E-mail Reminders for Prescription Monitoring Program Usage Among Clinicians in the United States

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Sector(s): Health

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Sample: 7,872 clinicians

Target group: Health care providers

Intervention type: Information

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Partner organization(s): Minnesota Management and Budget

Guideline-discordant prescribing for opioids and other risky drugs is a key factor in the high number of opioid-related deaths in the United States. Prescription Monitoring Programs (PMPs) can help clinicians make safer prescribing decisions for their patients. Although most state guidelines mandate PMP use, clinicians often underuse them. Researchers conducted a randomized evaluation to test the impact of e-mail reminders on clinicians' engagement with PMPs and their prescribing behavior. They also examined which type of messaging in the e-mails, either focusing on legal requirements or clinical benefits of PMPs, was more effective in improving PMP usage and prescription behavior. The e-mail reminders—particularly those focused on legal requirements—increased PMP usage, but had no effect on prescribing behavior.

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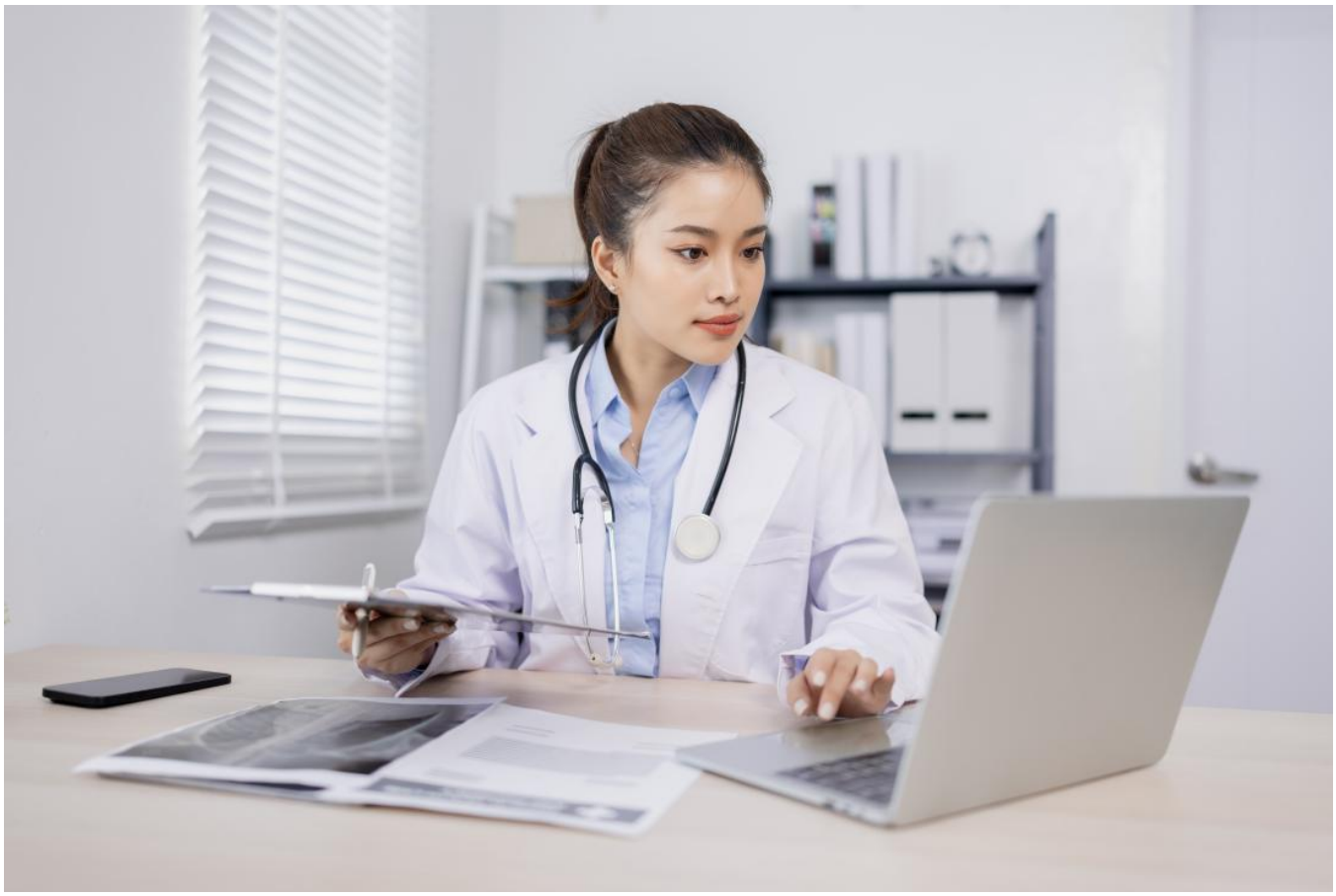
Despite recent declines in deaths related to opioid overuse, the United States still has high opioid death and prescription rates when compared to other high-income countries.[1], [2], Prescriptions of other risky drugs, such as stimulants, have also increased, as have overdose deaths involving stimulants.[3]

