

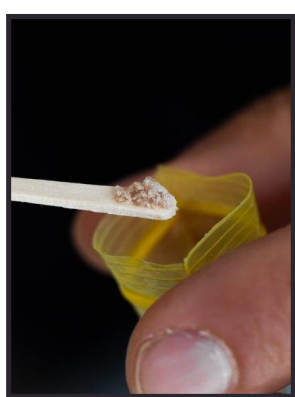
Variability in the unregulated opioid market in the context of extreme rates of overdose

Ashley Larnder, Armin Saatchi, Scott A. Borden, Belaid Moa, Chris G. Gill, Bruce Wallace, & Dennis Hore

"We found the opioid crisis to be less attributable to a bad batch of drugs but rather the general variability found in the unregulated market."

Background

Drug checking uses analytical chemistry technologies to report on the composition of drugs from the unregulated market to reduce substance use-related risks, while additionally allowing for monitoring and reporting of the supply. In the context of an overdose crisis linked to fentanyl, we used drug checking data to examine variability within the illicit opioid supply.



Methods

Drugs reported as opioids by participants were analyzed to determine sample composition and paper spray mass spectroscopy was used to quantify low-concentration actives. Interquartile and statistical process control (SPC) analysis, namely standard deviation control charts, were used to examine the degree of variability among samples.

Results

Fentanyl was found in 96% of samples reported to be opioids, with a median concentration of 9%. **Concentrations varied significantly, with a standard deviation of 7% for fentanyl and where nearly 20% of data points fell outside the control limits.** Over half of the samples contained an additional and unexpected active, most commonly etizolam (43% of samples). Etizolam also showed a large level of variability, uncorrelated to that of fentanyl.

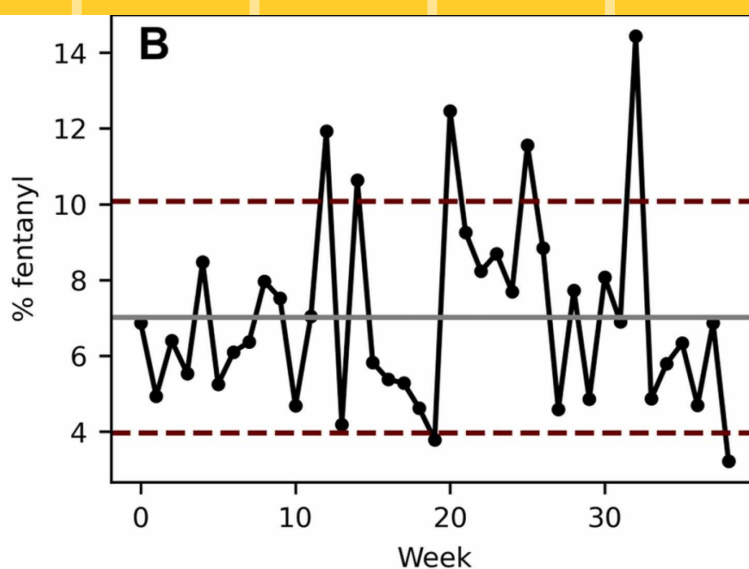
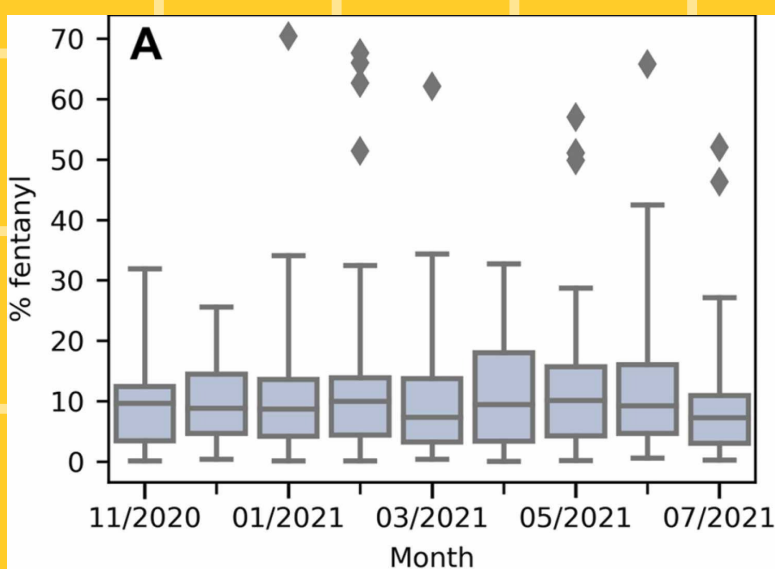


Fig. 1. (A) Quartile visualization of fentanyl concentration (%w/w) grouped by month checked at the drug checking service. (B) Shewhart control s-chart of the standard deviation in fentanyl concentration of samples checked per week of service.

Conclusion

Overall, the level of variability we have demonstrated interferes with the ability of PWUD to maintain stable consumption of illicit drugs. **The reality is that many of the opioids present in the illicit supply are not inherently unsafe drugs, they are simply unregulated drugs.**

