Mapping Children's Exposure to Drug Overdose Deaths

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Background

The opioid epidemic in the United States has gained widespread public attention, but this attention has focused mainly on its effect on adults and those who have died of overdoses. There has been less consideration of the potential effects of the opioid crisis on children. However, it is likely that millions of children have been affected, either directly—through parental addiction or death—or indirectly through the experiences of friends, classmates, or neighbors.

In this analysis, we combine county-level data from the U.S. Centers for Disease Control and Prevention (CDC) and the U.S. Census Bureau to investigate state and regional patterns and trends in children's potential exposure to drug overdose deaths.

Our goal is to identify groups of children who are the most vulnerable so that policymakers, health professionals, school administrators, and others can devise programs and strategies to meet their needs.

A Surge in Drug Overdose Deaths

In 1995, the Federal Drug Administration approved the prescription opioid painkiller OxyContin. It hit the market in 1996, and since then, has contributed to a surge in U.S. drug overdose deaths. In 1994, the drug overdose death rate was about 5 deaths per 100,000 people. By 2015, the rate had more than tripled to 16 per 100,000, and it continues to climb; provisional data show that in 2016, there were nearly 20 drug overdose deaths per 100,000 people.[1]

While prescription drugs like OxyContin fueled the initial surge in overdose deaths, more powerful fentanyl-type compounds and heroin have driven the recent increase.[2] According to the CDC, addiction to opioids is the strongest predictor of heroin abuse or dependence.[3]

The drug overdose crisis has been linked to a combination of factors, including the rise in prescription drug use (and abuse) and the growing availability and relatively low cost of powerful, illegal drugs like heroin.[4] People with lower levels of education and fewer economic prospects have been most affected.[5]

The Potential Impact on Children and Youth

Data from the National Survey on Drug Use and Health indicate that in 2009-2014, there were over 2 million children living with parents who were dependent on or abused illicit drugs.[6] Children growing up with parents who are addicted to opioids face a high risk of becoming addicted to drugs themselves. A recent review of the literature showed that between 47 percent and 59 percent of children with opioid-dependent parents exhibit "substance misuse behavior."[7] (Misuse behavior includes any use of a substance other than as directed, for example, taking medication prescribed for another person.)

Millions of other children may be exposed to drug addiction and drug-related deaths in their communities. There has been little research on the potential neighborhood-level effects of drug

use on children's well-being. However, a new study by the Department of Health and Human Services shows that counties with higher overdose death and hospitalization rates also have higher child welfare caseload rates.[8] Another study shows that parents living in areas with greater availability of drugs report higher levels of child abuse.[9] Neighborhood quality—including signs of drug use on the street—has also been linked to problem behavior among children and adolescents.[10]

Drug-related deaths among young adults are rising. Since 2014, among young adults ages 20 to 24, the number of accidental poisonings—mostly from drug overdoses—has exceeded the number of young-adult deaths due to homicides.[11] Death rates from drug overdoses and other forms of accidental poisoning among young adults increased nearly five-fold between 1999 and 2016, rising from 3.8 deaths per 100,000 to 18.9 deaths per 100,000. More than 4,200 young adults died as a result of accidental poisoning in 2016, accounting for nearly 1-in-5 (19%) of all young adult deaths.

Data and Methods

In this analysis, we compare national and state patterns and trends in the number and percentage of children under age 20 living in U.S. counties with high drug overdose death rates. Estimates for 2016 are compared with estimates for 2000, 2006, and 2010 to determine whether children's potential exposure to drug overdose deaths has increased over time, and to compare trends across different geographic areas and population subgroups.

County-level data on the population ages 0 to 19—by race/ethnicity—are from the U.S. Census Bureau's Population Estimates Program. Data from the Census Bureau's Small Area Income and Poverty Estimates (SAIPE) are also used to investigate patterns of child poverty (ages 0-17) in counties with high/low drug overdose death rates.

Data on drug-related deaths are from the CDC's modeled county-level database on drug overdose death rates.[12] Rates are age adjusted and represent the number of county-level deaths due to drug-poisoning per 100,000 population. Because these data are modeled estimates, discrete values are not published; rather, data are reported for the following ranges of drug poisoning deaths per 100,000 population: <2, 2.-3.9, 4-5.9, 6-7.9, 8-9.9, 10-11.9, 12-13.9, 14-15.9, 16-17.9, 18-19.9, 20-21.9, 22-23.9, 24-25.9, 26-27.9, 28-29.9, and 30+. In our analysis, counties are classified as having "high" drug overdose death rates if they had at least 20 deaths per 100,000 population (based on the lower bound of the CDC interval) in a given year.

