

DigiMed Bayern – Scientific and medical résumé

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Bayerisches Staatsministerium für
Gesundheit und Pflege

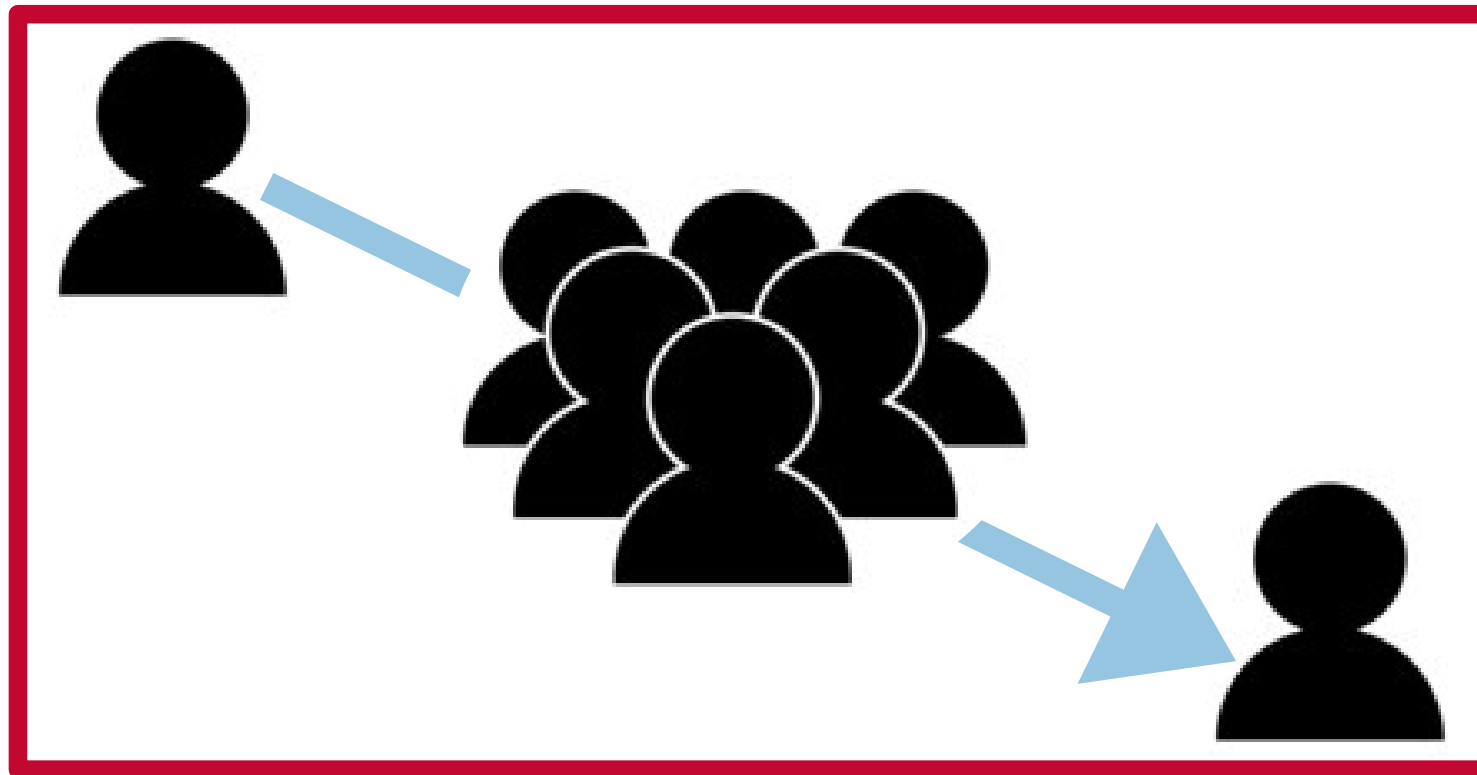


TUM
Technische Universität München



Deutsches Herzzentrum München
des Freistaates Bayern
Klinik a. d. Technischen Universität München

**personalised, preventive, predictive, participatory medicine
fighting atherosclerosis**



DigiMed Bayern – Aim

Developing applications and transferable infrastructures to improve patient care in coronary artery disease and stroke



