ENHANCE-CSVD: Transforming Stroke and Dementia Prevention through Digital, Integrated Primary Care for People Living with Cerebral Small Vessel Disease

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BACKGROUND

- Cerebral small vessel disease (CSVD) is a leading cause of **dementia**, **stroke, neuropsychiatric symptoms**, and **mobility impairment**.
- Despite its prevalence, prevention and effective treatments remain limited.
- Key modifiable risk factors, including hypertension, physical inactivity, poor sleep, and high glucose levels remain inadequately addressed.
- CSVD care is centred in tertiary settings, with **no personalised home-based monitoring** for prevention currently available.
- Scalable **preventative solutions** in **primary care** are **needed**.

MAIN OBJECTIVE

- ENHANCE-CSVD proposes an innovative, **primary care-based platform** integrating wearable technologies and an **e-health interface**.
- By combining **clinical**, **neuroimaging**, **fluid**, and **digital biomarkers** that track **blood pressure**, **sleep**, **mobility**, **glucose**, **cognition** and **brain structural integrity**, ENHANCE-CSVD seeks to detect early signs of CSVD to help improve stroke and dementia prevention.
- A key aim is to assess the **feasibility**, **tolerability**, and **effectiveness** of remote monitoring of CSVD-related risk factors.

METHODOLOGY

- Planned as a **36-month** prospective, **multicentre cohort** study to recruit **350 participants** across six centres in **Switzerland**, **France**, **Italy**, and **Lithuania**.
- Participants will represent the entire clinical CSVD spectrum from **mild** to **severe**.
- Real-world clinical, cognitive, neuroimaging, and wearable-derived cross-sectional and longitudinal data will be collected to support CSVD monitoring.
- A **remote digital platform** will enable telemonitoring and personalised support for **modifiable risk factors** including hypertension, physical inactivity, poor sleep, and high glucose levels.

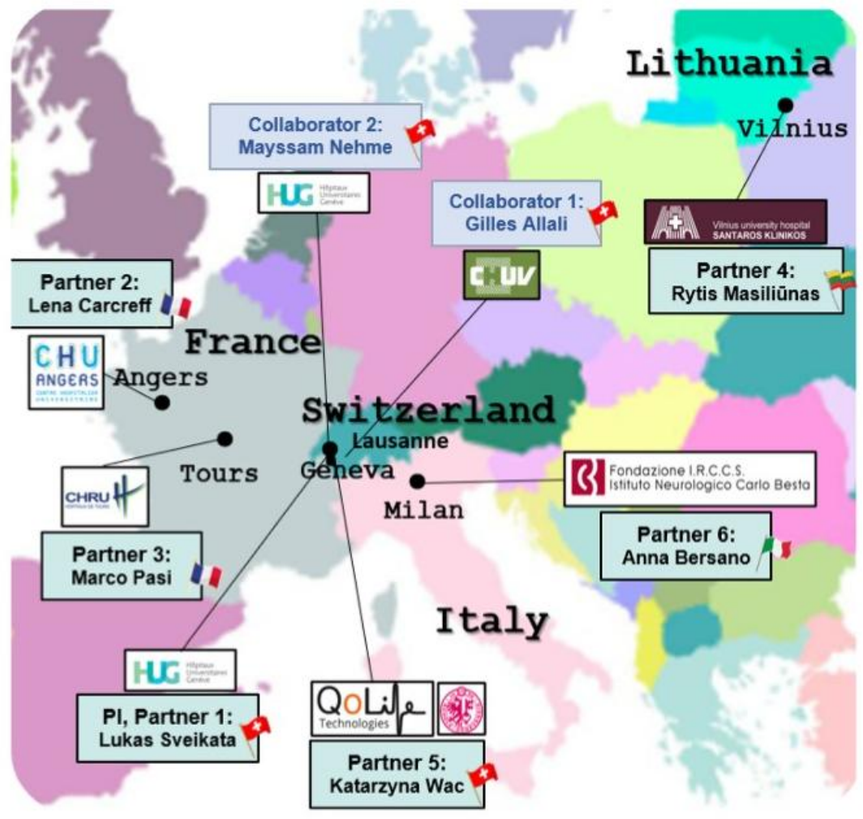


Figure 1. Overview of ENHANCE-CSVD consortium partners and collaborators including two centres in Switzerland, two in France, one in Italy, and one in Lithuania.

