American Indian mortality in Oklahoma: An ecological study of the 45-54-year-old age group (1999-2016)

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Abstract

Background A recent US study of surveillance data found a marked increase in all-cause mortality in 45-54-year-old non-Hispanic whites (NHW45-54), from 1999 to 2013. American Indian/Alaska Native opioid-related mortality has also been increasing in the US. Oklahoma is consistently a leading state in prescription opioid consumption, and substance abuse-related death in the 45-54-year-old age group. Various medical co-morbidities are known to be associated with opioid abuse and addiction; thus, it is necessary to look beyond external-cause mortality. The study hypothesis was that 45-54-year-old American Indian/Alaska Native (AI/AN45-54) all-cause mortality in Oklahoma is increasing.

Methods Oklahoma AI/AN45-54 annual mortality data were collected from the Centers for Disease Control & Prevention Wonder Detailed Mortality database, restricted to gender groups. Three broad categories of mortality were examined: all-cause, medical-cause, and external/behavioral-cause. Time trend graphs were produced, and Spearman's rank correlations were generated after de-trending using first differences; results were compared to those of the Oklahoma NHW45-54 population.

Results Oklahoma all-cause, medical-cause, and external/behavioral-cause mortality rates (1999-2016) are increasing in both AI/AN45-54 gender groups, with time trend period effects similar to NHW45-54. Within AI/AN45-54 female and male cohorts, medical-cause mortality was strongly associated with all-cause mortality: Spearman's coefficients, 0.956 ($P < 0.0001$) and 0.865 ($P < 0.0001$), respectively. A strong correlation in male all-cause mortality was also found between AI/AN45-54 and NHW45-54 groups: Spearman's coefficient, 0.628 ($P = 0.007$); along with very similar period effects.

Conclusions Oklahoma AI/AN45-54 all-cause, medical-cause, and external/behavioral-cause mortality rates are all increasing. The increasing all-cause mortality is primarily due to increasing medical-cause mortality. The strong correlation and similar mortality rate period effects between the male AI/AN45-54 and NHW45-54 groups may indicate non-random fluctuations and common risk factor(s); although misclassification between the two groups cannot be ruled out.