

AI Advances the Development of a Cancer Survival Calculator



According to a new study, presented at the ACS Clinical Congress 2023, researchers have created an AI-driven tool for calculating the long-term survival prospects of recently diagnosed cancer patients.

Estimating survival rates for patients with cancer normally depends on their cancer stage. However, numerous other factors can influence a patient's survival beyond their staging criteria.

This new cancer survival calculator aims to offer patients a more personalised estimate of their expected cancer prognosis.

A prototype tool called the Cancer Survival Calculator was created and tested on a nationwide cancer dataset. It estimated the five-year survival for patients with cancers of the breast, thyroid, and pancreas in 2015 and 2017.

The data included 259,485 breast cancer patients, 76,624 thyroid cancer patients, and 84,514 pancreatic cancer patients.

Seventy-five percent of the collected data was employed to train the machine learning algorithms. These algorithms were designed to identify patterns between patient characteristics at diagnosis and their five-year survival outcomes. The algorithms then ranked the factors based on their impact on survival.

The most influential factors determining whether patients were alive five years after diagnosis encompassed:

Breast cancer: whether the patient had cancer surgery, their age at diagnosis, tumor size, the time between diagnosis and treatment, hormone receptor status, and presence of Ki-67.

Thyroid cancer: age at diagnosis, tumor size, the time to treatment, and lymph node involvement.

Pancreatic cancer: cancer surgery, histology, tumor size, and age at diagnosis.

The calculator differed in several ways from cancer survival estimators. The calculator incorporates precise tumour biomarkers and treatment-related variables that are established to impact a patient's prognosis estimate. The calculator also uses new data modelling which speeds up processing, and the calculator also uses new data modelling for faster processing and demonstrated improved risk prediction accuracy.

Dr. Janczewski outlined the next steps, which involve finalising a user interface to enable the utilisation of the Cancer Survival Calculator in clinical practice.

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