Institution: University of Hertfordshire

Unit of Assessment: Panel A3A: Pharmacy and Pharmacology

Title of case study: Mitigating the Harm of 'Legal Highs'

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

Since 2010, the Recreational Drugs European Network (Rednet), a collaborative, Europe-wide project originating at Hertfordshire, has monitored and documented markets, consumption patterns and risks of 'new drugs'. In 2012 one of the university's researchers developed the integrated SMS and email ('Smail') rapid response service to deliver accurate, up-to-date drug intelligence to frontline workers, including doctors and police. [Text removed for publication] Smail researchers have also assisted addiction specialists to mitigate harm arising from newly emerging intravenous abuse of Tropicamide.

2. Underpinning research (indicative maximum 500 words)

Novel psychoactive substances (new drugs) are typically marketed online as a 'natural', 'safer' and 'legal' alternative to traditional illicit drugs. Building on the Psychonaut project, which originated at St George's, the **Recreational Drugs European Network** (Rednet) study began in April 2010 at the University of Hertfordshire.

Psychonaut's collated intelligence on around 412 substances was brought to the university in 2006 by its Principal Investigator, Professor Fabrizio Schifano. Dr Ornella Corazza joined the study in 2009. While extending the existing web/social network-monitoring methodology and continuing to gather data, Corazza realised that the collated information had significance for others besides academic researchers. She also pinpointed significant knowledge gaps in substance identification and the need to channel intelligence to the right people innovatively and rapidly. She proposed and subsequently co-ordinated Rednet, a multi-site study involving nine associate and thirteen collaborating European research centres.

Rednet continued analysing web-based markets and marketing, and tracking the cultural aspects of drug use throughout Europe via multilingual web searches. However, unlike Psychonaut's documentary approach, which focused on monitoring, quantifying and classifying websites as pro- or anti-drug, Rednet moved in a socioclinical direction, exploring chemical properties, effects, risks, markets and consumption trends, asking: What is on the market? How is it being used? How are people taking drugs and what effect do they have? What makes a substance psychoactive?

The research conducted at or led by the university consisted of four main strands: targeted monitoring of the online drug market; chemical analysis of selected substances; conducting surveys to establish existing levels of knowledge about new drugs; and developing ICT tools to share new information rapidly.

Monitoring activity resulted in an expanded database documenting over 650 substances, including 179 phenethylamines/MDMA-like drugs, 220 synthetic cannabimimetics, 126 psychedelic phenethylamines, and 6 herbs or plants. Researchers built a detailed picture of mephedrone ('meow'), methoxetamine (special M), and bromodragonfly (b-fly); and revealed the abuse of around 10 prescription or over-the-counter medicines, including Pregabalin, an anticonvulsant that can also cause euphoria. All 650 substances could be purchased online (including on eBay), and each had achieved some degree of popularity.

'Street' names and marketing ploys that label new drugs 'natural' cause difficulties in identifying psychoactive properties. Rednet obtained under Home Office licence fourteen of the most popular of the documented products, and Hertfordshire research chemists Drs Sulaf Assi, Jacqueline Stair and Suzanne Fergus developed a panel of assays, including handheld Raman spectroscopy techniques developed and piloted by Assi for rapid, accurate results, to analyse these previously undocumented substances for the first time.

Rednet's survey strand included administering a Europe-wide questionnaire amongst 907 professionals (led by Hertfordshire). Preliminary results suggest that a majority of the practitioners (74%) thought they had an average or above average knowledge of these new substances, and reported their chief interests as lying in gaining a general overview of new drugs as they emerged (90%), and of their adverse (89%) and desired psychoactive effects (87%). Further findings on preferred modes of receiving information led to new ICT platforms being developed for rapid intelligence sharing and dissemination.

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

Peer-reviewed Publications

Bold type indicates University of Hertfordshire authorship

1. **Schifano F**, D'Offizi S, Piccione M, **Corazza O**, et al. (2011). Is there a recreational misuse potential for pregabalin? Analysis of anecdotal online reports in comparison with related gabapentin and clonazepam data. *Psychotherapy and Psychosomatics*, 80 (2):118–122. doi: 10.1159/000321079

2. Carrus D and **Schifano F** (2012). Pregabalin Misuse Related Issues; Intake of Large Dosages; Drug-Smoking Allegations, and Possible Association With Myositis: Two Case Reports. *Journal of Clinical Psychopharmacology*, 32 (6): 839–40. doi: 10.1097/JCP.0b013e318272864d

3. **Corazza, O, Schifano, F**, Simonato PL, **Fergus, S, Assi, S, Stair, J, Corkery, J**, et al. (2012). Phenomenon of new drugs on the Internet: The case of the ketamine derivative methoxetamine ('MXE'). *Human Psychopharmacology: Clinical and Experimental*, 27: 145–9. doi: 10.1002/hup.1242

   – *REF2 Output*

4. Bersani, FS, **Corazza, O,** Simonato, P, Mylokosta, A, Levari, E, Lovaste, R and **Schifano, F** (2013). Drops of Madness? Recreational misuse of Tropicamide collyrium: early warning alerts from Russia and Italy, *General Hospital Psychiatry*, 35 (5): 571–3. doi: 10.1016/j.genhosppsych.2013.04.013

5. **Corazza, O, Assi, S**, Simonato, P et al. (2013). Promoting Innovation and excellence to face the rapid diffusion of Novel Psychoactive Substances in the EU: The outcomes of the ReDNet project. *Human Psychopharmacology: Clinical and Experimental* 28(4): 317–23. doi: 10.1002/hup.2299

   – *REF2 Output*

Funding

2010–12 European Commission, 'Recreational Drugs' European Network: An ICT prevention service addressing the use of novel compounds in vulnerable individuals. ReDNet'. Total award: €833,333; **Amount awarded to University of Hertfordshire** (Co-PIs and Grant Holders: Ornella Corazza and F. Schifano): **£195,258**.

