ApoBcomp: An R Shiny Framework for Apolipoprotein B Estimation and Cardiovascular Risk Modeling

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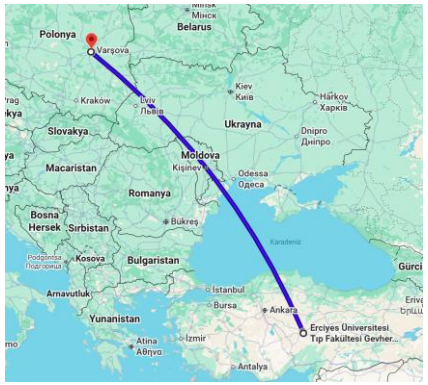
Precision Medicine and Advanced Analytics Research Group

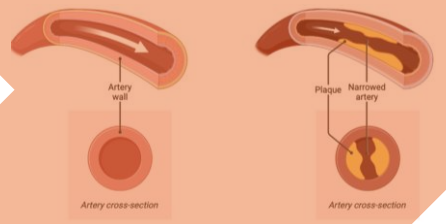


Hidden Risk & The Literature Gap

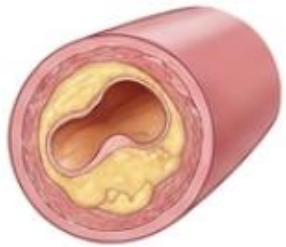
- Cardiovascular disease (CVD) remains the leading cause of morbidity and mortality worldwide.

Residual risk

CVD Risk



LDL-c



ApoB

- Superior Risk Prediction
- Guidelines Endorsed
- Measurement Limitations

No integrated framework for estimation and interpretation.

ApoBcomp: An Integrated R/Shiny

ApoBcomp About Data Upload Estimate Manual

ApoBcomp

An interactive and comprehensive web-based tool that designed to estimate Apolipoprotein B (ApoB) levels and performs cardiovascular risk assessment.

Apolipoprotein B (ApoB)

ApoB is an important marker that indicates the number of harmful lipoproteins carrying cholesterol. Also, it is a strong indicator to assess cardiovascular risk, guide lipid-lowering therapy, and monitor long-term outcomes.

Why ApoBcomp Was Developed?

ApoBcomp provides fast and reliable ApoB estimations to help clinicians, healthcare professionals and researchers for better decision-making and research.

Advanced Methodology

- **Dual Usage Mode:** Single patient data entry & Batch data upload options
- **Comprehensive Analysis:** 17 Equation Methods & 11 Machine Learning Models
- **Dual Output:** ApoB Levels Estimation & Cardiovascular Risk Score
- **Instant Results:** Immediate Estimation and Risk Assessment

Comprehensive Risk Assessment

Our estimation system is based on recommendations from two internationally accepted guidelines:

- 2019 ESC/EAS Dyslipidemia Guidelines
- 2017 AACE/ACE Lipid and Atherosclerosis Guidelines

Our model selection and validation process have been conducted in accordance with the scientific standards of these guidelines.

Technical Excellence & Reliability

The application offers an easy-to-use interface with sections for data input, method selection, and downloadable reports. Real-time server-side calculations are powered by R with ShinyProxy, OpenOnDemand, and Redis supporting multi-user sessions. Stability and reproducibility are ensured through shinytest and unit testing.

