

PESU-Ayushman Project

A PESU initiative towards advancing successful ageing in India through clinical research and AI innovations. Jointly led by PESU IMSR and Computer Science & Engineering.

Status: **Ongoing** · Funded by PES University · Project Started: 2025

<h2 style="margin: 0;">66</h2> <p style="margin: 0;">Validated Tests Across 4 health domains</p>	<h2 style="margin: 0;">4</h2> <p style="margin: 0;">Health Domains Physical · Cognitive · Biomarker · Mental</p>	<h2 style="margin: 0;">45–60</h2> <p style="margin: 0;">Target Age (years) Adults in their prime ageing window</p>	<h2 style="margin: 0;">CAI</h2> <p style="margin: 0;">(composite aging index)</p>
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About the Project

The PESU-Ayushman Project is a collaborative initiative between PESU Institute of Medical Sciences and Research (IMSR) and the Department of Computer Science and Engineering, PES University. It aims to develop and validate a scientifically rigorous, easy-to-use tool for assessing healthy ageing in the Indian population.

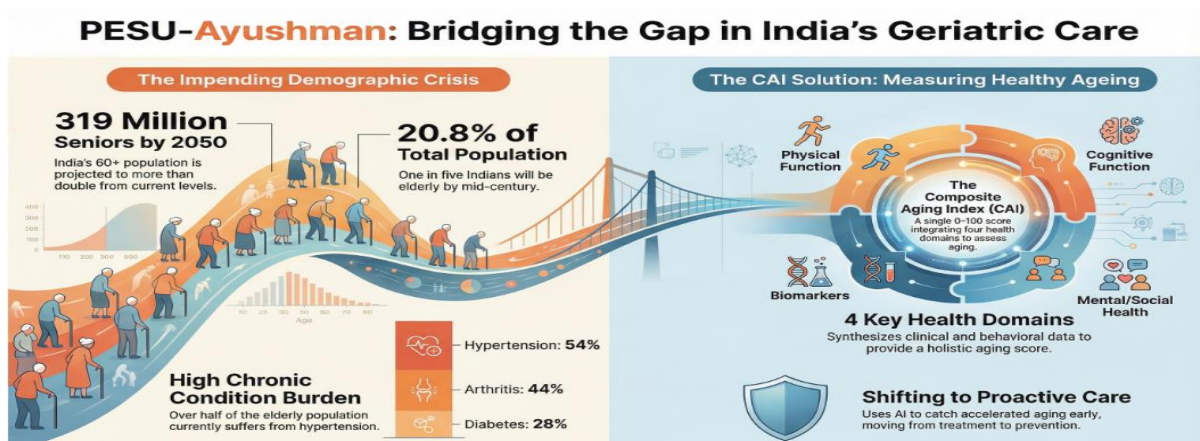
Mission: Advancing geriatric care with AI and innovations — bridging cutting-edge technology with clinical practice to make ageing measurable, predictable, and actionable.

At its core, the project has produced the Composite Aging Index (CAI) — a single score from 0 to 100 that brings together four key aspects of health: physical abilities, cognitive function, biological markers, and mental & social wellbeing. A higher score reflects better healthy ageing.

The CAI was developed on a large, nationally representative Indian ageing dataset and is currently being independently validated at PESU Medical College through a clinical study with adults aged 45–60 in Karnataka.

The Ageing Crisis in India

India stands at a demographic turning point. A rapidly expanding elderly population — combined with rising chronic disease burden and limited geriatric care infrastructure — makes this one of the most urgent public health challenges of our time.



Source: Census of India (2001, 2011); UN World Population Prospects 2022 (2021-2050 estimates)

Why This Study Matters

● Ageing Population Crisis	India has over 140 million people aged 60+, a number set to double by 2050. Healthcare systems must urgently adapt to this scale.
● No Holistic Indian Tool	No widely adopted, validated Indian tool currently integrates physical, cognitive, mental, and biological health into a single ageing measure.
● Regional Diversity	Ageing patterns and health baselines differ across India. Northern-developed tools must be validated for Southern populations before national deployment.
● Enabling Prevention	A composite score tracked over time lets clinicians catch accelerated ageing early — shifting focus from disease treatment to proactive care.
● AI-Powered Innovation	Combining clinical data with AI-driven analysis positions PESU at the forefront of translational geriatric research in India.

Project Phases

The project is structured across four phases — from scientific development through to real-world clinical deployment across India:

Phase	Title	Status	Description
Phase 1	Index Development	Completed	Built the Composite Aging Index (CAI) — a 0–100 score integrating physical, cognitive, biomarker, and mental health data — using a large nationally representative Indian ageing dataset.
Phase 2	Score Validation	Completed	Rigorous internal validation confirmed the CAI is accurate, consistent, and reliable — clearing it for independent clinical testing on new populations.
Phase 3	External Clinical Validation	Ongoing	Independent clinical study at PESU IMSR, Karnataka. Adults aged 45–60 undergo the full 66-item assessment battery to test the CAI's reliability in a South Indian population.
Phase 4	AI Integration & Deployment	Upcoming	AI-powered tools will automate scoring, flag high-risk individuals, and deliver personalised healthy ageing recommendations — making the CAI accessible at community and primary care level across India. Rapid AI-augmented diagnostic decision-support tools for ASHA workers

What the CAI Measures

The Composite Aging Index evaluates four distinct but complementary dimensions of health, giving a complete picture of how an individual is ageing:

Physical Function	How well a person moves and maintains independence — walking, climbing stairs, personal care, and household tasks.
Cognitive Function	Clarity of thought, memory, concentration, and reasoning — assessed through

Biomarkers	orientation, recall, and problem-solving tasks.
	Objective clinical measurements: body composition, blood pressure, grip strength, vision, blood sugar, and inflammation markers.
Mental & Social Health	Life satisfaction, social engagement, and emotional wellbeing — because healthy ageing is as much about fulfilment as physical health.

Collaborators & Partners

LASI Study Team	Primary data source and methodological partner; joint publications planned
University of Pennsylvania	Research advisor — Dr Sumedha Chhatre

Publications:

1. The AgeWell Index: An RF-Seeded Adaptive Genetic Algorithm for Explainable Aging Assessment in Mid-Life Adults – Doi: 10.1109/IITCEE67948.2026.11394091.
2. “Unsupervised Learning for Successful Ageing: Integrating PCA And Autoencoders in the Construction of a Multi-Domain Composite ageing index”, presented at the 10th International Conference on Information System Design and Intelligent Applications (ISDIA-2026) Organized by University of Wollongong in Dubai

Meet the Team



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