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The Cancer Control Challenge:
Better Understanding It to Better Face It

Impact of the Implementation of Mammography Screening on Breast Cancer Mortality Rates in Brazil (2010–2021): A Temporal Analysis.

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Introduction: Malignant breast neoplasms have a high incidence and represent significant causes of morbidity and mortality among the female population. Therefore, to ensure screening and early initiation of treatment, the Brazilian Ministry of Health, in 2014, established through the Unified Health System (SUS) the provision of free mammography exams for women of all age groups, prioritizing those aged 50 to 69 years, in accordance with WHO recommendations. Thus, it is essential to analyze the actual impact of early screening for this disease. **Objectives:** To analyze the temporal trend and projections of mortality from malignant breast neoplasms in Brazil between 2010 and 2021. **Methods:** This is a cross-sectional, observational, and retrospective study that utilized secondary data from the Department of Informatics of the Unified Health System (DATASUS) regarding mortality from malignant breast neoplasms and outpatient production of mammography exams. The number of deaths was used to calculate the mortality rate. The collected data were organized into tables using Excel®. For modeling and forecasting, the ARIMA (AutoRegressive Integrated Moving Average) model was employed, which is suitable for non-stationary time series. **Results:** Between 2010 and 2021, a total of 190,344 deaths were recorded in Brazil. The year with the highest number of deaths was 2021, with 18,361 (9.64%) deaths, while the year with the lowest number was 2010, with 12,853 (6.75%) deaths. Regarding educational level, the highest number of deaths occurred among individuals with no formal education or incomplete elementary education (1 to 7 years), totaling 75,302 (39.56%). The lowest numbers were observed among those with no education — 15,265 (8%) — and among those who had completed high school or higher education (12 years or more) — 24,072 (12.64%). Temporal analysis demonstrated an upward trend until 2019, followed by a decline through the end of 2020, after which an upward trend was again observed. The forecast (Figure 1) performed using the ARIMA model showed monthly values and trends that were either below or followed the pattern recorded throughout the years presented in the real mortality rate time series (Figure 2) **Conclusion:** The introduction of mammography within the Unified Health System (SUS) aimed to reduce breast cancer mortality through early diagnosis. However, an increase or stabilization in mortality rates has been

observed over the years. This may be explained by the greater effectiveness in diagnosing breast cancer through the use of mammography, thereby reducing the underreporting of the disease. Furthermore, an inverse relationship between educational level and the number of deaths from breast cancer is evident, highlighting the significant impact of patients' socioeconomic conditions on disease prognosis.

Keywords: Breast cancer; epidemiology; mortality rate