We chose 20 deaths per 100,000 population as the threshold because it exceeds the national average value for 2016 (19.8) and it has been used by other researchers to define areas with high death rates.[13] Although we do not know the extent to which individual children may be affected by high drug overdose rates in a given county, high death rates may be indicative of broader issues related to drug use and addiction. The CDC estimates that for every drug overdose death, there are 733 users of opioids (for nonmedical use), 108 people who are abusing opioids, and 26 visits to the emergency room related to opioid abuse.[14]

Child population estimates were linked with overdose death data by county FIPS codes. A county's status as "high-rate" (20 or more deaths per 100,000) or "low-rate" (fewer than 20

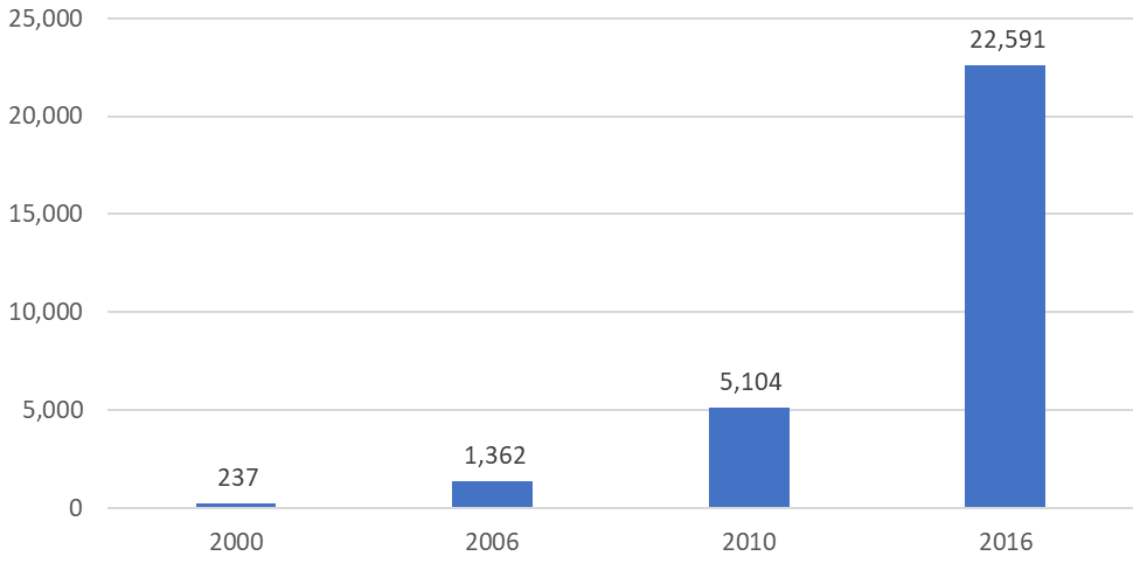
deaths per 100,000) was determined each year (2000, 2006, 2010, and 2016). County-level data were then aggregated to the state and national level to summarize the characteristics of children in high-rate and low-rate counties, by year.

Data were disaggregated by race/ethnicity and poverty status to determine whether children in certain population subgroups are at higher risk of being exposed to drug overdose deaths than others. We also classified counties by metropolitan/nonmetropolitan status to investigate whether children's risk of exposure is higher in rural areas—where the opioid crisis has received the most attention.

Children in Counties with High Drug Overdose Rates

Not surprisingly, as opioid death rates climbed in recent years, so too did the number of children living in high-rate counties. Between 2000 and 2016 the number of children living in counties with high drug overdose death rates rose from less than 250,000 (mostly in Baltimore city, MD) to nearly 22.6 million—nearly a 100-fold increase (see Figure 1). While the child population also increased over this 16-year period, population growth explains little of the increase. In 2000, less than 1 percent of all U.S. children lived in high-rate counties. By 2016 that share rose to 28 percent.

