PREDICTING THE PSYCHOSOCIAL NEEDS OF CANCER PATIENTS BY USING NATURAL LANGUAGE PROCESSING WITH PHYSICIAN DOCUMENTS

Background:
Our project aims to use natural language processing to automatically predict the psychosocial needs of cancer patients from physician documents. This will allow cancer agency psychiatrists and other physicians to better help cancer patients, and potentially improve outcomes in both physical and mental health.

Research Objectives:
It is known that cancer patients showing psychosocial risk factors (e.g. social isolation, depression, anxiety) are at increased risk for not only worsened quality of life, but also poorer survival (1–3). Psychosocial oncology psychiatrists aim to address these needs, but these needs often go undetected, leading to underutilization (4-5). We aim to produce a natural language processing (NLP) model to automatically predict psychosocial needs from physician documents, such as the initial consultations dictated by medical oncologists, so that these needs can be detected and addressed earlier.

We are unaware of previous work addressing this question, though predictive models have been used on cancer data (6) and using NLP methods on clinical documents in other areas of psychiatry (7).

Methods:
We are using the documents of patients who completed the Psychosocial Screen for Cancer (PSSCAN) questionnaire at the start of their cancer care, which records anxiety, depression, suicidality, and social isolation symptoms. We are training NLP models on these data to predict PSSCAN scores. This will train the NLP artificial intelligence to “read” physician documents and predict the psychological needs. Once trained, the model can be used on patients who have not completed the questionnaire, or at time points throughout their cancer care.

Interim Results:
Our project is currently in progress. Our dataset has over 1,250,000 documents, from 59,800 BC Cancer patients. We have obtained and cleaned the data and are now starting to build and train the models.