g. tramadol, gabapentinoids etc); and a range of PIEDs. It will be illustrated how the different NPS may possess one or more of the following psychopharmacological properties, including: DA agonism; CB1 partial/full agonism; 5-HT<sub>2A</sub> agonism; glutamate (NMDA and mGlu<sub>2/3</sub>) antagonism; and mu/delta/k opioid agonism. Finally, it will be argued here how these pathways/receptors' involvement might be associated with the risk of psychopathological disturbances/psychosis in the acute/chronic NPS misusers.

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## Oral Communications

# New drugs, old stories: NPS, the media and responsible communications

**H. Shapiro**

*DrugScope, London, United Kingdom*

Since the earliest days of the tabloid press in early 20th century America, drug stories have sold newspapers. They often combine the ‘right’ mix of sinister foreign forces supplying dangerous substances threatening the nation’s youth – and a good dose of sex helps as well. But the media are often helped in their invariably misinformed view of drugs, by professionals from enforcement agencies to clinicians and researchers. Many of the myths about drugs are not born in the minds of journalists; cannabis drives you mad (1950s), students on LSD looked into the sun and went blind (1960s), crack will destroy UK society (1980s). There is no doubt that the appearance of NPS do present challenges – in particular concerning supply and control – and there is much we do not know. But already there are mythologies and misunderstandings in circulation about NPS. Nowadays, every media story, irrespective of the subject, has to feature ‘an expert’. If you add in the 24 hour news cycle and the huge array of media outlets for news – including social media – then we are all potentially in the front line whatever our expertise. The media can be very helpful in getting across key messages, but as Director of Communications for DrugScope, which puts communications at the front and centre of our work, I have squashed many media stories that would be ultimately unhelpful in the cause of responsible communications.

## Dazed and Confused: a brief overview of novel psychoactive substances as new challenge for healthcare professional

P. Simonato

*School of Life and Medical Sciences, University of Hertfordshire, Hatfield, United Kingdom*

**Background:** novel Psychoactive Substances (NPS) are a new emergence in drug abuse even if they are not a completely unknown phenomenon. NPS are often mischievously advertised as legal alternatives to illicit drugs because created and distributed to exploit loopholes in legislation. NPS as chemical analogues and/or mimetics of well-known compounds are a brand new galaxy, which includes novel phenethylamines, tryptamines, piperazines, synthetic cathinones and cannabinoids, plant - derived and medical products and others.

**Methods:** in order to explore knowledge and awareness amongst healthcare professionals we carried out an online survey among Italian health professionals and evaluated some of the information services provided by ReDNet, an EU-funded prevention project based at the University of Hertfordshire.

**Results:** the emergence of NPS seems to be quite unfamiliar for professionals (26.7% declared not to know if their patients ever used NPS) even if it's not a rare event in everyday practice, with concerns for psychomotor agitation (75.7%), clinical assessment (75.6%), treatment (74.5%). Interviewees asked reliable and up-to-date resources, choosing for example prevention projects like ReDNet in order to inform themselves and its SMAIL service.

**Conclusions:** in order to expand awareness on novel compounds could be useful write an "hitchhiker's guide" to the NPS galaxy, including their effects and both medical and psychopathological risks.

## The 'drug policy ratchet': why do sanctions for NPS typically only go up?

A. Stevens<sup>1</sup>, F. Measham<sup>2</sup>

*<sup>1</sup>University of Kent, United Kingdom; <sup>2</sup>Durham University, United Kingdom*

In the UK, it has been much more common for drugs to be subjected to tighter rather than looser control as drugs and evidence about their effects has emerged. In this article (forthcoming in *Addiction*), we argue that there is in place a drug policy ratchet which subjects new psychoactive substances to increasing control through the continuation of historical patterns that involve the attribution to emerging drugs of guilt by three different kinds of association: guilt by deviant association; guilt by lunatic association; and guilt by molecular association. We use our contemporary ethnographic experience of drug policy-making to show how these processes continue to be applied to policy on NPS, alongside selective, narrative use of evidence and the 'silent silencing' by absorption of the concept of evidence-based policy. We show that the drug policy ratchet cannot be justified as an example of the precautionary principle in action, as this principle is itself not rationally justified. We conclude that recognition of the drug policy ratchet and its mechanisms may help researchers and policy-makers to improve regulation of NPS. We will also reflect on commentaries on this analysis that are also being prepared for publication in *Addiction*.

## Changes in electroencephalogram power spectra and locomotor behavior in rat exposed to synthetic cannabinoids

N. Uchiyama<sup>1</sup>, R. Kikura-Hanajiri<sup>1</sup>, K. Aritake<sup>2</sup>, T. Hakamatsuka<sup>1</sup>, Y. Urade<sup>2,3</sup>

<sup>1</sup>National Institute of Health Sciences (NIHS), Tokyo, Japan; <sup>2</sup>University of Tsukuba, International Institute for Integrative Sleep Medicine (IIS), Ibaraki, Japan; <sup>3</sup>Osaka Bioscience Institute, Osaka, Japan

**Introduction:** although synthetic cannabinoids (SCs) have become major classes of abused drugs worldwide, little information is available for their pharmacology. Many psychotropic substances affect electroencephalograms (EEG) in animals and humans. We previously reported that two SCs, cannabicyclohexanol and JWH-018, changed the EEG power spectra and suppressed the locomotor activity (LOC) in rats, more significantly for a long duration than  $\Delta^9$ -tetrahydrocannabinol [Forensic Sci. Int. (2012) 215, 179-183]. In this study, we examined the effects of three SCs, QUPIC (PB-22), 5F-QUPIC (5-Fluoro-PB-22) and NNEI indazole analog (MN-18), on the EEG spectra and the LOC and compared with those of JWH-018.

**Methods:** EEG of rat (Sprague-Dawley male, 10 weeks-old) was recorded for two days. On the first day: vehicle-treatment, the second day: drug-treatment (5 mg/kg i.p. at dark period). Cortical EEG signal was amplified, filtered (0.5-35 Hz) and recorded by using the analysis software "SleepSign". EEG spectrum was analyzed post fast Fourier transformation and LOC was measured by monitoring with an infrared device.

**Results:** QUPIC, 5F-QUPIC and NNEI indazole analog significantly decreased the total amounts of LOC to 32%, 36% and 71%, respectively, during 6-hour period after injection. QUPIC and 5F-QUPIC suppressed LOC stronger than JWH-018 (58%). These three SCs increased the EEG power for the first 6-hours in the frequency range of 5.0-6.0 Hz and 10.0-11.0 Hz, respectively. Their EEG spectra were similar patterns to that of JWH-018.

**Conclusions:** these three SCs significantly suppressed LOC and changed EEG power spectra in rats similar to JWH-018.

## Preliminary results on recreational NPS misuse in a young general population sample

A. Vento<sup>1</sup>, G. Martinotti<sup>2</sup>, E. Cinosi<sup>2</sup>, M. Lupi<sup>2</sup>, R. Santacroce<sup>2</sup>, O. Corazza<sup>2</sup>, M. di Giannantonio<sup>2</sup>

<sup>1</sup>Università degli studi "Guglielmo Marconi", Rome, Italy; <sup>2</sup>Neuroscience and Imaging Department, Chair of Psychiatry, "G. d' Annunzio" University, Chieti, Italy; <sup>3</sup>University of Hertfordshire, Hatfield, United Kingdom

**Introduction:** the limited information available suggests that NPS spread at the global level is far from negligible, and - once cannabis is excluded from the analysis - the spread at the global level of NPS comes close to, or even exceeds, the spread of several controlled drugs.

**Methods:** a questionnaire on recreational substances misuse have been filled by a young general population sample (mean age 25.4 years) at the entrance of some nightclubs in Rome.

**Results:** preliminary results on 273 subjects reveal that 56% have consumed illicit drugs in the last year while 39% at the time of the test claimed to have intaked Alcohol in conjunction with many other illegal psychoactive substances [mostly Cocaine and Derivatives (e.g. Crack), Amphetamine and Derivatives (e.g. Metamphetamine, MDMA), Cannabis]. Surprisingly, 78% of respondents have declared a lifetime abuse of NPS such as Synthetic Cannabinoid, GHB, Mephedrone, Ketamine, Salvia Divinorum, Popper, Medicinal Products and Psilocybin.

**Conclusions:** NPS have been reported in a number of countries in recent years. What is actually known today, however, may be just the very tip of the iceberg, as systematic studies on the spread of NPS do not exist. NPS misuse constitute a serious public health challenge since pharmacological, toxicological and psychopathological effects due to interactions between all these substances may be unpredictable and may be fatal in vulnerable individuals. It is here highlighted that more large-scale studies need to be carried out to confirm and better describe both the extent of NPS misuse and possible psychotropic/adverse effects.

## Novel Psychoactive Substances as adulterants of controlled drugs

**M. Ventura**

*Energy Control, Barcelona, Spain*

**Introduction:** the use of new psychoactive substances (NPS) as adulterants of controlled drugs has received little attention in the literature. In this presentation, results from Energy Control's drug checking service documenting the use of NPS as adulterants of controlled drugs will be presented, and some reflections about possible explanations for this new phenomenon, potential risks for users, and challenges that it poses will be discussed.

**Methods:** all samples were brought by drug users to Energy Control's central facility or were given by them to Energy Control's staff at recreational settings where the project provides outreach activities. Samples were analysed with a validated method of Gas Chromatography-Mass Spectrometry (GC/MS) in IMIM-Hospital del Mar.

**Results:** from 2009 to 2012, a number of NPS belonging to several chemical classes such as piperazines, phenethylamines, substituted cathinones, tryptamines, and methoxetamine were identified in samples believed to be MDMA, amphetamine, ketamine, cocaine, mescaline, or methamphetamine. NPS frequently observed as adulterants were mCPP, 2C-B or 4-FA. Different combinations of substances were detected, involving a controlled drug combined with an NPS, and one or more NPS that substituted the controlled drug.

