

**THE FIRST INTERNATIONAL CONFERENCE ON
NOVEL PSYCHOACTIVE SUBSTANCES (NPS)**

“THE EVER-CHANGING WORLD
OF PSYCHOACTIVE DRUGS”

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BOOK OF ABSTRACTS

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PLENARY PRESENTATIONS

PL01 **New psychoactive substances: a paradigm shift in the drugs field?**

Paul Griffiths

Scientific director, European Monitoring Centre for Drugs and Drug Addiction (EMCDDA)

To what extent does the emergence of new psychoactive substances represent a paradigm shift reflecting broader social processes - will be the question that this presentation is built around. This topic will be explored by considering the historical emergence of new psychoactive substances from the 1970s to the current day. The speed at which this phenomenon is developing is reflected, not only in the sheer number of substances appearing on the market, but also in their diversity and diversity in how they are produced, distributed and marketed. Particular emphasis will be put on more recent developments and how globalisation, chemical innovation and developments in information technology are impacting on the current drug situation. The presentation will use data from a recent international expert review to assess the extent to which this phenomenon can now be regarded as a global issue and contrast the speed of developments in these areas with our historical experience of the diffusion of drug trends. The argument will be made that we need urgently now to develop common concepts, terminology and instruments if we are to understand and respond adequately to developments in this area. Substantively the emergence of these new drugs is now challenging our current approach to drug monitoring. This calls for a re-evaluation of both the information sources we use and the ways in which we disseminate information to inform policy, practice and the general public. The presentation will conclude by identifying some of the critical research and information needs that are emerging in this area – in particular the need to better understand the possible acute and chronic health implications of the use of these new substances and to identify and monitor patterns and trends in their use.

PL02 **The ever-changing world of psychoactive drugs: clinical and pharmacological challenges**

Schifano, Fabrizio

The School of Pharmacy, University of Hertfordshire, UK

During his presentation, Professor Schifano will provide the audience with an overview of a range of novel psychoactive substances, discussing in detail the knowledge available relating to the clinical pharmacological issues pertaining to each of this class of substances. Furthermore, taking into account this data, it will be argued which, if any, psychopathological consequences could be associated with the intake of these compounds.

PL03 **Anticipating the future and responding to change: the role of the ReDNet project**

Corazza, Ornella

The School of Pharmacy, University of Hertfordshire, UK

Background and objectives: The recent emergence of novel psychoactive compounds (NPS) combined with the ability of the Internet to disseminate information quickly and act as an online marketplace, have raised prominent issues in the fields of drug policy, substance use research, and public health. In this context, the Recreational Drugs European Network (ReDNet) project is a multi-site implementation project funded by the European Commission with the aim of improving the level of information available to young people and professionals working with them on the effects of NPS and the potential health risks associated with their use. The ReDNet project's main objectives are to: (a) develop accurate information on novel psychoactive compounds; (b) develop and pilot a variety of innovative and effective ICTs to disseminate this information; (c) assess the feasibility of different ICTs and the relevance of the information being disseminated to the target groups; (d) inform future research in e-Health, selective prevention, and harm reduction, using ICT. **Methods:** Multilingual qualitative assessments of a range of websites, drug fora and other online resources were carried out using the Google search engine in 9 languages from a number of collaborating countries (the UK, Norway, Belgium, Germany, Hungary, Poland, Italy and Spain) and prevention messages were developed and disseminated via technological tools such as interactive websites, SMS alert, social networking (Facebook, Twitter), Multimedia (You Tube), Smartphone

applications (iPhone), and virtual learning environments (Second Life). **Results:** The first Europe-wide prevention programme designed for novel compounds based on the efficacy of ICT tools was created. Also thanks to the previous Psychonaut project (www.psychonautproject.eu), more than 450 novel products and combinations were identified; relevant information were disseminated to professionals and young people; advice was given to both EU/international agencies and national policy makers. The final findings and recommendations will be available by the end of June 2012. **Conclusions:** Evidence so far suggests that: (a) web monitoring activities with respect to drug-related issues are a necessary step to better tackle the diffusion of NPS; (b) the use of technological tools could be successfully incorporated in specific prevention programmes; (c) multi-disciplinary international partnerships are fundamental for anticipating the future and responding to the change brought by this rapidly expanding phenomenon.

PL04 **Global Drug Survey- Preliminary results from Europe. Part 1: 2012**

Winstock, Adam R^{1,2,3}

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Background and objectives: For 4 weeks towards the end of 2011, Global Drug Survey in partnership with Mixmag and The Guardian Newspaper, conducted one of the largest ever surveys of current drug use in the world. **Methods:** In just 4 weeks 15,500 people responded from all over the world. 7700 from the UK, 3300 from the USA. Preliminary results from the UK and USA will be released exclusively in Mixmag, the Guardian and at www.globaldrugsurvey.com on March 15th. **Results:** Today I will be presenting headline results from those more than 1600 participants who reported their drug use patterns and associated harms from across Europe (excluding the UK). Top line stories will include the prevalence of novel psychoactive substance use and the use of the internet to access drugs, motivations for the use of 'research chemicals'. **Conclusions:** In addition some preliminary risk and effect profiling of some of the more novel substances will be given, as well as a sneak look at the top stories related to novel psychoactive substances and the use of prescription medications that will be released on March 15th. Finally I will talk about a new smart phone and web based app 'drugs meter' that Global Drug Survey launches in March.

PL05 **The EU Early-warning system: new drugs coming our way****Gallegos, Ana; Sedefov, Roumen***Action on new drugs, Supply reduction and new trends unit, European Monitoring Centre for Drugs and Drug Addiction (EMCDDA)*

Background: Recent developments have led to new psychoactive substances becoming widely available at an unprecedented pace. The speed at which they appear and the way they can be distributed challenges the established procedures for monitoring, responding to and controlling the use of new psychoactive substances. Moreover, the current high profile policy concerns about new drugs and emerging trends, require quick responses to dynamic changes but also to new needs. **Methods:** The European Monitoring Centre for Drugs and Drug Addiction (EMCDDA) has been assigned a key role in the detection and assessment of new drugs in the European Union. The EMCDDA Early-warning system on new drugs (EWS) is a real time vehicle for the exchange of multidisciplinary information on new psychoactive substances that may pose public health and social threats. The mechanism is extensively used by the forensic science community, health and law enforcement professionals throughout Europe. **Results:** In 2011, 49 new psychoactive substances were officially notified for the first time in the European Union through the EWS. This represents the largest number of substances ever reported in a single year, considerably up on 2010 (41 substances) and 2009 (24 substances). The marked increase in the number of substances notified takes place in the context of the rapid development of the 'legal highs' phenomenon. The diversity in type of the substances identified reflects the speed and sophistication at which the market reacts to control measures. **Conclusion:** Multidisciplinary and supplementary information sources should be combined in order to dynamically monitor emerging trends, new patterns of use and potential threats in the use of new substances. The integration of leading-edge indicators such as Internet monitoring, hospital emergencies, waste-water analysis or computational studies for the prediction of the mode of action of untested compounds are considered particularly valuable.

PL06 **Best practice in drug prevention and the importance of the National Early Warning Systems**

Serpelloni, Giovanni¹; Rimondo, Claudia²

¹*Department for Antidrug Policies, Presidency of the Council of Ministers*

²*National Early Warning System, Department for Antidrug Policies, Presidency of the Council of Ministers*

Background and objectives: Drug use and addiction are relevant phenomena to be prevented with all available means so that the number of people involved in drug consumption and in related criminal activities may be strongly reduced. Strategies aimed at reaching this goal have been gathered into an institutional document, released by the Department for Antidrug Policies of the Presidency of the Council of Ministers, named the National Action Plan 2010-2013. The plan gathers strategic solutions and indications involving prevention, care, recovery and contrast to drug trafficking and dealing. **Methods:** Within this context, the Department for Antidrug Policies has developed specific programs about drug use prevention focusing on early information, universal and selective prevention, early detection and educational approaches. The Italian strategy is based on the following statements: (1) prevention is a priority for the reduction of drug demand; (2) all illicit substances must be considered dangerous and harmful for psycho-physic and social health of individuals; (3) prevention activities must focus on the early detection of drug use; ⁴ prevention actions must be well supported and long-lasting and they must be addressed especially to vulnerable social groups; (5) the main content of prevention actions is about highlighting drug harms and risks; (6) it is important to promote healthy and gratifying life styles, especially involving young people. **Conclusions:** A number of activities have been carried out at national level. One of them is about preventing the use, the commercialization and the trafficking of novel compounds, therefore preventing consumers from health risks and performing control and contrast measures in collaboration with law enforcement agencies. The Italian National Early Warning System is the main tool assigned to perform that task.

PL07 **The Clinical Toxicology and Patterns of Acute Toxicity Associated with Novel Psychoactive Substances**

Dargan, Paul

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Background and objectives: There have been significant changes in the pattern of recreational drug use over the last decade. In addition to established classical recreational drugs (e.g. cocaine, MDMA ('ecstasy') and amphetamine), there has been increasing use of a wide range of novel psychoactive substances. These are sold to users not only from street level drug dealers, but also from Internet suppliers and in high street head shops. They are marketed under a variety of names, such as "research chemicals", "bath salts" and "plant food". A number of studies have shown that the content of the products is variable and therefore the users may not know exactly which novel psychoactive substance they are taking. When these drugs first become available there is often limited information available on their pharmacology and toxicology and therefore the potential for acute toxicity associated with their use. Information on their acute toxicity use initially comes from a variety of sources including Internet discussion fora; clinical case reports/series; poisons centre series; and less commonly animal models/human studies. The majority of information comes from user discussion fora and case reports/series. However these generally do not include analytical confirmation of the drugs used, to be able to accurately attribute the pattern of toxicity to a confirmed novel psychoactive substance.

Methods: It is possible to triangulate data from the variety of data sources described above and this can provide information on the overall pattern of toxicity of these drugs. It appears that novel psychoactive substances can be categorised using the same system for patterns of acute harm associated with the use of classical recreational drugs. Using triangulation of these data sources, I will discuss the pattern of acute toxicity seen with some of the key novel psychoactive substance classes seen in the last decade.

Results: This will demonstrate that the piperazines, cathinones and the pipradrols are associated with stimulant toxicity and the synthetic cannabinoid receptor agonists and methoxetamine are associated with hallucinogenic toxicity. Some of the more recent stimulant drugs such as the pipradrols have been associated with prolonged neuropsychiatric effects lasting a few days in addition to classical stimulant effects.

Conclusions: It is essential that clinicians continue to work with analytical toxicologists to accurately describe the true pattern of acute toxicity associated with the use of novel psychoactive substances to inform clinicians managing these patients and also to ensure that legislative authorities

have access to accurate information to enable them to undertake an appropriate risk assessment regarding the control of these substances.

PL08 **Forums, Twitter, Facebook, YouTube, and Websites ... Marketing and promotion strategies of Legal Highs online**

Deluca, Paolo

Institute of Psychiatry, King's College London

This presentation focuses on the ongoing research work carried out within the EU FP7 funded ALICE RAP research programme which looks among other things at the online marketing and promotion strategies of “legal highs.”

The ‘Addictions and Lifestyles in Contemporary Europe Reframing Addictions Project’ (ALICE RAP) is a new, dynamic trans-disciplinary EU project which aims to help policy makers “rethink and re-shape” current and future approaches to the huge human and economic costs of addictions and lifestyles in Europe.

ALICE RAP weaves the work of over 100 scientists from 67 institutions in 25 countries into an integrated evidence base for informed policy action. The research programme includes a wide range of different quantitative and qualitative scientific disciplines stretching across the humanities and social sciences and the biological and medical sciences.

Within this, Work Package 11 (WP11) examines the direct impact of addictive “industries” on consumer behaviour through marketing and corporate social responsibility. There is evidence from several reviews (of tobacco and alcohol studies) that marketing encourages and increases consumption of addictive products and engagement in addictive behaviours.

However, little is known about how marketing contributes to addiction, how are marketing strategies used to (a) encourage people to start, (b) to step up people’s consumption level (c) to discourage cutting down or quitting or (d) to avoid consumer protection legislations. This is particularly true for novel/ legal psychoactive substances or “Legal Highs.”

During the 5-year study period 100 websites and other online resources will be monitored and archived at regular intervals and their promotion and marketing strategies assessed over time. It is expected that this WP will identify common strategies and evolving trends; and through surveys of users to reach an understanding of their role in starting up use, step up consumption and discourage cutting down.

PL09 **On the use of heterogeneous data and policy priorities to develop new drugs legislation, with a correct involvement of the essential functions of law**

Policastro, Pasquale

University of Szczecin, Poland

The development of the legislation on new drugs requires a remarkable combination of different skills. The approach to the problem shall start therefore with the development of a language that is able to include all the results of the different specific approach within terms related to the values that law may protect. Secondly, the subsumption in legal terms of the phenomena observed by the various sciences shall be transformed into legal descriptions. A third step ought to be the proposal of „prima facie” approaches to the solutions to the dangers to the previously highlighted legal values. The development of a model „prima facie” has the following functions: a) to permit the development of a detailed approach to the legal protection against new drugs, making use and mutually balancing the different function, which law may permit to display: to prevent, to control, to sanction and eventually to punish; b) to permit a feed back for a discussion (and an eventual confutation) of the proposed solutions, consistent with the language of the different sciences involved; c) to check-up the coherence of the proposed solutions with the overall values protected by the legal order, such as (but not only) privacy, freedom of economic activity, right to a legal process and to adequate procedural guarantees. For the reason stated above, the „prima facie” legal approach may require a multilayered implementation, in particular at international level and the national level. The case of new drugs has a specific feature, which is its quick and non linear development. Such characteristics require a probabilistic approach to the legal issues related with new drugs, where the joint study of the intersection of the messages coming from the language of the different experts or related subjects: physicians, pharmacologists, psychologists, pedagogy experts, police authorities. A probabilistic legal approach requires therefore a special use of legal instruments, which may be implemented with time. This paper provides therefore examples related to the use of the Conventions of the Council of Europe and European Union directives as means for a dynamic approach to the law aiming to prevent, to control (to the purpose of limiting) and, where appropriate, sanction the phenomena related with new drugs.

PL10 **Cathinone, my problem child and its children****Szendrei, Kálmán***Department of Pharmacognosy, University of Szeged, Hungary*

The chemical and pharmacological ancestor of one of the prominent sub-families of “designer drugs”, cathinone (= (-)-2-aminopropiophenone) was born in 1974, out of an unprecedented international research project under a UN-WHO umbrella. Since repeated previous efforts for almost 100 years to track down the genuine active principle(s) of fresh khat leaves yielded no plant constituents with sufficient specific activity, no quantitative explanation for the reported stimulant power of the fresh leaves could be offered. This situation prevented any national or international move of classifying (or not) khat as an addictive drug. Therefore, an international project with voluntary participation of certain grower countries (Yemen, Kenya, Madagascar), and a network of renowned research institutions (Karolinska Inst., NIH, Dept. of Organic Chemistry Nottingham, etc.) was initiated by the UN Narcotics Laboratory in Geneva. Within two years, some twelve members of two different alkaloid groups were discovered, and subsequently characterized. Most of them were new natural products at that time. The alkaloid responsible for the bulk of the leaves’ CNS effects was identified as (-)-2-aminopropiophenone, a chemical which had been known for almost 100 years as a synthetic compound, but was never discovered in nature before. The trivial name cathinone was proposed for the alkaloid by this author (endorsed later for global use by WHO’s INN Committee, and scheduled in 1992 by the UN-CND as Schedule I psychotropic substance). Sufficient quantities of cathinone for the evaluation of its CNS activity profile were subsequently synthesized, and by 1978 cathinone was characterized as an amphetamine-like natural substance (“natural amphetamine”) through the close collaboration of five pharmacology laboratories (in Lexington, Tokyo, Rome, Sao Paulo and Budapest). The availability of cathinone soon triggered a myriad of research projects (phytochemistry, synthesis, pharmacology-toxicology) worldwide. Yet, repeated efforts to establish cathinone as a pharmaceutical aborted due to its chemical instability and an unfavorable risks-benefits profile. For the same reasons no significant popularity was predicted for cathinone as a potential future drug of abuse. However, such considerations did not prevent the use for illegal purposes of the published (and/or patented) synthetic routes leading to cathinone and to its simple derivatives. Methcathinone (“cat”) represented the “first generation” of cathinone-related derivatives marketed as a very popular illicit stimulant in many countries. Concerted efforts to restrict the principal chemicals used in the clandestine synthesis of methcathinone later shifted the interest of some supply side operators towards alternate drugs

within the same chemical group. The results are a handful of various “second generation” chemical relatives of the parent compound cathinone, and are termed today as “designer cathinones”. Considering such rather unusual history in the field of illicit drugs, further generations of cathinone-descendants may be anticipated...