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

From 2010, Dr Corazza worked with drug charity DrugScope to determine an effective communication strategy for disseminating new drug information to young people as well as analytical chemists, toxicologists, nurses/other health professionals, charities, drug workers, and law enforcement agencies in Britain and worldwide. The Rednet database contained technical reports and factsheets for 650 drugs: on DrugScope's advice, the folders were presented in a 'Q&A' format with comprehensive sources, and the factsheets as two-page, 'quick read' versions of the folders. Corazza and Schifano publicised Rednet via press releases, using conferences, seminars and technological tools such as social networking and virtual learning environments for over 2,000 professionals, academics and policy makers in over 30 countries. A 2013 survey of 270 professionals on the Rednet mailing list, chiefly physicians, revealed that 59% of respondents used the Rednet resource in their work. [Section 5, Ref. 5.1]

Smail

In 2012 Corazza began to develop the innovative idea of integrating SMS and email ('Smail') to deliver accurate information quickly and efficiently to frontline workers. A significant finding from the survey of health professionals (Section 2) was the overwhelming preference for receiving information updates via email (76%), with less enthusiasm for e-newsletters, websites, social networks, texts and conferences (40%, 30%, 8%, 5% and 1% respectively).

The free Smail texting service was piloted April 2012–July 2013 to satisfy these preferences and the expressed desire for real-time rapid responses in the fast-moving world of so-called 'legal highs'. Registered users use Smail to request information about new drugs: for example, A&E staff or police officers faced with emergencies can text a substance's 'street', brand or chemical name to Smail and receive evidence-based information within seconds. If Smail cannot respond immediately, Rednet researchers speak to the service user, investigate further, and report back. These exchanges also allow the database to be updated with emerging trends and issues.

The pilot involved 126 registered users in 14 countries (from northern and southern Europe to north America, Australia, Asia and Russia): 42% were healthcare professionals, 25% field workers, 25% researchers, and 8% regulatory and governmental (including police and the US army). In total, 741 text requests were received and translated into rapid-response information searches. Since March 2013, users have registered via a dedicated website, and the considerable interest in the team's work is evidenced by its web traffic. Between March and July 2013, there were 3,148 unique visitors from 81 countries, most from the UK (2,751), with others from Italy (712), Australia (199), US (174), Canada (145), Norway (140), Belgium (118), Portugal (112), Germany (107), Spain (106) and the Netherlands (73). [Ref. 5.3]

Smail Users: Two Examples

Medical: Tropicamide Abuse in Trento, Italy

In March 2013, the Trento Addiction Treatment Unit observed an unusual increase in sales of Tropicamide, typically used as eye drops. Within 24 hours of receiving their Smail request, and using Internet research, Corazza had sent an initial report on previously unknown Tropicamide abuse. Finding evidence of IV injections and a fatality in Russia, she made contact with Russian researchers and consulted the GPHIN (Global Public Health Intelligence Network) database, a Health Canada and WHO secure Internet-based early warning system that monitors media reports in multiple languages, to which she had been granted access. Within two months Smail researchers had published a report in *General Hospital Psychiatry*, highlighting for the first time the intravenous misuse of Tropicamide, and the Russian death. [Section 3, Ref. 4] To inform more widely and prevent further harm an alert was issued, in collaboration with the Trento unit, via the Italian Early Warning System to its network of 70 collaborative centres (including forensic toxicologists, universities, and police), 22 clinical centres, 551 addiction treatment units, 101 emergency centres and others. [Ref. 5.4]

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

Rednet Resource

5.1 Pierluigi Simonato, Ornella Corazza, Fabrizio Schifano and John Corkery. 'Evaluating the impact of the Recreational Drugs European Network: An online survey', School of Life and Medical Science, University of Hertfordshire, July 2013.

– *This internal report documenting professionals' awareness and use of the Rednet database is available on request.*

Smail

Website/Smail Sign-up Page

5.2 Corroboratory details about the free Smail texting service are available at:

<www.novelpsychoactivesubstances.org/smail>

Pilot Data and Web Traffic

5.3 Smail pilot data (April 2012–July 2013), along with website visitor numbers, geographical breakdown (by country and by UK city) and related web data captured for the period 1 March to 31 July 2013, are available on request: details are provided separately of an individual who can confirm the data cited above.

Smail Users: Trento

5.4 One organisation has provided a document confirming the Trento incident, including the Early Warning alert. Further details are provided separately.

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