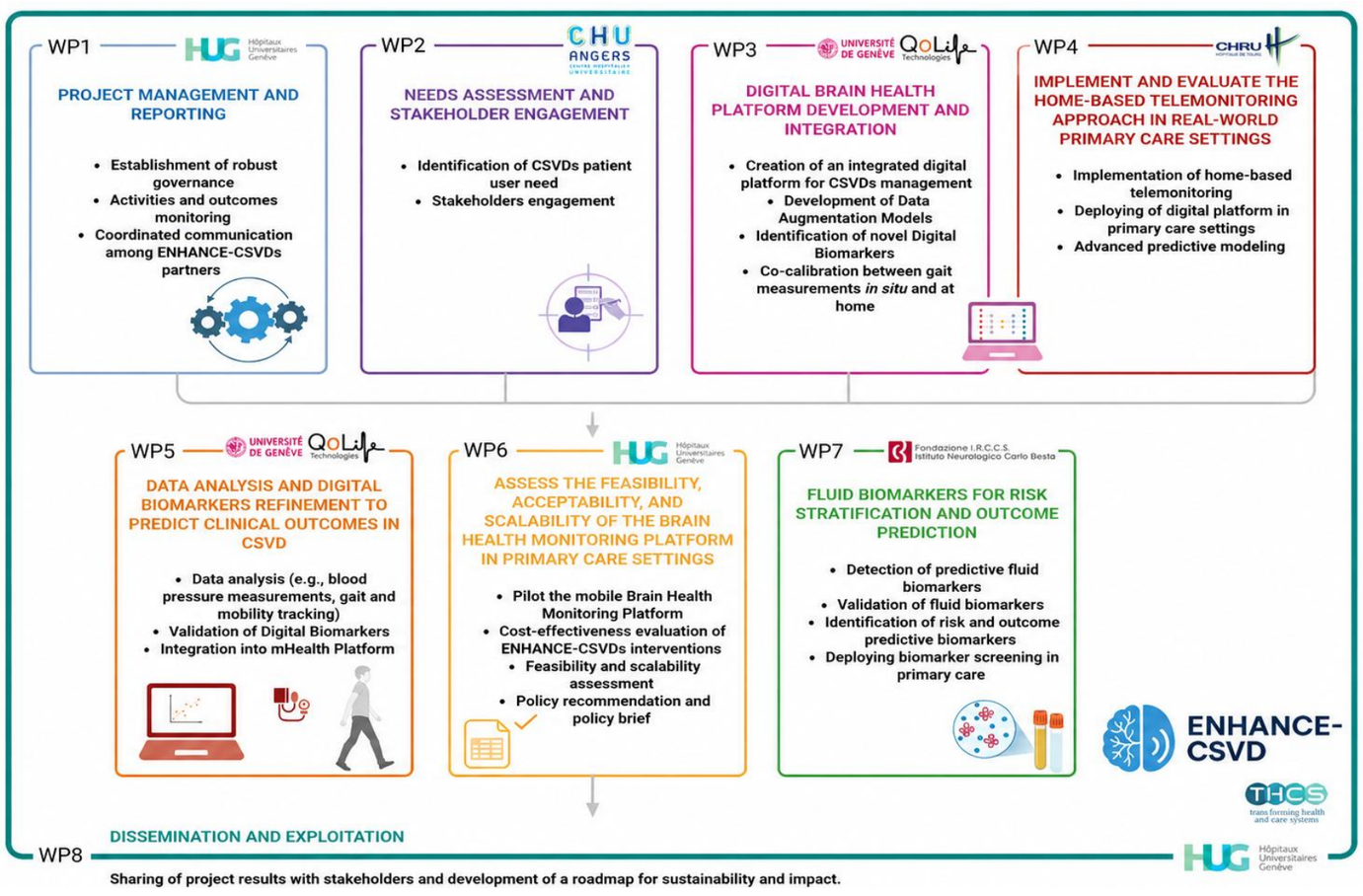


Figure 2. The ENHANCE-CSVD project comprises **eight synergistic work packages**, with the Geneva CSVD Lab leading project coordination and governance.

