

# Medical Marijuana Laws Linked to Fewer Opioid Deaths

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US states with laws that establish access to medical cannabis have lower rates of mortality due to opioid overdoses, according to a new study.

This finding suggests that some patients who used to get their pain relief from prescription opioid analgesics may be switching to medical marijuana now that it's available legally, and this transition may be associated with lower rates of mortality related to opioid overdose.

"I have treated lot of patients who have pain," said lead study author Marcus Bachhuber, MD, a primary care physician and clinical scholar, Philadelphia Veterans Affairs Medical Center and Robert Wood Johnson Foundation Clinical Scholars Program, Pennsylvania. "Some would tell me that they tried prescription painkillers, that those didn't work, and that marijuana was the only thing that worked for their pain."

The research was [published online](#) August 25 in *JAMA Internal Medicine*.

## "Striking" Implication



**Dr. Marcus  
Bachhuber**

The "striking" implication of the study "is that medical marijuana laws, when implemented, may represent a promising approach for stemming runaway rates of nonintentional opioid analgesic-related deaths," commented Marie J. Hayes, PhD, and Mark S. Brown, MD, Pediatrics and Neonatal Medicine, Eastern Maine Medical Center, Bangor, Maine, in an [accompanying editorial](#).

"If true, this finding upsets the applecart of conventional wisdom regarding the public health implications of marijuana legalization and medicinal usefulness."

For this study, the researchers abstracted data on opioid analgesic overdose mortality rates in each state from 1999 to 2010 from the Centers for Disease Control and Prevention. Three states (California, Oregon, and Washington) had medical cannabis laws before 1999, and 10 (Alaska, Colorado, Hawaii, Maine, Michigan, Montana, Nevada, New Mexico, Rhode Island, and Vermont) introduced such laws between 1999 and 2010.

Overall, the incidence of opioid analgesic-related mortality in these 13 states increased dramatically from 1999 to 2010. In a model adjusted for state and year, states with medical cannabis laws had a mean 24.8% lower annual rate of opioid analgesic overdose deaths (95% confidence interval [CI], –37.5% to –9.5%;  $P = .003$ ) compared with states without laws.

According to the authors, this translates to about 1729 fewer deaths than expected in 2010. This association was strengthened over the period of the study, from –19.9% in year 1 to –33.3% by year 6.

"We can't say that Oregon saw this and Washington saw that, but we can say that when we looked over time, the association generally strengthened," said Dr. Bachhuber. "So there was a lower level of opioid overdose deaths the more years after the law was passed."

Further analysis showed that the relationship between medical marijuana laws and opioid-related deaths was similar after exclusion of intentional deaths (or suicides).

### **Economic Turmoil**

"During this time period, there was and continues to be some economic turmoil and if economic trends affected suicide rates differently in states, we wanted to remove that," explained Dr. Bachhuber. "Also, we wanted to focus on the unintentional overdoses because these are people who are using prescription painkillers either prescribed by a doctor or illicitly, and they don't mean to overdose."

About 60% of all deaths from opioid analgesic overdose occur among patients with legitimate prescriptions for pain control from a single provider. "Over half of people who overdose are using painkillers as directed by a physician to treat pain, and they're not going to multiple doctors or getting it from friends," said Dr. Bachhuber.

Since the 1990s, there has been a push to prescribe opioid painkillers for chronic pain, which was considered a huge health problem. These patients may now be choosing medical marijuana in place of opioids for pain relief where medical cannabis is legally available.

The association between marijuana laws and lower deaths from opioid-related overdoses persisted even with the inclusion of heroin deaths. There is some thought that prescription painkillers are becoming difficult to come by, so users may be turning instead to heroin, said Dr. Bachhuber. "We found no difference when we combined them (deaths from prescription opioid overdoses and from heroin overdoses) so we don't think that the decrease is due to people shifting to heroin."

The research showed no association between medical cannabis laws and opioid analgesic overdose mortality over the 2 years before implementation of the laws. This, said Dr. Bachhuber, "is more evidence supporting the idea that the laws had an effect" on opioid overdose rates.

There was no significant association between medical cannabis laws and mortality associated with heart disease or septicemia. This suggests that differences in opioid overdose mortality can't be explained by broader changes in health, according to the authors.

But it might be that differences in health behaviors explain the findings to some degree. "It's possible that the association we found was at least in part due to something happening at the same time that states passed medical marijuana laws" such as greater awareness, more prescription monitoring, or pain management clinics, said Dr. Bachhuber.

"It also could be that attitudes shifted so that fewer pain patients want these medications or doctors have changed the way they prescribe them."

### **Many Unknowns**

The authors pointed to research showing that cannabinoids act at least in part through an opioid receptor mechanism. Cannabinoids increase dopamine concentrations in the nucleus accumbens in a way similar to that of heroin and several other drugs.

There are still many "unknowns" when it comes to medicinal marijuana, said Dr. Bachhuber. "Medical providers struggle with knowing how best to use it, who would benefit from it, what conditions should it be used for, and who's likely to have side effects."

The study was limited by the fact that the analysis couldn't be adjusted for characteristics of individuals within states, such as socioeconomic status, race, and medical and psychiatric diagnosis.

Now that 23 states and the District of Columbia have passed medical marijuana laws — and 4 more have pending ballot measures or legislation to legalize medical marijuana — the researchers plan to update the study results, possibly later this year or next year, said Dr. Bachhuber.

In their editorial, Dr. Hayes and Dr. Brown note that the study authors provided no information on such things as history of comorbid polypharmacy and obesity and other health issues associated with overdose mortality in the 60% of patients who had valid opioid prescriptions or the 40% who didn't.

Both opioids and cannabinoids reduce stress reactivity and increase dopamine-mediated reward, the editorialists write. They suggested that medical marijuana use may lessen the drive to use opiates at lethal levels in people with nonpain psychiatric conditions.

The implications for public policy of a potential protective role of medical marijuana in opioid analgesic-associated mortality "is a fruitful area for future work," they conclude.

### **Confounding Variables**

Asked to comment on these findings, Edward Michna, MD, an anesthesiologist at Brigham and Women's Hospital, assistant professor, anesthesia, Harvard Medical School, Boston, Massachusetts, and member of the American Pain Society, said he's not sure if any real connections can be drawn between marijuana laws and opioid-related overdoses.

"Opioid-related abuse has not been consistent across the country, with some areas having severe problems while others less so," Dr. Michna told *Medscape Medical News*.

In addition, marijuana laws in the various states can vary tremendously, he added. "Some have easier access than others, which again is a confounding variable."

So although the study results are interesting, Dr. Michna suggested it might be best to "wait to draw any real conclusions."

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