PL11 **A brief history of MDMA (Ecstasy): with some lessons for mephedrone research**

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MDMA has been used as a recreational drug for around thirty years, whereas mephedrone is a comparatively new drug. This talk will provide a brief historical overview of MDMA or ‘Ecstasy’, describing how patterns of its use have changed over time. When first used MDMA was generally taken as a mono-substance, but now it typically follows a polydrug usage pattern. Dosage levels have increased, with early users taking single tablets, but bingeing now more typical. In terms of its neuropsychobiological effects, three periods need to be investigated: acute or immediate, post-drug recovery, and long-term or cumulative effects. In acute terms, MDMA is a powerful CNS stimulant, generating aspects of the serotonin syndrome and/or overheating, which can be medically dangerous. Its mood effects are generally euphoric, but can be negative or unpredictable. The post-drug recovery period of low moods and lethargy, is typically longer than with other CNS stimulants. The chronic problems of regular users include deficits in retrospective and prospective memory, higher cognition, problem solving, and complex visual processing. Immunocompetence, pain, sleep, and psychiatric vulnerability, can also be adversely affected. Serotonergic neurotoxicity was first identified in laboratory animals, and has been repeatedly confirmed in abstinent MDMA users, with reduced serotonin transporter (SERT) levels across all higher brain regions. Turning to mephedrone or 4-methylmethcathinone, this has become used as a stimulant drug under the street name ‘m-cat’. There is comparatively little evidence on its neuropsychobiological effects, but a range of cognitive and health deficits have already been reported, and its addiction potential seems far stronger. Hence the assessment tasks and experimental procedures developed for MDMA, have already proved useful for cathinone research. Finally, it should be emphasised that MDMA and mephedrone usage are still very atypical. The overwhelming majority of young people use neither substance.

PL12 **How can mephedrone substitute other substances: an analysis of the subjective effects**

Demetrovics, Zsolt

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Background and objectives: Ever since ecstasy (MDMA) turned up and spread widely, mephedrone is the first designer drug that could become popular and gain a constant position on the illegal drug market. The paper discusses which characteristics of mephedrone make the substance able to be a potential substitute of earlier substances primarily MDMA, other psychostimulants and entactogen drugs. **Methods:** 135 mephedrone users were recruited by snowball method. Mean age of the subjects were 24.3 years; 71% male. Respondents filled out a questionnaire concerning their substance use habits requiring detailed information on the subjective effects of mephedrone and the characteristics of its use. Answers regarding subjective effects have been analyzed by means of factor analysis. **Results:** The analysis revealed 6 factors of mephedrone induced subjective effects: positive emotion, sensibility, adverse somatic effects, adverse psychological symptoms, stimulant effects, psychedelic effects. A preference list of subjective effects indicates that mephedrone is popular primarily for its psychostimulant and entactogen effects. Most important results of the analysis concerning subjective effects of mephedrone show that this substance is able to mimic the effects of other popular psychostimulant and entactogen drugs and probably this is the point that makes mephedrone suitable to act as a potential substitute of other popular designer drugs.

PL13 **Spice and synthetic cannabinoids - how toxic are these new drugs?**

Auwärter, Volker

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Although in the last years an increasing number of synthetic cannabinoids, mainly of the aminoalkylindoles type, entered the drug market as a substitute for cannabis and many people consume these drugs, relatively little is known about their toxicity. Apart from affinities to the cannabinoid receptors type 1 (CB1) and 2 (CB2), only for a few compounds data on intrinsic activity is available. None of the compounds has been evaluated in a clinical trial. From clinical reports of intoxication cases it is known that these drugs show effects similar to cannabis in some aspects, but are markedly different in others. Some of the symptoms frequently seen after analytically confirmed consumption

of Spice products (without concomitant use of other drugs) like generalised seizures, hypokalemia and nausea/vomiting in combination with somnolence give cause for serious concern. Furthermore, recent results of toxicological tests using e.g. single cell gel electrophoresis (SCGE) assays, suggest a carcinogenic potential of some of the CB1 receptor agonists. Even though these data are preliminary, it can be concluded that synthetic cannabinoid receptor agonists present in “Spice” products show a significantly higher toxicity compared to cannabis and pose a serious threat to public health.

PRESENTATIONS IN PARALLEL SESSIONS

1/A. EPIDEMIOLOGY OF NOVEL PSYCHOACTIVE SUBSTANCES

PS8 **Stoners 2.0 and Experimental Psychonauts – An Online Survey on
“Legal High” Use in Germany**

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Centre for Drug Research, Goethe-University Frankfurt, Germany

Background and Objectives: Since the phenomenon of “legal highs“ and “research chemicals” gained more and more attention in the last few years, the German Ministry of Health funded an online survey on the use of these drugs, conducted by the Centre for Drug Research at the University of Frankfurt. The survey addressed people with experience in the use of legal high products. It is the first quantitative research project dealing with this group of drug users. The major goals were to gain insights into the specifics of legal high users, patterns of use (legal highs and other drugs), motivations for use and other aspects related to the consumption of novel psychoactive substances. **Method:** Users of all kinds of legal high products (e.g., “herbal incense”, “bath salts”, “plant feeders”, “research chemicals”) were contacted via online social networks such as Facebook, drug-oriented internet forums, prevention websites, online shops, and other internet media, asking them to fill out an online questionnaire. The questionnaire – online for 3 ½ months in summer 2011 – contained multiple choice as well as open questions and took about 10-15 minutes to fill out. The data was analysed using common statistical procedures. **Results:** 860 persons who have ever used legal highs completed the questionnaire. Presumably, rather experienced users were overrepresented in the sample. 99% had prior experiences with illicit drug use; more than two thirds were current cannabis users, and one third current users of other illicit drugs. Herbal incense was the most prevalent type of legal high products, followed by research chemicals and “bath salts” or other misleadingly declared products. A total of nearly 100 different “research chemicals” and about 200 different brand names of legal high products were mentioned by at least one respondent. The legal and rather easy availability was one of the most important motives for the use of novel substances, mainly for the users of herbal incenses. For a significant part of these persons, also the non-detectability of the active substances in herbal incenses had some influence on their motivation. On the other hand, legal issues were

much less important for current users of research chemicals – these persons were more focused on the experimental nature of novel substances.

German regions with a more repressive approach on drug policy and law enforcement were overrepresented in the sample, hence the greater risk and limited availability of illicit substances seem to be encouraging factors for (temporary) switching to legal alternatives. The acute dangers of novel psychoactive substances were reflected in the rather large amounts of respondents who have experienced side effects of legal high products – mainly tachycardia, headache, nausea and anxiety.

Conclusions: Most users of legal highs consume these products rather in addition than as a substitute for illicit drugs. This can be due to a (temporarily) limited availability of illicit substances, the fear of legal consequences, but also for the desire to experience a variety of drug effects. Several types of legal high users can be identified, ranging from occasional users, to “stoners 2.0” (using cannabis and herbal incenses alternately), to well-informed specialised “psychonauts”, experimenting with different kinds of effects of novel psychoactive substances.

PS34 **Patterns of use of legal highs in a sample of research chemicals users in Spain.**

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Background and objectives: There are a broad category of unregulated psychoactive compounds or products usually sold via the Internet or in smart shops or head shops. The online vending of new psychoactive substances appears to be expanding. Most of these substances are sold as “research chemical”, “legal alternatives to well-known controlled substances” or “legal highs”. They include a wide range of synthetic and plant-derived substances and products, including ‘herbal highs’, ‘party pills’ and ‘research chemicals’, many of which may be specifically designed to circumvent existing drug controls. There is a lack of scientific information on its pharmacological and toxicological properties. Our aim was to study the patterns of use of the new synthetic drugs in consumers.

Methods: This was a cross-sectional, structured survey that was included in specific drug forums on the internet. A total of 228 Spanish research chemicals users completed the survey. **Results:** The most lifetime consumed substances

were 2-CB (79.8%), 2-CI (39.5%), methylone (40.8%) and mephedrone (35.5%). Frequently combined these with cannabis (70.2%) and ethanol (66.2%). The combination of 2-CB and MDMA has been used by a 26.6% of the sample. Most subjects obtained the drugs from friends (79.4%) and internet (41.7%). They usually search information on drug-web pages (88.6%), commonly analyze the material in harm-reduction NGO's and use precision scales to dose. **Conclusions:** Research chemicals users are polydrug users with some differential characteristics from other populations of drug users. Acknowledgements: Founded by grants from Plan Nacional sobre Drogas (PNSD 2009I047) and Fondo de Investigación Sanitaria-ISCIII-FEDER (RTA RD06/0001/1009 and FIS PI11/01961).

PS16 **Trends in the use of psychotropic substances amongst high school students in Poland**

Zawilska, Jolanta

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Background and objectives: In recent years, a new class of “designer drugs” (known as “legal highs” or “herbal highs”) has been widely distributed as easily available psychotropic substances, and has become a serious problem in numerous countries, including Poland. “Legal highs” mimic psychoactive effects of illicit drugs of abuse. However, they are claimed to consist of compounds that are legal to sell, possess and use, and sold for purposes other than human consumption. No guidelines exist as to what is sold and in what purity. The rapid spread of these new psychoactive substances has forced the Polish authorities to revise their standard policy to the drugs problem. Amendments to the Drug Addiction Prevention Act, putting new illegal drugs of abuse on lists of banned substances, have been recently passed. The aim of this study was to determine the frequency of use of psychotropic substances among high school students shortly after the law-reinforced closure of stores selling “legal highs”, to collect data on access to them and self-estimated health problems related to their use. **Method:** Data was collected using a questionnaire survey in high schools, in Lodz, Poland, in November-December 2010. A total of 563 individuals (307 females and 236 males), aged 16-18, completed the survey. **Results:** The most popular substance of abuse was alcohol. Overall, 93.2% of the students reported the past-year use of alcohol and 73.7% - drinking alcohol during the last month. Alarmingly, a total of 9.4% of the study group reported the use of at least 5 drinks on more than 5 separate occasions during one month period. One third of the students smoked cigarettes. Marijuana

was the most widely used illicit drug (past year: 8.5%; past month: 11.7%) within the sample, and was frequently mixed with alcohol. A small group of responders reported the past-year use of amphetamine (1.2%), LSD (0.7%), and hallucinogenic mushrooms (0.9%). A total of 11.9% of these surveyed had used “legal highs” in the past year, and 2% in the past month (i.e. after the closure of smart shops). The most popular were “spice” products. Half of the “legal highs” users combined these products with alcohol. Irregular drinking of alcohol, smoking cigarettes, and smoking marijuana was considered as safe or relatively safe by 68.5%, 54.2% and 33%, respectively, of the responders. One third of students considered sporadic use of “legal highs” as not risky. The most commonly reported effects of “legal highs” were: mild euphoria, improved mood, relaxation, excitement, increased vigour and activity, increased heart rate, agitation, anxiety, insomnia, sweating. A small number of responders reported panic attacks, visual and auditory hallucinations. **Conclusions:** Although some individuals strongly criticized any actions to counter the spread of psychotropic substances, a significant number of students supported prevention strategies such as education programs, leisure and sport activities, group trainings aimed to reduce susceptibility to stress, to increase self-confidence and sociability; chatty lectures by health experts. Supported by the Medical University of Lodz (503/3-011-01/503-01).

PS11 **Legal highs in Poland; information needs of potential users and professionals.**

Moskalewicz, Jacek; Pisarska, Agnieszka

Institute of Psychiatry and Neurology, Poland

Background and Objectives: Over the last few years the use of “legal highs” among young people in Poland has become a problem which attracts the attention of public opinion, media and policy makers. The study, commissioned in 2010 by National Bureau for Drug Prevention, showed that most high school students had heard about legal highs and approximately 11% reported lifetime use of these substances, called in Poland “dopalacze”. Available data, however, suggests that knowledge about legal highs among the Polish population is limited or insufficient. The objective of the study, conducted in the frame of the ReDNet Project, was to assess information needs of young people and professionals and most preferred ICT tools for dissemination of such information. **Method:** Data collected on an opportunistic sample of 18 – 25-year olds (N = 105) and professionals who work with young people at risk of legal high use (N= 54). An anonymous questionnaire was completed during

lectures and conferences. An online survey among professionals is being continued. Results of these studies are to be presented and discussed at the conference.

PS59 **Early Identification and Rapid Reporting of New Drug Developments – the FøreVar/BEWS system**

Flesland, Liv

Bergen Clinics Foundation, Norway

Backgrounds and objectives: In 2002 the Bergen Clinics Foundation established Føre Var; a citywide “earlier warning” system geared towards the identification, monitoring and reporting of drug and alcohol trends in the city of Bergen, Norway. The primary aim for the system was the dissemination of earlier, more reliable information on new and emerging trends, to enable timely and more effective interventions. **Methods:** The monitoring system triangulates and cross-references a wide range of statistical and quantitative data including seizures data, treatment figures, alcohol sales, school surveys, internet sites, youth and local media, cultural mapping and key informants. Data is collected every six months, analysed for identifiable patterns and trends, and disseminated widely. As of September 2012, the BEWS was utilising approximately fifty drug-related indicators and had reported publicly on eighteen occasions. **Results:** This presentation details the system’s developmental stages and methodologies, in addition to summarizing results over a period of nine years. A special focus will be held on the identification of “new” drugs. **Discussion:** In conclusion, the strengths and weaknesses of the model, its replicability, as well as the potential advantages of a city-level network, are discussed.

PS60 **Diffusion of NPS among young people: results of a rednet study in Italy**

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The ReDNet project in Italy aims to survey the current situation on new psychoactive drugs among young people aged 18-24. Also, it aims to develop and

pilot a variety of innovative and effective ICT tools to disseminate information on new psychoactive substances among professionals and young people.

One of the latest drafts of the English questionnaires was translated into Italian and validated with the Ethical committee and a group of young people. Methods of administration were both pen and paper and online. A total of 315 questionnaires were completed by young people in schools, at university, and by young professionals. Results are being analysed.

Three innovative and effective ICT tools were developed in cooperation with the “Servizio Territoriale Dipendenze Patologiche (STDP)” of Macerata: the SMS antenna aims at sending texts to circulate updated information on new psychoactive substances (target group: 18–24 yrs patients of the STDP); within the Quiz Smart Challenge, two quizzes on Facebook were developed to assess knowledge and encourage young people to become more informed on new substances and usage; the ReDNet Communication action involved the creation and evaluation of four short videos, in cooperation with the Academy of Arts of Macerata, designed to raise awareness among young people and promoting wellbeing and creativity.

1/B. POLICY, LEGISLATION, & CO-OPERATION

PS45 **The emergence of Novel Psychoactive Substances (NPS) as a new challenge for EU legislation**

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This paper provides an overview of the current challenges on novel psychoactive substances (NPS) legislation and aims at considering three fundamental aspects of EU criminal legislation.

The first part covers the following questions on the general rule of law.

Do we have legislation on NPS? and if so, does current legislation provide a framework to define the concept of NPS as drugs? and to what extent does it go into detail and according to what parameters?

The second aspect to be examined is the role of judges in applying the legislation to single cases. What are the key aspects to be considered in relation to drug-dependence? Is there any special treatment for young people?

The third part intends to deal with the role of the European Union, taking

into account the present structure of legislation on criminal matters. What legal instruments are available and useful to fight drug trafficking, especially considering new substances coming to the market and replacing 'traditional drugs' on the Internet?

PS41 **Drugs control and open legal problems**

Cerri, Augusto

Sapienza University of Rome, Italy

The criminal justice system is governed, in Italy as elsewhere, by the principle of legality. However, the identification of drugs is primarily a technical matter that, in Italy, is entrusted to decrees of the Minister of Justice that the primary legislation refers to. Already at this stage, a problem arises with respect to the rule of law. The Italian Constitutional Court has denied that the reference of the law to Government decrees (i.e. secondary regulation) violates the said fundamental principle, but such an opinion is still under dispute.

The problems become even more complex when rapidly changing technologies and the fast dissemination of new synthetic drugs make the existing tool of the ministerial decree inappropriate and untimely. We need to find instruments meeting the rule of law which, at the same time, allow a continuous adjustment of criminal prosecution to such rapid changes.

The unprecedented pace in the diffusion of new synthetic drugs sometimes allows a drug to be conveyed through a product, which is originally intended for lawful uses. The manufacturer then tries to promote the presence of this substance through subtle means of advertising, thus circumventing the immediate criminal ban.

A problem of repressive control also arises, therefore, with respect to these advertising practices. In both cases the development of appropriate responses to the increasingly aggressive invasion of harmful substances cannot be the work of lawyers alone. An adequate response to these practices requires an interdisciplinary approach involving experts from different backgrounds.

PS14 **Be updated of new trends and emerging drugs with T.E.D.I. (Trans European Drug Information)**

Ventura, Mireia

Energy Control-ABD

T.E.D.I. (Trans European Drug Information) is a European database system that collects, monitors and analyses developments in different drug scenes throughout Europe and reports about it on a regular basis to the stakeholders. An international website where all organisations who carry out drug checking or work in this field will include their data: scientific information on new substances and adulterants, drug checking results, standards for analysis, alerts, trend reports and specific recommendations to improve the field interventions of first line projects.

TEDI is involved in the Nightlife Empowerment & Well-being Implementation Project (NEWIP). The NEWIP (www.safernightlife.org) project proposes responses to the new challenges in the fields of harm reduction and health promotion.

TEDI project (www.tediproject.org) was born from the mutual interest of several risk reduction groups that used drug checking as a tool for contact with drug users. In Europe, trends, drugs and partygoers move quickly from one country to another. In recent years the same warnings were detected in several European countries. Sharing the drug checking's data from several countries enables faster detection of the spread of dangerous substances, as well as new drugs on European territory.

One of the key issues of TEDI is diffusing the collected and relevant data to the stakeholders, which includes information about the analysed drugs: types, adulterations, new drugs and emerging trends. This presentation aims to present the TEDI project and to explain how to be involved with TEDI, in order to be updated on new trends and emerging drugs.

PS10 **Polish case of legal highs - actors, claims and it's hidden meanings**

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Institute of Psychiatry and Neurolog, Poland

Background and objectives: This presentation attempts to depict public discourse on legal highs in Poland. Among aims of this analysis is identification of all social actors included in media discourse, arguments used and claims made in the frame of social, political, economical, legal and moral issues. The

role of printed media in construction of the problem is considered. Social constructionist theory, as well as moral panic concept, mainly constitute the theoretical background of this study.

