Drug and Alcohol Review

WILEY | APSAD

COMMENTARY OPEN ACCESS

The Need to Revitalise Drug Use Monitoring to Keep Pace With a More Dynamic, Digitally Enabled and Globally Connected Drug Market

Paul Griffiths[1] | Charles Parry[2,3] | Atul Ambekar[4] | Balasingam Vicknasingam[5] | Abel Basutu[6] | Bronwyn Myers[2,7] | Alessandra Bo[8] | Paul Dietze[1,9] | Ken Douglas[10] | Nadine Ezard[11,12] | Mauricio Fiore[13] | Marya Hynes[14] | Christopher M. Jones[15] | Pamela Kent[16] | Jane Mounteney[8] | Kamran Niaz[17] | Klaudia Palczak[8] | Antonio Pascale[18] | Amy Peacock[19] | Marta Rychert[20] | Lela Sturua[21,22] | Yong-an Zhang[23]

[1]National Drug Research Institute, Curtin University, Perth, Australia | [2]Mental Health, Alcohol, Substance Use & Tobacco Research Unit, South African Medical Research Council, Cape Town, South Africa | [3]Department of Psychiatry, Stellenbosch University, Cape Town, South Africa | [4]National Drug Dependence Treatment Centre, All India Institute of Medical Sciences, Ghaziabad, India | [5]Centre for Drug Research, Universiti Sains, Malaysia | [6]Department Health, Humanitarian Affairs and Social Development, African Union, Addis Ababa, Ethiopia | [7]Curtin enAble Institute, Curtin University, Perth, Australia | [8]European Union Drug Agency, Lisbon, Portugal | [9]Burnet Institute, Melbourne, Australia | [10]Independent Consultant, Drug Abuse Epidemiologist, Caribbean | [11]UNSW Sydney, Sydney, Australia | [12]St Vincent's Hospital Sydney, Sydney, Australia | [13]Brazilian Center of Analyses and Planning, São Paulo, Brazil | [14]Organization of American States, Washington, USA | [15]Center for Substance Abuse Prevention and Center for Behavioral Health Statistics and Quality, Substance Abuse and Mental Health Services Administration, U.S. Department of Health and Human Services, Rockville, USA | [16]Research and Emerging Trends, Canadian Centre on Substance Use and Addiction, Ottawa, Canada | [17]Research and Trend Analysis Branch, United Nations Office on Drugs and Crime, Vienna, Austria | [18]Center of Biomedical Sciences, University of Montevideo, Montevideo, Uruguay | [19]National Drug and Alcohol Research Centre, UNSW Sydney, Sydney, Australia | [20]Massey University, Palmerston North, New Zealand | [21]NCD Department, National Center for Disease Control and Public Health, Tbilisi, Georgia | [22]Public Health Department, Petre Shotadze Tbilisi Medical Academy, Tbilisi, Georgia | [23]International Centre for Drug Policy Studies, Shanghai University, Shanghai, China

Correspondence: Paul Griffiths (paul.griffiths@curtin.edu.au)

Received: 16 April 2025 | **Revised:** 22 July 2025 | **Accepted:** 28 July 2025

Funding: The authors received no specific funding for this work.

Globalisation, developments in information technology, and social and demographic changes are profoundly impacting the modern world [1]. They have also resulted in an illicit drug market that is more dynamic, complex and globally connected [2]. Drug consumption patterns are rapidly changing, with synthetic drugs, controlled psychoactive substances and poly substance use all playing a greater role [3]. These developments are impacting both the nature and the scale of associated health problems. Moreover, there are concerns that the pace of change may be rapidly growing in those parts of the world in which our current capacity to collect information is least developed [4]. Approaches to drug monitoring need to be timelier, better coordinated across jurisdictions and more digitally enabled to keep pace with the challenges we are facing in this area [5]. These were the conclusions from a recent informal technical meeting on the state of global drug surveillance held in the margins of the Lisbon Addictions 2024 Conference. A group of experts from different parts of the world met to critically review current monitoring capacity and to discuss what developmental actions were needed to better meet the needs of policy and practice in this area. The meeting focused on sharing innovations in methodology and insights on drug trends and new developments. The experts reviewed the current drug situation in South America, the Caribbean, North America, Africa, Europe, Asia and Oceania. From this meeting, it was evident that despite considerable heterogeneity in monitoring capacity, all regions now faced similar challenges in respect to the need to develop systems that could rapidly respond to the growing sophistication of drug markets and complexity in drug consumption patterns.