**Conclusions:** as these combinations could pose substantial risks to users, the need to improve knowledge about toxicity associated with these combinations, and the danger of these substances being incorporated into the products of illegal markets, are highlighted. Drug checking services and the European Union's early-warning system operated by the European Monitoring Centre for Drugs and Drug Addiction (EMCDDA) and Europol can play an important role in reducing the harm associated with this phenomenon.

## Using media to monitor the global spread of Novel Psychoactive Substances

**M. Young**

*Canadian Centre on Substance Abuse (CCSA), Ottawa, Canada*

The rapid emergence of Novel Psychoactive Substances (NPS), the variety of brand names on the market, and the variety of chemicals frequently found in any one product means monitoring the use of and harms associated with NPS using conventional strategies poses a number of considerable challenges.

We present the results of our work assessing the utility and validity of using media reports and other open source information to monitor the global spread of NPS. To conduct this work we have partnered with the Global Public Health Intelligence Network (GPHIN). Operated by the Public Health Agency of Canada, GPHIN monitors news sources and websites across the globe 24 hours a day, 7 days a week in 9 languages in order to provide alerts about international events of public health significance to both domestic and international partners. Part of its mandate is to gather information on unsafe products. As such, information on novel psychoactive substances is also collected by the GPHIN.

To determine whether information captured by the GPHIN could be used to monitor NPS, the number and location of media reports on NPS were plotted over time. Results were then compared to other available indicators of NPS use (e.g., U.S. poison control center exposures, volume of discussion on harm reductions discussion forums, and surveys). Results indicate our media monitoring approach is capable of generating useful data on NPS trends and that this information could be a low cost, valuable addition to the various indicators already used to monitor NPS.

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## Poster Sessions

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## WEDINOS: Developing direct access to new psychoactive substance testing and information from street to services

D. Acreman, M. Gagol, A. Hutchings, A. Westwell, M. Lyons, J. Smith

<sup>1</sup>Health Protection, Public Health Wales, Temple of Peace & Health, Cardiff, United Kingdom; <sup>2</sup>Cardiff Toxicology Laboratories, University Hospital Llandough, Cardiff, United Kingdom; <sup>3</sup>Cardiff School of Pharmacy and Pharmaceutical Studies, Cardiff University, Cardiff, United Kingdom

**Background:** acute adverse effects (physical, psychological and behavioural) have been reported by users of New Psychoactive Substances (NPS). Established early warning systems identified new substances and collated information relating to harms, however, this information remained academic, primarily influencing controls. WEDINOS (Welsh Emerging Drugs and Identification of Novel Substances) provides direct access to testing and dissemination of information to reduce harms.

**Methods:** WEDINOS comprises three elements: collection of samples with anonymous 'adverse effects records' (via NPS users, health / support services and criminal justice (where samples have no evidentiary value)); testing of samples using accurate mass TOF-MS and NMR; and dissemination of information including the chemical and toxicological profile, reported adverse effects, and pragmatic harm reduction information via public access website: [www.wedinos.org](http://www.wedinos.org).

**Results:** despite initial concerns regarding the concept and pragmatic public health approach, implementation in October 2013 included proactive engagement with 325 key individuals, representing 166 services including NPS users and clinicians. WEDINOS packs were made available from 70 sites and via the website. To date, 171 samples have been submitted, 70% complete with 'effects record'. 94 unique substances were identified, either in isolation or combination.

**Conclusions:** implementation of a direct access testing and information framework facilitates engagement with, and by, those at most risk of adverse effects – users of NPS. In addition, WEDINOS provides evidence-based information to those using or considering use, along with health, social and other related service practitioners on local and national trends in NPS, reported harms and pragmatic harm reduction advice.

## Analysis of a Bristol amnesty bin as an indicator of current drugs trends

MR. Alotaibi, SM. Husbands, IS. Blagbrough

*Department of Pharmacy and Pharmacology, University of Bath, Bath, United Kingdom*

**Introduction:** in the UK, drugs users represent 8.9% of the population,<sup>1</sup> and the widespread use of drugs costs society £15.4 bn annually.<sup>2</sup> Amnesty bin analysis can provide potential information about current drugs trends and possibly about drug availability.

**Methods:** powders and crystalline samples (169) were identified from an amnesty bin provided in a Bristol (UK) nightclub, and made available by the Police in 2013. Each sample was weighed, labelled, and analysed without any initial purification. For analysis the samples (20-50 mg) were dissolved in deuteriated solvent (0.6 mL) for Nuclear Magnetic Resonance (NMR) spectroscopy, as well as electrospray ionisation mass spectrometry (ESI-MS), and Fourier transform infrared (FT-IR) spectroscopy. All measurements were made at 20-25°C using: a Bruker 400 MHz NMR Spectrometer, a Perkin Elmer-Spectrum 65-FT-IR Spectrometer, and a Bruker Daltonics "microTOF".

**Results:** a crystalline form of ecstasy (MDMA) was clearly the dominant drug 69% (117 samples) alongside 2% (4) MDMA freebase. The second most common was ketamine (freebase) 11% (19) followed by: mephedrone (salt) 8% (13); benzocaine 7% (11); flephedrone (salt) 2% (4) and one sample of benzofury provided for "chemical research".

With mephedrone, 9 out of 13 samples were cut using monosodium glutamate (MSG). **Conclusions:** the purpose of this study is to provide information on current available drugs and these data from a Bristol amnesty bin allow such an analysis.

**Acknowledgments:** we thank the Government of Saudi Arabia for a fully-funded Scholarship (to MA) and the Avon and Somerset Constabulary for the collection and provision of the amnesty bin.

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Poster Sessions

## Chemical characterisation of seized flephedrone by <sup>1</sup>H, <sup>13</sup>C and <sup>19</sup>F NMR spectroscopy

MR. Alotaibi, SM. Husbands, IS. Blagbrough

Department of Pharmacy and Pharmacology, University of Bath, Bath, United Kingdom

**Introduction:** the identification of fluorine-containing drugs and their metabolites can be successfully achieved using NMR spectroscopic analysis. A complete pharmaceutical analysis of flephedrone (4-fluoromethcathinone) included Fourier transform infrared (FT-IR) spectroscopy and electrospray ionisation mass spectrometry (ESI-MS).

**Methods:** four flephedrone samples were identified in an amnesty bin from a nightclub in Bristol (UK) in 2013. The samples were analysed without any initial purification, at 20-25°C, using: a Bruker 500 MHz NMR Spectrometer, a Perkin Elmer-Spectrum 65-FT-IR Spectrometer, and a Bruker Daltonics "microTOF".

**Results:** a spectroscopic data set (FT-IR, NMR, MS) was acquired for the hydrochloride salt samples. The structures were confirmed by comparing the data with the literature values,<sup>1</sup> establishing that the regioisomer is *para*-disubstituted. <sup>1</sup>H NMR (D<sub>2</sub>O) δ 8.07 (2H, m, ArH), 7.31 (2H, m, ArH), 5.09 (1H, q, *J* 7 Hz, α-CH), 2.81 (3H, s, N-CH<sub>3</sub>), 1.60 (3H, d, *J* 7 Hz, α-CH<sub>3</sub>); <sup>13</sup>C NMR (D<sub>2</sub>O) δ 196 (C=O), 166.7 (C-F, d, *J* 254 Hz), 132.0 (CH<sub>arom</sub>, d, *J* 10 Hz), 129 (Cq), 116.4 (CH<sub>arom</sub>, d, *J* 22 Hz), 61 (CH), 31 (N-CH<sub>3</sub>), 15 (α-CH<sub>3</sub>) ppm; <sup>19</sup>F NMR -102.1 (tt, *J* 9.8, 5.1 Hz);<sup>1</sup> [M+H]<sup>+</sup> C<sub>10</sub>H<sub>12</sub>FNO requires 182.0981, found 182.0988.

**Conclusions:** the use of spectroscopic combinations including <sup>19</sup>F NMR provides a rapid method to detect flephedrone, indeed, <sup>19</sup>F NMR spectroscopy plays a significant role in the unambiguous detection of flephedrone. Acknowledgments: We thank the Government of Saudi Arabia for a fully-funded Scholarship (to MA) and the Avon and Somerset Constabulary for the collection and provision of the amnesty bin.

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Poster Sessions

## Use of novel psychoactive substances (NPS): a description of a harm reduction center in Barcelona

E. Aranda, E. Sala, M. Navarro, M. Vía, A. Lago, J. Rovira, L. Leal

CAS Baluard, Agència de Salut Pública de Barcelona (ASPB) Service, Managed by Associació Benestar i Desenvolupament (ABD), Barcelona, Spain

**Introduction:** CAS Baluard, a harm reduction center in Barcelona, has a yearly average of 2000 cocaine and heroin regular users in its injected and inhaled supervised rooms. Since early 2013 unexpected effects have been described. Considering alerts of NPS in Europe we decided to investigate their presence in our center.

**Methods:** during 2013, according to protocol, we analyzed drug samples looking for NPS in our supervised rooms, elaborated a questionnaire with demographics and description of drug use, and started interviewing our patients in July 2013. Substance analysis was performed using thin layer chromatography and gas chromatography-mass spectrometry. Statistical analysis performed with SPSS 18.

**Results:** we analyzed 47 samples of 26 patients, 10(21%) resulted NPS: 8=4-Methylethcathinone (4-MEC), 1=4-Methylamphetamine and 1=JWH-018. We interviewed 62 patients all polydrug users, mostly male (86%), Spanish (34%), average age was 38.5. 28(46%) had consumed NPS (all 4-MEC and/or ketamine) at least once, mostly com-

bined with heroin (n=24, 86%), 15(54%) used them daily and 14(50%) injected them. In regard country region we found that 4-MEC use was reported equally (n=7, 39%) between eastern and western Europeans and ketamine mostly by western Europeans (n=12, 80%).