Privacy and Security

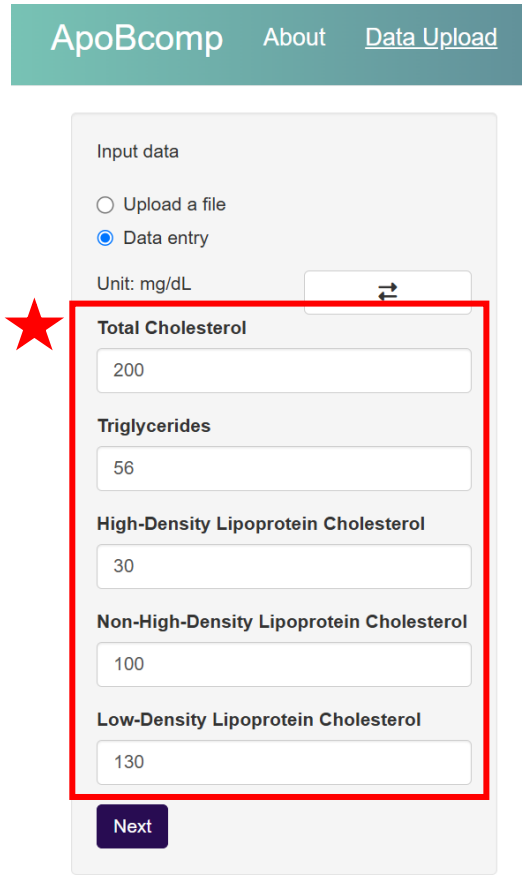
Your privacy and data security are fully protected. All data is processed locally, never stored or shared, giving you a safe and confidential ApoBcomp assessment.

Contact & Feedback

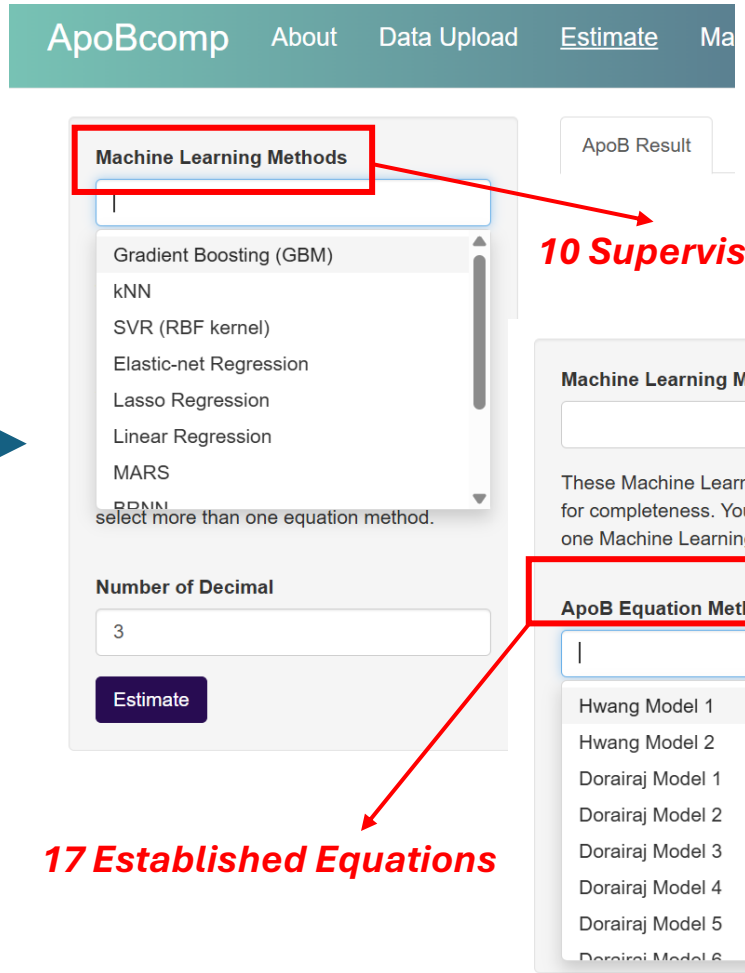
Your cardiovascular health is our priority, and we are committed to supporting informed decisions with advanced tools.

