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.

Methods: This study used a mixed-methods approach, combining a literature review on pandemic-related mental health impacts with an analysis of health databases and emergency room records from the USA. It compared pre-pandemic and pandemic data on telepsychiatry, in-person services, emergency visits, and opioid incidents, employing statistical analyses to identify key trends in healthcare utilization during the COVID-19 pandemic.

Results: During the COVID-19 pandemic, rates of telepsychiatry visit completion in the USA reached 74.2 percent, which was 6.68 times higher than in-person visits and indicated that telepsychiatry was an effective alternative. The use of in-person mental health services declined by 57 percent, while telehealth services increased by 1,925 percent, with a notable rise in telehealth for people with anxiety disorders. Concurrently, general emergency room visits dropped by 52 percent. In contrast, there was a 34 percent increase in opioid overdose deaths, reaching a record of 96,779 deaths in 12 months, which highlighted ongoing healthcare challenges in treating substance use disorders. The number of emergency room visits for opioid use disorder surpassed the 2019 value by May 2020.

Conclusions: The pandemic significantly shifted mental health services toward telepsychiatry, proving its effectiveness, especially for anxiety disorders. Despite reduced in-person service usage, telehealth played a vital role. However, the period saw heightened challenges in substance use disorders, marked by a significant increase in opioid overdoses and emergency visits for opioid use disorder, which underscored the need for adapted healthcare strategies.

PD179 Navigating Health Crises In Emerging Economies: A Comprehensive Examination Of COVID-19's Influence On Health Care Access And Resilience

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Introduction: This research focuses on the impact of the COVID-19 pandemic on health care in emerging markets. It examines the pandemic's effects on emergency surgeries, medical consultations, maternal care, primary health care services, and surgical interventions.

Methods: This study focused on assessing the effect of COVID-19 on healthcare services in emerging markets from 2019 to 2021. It involved a literature review of academic articles, health reports, and government data, targeting the pandemic's effect on healthcare access. Data were collected from official health records in Brazil, China, Ethiopia, Egypt, Poland, Qatar, Sub-Saharan Africa, Thailand, and Türkiye. The analysis focused on emergency surgeries, outpatient visits, hospital admissions, primary health care, prenatal and maternal care, clinic visits for cardiac implantable electronic devices (CIED), and general surgeries, aiming to understand changes in health care access during and after the pandemic.

Results: Emergency surgeries in Ethiopia decreased by 77 percent, while in Egypt there was a 66.4 percent reduction in chest clinic visits. Outpatient and hospital admissions fell by 7 to 17 percent in Sub-Saharan Africa. In China, hospital, primary care, and inpatient visits declined by 33, 71, and 42 percent, respectively. In Qatar, physical healthcare visits fell by 36 percent, though virtual consultations increased notably. CIED visits in Poland fell by 26 percent in 2020. Thailand struggled with increased COVID-19 cases and deaths in 2021, whereas Brazil's health care services were significantly reduced (42.6% reduction in screenings and 59.7% reduction in surgeries). In Türkiye, there was a 35 percent drop in hospital visits and a 15 percent drop in prescriptions, but with increased costs per visit (0.09%) and per prescription (42.3%).

Conclusions: This study highlights the profound impact of COVID-19 on health care in emerging markets, showing significant disruptions in services like surgeries and outpatient visits. The pandemic emphasized the necessity of robust, adaptable healthcare systems and accelerated the shift to digital health services. These findings urge the strengthening of healthcare in emerging markets to prepare them for future global health challenges.

PD180 Strategies To Minimize The Impact Of The COVID-19 Pandemic On People With Disabilities: Systematic Review And Deliberative Dialogues

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Introduction: The impact of the COVID-19 pandemic was unequal, leading to losses for specific population groups already exposed to social vulnerabilities in the pre-pandemic period—for example, the inequity in access to health care among people with disabilities. The study aimed to identify strategies for people with disabilities during a public health emergency, in particular the COVID-19 pandemic.

Methods: A systematic review was conducted following the PRISMA guidelines. The population was adults with disabilities. There were no restrictions regarding the type of disability, which could include visual, auditory, intellectual, physical, or multiple disabilities. The COVID-19 pandemic was the study exposure and the outcomes were strategies aimed at improving prevention and health care for the target population during the pandemic period. A literature search was conducted in June 2021 and updated in November 2022 in the following databases: PubMed, Web of Science, Scopus, the Virtual Health Library, CINAHL, PDQ-Evidence, Health System Evidence, PEDro, and PsycInfo. The protocol for the systematic review was registered on PROSPERO (CRD42021266341).

Results: The systematic review included 29 studies of 49 non-pharmacological strategies. The evidence was synthesized and structured into categories. The following eight categories were found: habitation and infrastructure; work; occupation and income; planning and management; social assistance; telehealth; communication; comprehensive health care; and education for people with disabilities.