Figure 1: Population Under Age 20 in Counties with High Drug Overdose Death Rates,* 2000-2016 (in thousands)

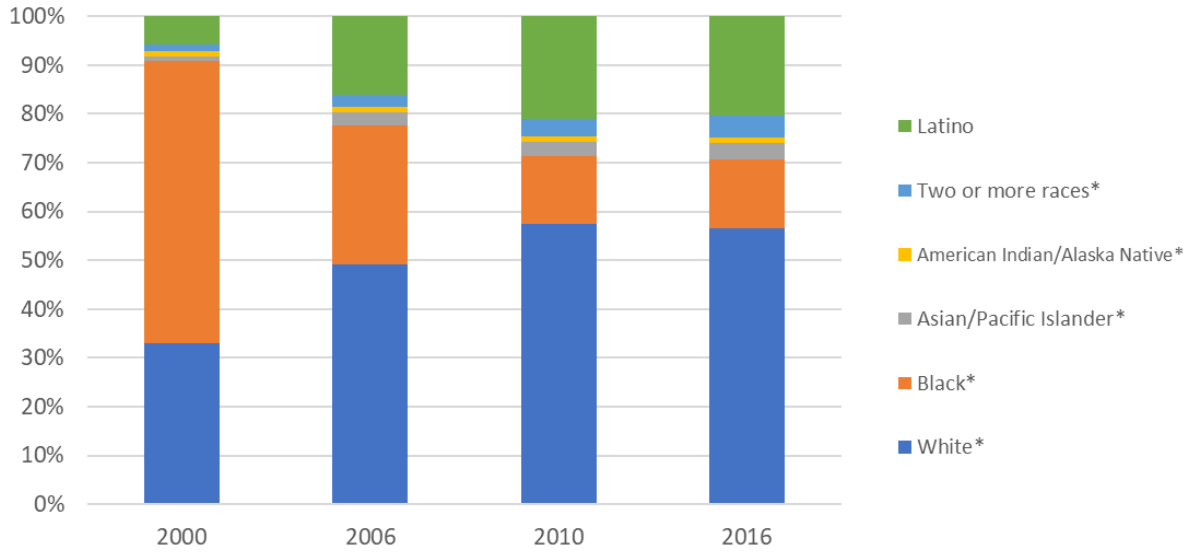


*20 or more drug-related deaths per 100,000 population.
Source: Population Reference Bureau analysis of data from the U.S. Centers for Disease Control and Prevention and the U.S. Census Bureau.

In 2000, Baltimore city was the only populous county with more than 20 drug overdose deaths per 100,000, so the demographics of children affected reflect the demographics of that area. More than half of children living in high-rate counties in 2000 (58 percent) were black (see Figure 2). As the opioid crisis spread, the demographic composition of children in affected counties shifted. By 2016 the majority of children in high-rate counties (57 percent) were non-

