

A methods-mapping review of substance-use related internet forum research

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Introduction

The Internet has reformulated the relationship between substances, substance-users, using environments and suppliers (Walsh, 2011). Online forums defined as virtual communities created around specific interests to allow discussion, information sharing, and emotional and peer-support (Burnett, 2000), are an increasingly important mediator of this relationship.

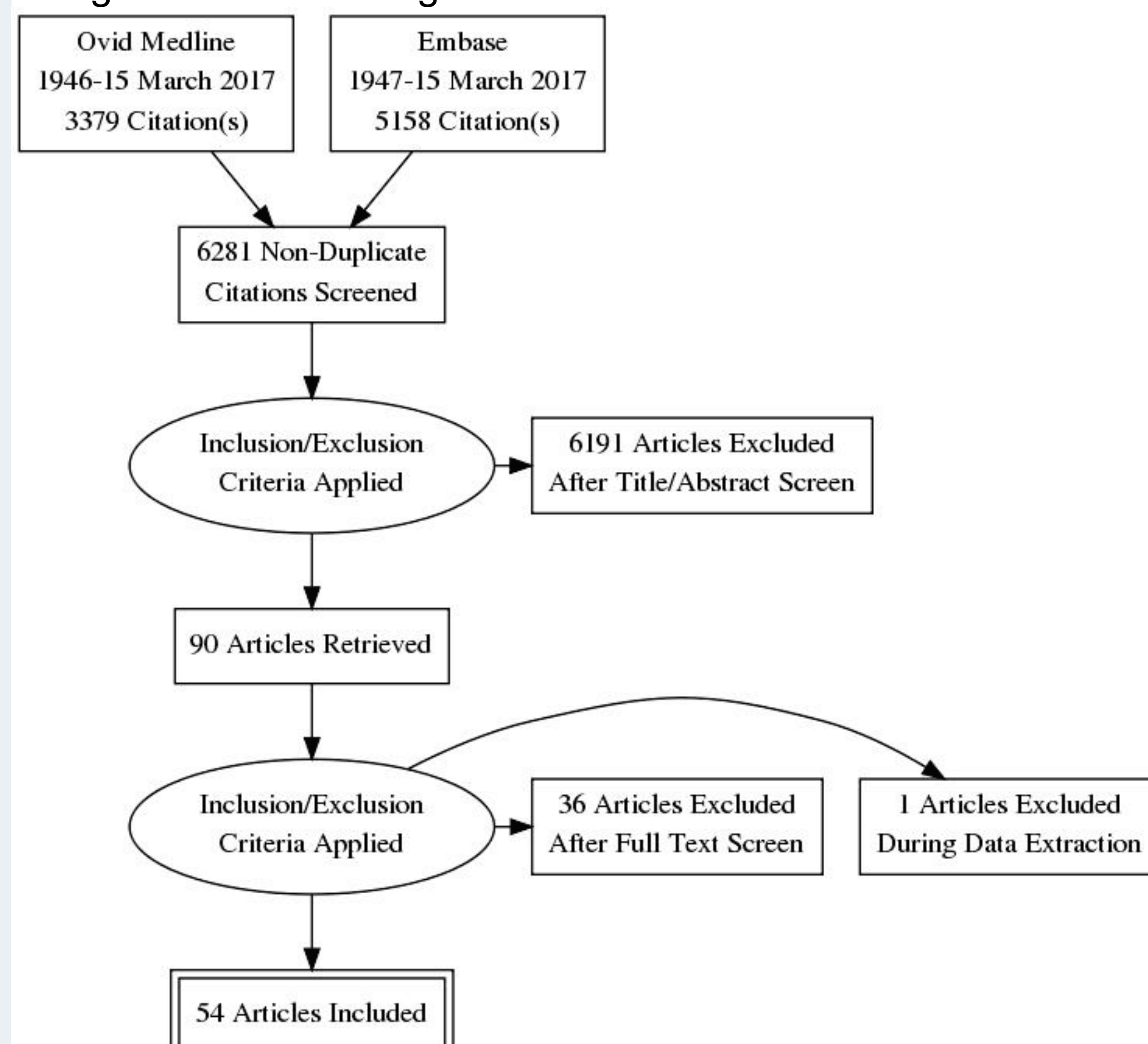
These forums disseminate information on effective and arguably safer ways of using substances, experiences of making online purchases and product quality (Rosino & Linders, 2015; Bancroft & Reid, 2016). Peer interactions also facilitate harm reduction, an essential characteristic of the calculating hedonist (Van Hout, 2015; Van Hout & Hearne, 2015).

