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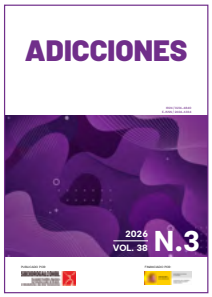

LETTER TO THE EDITOR

Challenges in the identification of fentanyl and its analogues in Mexico: Implications for public health

Retos en la identificación de fentanilo y sus análogos en México: Implicaciones para la salud pública

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In recent years, fentanyl has gone from being a substance of limited clinical use to becoming an increasingly frequent component of the illicit market. This change has not only altered patterns of consumption but has also introduced new difficulties in its detection and interpretation, particularly in contexts where substances circulate in mixtures and in variable presentations (UNODC, 2023; CDC, 2024).

One of the main complications stems from the constant emergence of fentanyl analogues. These substances exhibit structural variations that can significantly modify their potency and toxicological profile, while at the same time hindering their identification by conventional analytical techniques (Armenian et al., 2018; EMCDDA, 2024). Unlike other drugs with relatively stable compositions, fentanyl and its derivatives form part of a dynamic market in which the substitution and combination of compounds occur rapidly.

In practice, analytical identification is not always a straightforward process. Although techniques such as infrared spectroscopy and chromatography coupled with mass spectrometry remain fundamental tools, their interpretation may be limited when samples contain complex mixtures or adulterants. It is common to find evidence items containing multiple active substances, together with compounds that can mask the analytical signal or modify its interpretation (SWGDRUG, 2021). This situation is of particular relevance in the case of high-potency opioids, where small variations in composition can lead to substantial changes in the risk of overdose (O'Donnell et al., 2020).

Added to this is the difficulty associated with sampling. Under real-world conditions, seized substances are not always homogeneous, so a representative sample may not fully reflect the composition of the whole. This aspect, widely recognized in the forensic field, has direct implications for

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the interpretation of results and for the estimation of the risk associated with consumption (UNODC, 2009).

From a public health perspective, these analytical limitations have significant consequences. The undetected presence of fentanyl or one of its analogues in other drugs considerably increases the risk for users, who are frequently unaware of the actual composition of what they consume (Ciccarone, 2021). This phenomenon has been documented in different international contexts, where the increase in overdose deaths has been linked to the incorporation of synthetic opioids into various substances (CDC, 2024).

In the Mexican context, some recent reports have noted the complexity associated with the identification of these emerging substances, as well as the variability in their presentation and composition, which reinforces the need to strengthen analytical capacities and surveillance systems (González Lozano et al., 2024).

Furthermore, the speed with which new analogues emerge poses additional challenges in the regulatory sphere. The inclusion of these substances in regulatory lists usually lags behind their appearance on the market, generating temporary gaps that hinder their control. In this scenario, rather than an exclusively regulatory response, a comprehensive approach is required that brings together analytical capacities, epidemiological surveillance, and harm reduction strategies.

Overall, fentanyl and its analogues represent a challenge not only because of their potency but also because of the complexity they introduce in their identification and control. Recognizing these limitations makes it possible to better assess the magnitude of the problem and to move toward more effective responses, in which the information generated in the technical sphere contributes directly to public health decision-making, particularly in a scenario where the rapid evolution of these substances demands technical and coordinated responses.

Conflict of interest

The author declares no conflicts of interest related to the content of this manuscript.

Institutional disclaimer

The views and conclusions expressed in this article are solely those of the author and do not necessarily represent the institutional position of the Fiscalía General de la República.

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