Method: This presentation offers outcomes of qualitative, empirical analysis of press articles focused on the theme of legal highs. This analysis covered two popular Polish daily newspapers (*Rzeczpospolita*, *Gazeta Wyborcza*) and two weeklies (*Polityka*, *Newsweek*) starting from January 2008 to May 2011.

Results: During the data analysis several groups of actors were identified. Among them scientists, legal highs industry representatives and its clients, health sector, governmental organizations and non-governmental organizations, politicians and media itself. Their opinions, claims and beliefs essentially shaped public discourse on legal highs. Every social actor presented in the media tried to draw public attention to its own claims. Given the context of legal highs, the oppressive law and demand for legalization of cannabis was stressed. According to this argument, phenomenon of legal highs was a side effect of the current, restrictive policy towards drugs and drug users. In turn, legal high dealers defend their interests by emphasizing exaggerated intervention of the government; inadequate to the scale of the problem and remaining at odds with the law. Review of actor's statements involved in the discourse show the wide spectrum of the problem perception, often contradictory but always trying to convince a wider audience, that their position is right. However in the discussion on legal highs, the voice of the audience was not present at all as the lay people perspective was simply neglected. Interventions against legal highs in Poland, especially the governmental agenda and Prime Minister Tusk position, seemed to be a reference to the notion of the welfare state that secure and govern the life of its citizens. This might be controversial due to the terms of the neoliberal contract that transformed the shape of public health and social policy and contributed to the privatization of risk, resulting in delegation of responsibility for health and the quality of life at the individual level. The Polish government's decisions delivered a message that the late-modern state has not lost its authority over the public goods and its function in the regulation of people's lifestyle and style of consumption has not been marginalized.

Conclusions: The printed media played a major role in the construction of the legal highs problem by setting the agenda – selecting those deviant or socially problematic events deemed as newsworthy, then using advanced filters to select which of these events are candidates for moral panic.

In the Polish case 'moral panic' was triggered by applying a few relatively simple procedures as: (1) appealing to the good of young people and presenting them as particularly exposed to legal highs; (2) linking the phenomenon of legal highs to the world of illegal drugs; (3) pointing to the rising trend of the phenomenon; (4) highlighting the ruthlessness and immorality of the opponent.

PS61 **Legal highs in Romania – the story of a failed drug policy****Simionov, Valentin***Romanian Harm Reduction Network (RHRN), Romania*

Sometime in 2007, the first sites selling „ethnobotanical” (aka legal highs, new psychoactive drugs/ NPD) products appeared in Romania, recommending synthetic drugs as room aromatizers, bath salts or fertilizers. In four years, online selling has become just one method of buying “legal drugs”: adult users could order “ethnobotanical” stuff for home delivery, buy them in so called “dream stores” or “smart shops”, a sort of coffee-shop – Romanian version. In the past two years, criminalization increased the public health risks and pushed legal highs onto the black market.

Drugs info: Injecting drug users (IDUs) population in Bucharest in 2010: 18,316 (National Anti-drug Agency, 2011); Legal highs prevalence: 1.9% (population aged 15-64 years old) (National Anti-drug Agency); HIV prevalence: 1% (National AIDS Commission); Hep. C prevalence (IDUs): 88% (UNODC); 36% IDUs in Bucharest switched from heroin to NPD.

The Romanian Government answered the legal highs pandemic by criminalizing 44 new substances and plants and by expanding the Ministry of Administration and Interior power on proposing new substances for criminalization.

By a dedicated law, based on the Polish law, the government is entitled to shut down any website which is selling NPDs, investigate and charge with drug offences any suspected retailer and imprison users on illicit possession charges.

What could be done: (1) increased surveillance over smart shops in order to control selling to underage clients; (2) information campaigns concerning the effects of NPD; (3) public debate on the current drug control system (as NPD clearly challenge the current system); (4) develop front-line harm reduction and emergency services; (5) increase data collection and processing capacity in order to keep track on the market development, NPDs effects and risks; (6) initiate training for medical and social workers.

Consequences of the current policy: (1) NPD went underground; (2) heroin is mixed with NPDs; (3) injection rates have tripled; (4) new HIV cases among IDUs increased to more than 100 cases, compared to 2010: 12 cases.

What can still be done: (1) evaluate the effectiveness of the current policy; (2) review the policy based on policy evaluation; (3) focus on controlling blood borne infections among IDUs; (4) improve NPDs monitoring system; (5) initiate professional training and information campaigns targeting young people.

PS30 Risk Reduction strategies on New Drugs, a Spanish experience**Fornís Espinosa, Iván***ABD-Energy Control*

The drug checking service of Energy Control aims to monitor the evolution of the content of synthetic drugs, identify new or dangerous substances and make contact with drug users. Since its foundation in 2000, this service has analysed more than 6000 samples and made contact with thousands of drug users.

In the course of these years we have seen how new substances appeared. In the beginning the new drugs were brought by users with experimental and expert profile. This group was quite restricted and small. With the scarce existent scientific data and the experience reports from users, we provided information to reduce risks and consumption guidelines to reduce damages and promote extreme caution.

On the past years both the number of new substances and the number of consumers have greatly increased. We believe that this increment is due to the occurrences of certain phenomenon in the illegal drug market such as the lack of MDMA, the banning of mephedrone, etc.

This presentation aims to show the evolution of the use of new drugs in Spain from the data obtained through our drug checking results and the telephone-online consultations. It will also present the tools of risk reduction that we are using to advise the users and the adaptations we have to make in order to avoid sensational news from the media without leaving users without information.

PS66 The Greek Early Warning System (EWS): A Mechanism for the Rapid Exchange of Information on Emerging Trends in Drug Use**Siamou, Ioanna***Greek REITOX Focal Point – University Mental Health Research Institute, Greece*

Aims: Description of the structure and the operation of the national EWS and of the emerging trends in drug use in Greece. The network of the Greek EWS was established in 1998 at national level consisting of various information sources: forensic laboratories, law enforcement authorities and treatment or low-threshold services. **Method:** Three semi-structured questionnaires were constructed for the collection of information on new substances, new ways of using already known substances and new combinations of substances. The

Committee of Experts assesses the collected national data annually. **Results:** Emerging trends in drug use in Greece: 1) New substances being notified in 2010 and 2011 (cathinone derivatives, synthetic cannabinoids, tryptamines, piperazine derivatives, etc) and their national legal status. 2) The outbreak of methamphetamine use (street name: SISA) among drug users (immigrants, young people, heroin users) frequenting open drug scenes in Athens in 2011. **Conclusion:** The Greek market on new psychoactive substances appears to follow the trend regarding the increasing number of new substances circulating in recent years mainly in the countries of central and northern Europe. On the other hand, the local emerging drug phenomena confirm to an extent the unique characteristics of each member state drug market.

1/C. DRUG TESTING & ANALYSIS

PS13 **Using pooled anonymous urine collection from stand-alone urinals in the night-time economy to determine what “recreational drugs” people are actually using**

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Background and Objectives: There has been a significant change in the drugs used in the night-time economy over recent years, with increasing use of novel psychoactive substances (often known as “legal highs”). Current information on the epidemiology of established classical use and novel psychoactive substance use is often based on user's self-report of drugs use. This data may be unreliable, as users are often not aware of what drug(s) that they have used, and studies have shown that both Internet and street-level purchased drugs often do not contain the intended drug(s). Analysis of biological samples, such as urine, allows more accurate determination of the drug(s) being used. However, this

is logistically difficult due to the issues of obtaining informed consent for urine sample collection from an individual. This study was designed to determine the feasibility of collecting pooled anonymous urine samples using a urinal system for detecting the use of both classical and novel recreational drugs.

Methods: A portable study stand alone four-person male urinal was set up within a screened off external area during two promotions of a large south London night club during July 2011. Use of this urinal was anonymous and voluntary, and nightclub attendees had the option of using either this external study urinal or one of the standard toilets within the nightclub. Pooled urine samples were taken during each promotion and stored for analysis at 4°C. Samples were prepared for analysis in each of the collaborating laboratories using solid phase extraction, liquid/liquid extraction and dilute and shoot techniques. Analysis was undertaken by liquid chromatography coupled to tandem mass spectrometry (LC-MS/MS) and liquid chromatography coupled to accurate mass high resolution mass spectrometry (Orbitrap and Time of Flight (TOF)). The acquired data were processed automatically against databases containing over nine hundred drugs and metabolites representing prescription, over-the-counter, and classical and novel recreational drugs.

Results: A total of 72 parent drugs and their metabolites were detected, which could be divided into i) classical recreational drugs; ii) novel psychoactive substances; iii) potential adulterants (e.g. diltiazem, levamisole, caffeine, quinine); and iv) prescription / over-the-counter medications that could have been used legitimately or misused. The classical recreational drugs detected were morphine, methamphetamine, amphetamine, cocaine, MDMA and ketamine. Metabolites of cocaine (benzoylecgonine, ecgonine methyl ester, cocaethylene), amphetamine (hydroxy-amphetamine), ketamine (dehydronorketamine, hydroxynorketamine, norketamine and desmethylketamine) and MDMA (3,4-methylenedioxyamphetamine, 4-hydroxy-3-methoxy-methamphetamine), were detected, indicating actual use of the drugs. The novel recreational drugs detected were mephedrone, GHB (gamma-hydroxybutyrate), GBL (gamma-butyrolactone), TFMPP (3-Trifluoromethylphenylpiperazine) and 2-AI (2-aminoindane); metabolites of TFMPP and mephedrone were also detected again indicating use of the compounds. **Conclusions:** This is the first study to show that analysis of pooled collection of urine from a urinal at a nightclub is feasible and offers the ability to detect both classical and novel recreational drugs. We feel that as the sampling modality does not require individualised consent and the results cannot be traced back to anyone individual who has eliminated urine into the study urinal, there is the potential to further develop this technique to look at the pattern of drugs being used within discrete environments, such as a night-time economy venue, music

festival and school/college. In addition, there is the potential to study trends in patterns of drugs detected across geographical areas and/or across time.

PS17 **The trends of the abuse of designer drugs and their legal status in Japan**

Kikura-Hanajiri, Ruri; Uchiyama, Nahoko; Kawamura, Maiko; Goda, Yukihiro

National Institute of Health Sciences, Japan

Background and Objectives: In recent years, many analogs of narcotics have been widely distributed as easily available psychotropic substances and have become a serious problem in Japan. To counter the spread of these non-controlled substances, the Pharmaceutical Affairs Law in Japan was amended in 2006 to establish a new category; “designated substances” in order to more strictly control these psychotropic substances. Now, there are three main steps in the control of drugs in Japan. These are “non-authorized pharmaceuticals”, “designated substances” and “narcotics”. In this presentation, we show the trends of the abuse of these drugs and their legal status in Japan, focusing especially on synthetic cannabinoids and cathinone derivatives. **Method:** More than 1200 products sold in Japan were collected from head shops or via the Internet from 2002 to 2011. Their MeOH extracts were analyzed using GC-EI-MS and LC-ESI-MS. The identification of unknown compounds was mainly done by NMR and TOFMS analyses. **Results and Conclusions:** In April 2007, 31 compounds and 1 plant were first controlled as “designated substances”. Before 2007, the major compounds distributed in the Japanese illegal drug market were tryptamines, phenethylamines (such as the 2C series) and piperazines. Alkyl nitrites, such as isobutyl nitrite and isopentyl nitrite, were also widely distributed in Japan. After they were listed as “narcotics” or “designated substances” in 2007, these compounds, especially the tryptamines, quickly disappeared from the market. In their place, cathinone derivatives have been widely distributed, as well as different phenethylamines and piperazines. Since 2008, herbal products containing various synthetic cannabinoids have also been widely spread. We found at least 23 synthetic cannabinoids and 23 cathinone derivatives in the products. Additionally, methoxetamine; a derivative of ketamine (an NMDA receptor antagonist) appeared in 2011. As of November 2011, 69 substances (including 1 plant; *Salvia divinorum*) are listed in the category of “designated substances”. They were 13 tryptamines, 27 phenethylamines including 10 cathinones, 4 piperazines, 16 synthetic cannabinoids, 8 other compounds and 1 plant. After 11 synthetic cannabinoids were newly controlled as designated substances in 2011, their new analogs such as CB-13, AM-2233, AM-1220 and

other novel compounds have quickly appeared, and emergency hospitalization caused by synthetic cannabinoids remarkably increased in 2011. To avoid health problems and abuse caused by new designer drugs, we have to continuously monitor the distribution of these products through surveillance.

PS20 **Poly-drug use with new psychoactive drugs**

Elliott, Simon

(ROAR) Forensics Ltd, UK

Background and Objectives: Since the explosion in substituted phenylethylamines and tryptamines, psychoactive drug chemistry has led to alternative groups such as piperazines and cathinones being used as a basis for the next generation of drugs of abuse. Following the initial popularity of mephedrone (4-methylmethcathinone) and arguably due to subsequent control, new variants have become available as well as other framework drugs (e.g. 2-aminoindane and substituents). **Methods:** As part of our forensic toxicology investigations (fatalities, criminal casework, drugs driving, drug-facilitated sexual assault, etc) between January 2010 and December 2011 we have detected new psychoactive drugs in 92 cases. Non-targeted and targeted analysis involves U/HPLC-DAD, LC-MS/MS and/or UHPLC-QTOF-MS. **Results:** Those detected in in life or post mortem blood and urine are, in order of frequency; Mephedrone (54 cases), BZP (14), TFMPP (10), 4-Fluoromethcathinone (8), MDPV (7), 4-Methylethcathinone (6), Methylone (4), Naphyrone (3), 4-Methylamphetamine (2), Alpha-Methyltryptamine (2), Butylone (2), Desoxyipradrol (2), MDAI (2), 2-AI (1), 5-IAI (1), 5-MeO-DALT (1), D2PM (1), MDPBP (1), Methoxetamine (1) and Pentylone (1). Other drugs or alcohol were detected in 80% of the cases including other new psychoactive drugs and in fatalities it should be noted that alternative causes of death (including mechanical suicide, accidental death and non-psychoactive drug overdose) accounted for the majority. In one particular fatality, 5-iodo-2-aminoindane (5-IAI), alpha-tryptamine (AMT), 5,6-methylenedioxy-2-aminoindane (MDAI), methoxetamine and methylone were all found but this was atypical. Other drugs found in order of frequency; Alcohol (31 cases), Cocaine (16), Amphetamine (14), Diazepam (13), Morphine/Heroin (12), Cannabis (11), Citalopram (7), Ketamine (6), Levamisole (6), Lignocaine (6), Methadone (5), Ibuprofen⁴, Amitriptyline (3), Fluoxetine (3), Mirtazapine (3), Paracetamol (3), Venlafaxine(3), MDMA (2), Olanzapine (2), Quetiapine (2), Sildenafil (2), Buprenorphine (1), Chloroquine (1), Carbon Monoxide (1), Ephedrine (1), GHB (1), Haloperidol (1), Lamotrigine (1), Lorazepam (1),

Nitrazepam (1), Quinine (1), Tramadol (1), Trimethoprim (1) and Zopiclone (1). **Conclusions:** Of particular note was the relative high frequency of other stimulants (notably cocaine and amphetamine) and that in only around 10% of cases were the new designer drugs the sole agent, suggesting that most users were not naïve to recreational drug use.

PS49 **Overview of the use of psychoactive substances in Serbia**

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Background and Objectives: The use of psychoactive substances in Serbia has been steadily increasing over the last three years. The Republic of Serbia has 7,5 million population (excluding Kosovo and Metohija) and a surface area of 88,361 km². **Methods:** Analysis, detection and interpretation of psychoactive substances is carried out in any one of three regional Forensic centres – in Beograd, Novi Sad and Nis. With the increased number of illicit drug users, particularly amongst young adults, there is an immediate need to raise the awareness of the dangers of abuse of psychoactive substances and its prevalence. It is notable that new types of psychoactive substances are emerging rapidly and updating the current legislation so as to widen the existing approved psychoactive substances list is a priority. In 2011, The National Forensic center in Serbia detected some 39 different, potent psychoactive substances that are not on the list of officially approved psychoactive substances. **Results:** In the last six months, amongst detected substances, mephedrone and synthetic cannabinoids (JWH-type) have appeared a few times and in locations in Serbia. MeOPP and Fluoro-amphetamins have only sporadically been detected. **Conclusions:** The qualitative analysis of the chemical structure and type of psychoactive substances needs to be fast and efficient (results released within 48 hours) for which reliable and accurate equipment is a necessity. More research in future would need to look into the type and frequency of illicit drug use amongst the users (influence of age and gender), traffickers and ways of raising awareness of the harms and health implications of abuse of psychoactive substances, particularly in young people.

PS63 **Counterfeit medicines: an analyst's perspective****Assi, Sulaf***The School of Pharmacy, University of Hertfordshire, UK*

Background and objective: Medicine counterfeiting is a global problem that has been expanding markedly over the last number of years. According to the World Health Organisation (WHO), "Spurious/ falsely-labelled/ falsified/ counterfeit (SFFC) medicines are medicines that are deliberately and fraudulently mislabelled with respect to identity and/ or source". In fact, medicine counterfeiting can occur with both branded and generic products, different drug classifications such as life-style and life-threatening medicines and anywhere in developed countries, developing countries, the wholesale supply chain and the Internet. A counterfeit medicinal product can contain a range of inactive substances to toxic and lethal substances. It is imperative to distinguish substandard medicines in this case; which are genuine drugs that fail to fulfil the quality specifications set for them by regulatory agencies. If they are deliberately and fraudulently labelled, then these medicines are counterfeits. The objective of this work is to inspect the different types of counterfeit medicines obtained from various parts of the world market as well as the Internet using near-infrared (NIR) and Raman spectroscopic techniques.