More specifically, the group concluded that there is now greater diversity in the range of drugs being used, with both

long-established synthetic drugs like methamphetamine as well as more novel substances—now playing a more prominent role. A characteristic of many modern drug markets is that producers are constantly innovating, leading to the appearance of new substances which can elude routine detection using existing approaches [6]. At the same time, the simultaneous use of multiple drugs continues to complicate monitoring efforts and challenge public health responses [7, 8]. Interactions between drugs commonly used together can have important implications for public health, but tracking trends in patterns of poly-substance use is methodologically challenging [9]. Relying on self-reported data alone has become more problematic as consumers may be unaware of or misinformed about the drug or drug combinations they are consuming [3]. As a result, some regions have expanded their established approaches to drug monitoring to include forensic or toxicological chemical testing across a range of samples and sources [10]. More generally, there is now increasing interest in the use of more novel and developmental approaches that include wastewater analysis [11, 12], the analysis of data from drug checking services [13], syringe residue studies [14] and discarded packaging analysis [15], as well as the greater recognition of the need for investment in analysing biological samples from both fatal and non-fatal drug overdoses [16, 17]. New technologies also offer new opportunities for drug surveillance [18]. Online surveys, electronic tools for monitoring online drug markets, and the utilisation of open-source information are all now integral components of some information systems [19]. The deployment of artificial Intelligence (AI) is also likely to play an important role in the future. AI demonstration projects already exist in some areas such as the monitoring of drug-related threats on social media or of online drug discourses [20–22].

There have also been advancements in the development of innovative approaches to data collection and methodologies that permit the timelier collection, collation and reporting of information. Different analytic methods, including disaggregation of data by age, gender, and sub-population, are now more commonly being utilised to better understand changes in drug use and harm patterns across different countries and regions over time. Early warning systems have been introduced in many parts of the world that complement more established approaches [23, 24]. There has also been a move towards real-time reporting of findings, through threat assessments and alerts, intended to prompt more timely actions by services and/or alert people who use drugs to the appearance of particularly high-risk substances [16, 25].

Despite these developments, there are still significant gaps in data availability in many parts of the world. Time lags in data analysis and reporting also raise questions about the relevance of findings in the context of rapid change. Many systems, particularly in the global South, continue to focus largely on treatment demand data, school surveys, and law enforcement data, such as police arrests and seizures [26] without sufficient consideration of the potential limitations of these sources if they are used in isolation. Prevalence estimates from well-conducted population surveys are still regarded as an important pillar for any drug surveillance system. However, the cost and practical difficulties in connecting credible representative surveys in many parts of the world mean these data are often unavailable or collected at such disparate time intervals that their utility is often limited.

A challenge for all countries and regions is that regardless of the data available, they are often not analysed at the systems level, and data from different sources and methods are not triangulated in a way that can increase the validity and therefore the utility and credibility of findings for informing policies and actions. This is not unique to the drug monitoring area but rather reflects a more general conclusion for public health monitoring that we need to advance data integration at the systems level to provide rapid and easy linkage across sources. Whilst practical and governance challenges exist to achieving this objective, developments in information technology and AI are also creating exciting new opportunities to make progress in this area [27]. The increased availability of both established synthetic substances as well as more novel ones does however create a more specific and pressing challenge for drug monitoring systems to have the capability to further develop and better integrate forensic and toxicological information sources. Globally, this capacity remains insufficient, with few countries possessing systems that can routinely, rapidly, and comprehensively identify substances linked to poisoning events or identify the appearance of new and novel substances appearing on the drug market. This is an important first step for initiating further risk assessment work, as the threats to public health posed by the appearance of many new substances are often poorly understood.

In response to these challenges, there was a consensus among the expert group that there was a need to both rethink and reenergise our current approach to drug monitoring. It was recognised that we face increasingly common challenges in this area, and we need to work closer together as a global community of practice to address these. The need to build capacity exists in many parts of the world where surveillance systems do not exist or are not sufficiently developed. Capacity building and the sharing of experiences, as well as timely information sharing on emerging drug-related health problems, can be helpful in addressing these deficiencies. In many countries and regions, the data that are being collected do not sufficiently influence health-related policy-making and practices. We need to work to improve the evidence literacy of our stakeholders while developing appropriate channels for providing evidence at a time and in a form that has greater utility for informing policies and actions to protect individual and population health.

