

RADARS[®]

SYSTEM

Researched Abuse, Diversion and Addiction-Related Surveillance System



Third Quarter 2014 Technical Report

Opioid-Related Mortality Rates Estimated Using National Vital Statistics System Data versus RADARS[®] Poison Center Program Data

Key Points:

1. The Researched, Abuse, Diversion, and Addiction-Related Surveillance (RADARS[®]) System is able to track trends in opioid-related mortality through its Poison Center Program data.
2. Trends in opioid-related mortality rates estimated using Poison Center Program data track well with rates estimated using the Centers for Disease Control and Prevention's National Vital Statistics System data.
3. Opioid-related mortality data are available near real-time from the Poison Center Program.

Background

The Researched, Abuse, Diversion, and Addiction-Related Surveillance (RADARS[®]) System is a comprehensive network of programs that collect data on various aspects of prescription drug abuse that are timely, as well as product- and geographically-specific. The RADARS System Poison Center Program (PC), coordinated by the Rocky Mountain Poison and Drug Center (RMPDC), gathers data on spontaneous reports of exposures and acute medical events associated with one or more prescription drugs of interest, including opioid-related mortality.

The National Center for Health Statistics, a part of the Centers for Disease Control and Prevention (CDC), collects death certificate information and standardizes details on causes of death, including opioid-related mortality.

PC data are immediately available from participating centers which provide services to approximately 90% of the United States population. While the CDC data are based upon a larger population, data releases lag by approximately two years (e.g., 2011 data were released in July 2014). Thus, if opioid-related mortality rates based on PC data trend well in comparison to CDC rates, then the virtually real-time availability of PC data would allow researchers to more readily track generalizable trends in opioid-related mortality. This technical report aims to compare opioid-related mortality rates using PC data to estimated rates from the CDC.

Methods

Complete-year PC data were available from 2003 through 2013. The mortality data encompassed cases related to the following opioids: buprenorphine, fentanyl, hydrocodone, hydromorphone, methadone, morphine, oxycodone, oxymorphone, tapentadol, and tramadol.

The CDC National Center for Health Statistics' National Vital Statistics System data used consisted of the Multiple Cause of Death database with mortality details listed. Data were extracted using the Wide-ranging Online Data for Epidemiologic Research (WONDER) apparatus (CDC, 2013). Data were available from 1999 through 2011. The underlying causes of

death were limited to the following International Statistical Classification of Diseases and Related Health Problems 10th Revision (ICD-10) codes: T40 (poisoning by narcotics and psychodysleptics), consisting of subparts T40.2 (other opioids), T40.3 (methadone), T40.4 (other synthetic narcotics), which are typically used to define opioid-related mortality in the CDC data (CESAR, 2013; WHO, 2014).

Mortality rates were calculated as the number of opioid-related mortality cases divided by the interpolated United States population in that year, based on census data from 2000 and 2010.

Results

Mortality case counts based on PC data and CDC data were higher in 2011 in contrast to 2003 (Table 1). The percent of PC cases relative to CDC cases was also higher in 2011, in contrast to 2003. The rates of opioid-related mortality per 100,000 population estimated using PC data varied over the 2003 to 2011 time period, but generally increased up until 2010. Mortality rates estimated using CDC data increased between the 2003 to 2011 time period.

