

# Unveiling the Interplay: Bayesian Insights into the Intersection of Cancer Diagnoses and Mental Health Challenges

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In 2020, an estimated 1,806,590 new cancer cases emerged, with a projected 606,520 cancer-related deaths. The predominant cancers in the US, ranked as breast, lung, and prostate, underscore the widespread impact of this disease. Beyond the physical challenges of cancer treatment, the mental health implications for patients are substantial. This study employs Bayesian Network Modeling to uncover influential factors affecting individuals diagnosed with cancer. Leveraging the Health Care Utilization Project (HCUP) National Inpatient Sample datasets from 2016 to 2020, the analysis focuses on breast and prostate cancer patients, matching them with anxiety controls by age and sex.

The methodology involves identifying cancer patients, particularly those with breast and prostate cancer, and creating age- and sex-matched anxiety control groups. Individual Bayesian network models, developed using the tabu algorithm for structure learning, are utilized, followed by the generation of posterior probability maps from the data.

Preliminary analysis of HCUP data reveals a significant co-diagnosis of anxiety among cancer patients. Recognizing this relationship enables medical practitioners to proactively address signs of anxiety, depression, and suicidal ideation. Future analyses will explore whether this patient population faces an elevated risk of suicide and other mental disorders.