

PHRESH

Advancing remote monitoring for health equity

To improve health risk assessment, emergency response and treatment, the ITEA project PHRESH (Patient Health Response in Emergent and Secure Habitats for Connected Healthcare) will integrate sensors, real-time analysis, advanced data, and network connectivity into a privacy-preserving framework.

Addressing the challenge

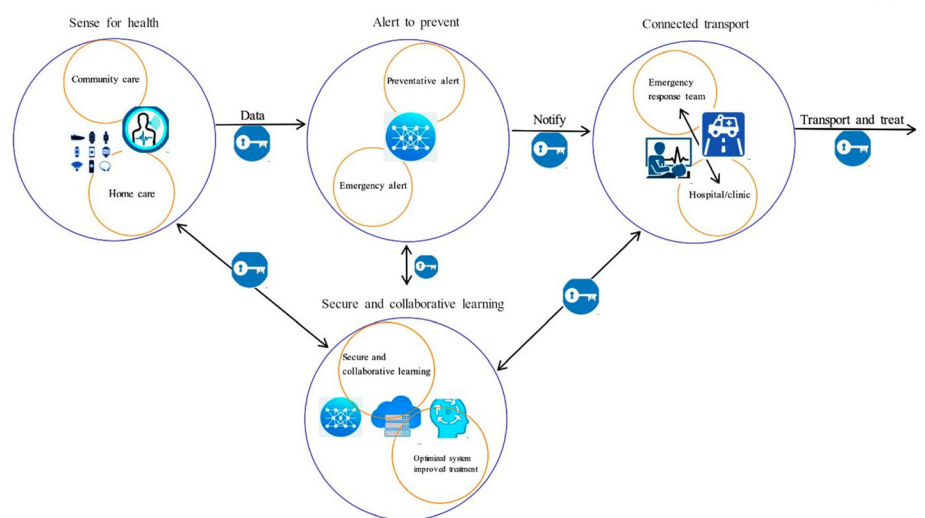
Health equity poses distinct challenges – especially in acute care situations and for remote population groups, where timely and cost-effective access to specialised and preventative care is often constrained. However, the widespread adoption of remote patient monitoring technologies (RPMT) remains constrained by the lack of interoperable platforms and trusted communication protocols that comply with data security regulations and enable large-scale data exchange.

Proposed solutions

To unlock the transformative potential of RPMT, it is crucial to ensure seamless, transparent and secure access to health data by patients, caregivers and practitioners. This is the ambition of PHRESH, which will develop a framework of sensors and wearables that work together to collect data on-demand, ensuring synchronisation. Data will then be pre-processed and correlated, enabling cross-referencing of various vital signs. This layer of devices will enhance data intelligence to improve the understanding of a patient's physiological state and facilitate personalised insights for home-based treatment. By incorporating artificial intelligence (AI) and advanced encryption techniques like homomorphic encryption, the framework will also ensure privacy and security. Notably, PHRESH will utilise a hybrid data model, integrating real patient data with context-aware synthetic data to enhance precision and efficacy. This approach recognises that data quality,

relevance and diversity are crucial to AI and machine learning-driven insights, making smart synthetic data a valuable addition to authentic, sensor-derived patient data.

15% improvement in patient outcome, measured as increased remote access, better prediction, and accelerated diagnosis and intervention. This will be underpinned by the project's technical advancements, including a processing speed reduction from five minutes to one minute for a gigabyte of data and a decision support processing time reduction from ten seconds to three seconds – all while remaining compliant with security standards and privacy regulations. At the societal level, this



Projected results and impact

With its disruptive technologies, PHRESH targets healthcare improvements from multiple angles. At the individual level, the integration of RPMT and advanced sensors will facilitate wider adoption of portable/wearable medical devices and next-generation networks, thereby overcoming geographic and socioeconomic barriers to healthcare. Treatment itself will then benefit from a focus on proactive monitoring, early detection and personalised care. Together, these are expected to yield a

streamlining of pre-hospital processes, emergency care and remote monitoring will contribute to more efficient healthcare delivery and resource allocation. At the same time, PHRESH will expand opportunities for healthcare providers, technology companies and startups in markets such as AI in healthcare, expected to grow from USD 15.1 billion in 2022 to nearly USD 188 billion by 2030. The project is thus positioned to make an important contribution to universal access to essential healthcare, irrespective of geography or socioeconomic status.



Project start
January 2025

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Project website
<https://itea4.org/project/phresh.html>

Project end
December 2027

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