Method: Medicine products were obtained from both the Internet and different sources of the world market including pharmacies, hospitals, clinics, street markets and through the wholesale supply chain. The countries these products were purchased included: Australia, Egypt, France, Ghana, India, Korea, Lebanon, New Zealand, Switzerland, Tanzania, Turkey and the United Kingdom. Products were measured as received without sample treatment using NIR and Raman spectroscopic techniques with laboratory based and handheld instruments. Spectra were exported and analysed by Matlab R2007a using multivariate classification and regression methods. The classification methods included correlation in wavelength space (CWS) and principal component analysis (PCA) methods; whereas the regression method included partial least square regression (PLSR).

Results and discussion: To counterfeit a branded medicine product, not only the chemical makeup of the product should be matched, but also the physical properties such as excipients, particle size and water content. As NIR spectroscopy can look at both physical and chemical properties of the sample; it was applied for authentication of a branded test products. The results showed that the use of both CWS and PCA methods simultaneously was successful in identifying counterfeit medicines products such as Cialis, Levitra, Lipitor, Plavix and Viagra products. The method was able to identify 17% of potential

counterfeit products from the open market, 12% from the Internet and 9% from the whole sale supply chain.

However, this method was not possible with generic medicines due to the diverse set of excipients among different products. The questions raised in this case are: Does the product contain the active pharmaceutical ingredient (API)? If yes, at which dose? NIR with multivariate regression analysis methods such as partial least square regression (PLSR) was successful in quantifying the API in generic medicines within accuracy of 5%. Another approach successful in analysing generic products was Raman spectroscopy that looks only at Raman active species in a sample. In fact, most APIs are known to be Raman active; whereas excipients are inactive. Consequently, PLSR and Raman spectroscopy were successful in quantifying the API in generic tablets but the method stayed semi-quantitative in nature (accuracy within 30%). The method were transferred to handheld NIR and Raman instruments which offer the flexibility of carrying the laboratory to the sample; thus, cutting down analysis cost. The use of both in-built instrumental algorithms and offline analysis were successful in identifying counterfeit Cialis, Levitra and Viagra tablets. **Conclusion:** Medicine counterfeiting is a rapidly expanding problem that can be encountered anywhere in the world and can occur with both branded and generic medicines. The use of NIR and Raman spectroscopy with chemometrics serve as a powerful tool for identification of these medicines.

PS31 **Monitoring RC composition, use and supply among users. A challenge for prevention. Results of SINTES monitoring device in 2011**

Lahaie, Emmanuel

French Monitoring Center on Drugs and Drug Addiction, France

Background & objectives: The French NFP launched a national-wide monitoring device (SINTES) in 1999 enabling the collection of substances from users and to provide a laboratory based analysis of their real composition. Since the first analysis of mephedrone in the beginning of 2008, the SINTES monitoring device has been paying a special attention to the Research chemicals (RCs). Its main objective is to analyze the real composition of the collected substances according to their modalities of uses. The secondary objectives are the spreading of the information on these new substances available on the Internet toward the traditional psychoactive substance users; to estimate the ratio of reselling (trafficking) compared to the general amount bought through the Internet; to better uncover the labels used for reselling and, finally, to document the substances used in association and the experienced effects

reported by the users. **Methods:** The SINTES collecting device includes a hundred collectors, permanent or temporary (outreach field workers, social assistants, health professionals from hospital background, treatment centres or harm reduction facilities), nationally wide-spread.

The criterion of inclusion is defined as any psychoactive substance unknown or supposedly new, or having induced any particular health problem. The collections do not aim at being a representative sample of the supply at a national level. They depend on the availability of any given substance and the opportunity given to a collector to access it. **Results:** In 2011, 25 out of a grand total of 140 substances collected within the SINTES framework were presented as RC. The remaining substances were constituted of MDMA, heroin and cocaine. 14 were analysed for the first time in France. 75% of the collections took place out of the party scene. In 60% of the cases, the user bought the substance directly through the Internet, while the remaining 40% bought it from a dealer. The average price was 30€ in both cases but the average quantity bought was 0.8g to the dealer and 3g through the Internet. The analysis confirmed the sole presence of the expected substance in 38% of the cases when bought directly through the Internet, vs. 62% when resold. Another single substance was analysed in 17% of the cases, and at least two were found in 35 % of the case. **Conclusions:** Even if the spreading of RC is far from reaching the level of more traditional illicit substances, unlike 2009 these new substances are not misrepresented as amphetamines or MDMA. They now spread under their own labels, are sold by dealers who becomes the only source of information to the user. The importance of reselling off the Internet tracks should be taken into account in the making of information messages toward the community of users. Moreover, the composition chemical analysis should not be restricted to the orders made on the Internet.

1/D. PREVENTION, COUNSELLING, & HARM REDUCTION

PS12 (II) Legal highs – current situation and challenges for users and social workers in the drug field

Kettner, Antje; Graubaum, Daniel ; Schroeder, Katrin

Drug Scouts, Germany

Drug Scouts are a German based project that was established in 1996 by a group of young people from the party scene who came together, collected

and spread information about legal and illegalised substances in clubs and at parties. Now it works as an NGO which is supported financially by the youth council of Leipzig. The project offers party intervention work, counselling via phone, web and face to face and hosts the most popular website on drug related issues in the German speaking area (<http://drugscouts.de>). The target group is young recreational drug users. Drug Scouts are also one of the main partners of the NEW Implementation Project (NEWIP).

Drug consumption patterns among young people equal those of most European cities; however there is - as in many East German towns close to the Czech border - a high level of Methamphetamin use. During the last two years (il)legal highs became an important topic among users and social workers in the area. Through talks on parties, via mail counselling and via the experience reports published on the website we get a very good insight into users needs and interests. However, reaching out to users offering harm reduction strategies and information proves to be more difficult when it comes to (il) legal highs. There is a lack of information concerning (long term) side effects or risks of drug mixing. Users report unexpected effects or crises when consuming drugs they normally know well (like XTC) because the pill or powder contains research chemicals. This situation causes a certain level of insecurity among users. Still, people are ready to take more risks when it comes to legal highs; in fact, they actually consider legal drugs less risky as such. In addition, legal aspects are discussed wildly among users.

Based on our observations of the user group and their needs approaches to the target group were developed taking scientific findings but also user's opinions into account.

The presentation will focus on user's needs and interests as well as approaches that are in use. In addition, challenges the new situation poses to social workers in the drug field will be introduced. Additionally, ways and also problems in communicating with authorities and public stakeholders will be discussed.

PS18 **Drugwatch – an approach to standardising EWS's**

Linnell, Michael

Lifeline, UK

Front-line staff who work with people who use drugs often receive 'warnings' about drugs, that are passed on by the police, hospitals and from one service to another. These warnings are sometimes inaccurate and are nearly always unverifiable. Increasingly in this age of instant communication, warnings

are supplemented with information cut and pasted from user forums or news outlets, without any way of checking the accuracy or appropriateness of the message. For instance, telling the clients of drug services in one area, that a 'legal' drug being used in another area is 'very strong', can be, at best, counterproductive. Equally, staff who work with people who use drugs pick up information about new, 'bad' or adulterated drugs without any clear and consistent mechanisms for reporting this to other professionals or the clients themselves.

A plethora of 'Early Warning Systems' (EWS) have been set up in response to NPS's. Some of these simply aim to indentify new compounds and then pass that information on to policy makers for them to ban it. This we know can simply lead to more dangerous drugs appearing on the market and anyway, seems to make little difference if a drug is genuinely popular. The use of ketamine for instance has doubled in the UK, since 2006, when it went from being a 'legal high' to an illegal drug.

DrugWatch is an informal network of charities, organisations and individuals working in the UK drug treatment field. It was set up as a bottom up initiative in response to the lack of any systematic, accurate or practically useful warning system during the 2010 heroin drought and in response to the new psychoactive substances now on the market. DrugWatch covers both the more traditional illegal drugs as well as 'newer' substances that may still be legal, as in reality people who use drugs use both, often at the same time.

DrugWatch was set up to find a way of creating a system that is of a practical use to drug workers and people who use drugs. We are not aiming to supplant other EWS, as apart from anything else we are presently doing this work without any funding. Our main aim is to promote both standards and a standardized way of recording and reporting concerns about new or adulterated drugs. We aim to promote an approach to providing new or adulterated drug information in a standardized, verifiable format that comes from a variety of sources: drug workers, people who use drugs, drug forums, hospitals, police, drug analysis etc, as well as existing EWS or mechanisms. We are also looking at ways of weighting and distributing this information and providing advice to the appropriate target group. The ultimate aim of DrugWatch is to reduce the potential for harm to people who use drugs.

The author will describe the DrugWatch initiative and offer some thoughts about the limitations and practical uses of an EWS for those who work with people who use drugs.

PS25 **Novel prevention models and harm reduction methods from the drug users' point-of-view**

Móró, Levente

Centre for Cognitive Neuroscience, University of Turku, Finland

Over the last few years, drug use habits have been characteristically changed by the rapid emergence of dozens of novel psychoactive substances (NPS). In the wake of this significant change, drug policy makers and authorities often stand surprised and unprepared for the phenomenon. However, for certain drug user subcultures, the NPS boom was quite evident and long expected. Unfortunately, from the „official side” there seems to be an inherent reluctance to communicate with drug users, who are often dismissed as either criminals or addicts/patients.

Contrary to conventional views on drug users as passive and helpless victims, there exist numerous active self-organized drug user groups, where predominantly moderate and non-problematic drug users provide harm-reducing drug information and peer-help to each other. In Hungary, such a group is DAATH, the Hungarian Psychedelic Community, comprising more than 9000 online registered members since its debut in 2001. In trying to minimize some of the potential dangers of drug use, DAATH has been informing and educating drug users by providing various online and offline services, such as maintaining an Ecstasy pill database, and distributing drug field-testing kits. However, the emerging NPS phenomenon has also transformed the needs for drug-related help, pushing drug users towards innovative prevention and harm reduction methods.

By an in-depth look, the NPS phenomenon can be seen as a straightforward convergence of multiple failed drug policy paradigms, double-moral societal concepts, uncontrollable e-commerce, emerging internet communication technologies, and 21st century youth culture. In order to develop efficient prevention models, the mechanisms that led to the current NPS situation should be better understood, mistakes should be accepted, and lessons should be learned. The lifecycle of drugs - whether becoming popular or sinking into oblivion - cannot be stopped by force, but their course may be partially affected by carefully chosen interventions.

Based on a decade-long participative observation in drug user subcultures, my central claim is that the NPS phenomenon should be primarily addressed as a cultural and economical issue, and not as a legislative and public health issue. In my presentation, the timeline and history of NPS will be briefly reviewed, along with an analysis of forces that may potentially affect the phenomenon. Using DAATH's activities as an example, I will review some of the earlier drug

user self-help harm reduction models, describe the actual problems with NPS, and suggest novel prevention models and harm reduction methods - from the drug users' point of view.

PS32 **Possible responses to the trend of new psychoactive substance use within counselling, addiction prevention and legislative measures**

Kociper, Karl

ChEck iT!, Austria

ChEck iT! is a project for recreational drug users based in Vienna (Austria). The general aim is to prevent problematic consumption patterns and avert or reduce short, middle and long term adverse health consequences. Users of psychoactive substances and potential users are provided with information and counselling in the sense of prevention, harm and risk reduction. Check iT! runs a counselling centre and offers a target group adequate on-site service: information, counselling and drug checking directly at electronic music parties.

The consumption of new synthetic drugs has risen in recent years. At the beginning of the century ecstasy and speed were still dominating the scene. During the last three years we observed a trend towards the so called Research Chemicals. Their properties are poorly studied. Little is known about psychoactive effects, toxicology, long-term effects, possible lethal doses, and the consequences of overdoses. Hence the trend towards these new substances poses an incalculable risk to drug users.

This presentation focuses on working with users of the new drugs and methods of risk reduction.

What are possible responses to this new trend within counselling, addiction prevention and legislative measures (a review of the Austrian law on new psychoactive substances issued January 2012)?

PS54 **Dealing with new drugs and trends on Flemish-Belgian dancefloors, Vitalsounds' point of view**

Boone, Bert

Vitalsounds, Belgium

Harm reduction and peer support in the Flemish party scene: Seven years ago the Vitalsounds project formed in response to the need for safer partying on

Flemish dancefloors. One of our missions is to provide adequate information about substances and their effects. High risk substance use is increasing: a variety of new drugs, combinations and form of consumption are rising. Vitalsounds follows the path of the party people and goes to all kinds of raves, parties, clubs and festivals. On our infostand our PartyPeers provide objective information about (il)legal drugs, hearing damage and sexuality, combined with harm reduction tools like sniff kits, EWS-messages, condoms and ear plugs. They meet and listen to people with a non-judgemental attitude. Our peers have a background in different subcultures and provide the project more credibility and access to underground scenes that are hard to make contact with. A lot of “weekend consumers” are unreachable trough ‘common’ prevention projects, and few of them take measures to reduce health risks.

Movements on the dancefloor – new products+trends in recreational use: People will look for sensations and an ecstatic state of mind at the weekend, right here & right now! Often partygoers will use drugs to reach this state of mind. Beside the more common products, they will also experiment with new or rare substances that are available on the market. An important task of our project is to keep up with these movements.

So how do we keep up with these trends? First of all, the conversations and our anonymous questionnaires at the infostand are very important. Secondly, meetings and focus groups with our peers from different scenes are also a reliable source to find out what’s going on in ‘the ever-changing world of psychoactive drugs’. A third way to keep up with trends and new substances is an intensive follow-up of specialised drug forums. Through all these channels we spot trends like an increased use of DMT (+variants) and MDMA crystals.

Problems and challenges: First of all the wide variety of psychoactive substances available on the market poses a great challenge for peer-based harm reduction projects. There is a lack of scientific research regarding the active compounds of these products, which makes it hard to provide adequate information to the partygoers. There is also a gap between the field workers and researchers, and the research that is done, doesn’t always reaches the professionals in the field. The lack of drug-testing possibilities is another problem that we face. More drug-testing possibilities would be a big step forward to give more detailed information and detect unknown or dangerous compounds. There are too few warning messages about dangerous or high-dosed substances that reach our target group. Often the media spreads panic-mongering messages to the general public, seeking sensation. The future? (1) More cooperation between researchers, prevention, harm reduction and treatment projects (top down meets bottom up), (2) More specific communication about new products/dangerous compounds etc. through specific channels that reach the target group; (3) Develop consultations on

location (early intervention, motivational intervention, drug- testing. ...);
(4) Further development of harm reduction projects in response to trends in substance use.

More stable funding for harm reduction projects?

PS57 **Prevention challenges: Distinguishing universal and selective prevention in school based and community based interventions**

van der Kreeft, Peer^{1,2}

¹*De Sleutel De Sleutel*

²*University College Ghent, Belgium*

The ReDNet project delivers an important contribution to information on emerging and new drugs. Knowledge on drugs is necessary for potential drug consumers to estimate the risk. The skill of risk estimation is a protective factor for development of dependence or other drug related problems. It is in this perspective a priority to bring the information to the potential users. In the design or choice of interventions it is however necessary to distinct populations for universal and for selective prevention. Providing information on substances to a wrong target audience might cause iatrogenic or negative effects, so that must be avoided.

The ReDNet output of fact sheets are typical instruments for a selective prevention approach, and the intermediate professionals should use their expertise to deliver this information to the high risk groups and not to groups that are not in contact or not at high risk for contact with the drugs at stake. It is easily said, but less easily done. Good practices, mostly found within community based interventions, point out quality factors for this selective prevention.

There are also interesting ingredients in the ReDNet and other internet-based information initiatives for universal prevention. The obscure area where the legal and illegal substance components are acquired is an area where all young people should be cautious: legal is not synonym of safe is a universal prevention message. In universal prevention the traditional setting is the school, we will also describe in what type of programs such prevention will be most effective.

