PD175 Using Machine Learning To Optimize Systematic Literature Reviews

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Introduction: Screening and selecting publications are very time consuming when conducting systematic literature reviews. Currently, in the field of robotic-assisted surgery (RAS) there is an average of 12 to 15 studies published daily, making manual data management unsustainable. We aimed to investigate how machine learning (ML) can be used to optimize the manual processes of literature reviews.
Methods: New RAS publications in PubMed, Scopus, and Embase are routinely screened for relevancy and then tagged with metadata to aid future analysis. A curated library of approximately 40,000 tagged RAS publications served as our training dataset. To support manual screening and tagging efforts, multiple ML models were benchmarked, including logistic regression, decision trees, and gradient boosting. All model implementations came from the Python scikit-learn package. The evaluation metric for this study was the F1 score, and the fields of interest tagged were procedure type and surgical approach. Models were trained on publication abstracts and compared with a baseline keyword search to measure changes in performance.
Results: The findings demonstrated that ML models can classify key metadata with high levels of accuracy. The decision tree model correctly labeled the five most common procedures in the dataset, with an average F1 score of approximately 0.90. This same model predicted surgical approach with an average F1 score of 0.84. It is important to note that different models performed best in different scenarios. To compensate for this variability, all models were fed into a stacking classifier—an ensemble model that takes the output of other models as input training data.
Conclusions: It is evident that ML models can reduce the cognitive burden of clinical librarians and shift their role from hand-screening papers to validating ML predictions. Future work may involve comparing the performance of traditional ML models with large language models (LLMs) to further improve F1 scores and reduce class imbalances.

PD177 The Effect Of COVID-19 On Cancer Screening In Brazil, Canada, And The USA: A Cross-National Study

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Introduction: The COVID-19 pandemic strained hospital systems and diverted resources, prompting a reorientation of healthcare priorities. This shift disrupted patient access to preventive cancer screenings and curtailed interactions between medical professionals and patients. This study aimed to examine changes in cancer screening during the COVID-19 pandemic period (2019 to 2021) in Brazil, Canada, and the USA.
Methods: The study included a literature review of academic articles, health reports, and government data that focused on the impact of the pandemic on cancer screening. Official health data in Brazil, Canada, and the USA were collected from medical records, national health databases, and screening statistics. A comparative analysis was conducted to unveil the changes in access to screening services for colorectal cancer (CRC), breast cancer, hepatocellular carcinoma (HCC), and cervical cancer.
Results: During the COVID-19 period, significant declines in cancer screening were observed globally. In Canada, CRC diagnoses dropped by 55 percent and remained 20 percent lower than averages from previous years, with an estimated 467 cases undiagnosed by August 2020. In the USA, HCC screenings were reduced by 44 percent, while cervical cancer screenings for women aged 21 to 29 years plummeted by 78 percent. Additionally, mammography screenings fell drastically from 180,724 in March to May 2019 to just 1,681 in the same period of 2020, leading to fewer breast cancers detected and a surge in symptomatic, aggressive tumors. Similarly, Brazil saw a 39 percent drop in breast cancer screenings.
Conclusions: The COVID-19 pandemic significantly disrupted cancer screening programs across Brazil, Canada, and the USA, resulting in marked declines in the number of diagnoses of various cancers. This reduction highlights the extensive impact of the pandemic on preventive health care, necessitating strategies to address the backlog and ensure timely cancer detection and treatment in the post-pandemic era.

PD178 Impacts Of COVID-19 On Mental Health Services: Telepsychiatry Efficacy And Substance Use Disorder Challenges In The USA

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Introduction: The COVID-19 pandemic significantly affected mental health, particularly among individuals with existing issues, and altered mental health services. While the direct psychiatric effects of SARS-CoV-2 are unclear, there is potential for the virus to cross the blood-brain barrier, raising concerns about neural invasion and inflammation. This study explored these impacts and the implications for future psychiatric disorder epidemiology.

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