



## **Impacts on life expectancy due to progressive reduction of deaths from homicides and traffic accidents in the urban areas of Brazil.**

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Urban violence differs from other phenomena due to aggressive and malicious behavior that occur as a function of urban life, which is derived from living conditions in big cities. Mortality from external causes in Brazil has reached very high levels, which places it among the top three causes of death, next to cardiovascular diseases and cancer. Violence, as well as other expressions of social issues, has been a major challenge for the Brazilian state which composition by age, sex and region varies considerably. In this study we use the approach of competing risks, adopting progressive scenarios (5%, 10%, 30%, 50%, 80% and 100%) of reduction of homicides and traffic accidents by gender for all 27 capital cities, excluding São Paulo and Rio de Janeiro, which were studied separately due to the huge contingent of population. The method proposed by Chiang was used to construct simple and multiple decrement life tables in combination with the method proposed by Tsai for measuring the effect on the life expectancy after a partial reduction of deaths by causes in progressive scenarios. Comparisons were made between the mortality patterns by age groups before and after the elimination of the causes of death. Death data were extracted from the Ministry of Health and the population from the 2000 and 2010 censuses. Life expectancy for all capital cities in 2010 was about 71.8 for men and 80.3 for women. For homicides there was a decrease in the period in gains in life expectancy for all scenarios. The elimination of 100% of male homicides in 2000 to all capital cities, Rio de Janeiro and Sao Paulo caused an increase in life expectancy of 1.77, 2.29 and 2.62 years respectively. Ten years later the increase was 1.65, 1.22 and 0.62 years in the same order. With lower levels comparing with the homicides, the mortality levels from traffic accidents increased. The patterns of the probabilities of dying showed a marked increase in risk of death for ages between 15 and 30 years. Considering the different spatial contexts, the downward trend in homicide rates in Brazil was more pronounced in large capital cities, and in capitals belonging to metropolitan areas. This study reinforces the need to develop public initiatives focused on young people, prevent internalization of violence in smaller urban centers and preventive actions to reduce deaths in urban traffic which is growing fast.

**Keywords:** life table; Brazilian capitals; multiple decrement models; competing risks.