

## Detection of Suicide Risk in Patients Presenting to the Emergency Department – Towards a Collaborative and Systematized Screening (CARES)

### JUSTIFICATION

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Suicide is an important cause of premature death, especially among young people, causing immense grief and societal costs. Research indicates that **1.1%** of all emergency department visits are directly linked to suicidal thoughts or behaviours, with 49-60% of suicide victims having had ED visits in the critical period leading to their attempts. **Emergency departments** are therefore **strategically well-placed settings** to detect individuals at high risk for suicide and provide timely interventions.

An important finding is that substantial proportions of patients visiting the emergency department **may not spontaneously disclose suicidal thoughts unless explicitly inquired**. Previous studies have revealed that **3-8%** of individuals seeking emergency care for non-psychiatric issues screen positive for active suicidal ideation or recent suicidal behaviour. Despite the evident importance, conducting systematic screenings for all patients may prove challenging due to high workloads and limited resources in emergency departments.

Furthermore, **identifying those truly at risk for suicide is complex**, given the unpredictable nature of this behaviour. Unassisted clinical judgment and traditional screening methods exhibit limited accuracy in this context. This underscores the necessity for innovative approaches, such as **leveraging machine-learning techniques on extensive clinical data**. By embracing these advancements, we can enhance our ability to detect and intervene in cases of suicidal ideation, contributing to **more effective suicide prevention strategies**.

### OBJECTIVES

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The CARES research project aims to develop a **Clinical Decision Support System prototype** – a medical software designed to furnish healthcare professionals with **automated alerts regarding elevated suicide risk** in patients seeking **emergency department** assistance for **non-psychiatric issues**. Our goal is to optimize the **usability, feasibility, and acceptability** of this medical software among all end-users, ensuring an **optimal integration** in existing healthcare infrastructure and information systems, and **minimizing disruption** to daily clinical workflows.

The methodology employed in the CARES research project is illustrated in Figure 1 below.

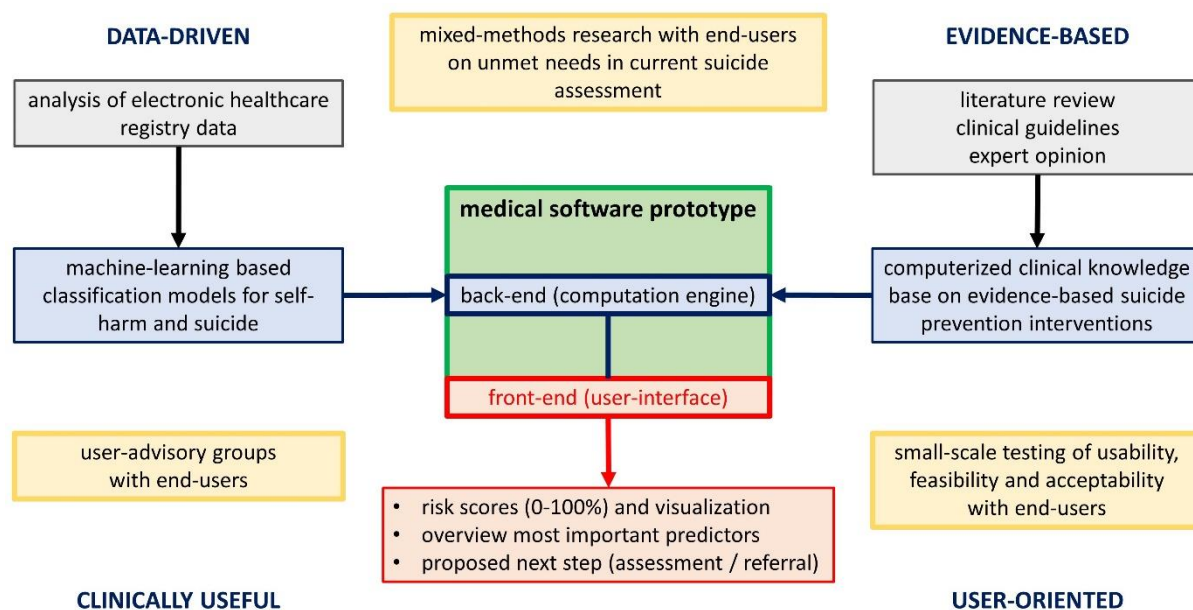


Figure 1: overview of methodological aspects of the CARES research project.

The data-driven component of CARES research project involves **analyzing registry data**, including **electronic medical records** that code episodes of self-harm and suicide. Specifically, registry data from the Catalonia Suicide Risk Code Epidemiology study will be utilized to develop **machine learning-based classification models**. These models will enable the calculation of **risk scores for self-harm and suicide** based on a **comprehensive set of patient characteristics**.

A thorough review of scientific literature, consideration of existing clinical guidelines, and consultation with experts in the field will inform the creation of a **computerized clinical knowledge base** containing **effective, evidence-based interventions for suicide prevention**.

To ensure the project's relevance and utility, **user advisory groups** comprising **patients, clinicians, and individuals with personal lived experience**, along with their **support networks**, will be established. These groups will contribute valuable perspectives and knowledge to guide the project's development, ensuring that **user needs are effectively addressed**.

In the final phase of the project, **small-scale pilot tests** will be conducted to assess the **usability, feasibility, and acceptability** of the tools and software developed. Both patients and clinicians will participate in these tests, ensuring that the tools are tailored to their specific needs and preferences.

The ultimate deliverable of the project will be a Clinical Decision Support System software prototype. The **backend** of the prototype will calculate and generate **personalized risk profiles**, linking them with evidence-based interventions. On the **frontend**, a user interface will display **risk scores, key predictor variables, and proposed next steps**, which may include further assessment.

By developing a Clinical Decision Support System, CARES aims to **enhance the quality of care** for patients at risk of self-harm or suicide. This system facilitates **early risk detection and intervention**, improving the **continuity and standardization of care**. Moreover, it **optimizes resource allocation** in the high-pressure environment of the emergency department by directing resources systematically to patients with the highest levels of need.

## THE TEAM

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## Publications

No publications yet!

## Funding

The CARES project is funded by la Fundació La Marató de TV3 (2021 Salut Mental – Project No 202220-30-31).