Examining Chronic Disease Mortality Rates in Cleveland, Ohio through Geographic Information Systems (GIS) Mapping, 2008-2012

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BACKGROUND

The Cleveland Department of Public Health (CDPH) recognizes the importance of chronic disease indicators for the City of Cleveland. In particular, CDPH has a strong focus on minority health due to the city's large minority population. 73.3% of the population in Cleveland is Black/White American (B/WA). Based on 2000-2010-Cuyahoga County Behavioral Risk Factor Surveillance System (BRFSS) data for the City of Cleveland, the B/WA population had high prevalence rates of hypertension and obesity. Hypertension prevalence among B/WA was at 40.2%, and obesity prevalence was at 42.3%. Both rates were significantly higher when compared to rates among Whites. With hypertension and obesity being high risk factors for heart disease and stroke, CDPH did a closer examination of overall mortality, heart disease mortality, and stroke mortality data at the neighborhood level in the City of Cleveland.

METHODS

The CDPH recently participated in the National Association of Chronic Disease Directors (NACDD) Geographic Information Systems (GIS) Training for Surveillance of Heart Disease, Stroke, and Cancer. The University of Michigan and the Center for Disease Control and Prevention. Maps were created under the guidance of the training. Data were mapped across 31 statistical planning areas (neighborhoods) in Cleveland. Data was obtained from Ohio Department of Health and CDPH, Office of Biostatistics. SAS (SAS Institute, Cary, NC) and ArcGIS v10.1 (Environ, Redlands, CA) software were used in calculating rates and mapping the data, respectively.

The maps are based on average annual age-adjusted mortality rates for the five year period (2008-2012) in the City of Cleveland’s statistical planning areas (SPA) as neighborhoods. Rates were age-adjusted to the 2000 U.S. standard population. Rates are per 100,000 population. Heart disease deaths were defined using the following ICD-10 codes: I00-I09, I11, I13, I20-I51. Stroke deaths were defined using the following ICD-10 codes: I60-69. The maps also include all hospitals in the City of Cleveland in order to provide heart disease and stroke mortality data as it relates to hospital locations.

RESULTS

The average annual rate of stroke mortality in Cleveland was 46.8 per 100,000. Among Whites, there were no neighborhoods with significantly higher stroke mortality rates than the city's average. However, among B/WA, non-adjacent neighborhoods of Edgewater, Shire-Miles, and Glenville had stroke mortality rates that were significantly higher than the city's average. The average rate of heart disease mortality in Cleveland was 203.0 per 100,000, higher than state and national averages. Overall, nine neighborhoods had heart disease mortality rates that were significantly higher than the city's average. One was higher among White and B/WA, four for White only (three adjoining), and four others for B/WA populations (non-adjointing).

These findings are in keeping with those of the Chief Executive, and Better Health Greater Cleveland and Metro Health Hospital System to create and disseminate culturally sensitive materials based on the findings. CDPH will also be working with the Office of Minority Health to disseminate maps to the community through social media, flyers, and the Annual Minority Health Report for the City of Cleveland.

PUBLIC HEALTH ACTION

This work is supported by the Public Health Service of the U.S. Department of Health and Human Services, the Cuyahoga County Board of Health, and the Greater Cleveland Rainbow Fund.

REFERENCES

[1] 2009-2010 Cleveland Department of Public Health Annual Report to the Chief Executive, Better Health Greater Cleveland and Metro Health Hospital System to create and disseminate culturally sensitive materials based on the findings. CDPH will also be working with the Office of Minority Health to disseminate maps to the community through social media, flyers, and the Annual Minority Health Report for the City of Cleveland.