**Conclusions:** this is the first study describing injected NPS in Spain. Almost all of our patients referred that they started using this substances in 2013 which confirms new trends described in Europe; acquisitions were in local establishments not by internet as usually reported. Since there is no substantial information about injected NPS we should keep studying this possible trend in IDUs.

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## Poster Sessions

# The Internet Tools for Research in Europe on New Drugs (ITREND) Project

**E. Begley**

*Liverpool John Moores University, Liverpool, United Kingdom*

**Background:** the growth in online retailing and the development of synthetic psychoactive substances has had a major impact on the patterns of drug use and associated behaviours of those engaged in the use of Novel Psychoactive Substances (NPS). The ban of Mephedrone in 2010 introduced a new era of “legal highs” and methods used to purchase these substances. With the internet becoming an increasingly popular source of information about drugs and a route for purchasing them, it has also emerged as a powerful point of observation of the clandestine NPS markets.

**About the project:** through monitoring and observation of NPS activity, ITREND aims to consolidate sources of evidence that will identify trends and establish up-to-date information regarding emerging new drugs. Supported by the EU commission, ITREND consists of four work streams; analysing online drug forums, monitoring online marketing strategies, a web-based survey of NPS use and toxicological substance analysis. The project aims to triangulate such data to provide practitioners and policy makers with comprehensive information on a ‘Top 10’ list of NPS.

**In depth forum analysis:** the poster will highlight methods and results of a detailed analysis on UK drugs forums. Qualitative and quantitative analysis will provide an insight into user attitudes and perspectives on a range of issues including specific drug prevalence, patterns of use and common effects. The key findings will be examined in the context of their public health implications within the UK. Furthermore this evidence will contribute to a wider understanding of NPS across Europe.

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## Poster Sessions

# The use of NPS in Switzerland

**A. Bücheli**

*Recreational Drug Prevention, Zurich, Switzerland*

Safer Nightlife Switzerland is a national competence network under the umbrella of the national addiction coordination service Infodrog. One of the main aims is to empower professionals in charge of drug users by providing trustful information. New Psychoactive Substance (NPS) is one of the issues which creates the most uncertainty at the time. Since several years NPS emerges in all countries over the world, also in Switzerland. The Swiss Government has developed as a first response a new substance control process. The goal of this adapted law is to accelerate the response time between the first detection and the decision of banning a substance from the national market. Since 2011 over 100 different concrete-chemical-structures and analog-chemical-groups are banned from the Swiss market. But are NPS really an issue for recreational drug users?

This contribution will focus on the reality of NPS use among recreational drug user in Switzerland. For the first time Safer Nightlife Switzerland will merge and analyzing subsidiary results of the following national studies. Global Drug Survey 2014, a specific online survey among NPS users and the findings of an ongoing questionnaire research among

party drug users reached by prevention offers and Drug Checking services. Beside the results of this subsidiary analyze this contribution will also include possible prevention and harm reduction strategies related to the use of NPS.

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## Poster Sessions

# 'Special M' related fatalities in the UK

S. Chiappini, H. Claridge, J. Corkery, C. Goodair, B. Loi, F. Schifano

<sup>1</sup>St George's University of London, London, United Kingdom; <sup>2</sup>School of Life and Medical Sciences, University of Hertfordshire, Hatfield, United Kingdom; <sup>3</sup>Catholic University of the Sacred Heart, Rome, Italy

**Introduction:** methoxetamine (MXE; 'special M') is a novel psychoactive substance that first appeared in 2010 as a legal alternative to ketamine and, despite now being a Class B drug, is still widely marketed via the internet as a research chemical.

MXE acts similarly to a non-competitive antagonist at the N-methyl-D-aspartate receptor and as well as a dopamine reuptake inhibitor. It presents with behavioural effects of dissociative anaesthetics, including euphoria; empathy; dissociation from the physical body; and hallucinations. Adverse side effects include: cognitive impairment; cardiovascular symptoms; and cerebellar signs.

This poster provides an overview of MXE-related fatalities reported in the UK in 2011-2013.

**Methods:** deaths involving MXE data were extracted from the database of the National Programme on Substance Abuse Deaths (NPSAD), which receives information on drug-related deaths from Coroners in the UK and Islands (Isle of Man, Jersey, Guernsey), and maintains a database of about 30,000 cases, with Coroners and relevant regional authorities voluntarily submitting information on drug-related deaths since 1997.

**Results:** between 2011-2013, MXE was reported as involved in the deaths of eight individuals: seven males and one female, with a median age of 27 years. MXE was used together with other substances in 7/8 cases. MXE was found at post-mortem in all cases, and implicated in the deaths of seven.

**Conclusions:** further research needs to be carried out on MXE health effects and toxicity potential. Health care professionals should be made aware of the MXE health effects, in order to develop early intervention measures and minimize the number of MXE-related poisonings and fatalities.

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## Poster Sessions

# Use of novel psychoactive substances by patients of an Australian acute inpatient public mental health unit

R. Clancy

Hunter New England Local Health District, Australia

**Introduction:** this paper explores the prevalence of self reported use of novel psychoactive substances by people admitted to an Australian acute inpatient public mental health unit which provides specialist services to people with comorbid substance use issues.

**Methods:** this cross sectional design utilises health service data drawn from a screening instrument designed to gather detailed self-report information on novel psychoactive substance use. Data was matched to demographic and discharge diagnosis information for 101 admissions to the unit. ANOVA and Chi-square analyses were conducted to ascertain relationships between recency of use of novel substances and discharge diagnoses, length of stay and treatment history. Reasons for use, experience of intoxication and mode of use are reported.

**Results:** fifty six percent of admissions reported using synthetic substances in the past including 34% who had used synthetic cannabinoids only, 3% who reported using other novel psychoactive substances only and 19% who reported using both. Twenty seven per cent of admissions had used synthetic cannabis in the month prior to admission in-

cluding 19% who had used in the week prior to admission. Univariate analyses found no significant associations between multiple demographic and treatment factors and recency of use. Every individual reporting the use of novel psychoactive substances reported their point of purchase as a shopfront (eg. tobacconist) none reported making purchases on the internet.

**Conclusions:** people with mental health disorders perceive novel psychoactive substances as a safer alternative to traditional substances of abuse. The prevalence of use in this population exceeds clinicians expectations. Their purchasing methods differ from community samples. The data from this sample will serve as a useful baseline to gauge changes in patterns of use in this vulnerable population.

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## Poster Sessions

# Effects of Methoxetamine in rat bladder and nucleus accumbens brain tissue

C. Davidson, G. Hashemi, A. Gant, S. Fergus, C. Benham, L. Lione

<sup>1</sup>St George's University of London, London, United Kingdom; <sup>2</sup>University of Hertfordshire, Hatfield, United Kingdom;

<sup>3</sup>University of Kingston, London, United Kingdom

**Introduction:** there have been increasing reports of severe bladder toxicity, characterized by ulcerative cystitis, relating to the chronic use of ketamine. Methoxetamine, an N-ethyl derivative of ketamine, is being marketed as a "bladder safe" alternative to ketamine, however pharmacological studies have not been conducted to confirm whether or not this is the case. It has been suggested that methoxetamine is both an NMDA receptor blocker and a dopamine reuptake inhibitor. We thus tested the effects of methoxetamine in the rat nucleus accumbens to determine if it increased dopamine levels, giving us some idea of its abuse potential.

**Methods. Bladder Methods:** longitudinally oriented rat urinary bladder strips from male Wistar rats (Charles River, UK, 300-500g) were suspended in organ baths containing oxygenated Krebs solution at 37°C. Tension changes were recorded using an isometric transducer. We tested methoxetamine in concentration range 10<sup>-6</sup> to 3x10<sup>-4</sup>M. **Nucleus accumbens dopamine measures:** Male Wistar rat (8 weeks) were killed by cervical dislocation and 400 µm accumbens brain slices taken. Slices were superfused with oxygenated aCSF at 32.5°C. Dopamine was electrically evoked (10 pulses at 100 Hz) and measured using fast cyclic voltammetry.

**Results:** methoxetamine showed a concentration dependent effect on evoked dopamine efflux, increasing peak dopamine efflux and slowing dopamine reuptake at 30 and 100 µM. 3 and 10 µM had little effect on either parameter. Bladder analysis is ongoing and results will be presented.

**Conclusions:** methoxetamine, at high concentrations, is a dopamine transporter blocker and this property might be involved in its addictive liability.

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## Poster Sessions

# Neuroprotective effects of some new drugs of abuse in an in vitro model of stroke

C. Davidson, R. Jozi

St George's University of London, London, United Kingdom

**Background:** recently, some drugs of abuse have been tested in CNS disorders, for example, amphetamine has been tested in stroke patients, ketamine has been tested for depression and MDMA (Ecstasy) has been tested in PTSD. Ketamine, a dissociative anaesthetic and popular drug of abuse, is primarily an NMDA receptor antagonist and drugs with this property have long been tested in models of neurotoxicity. With this in mind we tested ketamine and 2 other abused drugs, phencyclidine (PCP) and methoxetamine, which are also NMDA receptor antagonists, in an in vitro model of stroke.

**Methods:** 8-week old male Wistar rats were killed by cervical dislocation and 400  $\mu\text{m}$  section of caudate were taken. Caudate slices were superfused with artificial cerebrospinal fluid (aCSF; 32.5°C, 100 mL/h) bubbled with 95%O<sub>2</sub>/5%CO<sub>2</sub> for 30 min then exposed to oxygen and glucose deprivation (OGD) for 15 min. OGD solution had lower (2 Vs 10 mM) glucose and was bubbled with 95%N<sub>2</sub>/5% CO<sub>2</sub>.

**Results:** after about 500s of OGD, we observed an increase in dopamine efflux, caused by anoxic depolarisation. Pre-treatment with ketamine, PCP or methoxetamine (all 10  $\mu\text{M}$ ) increased the time to onset of OGD-evoked dopamine efflux by about 50%.

