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Social Inequalities and the Decline of Stroke Mortality Rates in the City of São Paulo, Brazil

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Introduction: Despite the decline of stroke mortality rates since the early 1980’s, cerebrovascular death rates in Brazil are the highest in the Americas. We previously described in the city of São Paulo that people living in the poorest area had a risk two times higher of a stroke death compared to people living in the wealthiest area of the city. Hypothesis: to verify if mortality rate trends are occurring at the same pace in different areas of the city according to socioeconomic status. Methods: The Estudo de Mortalidade e Morbidade do Acidente Vascular Cerebral - EMMA Study is a surveillance study addressing mortality and morbidity from cerebrovascular diseases. We analyzed all 35,926 deaths classified as stroke from 1996 (first year of 10th Revision of the International Classification of Diseases) to 2007 (most recent year available) for people ages 35 to 74 years-old of both sexes. São Paulo is organized into 96 districts that were classified into four areas, from the wealthiest (#1) to the poorest (#4), according to the proportion of households with a family income less than or equal to five minimum wages identified on National Census data (1991 and 2000). The population estimate for each district was based on National Census data by extrapolation and estimation on the intercensus years by the official demographic agency. Death rates were adjusted by the Segi’s standard population. “Jointpoint Regression Program 3.3.1” was applied to perform a simulation to verify the peak and the trends of stroke deaths in a log-linear model using Poisson regression; it created a Monte Carlo permutation test to identify points where the trend line changes significantly in magnitude or in direction; and it also allows calculation of the Annual Average Percent Change with 95% Confidence Interval. We also compared the ratio risk between the first triennial (1996-98) to the most recent (2005-07). Results: For all areas, the pattern of decline was linear and continuous. For men, the Annual Average Percent Change for age-adjusted stroke death rates observed was area #1 (wealthiest): -5.2 (-6.6 to -3.7); area #2: -4.4 (-7.9 to -0.7); area #3: -4.2 (-5.3 to -3.1), and for area #4 (poorest): -4.2 (-5.3 to -3.1). For women, the Annual Average Percent Change was for area #1: -5.7 (-6.8 to -4.5); area #2: -4.7 (-5.8 to -3.6); area #3: -4.3 (-5.2 to -3.4); and for area #4: -4.3 (-5.3 to -3.3). The risk ratio of age-adjusted death rates from area #4 to area #1 increased slightly (with no statistical significance) from 1996-98 (men, 2.08; women, 2.21) to 2005-07 (men, 2.15; women, 2.38). Conclusion: an overall decline of stroke death rates was observed for all areas of the city according to socioeconomic classification for both sexes. However, the “double risk” of stroke death has been maintained in the poorest area when compared to the wealthiest area.