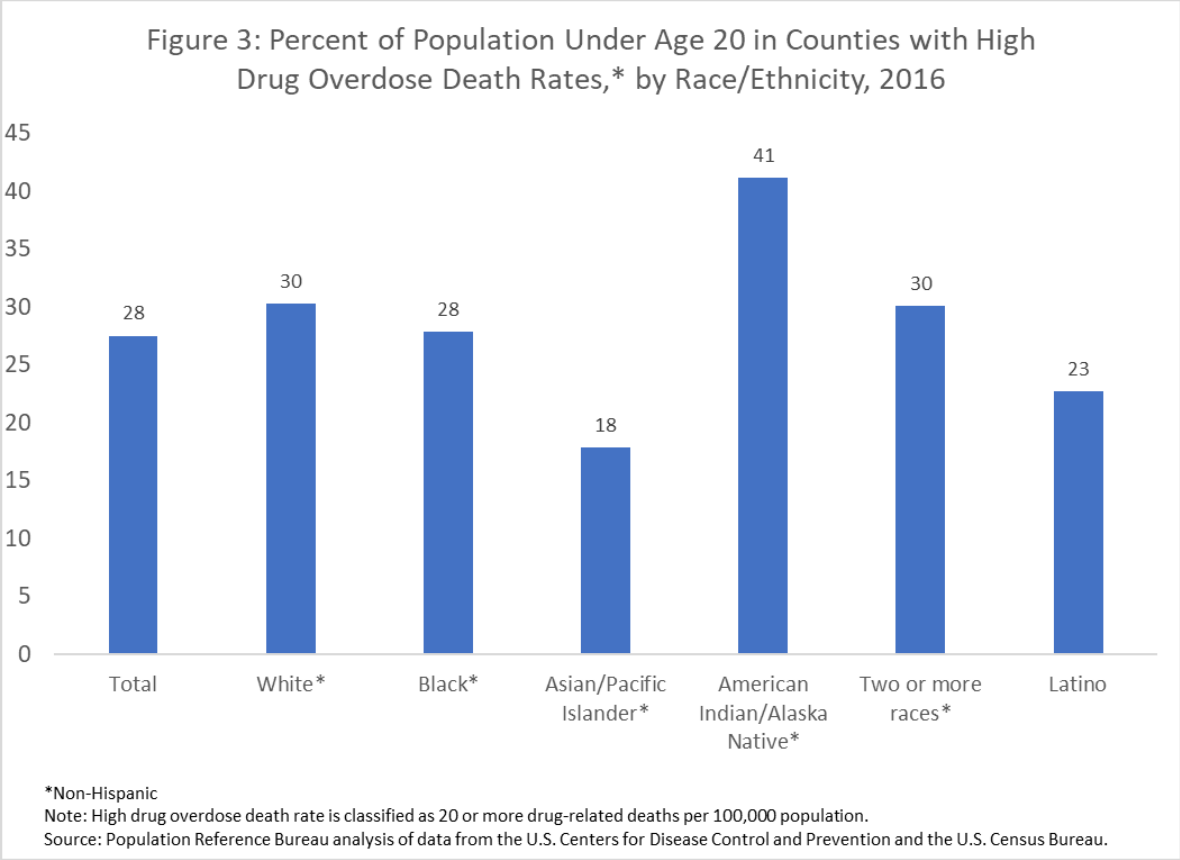
Hispanic white, higher than the share of children nationwide who were non-Hispanic white (51 percent). Research has shown that drug-related deaths are highly concentrated among whites with lower levels of education.[15] The share of Latino children in high-rate counties also increased sharply over time, from 6 percent in 2000 to 20 percent in 2016, but remains lower than the national share of Latinos in the population under age 20 (25 percent).

Figure 2: Racial/Ethnic Distribution of the Population Under Age 20 in Counties with High Drug Overdose Death Rates,* 2000-2016