In conclusion, there is a global policy consensus that drug monitoring systems can support the development of more informed policies and interventions and that networking and capacity building in this area require development [28]. The world is also changing, however, in ways that create a pressing need to revitalise our approaches in this area if they are to remain fit for purpose. In addition to established approaches, the greater use of timely forensic analysis and toxicology information sources derived from a range of samples is needed to increase the validity of our insights to better inform policy development. Involving people who use drugs and the wider community in research and the co-production of data and analysis is also critical. Not only does this approach provide valuable insights into the information available, it represents an important resource for translating this analysis in ways that can better inform the development of culturally and contextually appropriate responses to reduce drug-related harm and to protect population health. The use of AI and other new technologies has the potential to support

more efficient and informative data analysis and reporting. Furthermore, moving beyond monitoring and early warning, and incorporating forecasting and foresight approaches into our information models has the potential to allow us to anticipate better the future challenges we may face [29]. Given the speed at which drug trends can now transcend geographical boundaries, there is now a clear and pressing need to invest more in international partnerships and discourse to support the identification of emerging trends, support capacity building efforts and the introduction of new methods, and to permit the timely sharing of data and analysis to inform policy and programmatic planning and decision making.

Author Contributions

The concept for this editorial arose from the discussions that took place at an expert meeting on global drug trends in which all authors were active participants. P.G. and C.P. developed an outline for an initial draft manuscript. This was then critically reviewed by all authors who provided comments and/or substantive amendments. All authors read and approved the final manuscript.

Acknowledgements

The authors would like to acknowledge the European Union Drug Agency for the support they provided for the expert technical meeting on global drug trends that provided the inspiration for this commentary. Open access publishing facilitated by Curtin University, as part of the Wiley - Curtin University agreement via the Council of Australian University Librarians.

Conflicts of Interest

The authors declare no conflicts of interest.

Data Availability Statement

Data sharing is not applicable to this article as no new data were created or analyzed in this study.

References

1. United Nations, "Fulfilling the promise of globalization: advancing sustainable development in an interconnected world. Report of the Secretary General to the Seventy-second Session of the General Assembly," 2017, https://docs.un.org/en/A/72/301.

2. P. Griffiths and J. Mounteney, "Disruptive Potential of the Internet to Transform Illicit Drug Markets and Impact on Future Patterns of Drug Consumption," *Clinical Pharmacology and Therapeutics* 101 (2017): 176–178, https://doi.org/10.1002/cpt.561.

3. A. Peacock, R. Bruno, N. Gisev, et al., "New Psychoactive Substances: Challenges for Drug Surveillance, Control, and Public Health Responses," *Lancet* 394, no. 10209 (2019): 1668–1684.

4. S. El Hayek, V. Lasebikan, and A. Noroozi, "Editorial: Alcohol and Drug Use in Low- and Middle-Income Countries," *Frontiers in Psychiatry* 15 (2024): 1381726.

5. J. Raubenheimer and M. Barratt, "Digital era drug surveillance: Quo vadis, Australia?," *Drug and Alcohol Review* 37, no. 6 (2018): 693–696, https://doi.org/10.1111/dar.12853.

6. J. Eligh, "Global Synthetic Drug Markets. Global Initiative Against Transnational Crime. Research Report. Geneva, Switzerland. Jason-Eligh-Global-synthetic-drug-markets-The-present-and-future-GI-TOC-March-2024.pdf," 2024.

7. O. Price, R. Sutherland, N. Man, et al., "Trends and Psychosocial Correlates of Same Day Polysubstance Use Among People Who Inject Drugs in Australia, 2012-2022," *International Journal of Drug Policy* 2023 (2023): 104150.

8. A. Palmer, P. Higgs, N. Scott, P. Agius, L. Maher, and P. Dietze, "Prevalence and Correlates of Simultaneous, Multiple Substance Injection (Co-Injection) Among People Who Inject Drugs in Melbourne, Australia," *Addiction* 116, no. 4 (2021): 876–888, https://doi.org/10.1111/add.15217.

9. N. Marshall, "Monitoring the Complications of Poly-Drug Use: A Multifactorial Perspective," *Journal of Addiction Research & Therapy* 14 (2023): S12.

10. E. Biggar, K. Papamihali, P. Leclerc, et al., "Towards Cross-Canada Monitoring of the Unregulated Street Drug Supply," *BMC Public Health* 21 (2021): 1678, https://doi.org/10.1186/s12889-021-11757-x.

11. C. Ort, A. L. van Nuijs, J. D. Berset, et al., "Spatial Differences and Temporal Changes in Illicit Drug Use in Europe Quantified by Wastewater Analysis," *Addiction* 109, no. 8 (2014): 1338–1352, https://doi.org/10.1111/add.12570.

12. B. Moslah, O. Smaoui, M. A. Nouioui, et al., "Sewage Analysis as an Alternative Tool for Assessing Drug of Abuse and New Psychoactive Substances in Tunisia," *Forensic Science International* 347 (2023): 111672, https://doi.org/10.1016/j.forsciint.2023.111672.

13. K. J. Moon, H. D. Whitehead, A. Trinh, et al., "Enhancing Drug Checking Services for Supply Monitoring: Perspectives on Implementation in Syringe Service Programs in the USA," *Harm Reduction Journal* 21 (2024): 11, https://doi.org/10.1186/s12954-023-00924-5.

