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

TEMPORAL DISTRIBUTION OF THE INCIDENCE OF PROSTATIC MALIGNANT NEOPLASIA DURING ANDROPAUSE IN THE AMAZON OF PARÁ

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Introduction: Cancer currently represents a public health challenge, with approximately 20 million new cases in 2022 alone. For Brazil, the estimate for 2023 to 2025 is an increase to 704 thousand new cases. Prostate cancer (PC) is identified as the second type of cancer that causes the most deaths in Brazil, especially among older people, with an incidence of approximately 600 thousand new cases per year. **Objectives:** To analyze the temporal distribution of the incidence of malignant prostatic neoplasia in andropause, in the state of Pará. **Methods:** This is an ecological study using temporal analysis techniques. The study scenario is the 144 municipalities of the State of Pará and uses data consolidated by IntegradorRHC as a source of information. Furthermore, to calculate incidence rates, population data from the 2022 Demographic Census of the Brazilian Institute of Geography and Statistics (IBGE) were extracted. As eligibility criteria, data on the incidence of PC in andropause were collected between 2012 and 2022, respecting the variables of year of diagnosis, sex, age range from 40 to 85+ years, origin in the state of Pará, and primary location. Cases that did not apply to the inclusion criteria were discarded, such as those with no record of origin. After data collection, time series analysis and modeling were performed. To this end, the Autoregressive Integrated Moving Average Model (ARIMA) was applied, and predictive performance was measured considering the following measures: Root Mean Square Error (RMSE), Mean Absolute Error (MAE) and Mean Absolute Percentage Error (MAPE), which allowed the accuracy of estimates and forecasts to be assessed in confidence intervals from 80 to 95%. **Results:** The analysis of the standardized incidence rates between 2012 and 2019 revealed significant fluctuations over the analyzed period, with variability of values within the range of 54.06 to 71.10 cases per 100,000 inhabitants, with peaks and reductions over the years. The forecast from 2020 indicates a gradual increasing trend until 2029, according to modeling performed in the MiniTab Software. The ARIMA (0, 1, 0) model was selected based on the lowest AICc values (114.19), indicating a good fit. In addition, the low forecast errors, represented by MAPE of 3.69% and MAD of 2.36%, reinforce the accuracy and reliability of the estimates made. When evaluating the ACF and PACF

graphs of the residuals, the adjusted ARIMA model appears to be adequate, since the autocorrelations remain within the confidence intervals, indicating satisfactory capture of the data structure and reliable forecasts. **Conclusion:** Based on the subsidy in ecological research, the management capacity, risk reduction, monitoring of non-communicable diseases and early warning, starting with treatment, are, in their entirety, the possibility of establishing local goals, adapted to the indicators of the 144 municipalities of the state of Pará.

Keywords: Prostatic Neoplasms; Andropause; Incidence; Amazon Region