Institution: Liverpool John Moores University

Unit of Assessment:
Allied Health Professions, Dentistry, Nursing & Pharmacy (UoA 3)

Title of case study: New psychoactive substances – responding to emerging public health needs.

1. Summary of the impact (indicative maximum 100 words)

The emergence of new psychoactive substances (NPS) in Europe over the last decade (including performance and image enhancing drugs), poses challenges to policy makers. These are substances which are frequently not controlled under law, and governments have struggled to address potential societal and health harms of use. We have analysed this drugs market, described the potential health harms of NPS, and generated evidence on effective intervention responses for some of these. Our findings have provided the necessary evidence to support the development of robust, responsive and predictive policy making at both national and international levels.

2. Underpinning research (indicative maximum 500 words)

We have undertaken a programme of research investigating the pharmacology, forensic chemistry and behavioural epidemiology of NPS. Our work has led to national and European decision makers being better informed about the most appropriate evidence based responses to NPS.

Coinciding with the UK legal control of mephedrone in 2010, the group began a novel programme of research investigating the emergence of NPS in the UK drugs market [1]. Studies conducted indicated that drugs sold under new 'brand names' after the ban were controlled drugs. In light of several high profile deaths, characterisation of subtle differences in the pharmacology of such NPS, compared with 'classic' illegal drugs, suggested that NPS warrant special consideration with regards to harm reduction strategies, medical intervention and policy [2-3]. Our work was one of the first to examine the ways in which the 'legal highs' retail market responded to changes in UK drugs legislation. This is important as it provides an understanding of how existing drugs policy (i.e. the Misuse of Drugs Act, 1971) is unlikely to provide sufficient control of NPS, and illustrates the harms that users may face (health and societal) in purchasing such products.

We have also provided some of the first pharmacological data on the mechanism of action of a number of NPS [2]. This work is important because legislation and understanding of the potential adverse health effects of these drugs have largely been based upon their dis/similarity to existing illegal substances (e.g. MDMA).

Grant funded activities (*iTrend* project; grant reference i) have supported the analysis of a diverse range of NPS samples and facilitated exchange of reference standards among international laboratories, in addition to activities including the monitoring of online user forums and online shops; online surveys and triangulation with field data from existing drug monitoring networks. This work contributes to a European wide Early Warning System on NPS which we coordinate in the UK (ii). We have also developed evidence based quality standards in drug prevention that form part of the key recommended actions that the European Commission has proposed in response to the increased use of NPS in the EU (iii).

We also research the use of growth hormones and anabolic steroids to enhance bodily aesthetics, and were the first group to publish on the self-injected tanning agent Melanotan [4-5]. The work also identified the extent of the market for such drugs, clinical utility, potential health harms, and implications for policy. Furthermore, alongside partners including Public Health England, Health Protection Agency and Public Health Wales (iv), we have conducted the largest study of blood borne viruses amongst users of these types of drugs, and were the first to identify HIV within the user population [5]. Our group has also undertaken research to support the development of NICE guidance in 2009 to examine the evidence for how needle and syringe programmes may be optimally configured in order to increase service coverage for users of performance and image

enhancing drugs [6]. This client group represent the largest proportion of new presentations to such services but have been historically underserved.

Research group members: Professor Harry Sumnall (Professor in Substance Use, from 2003); Dr Simon Brandt (Reader in Bioactive Drug Chemistry, from 2005); Jim McVeigh (Reader in Substance Use Epidemiology, from 1998); Michael Evans-Brown (Researcher in Emerging Drug Issues, 2006-2012); Lisa Jones (Reader in Public Health Evidence, from 2005); Amanda Atkinson (Researcher in Public Health, from 2008).

3. References to the research (indicative maximum of six references)

Representative peer reviewed journal articles (citation information taken from Scopus unless otherwise stated, 20th November 2013):

1. Brandt SD, Sumnall HR, Measham F and Cole JC (2010). Analyses of second-generation 'legal highs' in the UK. *Drug Testing and Analysis*, *2*, 377-382. DOI: 10.1002/dta.155. Cited 91 times.
2. Baumann MH, Partilla JS, Lehner KR, Thorndike EB, Hoffmann AF, Holy M, Rothman RB, Goldberg SR, Lupica CR, Sitte HH, Brandt SD, Srihari RT, Cozzi NV and Schindler CW (2013). Powerful cocaine-like actions of 3,4-methylenedioxypyrovalerone (MDPV), a principal constituent of psychoactive “bath salts” products. *Neuropsychopharmacology, 38*, 552-62. DOI: 10.1038/npp.2012.204. Cited 8 times.
3. Sumnall HR, McVeigh J and Evans-Brown M (2011). Social, policy, and public health perspectives on new psychoactive substances. *Drug Testing and Analysis, 3*, 515-523. DOI: 10.1002/dta.310. Cited 10 times.
4. Evans-Brown M, Dawson RT, Chandler M and McVeigh J (2009). Use of Melanotan I and II in the General Public. *British Medical Journal*, *338,* b566. DOI: http://dx.doi.org/10.1136/bmj.b566. Cited 9 times (Web of Science).
5. Hope VD, McVeigh J, Marongiu A, Evans-Brown ME, Smith J, Kimergard A, Croxford S, Beynon CM, Parry JV, Bellis MA and Ncube F (2013). Prevalence of, and risk factors for, HIV, hepatitis B and C infections among men who inject image and performance enhancing drugs: a cross-sectional study. *BMJ Open* 3:e003207. DOI:10.1136/bmjopen-2013-003207.
6. Jones L, Pickering L, Sumnall H, McVeigh J and Bellis MA (2010). Optimal provision of needle and syringe programmes for injecting drug users: a systematic review. *International Journal of Drug Policy*, *21*, 335–342. Cited 7 times.