**Conclusion:** these data suggest that ketamine, PCP and methoxetamine have neuroprotective effects in this in vitro model of stroke. Further research is justified into potential clinical uses of these and similar drugs.

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## Poster Sessions

# Is Venlafaxine a potential substance of abuse?

G. Francesconi<sup>1</sup>, D. Papanti<sup>3</sup>, L. Orsolini<sup>1</sup>, F. Schifano<sup>2</sup>

<sup>1</sup>Academic Department of Experimental and Clinical Medicine, Polytechnic University of Marche, Ancona, Italy;

<sup>2</sup>School of Life and Medical Sciences, University of Hertfordshire, Hatfield, United Kingdom; <sup>3</sup>Medical School, University of Trieste, Trieste, Italy

Venlafaxine (VEN) is the first SNRI marketed in the United States. It has now become generally the most frequently prescribed individual antidepressant by most mental health professionals and primary care physicians in many countries. There has been some debate about its limitations, especially the high dosages' toxicity and the suicide risk. For this reason in the UK the Medicines and Healthcare products Regulatory Agency issued a warning about the relatively high toxicity of VEN in 2006, recognising that patients with more severe illness and higher susceptibility to suicide are commonly prescribed VEN resulting in apparent greater toxicity. It seems to be more toxic than SSRIs in overdose especially when present in combination with other serotonergic drugs. Furthermore, the misuse of medicinal products containing VEN has been reported in the literature. Recently, the European Monitoring Centre for Drugs and Drug Addiction notified the VEN as a potential substance of abuse. There are many aspects of the SNRIs' pharmacodynamic suggesting these as potential substances of abuse. The aims of this study are: to investigate the VEN potential of abuse in people addicted or not through a literature review and the deaths related to VEN abuse/misuse; to look for this drug on the websites and blogs, including the black market of online pharmacy websites that do not require a prescription. From a first search, the data seem to be in line with those of the literature. It is also pretty easy to find this drug on the web, also without a prescription.

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## Poster Sessions

# Naucleadol: The Tramadol Tree

G. Francesconi<sup>1</sup>, D. Papanti<sup>3</sup>, L. Orsolini<sup>1</sup>, F. Schifano<sup>2</sup>

<sup>1</sup>Academic Department of Experimental and Clinical Medicine, Polytechnic University of Marche, Ancona, Italy;

<sup>2</sup>School of Life and Medical Sciences, University of Hertfordshire, Hatfield, United Kingdom; <sup>3</sup>Medical School, University of Trieste, Trieste, Italy.

*Nauclea latifolia* Smith (Rubiaceae), commonly known as "African peach" and "Pincushion tree", is a flowering sub-Saharan evergreen that grows widely across Central and West Africa and has a long tradition of use by local populations to treat a wide variety of ailments including epilepsy, malaria, general pain and many infectious diseases. Recently it was found that the decoction of root bark of *Nauclea* contains clinically viable concentrations of the opioid analgesic tramadol. After testing the resulting fractions, obtained by a very simple procedure, in a biological assay using live mice, the research team were able to determine the structure of the active compound in the fractions with the highest analgesic potency and confirm it to be identical with tramadol. Although there are other previous examples of synthetic drugs that have later been found in nature, this is the first instance where the discovery has involved clinically relevant concentrations! Furthermore, all plant parts of the *Nauclea* species are a rich source

of monoterpene indol alkaloids and previous studies had been concluded that psychoactive substances are present in the aqueous extract. This study aims to investigate the main web sites and blogs to monitor the black market and the eventual recreational use of Nauclea, as already documented for Tramadol, a substance well known to psychonauts for its chemical properties.

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## Poster Sessions

# Novel psychoactive substances (NPS) use in pregnancy: a case report

**N. Girona, E. Aranda, M. Navarro, E. Sala, J. Rovira, L. Leal**

*CAS Baluard, Agència de Salut Pública de Barcelona (ASPB) Service, Managed by Associació Benestar i Desenvolupament (ABD), Barcelona, Spain*

Recently reports in Europe of NPS involve the challenge of pregnant women care. In CAS Baluard, a harm reduction center in Barcelona, we identified 4-Methylethcathinone (4-MEC) intravenous use in a pregnant patient. There is limited information on this topic, reason to present this case.

A woman, 23 years old, born in Romania, male partner, mother of 2, infected by Hepatitis C Virus, on social exclusion. Started inhaled heroin use in 2007 and switched to intravenous in 2010, irregular methadone treatments. When arrived in Barcelona referred 8 months total abstinence. In October 2013 we suspected couple's NPS intravenous use and confirmed 4-MEC by thin layer chromatography and gas chromatography-mass spectrometry. From that moment replaced heroin because paradoxical effects. Noteworthy most of consumptions were outside supervised rooms and as a couple. We analyzed another 4 samples and also found 4-MEC. She denied any abstinence symptoms but referred tolerance. A month later she was diagnosed with a 24.3 weeks pregnancy, abortion was not possible and started hospital follow-up.

Continued 4-MEC consumption, now supervised, but refused most of individualized interdisciplinary intervention due to codependency with partner. After 8 weeks of started 4-MEC use, she referred diaphoresis, asthenia, myalgia and irritability when 5 days abstinent. In December 2013 enters prison, stay in 4 weeks and in abstinence. Once released we suspected relapse but still haven't confirm by sampling. On February 2014 patient remains in a good general condition and fetus shows no malformations or any health problems. Birth prevision is on March 2014.

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## Poster Sessions

# Responding to the Challenge of New Psychoactives – Future proofing Drug Policy

**G. Hall**

*The STAR Trust, New Zealand*

The global war on drugs has failed. Governments around the world have adopted policies that are ineffective, expensive and that have only contributed to the challenges of drug control.

This is happening against a changing drug landscape. New substances have come onto the market new suppliers and manufacturers have been created, and millions of recreational users have chosen to try new psychoactive drugs.

However, this changing landscape has not resulted in changing laws. Domestic legislation and international drug policy has failed to keep pace with the modern and ever changing reality of drugs and drug control.

Domestic governments have struggled to answer the central question of drug policy, that being: "what is drug policy for?". The answer to this question is simple. Drug policy should be designed solely to minimise harm, protect the health and safety of drug users and their communities, and to uphold every person's human right to liberty and autonomy over their bodies and lives.

This requires policy that reflects the changing nature of drug use and is responsive to the changing nature of psychoactive substances. In particular, modern drug policy needs to respond to the development and regulation of new psychoactive substances that exist beyond the outdated schedules of the United Nations Convention on Narcotic Drugs. This presentation is intended as a steering document for policy makers, progressive law reformers, government officials and politicians with an interest in effective drug policy. This document canvasses the history of psychoactive use; what the Star Trust's vision of good drug policy looks like; how the present system is not working; and it then provides evidence supporting a new approach to the regulation of novel psychoactive substances, with special reference to New Zealand's new and world leading Psychoactive Substances Bill.

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## Poster Sessions

# Online market with new psychoactive substances in the Czech Republic - current situation and new techniques of monitoring

D. Kmetonyová, T. Zábranský, V. Mravčík, V. Běláčková, K. Grohmannová

*Department of Addictology, First Faculty of Medicine, Charles University, Prague, Czech Republic*

**Introduction:** new psychoactive substances (NPS) have been retailed on the world wide web in the last decade. The EMCDDA has been monitoring their online availability through multilingual "snapshots" since 2006. The aim of the paper is to assess the current situation of the online market with NPS in the Czech republic with a novel monitoring tool developed by the authors.

**Methods:** a new ("scraping") software tool has been developed, enabling automatic data collection from various internet sources. The advantages of the method are such that the input of human resources is minimized, and the frequency of data collection, in contrast to the existing monitoring tools, can be increased from a 6-months to a daily basis.

**Results:** a list of 29 webshops was identified in Jan 2014 through the scraping tool (in contrast to 19 webshops identified in the snapshot monitoring from March 2013). From this list, 6 were chosen based upon their ranking, durability on the market, and their marketing strategy (so-called "RC-shops" vs. "Commercial shops"). The selected shops were "scraped" for their products, pricing strategies, and purchasing forms (bath salts, fertilizers etc.). Several items had to be coded manually (labelling and marketing strategies for substitute/complementary products etc.). The paper will present outcomes of the monitoring, and compare it to the up-to date snapshots.

**Conclusions:** the scraping tool for monitoring availability of NPS in the online space seems to be an effective data-collection tool. The tool will be made freely available to research institutions and drug monitoring institutions.

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## Poster Sessions

# Does the home-made psycho stimulant drug Ephedrone (Methcathinone) induce nigrostriatal pathology similar to that seen in Parkinson's Disease?

W. Kwok

*Kings College of London, London, United Kingdom*

**Background:** recently there has been a rise in the synthesis of a home-made psycho stimulant Ephedrone (Methcathinone), using the legal drug Sudafed. Drug addicts taking ephedrone, which contains Manganese (Mn) as a toxic



by-product, have presented with Parkinsonism in Estonia and Russia. The syndrome has comparative motor symptoms as patients with Parkinson's disease, therefore the underlying pathology in the nigrostriatal pathway may be similar.

**Objectives:** to investigate the effects of Sudafed, Ephedrone and Manganese on the nigrostriatal pathway, by measuring changes in dopaminergic (DA) neurones, the dopamine active transporter (DAT) and Vesicular monoamine transporter 2 (VMAT2).

**Methods:** mice injected with the toxins were dissected and brain sections were taken at the level of the Substantia nigra (SN) and Striatum. Immunohistochemistry was used to stain for tyrosine hydroxylase, a marker for DA neurones in the SN. Healthy neurones were counted for each treatment group using a light microscope. Separate brain sections were used to stain for DAT and VMAT2 in the striatum. The density of each transporter was measured using Image J software.

**Results:** significant DA neurone loss was observed in the Sudafed, Ephedrone and Mn treated groups ( $p < 0.05$ ) compared to the control. No significant changes were seen in DAT or VMAT2 density between the treatment and control groups.