2/A. RISKS & CHARACTERISTICS OF NPS

PS9 **Subjective, adverse effects and presence of psychedelic phenethylamines (“2C-X”) in the recreational Spanish drug market (2006-2011)****Caudevilla, Fernando¹ ; Bouso, Jose Carlos² ; Ventura, Mireia¹ ; Fornís, Iván¹; Riba, Jordi²**¹*Energy Control, Spain*²*Centre d'Investigació de Medicaments, Servei de Farmacologia Clínica, Hospital de la Santa Creu i Sant Pau, Barcelona, Spain*

Background: 2C-x is a general name for psychedelic phenethylamines containing methoxy groups on the 2 and 5 positions of the benzene ring. These drugs have been occasionally detected in recreational settings over the last two decades, but it seems that their use is becoming increasingly popular as rave and club drugs. **Objectives:** To investigate the presence of 2C-x in the illicit drug market in Spain in recent years, to describe their patterns of use among recreational drug users and to assess their profile of subjective and adverse effects. **Material and Methods:** We searched the database of the drug analysis service of Energy Control (a Spanish NGO focused on risk reduction in recreational drug users) between January 2006 and December 2011. Participants were recruited from among users who had submitted any sample of 2C-x for analysis. Users were invited to participate in a study evaluating their pattern of use of these drugs and the subjective effects elicited by them. Socio-demographic data, number of consumptions, route of administration, consumption context, used doses, duration of the experience, drug source, simultaneous use with other drugs and satisfaction with the experience were collected in a specifically designed written questionnaire. It includes three lists of 15 questions to which participants have to give yes/no answers to characterize the experienced acute psychological effects, acute adverse effects and subacute adverse effects. **Results:** In the 6-year period, 292 samples tested positive for any 2C-x compound, with an increasing tendency with time. Samples were sent from 14 of 17 Spanish regions. The most frequently detected compounds were 4-bromo-2,5-dimethoxyphenethylamine (2C-B, nexus) (n:181, 61.98%), 4-ethyl-2,5dimethoxyphenethylamine (2C-E) (n:32, 10,95%) and 4-iodo-2,5-dimethoxyphenethylamine (n: 28, 9,58%), 8 additional compounds were detected. 193 of the 292 samples were in powder form, the

remaining 98 were in tablets (94 tablets with 8 different logos containing 8.1 ± 2.3 mg of 2C-B, 4 tablets of the same brand containing 5-10 mg of 2C-I). Presence of 2C-B tablets showed a sustained tendency with time. We obtained 56 valid questionnaires. Participants showed high rates of illicit drug use in the previous month. 2C-B was preferred by 72.41% of the sample. Most of them have used 2C-x occasionally (76.78% between 1-4 times), but 85% reported their intention to use them in the future. Most participants took the drug orally but intranasal use was used, at least occasionally, by 21.42%. Typical settings of use were recreational environments (clubs, parties and raves) (58.92%), followed by home use with friends (37.5%), at home with a partner (35.71%) or in the countryside (14.28%). Regarding subjective effects, changes in tactile, visual and auditory perception were the most frequently reported. 73.21% of the sample reported having experienced some unpleasant effect during the acute experience. Insomnia, anxiety and the involuntary reoccurrence of the experience ('flashbacks') were the most frequently adverse effects reported. A case of hyperthyroidism probably related to 2C-I ingestion was detected. **Conclusions:** We confirm the presence of 2C-X in the illicit market of recreational drugs in Spain between 2006 and 2011. Our data suggest that these drugs, and particularly 2C-B, are consistently accessible to users. The high frequency of tablets as a presentation form for this drug suggests that 2C-B distribution may have become more professionalized, possibly now using the distribution channels used for ecstasy. Participants reported a series of acute unpleasant effects. Some of which are possibly related to sympathetic activation, others may be dose-dependent or idiosyncratic. Additional research is needed on the pharmacology of these substances in order to assess the potential health risks associated with their use.

PS19 **Simultaneous polydrug use: Mephedrone and alcohol use in context**

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School of Sociology, Social Policy and Social Work; Queen's University, Northern Ireland

Background and Objectives: Research shows that the consumption of multiple psychoactive substances can extend to both "recreational" and problem drug use. Commonly referred to as polydrug use, our interest here is with simultaneous polydrug use, i.e., the consumption of two or more psychoactive substances during the same drug episode, with episodes occurring over a relatively brief timeframe (e.g., 12 hours or less). Simultaneous polydrug use can be planned, spontaneous or have elements of both processes. Research

conducted in several countries suggests that alcohol might represent the most frequently consumed substance during episodes of simultaneous polydrug use. However, simultaneous polydrug use that involves alcohol appears to differ across cultures and across drug scenes within cultures. The focus of this paper is on the simultaneous use of alcohol and mephedrone. Although previous research has identified this pattern of use, considerably less is known about the social meaning that users attach to the behaviour and the contexts in which it occurs. This line of inquiry is important; biochemical interactions between alcohol and other drugs have been linked to adverse health effects.

Method: This paper draws from two qualitative datasets, based on samples of individuals who had used mephedrone following the introduction of legislative controls over the substance. Both studies utilised semi-structured interviews with individuals aged 18 or older. Study participants resided in urban or non-urban areas of Northern Ireland, and included males and females, all with a history of drug taking before initiating mephedrone.

Results: Nearly all respondents had consumed alcohol during the most recent mephedrone episode, however, the amount and timing of alcohol use varied across respondents and social contexts. We identified three general patterns of mephedrone/alcohol mixing: 1) Party folk, 2) Sippers, and 3) Remedy makers. Most respondents were categorised as Party folk who ingested relatively large amounts of alcohol during the mephedrone experience. Most Party folk reported that the mephedrone/alcohol episode was planned. A few other Party folk reported that their mephedrone use was nearly always unplanned, and that using mephedrone was influenced by “alcohol-fuelled courage.” Unplanned mephedrone use was often accompanied by greater use of alcohol. Using alcohol and mephedrone during the same session was not generally viewed by Party folk as “mixing drugs.” Sippers tended to more interested in experiencing what they perceived to be the full effects of mephedrone, rather than experiencing the confounding effects of mephedrone and alcohol. Remedy makers were few in number and we considered them to be sample outliers in this study.

Conclusions: The majority of respondents initiated and continued to use mephedrone while having little knowledge about the pharmacological implications of mephedrone or its combined use with alcohol. “Heavy” alcohol use in general has been described as normative behaviour. Coupled with alcohol’s legality, it is not generally viewed as a psychoactive substance, and certainly not described as a drug. The health implications of mixing mephedrone and alcohol need further investigation. In the present study, some of the Party folk believed that mephedrone “cancels out” the effects of alcohol. Moreover, the ability to drink alcohol without experiencing its full effects was perceived as beneficial. Like other stimulants, mephedrone might mask the effects of alcohol, which might encourage individuals to continue

drinking or drink larger amounts in order to alter the state of consciousness. The limitations of the study are discussed.

PS28 **Changes in substance use patterns in the injecting drug user population in Budapest**

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²*Doctoral School of Pathology, Semmelweis University, Hungary ;*

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Background and Objectives: The goal of the present study was to reveal whether the emergence of MDPV (Methylenedioxypropylvalerone) has any effect on the substance use patterns in the injecting population. To examine the possible influence of MDPV we planned a “snapshot” survey among the clients of the largest needle exchange program running in Budapest, Hungary. The needle exchange program is located in one of the poorest districts of Budapest. At the end of 2011 it had more than 2500 registered users, while the estimated number of IDUs in Hungary is 5700. We know from previous research, that the clients of the NEP are socially disadvantaged, with low educational attainment and poor labour market situation, and of Roma origin. The rate of HCV among the clients of the NEP is the worst in Hungary: approximately 70% compared to the national level of 23%. **Method:** Based on our former research experience in this population we planned a short questionnaire with three simple questions, easy and quick to answer. The first question aimed to reveal what kind of drugs the person injected in the past 30 days. Question 2 asked about the age of starting injecting regularly. Question 3 asked about the first substance that the person injected regularly. Besides these questions all clients were interviewed when entering the programme and provided the following data: year of birth, sex, primarily injected substance and place of residence. All clients are registered with an anonym code. The data collection was made by the staff of the NEP. The team members were instructed to ask every IDU entering the programme to answer our questions. Participation in the study was voluntary and anonymous; neither participation nor refusal had any influence on the treatment. The study was approved by the Institutional Review Board of the Eötvös Loránd University. Data collection was carried out in a one month period between 13 September, 2011 and 15 October, 2011. During this period all clients entering the program was asked to participate in the study. During the data collection period 407 IDUs visited the program of which 183 provided valid questionnaires (response rate 45%). **Results:** the structure of the primary injected substances among the IDUs using the NEP

was relatively stable in the previous five years. About two-thirds injected amphetamine and one-third injected heroin. The present survey showed a complete restructuring of this picture. 45.9% of the respondents mentioned amphetamine as the primarily injected substance and another 48.1% reported to inject primarily MDPV. Only 4.4% mentioned opiates and 1.6% other substances. If looking at the answers given for the question about the first regularly used substance, we can follow the switches occurred in the preferred substance (Figure 2). Close to half of the former amphetamine (64 persons; 45.1%) and opiate (10 persons; 41.7%) users switched for MDPV, while 78.6% of those using other substances (cocaine, mephedrone) did the same. At the same time none of those who started to inject MDPV (only 3 persons) changed for any other substance. The question remains whether the different injecting groups differ according to the measured characteristics. In this regard we found no significant difference between the two major groups (amphetamine and MDPV) according to sex (chi-square: 2.366; n.s.), age, place of residence, time of injecting or time of using the NEP. **Conclusions:** The emergence of novel compounds caused radical changes, the IDUs using these substances extensively. The users shift more quickly from one substance to another than the appropriate answers could evidence. The lack of information and evidence based methods in harm reduction and treatment is a major difficulty for service providers. Therefore new approaches might be needed to respond more quickly to this phenomenon.

PS38 **Cathinone-related mortality: khat, mephedrone and related novel psychoactive substances and their role in deaths – the UK experience**

Corkery, John Martin

The School of Pharmacy, University of Hertfordshire

This paper will present an overview of the work undertaken in the UK to establish a solid evidence base on the relationships between khat, mephedrone, and related novel psychoactive substances to mortality. The processes of case criteria and classification, case identification and verification, data sources and collection activities will be explained, emphasising the ethical and practical considerations that have to be met. Up to date information from the National Programme on Substance Abuse Deaths will be presented showing what is currently known about these substances with regard to their associations with fatalities, and the gaps in knowledge that remain. The implications of the lack of information about these substances, especially in a period of increasingly rapid changes in drug supply and consumption patterns, will be

outlined in respect of approaches to treatment, education, prevention, and regulation.

2/B. QUALITATIVE METHODS IN STUDYING NPS

PS27 **Purchasers of new drugs online: who are you?**

Martinez, Magali; Cadet-Tairou, Agnès

OFDT, French Focal Point, France

Background and Objectives: The interaction between three elements is considered: users of psychoactive substances, the development of new synthetic drugs and the internet. They have changed dynamics in the field of drugs. These changes have led us to consider the identities of people who use Research Chemicals purchased online. New and accessible drugs on the internet may imply that the people who use them have newly or previously unobserved characteristics. For example, access to the internet and holding a bank account means that those people have a different socio economic level than users usually seen in drug treatment centers. The work conducted by the OFDT on new drugs and the internet aims to develop observation tools using qualitative research methods. Emphasis is placed on the new drugs and users with their characteristics. The objective is to get acquainted with the identities of consumers and their relationship with specific substances. **Methods:** The internet is especially relevant for observation, given that contacts and exchange of information among users of new synthetic drugs occur online. Qualitative analysis was performed on two francophone users' forums with a focus on methoxetamine (MXE) threads. A total of 29 discussions on MXE with 738 posts were considered. All types of virtual data were saved: textual, avatars, videos, citations/signatures. Analysis is based on grounded theory and the utilization NVIVO as supporting software. The first aim was to draw a substance fact sheet on MXE. Along the way, as similarities between users appeared, other indicators were developed to highlight trajectories, relationship with the substance and cultural references. **Results:** Analysis based on monitoring of MXE threads reveals the following: (1) Users are mostly male, RCs are often consumed in private settings, at home for example, alone or by pairs; (2) Consuming RC requires prior information (how to dose and administer) and a certain level of knowledge. Absence of information somewhere else than on these sites, means that people use these sites to obtain it. There is a real effort to acquire relevant

information with the view to understanding the risks involved. There is also an interest in scientific and academic sources to understand the effects of the substance (pharmacodependance, tolerance, neurochemical mechanisms); (2) There is a sense of being part of a pioneering community of users while acting as a consenting ‘guinea pig’; (3) Substances and patterns of use are chosen so that experimentation will not impede sociability in public or festive settings (for example due to motricity or behavioral problems). **Conclusion:** The main limit of this study is that the sample may not be as representative as needed: The target is only made of French people, clearly expressing themselves on forums, using relevant references about the chemicals names of the compounds. The silent majority, who only read the threads, and those who usually purchase “branded drugs”, have to be taken into account. Nevertheless, some elements appear to be significant. The accessibility of synthetic drugs on the internet highlights a not well known category of users. They are employed or are studying; some have a family life, and are mainly non problematic drug-users. Those consumers may not stick to the usual cliché that users of recreational drug are linked to night life environment. They share the need to learn more about the product and its specifics schemes of consumption. This may be one of the reasons explaining the poly consumption, as being part of a strategy to control their own dependence on drugs. In the mean time, they claim to be responsible drug users and express a different image than the one usually associated to a drug user.

PS29 **Initiation into Salvia Divinorum Use among Youth: Implications for the Emergence of Legal Highs**

Kelly, Brian

Purdue University, USA

The use of unscheduled substances has grown considerably among young people over the past two decades. A wide range of substances – including tryptamines, synthetic cannabinoids, phenethylamines, and drugs such as salvia divinorum – have piqued the interest of young people looking for novel or alternative highs. Many of these drugs have hallucinogenic properties. Salvia divinorum is an intense but short acting hallucinogen legally available for purchase in many states within the U.S. Based upon qualitative data generated from a qualitative study funded by the U.S. National Institute on Drug Abuse, this paper examines the patterns and processes by which young people initiate into the use of salvia divinorum. The author assesses the social and psychological contexts underlying these initiation experiences. Drawing from the initiation

experiences of young people using *salvia divinorum*, the author explores the implications of the use of this drug on the phenomenon of legal high use more broadly. These implications extend from the local moral worlds these youth inhabit to the broader global contexts in which their lives are situated. Ultimately, the author examines the potential public health impact greater attention to legal highs may have on patterns of drug use more broadly.

PS62 **Characteristics of GHB use in a mixed clinical and non-clinical sample**

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Introduction: Today, characteristics of GHB (*gamma-hydroxybutyrate*) use and the potential role of this substance in sexual and acquisitory crimes are frequently mentioned issues, and yet, there are not many studies aiming to explore the characteristics of GHB use. The goal of our study was to (1) identify the characteristics of GHB use, to (2) explore the motivational background of use, and to (3) reveal the subjective and somatic effects of this substance.

Methods: 48 GHB users were interviewed, who were recruited via the Clinical Toxicology Ward of the Péterfy Sándor Street Hospital and by snowball sampling. **Results:** Regarding the first GHB use, 91.7% of the sample has been given GHB for free, most frequently from a close acquaintance or a friend (47.9%), and the majority of the sample has tried GHB for the first time with several friends (64.6%) in a disco or a house party (37.5%). Regarding current GHB use, 78.3% of the subjects still purchase the substance for free, and get the drug primarily from a friend or via the internet. The most significant locations of GHB use are house parties. Most of the subjects nearly always or always use GHB in order to experience altered state of consciousness (31.9%), and the most frequently mentioned subjective effect of this substance is pleasant mood. With regard to comedown effects of the substance, it was found that 17.8% of the sample nearly always or always experience fatigue and weakness on the next day of the GHB use. As for the GHB's effect on sexual life, 34% of the subjects nearly always or always experience sexual unscrupulousness when they are using GHB. Along GHB use, majority of the sample often uses marijuana/hashish, ecstasy, and cocaine. **Conclusions:** GHB use became popular in Hungary on one hand in connection with the recreational scene, while on the other hand

there is another popular form of consumption isolated from this field (house parties). Besides its preferred effects users of the substance report numerous adverse effects, which makes the perception of the drug ambivalent.

PS67 **Trends in online sales of new drugs**

Solberg, Ulrik

European Monitoring Centre for Drugs and Drug Addiction

In recent years the internet has become a dynamic marketplace for supplying non-controlled psychoactive substances. In response to this development, attempts have been made to monitor this new marketplace. The European Monitoring Centre for Drugs and Drug Addiction (EMCDDA) has therefore developed a methodology to carry out ‘snapshots’ of the online new drugs market. The presentation will present the development of this ‘snapshot’ methodology as well as findings. The results from these snapshots show that online vending of new psychoactive substances/‘legal highs’ appears to be expanding at an unprecedented speed. In January 2010 170 online new drugs shops were found who were willing to ship their goods to at least one EU Member State. By January 2011 that figure had almost doubled to 314 which then doubled in just six months to 630 in July 2011.

The factors behind this are difficult to ascertain. However, they may include an increase in online vending in response to growing market demand or expansion resulting from the closure of physical smart shops (for instance, in Poland). Notably, almost a third of the over-600 sites identified in January 2011 appeared to originate in the USA, with the number of US-based sites tripling since January 2011. Caution is required, however, as while Internet monitoring may provide some insight into the online availability of ‘legal highs’,

what remains unclear is the actual size of the Internet market and the extent to which drug users are choosing to access the web as a main source of supply.

Internet monitoring of online sales is still in its infancy and has a number of limitations. The very size and scale of the Internet precludes the possibility of comprehensive monitoring of drug-related content. Conversely the challenge posed to legislative bodies and regulatory agencies by new psychoactive substances/‘legal highs’ online vending is unlikely to diminish in the near future, necessitating increasingly sophisticated and flexible monitoring mechanisms capable of following this particularly dynamic and expanding phenomenon.