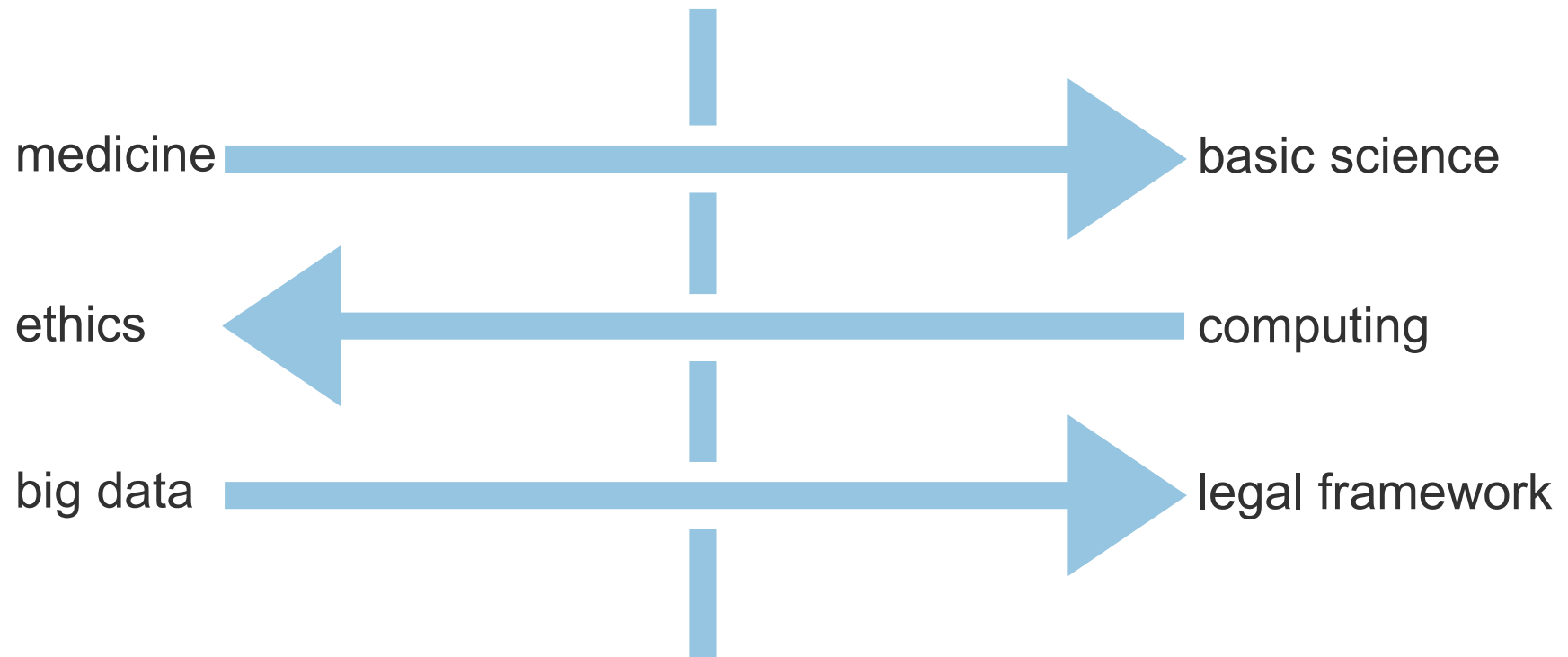
MAX-PLANCK-GESellschaft



HelmholtzZentrum münchen
Deutsches Forschungszentrum für Gesundheit und Umwelt



A highly productive collaboration crossing borders



A highly productive collaboration crossing borders

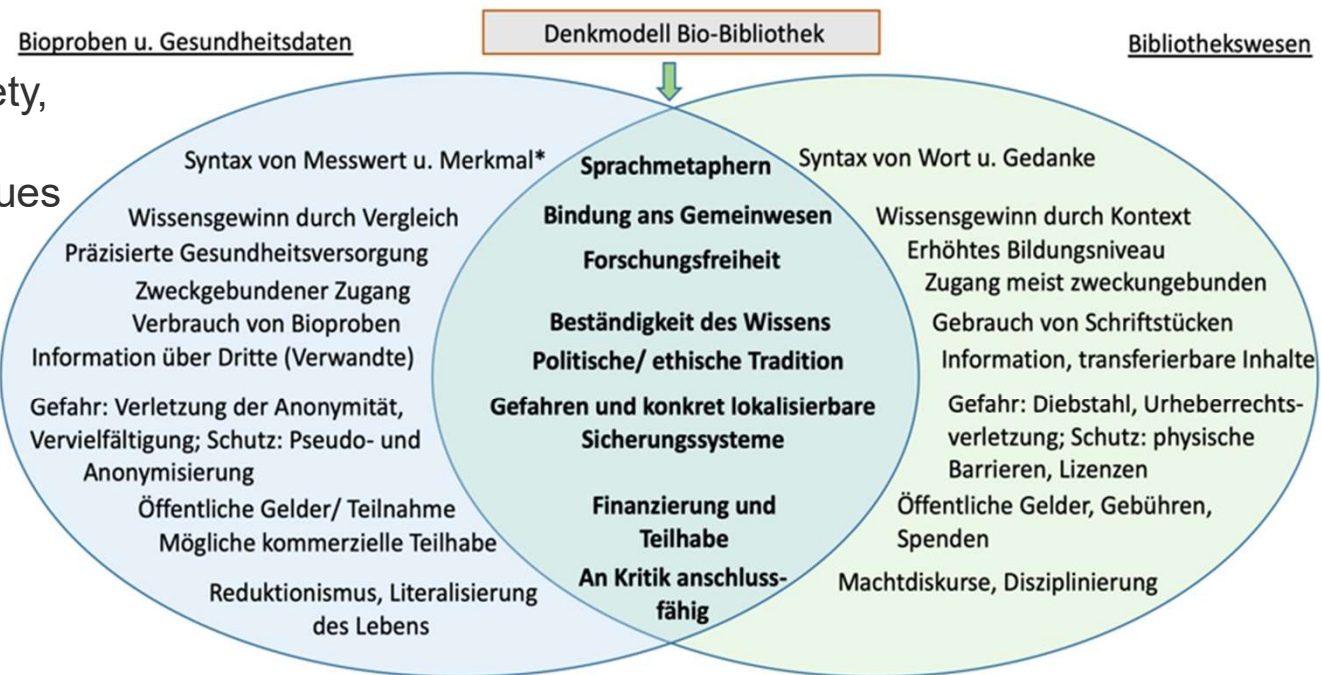


Data safety,
Ethical,
Legal issues

A highly productive collaboration crossing borders



