The US Drug Enforcement Administration's decision to restrict prescription drugs containing hydrocodone (a popular opioid painkiller) was associated with a 'significant' increase in illicit trading of opioids through online markets, finds a study published by *The BMJ* today.
In this study, the term opioids refers to drugs that are usually available by prescription but here are sourced illegally through the dark net and are not prescribed by anyone.

The findings show that the proportion of sales of opioids through illicit markets doubled over the study period and sales of more potent opioids also increased.

Overdose death rates have quadrupled in the US since 1999, and 40% of all deaths involve prescription opioids, which are primarily used for pain relief.

In October 2014, the US Drug Enforcement Administration decided to move hydrocodone opioids from schedule III to schedule II (a more restrictive category), making it more difficult for patients to access these drugs on prescription and stopping automatic repeat prescriptions.

There is concern that opioid users will source drugs from illegal online markets called 'cryptomarkets' rather than from pharmacies. Users only access these cryptomarkets via the 'darknet', where people can sell and buy drugs anonymously.

Although the legitimate supply of opioids may have decreased, overall consumption will remain unchanged if users decide to source them from illicit markets.

So an international research team set out to investigate whether there was a link between the 2014 reclassification of hydrocodone opioids and an increase in trading of illicit prescription drugs on cryptomarkets.

Using web crawler software, they compared sales for prescription drugs containing hydrocodone with other prescription drugs and illicit opioids from 31 different cryptomarkets operating from September 2013 to July
2016 (before and after reclassification).

They looked at three pieces of information from each product listing placed by a seller: the drug type on offer, the country from where products would be shipped, and the number of reviews the listing had received, to compare usage in relation to the 2014 reclassification.

The researchers found that the sale of opioids through US cryptomarkets increased after the 2014 reclassification, with no significant changes in sales of sedatives, steroids, stimulants, or illicit opioids.

In July 2016, sales of opioids through US cryptomarkets represented 13.7% of all drug sales compared with a modelled estimate of 6.7% of all sales (a 4% yearly increase in market share) had the new schedule not been introduced.

They also report a change in the type of drugs purchased after reclassification. Oxycodone purchases decreased, and fentanyl (a stronger and potent than hydrocodone) moved from being the least sold product to being the second most popular prescription opioid bought from cryptomarket sellers based in the USA. Fentanyl is currently the leading cause of opioid overdose in the USA.

The researchers outline some study limitations. For example, there may have been a general increase in demand that was unrelated to the 2014 restriction, and the source and destination of the drugs cannot be independently confirmed.

Nevertheless, they say their results "are consistent with the possibility that the scheduled change might have directly contributed to the changes we observed in the supply of illicit opioids."

This possibility "is reinforced by the fact that the increased availability
and sales of prescription opioids on cryptomarkets in the US after the schedule change was not replicated for cryptomarkets elsewhere," they add.

By purchasing from cryptomarkets, it becomes more difficult to track individual use of prescription opioids, and to offer treatment and help to users, say the authors, and they suggest strategies to minimise harm, such as dealing with over-prescribing, and making more information available to users about the nature and dangers of prescription opioid use.

"These alternatives are known to have an impact on drug use and could be employed before and after schedule changes to alleviate their negative impacts" they conclude.

In a linked editorial, Scott Hadland from Boston Medical Center's Grayken Center for Addiction and Leo Beletsky from Northeastern University School of Law and Bouvé College of Health Sciences say this analysis illustrates "the predictable consequence of cutting supply without tackling demand."

They point out that the US Department of Justice recently announced it is doubling resources allocated to combatting dark web drug sales, but argue that this approach is unlikely to succeed.

They say demand for opioids in the US will decrease sustainably "only when high-quality evidence-based prevention and treatment programs are broadly implemented, robustly funded, and universally available."

And they warn that the overdose crisis "will likely worsen so long as supply-side interventions are not coupled with evidence-based measures to cut demand and reduce harm."

**More information:** Research: Effect of restricting the legal supply of
prescription opioids on buying through online illicit marketplaces: interrupted time series analysis, [www.bmj.com/content/361/bmj.K2270](www.bmj.com/content/361/bmj.K2270)

Editorial: Tighter prescribing regulations drive illicit opioid sales, [www.bmj.com/content/361/bmj.K2480](www.bmj.com/content/361/bmj.K2480)

Provided by British Medical Journal


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