Geography of Opiate Abuse, Overdose & Treatment in Tennessee

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Introduction

Opioid addiction and overdose has become a national epidemic in the United States over the past 30 years. According to the Centers for Disease Control and Prevention, more than 20,000 Americans died from prescription drugs alone in 2014 – far more than alcohol-related car accidents. Of the 20.5 million American adults who had a substance abuse disorder in 2015, 2 million were addicted to prescription pain relievers and 591,000 were addicted to heroin. As early as 2012, an astounding 259 million prescriptions were written for opioid-based pain medications – more than enough to give every American adult their own bottle of pills. Four in five new heroin users went from abusing prescription painkillers to using street heroin because pills from a pharmacy are far more difficult and expensive to acquire than heroin on the black market.

Tennessee ranks high in the number of opioid prescriptions and overdoses compared to the rest of the US. The Volunteer State is one of only 13 where doctors issued between 96 and 120 opioid prescriptions per 100 people. This project maps opioid prescriptions and overdoses in Tennessee, identifies a major “hotspot” of abuse and overdose, locates areas where opiate-addiction treatment centers currently exist, and proposes a location where a more intensive treatment center is needed.

Methodology Continued

A “corners method” hotspot analysis offered the best technique to pinpoint the biggest trouble area in the state. The corners method finds correlations between prescription and overdose deaths in counties adjacent to one another in all directions, rather than simply north, south, east, and west.

Results

Not surprisingly, prescription rates are usually high across the state, with the exception of most urban counties where more affluent populations and easier access to preventative education and substance abuse treatment exist. Other than Knox county, urban counties had relatively low prescription and overdose rates. Some suburban counties contain high rates of prescription but lower levels of overdose, indicating more accessible treatment centers and more efficient support systems; however, some suburban and several rural areas contain numerous counties where prescription and overdose rates soar in parallel.

Conclusion

While the opioid epidemic has plagued Tennesseans across the state, the data clearly shows that four counties in a fairly isolated and depressed area in the northeastern region have been significantly affected and have few options for meaningful detox and treatment programs. Outpatient and office-based opiate abuse treatment facilities exist across the region, but they are spatially limited, have low capacities, offer minimal support, and are largely ineffective. The closest inpatient facilities are located only in cities such as Knoxville, Kingsport, and Johnson City, the closest of which can be over an hour away for some residents along the fringes of the region.

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Data Sources


Recipients of Overdose Death Rate Per 100 People

Overdose deaths in Campbell, Anderson, Union, and Knox counties in 2016. A total of 526 overdose deaths occurred across all four counties, with an average overall death rate of 15.6 per 100,000 people. Campbell and Anderson had high overall death rates of 28 and 40, respectively, while Anderson and Union reported 59 and 19 overdose deaths with overall death rates of 88 and 33 respectively. The 4 inpatient centers in Knox County are not sufficient to service the vast area encompassing Anderson, Campbell, and Union counties.

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Of all the trouble areas, none were as highly concentrated as four adjacent counties in Upper East Tennessee - Anderson, Campbell, Knox, and Union counties. In these four counties alone, 526 overdose deaths were reported in 2016, or 11.68% of all deaths. On average, 131.5 people died from overdose while the total capacity for inpatient care across all counties is only 130 patients, 119 of which are in Knox county alone.

An ordinary least squares (OLS) statistical analysis shows a direct positive causal correlation between prescription rate (independent variable, horizontal x axis) and death rate (dependent variable, vertical y axis), illustrated in this scatter plot.