Cancer Screening Mobile Application: A Novel Machine Learning Based Approach Utilizing Retrospective Data

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Cancer is one of the most prevalent diseases affecting humans today and its lack of early diagnosis is leading to many millions of deaths worldwide. Hypothesis, in order to help people screen themselves for certain types of cancer early on, can a downloadable mobile application be developed? The application targeted screening for lung cancer and lymphoma, because these cancers have predominant early warning signs and symptoms. The novel approach was the use of retrospective data from nationally available cancer registries to develop an algorithm via machine learning. To determine one's percentage risk of cancer, seven prevalent symptoms one may experience were used, as well as user's demographics such as age and ethnicity. Then a rigorous analysis was performed to create and validate the app. The retrospective data allowed the testing of tens of thousands of data points and create accurate percentages of the user's risk of cancer based on their symptoms and demographic data. Through significant research of these cancers the observation was made that some symptoms are more diagnostic than others. The machine was trained to factor the symptoms based on the diagnostic importance of each one based on the research. In addition, the demographic distribution, age, ethnicity and incidence rates obtained from the cancer registries were factored into the machine to generate the algorithm. In the final calculation of risk percentage, the more diagnostic symptoms were weighted higher than the less indicative symptoms. This provided a statistical measurement of one's percentage risk of cancer. Consequently, this mobile application provides a viable way to screen people for certain types of cancer, so they can improve their survival rate by getting diagnosed early.

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