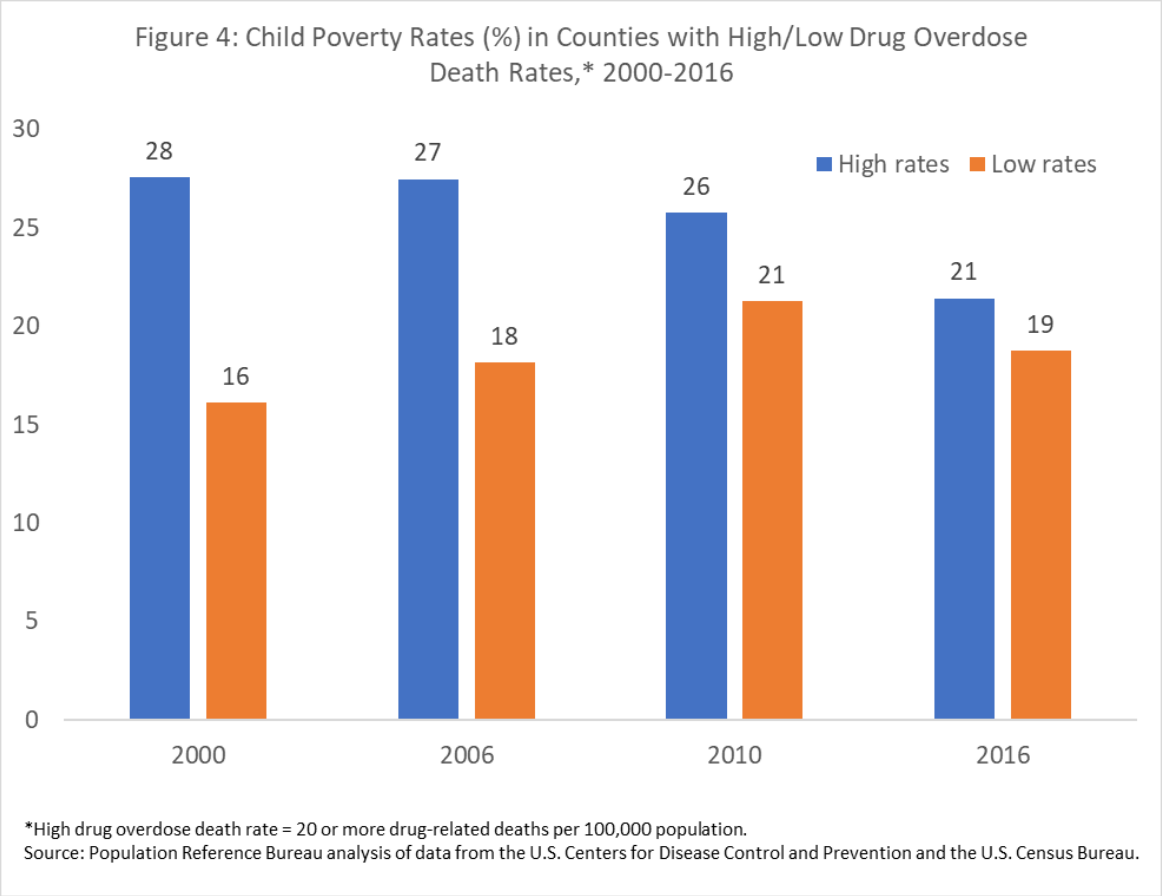


*Non-Hispanic.
Note: High drug overdose death rate is classified as 20 or more drug-related deaths per 100,000 population.
Source: Population Reference Bureau analysis of data from the U.S. Centers for Disease Control and Prevention and the U.S. Census Bureau.

Among all U.S. children, 28 percent lived in counties with high drug overdose death rates in 2016. Yet there are sharp differences among racial/ethnic groups (see Figure 3). While whites made up the largest share of children in high-rate counties, American Indian/Alaska Native children were the most likely to live in high-rate counties, at 41 percent. Counties with large concentrations of American Indians—mostly located in the rural Midwest and Southwest—have among the highest poverty rates in the nation. At the lower end of the spectrum, 18 percent of Asian/Pacific Islander children lived in counties with high drug overdose death rates, followed by Latino children at 23 percent.