Promoting safer prescription of opioids and other controlled substances, such as stimulants, may be an important and effective way of reducing substance-related deaths. Prescription monitoring programs (PMPs)—databases that track controlled substance prescriptions—allow clinicians to be better informed about safe prescribing, which can reduce guideline-discordant prescribing. Federal guidelines recommend clinicians check PMPs before prescribing new opioid prescriptions for pain, but they are often underused by clinicians. Can e-mail reminders about legal requirements or the benefits of PMPs increase their use by clinicians and lead to safer prescribing of controlled substances?

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PMPs are operational in all states, and most require clinicians to have a PMP account if they prescribe controlled substances. Once clinicians create an account, they can search the database to see if the medication they are prescribing may interact with other medications that their patients might be taking. Previous research has shown that PMP mandates can make prescribing safer.[4]

This study took place in Minnesota, which began requiring PMP account holding and searching in 2017 and 2021 respectively. In 2023, 32 percent of opioid prescriptions came from clinicians who did not search the database, and 20 percent of these clinicians did not hold a PMP account. Participants were clinicians in Minnesota—83.5 percent of whom were physicians and 16.5 percent were physician assistants—who prescribed controlled substances and met one of the following criteria: 1) not having a PMP account (51.7 percent), 2) having an inactive account (9.8 percent), 3) not searching the PMP (22.3 percent), or 4) searching infrequently (16.3 percent).



Doctor sits at computer.

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The researchers evaluated how e-mail outreach and messaging impacted clinician engagement with PMP and prescription behavior. They identified 7,872 clinicians who were not engaged with the PMP (as defined above) and randomly assigned them to one of three groups:

1. *Legal requirements group* (2,624 participants): Clinicians received an e-mail focused on the state's legal requirements of PMP account holding or searching. A follow-up e-mail was sent to clinicians who did not engage with the PMP as noted in the first e-mail one month after receiving the initial e-mail.
2. *Clinical benefits group* (2,624 participants): Clinicians received an e-mail referencing national clinical practice guidelines and stating that PMP account holding or searching could increase guideline adherence. A follow-up e-mail was sent to clinicians who did not engage with the PMP as noted in the first e-mail one month after receiving the initial e-mail.
3. *Comparison group* (2,624 participants): Clinicians in this group did not receive any e-mails.

Researchers identified study participants using state licensure and PMP data by tracking clinicians' prescription behavior during a sixty-day period and engagement with the PMP. Researchers collected data on controlled-substance prescriptions and PMP engagement and searches from the Minnesota PMP, as well as licensure data from the Minnesota Board of Medical Practice.