Cited Grants

i. Internet Tools for Research in Europe on New Drugs (I-TREND): interdisciplinary and integrated approaches to substances, users and markets. €317,554. Funding body: DG-Justice Drug Prevention and Information Programme. 2013-2015. Awarded to McVeigh (CO-PI).

ii. Contract for the provision of the UK component of a European wide Early Warning System (EWS) on new psychoactive substances on behalf of the UK Focal Point on Drugs. £19,295 p.a. Department of Health (UK). 2011-2014. Awarded to McVeigh after competitive tender.

iii. European Drug Prevention Quality Standards. €284,507. Funding body: EU Executive Agency for Health and Consumers. 2008-2011. Awarded to Sumnall (PI).

iv. Public Health Impact of PIEDs in Wales. £75,000. Funding Body: Welsh Assembly Government. 2012-2015. Awarded to McVeigh (PI).

4. Details of the impact (indicative maximum 750 words)

The work of the Centre for Public Health (CPH) places Liverpool John Moores University (LJMU) in a unique position whereby our researchers are influential in informing national and international policy and procedures with respect to NPS. Our work in this area has demonstrable policy impact, and this is likely to continue as the UK Government and the European Commission (EC) have

indicated their intention to develop new legislation and recommendations in this area.

Our work has been particularly influential with respect to EU policy making. For example, as part of coordinated EC actions developed in response to the emergence of NPS planned actions referred to implementation of "Minimum quality standards to improve drug prevention, treatment and harm-reduction services". The prevention component of this action comprises the EU Drug Prevention Quality Standards developed by Sumnall, which is also included in the overall EU drugs strategy (2013-2020) (corroborating reference 1)**.**

The group also provides dynamic scientific responses to NPS. When an NPS is first detected in any EU Member State, detailed information on the manufacture, traffic, use, and harms is sent to the European Police Office (Europol) in The Hague, and the European Monitoring Centre for Drugs and Drug Addiction (EMCDDA) in Lisbon. The EMCDDA also runs a "European Database on New Drugs" which is a European information system and database on new drugs. Our work regularly contributes to this by making available important forensic data that are shared across European forensic providers who need to be able to identify new and unknown drugs. The UK NPS Early Warning System (EWS), based at LJMU and led by Atkinson and Brandt, contributes the UK's response to this network through collation and analysis of scientific submissions from a wide variety of UK providers including police, forensic science organisations, drug workers, and academics (corroborating reference 2). For example, forensic chemistry and pharmacology work published by Brandt, was included as a key analytical reference in a joint EMCDDA-Europol risk profile assessment of the synthetic hallucinogen drug 5-IT (April, 2013). In October 2013, the EC recommended an EU wide ban of this substance (Council Decision 2013/496/EU).

The EWS at LJMU also reports directly to UK policy makers (e.g. Department of Health; Home Office; Department for Business, Innovation & Skills), who are able to use the evidence synthesised to inform their own decision making. The Advisory Council on the Misuse of Drugs Act (1971) was established under the Misuse of Drugs Act 1971 and provides independent advice to the Home Secretary on drug classification and issues of drug harm. The ACMD's *Consideration of the Novel Psychoactive Substances ('Legal Highs')* report was published in November 2011 and makes recommendations to Government on options for controlling access and availability of NPS, and how harms from use may be reduced. Sumnall was appointed to the ACMD in 2011 (one of six academics in the 23 member panel) and contributed to the drafting of this report, and CPH's forensic work identifying the illegal content of products sold as 'legal highs', is cited throughout. The better use of medicines regulatory and consumer protection mechanisms, as suggested by Evans-Brown et al (2011) is also recommended. Our research group has also contributed to other ACMD work. The ACMD's *Consideration of the Anabolic Steroids* report included McVeigh and Evans-Brown as working group co-optees. As well as contributing to the drafting, the report was informed by substantial elements of research produced by the team (corroborating reference 3). As a result of recommendations outlined in the report anabolic steroids were placed in Class C under the Misuse of Drugs Act 1971.

Due to changes in the demand on NSP, new guidance was required and the research conducted by our group informed this guidance. This has had a direct impact on how services are commissioned and practiced by staff within specialist services and pharmacies (corroborating reference 4).

5. Sources to corroborate the impact (indicative maximum of 10 references)

1. **Drug Prevention Quality Standards European Policy impact:**

- NPS - European Commission Press Release 25th October 2011, Annex action 5 - available from: http://europa.eu/rapid/pressReleasesAction.do?reference=IP/11/1236&format=HTML&aged=0&language=EN&guiLanguage=en (accessed 4/11/13).
- European Drugs Strategy (2013-2012). Paragraph 19.1 refers to the European Drug Prevention Quality Standards

Corroboration:
EMCDDA Secondment European Commission, c/o DG Justice, Freedom and Security

2. Impact of the UK-EWS

Corroboration:
Head of Action on NPS, c/o EMCDDA

3. UK Misuse of Drugs Act 1971 impact:

- ACMD (2011) Consideration of the Novel Psychoactive Substances ('Legal Highs'). London, ACMD
- ACMD (2010) Consideration of the anabolic steroids

Corroboration:
Chair, Advisory Council on the Misuse of Drugs, c/o Home Office

4. NICE guidance:

- NICE (2009) Needle and Syringe Programmes. NICE Public Health Guidance 18. London, NICE (2012) Hepatitis B and C - ways to promote and offer testing. NICE Public Health Guidance PH43. London, NICE http://guidance.nice.org.uk/PH18

Corroboration:
Associate Director, Public Health Excellence
National Institute for Health and Care Excellence