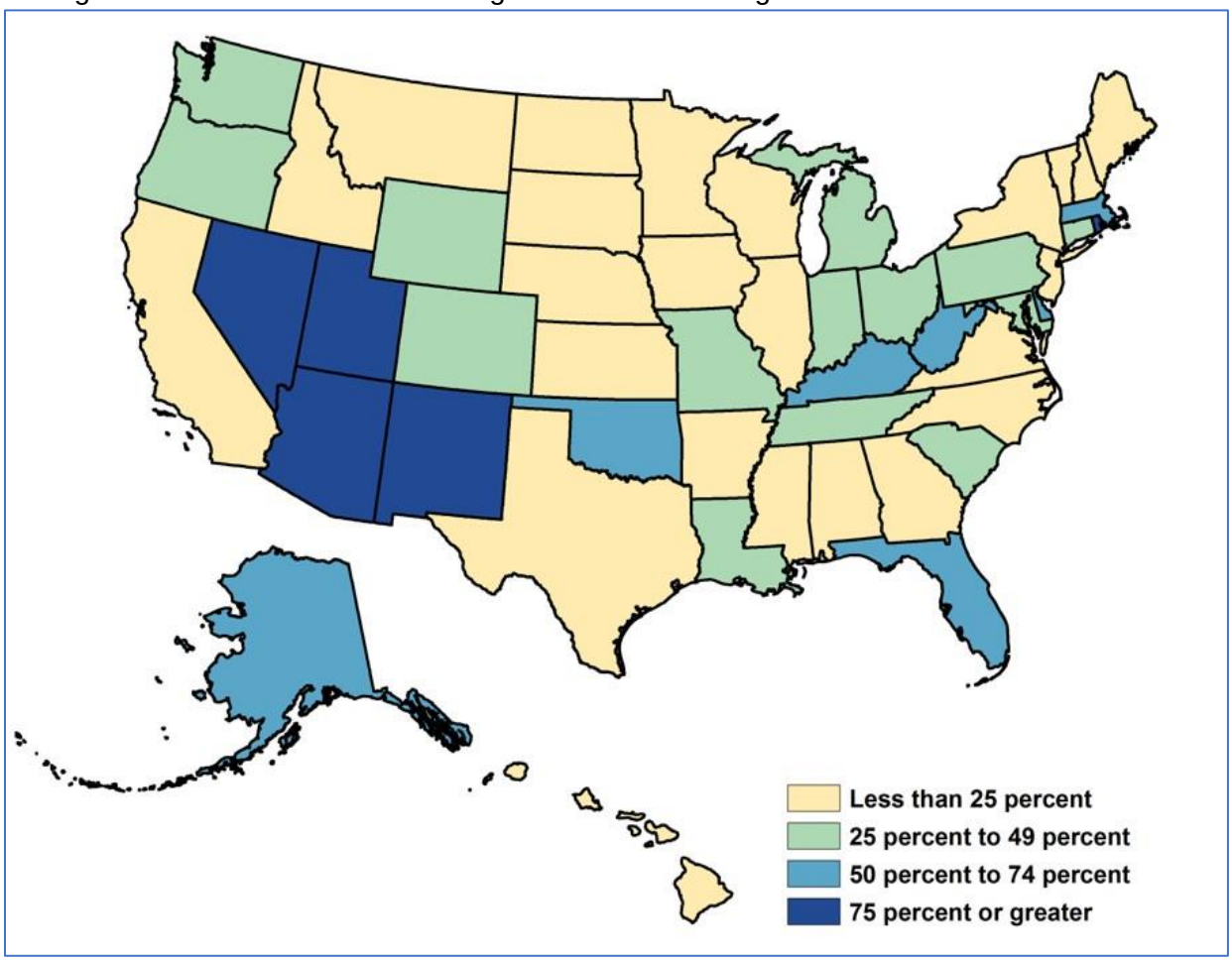
There has also been a dramatic shift in the poverty status of children living in counties with high drug overdose rates. Between 2000 and 2016, the poverty rates of children under age 18 in high-rate counties has fallen from 28 percent to 21 percent, which is just slightly higher than the poverty rates in counties with low death rates in 2016 (19 percent) (see Figure 4). This trend reflects the rising overdose death rates in communities across the socioeconomic spectrum—including many higher-income suburbs.



State and Regional Differences

Drug overdose deaths are not evenly distributed across the country. There are four states in which more than 8-in-10 children live in counties with high drug overdose death rates, all in the Southwest (New Mexico, Arizona, Utah, Nevada). In Utah and Nevada, nearly all children (92 and 95 percent, respectively) live in counties with high overdose death rates.

Figure 5: Percent of Children Living in Counties with High Overdose Death Rates*: 2016



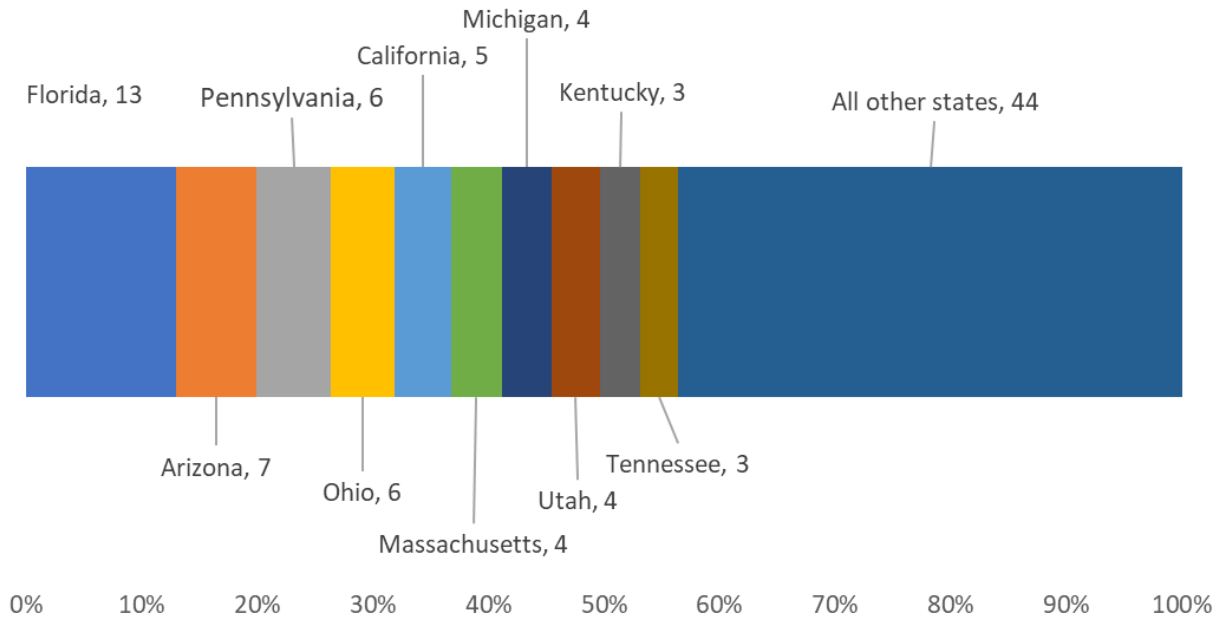
* 20 or more drug-related deaths per 100,000 population.
Source: PRB analysis of data from the U.S. Centers for Disease Control and Prevention and the U.S. Census Bureau.