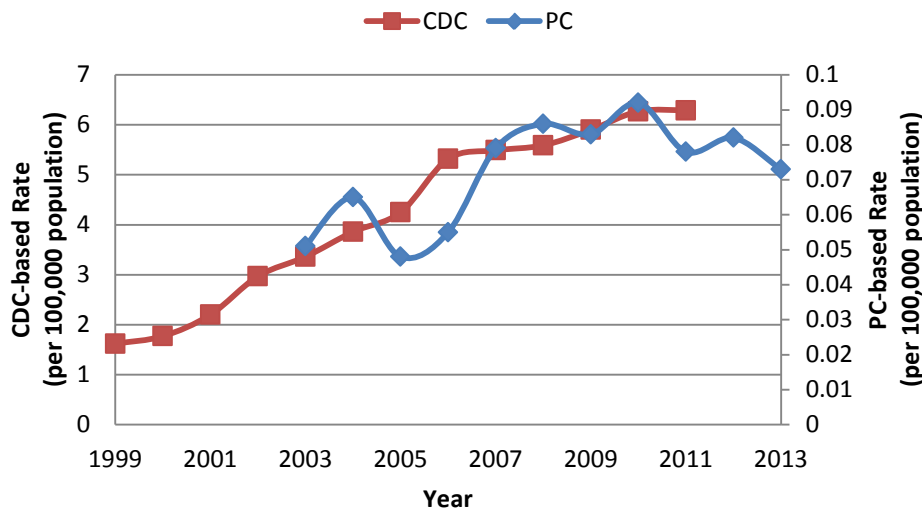
The PC mortality rates trended well with the CDC mortality rates ($p=0.01$). The Pearson correlation coefficient for this association was 0.80, and the adjusted R-squared value was 0.58.

Table 1.
Opioid-related mortality, population sizes, and mortality rates for Poison Center Program (PC) data and CDC National Vital Statistics System (CDC) data.

Year	Case Count			Population		Rate (per 100,000 population)	
	PC	CDC	PC/CDC*100	PC	CDC	PC	CDC
1999		4,518			279,040,168		1.62
2000		4,980			281,421,906		1.77
2001		6,257			284,968,955		2.20
2002		8,544			287,625,193		2.97
2003	55	9,749	0.56%	108,810,868	290,107,933	0.051	3.36
2004	74	11,308	0.65%	114,599,731	292,805,298	0.065	3.86
2005	101	12,548	0.80%	212,366,849	295,516,599	0.048	4.25
2006	129	15,874	0.81%	236,483,203	298,379,912	0.055	5.32
2007	184	16,527	1.11%	233,414,205	301,231,207	0.079	5.49
2008	221	16,997	1.30%	258,361,265	304,093,966	0.086	5.59
2009	217	18,112	1.20%	261,225,521	306,771,529	0.083	5.90
2010	245	19,359	1.27%	265,299,412	308,745,538	0.092	6.27
2011	218	19,605	1.11%	280,084,289	311,591,917	0.078	6.29
2012	235			285,974,598		0.082	
2013	217			296,477,753		0.073	

Based on the PC data, mortality rates peaked in 2010 (Figure 1). CDC data past 2011 were not yet available, but the 2011 results increased to a lesser extent from 2010 relative to previous year-to-year changes, including the 2009 to 2010 increase and the 2008 to 2009 increase (Table 1).

Figure 1.
Trends in opioid-related mortality rates based on
Poison Center Program (PC) data and CDC National Vital Statistics System (CDC) data:
1999-2013



Conclusions

Trends in RADARS PC-based mortality rates appear to track well with trends in CDC-based rates. The PC data also suggest a decrease in opioid-related mortality rates after 2010. The CDC-based rates suggest a plateauing effect between 2010 and 2011. However, data are not available for the time period after 2011, so a longer-term trend cannot be determined using the CDC data. Based on these findings, PC data offer the advantage of generalizable trends that can track recent developments in opioid-related mortality in a timelier manner, allowing for closer monitoring of public health concerns as well as impacts of interventions intended to reduce opioid-related mortality.

References

(CDC) Centers for Disease Control and Prevention, National Center for Health Statistics. 2014. "Multiple Cause of Death: 1999-2011 on CDC WONDER Online Database, released 2014." Data are from the Multiple Cause of Death Files, 1999-2011, as compiled from data provided by the 57 vital statistics jurisdictions through the Vital Statistics Cooperative Program. <http://wonder.cdc.gov/mcd-icd10.html> Accessed on July 30, 2014.

(CESAR) Center for Substance Abuse Research. 2013. Number of Unintentional Opioid Analgesic Deaths Continue to Increase; Benzodiazepine-Related Unintentional Deaths Now Surpass Cocaine. University of Maryland. 22(16):1.

(WHO) World Health Organization. 2014. "ICD-10 Version: 2010." <http://apps.who.int/classifications/icd10/browse/2010/en> Accessed on July 30, 2014.

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