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Mortality and Socioeconomic Consequences of Prescription Opioids

Evidence from State Policies

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The opioid “epidemic” is one of the most pressing public health issues for local, state, and federal policymakers and its consequences have been widely documented. The so-called epidemic is often characterized by the rise of prescription opioid use. Between 1992 and 2011, the number of opioid prescriptions in the United States increased nearly threefold from approximately 75 million annually to 220 million annually. At its peak in 2010–2012, the opioid prescription rate was 80 per 100 people in the United States, although only about 20 percent of the population had one or more prescriptions. Since 2010, the opioid prescription rate had declined to 59 per 100 people in 2017.

The second prominent fact used to characterize the opioid epidemic is the rise in prescription opioid-related mortality. Between 1999 and 2010, the rate of prescription opioid-overdose deaths increased from just over 1 death per 100,000 population to just over 5 per 100,000 and remained at around 5 per 100,000 through 2016. Finally, the rise in nonprescription opioid (e.g., heroin and fentanyl) deaths is also often included to document the epidemic. The rate of nonprescription opioid (heroin and fentanyl combined) deaths increased from approximately 1 per 100,000 in 1999 to 2 per 100,000 in 2010. After

this date, nonprescription opioid deaths began to increase markedly, rising to more than 10 per 100,000 by 2016.

While the sheer magnitude of opioid prescriptions and the mortality consequences of the opioid epidemic have garnered most of the research and public policy attention, the rise in prescription opioid use may have had other consequences. For example, outcomes that may be plausibly affected by opioid use (both medical and nonmedical) include marriage, earnings, and health. There have been no studies of the effect of prescription opioid use on these outcomes. There have been a few studies of the effect of opioid use on employment, although evidence from these few studies remains mixed.

To add to this limited literature, I exploit variation in prescription opioid use caused by two state policies. First, prescription drug monitoring programs (PDMPs) are state-wide databases that collect data on opioids dispensed in the state. “Modern” PDMPs are fully electronic, are more accessible to physicians, pharmacists, and other pertinent parties, and often include requirements for mandatory use. Second, “pill mill” statutes target prescribers who account for a disproportionate share of opioid prescribing (pain management clinics) and include provisions establishing state inspection authority or specific training requirements.

These laws are associated with a decrease in the number of pain management clinics.

The adoption of PDMPs, particularly modern PDMPs, and the adoption of pill-mill legislation reduced prescription opioid sales by 5–20 percent. This evidence is consistent with several prior studies. The variation in prescription opioid sales, and presumably opioid use, caused by the state policies provides variation in prescription opioid use that we use to assess the effects of prescription opioid use on socioeconomic outcomes. We also estimate the effect of state policies on mortality.

An important contribution of my analysis is the stratification of the sample by age and gender. This stratification is motivated by evidence suggesting that most prescription opioid use is medical and that rates of nonmedical use and the ratio of nonmedical-to-medical use of prescription opioids differ significantly by age, gender, and to a lesser extent, education. For example, approximately 16 percent of females aged 50–64 had a prescription opioid in 2002–2006, but only 2 percent reported nonmedical use, and about 1 percent reported heroin use in the past year. These figures suggest that this group of females has a relatively high rate of prescription opioid use that is almost all medically prescribed. There is little purposeful misuse of prescription opioids, or use of illegal opioids, among this demographic group. In contrast, among men aged 26–34, only 9 percent had a medical prescription for opioids in 2002–2006, but 9 percent also reported nonmedical use, and 3 percent reported past-year heroin use. For this group, much of prescription opioid use is misuse, and this group has a relatively high rate of illegal drug use. Given these differences in opioid use, it is likely that changes in prescription opioid use due to state policies had different effects on the mortality and socioeconomic outcomes of these demographic groups.

Results of my analysis indicate that state implementation of a modern PDMP is associated with modest decreases in opioid sales of between 5 and 10 percent, although estimates are not always statistically significant. Pill-mill laws are more strongly associated with decreased opioid sales; adoption of such statutes is associated with a decrease in opioid sales of between 10 and 20 percent, and estimates are highly significant. I also show that the effects of these two state policies are larger in urban areas.

The reductions in prescription opioid sales associated with adoption of a modern PDMP and a pill-mill law were not associated with moderate or large effects on mortality or socioeconomic outcomes. There was limited evidence that pill-mill laws reduced drug-related mortality among young males, which is consistent with this group having the highest rates of prescription opioid misuse. However, though large (25 percent), these estimates were not statistically significant. I also found that adoption of a modern PDMP decreased earnings (2–5 percent) and that the adoption of a pill-mill law increased earnings (2–6 percent) among young people aged 18–34, but the statistical significance of these estimates was marginal. Overall, while state policies have had a significant effect on prescription opioid sales, the impact of this decline on opioid prescriptions and the impact of these policies on mortality and socioeconomic outcomes have been insignificant.

NOTE:

This research brief is based on Robert Kaestner and Engy Ziedan, “Mortality and Socioeconomic Consequences of Prescription Opioids: Evidence from State Policies,” NBER Working Paper no. 26135, August 2019, <http://www.nber.org/papers/w26135>.