2/C. PHARMACOLOGY & NEUROPSYCHOLOGY
OF NOVEL PSYCHOACTIVE SUBSTANCESPS24 **How do Novel Psychoactive Drugs Work? Mode-of-Action Analysis by
Combining Machine Learning and Bioactivity Database Knowledge****Mohd Fauzi, Fazlin; Koutsoukas, Alexios; Bender, Andreas***Unilever Centre for Molecular Science Informatics, Department of Chemistry, University of Cambridge, UK*

Background: The line between psychoactive prescription drugs and illicit psychoactive substances is often hard to define; the separation is not defined by science but by consumption patterns and legal decisions. Decisions on which compounds belong into which category often depend on time (heroin was used as a cough suppressant) and place (cannabis is today treated differently in different legislations). Therefore, there is a need to define the mode of action (MOA) of compounds early on; to define which receptors a compound modulates, its potential misuses, side effects and ultimately what it can be used for in both a clinical setting and in an illicit manner. Generally, this is a challenge as drugs acting on the Central Nervous System (CNS) often show polypharmacology, making it difficult to have a clearly defined MOA for psychoactive drugs. Hence, we employ the use of our computational ‘target prediction tool’ which, given a chemical input structure, is able to anticipate the pharmacology of a compound on a human being (both its effects and potential side effects). This tool is based on the ‘chemogenomics principle’ to explain the MOA of a compound given the chemical structures and phenotypic readouts. The goal for illicit drugs is to estimate its abuse potential early on and to fully explain pharmacological effects observed in human for prescription drugs. **Objective:** The objective of our work is to utilise the chemogenomics principle; relating ligand chemistry to target structures to anticipate the effect of a chemical compound on a large set of receptors, and hence both its use and abuse potential. This knowledge can then be employed to judge early on whether a novel compound coming onto the market (both ‘street’ and clinical market) is likely to exhibit particular effects and side effects, which has implications both for legislation as well as future prescriptions of drugs. **Methods:** The target prediction tool is based on chemogenomics principle where similar targets share similar ligands. By analysing a group of ligands that

binds to a group of related targets, we can determine the prominent structural features for a group of related targets using machine learning methods such as the Naïve Bayes classifier. Consequently, the potential targets for an unknown compounds annotated with phenotypic readouts can be predicted based on structural similarity to the established structural features of ligands recognised by the group of related targets. **Results:** In our experiment, we were able to reproduce the targets for compounds where the bioactivity profile is well known. Two of these; Lysegic Acid Diethylamide (LSD) and Oxycodone are examples of psychoactive compounds. The target prediction tool in most cases predicts the right target for the compound in question; LSD is well established to modulate a set of G-Protein Couples Receptors, while Oxycodone binds to a set of opioid receptors which were all properly predicted by the tool. FK506-binding protein 1A has not been reported to bind to Oxycodone, hence this target was given a low score among the top 5 predicted targets. **Conclusion:** Given the size of current bioactivity databases, we can employ computational algorithms to anticipate the bioactivity spectrum of illicit drugs early on. This knowledge can be used to guide our assessment of novel compounds and to anticipate uses and abuses of drugs, as well as the potential of side effects and impact on legislation as well. In our future work, we will analyse the relationship between chemical structure and bioactivity space for illicit drugs and prescription drugs in more detail, with the aim to explain phenotypic effects on multiple levels, and also to impact drug discovery (to find the desired chemical matter to have the desired effect) and to rationalize the potential of drugs of abuse in order to support legislation of chemical substances using appropriate scientific methods.

PS26 **The Aminoindanes: The Search for 5-iodo-2-aminoindane**

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The aminoindanes are a group of Novel Psychoactive Substances (NPS) that have recently appeared in internet legal high products. Although considered as NPS they first appeared in the scientific literature in the early 1990s when synthesised by David Nicholls. Despite this, little is known about their pharmacology and toxicology. Internet products containing aminoindanes are sold as either the named NPS or as named products that give no indication of the NPS content. Here we report the analysis of a range of both types of products purchased during 2011 and early 2012 focussing on the two popular NPS, 3,4-methylenedioxy-2-aminoindane (MDAI) or 5-iodo-2-aminoindane

(5IAI). The analysis was carried out using infrared spectroscopy and gas chromatography-mass spectrometry in both electron impact and chemical ionisation mode. MDAI appears to be widely available and is the main NPS in products sold as named MDAI. Surprisingly 5IAI does not appear in any of the products tested. However these often contain either other legal NPS or controlled substances.

7 **Prospective memory impairment in former users of methamphetamine**

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Objectives: The present study assessed how prospective memory (PM) is affected in former methamphetamine (MA) users. **Methods:** 30 adults with a history of MA (average duration of use, 2.7 years) who have fulfilled the diagnostic criteria of DSM-IV-TR and are currently engaged in rehabilitation and abstinent for an average period of 6 months, were recruited through the rehabilitation clinic in Semnan city, Iran. A control group of 30 participants with no history of substance abuse were also recruited. The prospective memory questionnaire (PRMQ), and PM task were administered. **Results:** MA users were significantly impaired on the measures of PM. In addition results showed that in all measures of PM, the control group had superiority when compared with MA users. **Conclusions:** PM deficits are associated with MA use and have potentially important implications for rehabilitative practice.

PS22 **Subacute encephalopathy caused by manganese compounds used for ephedrone production**

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Background and Objectives: This presentation contains preliminary results (case descriptions, preliminary findings) of ongoing research on severe subacute encephalopathy caused by manganese compounds (potassium permanganate) used for ephedrone (methcathinone) production from medicines containing pseudoephedrine (Sudafed). In last 1.5 years, shortly after the introduction of a restrictive „anti-legal-highs” policy in Poland, a

rapid increase of the number of severe encephalopathies among drug users was observed. **Methods:** Patients with symptoms of manganese induced encephalopathy were assessed by psychiatrist, neurologist (Levin's Scale), neuropsychologist (neuropsychological battery test + hand writing assessment). Level of manganese in blood and urine was determined and MRI of brain was made. **Results/Findings:** The leading syndrome was manganese induced parkinsonism (MIP), but many additional brain impairments were found: severe dysarthria, duck gait, postural muscles tension disturbances etc.

Many different neuropsychological abnormalities were found. The majority of patients had brain abnormalities in MRI T1 weighted scans: common was T1 increased signal in globus pallidus, but in some patients abnormalities in other brain regions were localized. In the majority of cases levels of manganese in the blood was elevated, in one case up to 7 times. This seems to be independent of current or past manganese compound use. Blood/urine manganese ratio was high, which means that manganese is very slowly eliminated. **Conclusions:** Limited possibility of treatment will be discussed. An increased number of severe manganese induced encephalopathies in a context of the Polish „anti-legal-highs” policy will be discussed, too.

2/D. NEW APPROACHES IN THE TREATMENT OF NPS USE

PS4 **One year results from a UK specialist club drug clinic. Who presented and what are they using.**

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Background and objectives: The Club Drug Clinic is the UK's only open access, multidisciplinary service delivering treatment specifically for club drug problems. Club drugs are considered to include legal highs, Ketamine, Cocaine, Mephedrone, GBL/GHB and crystal methamphetamine. The service is staffed by doctors, psychologists, nurses, sexual health specialists, drugworkers and volunteers. It is based in Central London and people can self refer from anywhere in the UK.

The clinic objectives include: (1) Test the feasibility of providing a specialist service; (2) Explore the acceptability of a range of psychological and

pharmacological interventions; (3) Understand the characteristics of those presenting for help; (4) Describe the types of substances used by attendees; (5) Examine the outcomes to treatment. **Methods:** The clinic has been promoted at club venues and Universities as well as through a variety of media. The clinic has used mobile telephone technology to disseminate information about the clinic and to improve access to treatment. People may self refer via email or telephone call or be referred by their local doctor. The Clinic has developed specific data collection tools to measure treatment outcomes including TOP, GAD-7, PHQ-9 and patient satisfaction ratings. **Results:** Since the clinic opened, 115 patients have been accepted for treatment. The majority were male and homosexual. The average age was 35 years (range 19-55). The majority of attendees were employed or studying. Strikingly, two thirds had not previously presented for help with substance misuse. The primary substance was described as GBL, Crystal Methamphetamine, Ketamine, Cocaine and Mephedrone. Co-morbid psychiatric illness was common with depression being the most common diagnosis followed by Anxiety Disorder. Considering treatment, structured psychological interventions were the commonest followed by specialist prescribing. Community detoxification for GBL/GBH was undertaken in 33 patients. The analysis of outcome is ongoing and initial findings will be available shortly. **Conclusions:** Early evidence suggests that an 'open access' specialist club drug service is a feasible and acceptable model. The main problem substances included GBL, Methamphetamine, Ketamine, Cocaine and Mephedrone with polysubstance extremely common. Problematic MDMA and legal high use was uncommon despite widespread recreational use of these substances. The high number of treatment naïve attendees suggests that the clinic is penetrating new populations, particular in the LGBT community. The high levels of psychiatric co-morbidity suggest a poor prognosis. However, retention and outcomes have been encouraging with club drug specific psychological and pharmacological interventions proving beneficial for most attendees.

PS40 **A stepped care approach to reducing harm and supporting recovery**

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Crew are a Scottish drugs charity established in 1992 using a peer education model. With Scotland being described as the cocaine capital of the world (World Drugs Report, 2010) and poly drug use common amongst psychostimulant

drug users, emerging trends with new psychoactive substances have become a key issue in Scotland and the wider UK.

Crew has developed a model of practice which is described as a Stepped Care Approach to working with people around substance use. Its key elements are that it is easily accessible, person centred, is proportionate to wherever someone may be in their substance use and crucially doesn't wait until people become problematic users before engaging with them. This approach has been applied to issues such as the emergence of new psychoactive substances to recovery support initiatives and utilises advancements in new media alongside more traditional support methods.

Successful interventions have been pioneered here in Scotland by Crew which provide an effective preventative agenda alongside treatment and recovery development. For too long there has been a false dichotomy between harm reduction and recovery. Crew's system is holistic and marries harm reduction with recovery orientated services including recovery support.

The author will share Crew's experiences of trends in new psychoactive substance use, the challenges facing front line workers in Scotland and the development of a low threshold, needs led service in response to such emerging trends. They will also explore tools for the dissemination of credible information which informs policy, practice and the general public. Utilising new media, online assessment and support, counselling and recovery support are all areas that Crew uses to engage with people thinking about or already using new psychoactive substances.

PS6 **The Sexualised Use of Crystal Methamphetamine and GBL in LGBT Populations**

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An alarming new global trend has been developing around the use of Crystal Methamphetamine and GBL; that being the increased sexualised use of these drugs in MSM (Men who have Sex with Men) populations. While charities for gay men are familiar with this epidemiology, statutory drug services that recognise the dangers of opiate and crack cocaine, are often ill-equipped to address these problems.

The Antidote service at the charity London Friend is the UK's only substance misuse service targeted at the LGBT (Lesbian, Gay, Bisexual and Transgender) community, and has approximately 1,000 people in treatment each year; 70% of these are using crystal methamphetamine and/or GBL

(Gammabutyrolactone) in a problematic sexual context, and our links/communications with international LGBT services suggests the same trends occurring elsewhere. Though these numbers are small compared to the wider community, UKA&E departments and sexual health clinics have been overwhelmed with presentations of this sort and have been forced to seek specialised training and to form better relationships with LGBT charities to cope with their increased presentations.

The dangers of Crystal Methamphetamine are well-documented; the increased injecting use, HIV and Hepatitis C risks, crime, and the psychosis with which it is associated. The epidemiology of GHB/GBL is perhaps less documented, but is associated with fatal toxicity/overdoses as well as very dangerous physical dependence and very problematic withdrawals that can also be fatal. Drug services are still struggling with successful treatment protocols for detoxification from this drug.

Both of these drugs are widely used in LGBT populations, mostly by MSM to facilitate sex. This is a community of people for whom sex is very often associated with shame, guilt, disease, sin and rejection; where homosexual relationships, love and intimacy is not taught in schools, role-modelled by parents or widely represented positively in the media, but often learnt from pornography, word of mouth and singles bars. Large communities of MSM are using drugs to feel liberated from the stigmas and shame, and to gain a sense of entitlement to the enjoyment of sex that they are otherwise unfamiliar with. Many among this group report being unable to experience sober sex at all.

Traditional treatments provided at statutory drug services have very poor outcomes with this patient group, as they focus on crime, homelessness and generic relapse-prevention strategies. Innovative treatments need to be employed that address the Web's social networks used to find sex-partners (for what is widely known as "Chem-sex"), addressing the shame and stigma associated with sex and intimacy, HIV stigma, motivational interviewing techniques that address the ambivalence around safer sex practices as well as very close working relationships with Genito-Urinary clinics, HIV and Hep C services.

The purpose of this presentation is to raise awareness of the growing epidemiology of these drugs; the pharmacology, context of use and the tailored treatments that are required to obtain positive outcomes. It would also be an opportunity to invite debate and seek input on how to improve treatment for this patient group while also sharing some of the obstacles and successes we've had in working with this group. And finally, to explore some of the issues around misunderstood minority groups and sexual behaviours that may challenge us as professionals working with this group.

PS58 **NPS as a new challenge for clinical professionals: an online survey in Italy**

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Background and Objectives: Novel Psychoactive Substances (aka ‘Legal highs’ or ‘smart drugs’) are advertised online as “safe” and “legal” synthetic analogues of controlled illicit drugs. As the case of Mephedrone recently suggested, for physicians and health professionals a new, rising challenge exists in identifying intake, effects and symptoms of these heterogeneous classes of compounds, in order to avoid misdiagnosis, erroneous treatments or medical errors. **Methods:** The ReDNet online survey collects data from European health professionals regarding their expertise and knowledge about NPS. The data presented here refers to the Italian sample, which was the pilot group of our investigation. The survey was offered to Departments of Addiction, Psychiatry, Paediatrics and Emergency Room Services in Italy. **Results:** The Italian sample recruited 241 respondents, mostly from Departments of Addiction (35%) and Psychiatry (28.4%). Transversally the health professionals interviewed self reported poor knowledge about NPS, minimal level of information and frequently (26.7%) they did not know if their patients had used novel compounds. On the other hand the phenomenon of NPS is not a rare event in Italy and health professionals suggested a high psychopathological risk with a particular concern for psychomotor agitation. **Conclusions:** The ReDNet online survey is the first questionnaire posed to European health professionals regarding the relevance of NPS in their clinical activity. The Italian respondents revealed a limited expertise on novel compounds but judged this new phenomenon very relevant to their clinical practice, reporting serious concern for medical and psychopathological consequences in their patients and clearly asking for more reliable source of information.

PS64 **Use of tramadol and tilidine by patients in inpatient detoxification treatment**

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Background: There has been an increase of the prescription of opiate analgesics in Germany during the last 20 years. Regarding the non-scheduled analgesics

tramadol and tilidine in particular, there is the suspicion that the increase in prescription indicates at least partly an increase of abuse of these drugs. One risk group for the abuse of opiate analgesics is patients with an addictive disorder in their history. **Methods:** In this study patients of two wards for the detoxification treatment of alcohol addicts and opiate addicts, respectively, were interviewed once a month in the context of a routine ward round about the life-time use of opiate analgesics. In addition, in case of a history of use the dosage, the duration of use, the medical indication or the personal aim, respectively, and the source of the drug (physician, black market etc.) were documented. **Results:** In total, 262 patients were seen in the ward rounds during the observation period. Due to recurrent admissions there were 209 different persons. 90 of them (43%) reported 139 episodes of the use of an opiate analgesic. 71 reported on a use of tramadol or tilidine. Regarding age and sex, users of opiate analgesics were not different from the remaining patients. In most cases the use of opiate analgesics was limited to a period of up to 1 month. The most important reasons were medically indicated pain relief or temporary use of opiate analgesics as an illegal substitute for heroin by opiate addicts. The mostly used preparation was oral tramadol solution. **Conclusion:** A strong minority of patients of two detoxification wards had experience with tramadol and tilidine. However, cases of long-term and possible addictive use were rare.



POSTERS

PO15 **Drug prevention using a novel legislative solution in Sweden**

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A new legislation that concerns the destruction of certain substances of abuse hazardous to health was implemented in April 1st 2011 in Sweden (SFS 2011:111). The law aims to prevent the use and distribution of hazardous substances that are not yet regulated or in a process to be regulated as narcotic drugs (SFS 1992:860) or as substances hazardous to health (SFS 1999:42).

For a substance to be destroyed certain obligations in The Act (2011:111) on destruction of certain substances of abuse hazardous to health must be fulfilled: (a) the substance has been declared as narcotics or hazardous to health in an ordinance not yet in force; (b) the substance has been internationally controlled under the 1961 Or 1971 UN Drug control conventions but not yet in force; (c) the substance can be presumed to become regulated as narcotic substance of abuse or hazardous to health by the Swedish government.

Police and Customs have, according to the law, the right to dispose of a substance awaiting the decision from a prosecutor. A prosecutor is responsible for the decision of destruction after an inquiry and a statement from the Swedish National Institute of Public Health (SNIPH) or in some cases the Medical Protection Agency.

For the substance to be destroyed it is required, apart from the conditions above, that it can be assumed that there is an intention by the user of intoxication and therefore a risk of harm or death. There are currently 35 public prosecution offices in Sweden where one prosecutor in each office is mainly working with this legislation as well as ten Customs prosecutors at three main locations.

To be able to investigate if the substance can be destroyed a report regarding the identity of the substance is needed from The National Laboratory of Forensic Science or the Swedish Custom laboratory. A statement is also required from the National Institute of Public Health in Sweden (SNIPH) confirming that the substance can be assumed to be classified as narcotics or hazardous. SNIPH has two working weeks to make the statement with an obligation to start a classification process within approximately one year.

All matters are handled according to The Administrative Act (SFS 1986:223) and are not viewed as criminal offences. Certain protocols must be used and the

decision can be appealed to court. In order to facilitate the prosecutor's work and to inform the general public all statements from SNIPH are published on the public webpage <http://www.fhi.se/Tillsyn/Klassificering/Substanser-under-utredning-infor-framstallan-om-klassificering-som-narkotika-eller-halsofarlig-vara/>

SNIPH estimated that the new legislation would add 600 cases concerning destruction of psychoactive substances to the workload annually. So far after nine months under the new legislation, 20 new substances have generated over 40 statements and more than 100 decisions about destruction. Due to the lack of analysis capacity at the labs the handling of cases is delayed. Several hundred seizures are in the pipeline and are expected to be handled under the new legislation.

