COVID-19 has exacerbated the opioid crisis in the USA because of lockdowns, treatment centres closing, and pervasive triggers for addiction and relapse, like stress and social isolation. By August, 2020, more than 88,000 drug overdose deaths had occurred in the USA in the previous 12-month period, largely driven by synthetic opioids, such as fentanyl, making 2020 the worst single year in history for fatal overdoses. Additionally, some survivors of COVID-19 have been prescribed opioids for lingering symptoms, which could potentially lead to addiction and further fuel the opioid crisis.

In this issue of The Lancet Digital Health, Bharat and colleagues review the potential of big data and artificial intelligence to reduce harms related to opioid use (ie, prescribed and illicit), such as the use of administrative data to establish global trends of opioid use, machine learning to predict risk of overdose, and surveillance systems to monitor opioids sold over the internet. But opioid misuse is a complex public health problem with a wide range of risk factors. For instance, poor mental health and opioid misuse are often comorbid conditions and the relationship can be bidirectional. Evidence suggests that people with mental health disorders are likely to not only experience chronic pain but also be prescribed opioids to treat that pain, putting them at high risk of developing adverse opioid-related problems, such as opioid use disorder (OUD). In a positive step forwards, President Joe Biden has signed the American Rescue Plan Act, which includes funds of almost US$4 billion towards substance use and mental health prevention and treatment programmes.

Such funding can also enable national-level data collection. The Review highlights that these data should come from multiple sources—eg, electronic health records, medical insurance claims, and criminal justice sources—and be linked, to account for both clinical and social determinants of overdose risk and improve risk prediction. Data linkage could also help to identify treatment gaps and influence policy, such as by providing evidence-based support for Medicaid expansion, thus championing equitable health coverage for people with OUD.

On a community level, Medicaid expansion could increase availability of medications for OUD, such as opioid agonist treatment (OAT). Community-level modelling projections suggest that only those communities with increased capacity for treating (and retaining) people with medications for OUD will see a substantial reduction in overdose mortality. Scaling up OAT coverage could therefore prevent a substantial number of drug-related deaths.

However, bias in prediction models can hamper efforts towards health equity. Racial and ethnic minorities have been disproportionately impacted by COVID-19; this trend is also apparent for people with substance use disorders (particularly OUD), who are also at increased risk of adverse pandemic-related mental health and economic outcomes. If prediction models are not built on representative data, they could overestimate or underestimate overdose risk in some populations and perpetuate systemic discrimination in clinical practice. Also, models built on a population with a low prevalence of overdose outcomes can generate a high rate of false positives; at an individual level, this could become a barrier to care as people who are incorrectly identified as being at high risk of overdose might be prevented from accessing treatment. This effect could also deter people from sharing their health data. Robust evaluation and validation of models in diverse populations and across a range of contextual factors, and a culture shift that promotes model explainability and governance over data sharing, are pivotal to fostering trust in predictive models.

Big data and artificial intelligence could help to turn the tide of this crisis through tightly governed data collection and analysis at a national, community, and individual level. National-level data linkage can help to target preventive measures (eg, addressing comorbidities and socioeconomic inequalities) to reduce future risks of opioid misuse. Community-level modelling can forecast the number of fatal overdoses that could be avoided through wider availability of key treatments. But model explainability and integration of all individual-level factors—ie, clinical and social—are crucial to remove barriers and ensure prevention and treatment efforts are accessible to all.

■ The Lancet Digital Health

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