



Researched Abuse, Diversion and Addiction-Related Surveillance System

QUARTERLY Technical REPORT

Second Quarter, 2017

Comparison of Population Rate Trends between the National Vital Statistics System and the RADARS® System Medical Examiner Program

Key Findings

1. The death rates from select individual states in the RADARS® System Medical Examiner Program correlate strongly with rates from the National Vital Statistics System for poisonings where the underlying cause of death involved exposure to opioids or hallucinogens.
2. The RADARS® System Medical Examiner Program is able to provide detailed analyses of mortality involving a variety of active pharmaceutical ingredients, which is currently unavailable through the National Vital Statistics System.

Background

Opioid related mortality has been rising dramatically in recent years¹. From 2010 to 2015, the national mortality rate where the underlying cause of death was exposure to opioids or hallucinogens rose by nearly 50%. The RADARS System provides timely, product-specific data through a mosaic of programs that monitor drug abuse, misuse, and diversion. With the Medical Examiner Program, the RADARS System provides mortality data at the state level and, in some states, sub-state level analyses of individual active pharmaceutical ingredients (API). This level of detail is not available in the publicly available data from the National Vital Statistics System (NVSS Wonder database). This analysis assesses the agreement between mortality rates obtained from the Medical Examiner Program and the NVSS Wonder database and forms a foundation for future, more detailed studies of APIs with these data.

Methods

RADARS® System Medical Examiner Program

Mortality data were obtained directly from the vital statistics offices of four states: Florida, Oregon, Utah, and Washington. Each state collects data on mortality and is required to use the International Classification of Diseases and Related Health Problems Revision 10 (ICD-10) for classification and submission for national vital statistics reporting. Individual death records were obtained for all deaths involving an underlying cause of death of poisoning (ICD-10 codes of X40-44, X60-64, X85, and Y10-Y14, based on the definition used by the Centers for Disease Control and Prevention), for years from 2006 through 2015. Data from all states and the District of Columbia are not available yet, so a comparison to the national rate from the NVSS Wonder database is not possible.

National Vital Statistics System

Number of deaths and crude population rates were obtained at the national level and for individual states from the Wonder database². Aggregation of number of deaths and populations were obtained from 2006 through 2015. Individual death records are not available through the NVSS Wonder database.

Statistical Analysis

Crude population rates were calculated using data from the RADARS® Medical Examiner Program and the NVSS Wonder database for multiple cause of death (detailed mortality). For both sets of data, only deaths with an underlying cause of death of poisoning by and exposure to narcotics and psychodysleptics (hallucinogens) where intent was accidental, intentional self-poisoning, or of undetermined intent (ICD-10 codes of X42, X62, and Y12) were included. Deaths from all three codes were aggregated to the year level. Population data from the NVSS Wonder database were used as the denominator.

Similarity between the crude rates for the individual states was assessed using Lin's concordance correlation coefficient^{3,4}. This statistic measures agreement between two variables by the distance from the x=y diagonal. Values closer to 1.0 indicate the two rates are closer in agreement.

Results

Figure 1 shows the similarity between the Medical Examiner Program rates and the NVSS Wonder database rates by state. Figure 2 shows the concordance correlation coefficient for the four states selected. All correlations are strong (>0.85); the black line is the x=y line. Lin's concordance correlation coefficient was lowest for Utah where we see a tendency for the State data to be lower than the NVSS data. Only Florida has a similar trend to the national data. Small discrepancies between the NVSS Wonder database and data directly obtained from state vital records offices exist; reasons for the variation may include data updates or transmission completeness between the individual states and the national database.

Figure 1. RADARS® System Medical Examiner Program and National Vital Statistics System (NVSS) Wonder Database Mortality Rates per 100,000 Population 2006 to 2015