With the first paper studying substance use and the Internet published 20 years ago (Coomber, 1997), it is timely to review the evolution of methods used to investigate substance-use related internet forums. The aim of this project was to capture the breadth of approaches used to research substance-use related internet forums.

Methods

Ovid and Embase databases were used to perform searches for the unsanctioned use of a broad range of substances including prescription medication, novel psychoactive substances (NPS), image and performance enhancing drugs (IPEDS) and conventional drugs such as heroin, cocaine and ecstasy. This search was overlapped with studies on internet forums. Excluded were studies which looked at other forms of internet communication such as Twitter and studies which were intended solely to identify generic adverse effects with new pharmaceuticals.

Figure 1: Prisma diagram



Results and discussion

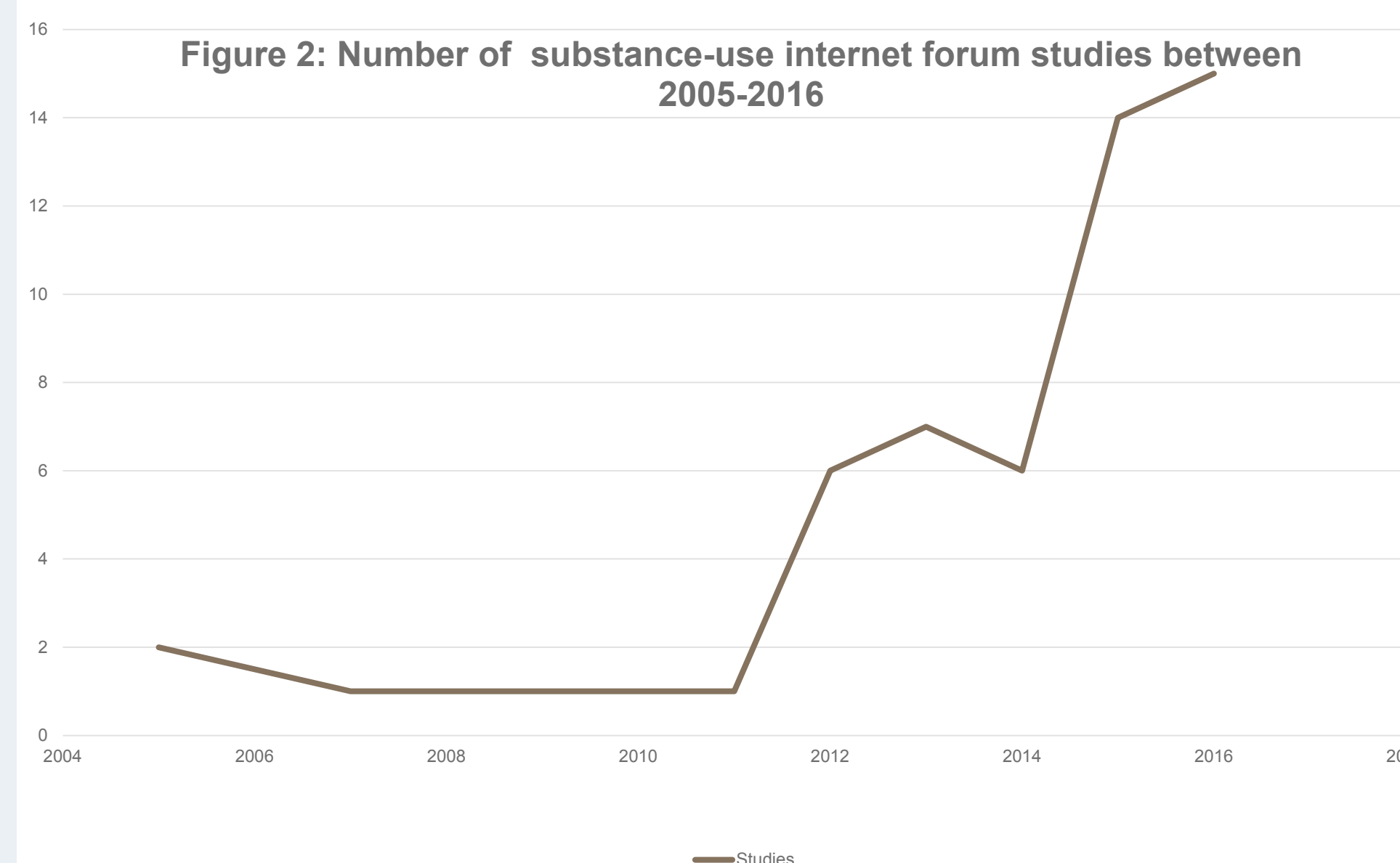


Figure 3. Substances examined in the selected studies

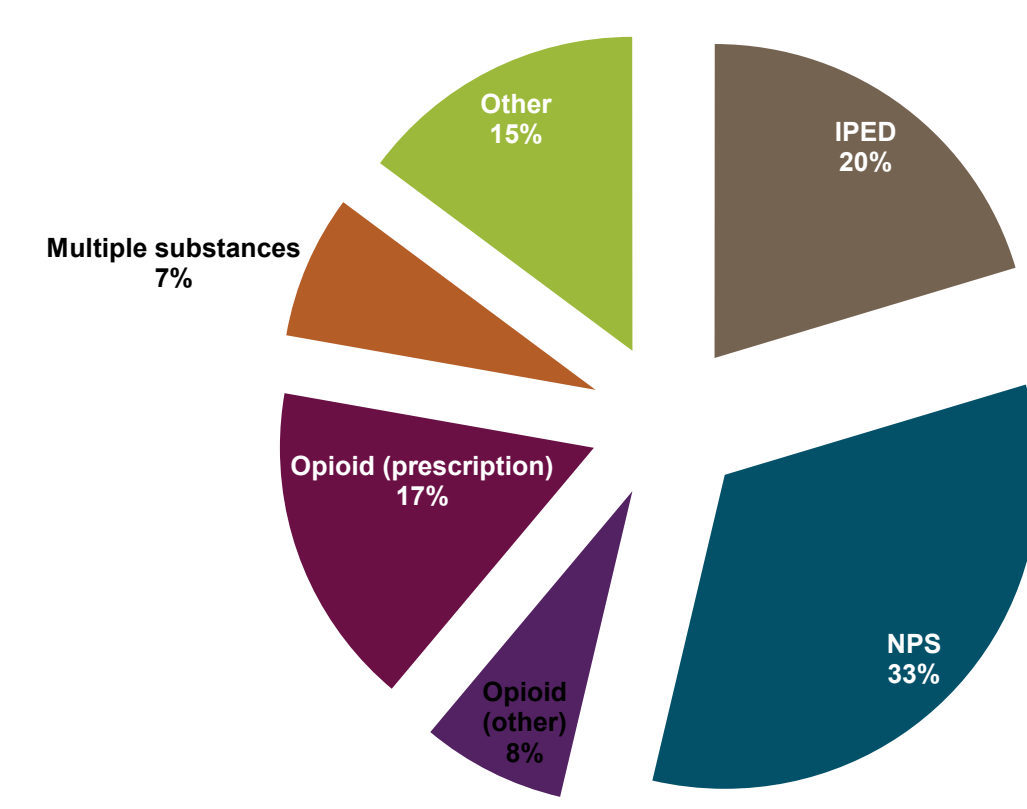
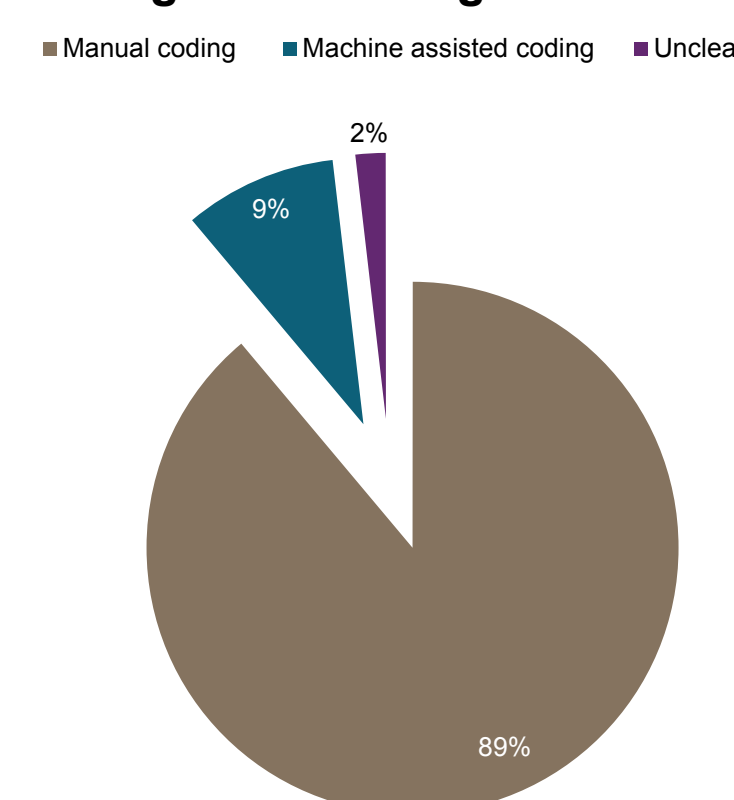


