The National Breast Cancer Foundation is an Australian non-profit organisation dedicated in funding life-saving breast cancer research. NBCF has invested in innovative research to improve prevention, diagnosis, treatment of breast cancer patients, with the goal of achieving zero deaths from breast cancer by 2030.

Recommendation

To increase the predictability of cancer patients, NBCF should conduct analysis on the influence of demographic variables such as age and race on breast cancer outcomes. This can aid in identifying high-risk population and enable precise treatments while spreading awareness. Resulting in a likelihood in reducing breast cancer mortality.

Evidence

The data analysed in this research is sourced from SEER Breast Cancer Data (IEEEDataPort), contributed by JING TENG. The dataset involves 4024 female patients, including various features on their identity and cancer.

1. Analyse survival months by Age groups, Race, and Marital Status.

Survival Months by Age groups, Race, and Marital Status.

Comparing the impacts of these factors through boxplot shows noticeable patterns hinting at possible relation between unique features leading to fewer survival. Most remarkable is the separated marital status, having a lower median at 67 compared to 73 averaged from other marital status. This result suggests some demographic groups would undoubtedly impact breast cancer mortality rate.

1. Evaluate survival curves by Age Group

The survival curve displays 2 trends, a faster decline rate for age 31-40 and 60-70, and a slower decline rate for 41-60. Similar study conducted in 2016 shows matching results – “Middle-aged breast cancer patients showed better survival than younger and older groups, except in advanced-stage disease” [1]. These replicable results implying the susceptibility of low and high aged breast cancer patients, showcasing mortality follow an age-based trend, and that possibility of other demographic factors contributing to fatality.

1. Positive Regional Node Percentage vs Age Group

Highlighted by the density graph of Positive Regional Node Percentage (Regional Node Positive / Regional Node Examined)

Acknowledgement

* [1] Chen HL, Zhou MQ, Tian W, Meng KX, He HF. Effect of Age on Breast Cancer Patient Prognoses: A Population-Based Study Using the SEER 18 Database. PLoS One. 2016; 11:e0165409. 10.1371/journal.pone.0165409 [[DOI](https://doi.org/10.1371/journal.pone.0165409)] [[PMC free article](https://pmc.ncbi.nlm.nih.gov/articles/PMC5087840/)] [[PubMed](https://pubmed.ncbi.nlm.nih.gov/27798652/)] [[Google Scholar](https://scholar.google.com/scholar_lookup?journal=PLoS%20One&title=Effect%20of%20Age%20on%20Breast%20Cancer%20Patient%20Prognoses:%20A%20Population-Based%20Study%20Using%20the%20SEER%2018%20Database.&author=HL%20Chen&author=MQ%20Zhou&author=W%20Tian&author=KX%20Meng&author=HF%20He&volume=11&publication_year=2016&pages=e0165409&pmid=27798652&doi=10.1371/journal.pone.0165409&)]