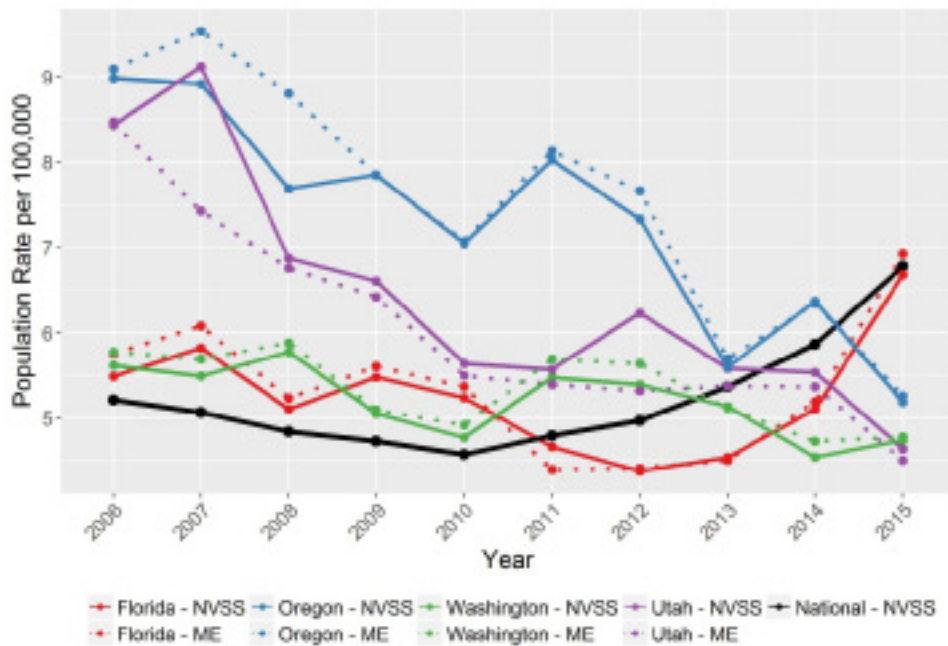
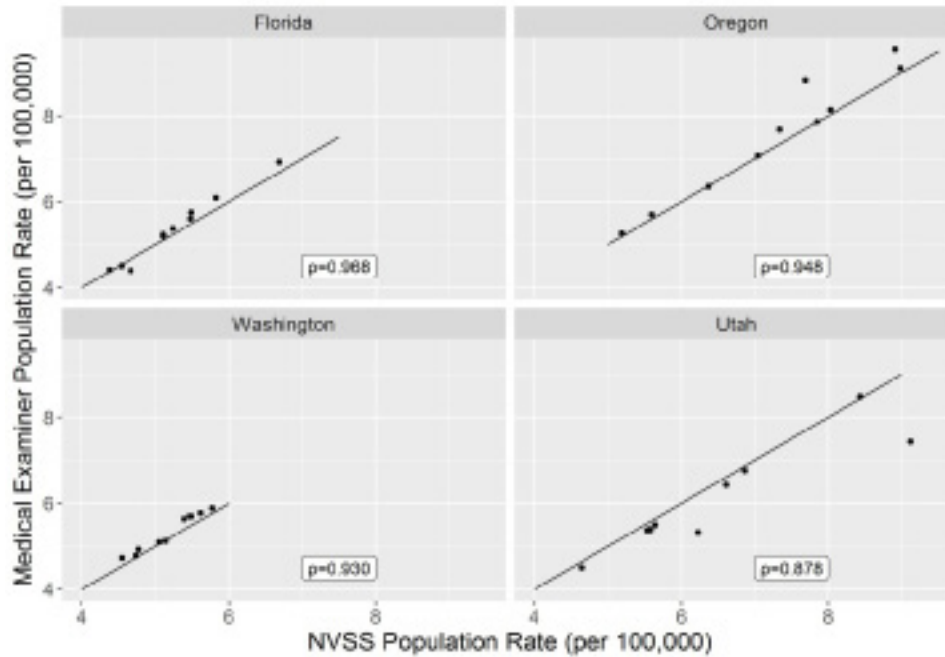


Figure 2. RADARS® System Medical Examiner Program and National Vital Statistics System (NVSS) Wonder Database Mortality Rates per 100,000 Population 2006 to 2015



Conclusions

Mortality rates for deaths involving opioids and hallucinogens are highly correlated between the RADARS System Medical Examiner Program and the NVSS Wonder database for four selected states. State-level analysis is appropriate because trends in rates across years for individual states differ from the national trend and from each other. This agreement forms the foundation for future, more detailed analyses of API-specific or geographic trends using state-level medical examiner data that otherwise would not be possible from the publicly available NVSS data.

Suggested Citation

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References

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4. Lin L (2000). "A Note on the Concordance Correlation Coefficient". Biometrics. 56: 324–325