PO21 **A case report: Ketamine as lucid dream inducing drug taken as an alternative to cocaine**

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Cocaine addicts can take a low dosage of ketamine to contrast cocaine adverse effects. The ketamine is an antagonist of NMDA receptor, which causes psychedelic effects similar to those of the near-death experiences (NDEs). In 10–45 minutes you may feel dissociated from your physical body and floating above it, in a sort of “lucid dream”. Higher doses may even cause: 1) dazzling insights, 2) hallucinations, 3) dissociative effects, also known as the “K-hole”.

Case report. When S.S. started the Therapy, he was a 25 years old, unemployed high-school graduate. He joined the Addiction Centre (Ser.T.) after 7 years of cocaine addiction. The cocaine use gradually increased from occasional to daily in 4 years. When his parents discovered his addiction, he started to take massive quantities of substance, losing control. At that time S.S. inhaled ketamine to limit cocaine side effects. His parents decided to bring S.S. to the Ser.T and he started the therapy: the aim of S.S. was to control cocaine abuse by limiting its use to the weekend. He was monitored by urinary test and treated weekly with Cognitive Behavioral Therapy (CBT). He regularly attended the Ser.T and he stopped using cocaine. In the 4th month of therapy S.S. relapsed in a massive abuse of cocaine. In the last year he was totally cocaine abstinent, but 2–3 times per month he inhaled medium doses of ketamine to induce dissociative experiences, using them to stop anxiety and to escape from reality. *Outcome evaluation.* The aims of the treatment were: the identification of personality disorders and their cognitive status; the first A7 test showed a

schizoid trait with a passive-aggressive trend and an anti-social condition. The retest, performed five years later, showed the passive-aggressive trait, while the anti-social condition decreased and the schizoid trait disappeared. The 2nd A7 test showed a histrionic trait of personality. *Conclusions.* The recent cocaine abuse and the relationship with other drugs capable of reducing the side effects, bring us to pay attention toward a new phenomenon among young people. Ketamine use seems to be widespread in nightclubs and probably underestimated in terms of diffusion and risk. Ketamine alters the perception of hearing, viewing and pain stimuli and the effects can cause a lack of ability to answer them intentionally; that can bring the abuser towards a potential and extremely risky personal damage condition. Today Ketamine use is not well monitored and the probability that some road-accidents are caused by the drug is very high.

PO23 **Analysis and prevalence of certain amphetamine-type designer drugs in Csongrád county (Hungary)**

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Fourteen amphetamine-type stimulant designer drugs (4-MA, 4-MMA, 4-FA, 4-FMA, PMA, 4 MEC, 3-FMC, 4-FMC, MDPV, 3,4-DMMC, 6-APB, methylone, butylone, MDPV) were measured from urine and blood samples taken by the authorities. The analysis was performed by gas chromatograph - mass spectrometer (GC-MS) in electron ionisation (EI) mode. Linearity, limit values, precision, accuracy, recovery, stability and selectivity of method in the prepared samples were studied.

62 of 387 persons (16 %) used one or more types of designer drugs, 50 of them were polydrug users. The following drugs were found in samples: methylone (34), 4-MEC (31), MDPV (25), 4 FMC (12), 4-FA (10), 3,4-DMMC (3), 6-APB (2), PMA (1), butylone (1). Mean age of drug users was 28.3 (14-53, sd 8.1), and most of them (92 %) were men.

Results are correlated with the amount and frequency of seized drugs in Csongrád county. Many polydrug user persons used legal designer drugs combined with illegal ones. Therefore, the following conclusion can be drawn: not only is the legal status of designer drugs attractive, but also their price and their availability.

PO33 **Knowledge about new synthetic drugs in a sample of mental health professionals in Spain: the ReDNet project (Recreational Drugs European Network).**

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Background and objectives: The influence of new technologies causes changes in the appearance and use of new drugs. This phenomenon is a challenge for professionals who are working in addictive disorders. The RedNet project has been developed in eight European countries (UK, Poland, Spain, Italy, Hungary, Belgium, Norway and Germany) with the aim of improving knowledge of “legal highs” to decrease the risk associated with its consumption. The aim of the present study was the assessment of current knowledge about “legal highs” among mental health professionals. **Methods:** This was a cross-sectional, structured survey developed to evaluate the knowledge about new synthetic substances. The same survey was administered in some of the participant countries. **Results:** We present preliminary results of the survey in Spain. One hundred and eighty professionals responded the survey. Most were women (68%), mean age was 37 years, and an average of 8 years working. The “Legal highs” more known by professionals were GBL, GHB, 1-4 butandiol (26%-good knowledge), Spice Drugs (21.4%-medium knowledge) and NRG-2 (94,3%-any knowledge). Participants desired to have more knowledge of “legal high” related psychopathological disturbances (62,7%), withdrawal symptoms (53,9%) and side effects (58,4%). Professionals will prefer in the future to receive information about these substances via e-mail (79%). **Conclusions:** Professionals’ knowledge of new drugs is limited. The results of this study will serve to improve the access to current information on “legal highs” to health professionals working in mental health.

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PO35 **Forensic issues of designer drug use and related death cases in Hungary in 2011**

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Background and objectives: New psychoactive drugs (designer drugs) have become more common on the illegal drug market in recent years. Parallel to this, lawmakers try to keep up with this process by controlling consumers, developing analytical methods, analyzing biological samples and seized materials, and by legal regulation. At the same time forensic experts are encountered with a number of new challenges: little information is available about acute and long term clinical effects of these drugs, about their side-effects, development of addiction (psychological and physical), withdrawal symptoms, lethal doses, blood levels at which symptoms occur, and pharmacokinetics. **Method:** According to Hungarian law all persons who died under unclear or suspicious circumstances, died by violence (accident, poisoning, suicide), substance abuse, or sudden previously unknown fatal disease, when medical malpractice is suspected, or their identity is unknown, are subjected to medico-legal examination (autopsy). All cases were pre-screened by immunoassay test and positive cases were confirmed by GC-MS analysis. **Results:** 571 autopsies were performed in our Institute in 2011, from which licit drugs were identified in 8, while amphetamine-like psychoactive substances in 3 cases. In the first case the question was whether the level of designer drugs in the blood could cause such a degree of impairment that could lead to traffic accident. The second case raises the possibility that the non-lethal dose of methylone could play a role in a death considered to be natural. In the third case the possibility raises that regular drug (MDPV, amphetamine) consumption reported in the medical history may have contributed to personality disorder and suicide. **Conclusions:** As drugs which are not involved in the list of illicit or psychoactive drugs in Hungary are not routinely analyzed, thus the number of intoxicated and fatal cases in which designer drugs can play a role could be underrepresented.

PO36 **Forensic Impurity Profiling and Synthesis of Precursors to the Hallucinogenic Amphetamine DOB**

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Impurity profiling is a method of characterisation of illicit drug samples. Each illegal drug will contain its own set of impurities, which allows the chemist to ascertain its unique “chemical fingerprint”. The impurity profile of an illicit drug sample may then be used as an intelligence gathering tool to link related samples, identify a possible manufacturing source and to gather information on trafficking routes.

DOB (4-bromo-2,5-dimethoxyamphetamine) is a newly emerging hallucinogenic amphetamine that sparked serious health warnings in Ireland following its first seizure back in 2003. Known more commonly as “snowball”, this drug is highly potent and may be used as a substitute to ecstasy (MDMA) and lysergic acid diethylamide (LSD). Its hallucinogenic response can be attributed to the molecules’ interaction with the 5HT_{2A} and 5HT_{2C} (serotonin) receptors. To date, the work carried out on the impurity profiling of DOB is limited in comparison to MDMA and methamphetamine.

This project will focus on the isolation and characterisation of impurities from the synthesis of DOB and its precursors. Following this, independent synthesis of some of these impurities will be carried out for use as reference standards. It is hoped also that street samples of DOB will be acquired so that authentic impurity profiles can be established.

In order to build an impurity profile, DOB and its precursors are synthesised using both literature and novel routes. Extensive chromatographic and spectroscopic analysis is performed on the newly prepared compounds, to determine their purity and chromatographic profile. This would allow for the conformation of previously proposed impurity structures, preparation of standard reference samples for use by forensic laboratories and evaluation of possible pharmacological properties.

In this work, the phenylacetic acid synthetic route to 2,5-dimethoxypropan-2-one (a precursor to DOB) is under investigation. The most common impurity of this step is based on a diphenylketone core structure. For use as reference standards, a number of isomeric brominated diphenylketones were independently synthesised as potential impurities of the phenylacetic acid

route to DOB. These various brominated analogues may arise due to a non-regiospecific bromination step in the synthesis of DOB.

An opportunity arose during the synthesis of these compounds to carry out some biological testing. Recent publications have shown that compounds related in structure to illicit drugs have anti-cancer properties. Compounds with a diphenyl nitrostyrene core have been shown to have antiproliferative activity, particularly against Burkett's lymphoma. As an intermediate in the synthesis of our diphenylketones possesses this diphenyl nitrostyrene core, it was decided that these intermediates would be assessed for antiproliferative activity in two cell lines. Initial results indicate that our unbrominated and brominated 2,5-dimethoxy-diphenyl nitrostyrenes are 2-3 times more effective than the most potent previously tested nitrostyrene. Following these promising results, a number of isomeric brominated analogues have since been sent for further biological evaluation.

PO37 **Investigation into the Synthesis and Impurity Profiling of Known and Novel Routes to the Alpha-Methylphenethylamine known as "Bromo-DragonFLY"**

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Designer alpha-methylphenethylamine drugs of abuse sold on the illicit market can contain high levels of unwanted impurities inherent from the manufacturing process employed by underground laboratories, which rarely incorporates any degree of quality control.

Each particular method of production creates a unique set of impurities known as route-specific markers. These impurities or chemical signatures are of particular interest to the forensic chemist as they can be used as a tool to determine the synthetic protocol. Impurity profiling is used to generate this chemical fingerprint, providing useful information to the drug enforcement agencies, assisting them in the detection of clandestine laboratories. Impurity profiling also facilitates the identification of potentially harmful impurities in drugs.

The work described in this research poster focuses on the synthetic steps leading to the synthesis of 1-(8-bromobenzo[1,2-b:4,5-b']difuranyl-4-yl)-2-aminopropane (the amphetamine commonly known as Bromo-DragonFLY) and the impurity profiling of its key precursors. This investigation builds

on previous studies by this group on methylenedioxy-, alkylthio- and 2,5-dimethoxyamphetamine analogues.

The Leuckart route to amphetamine is a common synthetic pathway used by clandestine chemists in the manufacture of many amphetamines. This route often produces a myriad of novel, route-specific heterocyclic impurities. Of particular interest in this work is the synthesis of several Leuckart derived N-formyl substituted intermediates whose ¹H- and ¹³C-NMR spectra exhibit double the number of signals one would expect in a typical spectrum. This is due to the partial C-N double bond character of the amide functionality which results in restricted bond rotation. When NMR spectra are acquired at the standard temperature of 300 K, the rate of rotation about the hindered „partial double bond” is slow, thereby resulting in two sets of signals. This effect and the ratios of each rotamer may be altered by obtaining the spectra at different temperatures. Manipulation of the temperature also allows the greater resolution of distinct signals which may otherwise coalesce.

The synthesis of the key precursors of Bromo-DragonFLY, namely (E)-4-(2-nitro-1-propenyl)-2,3,6,7-tetrahydrobenzo[1,2-b:4,5-b']difuran and 1-(2,3,6,7-tetrahydrobenzo[1,2-b:4,5-b']difuran-4-yl)propan-2-one was adapted from previous work carried out in our group and from the literature. This work also involved a detailed analysis of their synthesis for potential impurities and possible synthetic derivatives. Several novel compounds were isolated as a result of the study.

The desired precursor 1-(2,3,6,7-tetrahydrobenzo[1,2-b:4,5-b']difuran-4-yl)propan-2-one has been synthesised in moderate yields, the highest yield being 54% via a 6-step synthesis from HQEE. Several other chemical pathways to this compound were also explored, resulting in the identification of several novel impurities including pyrimidine-type compounds arising from the Leuckart step.

Additionally, there is evidence to suggest that other novel amphetamine-type compounds may also be formed from the derivitisation of intermediates and impurities carried forward from the synthesis of the 2,3,6,7-tetrahydrobenzo[1,2-b:4,5-b']difuran core.

PO39 **Can mindfulness be beneficial in the treatment of drug addiction?**

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Caught up in the frenetic rhythms of our daily activities, rapid communication and transportation, we feel very much dissociated from our bodies and the environment around us.

The dominant narrative is one of a stress, anxiety, hopelessness, and low self-esteem, especially among young people, who often use drugs such as pharmaceutical, chemical, and herbal products to escape from these negative emotions. A recent UK survey addressing young people's experience and awareness of drugs, as well as their attitudes towards drug information has shown that almost two thirds (63%) of respondents had personally taken a recreational drug. More than half (53%) of them said that many of their friends 'take drugs regularly' and two in ten had provided financial support to someone who uses drugs (YouthNet, 2010).

Over the last decade, interventions to reduce substance misuse have largely increased, however, the effectiveness of current treatments remain unsatisfactory (Bowen, 2006) with a rate of relapse exceeding 60% (Zgierska, 2009). More recently, Mindfulness-based interventions have been applied to the field of drug misuse. Mindfulness is 'a particular way of paying attention: on purpose, in the present moment and non-judgementally' (Kabat-Zinn, 1994).

Mindfulness had its origins in the Buddhist tradition but Mindfulness practice is not religious or exoteric in nature. The main feature of Mindfulness-based interventions is Mindfulness meditation, which encourages awareness of thoughts, feelings and body sensations as they arise in the field of the experience.

The therapeutic potential of mindfulness in the field of drug addiction seems to be clear if we think that very often those who suffer from drug addiction seek to avoid ordinary reality in any possible way. Mindfulness-based interventions aim to enhance a person's ability to embrace fully the 'here and now' of life, hence increasing well-being, self-awareness, and most importantly, reducing dissociations from reality. Furthermore, practicing core Mindfulness techniques including yoga, meditation and gentle mindful movements, can be very beneficial to drug misusers because they aim to non-judgmentally acknowledge and accept current experiences rather than suppress or avoid them. The consequent shift in perspective, from reacting to observing, may reduce the sense of drug urgency and attenuating the pull exerted by certain substances.

Mindfulness-based interventions have been successfully applied for stress management and chronic pain (Kabat-Zinn, 1982; 1992), prevention of depression relapses (Teasdale, 2000), anxiety (Vøllestad, 2011), and alcohol addiction (Marlatt, 2002) among others. Nonetheless, the question 'Can Mindfulness be beneficial in the treatment of drug addiction?' remains open and evidence-based studies are greatly needed.

PO42 **The Recreational Drugs Network (ReDNet) e-learning experience for Health Professional in Second Life.**

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Our digital, telematic, culture is a nebulous entity; constantly changing its form in an attempt to integrate advances made in the computing industries from which it stems. True to form, this force of change impacts a number of mediums, the most pertinent of which are the vectors of dissemination used by agencies to inform their respective audiences of products and information. Regrettably, these channels are also used by unregulated entities to market Novel Psychoactive Substances (NPS), otherwise known as “legal highs”, the likes of which are not deemed fit for human consumption.

In an attempt to reach out to the greatest number of health professionals working in the sector of substance misuse, to inform them about the new substances that are detected every day and the dangers of such substances, the Recreational Drugs Network (ReDNet) project experience has sought to establish a presence inside the virtual world of Second Life. ‘Second Life’ is an online general purpose multi-user 3D environment consisting of hundreds of thousands of active users.

Through a series of hosted events, speakers were invited to present information on their findings, concerning the aforementioned substances, to health care professionals inside the virtual environment. Activities were evaluated and data collected in order to assess the efficacy of this new form of training and improve the proposed e-Health service.

PO44 **New drug prevention models: the results after one year from the ReDNet project**

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Background: In 2002 the Bergen Clinics Foundation established Føre Var; a citywide “earlier warning” system geared towards the identification, monitoring and reporting of drug and alcohol trends in the city of Bergen, Norway. The primary aim for the system was the dissemination of earlier, more reliable information on new and emerging trends, to enable timely and more effective interventions. **Methods:** The monitoring system triangulates and cross-references a wide range of statistical and quantitative data including seizures

data, treatment figures, alcohol sales, school surveys, internet sites, youth and local media, cultural mapping and key informants. Data is collected every six months, analysed for identifiable patterns and trends, and disseminated widely. As of September 2012, the BEWS was utilising approximately fifty drug-related indicators and had reported publicly on eighteen occasions. **Results:** This presentation details the system's developmental stages and methodologies, in addition to summarizing results over a period of nine years. A special focus will be held on the identification of "new" drugs. **Discussion:** In conclusion, the strengths and weaknesses of the model, its replicability as well as the potential advantages of a city-level network are discussed.

PO50 **Quantification of legal high substances using attenuated total reflectance-Fourier transform infrared spectroscopy and partial least square regression**

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Background and objective: Legal high products purchased from the Internet are often contaminated with mixtures of drugs/impurities that do not match their "label" claim. This can result in harmful drug interactions and side effects, including psychological and physical harm to the abuser. Attenuated total reflectance-Fourier transform-infrared spectroscopy (ATR-FTIR) is a rapid and non-destructive technique, which provides chemical analysis of minute amounts of sample (few milligrams).