Hidden Risk & The Literature Gap

Inputs

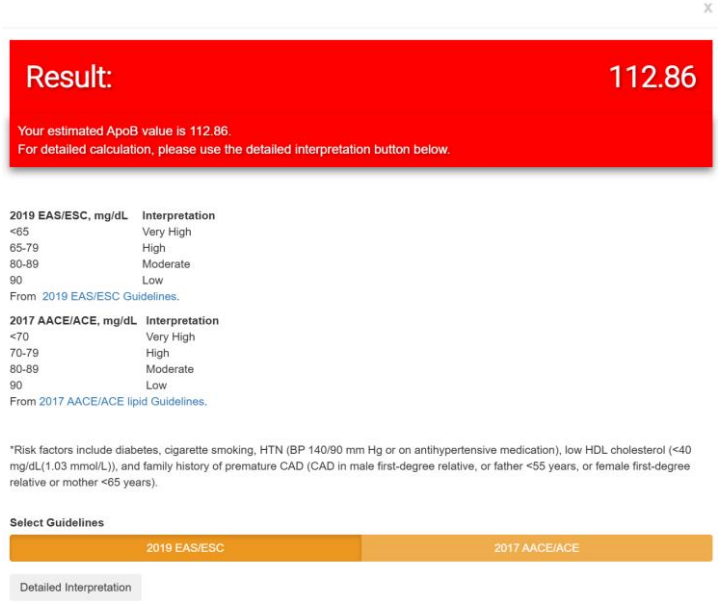


Engine



Outputs

Real-time computation & reproducible reporting



Guideline-aligned clinical risk categories for actionable insights

Validation: Grid-search optimization, repeated CV, external validation

Architecture, Stability & Scale

★ ***Real-time server-side computation***

Scaling & Queueing

ShinyProxy → **Redis** → **OpenOnDemond**

★ ***Multi-user session management & task queuing***

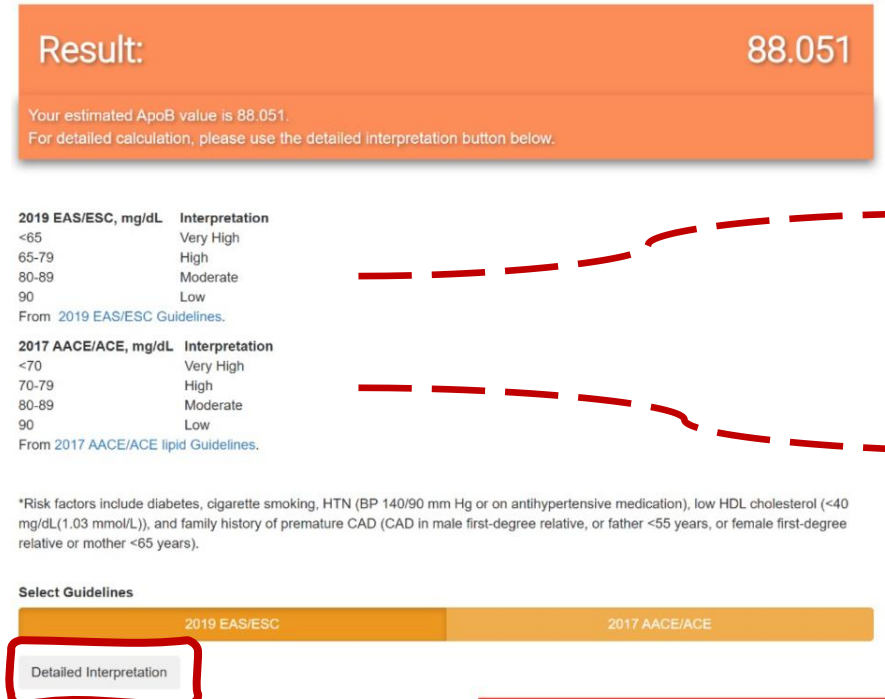
CI/CD & Reliability

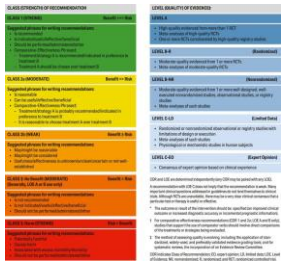
shinytest

★ ***Strictly verified via unit testing***

Clinical Impact & Try It Yourself

Guideline-aligned clinical risk categories for actionable insights





https://biotools.erciyes.edu.tr/ApoBcomp/

Data-Driven Clinical Decisions

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