WATCHING THE RISK FACTORS

WARIFA

ARTIFICIAL INTELLIGENCE AND THE PERSONALIZED PREVENTION AND MANAGEMENT OF CHRONIC CONDITIONS

Updates on the final project results

Shaping the Future of AI-Driven Healthcare with WARIFA

Over the past months, the WARIFA consortium has made significant progress across key areas of the project. Building on insights from over 600 stakeholders in Norway, Spain, and Romania, we have deepened our understanding of user and community needs, and translated them into concrete system requirements, health risk profiles, and a technical blueprint for the WARIFA solution. At the same time, new data acquisition pipelines and machine learning models have been developed and tested, while user-centered design and clinical trials are helping to evaluate the app's impact on lifestyle, health goals, and disease prevention.

Beyond the technical work, WARIFA has successfully engaged policymakers, researchers, and innovators through dedicated workshops and dissemination activities, most notably the high-impact Workshop on AI in Healthcare at EFMI MIE 2025. Together, these efforts bring us closer to our goal: delivering a trusted, explainable, and user-centered AI solution to support healthier lives across Europe.

USER AND STAKEHOLDER NEEDS

As part of WP2, three deliverables have been successfully developed, finalized, and officially submitted:

Deliverable 2.2 – Stakeholder Review Report on Roles, Needs, and Preferences

Submitted in June 2023 (M30), this report compiled valuable insights from stakeholders across Norway, Spain, and Romania. It included a survey with 633 participants and three focus groups: two virtual sessions with healthcare and IT professionals from all three countries, and one in-person session with the general population in Santa Cruz de Tenerife (Spain). Findings revealed that participants were generally comfortable with digital tools and saw the WARIFA App as a promising solution to support non-communicable disease prevention and improve access to health services.

Deliverable 2.6 – Community Health Risk Profiles Website

Submitted in December 2023 (M36), this deliverable led to the creation of a dedicated online platform featuring community health risk profiles for the pilot cities of Santa Cruz de Tenerife and Las Palmas de Gran Canaria (Spain), Tromsø (Norway), and Brașov (Romania). The website presents local data on key public health risk factors and provides practical recommendations tailored to each city. It is fully integrated within the WARIFA project website and the WARIFA mobile app, making it easily accessible to a wide audience.

Deliverable 2.7 – Stakeholder Feedback and System Blueprint

Also delivered in December 2023 (M36), this report defined the technical blueprint of the WARIFA system. It includes essential input and output variables, as well as end-user requirements and specifications, serving as a foundation for the system's continued development and ensuring alignment with stakeholder expectations.

DATA ACQUISITION AND PREPARATION

The app was designed to query the users with a multitude of questionnaire, in collaboration with the SME Netsun's questionnaire engine, as well as a solution for acquiring data from Continuous Glucose Monitors for users with type 1 diabetes, in collaboration with the SME Sensotrend. In addition, real-time sensor data were included in the app for sleep, physical activity and heart rate – either through a Samsung Galaxy smartwatch, or through other devices that were connected to Google's Health Connect platform. Various feedback functionalities were programmed, tested and included as well, which gave the users recommendations and predictions based on their own data.

DATA PROCESSING AND MACHINE LEARNING ALGORITHMS

WP4 has worked on several pilot studies based on AI-based model for primary prevention and tertiary prevention in diabetes. These studies were conducted utilizing publicly accessible datasets and real data collected within the project by WP7 (for the type 1 diabetes use case) to determine which risk factors those listed in each database are most pertinent to a certain condition (CVD, diabetes, and melanoma). Furthermore, we provided some initial experiments aimed at developing novel AI models to personalize glucose prediction for T1D patients. For skin cancer prevention, AI-based preprocessing methodologies are first proposed for two types of images: dermoscopic and macroscopic. Subsequently, different public image datasets, pre-processed with these algorithms, are employed to implement models capable of distinguishing between malignant and benign lesions. A private dataset has been collected within the WARIFA project at the Tromsø hospital, including dermoscopic, macroscopic, and hyperspectral images. The developed models are tested on this private dataset.

CONTEXT AWARENESS AND SIMULATION OF BIG DATA

In the final months, WP5 delivered the layer that allows WARIFA to interpret every machine-learning prediction in the context of the user and produces statistically faithful records for large-scale testing. Both capabilities are requirements for the personalized, explainable recommendations generated.