PARTICIPANT & STAKEHOLDER ENGAGEMENT

- Patient and stakeholder experiences will directly inform the development of the platform.
- **Patients**, **caregivers**, and **healthcare professionals** will participate in **focus groups** and **iterative co-design workshops** to identify user needs, acceptable monitoring burden, and meaningful outcomes.

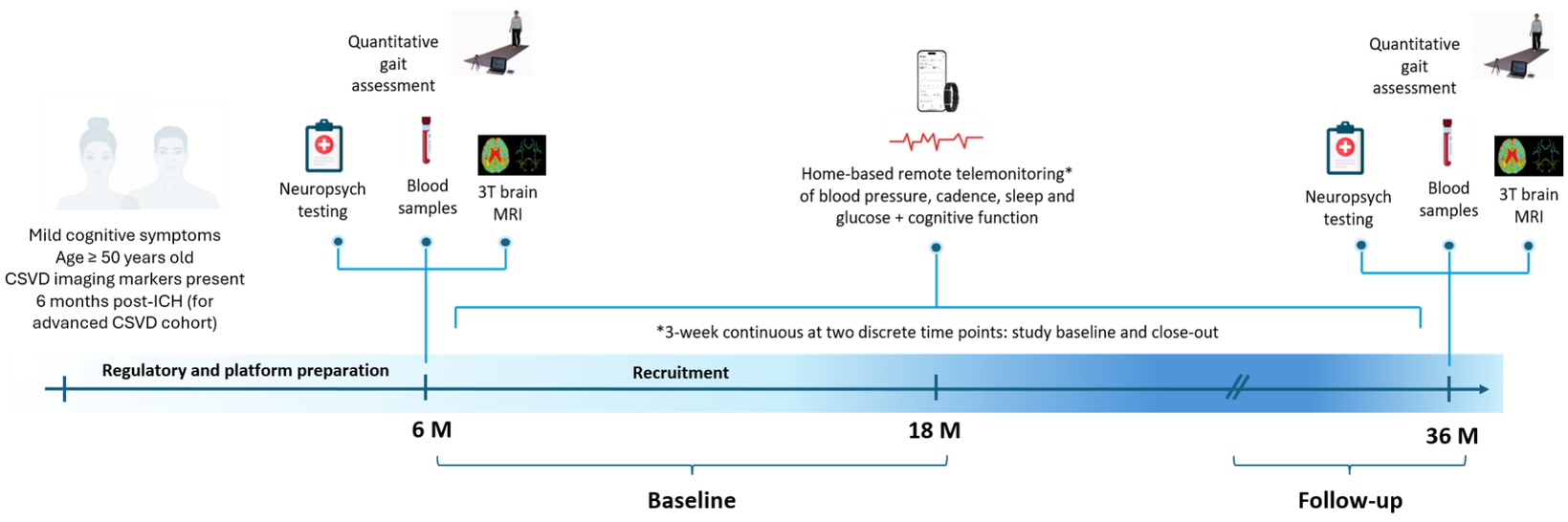


Figure 3. Study timeline over the planned 36-month period.

EXPECTED IMPACT

- Extend CSVD monitoring into patients' homes.
- By harmonising digital, clinical, neuroimaging, and fluid biomarker data across European centres, ENHANCE-CSVD will establish a foundation for more accessible, scalable, and personalised CSVD monitoring and **future interventions**.

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