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Geographic variations of cancer mortality in the capital and northeast region of the state of São Paulo, Brazil

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Background: Cancer is a major and growing public health problem in both developed and developing countries. The International Agency for Research on Cancer (IARC) has estimated there are over 19 million new cases and 10 million cancer deaths worldwide in 2020. The greatest impact of the rising cancer burden will occur in less developed countries, where four-fifths of the world's population resides. In Brazil, the National Cancer Institute (INCA) estimates that there are 625,000 new cases of cancer in each year of the 2020-2022 triennium. This study examines the geographic variations in cancer mortality in the State of São Paulo, Brazil, comparing profiles in the capital (São Paulo, population=12,396,672) and the Regional Health Department of Barretos (RHD-Barretos, population=445,216), describing the magnitude and distribution of deaths of the major cancer types over the period 2003-17. Methods: The total of 7,513 and 201,156 cancer deaths occurring 2003-17 in São Paulo and RHD-Barretos, were respectively obtained from the Brazilian public government database, the Information System on Mortality, developed as part of the Informatics Department of the Unified Health System (DATASUS). Age-standardized rates (ASR), per 100,000 persons-years, were calculated for all cancer combined and the six most common cancers using the Segi-Doll World standard population. The results are presented in thematic maps, by municipality for the RHD-Barretos, and by districts for the municipality of São Paulo. The software RStudio® version 2022.02.3 was used for the analysis and QGIS® version 3.22 were used to prepare the maps. Results: Lung cancer is the leading cause of cancer death, with 1,023 deaths (13.6% of total deaths) in RHD-Barretos, followed by colorectal (9.1%), stomach (7.6%), breast (6.7%) and prostate cancer (6.6%). In the municipality of São Paulo there was a similar distribution with 25,420 lung cancer deaths (12.6% of total deaths), followed by colorectal (11.1%), breast (9.1%), stomach (7.6%) and prostate cancer (5.6%). Overall death rates (per 100,000) were slightly lower in the RHD-Barretos in comparison of the municipality of São Paulo for breast (11.6 vs 15.9), prostate (12.6 vs 13.8), colorectal (8.3 vs 11.1), stomach (7.0 vs 7.7) and cervix uteri (3.2 vs 3.6), with the exception of lung cancer (13.1 vs 12.9), respectively. Conclusions: Lung cancer followed by colorectal were the leading cause of cancer death in both regions, though geographic differences in mortality were also identified for the major cancer types. This study aims to contribute to a better understanding of the profile of the cancer mortality burden in the region, as a means to better inform tailored cancer policies, and so doing, minimizing the future impact of cancer mortality in the population.

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