The high share of children in high-overdose counties is not merely a factor of concentration of child population in one or two counties with high death rates. In Utah, no single county accounts for more than 35 percent of the state's total child population. Nevada's child population is concentrated in Clark County (Las Vegas area, 75 percent of child population) and Washoe County (Reno area, 15 percent of child population), but 12 of the 17 counties in the state have high overdose death rates.

At the other end of the spectrum, five states (Hawaii, Iowa, Nebraska, New York, and North Dakota) have no counties with high overdose death rates, and thus no children living in counties with high rates. In another five states (Kansas, Minnesota, South Dakota, Texas, Vermont), less than 5 percent of children live in high-rate counties.

States vary in population size and overdose death prevalence. Combining both factors, we ranked states by the number of children at risk. Ten states (Florida, Arizona, Pennsylvania, Ohio, California, Massachusetts, Michigan, Utah, Kentucky, Tennessee) account for more than half (56 percent) of all children at risk, despite accounting for only 37 percent of the nation's children (see Figure 6). Florida alone accounts for 13 percent of all U.S. children at risk, although it is home to only 6 percent of all U.S. children.

Figure 6: Percent Distribution of the Population Under Age 20 in Counties with High Drug Overdose Death Rates,* by State, 2016



*20 or more drug-related deaths per 100,000 population.
Source: Population Reference Bureau analysis of data from the U.S. Centers for Disease Control and Prevention and the U.S. Census Bureau.

California is the most populous state in the nation (home to 12 percent of U.S. children), but accounts for only 5 percent of children in high-rate counties. Texas, the nation's second-most populous state (10 percent of U.S. children), has such a small share of children in high-rate counties that it does not appear in the top-10 states for number of children at risk. One possible explanation for Texas' relative success may be that it is one of the few states that had tracking systems in place for decades to track prescriptions of "Schedule II" drugs—those with a high potential for abuse.[16]

Researchers have also found high concentrations of drug overdose deaths in many rural (nonmetropolitan) counties—especially areas with high rates of poverty, unemployment, and disability.[17] However, the data show that the share of children in high-rate counties classified as nonmetropolitan *decreased* from 2000 to 2016, from 23 percent to 14 percent. Again, these trends point to growing concentrations of drug-related death across the country—not only in distressed rural communities.

Study Limitations

Because available data are limited to the county level, this analysis does not account for neighborhood-level variations in death rates within counties. Within low-rate counties, there may be neighborhoods with high concentrations of drug-related deaths, and within high-rate counties there may be neighborhoods with relatively few deaths. Similarly, we lack data for a measure of

within-family or within-household risk. Because these data are ecological, rather than individual, we caution readers not to presume that all children in high death communities are at high risk (just as not all children in low death counties are at low risk). Nevertheless, since much governance and public health work occurs at the county level, we believe this analysis adds important context to the literature.

Implications

The rapid increase in drug overdose deaths in the United States is cause for alarm. This study shows the potential impact of rising levels of drug abuse on children—as measured through county-level drug overdose death rates. More research is needed to explore the potential implications for children's health and safety. However, our results suggest that a growing number of children—regardless of racial/ethnic background, socioeconomic status, or area of residence—may be affected.

Endnotes

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