Data safety,
Ethical,
Legal issues



DSGVO: Interessenskonflikte zwischen
Datenschützern, Patienten und Teilnehmern, Forschern
Begleitnarrativ: „Disruption“ und Hype

A highly productive collaboration crossing borders

Data safety,
Ethical,
Legal issues

Individual consent
Ethical consent
Legal consent
Societal consent

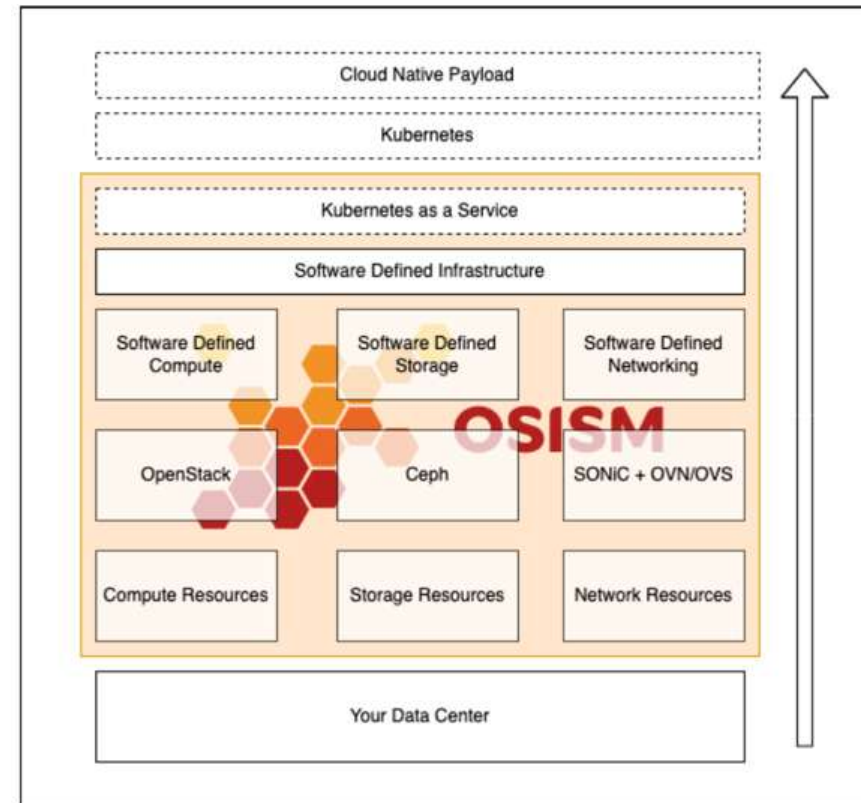
(MongoDB & SQL)