BAYESIAN BELIEF NETWORKS

Three different methodologies have been developed within the project, each to address a specific issue. In particular, the first one is a Bayesian Belief Network based model to quantify the probability of cardiovascular (CVD) events in people with type 1 diabetes (T1D). In case a suitable database is available, this method can be adapted to cope with the case of general population. The second methodology proposed is a methodology to quantify the influence of single risk factors on the probability of adverse event occurrence, using a combination of three different methods. This methodology is general but it is applied here in the case of CVD events for people with T1D. The last of the three methodologies concerns two algorithms to predict hypoglycaemia during exercise in individuals with T1D. Both the algorithms use continuous glucose monitoring data of the individual, together with additional information as the planned duration of the session and the type of training performed.

USABILITY, PERSONALIZATION AND VALIDATION

After a review of the available literature, evidence-based recommendations were designed for the individualized promotion of healthy lifestyles. After the involvement of end-users in the co-creation of the WARIFA app through focus groups, individual interviews and iterative evaluations, ULPGC has led the design and performance of a randomized controlled, double-blind, parallel group trial, in order to evaluate the effects of twelve weeks using the WARIFA app on participants' self-defined objectives and health-related behaviours. The WARIFA intervention app, including personalized risk evaluation and recommendations was compared to a control app. The results of the trial will allow us to assess the impact of the present version of the app and help us identify areas for improvement. The trial protocol has been registered in ClinTrials.gov and the study was implemented in three countries: Spain, Norway and Romania.

COMMUNICATION, DISSEMINATION AND EXPLOITATION INCLUDING POLICY RECOMMENDATIONS

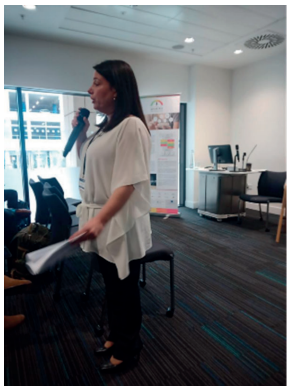
WP8 continued the communication and dissemination actions in line with the project strategy. Most effort was spent into the organization of the WARIFA Workshop on AI in Healthcare at EFMI MIE 2025. Linked to this, a survey was elaborated and shared to gather useful insights to finalize the policy recommendations. The exploitation strategy evolved over time, culminating in the "D8.9 -Business and commercialization plan–update": the document outlines the exploitation planning and strategies for the WARIFA project, emphasizing the importance of leveraging both tangible and intangible results. The exploitation strategy reflects adaptations to market changes, technological progress and further analysis of exploitation mechanisms. The plan incorporates diverse expertise, including AI technologies, e-health, clinical medicine and communication. Activities within the strategy include evaluating WARIFA results, developing the main key exploitable results, publishing scientific articles, and defining pathways for exploiting project innovations, particularly the WARIFA solution.

WARIFA HOSTED HIGH-IMPACT WORKSHOP ON AI IN HEALTHCARE AT EFMI MIE 2025

On Monday, May 19, the WARIFA Project held a high-level workshop at the EFMI MIE 2025 conference in Glasgow, bringing together leading experts, researchers, and digital health innovators to discuss the real-world implementation of AI-based medical devices in Europe.
Titled "*Exploring the Benefits, Risks, and Ethical Considerations of AI-Based Medical Devices: Navigating Law, Policy, and Data Access Rights*," the workshop provided a vibrant platform for debate on the challenges and opportunities of developing, regulating, and adopting AI in healthcare.

The event featured two engaging panels:
Panel 1 – From Innovation to Impact: WARIFA and the Future of AI in European Healthcare
Moderated by Conceição Bartnæs (Norwegian Centre for E-health Research) with insights from:

- Rachel Fellner (OECD)
- Ricardo João Cruz Correia (University of Porto)
- Gro-Hilde Severinsen (Norwegian Centre for E-health Research)



Panel 2 – AI-Powered Healthcare in Europe: From Policy to Practice, Market & Reimbursement
Moderated by Thomas Schopf (Norwegian Centre for E-health Research), a multi-project panel discussion with representatives from EDIHTA, FLUTE, TRUMPET, ONCOVALUE, and WARIFA:

- Line Helen Linstad (Norwegian Centre for E-health Research)
- Nicola Gentili & Alice Andalò (IRST Srl)
- Conceição Bartnæs (Norwegian Centre for E-health Research)
- Chiara Zocchi (CiaoTech – Gruppo PNO)


The workshop highlighted WARIFA's role in shaping the future of AI-driven healthcare—from innovation and ethics to market readiness and reimbursement frameworks—furthering the vision of a European Health Union. A sincere thank you to all speakers and participants for making the event a success!

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ULPGC Universidad de Las Palmas de Gran Canaria

UiO : University of Oslo

MTU Ollscoil Teicneolaíochta na Mumhan Munster Technological University

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