Figure 4. Coding method



Proliferation of online research: Figure 2 illustrates the increased research interest in Internet forums as an environment to observe substance use behaviours. The studies examined here included those which characterise niche behaviours such as the use of Laudanum (Van Hout 2015) and Dextromethorphan (Pringle 2015), the ways information is generated and consumed (Barratt 2014, Duxbury 2015) and the continuity of offline and online environments (Barratt 2014, Moro 2013). However, it is the consumption of NPS and IPEDS and prescribed opioids (Figure 3) which have received the most attention. The consumption of these substances may have benefited the most from the growth of the Internet through a combination of consumerism, rapid information dissemination of novel substances and internet pharmacies. Cryptomarkets, by nature difficult to investigate were also examined (Van Hout 2016, Bancroft 2016).

Limitations: A number of studies identified a lack of demographic and geographic data due to privacy restrictions from web-forum administrators, undeclared by participants or difficulties in accessing the information on a wide scale because of variation in web-forum structure. Absence of this data may support critiques of whether web-data can be accepted as representative of the substance using community more generally. A further issue is the risk of incorrectly identifying or over-generalizing information on emerging drug use trends. One solution was to sample more extensively from the web, discussed in the next point. Other strategies included triangulation (Petrioczi 2015, VanSchipstal 2016) and cross validation against survey data (Paul 2016).

Machine learning techniques: The amount of data in each study varied considerably from between 60 threads incorporating 13,082 posts (Soussan 2014b) to over 1 million posts from 35,974 individual users (Cameron 2013). The sheer volume of internet data generated daily makes manual coding increasingly unachievable and a growing number of studies have evolved to address this (Figure 4). 4 studies (DeVaugh-Geiss 2016, Paul 2012, Pineau 2016 & Cameron 2013) used machine-learning techniques to automatically capture complex semantic relationships between concepts, essentially automating the coding process. The development of automated methods collect, extract and code user generated content is arguably essential to realising the full potential of this form of research.

Online participatory research and bottom-up harm reduction: Two studies in particular incorporated a collaborative research approach. In one, the forum owners were involved in all aspects of the research which facilitated more in depth knowledge and understanding (Chiauzzi 2013). The second project (Moro 2013) was a substance user derived initiative with online and offline harm reduction interventions which included trip reports, pill testing, an early warning system and public service information. Both these studies capitalised on the community nature of internet forums in novel ways.

Conclusions

Novel approaches to internet forum research such as triangulation with other data sources, large scale automated coding and virtual community focused collaboration are as yet uncommon compared with traditional netnography and virtual ethnography. Nevertheless, novel methods have the potential to substantially contribute to substance use epidemiology and interventions. Machine learning techniques in particular will become increasingly necessary to address the large and growing digital data mountain.

References

- Bancroft, A., & Reid, P. S. (2016). Concepts of illicit drug quality among darknet market users: Purity, embodied experience, craft and chemical knowledge. *International Journal of Drug Policy*, 35, 42–49.
- Burnett, G. (2000). Information exchange in virtual communities: A typology. *Information Research*, 5(4). Retrieved from <http://informationr.net/ir/5-4/paper82.html>
- Chatwin, C., Measham, F., O'Brien, K. and Sumnall, H., 2017. New drugs, new directions? Research priorities for new psychoactive substances and human enhancement drugs. *International Journal of Drug Policy*, 40, pp.1-5.
- Coomber, R., 1997. Dangerous drug adulteration-an international survey of drug dealers using the internet and the world wide web (WWW). *INTERNATIONAL JOURNAL ON DRUG POLICY*, 8, pp.71-81.
- Rosino, M., & Linders, A.(2015).Howard Becker in hyperspace: Social learning in an on- line drug community. *Deviant Behaviour*, 36(9), 725–739.
- Van Hout, M. C. (2015). Nod and wave: An internet study of the codeine intoxication phenomenon. *International Journal of Drug Policy*, 26(1), 67–77.
- Van Hout, M. C., & Hearne, E. (2015). Word of mouse: Indigenous harm reduction and online consumerism of the synthetic compound methoxphenidine. *Journal of Psychoactive Drugs*, 47(1), 30–41.

The papers used in this project are cited in brackets and italics and are listed at: www.sphsu.mrc.ac.uk/methods/

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