Digital decision support system that integrates large scale digitalized welfare and healthcare data for early identification of child maltreatment

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Child maltreatment is a serious social welfare and public health problem worldwide with significant financial costs. Research provides persistent evidence of under-identification and reporting of child maltreatment in healthcare systems. For example, up to 50% of children who die from physical abuse have been previously evaluated for abusive injury. The goal of the current presentation is to describe the development of a digital decision support system (CDS) to enable timely identification of children who are suffering or likely to suffer from physical abuse, thus facilitating reporting and early or preventive help.

Through the presentation we will elaborate on the process of generating the CDS using large scale digitalized welfare and healthcare data and machine learning techniques. The project builds upon a unique digital infrastructure to merge information from the welfare and healthcare systems of the larges municipality in Israel. Information on 1.8M clinical encounters by 845K unique children from the years 2015-2021 is merged with detailed information on 15,000 children who received services from the municipality welfare department. All records are deidentified using the same one-way hash function, thereby preserving the ability to link records of the same patient from different sources without disclosing any identifying information. Using only clinical data that were available prior to the detection of physical abuse, we will develop a machine-learning algorithm to risk stratify patients for abuse based on their clinical information. Finally, we will collaborate with one medical centre to test pilot this CDS system in real-life. The CDS system will include both an implementation of the above-mentioned machine-learning algorithm, as well as a previously validated universal screening

questioner (P-CAST). The performance of the tool will be evaluated against 2 outcomes: report generated (case was reported to the social services) and report validated (report was confirmed by municipal services). During the presentation we will also discuss barriers and challenges, such as ethical concerns and how they were addressed.