**Conclusion:** although the drug users have similar decreased DA neurone counts as patients with PD, no significant changes in DAT or VMAT2 suggests a intact nigrostriatal pathway. Therefore the pathological changes is not similar to PD. The mechanism ephedrone acts by to cause DA neuronal degeneration is unknown.

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Poster Sessions

## Real time detection of novel psychoactive substances with the help of a Selective Reagent Ionisation – Time of Flight – Mass Spectrometry (SRI-ToF-MS) instrument

M. Lanza, WJ. Acton, P. Sulzer, K. Breiev, S. Jürschik, A. Jordan, E. Hartungen, G. Hanel, L. Märk, CA. Mayhew, TD. Märk

<sup>1</sup>IONICON Analytik GmbH, Innsbruck, Austria; <sup>2</sup>Institut für Ionenphysik und Angewandte Physik, Leopold-Franzens Universität Innsbruck, Innsbruck, Austria; <sup>3</sup>Lancaster Environment Centre, Lancaster University, Lancaster, United Kingdom; <sup>4</sup>School of Physics and Astronomy, University of Birmingham, Birmingham, United Kingdom

**Introduction:** SRI-ToF-MS is a flexible, high sensitive (pptv within seconds), extremely fast and very selective analytical method able to detect trace gas compounds without any sample preparation [1-2]. Due to the soft chemical ionisation conditions in the drift tube significant fragmentation of the analytes is avoided, thus enabling novel psychoactive substances (NPS) identification with a high level of confidence. This is of a particular importance, for example, in case of intoxication, when a rapid identification of the composition of the NPS ingested is needed, since their composition could change between different vendors and even between different batches of the same vendor.

**Results and conclusions:** examples of the headspace detection of pure and blend substances, e.g. ethylphenidate, dimethocaine and synthacaine, using a SRI-ToF-MS instrument will be provided, together with an example of application to the unambiguous identification of the composition of a commercial blend using reduced electric field strength ( $E/N$ ) studies. The results obtained (in combination with our previous studies on chemical warfare agents and illicit and prescribed drugs[3-5]) demonstrate that SRI-ToF-MS is a versatile, sensitive and selective analytical detector for virtually all kinds of illicit and/or dangerous substances.

## Epidemiology of new psychoactive substances in a sample of Italian young adults: a cross-sectional study

M. Lupi<sup>1</sup>, G. Martinotti<sup>1</sup>, E. Cinosi<sup>1</sup>, R. Santacroce<sup>1</sup>, E. Chillemi<sup>2</sup>, L. Bonifaci<sup>2</sup>, L. Janiri<sup>2</sup>, M. Di Giannantonio<sup>1</sup>

<sup>1</sup>Department of Neuroscience and Imaging, University "G. d'Annunzio" Chieti, Italy; <sup>2</sup>Institute of Psychiatry, Catholic University Medical School, Rome, Italy

**Introduction:** new Psychoactive Substances (NPSs) are currently determining a sanitary issue of growing importance, especially in relation to the fast-moving and the potentially unlimited nature and of the market. Aim of our research project is to assess the knowledge of NPSs and the extent of their diffusion amongst Italian young people.

**Methods:** a questionnaire has been administered to a youth population (3014 subjects, 16-24 year old) randomly selected from a representative group, to evaluate their knowledge/use of a group of NPSs. Other items evaluate possible alcoholic abuse, use of other drugs, smoking habit, consumption of energy drinks/cafeinate beverages, time spent over the Internet per day.

**Results:** preliminary results based on 500 subjects evidence partial knowledge and use of NPSs. The use of Cannabis in form of "Spices", "Bath Salts" including mephedrone, Salvia divinorum and Crystal Meth was found in 1%, 2.8%, 0.8% and 0.4% respectively. Relevant is the consumption of alcoholic beverages, with an important prevalence of binge drinking habits (98% of alcohol drinkers, 48,4% of total sample).

**Conclusions:** the results evidence a partial, but presumably significant compared to the general population, knowledge of use of New Psychoactive Substances among selected Italian adolescents and young adults. Peculiar is the percentage of subjects with Binge Drinking habits (98%) among alcohol consumers (50,8% of total sample). We aim to widen the data with further questionnaire collection, in order to present more significant results.

## When is Ecstasy not Ecstasy?

K. MacLeod

National and Training Development Officer for the Scottish Drugs Forum (SDF), Glasgow, United Kingdom

Over the last few years, the Ecstasy market has seen many changes. Availability of MDMA was affected, possibly due to issues sourcing pre cursor chemicals, Piperazines such as BZP began to be sold as Ecstasy and more recently there has been both a resurgence of MDMA and drugs such as PMA and PMMA being sold as Ecstasy.

These changes to the Ecstasy market have had a significant knock on impact on people who choose to use Ecstasy: there are differences in potential harms, challenges in being able to make informed choices about Ecstasy and lack of knowledge of how to reduce the risk of using ecstasy if determined to use.

This abstract will discuss the 'Ecstasy' related deaths cluster in Scotland in 2013 where many of the deaths had the drug PMA implicated. It will look at the demographics/circumstances of people affected, the service response and the continued changes to practice in Scotland to adapt to this changing market. Finally the abstract will discuss the current trends with using patterns of Ecstasy and other psychostimulants, such as poly-drug use which is often connected with such incidents.

Abstract is submitted by Katy MacLeod National and Training Development Officer for the Scottish Drugs Forum (SDF). SDF are a membership based drugs policy and information organisation and a national resource of expertise on drug issues. SDF are currently funded by the Scottish Government to provide training and quality development support to services on NPS and psychostimulants.

## Designer drugs and their misuse: biological relevance, metabolic reactions, and detection in doping analysis

M. Mazzarino, C. Covelli, X. de la Torre, I. Fiacco, F. Botrè

<sup>1</sup>Laboratorio Antidoping Federazione Medico Sportiva Italiana, Rome Italy; <sup>2</sup>Dipartimento di Medicina Sperimentale, "Sapienza" Università di Roma, Rome, Italy

**Introduction:** besides amphetamine-type designer drugs, widely abused for decades, a significant number of new classes of psychoactive substances (i.e. cannabimimetics, b-keto amphetamines and 2,5-dimethoxy amphetamines) have recently been made available on the illicit drug market. The continual emergence and rapid diffusion of those compounds not only pose a serious health risk to consumers due to the scarce toxicological information available, but also present ongoing challenges to forensic laboratories, mainly due to the lack of both reference materials and pharmacokinetic data. The characterization of their metabolic profile and the parallel development of analytical procedures to detect their presence in biological samples are necessarily to activate the most appropriate policies to control their misuse. This applies to different fields of analytical toxicology, including anti-doping analysis.

**Methods:** *in vitro* metabolism studies – using human liver microsomes, CYP, UGT isoforms – were performed on selected compounds belonging to the classes of b-keto amphetamines, synthetic cannabinoids, 2,5-dimethoxy amphetamines. Analysis of metabolic profiles was carried out by LC-ESI-MS/MS methods, in positive ionization, and using different analyzers and acquisition modes.

**Results:** the results show that our approach allows the identification of both known and unknown metabolites. In details, the *in vitro* metabolism studies show that hydroxylation is the predominant and most common biotransformation pathway, being the other metabolic reactions strictly dependent on the specific chemical class.

**Conclusions:** the *in vitro* + LC-MS/MS approach allows to identify the most appropriate marker(s) for the detection, in biological fluids, of novel designer drugs, also drastically reducing the time necessary to identify previously unknown, newly synthesized variants.

## A legal high awareness raising and harm reduction campaign

C. McGregor-Paterson

The Oasis Partnership, High Wycombe, United Kingdom

**Introduction:** we would like to have a visual display which showcases our legal high awareness raising and harm reduction campaign. The display could be on a notice board with possibly a small table for additional information. The conference will be great and this is an opportunity to promote our approach to reducing harm.

We have 3 characters representing different legal high families, and small legal high looking packs with the characters on and harm reduction info inside. There are QR codes on the posters and packs which will take people to one of 3 - 30 second videos.

Other attendees may want to use our tools for their own awareness raising campaigns.

**Results:** participants have an awareness of an effective awareness raising campaign.

**Conclusions:** shared knowledge related to getting messages out to potential legal high users.

## Correlation between drugs abuse, cognitive impairment and onset of a psychotic disorder: a pilot study using SPECT and neuropsychological assessment

G. Miti<sup>1</sup>, A. Borriello<sup>1</sup>, R. Bandiera<sup>1</sup>, L. Mango<sup>2</sup>

<sup>1</sup>*Servizio Psichiatrico Diagnosi e Cura, ASL RM D, Ospedale San Camillo-Forlanini, Rome, Italy;* <sup>2</sup>*Director of the Department of Nuclear Medicine, Rome, Italy*

The objective of this study is to assess the relationship between substance abuse in a group of young patients (mean age 24.33 years) with prevalent previous diagnosis of personality disorder, the results of brain SPECT (done at the onset of symptoms of a psychiatric disorder) and cognitive abilities measured through several neuropsychological tests. Specifically, tests were used to assess cognitive flexibility, working memory, attention, short and long-term memory.

The first results show the presence of a link between cognitive deficits, hypoperfusion in specific areas of the brain revealed by SPECT and the evolution of diagnosis from axis II to axis I according to DSM IV-TR. Both the results of SPECT and the cognitive deficits are comparable to those found in schizophrenic adults.

Our objective is to carry out a retest of the neuropsychological assessment and a cerebral SPECT after a pre-defined time period, comparing a group of patients who performed a cognitive rehabilitation through the Integrated Psychological Therapy (IPT) with a group that did not.