The primary outcomes of interest were PMP use (account creation, account activation, any PMP search or an increase in search rate) and prescription behavior. The latter was measured using a composite of five measures: opioid-opioid overlap days with multiple prescribers, opioid-benzodiazepine overlap days, opioid-gabapentinoid overlap days, days with high opioid doses, and dispenses with more than a seven-day supply for patients without previous opioid prescriptions. Secondary outcomes further disaggregated these primary outcomes, including specific measures of e-mail engagement, general PMP usage, and each of the five prescribing measures assessed individually. Researchers measured outcomes for seven months following the initial e-mail send date.

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Receiving an e-mail increased PMP engagement but did not affect prescribing behavior. Although both e-mail types increased PMP engagement, receiving a legal requirements e-mail increased engagement by approximately twice as much as the clinical benefits e-mail. For clinicians who received the e-mails, the effects persisted for at least seven months.

PMP engagement

For those that received e-mails focusing on legal requirements, PMP engagement rates increased by 26.5 percentage points from a baseline of 11.8 percent, more than tripling the share who engaged. E-mails focusing on the clinical benefits raised the PMP engagement rate by 14.2 percentage points from a baseline of 11.8 percent, more than doubling the share who engaged.

Prescribing behavior

The e-mails had no measurable effect on clinicians' overall prescription behavior.

Secondary outcomes

1. Holding an account: Sixty days after clinicians received the e-mails, receiving an e-mail that focused on legal requirements increased the share of clinicians who held a PMP account by 17.4 percentage points from a baseline of 49.7, a 35.0 percent increase. During the same time period, receiving an e-mail that focused on the clinical benefits increased the share of clinicians who held a PMP account by 7.9 percentage points from a baseline of 49.7, a 15.9 percent increase.
2. Having an active account: The e-mails had a similar effect on clinicians holding an active account. After the study period, the legal requirements e-mails increased the share of clinicians that had an active account by 21.1 percentage points from a baseline of 40.1 percent, a 52.6 percent increase. The clinical benefits e-mail increased the share of clinicians that had an active account by 10.8 percentage points from a baseline of 40.1 percent, a 26.9 percent increase.
3. Searching the PMP: During the same sixty-day period, the legal requirements e-mail increased the share of clinicians that searched the PMP by 9.8 percentage points from a baseline of 14.6 percent, a 67.1 percent increase. The clinical benefits e-

mail increased the share of clinicians that searched the PMP by 5.3 percentage points from a baseline of 14.6 percent, a 36.3 percent increase.

4. Search target (the ratio of searches to opioid dispenses): There was a similar effect on the search target. The legal requirements e-mail increased the share of clinicians that met the search target by 9.6 percentage points from a baseline of 11.1 percent, an 86.4 percent increase. The clinical benefits e-mail increased the share of clinicians that met the search target by 5.4 percentage points from a baseline of 11.1 percent, a 48.6 percent increase.
5. Specific prescribing behaviors: The e-mails did affect one measure that was included in the composite measure—opioid-benzodiazepine overlap days—for the group that received the legal requirements e-mail. There was an adjusted difference of 0.95 fewer days of overlap from a baseline of 15.12 days, a 6.2 percent decrease. The e-mails had no effect on the other measures that made up the composite measure.

Although the reminder e-mails increased PMP usage, guideline-discordant prescribing behavior was not affected. The results also suggest that framing e-mails around legal requirements, rather than the clinical benefits, can be more effective in encouraging PMP use. Overall, this study demonstrates how a low-cost and easily scalable intervention has the potential to encourage higher PMP usage, though not necessarily prescribing behavior. The research team has continued to partner with its collaborators in the Minnesota State government to explore ways to address opioid overdoses.

Sacarny, Adam, Tatyana Avilova, Ian Williamson, Weston Merrick, and Mireille Jacobson. "Prescription Drug Monitoring Program Reminder Emails, Program Use, and Prescribing: A Randomized Clinical Trial." In JAMA Health Forum, vol. 6, no. 12, p. e255623. American Medical Association, 2025.

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