14. T. Nefau, E. Charpentier, C. Elyasmino, Y. Levi, and S. Karolak, "Drug Analysis of Residual Content of Used Syringes: A New Approach for Improving Knowledge of Injected Drugs and Drug User Practices," *International Journal of Drug Policy* 26, no. 4 (2015): 412–419.

15. H. West, J. Fitzgerald, K. Hopkins, et al., "Early Warning System for Illicit Drug Use at Large Public Events: Trace Residue Analysis of Discarded Drug Packaging Samples," *Journal of the American Society for Mass Spectrometry* 32 (2021): 2604–2614.

16. R. Syrjanen, J. Schumann, J. Fitzgerald, et al., "The Emerging Drugs Network of Australia - Victoria Clinical Registry: A State-Wide Illicit Substance Surveillance and Alert Network," *Emergency Medicine Australasia* 35, no. 1 (2023): 82–88, https://doi.org/10.1111/1742-6723.14059.

17. T. Zellner, F. Eyer, C. Rabe, S. Geith, B. Haberl, and S. Schmoll, "Recreational Drug Overdose—Clinical Value of Toxicological Analysis," *Toxics* 12, no. 9 (2024): 662, https://doi.org/10.3390/toxics12090662.

18. A. Sarker, M. A. Al-Garadi, Y. Ge, et al., "Evidence of the Emergence of Illicit Benzodiazepines From Online Drug Forums," *European Journal of Public Health* 32, no. 6 (2022): 939–941, https://doi.org/10.1093/eurpub/ckac161.

19. European Union Drug Agency (EUDA), "European Drug Report: Trends and Developments," 2024, www.euda.europa.eu.

20. A. Fisher, M. M. Young, D. Payer, K. Pacheco, C. Dubeau, and V. Mago, "Automating Detection of Drug-Related Harms on Social Media: Machine Learning Framework," *Journal of Medical Internet Research* 25 (2023): e43630.

21. B. Guarita, V. Belackova, D. Gouwe, M. Blankers, M. Pazitny, and P. Griffiths, "Monitoring Drug Trends in the Digital Environment-New Methods, Challenges and the Opportunities Provided by Automated Approaches," *International Journal of Drug Policy* 94 (2021): 103210, https://doi.org/10.1016/j.drugpo.2021.103210.

22. S. Sumner, D. Bowen, K. Holland, et al., "Estimating Weekly National Opioid Overdose Deaths in Near Real Time Using Multiple Proxy Data Sources," *JAMA Network Open* 5, no. 7 (2022): e2223033, https://doi.org/10.1001/jamanetworkopen.2022.23033.

23. P. Griffiths, L. Vingoe, N. Hunt, J. Mounteney, and R. Hartnoll, "Drug Information Systems, Early Warning, and New Drug Trends: Can Drug Monitoring Systems Become More Sensitive to Emerging Trends in Drug Consumption?," *Substance Use & Misuse* 35, no. 6–8 (2000): 811–844.

24. L. B. Cottler, B. A. Goldberger, S. J. Nixon, et al., "Introducing NIDA'S New National Drug Early Warning System," *Drug and Alcohol Dependence* 217, no. Dec 1 (2020): 108286.

25. J. Morais, M. Evans-Brown, A. Gallegos, et al., "New Psychoactive Substances: 25 Years of Early Warning and Response in Europe. An Update From the EU Early Warning System," *Toxicologie Analytique et Clinique* 34, no. 3 (2022): S29–S30.

26. United Nations, "High-level declaration by the Commission on Narcotic Drugs on the 2024 midterm review, following up to the Ministerial Declaration of 2019. United Nations, Vienna," 2024, https://www.unodc.org/documents/commissions/CND/2024_high-level_declaration/2414246E-Declaration-2024-eBook.pdf.

27. E. D. Carter, D. E. Stewart, E. E. Rees, et al., "Surveillance System Integration: Reporting the Results of a Global Multicountry Survey," *Public Health* 231 (2024): 31–38, https://doi.org/10.1016/j.puhe.2024.03.004.

28. Commission on Narcotic Drugs, "Resolution 63.2 Promoting and improving the collection and analysis of reliable and comparable data to strengthen balanced, integrated, comprehensive, multidisciplinary and scientific evidence-based responses to the world drug problem," 2020, https://www.unodc.org/documents/commissions/CND/Drug_Resolutions/2020-2029/2020/Resolution_63_2.pdf.

29. T. Rhodes and K. Lancaster, "Futures-Oriented Drugs Policy Research: Events, Trends, and Speculating on What Might Become," *International Journal on Drug Policy* 94 (2021): 103332.