## The dark side of the e-Psychonauts

L. Orsolini<sup>1</sup>, G. Francesconi<sup>1</sup>, D. Papanti<sup>3</sup>, F. Schifano<sup>2</sup>

<sup>1</sup>*Polytechnic University of Marche, Ancona, Italy;* <sup>2</sup>*Medical School, University of Trieste, Trieste, Italy;* <sup>3</sup>*University of Hertfordshire, Hatfield, United Kingdom*

In the online drug forum communities there are some “educated and informed” users who can provide reliable information about previously unknown compounds and combinations. These users, also called “e-Psychonauts”, own a general technical knowledge in association with pharmacological and chemical notions of the most recent chemical compounds, including the “novel psychoactive substances” on the cybermarket. This new generation of “drug-consumers” seems to be new type-profile compared to the “old-generation druggies”, and they show a technical culture of an extremely high standard. An unobtrusive observational approach of a list of cyber drug communities (blogs, forums, Facebook® and Twitter® pages), searching by Duckduckgo® (<http://www.duckduckgo.com>) and Google® (<http://www.google.co.uk> and <http://www.google.com>) engines, was performed. The forum posts and threads were viewed, accurately selected, analysed and compared in clusters of homogeneous characteristics. We have focused on the key-features of a e-Psychonaut, the socio-demographic and psychological characteristics and the most frequent patterns of abusive substances. We have attempted to provide a proposal for a classification that takes into account these characteristics analyzed. These new drug users imagine themselves as ‘amateur chemists’, sampling and resynthesizing drugs to achieve exactly the state of consciousness they find most pleasurable. It needs to improve our knowledge on this “new generation of druggies” and consider them not only as patients with an addiction problem, with or without psychological and/or psychiatric problems, but also increase our field of action towards a new category of drug consumers.

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## Profiling the online drug consumer: a systematic literature review on legal or illegal pharmacies on the Web

L. Orsolini<sup>1</sup>, A. Giorgetti<sup>1</sup>, G. Francesconi<sup>1</sup>, D. Papanti<sup>3</sup>, F. Schifano<sup>2</sup>

<sup>1</sup>Academic Department of Experimental and Clinical Medicine, Polytechnic University of Marche, Ancona, Italy; <sup>2</sup>School of Life and Medical Sciences, University of Hertfordshire, Hatfield, United Kingdom; <sup>3</sup>Medical School, University of Trieste, Trieste, Italy.

The internet and social networking sites play a significant role in the marketing, sale and the distribution of drugs. The internet is being used both as a source of information and communication but also as a tool to disseminate drug-related websites and sell controlled substances without prescriptions. Our review aims to obtain knowledge concerning the profile of the online drug consumer and the determinants of internet preference. PubMed, Google Scholar and Scopus databases were searched without any language limitations by using a set of keywords. For each set of keywords we evaluated all articles providing socio-demographic characteristics of online drug consumers; reasons for purchasing online drugs; risks related to the online shopping of medications and features of illicit/legitimate commercial sites. All data has been analysed and compared for these specified clusters. Results report a majority of Caucasian males in their twenties, both in internet users and drug user/abusers. Several studies reported that the men usually perceive less risks, are more likely to turn to the internet as a source of prescription drugs and, subsequently, more likely to buy drugs and illegal substances online. On the other hand, women were noted as more likely to search for health information. The protection of identity by screen pseudonyms, variety and quality of product listings, selection of vendors based on review feedbacks, reduced personal risks, forum activity and the availability of a service for prescription-only drugs stimulate the growth and development of both OPs and drug marketplaces.

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## Legal highs' as a weight loss aids: an overview of available web information and consumers' experiences

L. Orsolini<sup>1</sup>, D. Papanti<sup>3</sup>, G. Francesconi<sup>1</sup>, F. Schifano<sup>2</sup>

<sup>1</sup>Academic Department of Experimental and Clinical Medicine, Polytechnic University of Marche, Ancona, Italy; <sup>2</sup>School of Life and Medical Sciences, University of Hertfordshire, Hatfield, United Kingdom; <sup>3</sup>Medical School, University of Trieste, Trieste, Italy.

The recent explosive growth and diffusion of the Web sources has facilitated the free and easy exchange of ideas, opinions but also the proliferation of drug-related informations and the drug market of the 'legal highs', 'research chemicals' (RC), 'smart' and/or 'designer drugs'. Moreover, it's growing up, in parallel, the diffusion of pro-ANA (anorexia nervosa) websites with specified sections about illegal or 'legal' compounds specifically designed for the weight loss. The purpose of this study is to evaluate the actual possibility to access these products for weight control, in particular those belonging to the category of 'herbal or legal highs' and RC in order to obtain information about their features, quality, typology and side effects. A systematic review of the web availability and purchase of 'legal highs for weight loss' and an observation study on drug forums and blogs that talk about 'legal highs for weight loss' have been conducted looking on the internet with the most popular search engines, Google (<http://www.google.com>) and Yahoo (<http://www.yahoo.com>) and a set of specified key words (('legal high OR herbal high OR smart drug OR research chemical OR designer drugs OR synthetic drugs) AND (weight loss OR weight control)) formulated in Italian and English language. The variety of data was included in a database that contains informations about website name

and URL (universal resource locator) address; the available drugs for weight-loss; the best-selling drugs; the costs and the amount of information about these drugs. Moreover, they have been reported some case-experiences of users.

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## Poster Sessions

# Synthetics cannabinoids...Cannabinoids? Of course not, and not just cannabimimetics!

D. Papanti<sup>1</sup>, G. Francesconi<sup>3</sup>, L. Orsolini<sup>3</sup>, F. Schifano<sup>2</sup>

<sup>1</sup>University of Trieste, Psychiatry Residency, Trieste, Italy; <sup>2</sup>University of Hertfordshire, Hatfield, United Kingdom;

<sup>3</sup>Polytechnic University of Marche, Ancona, Italy

'Spice products/drugs' are synthetic cannabimimetics(SC)-based designer drugs (mis)used as a legal alternative to marijuana for their very strong tetrahydrocannabinol(THC)-like effect.

Spice is composed by a dried vegetal matrix (in order to mimick the 'grass effect' of marijuana dried buds) mixed with SC sprayed on it.

Both in terms of compounds contained, psychotropic effects and in toxicology profiles, they show many differences with cannabis as they are in fact poly-cannabimimetics designer drugs with synergistic effects between SC (almost always more than one SC is contained in spice) and active metabolites are implicated in human metabolism of these compounds. Furthermore it has been shown that other NPS and psychoactive plants can be contained, together with SC, in the vegetal matrix and that the concentration of SC in it can be very variable.

While cannabis intake is associated with some antiemetic and anticonvulsant effects, spice intoxications present with vomit and seizures not uncommonly. From a psychopathological point of view, spice misuse is associated with psychotic disturbances that show a higher presentation of visual hallucinations in comparison to cannabis. This could at least in part explicated by the action of indole moiety present in many SC-compounds exerted on 5HT<sub>2A</sub> receptors, resulting in a pro-hallucinogenic effect. We offer a comprehensive presentation of the available evidence in human pharmacology, toxicology and neurobehavioural correlates in related to SC-misuse.

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## Poster Sessions

# THE CHILDREN OF NPS: Research of patterns of use of NPS in Slovenija – preliminary results and challenges for harm reduction and therapy

M. Paš

*Association DrogArt, Slovenia*

Association DrogArt is NGO from Slovenija, founded in 1998 and working in harm reduction for club drug and cocaine users. Since 2008 we are experiencing changes in patterns of club drug use in Slovenija, with popularisation of novel psychoactive substances (NPS). This change requires an adjustment in harm reduction approaches for the users of NPS and adjustment of counseling and psychotherapy in our therapy program for cocaine and club drug users.

In the presentation I will present preliminary results of the research of patterns of use of NPS in Slovenija. The research is a qualitative research with the research instrument of extended interviews with NPS users. Through interviews we managed to get an overview of the patterns of use of NPS in Slovenija and main risks, connected with their use. The results of the research will help us form effective harm reduction responses for NPS users, which are quite a challenge, because they have to be quick, reliable, user friendly and very importantly: they have to reach also the users who are most vulnerable and usually don't have access to standard harm reduction packets. A majority of users

we encountered in a research were very young: from 15 to 20 years old and a very important collateral outcome of the research has been establishing direct and trusting contact with this group NPS users, which are very hard to reach. In a presentation I will also talk about the experiences of working with NPS users in our therapy program.

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## Poster Sessions

# Personality and Metacognition In Substance Users

**M. Pasinetti, M. D'Urzo, D. Catania, G. Dimaggio**

*Centre for Metacognitive Interpersonal Therapy, Rome, Italy*

To date research evidence suggests a link between specific personality disorder traits, metacognitive dysfunctions and greater tendencies to substance abuse, both in adolescents and adults. As a result, a complex pattern of co-occurrence between substance / behavioural addiction and personality disorders poses unique challenges to the treating clinician.

The term metacognition refers to the ability to identify, differentiate and reflect on one's own and others' mental states and to use psychological knowledge to solve relational problems and regulating emotions and behaviours. People with poor metacognitive skills lack the ability to be aware of what they feel, of the eliciting factor of their distress. As a consequence, they are deprived of psychological abilities to regulate emotional arousal. Such a dysfunction may lead to substance abuse as a maladaptive form of self-medication.

This presentation aims at illustrating the most typical personality disorder features and metacognitive dysfunctions observed in these complex cases, and give a snapshot about possible treatment avenues.

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## Poster Sessions

# Drug use and risk behaviours in nightlife settings: an ever-changing scenario

**E. Perizzolo, A. Contino, R. Balestra, S. Pallaver, CD. Germano, R. Tominz, M. Bovenzi**

*<sup>1</sup>Associazione A.L.T., Trieste, Italy; <sup>2</sup>Azienda per i Servizi sanitari n.1 Triestina, Trieste, Italy; <sup>3</sup>Associazione Etnoblog*

**Introduction:** youth population recognizes in nightlife settings the ideal scene to experience risky behaviours, such as use of legal and illegal drugs, hazardous sexual behaviours and drunk-driving. Regarding these issues, a survey was conducted to investigate new trends in drug use and risky behaviours in nightlife settings.