The objective of this work is to develop a method for identification and quantification of legal high substances using ATR-FTIR and partial least square regression (PLSR). **Method:** Pure substances of 2-aminoindan hydrochloride (2AI), caffeine (CAF), dextromethorphan hydrobromide (DXM) and lidocaine hydrochloride (LID) were used in this work. Models were constructed from binary mixtures of these substances to contain 5 – 95% m/m of each constituent as follows: Model 1 (2AI/ CAF), model 2 (DXM/ CAF) and model 3 (LID/ CAF) and were stored in glass vials. External test sets containing mixtures of 2AI/ CAF, DXM/ CAF and LID/ CAF were prepared for each model. Each vial was mixed for one minute using a Vortex-Genie 2 prior to analysis. A few milligrams of powder was taken from each vial and measured using a Nicolet 6700 FT-IR spectrometer equipped with a smart iATR diamond. Three replicate spectra were collected for each mixture. Each spectrum was the sum of 32 scans over the wavenumber range 4000 - 650 cm^{-1} at a 4 cm^{-1} interval. The spectra were exported to Unscrambler 9.2 where multiplicative

scatter correction–first derivative pre-treatment (MSC-D1) and PLSR were applied. **Results and discussion:** The three PLSR models were created for each binary mixture by splitting the spectra into calibration and validation sets in the ratio 2:1. The number of factors used was 1, 3 and 5 for the three models respectively and was chosen to give a low relative square error of prediction (RSEP). Model 1 and model 2 showed good linearity among both calibration and validation set ($r^2 > 0.96$); whereas this was not observed for model 3. Model 1 was the most robust as it had good agreement between its root mean square error of calibration (RMSEC) and prediction (RMSEP) values which were 5.65 and 5.24% m/m respectively. On the other hand the RMSEC and RMSEP values were 3.24 and 8.76% m/m respectively for model 2 and 8.48 and 10% m/m respectively for model 3. When the external test sets for each of the three models were predicted, the lowest RSEP value observed was 14% and was observed for the 2AI/ CAF test set. This showed that the method was semi-quantitative in nature and did not fit with the pharmacopoeial requirements (within 5% RSEP). **Conclusion:** The use of ATR-FTIR and PLSR has the potential to offer a rapid and non-destructive technique for the quantification of drugs/impurities in legal high products. It has the potential to be used without a reference analytical technique. In this study the identity of the individual constituents could be predicted with the models developed, however the method remains semi-quantitative when predicting relative amounts. The accuracy of this method to predict drug quantity is still not satisfactory to fit with the pharmacopoeia requirements and thus further work is needed to improve quantification.

PO51 **Comparison of laboratory based and handheld near-infrared spectroscopic instruments for the offline quantification of legal high substances**

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The School of Pharmacy, University of Hertfordshire, UK

Background and objective: Legal high abuse has been emerging rapidly over the last few years facilitated by the Internet. In addition to their abuse potential, the identity and purity of these substances are often unknown. A recent study has shown that over 60% of legal high products did not match their 'label' claim. This stimulates the need for rapid and non-destructive techniques to determine the content of these products. Near-infrared spectroscopy (NIRS) offers this advantage of quick chemical analysis with minimal sample preparation. Furthermore, handheld NIRS offer mobility from the laboratory setting

The objective of this work is to compare a handheld to a laboratory based NIR instrument for the quantification of three common legal high substances 2-aminoindan hydrochloride (2AI), dextromethorphan hydrobromide (DXM) and lidocaine hydrochloride (LID) using partial least square regression (PLSR).

Method: Standards of 2-aminoindan hydrochloride (2AI), caffeine (CAF), dextromethorphan hydrobromide (DXM) and lidocaine hydrochloride (LID) were used. Models were constructed from binary mixtures of each legal high with caffeine to contain 5 – 95% m/m of each constituent. Model 1 (2AI/ CAF), model 2 (DXM/ CAF) and model 3 (LID/ CAF) were stored separately in glass vials for subsequent analysis. Similarly, external test sets composed of the same binary mixtures but at random concentrations were used for each model. Three spectra were collected from each sample through its glass vial. Each spectrum was the sum of 16 scans using the PerkinElmer FT-NIR spectrometer and three scans using the Thermo microPHAZIR handheld instrument. The spectra were recorded and exported to Matlab® R2007a, where spectral pre-treatment using standard normal variate-second derivative (SNV-D2) and PLSR was applied.

Results and discussion: Three PLSR models were created for each binary mixture by splitting the spectra for each model into calibration and validation sets in the ratio of 2:1. Two factors were chosen for all models based on obtaining a representative PLSR loading as well as a low relative standard error of prediction (RSEP). To evaluate the predictive ability of the model three parameters were taken into consideration: the correlation coefficient value (r^2), the root mean square error of calibration (RMSEC) and prediction (RMSEP). Using both instruments, all the three models showed good linearity with r^2 values above 0.98. In addition, there was close agreement between the RMSEC and RMSEP values of the models which were below 5% m/m. This indicated the robustness of the PLSR method for quantification. However for external test set prediction, the handheld instrument showed less accurate predictions (RMSEP < 10% m/m) than the laboratory based instrument (RMSEP < 5% m/m).

Conclusion: The use of NIRS and PLSR serve as a powerful tool for rapid and non-destructive quantification of legal high substances. Both laboratory and handheld instruments could predict these substances within an accuracy of $\leq 10\%$ m/m. Although the laboratory based instrument showed higher accuracy, the handheld instrument offers more flexibility in carrying the laboratory to the sample.

PO52 **On-spot identification of so-called ‘legal highs’ using handheld Raman spectroscopy**

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Background and objective: Recently, a large number of drug products have emerged which are easily purchased via the Internet. These products are used particularly by the teenage population and are not limited to only nightclubs and party scenes. This stimulates the need for rapid identification techniques that can identify ‘legal highs’ at the site they are encountered. Handheld Raman instruments offer the advantage of rapid, non-destructive and on-spot identification of these products which saves both time and money from transferring the sample to a laboratory. The in-built algorithm of the instrument has the potential of giving an instant yes or no answer to the suspect material. The objective of this work is to identify drugs and impurities commonly present in ‘legal high’ products using handheld Raman spectroscopy.

Method: The substances used in this study included: 2-aminoindan (2AI), benzocaine (BEN), caffeine (CAF), dextromethorphan hydrobromide (DXM), ephedrine hydrochloride (EPH), lactose (LAC), lidocaine hydrochloride (LID), microcrystalline cellulose (MCC), paracetamol (PAR), procaine hydrochloride (PRO) and talc (TAL). In addition, three binary mixtures of each of 2AI/CAF (mixture 1), DXM/CAF (mixture 2) and LID/CAF (mixture 3) were prepared in the range of 5 – 95% m/m. The powders were stored in glass vials and measured ‘as they are’ using a handheld Thermo TruscanRM equipped with a vial holder. **Results and discussion:** The substances were identified with the in-built instrument algorithm which operates using Bayes’ theorem that determines the probability (pvalue) of how similar is a test spectrum (B) to a reference library spectrum (A). A pvalue greater than 0.05 indicated that both spectra were similar and a ‘Pass’ result was obtained. On the other hand, a pvalue of 0 indicated that the spectra were different and a ‘Fail’ result was obtained. If the result was a ‘Fail’, the instrument has the option to go to discovery mode where a percentage match of how close the test spectrum to signature(s) in the library was given. A signature or high quality spectrum was created for each of the pure substances and the 50:50 dilutions of mixtures 1, 2 and 3. These signatures were stored in the instrumental library as four methods (Pure substances, 2AI/CAF, DXM/CAF and LID/CAF) to act as reference spectra for comparison. Then the pure substances and different dilutions of the mixtures (5 – 95% m/m) were matched against this library. All pure substances were matched correctly each against its signature with a minimum pvalue far above the threshold. The lowest pvalue was observed

for DXM (pvalue = 0.2279) and the highest was observed for paracetamol (pvalue = 0.6272). For the mixtures comparison, the results were similar between the three mixtures. Thus, in the range of 20 - 85% m/m the mixture spectrum matched its own signature either by giving PVALUES above 0.05 or in discovery mode. However, below 20% m/m and above 85% m/m, the mixture spectrum matched the signature of the substance with the highest concentration. In all case, no mismatches were obtained. **Conclusion:** The handheld ThermoTruscanRM offered a rapid, on-spot and non-destructive identification of chemicals found in 'legal high' products. It could accurately identify substances present in pure forms and in mixtures provided they are in the range of 20 – 85% m/m in the product.

PO53 **Recreational use of benzydamine in Italy: reports from two addicted patients and in web forums**

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Background and objectives: Benzydamine is a non-steroidal anti-inflammatory compound misused as recreational drug in Brazil and in some Eastern Europe countries. In Italy benzydamine is used as vaginal lavage for non-specific vaginitis (Tantum Rosa®) and its intentional misuse has been only occasionally reported. The purpose of this brief survey is to assess whether the phenomenon of benzydamine recreational use exists in Italy and what are the effects reported by users. **Methods:** Non structured interviews focused on the recreational use of benzydamine were administered to drug addicted patients. We also monitored Italian web forums dedicated to the use of psychoactive drugs searching for reports from benzydamine users. **Results:** We found two addicted patients that reported benzydamine use. *Patient 1.* A 54 year old man with a past history of both heroin and alcohol dependence currently under methadone treatment and with psychotic comorbidity. He reports first use of Benzydamine (Tantum Rosa®) in 1990 when he was in jail after being informed by other inmates about the drug's hallucinatory effects. For the first three months he was taking one 500 mg packet daily, than he continued to use it occasionally. He experienced visual hallucination consisting in bright geometric drawings that lasted one hour. *Patient 2.* A 42 year old man with a past history of heroin dependence and of recreational use of cocaine and other psychoactive drugs, currently under methadone treatment and with a psychiatric diagnosis of borderline personality disorder. He first experienced

one 500 mg packet of benzydamine (Tantum Rosa®) in 2001 but he quit it because of its aversive effects. He described the effects to be similar to LSD, with visual hallucination, altered self-perception, agitation and unsteadiness; he also reported anxiety, insomnia, abdominal pain and palpitations.

In the *forum survey*, we selected two web sites with benzydamine misuse as the main topic. We found 66 reports by 19 different forum users, referred to a five months period (from August 2011 to January 2012). The main topics of these forums concern both the ways to separate benzydamine from the vehicle and the psychoactive effects experienced with the drug. Regarding the effects one user reported “the low doses (250-300mg) are stimulants: you are more sociable, euphoric, restless and you see the colors more vivid; at higher doses (500 mg), you experience auditory and visual hallucination as spiders, birds and insects. It takes a long time to recover from this experience and after many hours you start feeling weak”. One other user described the extraction process: “you should choose the powder form; you have to dissolve one packet in 25 ml of water and filter the solution after 10 minutes. In this way you obtain 350mg of pure benzydamine”.

Conclusions: From these preliminary observations it results that Italy has to be listed among countries where benzydamine is misused for its psychotropic effects. The two cases described here show that visual hallucinations are a prominent effect of benzydamine. In one of the patients these hallucinations recall previous LSD-associated experiences, suggesting the possibility that serotonergic mechanisms are elicited by benzydamine. Moreover, since psychotic disorders are most commonly accompanied by auditory hallucinations, it is unlikely that benzydamine-associated hallucinations are explained by the schizotypal disorder comorbidity in the first patient. The few reports screened in the web forums confirm a reason for interest toward benzydamine recreational use in people that are aimed at experiencing drugs. In this scenario it should be taken into account a potential risk of abuse for benzydamine. Further studies are needed to shed light on the neurobiological substrate that underlies psychotropic effects of benzydamine and on whether benzydamine is able to maintain drug taking behaviour.

PO55 Searching the web for psychoactive compounds, an extreme case

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Introduction: This case report highlights 2 different aspects of psychoactive compounds of misuse: (1) Awareness about different compounds available and ways to use them; (2) Complexity of the matter makes it difficult to treat these patients, leaving us in despair. **History:** K is a young man currently 21 years of age, who started buying psychoactive compounds over the internet from an early age of reportedly 12 years and still continuing to do so. Due to extensive use of psychoactive compounds K has failed to pursue his education and career. K is very intelligent and has very good knowledge of the compounds he uses to help with his motivation, lack of pleasure and depression. This has got worse by the use of these compounds rather than getting better. Below mentioned are some of the drugs that he has been buying over the internet.

Ketamine, Valerian, Nytol, Ginseng, Rhodiola, Melatonin, Phenzelzine, Silagra, Nardil, Pregabalin, Isoprophyl. Nitrate, Silegilene, Ritalin, wellbutin, PEA, Tryptophan, DLPA, Phenylalanine, GBL, Theanine, Creatine, Alprazolam, Kava kava, Silvia, Rubifen, Ephedrine, MXE.

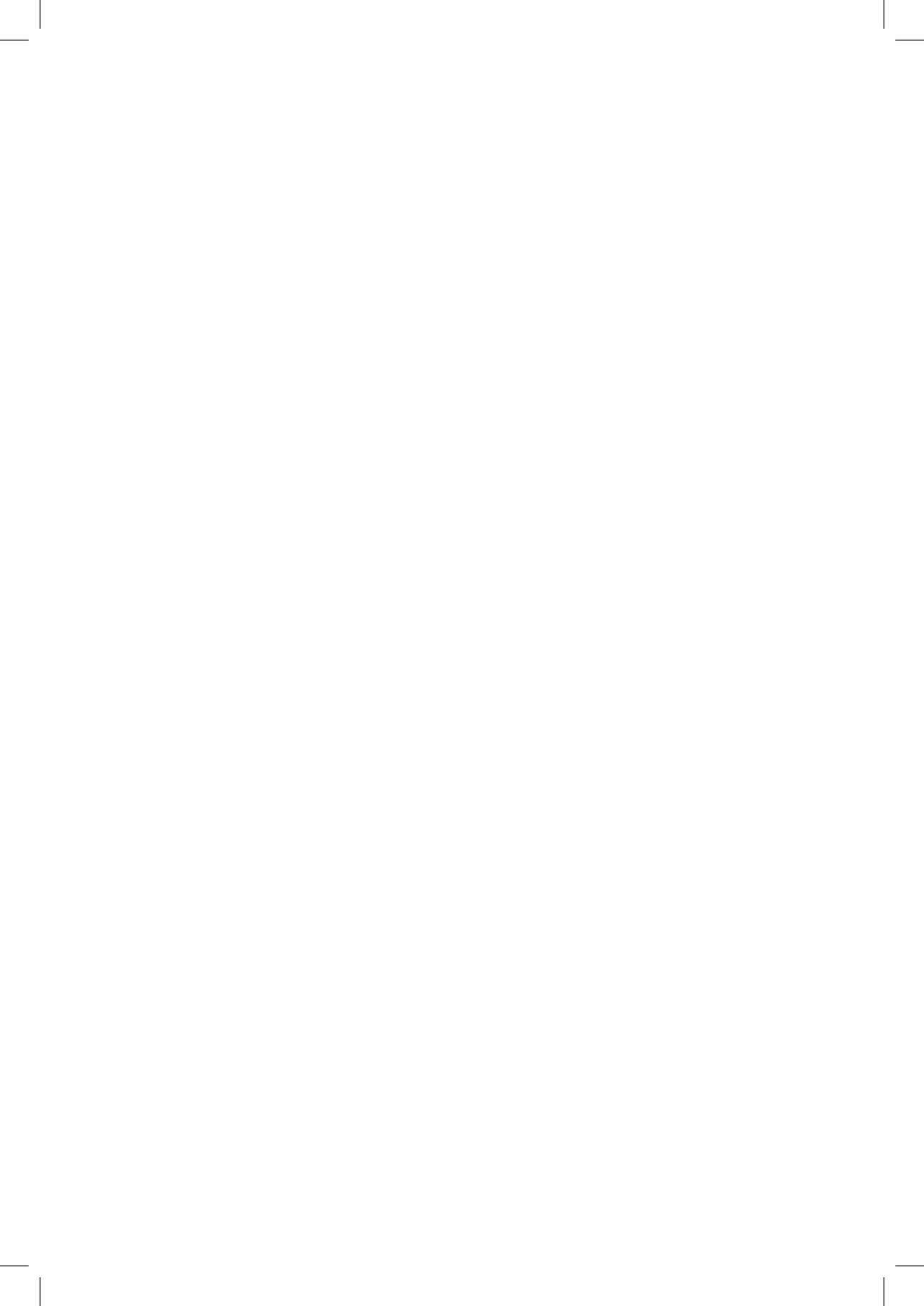
The Psychiatrist has stopped prescribing him psychotropic drugs due to his continuing use of compounds being bought over internet. **Conclusion:** This case highlights the difficulty of treating such clients, due to the complex clinical pharmacological picture and lack of safeguarding processes to protect vulnerable people.

PO05 **Substance Misuse and Lifestyle**

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Victory Foundation is a faith based non-governmental organization dealing with various activities that affect the African youth in the continent today. One of our key activities is the circumcision of young boys. According to the culture of the Kikuyu people in Gatundu area of Thika County in Kenya, circumcision is a vital rite of passage, and therefore a critical area, as this is the time that they learn life skills. During these initiations, the boys are taken through counselling sessions and also other life skills that will help them avoid infection. The organization uses locally trained doctors to perform the operation. The boys are also taken through some lessons to assist them in behavior modeling. They are taught how to build relationships, how to manage stress, sexuality, HIV/AIDS, the effects of the internet on the Youth, Drugs and substance abuse and how this can lead to HIV infection.



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