**Methods:** in this descriptive observational study, both in 2008 and in 2013 we interviewed young people aged 15-29 living in Friuli Venezia Giulia Region and met in nightlife settings where outreach workers of Overnight Project were operating, using an anonymous and self-administered questionnaire.

**Results:** comparing the two surveys underlines important changes in some patterns of use. The use of alcohol (overall and between meals) and the lifetime prevalence of drugs have both increased (68% vs 60%), like the use of psycho-stimulants, LSD and magic mushrooms. Use of popper has decreased (10 % vs 25 %). 21% of the 2013 answering sample has tried synthetic cannabinoids. The percentage of girls having used the day after pill has remained stable (44%).

**Conclusions:** comparing the two surveys highlights an increase of drug use and the launch of new drugs onto the illegal market (synthetic cannabinoids). Surveys conducted in nightlife settings allow to interviewing young people not easily reached by most surveys, such as dropped-out or post-diploma students, helping to plan future prevention and harm reduction activities evidence based, addressing young population's concrete and current needs.

## The Chemical Analysis in Risk Reduction

**P. Pinan**  
Spain

Since 2011, several drugs working groups from various countries of the European Network of Forensic Sciences (ENFSI) have been warning about a new wave of chemical substances, commercialized under the name of “Legal Highs” and sold in envelopes containing powders, pills or vegetable substances. They are a great risk for the drug consumer, not only because there is very few toxicological or pharmacological information about them, but also because on the envelopes there is no reference to their chemical composition and this one can change significantly even in those with the same physical appearance. For that reason, a chemical analysis is totally required to know its components. Even though the detected substances and their possible derivatives are regulated, there will be, in just a week, a whole bunch of new compounds with similar properties but with totally unexpected chemical structures, leading to a synthesis – regulation cycle that seems never ending. Up to 251 new psychedelic substances have been already discovered, making it harder to correctly identify them for the reason of not having standards or spectral databases to ascertain their chemical components.

## The mapping of the classic in comparison to novel psychoactive substances on the territory of the Republic of Serbia in 2013

**N. Radosavljevic-Stevanovic, A. Maric, J. Delic**

<sup>1</sup>The National Crime-Technical Centre, Ministry of Interior of the Republic of Serbia Belgrade, Serbia; <sup>2</sup>Department of Pharmacy, University of Hertfordshire, Hatfield, United Kingdom

The territory of the Republic of Serbia includes more than 88 km<sup>2</sup> and is located between Hungary, Croatia, Bosnia and Herzegovina, Albania, Macedonia, Bulgaria and Romania. According to the specific geographic position, the market of the psychoactive substances in Serbia is specific and varies within its regions. The mapping of the seized materials of classic and novel substances was done and based on the data obtained from five available forensic units of the National Crime-Technical Centre in 2013. This revealed the significant differences in the types of substances seized across five different regional forensic units. The frequency of appearance of novel psychoactive substances is evidently more intensive in the northern parts of Serbia and in Belgrade, while the classic market is still more present in the eastern and western part of the country. The reasons for this are well-known psychoactive substances smuggling routes, but also the social factors affecting the population of Serbia.



## “Legal highs, lethal lows”: a successful local harm minimisation campaign

R. Rodriguez

*Leicestershire Substance Misuse Partnership, United Kingdom*

**Background:** december 2012 saw the launch of “Legal Highs, Lethal Lows” campaign by Leicestershire Substance Misuse Partnership. During 2012 and 2013 a host of initiatives have been undertaken to highlight the risks of legal highs and provide advice, information and support to those within our local communities and throughout the UK.

**Methods:** SMP ran a 12 Days of Christmas campaign in December 2013, on each of the 12 days, legal high advice and support were posted via our @SMP\_Leics Twitter feed with a giveaway promotion each day. Participants were encouraged to follow, retweet and email us telling us what they know about legal highs throughout the period to enter in the competition.

**Results:** 260 people retweeted us during the 12 days of Christmas and over 1300 people visited our website [www.legalhighslethallows.co.uk](http://www.legalhighslethallows.co.uk).

From all the emails we received during the competition: 22% copied and pasted a text of our website; 20% told us they are aware of the dangers and serious consequences of taking legal highs; 16% did not know about legal highs; 12% were parents worried about their children and the availability of legal highs in local shops; 2% said legal highs are good; 28% were invalid blank emails to enter in the competition.

Crucially, the campaign has increased the number of people seeking help for legal highs.

**Conclusions:** this local campaign has successfully raised awareness of the real dangers of legal highs so that individuals can make an informed choice and seek professional help should they require it.

## Personality and character traits in users of Novel Psychoactive Substances (NPS)

D. Sabatini, M. Aceto, E. Malavasi, C. Schepisi, M. Graziani, A. Badiani

*<sup>1</sup>Department of Physiology and Pharmacology, Sapienza University of Rome, Rome, Italy; <sup>2</sup>Drug Addiction Unit, University Hospital Umberto I, Rome, Italy*

**Introduction:** previous studies have demonstrated that personality traits are important predictors of the vulnerability to drug abuse. Abuse of new psychoactive substances (NPS) among young people is phenomenon that appears to be on the rise in many European countries. The aim of this study was to evaluate the relationship between personality profile and NPS use in young adults.

**Methods:** a total of 91 subjects (age 18-30) were recruited using a “snowball” approach. There were 45 subjects reporting NPS use and 46 age-matched controls. Personality traits were assessed using the Cloninger’s Temperament and Character Inventory (TCI), consisting of seven items, four of which concern temperament (novelty seeking [NS], reward dependence [RD], harm avoidance [HA], persistence [P]) whereas three items concern character dimensions (self-directedness [SD], cooperativeness [C], self-transcendence [ST]). The use of NPS was assessed through self-report (questionnaires).

**Results:** three of seven items investigated through TCI were significantly different between groups. In particular, SD and C were significantly lower in NPS users than in controls. In contrast, NS was increased in NPS users relative to controls.

**Conclusion:** subjects who scored high for NS are more inclined to risk-taking behaviors, which may confer vulnerability to substance abuse. Novelty seeking is a temperament trait, which is thought to be heritable and to remain stable throughout life. In contrast, being SD and C character traits, they may be influenced by social and cultural context and may evolve during life. In particular SD describes the ability to achieve goals through behavioral adaptation

whereas C is related to social skills such as empathy, collaboration and helpfulness. Interestingly, both SD and C have been shown to be deficient in drug addicts.

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## Poster Sessions

# Gabapentinoids' misuse issues

F. Schifano<sup>1</sup>, S. Chiappini<sup>2</sup>

<sup>1</sup>St George's University of London, London, United Kingdom; <sup>2</sup>School of Life and Medical Sciences, University of Hertfordshire, Hatfield, United Kingdom

**Introduction:** pregabalin and gabapentin (gabapentinoids) are anticonvulsants prescribed in a range of clinical conditions. Recently, both drugs have been reported as possessing a potential for misuse. Furthermore, increasing levels of prescriptions; rising numbers of related fatalities; and an anecdotally growing black market have been reported at the EU-wide level.

Gabapentinoids effects derive from their binding at the calcium channel, resulting in decreased levels of central excitability. Furthermore, they are thought to possess GABA-mimetic properties whilst possibly presenting with direct/indirect effects on the dopaminergic 'reward' system. Although therapeutic dosages of gabapentinoids may present with low addictive liability levels, misusers' perceptions for these molecules to constitute a substitute for illicit drugs may be a reason of concern. Online reported experiences associated with gabapentin abuse (alone or in combination with other drugs) include: euphoria; relaxation; a sedative/'opiate buzz' and MDMA-like effects as well.

This poster provides a review of the current evidence of gabapentinoids' potential of misuse

**Methods:** a literature search was carried out on PubMed and other resources, together with a focused Internet search in order to identify both existing prescribing guidelines and remaining relevant documents. Moreover, data from systematic reviews and randomized controlled trials were used.

**Results:** gabapentinoid experimenters are here profiled as individuals with a history of recreational polydrug misuse who typically self-administer with dosages up to 3–20 times the therapeutic range.

**Conclusions:** in considering prescribing gabapentinoids, clinicians should carefully assess their clients' possible history of drug misuse. Further studies should be encouraged, focusing on a better assessment of gabapentinoids' addictive liability levels.

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## Poster Sessions

# Harm reduction message based on pharmaceutical analysis of crack cocaine samples

ZM. Shehab, IS. Blagbrough, R. Price, MG. Rowan, J. Scott

Department of Pharmacy and Pharmacology, University of Bath, Bath, United Kingdom

An information motivation behaviour (IMB) model has been proposed as a mechanism for changing risky behaviours. We report here preliminary studies aimed at developing an IMB-based intervention to reduce the harm associated with crack cocaine abuse. Seized crack samples were analysed and different crack pipes were evaluated, and the results used to design a Harm Reduction intervention delivered to crack smokers. The smoking model we have developed determines the emitted dose of cocaine from 3 different types of crack pipes. It provides evidence that more than half of the samples will be wasted by using hand-made pipes or drinks cans and that toxic phenacetin is also efficiently delivered via this route. The results were used to design an intervention (leaflet, fliers, advice, discussion groups) to measure the impact of these analytical results on users' behaviour. Harm Reduction workers will deliver the intervention and collect data to evaluate its effectiveness in informing the users of risk and modifying their drug-using behaviour. Our intervention will measure the impact of crack sample analytical data, and the differences between various crack pipes on users' behaviour and knowledge, in an attempt to minimise the problems associated with crack smoking. If users do successfully adopt a device such as the Canadian Shooter, which would deliver a

higher dose of cocaine and phenacetin, using such a pipe may lead to other benefits such as lower cross contamination and fewer accidental injuries. We thank the University of Bath, The Wellcome Trust and The Said Foundation for financial support.

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## Poster Sessions

# Thermal Behaviour of Street Samples of Crack Cocaine

ZM. Shehab, IS. Blagbrough, R. Price, MG. Rowan, J. Scott

*Department of Pharmacy and Pharmacology, University of Bath, Bath, United Kingdom*

**Introduction:** a DSC study of cocaine, street samples of crack cocaine, and its common adulterants was undertaken to devise an experimental model of the crack cocaine smoking process. This is the first study of the thermal properties of cocaine base and modern adulterants undertaken to understand the processes that occur during the smoking of crack. **Materials and Methods:** crack was seized by the Police in Swindon, UK, analysed on a DSC 2920 TA instrument (30 L/min N<sub>2</sub>, 10 C/min, 50-275 C).

**Results and Discussion:** DSC scans of pure samples of cocaine HCl, cocaine base, phenacetin, benzocaine, and glucose were produced. All showed the expected endothermic peaks followed in some cases by evidence of thermal decomposition. DSC scans of the street samples of crack cocaine generally showed a slight depression in the transition temperature of both cocaine base and the main adulterant. Moreover, the scans also showed other complex features which may be related to minor components in the mixtures or possibly to chemical reactions between components.

**Conclusions:** different street samples of crack cocaine gave markedly different DSC profiles; it is likely that this reflects the performance of the crack during use. We have used these data to devise an experimental model of the process of crack smoking, evaluating the performance of various types of crack pipe with a long-term view of informing suitable harm reduction interventions. **Acknowledgments:** We thank the University of Bath, The Wellcome Trust, and The Said Foundation for financial support, and the Swindon Police for sample provision.

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## Poster Sessions

# Changes in electroencephalogram power spectra and locomotor behavior in rat exposed to synthetic cannabinoids

N. Uchiyama, R. Kikura-Hanajiri, K. Aritake, T. Hakamatsuka, Y. Urade

*<sup>1</sup>National Institute of Health Sciences (NIHS), Tokyo, Japan; <sup>2</sup>University of Tsukuba, International Institute for Integrative Sleep Medicine (IIIS), Ibaraki, Japan; <sup>3</sup>Osaka Bioscience Institute, Osaka, Japan*

**Introduction:** although synthetic cannabinoids (SCs) have become major classes of abused drugs worldwide, little information is available for their pharmacology. Many psychotropic substances affect electroencephalograms (EEG) in animals and humans. We previously reported that two SCs, cannabicyclohexanol and JWH-018, changed the EEG power spectra and suppressed the locomotor activity (LOC) in rats, more significantly for a long duration than  $\Delta^9$ -tetrahydrocannabinol [Forensic Sci. Int. (2012) 215, 179-183]. In this study, we examined the effects of three SCs, QUPIC (PB-22), 5F-QUPIC (5-Fluoro-PB-22) and NNE1 indazole analog (MN-18), on the EEG spectra and the LOC and compared with those of JWH-018.

**Methods:** EEG of rat (Sprague-Dawley male, 10 weeks-old) was recorded for two days. On the first day: vehicle-treatment, the second day: drug-treatment (5 mg/kgi.p. at dark period). Cortical EEG signal was amplified, filtered (0.5-35 Hz) and recorded by using the analysis software "SleepSign". EEG spectrum was analyzed postfast Fourier transformation and LOC was measured by monitoring with an infrared device.

**Results:** QUPIC, 5F-QUPIC and NNEI indazole analog significantly decreased the total amounts of LOC to 32%, 36% and 71%, respectively, during 6-hour period after injection. QUPIC and 5F-QUPIC suppressed LOC stronger than JWH-018 (58%). These three SCs increased the EEG power for the first 6-hours in the frequency range of 5.0-6.0 Hz and 10.0-11.0 Hz, respectively. Their EEG spectra were similar patterns to that of JWH-018.

**Conclusions:** these three SCs significantly suppressed LOC and changed EEG power spectra in rats similar to JWH-018.

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Poster Sessions

## Ethylphenidate- Legal High or Legal Treatment Option

E. Ugoh

*CRI Spectrum Hertfordshire, United Kingdom*

30 year old male British Caucasian, with long history of treatment resistant depression reported improved mood and general functioning with high doses ~ 350mg daily of a psychostimulant, Ethylphenidate. There is currently no robust evidence of its efficacy as a pharmacological intervention for treatment resistant depression but there appears to be increasing anecdotal evidence that due to its ability to boost norepinephrine and dopamine neurotransmitters, its euphoric effects might need further investigation as a management of this condition. As it is very much similar to the parent compound, methylphenidate, in efficacy; there is some evidence that one of its less common side effects is also depression hence further risk assessments needs to be done.

Ethylphenidate is currently not controlled in the UK, and it is not specifically named in the Misuse of Drug Acts. This might then pose a challenge as British policy makers need to take into accounts the attraction of Ethylphenidate and its perceived mood elevating effects, to this emerging population of clients with treatment resistant depression; in determining further legislative action. Of course risk assessments needs to be done by the scientific bodies such as the European Monitoring Centre for Drugs and Drug Addiction (EMCDDA) and the Advisory Council on the Misuse of Drugs (ACMD). However factors such as the consequences of legislation need to be balanced against anecdotal evidence of emerging positive impact on treatment resistant depression and possibly lack of adequate research of this trend.

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Poster Sessions

## Olanzapine as the ideal 'trip terminator' of Novel Psychoactive Substances-induced psychotic symptoms? Analysis of online reports relating to its use and misuse

G. Valeriani<sup>1</sup>, O. Corazza<sup>2</sup>, FS. Bersani<sup>1</sup>, C. Melcore<sup>3</sup>, A. Metastasio<sup>3</sup>, G. Bersani<sup>1</sup>, F. Schifano<sup>2</sup>

<sup>1</sup>Sapienza University of Rome, Rome, Italy; <sup>2</sup>University of Hertfordshire, Hatfield, United Kingdom; <sup>3</sup>Norfolk and Suffolk NHS Foundation Trust, Ipswich, United Kingdom

**Introduction:** the second generation antipsychotic olanzapine is the most frequently indicated self-medication to treat drug-induced psychoses among Novel Psychoactive Substance (NPS) users and can be misused for recreational purposes. The objective of the study was to better assess and review the use of olanzapine as a self-medication to treat unwanted NPS effects.

**Methods:** a regular monitoring of web sources (e.g., drug forum communities, online shops, social networks) has been conducted between November 2012 and December 2013. In the same period, additional searches were carried out in the database provided by the Global Public Health Intelligence Network (GPHIN), a monitoring global media

sources system operated by the Public Health Agency of Canada. Finally, findings were integrated with scientific data from PubMed and Psychinfo databases.

**Results:** most NPS-users assume olanzapine for very short periods at 5-10 mg/day as a treatment for the unwanted effects of psychedelic crises/'bad trips'. Cases of misuse of olanzapine at high dosages (up to 50 mg/die) have been reported, leading to the idea of a possible trend of misuse of this medication also for recreational purposes.

**Discussion:** olanzapine seems to be frequently suggested as the ideal prescribing molecule to terminate 'bad trips' from a range of pro drug websites, but only a few research studies have preliminarily assessed the effectiveness of olanzapine and other second generation antipsychotics to treat NPS-induced psychosis. Health and other professionals should be informed about the risks related to olanzapine misuse.

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## Poster Sessions

# Changes in Patterns of NPS use over Time – Results from two Online Surveys in Germany, 2011 and 2013/14

**B. Werse**

*Goethe-University Frankfurt, Centre for Drug Research, Frankfurt, Germany*

**Introduction:** the presentation discusses the results of two online surveys of NPS users in Germany between 2011 and 2013/14.

**Methods:** the sample of the respective surveys consist of self-selected users of "legal high" products, who answered questions on use, motivation and other factors associated with the subject. Data was analysed using common statistical procedures. The adjusted samples amounted to n=860 (2011), and n=771 (2013/14), respectively.

**Results:** as the second survey has just been closed (mid-February 2014), only very preliminary results can be reported in this abstract: it seems like synthetic cannabinoid products are still the most important class of NPS products for German users, while research chemicals show relatively high rates for current use, including synthetic cannabinoids as pure substance. Regional differences are even more pronounced as in the first inquiry: particularly Bavaria is massively overrepresented within the sample.

**Conclusions:** with the second online NPS survey, the notion that the level of repression for illicit drugs appears to be an important factor for regular use of "herbal blends" has gained more evidence. It appears that since the phenomenon has emerged in Germany, the population of regular NPS users is more and more focused on either "substituting" cannabis users with legal motives or well-informed "psychnauts".

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## Poster Sessions

# The impact of new retail restrictions and product licensing of NPS products on the prevalence, availability and price of NPS and other drugs in New Zealand

**C. Wilkins, S. Jawalkar, M. Wall, K. Parker, T. Graydon-Guy**

*SHORE and Whariki Research Centre, School of Public Health, College of Health, Massey University, Auckland, New Zealand*

**Background:** New Zealand has recently established the world's first regulated legal market for New Psychoactive Substances (NPS) ('legal highs'). While the new NPS regime is not yet fully operational, a range of retail restrictions

and an interim product licensing scheme have been introduced for NPS products, and this interim regime has now been in operation for six months.

**Aims:** to measure the impact the new NPS retail restrictions and product licensing requirements have had on the prevalence, availability and price of NPS products and other drugs among young people.

**Methods:** a sample of 400 young people aged 18-24 who regularly 'party' in central Auckland past midnight were recruited using a web-based Respondent Driven Sampling (web-RDS) methodology. The survey 'seeds' were recruited in person from outside central Auckland nightlife areas. The 'seeds' were then directed to recruit other people in their social networks who they knew were also 18-24 years old and regularly 'partied' late in central Auckland. Participants received a \$20 voucher for completing the survey, and a further \$20 voucher for each of the three people they invited who also completed the survey. The on-line survey asked participants about their: (i) recent NPS, alcohol and other drug use; (ii) the availability of NPS, alcohol and other drugs; and, (iii) the price of NPS, alcohol and other drugs. RDS weights controlling for differential recruitment and social network size were applied to the sample.

**Results:** the survey is currently in the field. Results will be available by April 2014.