Health Cloud

Infrastructure – DigiMed Cloud



- Open-stack based
- Centralized digital platform
- Secure GDPR compliant data access
- Personalized dashboards
- Algorithm based analytical tools including ML

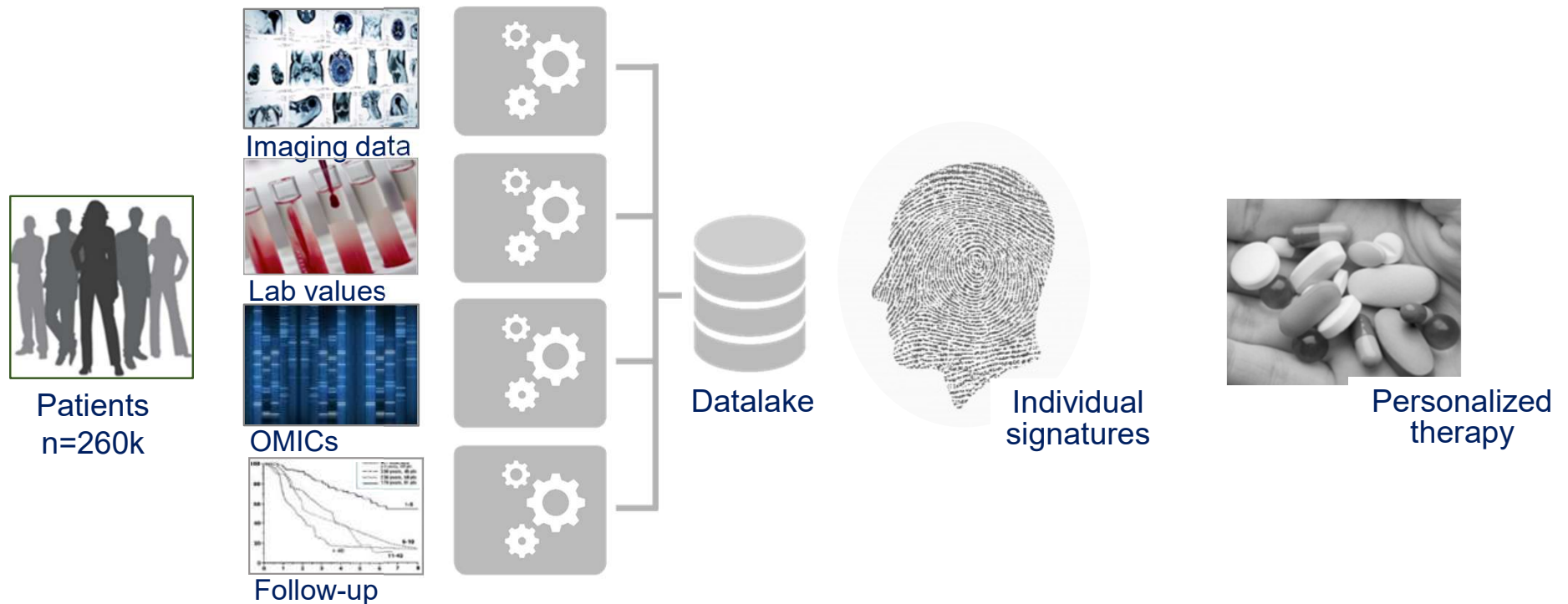


2 PB storage, GPU/CPU on demand

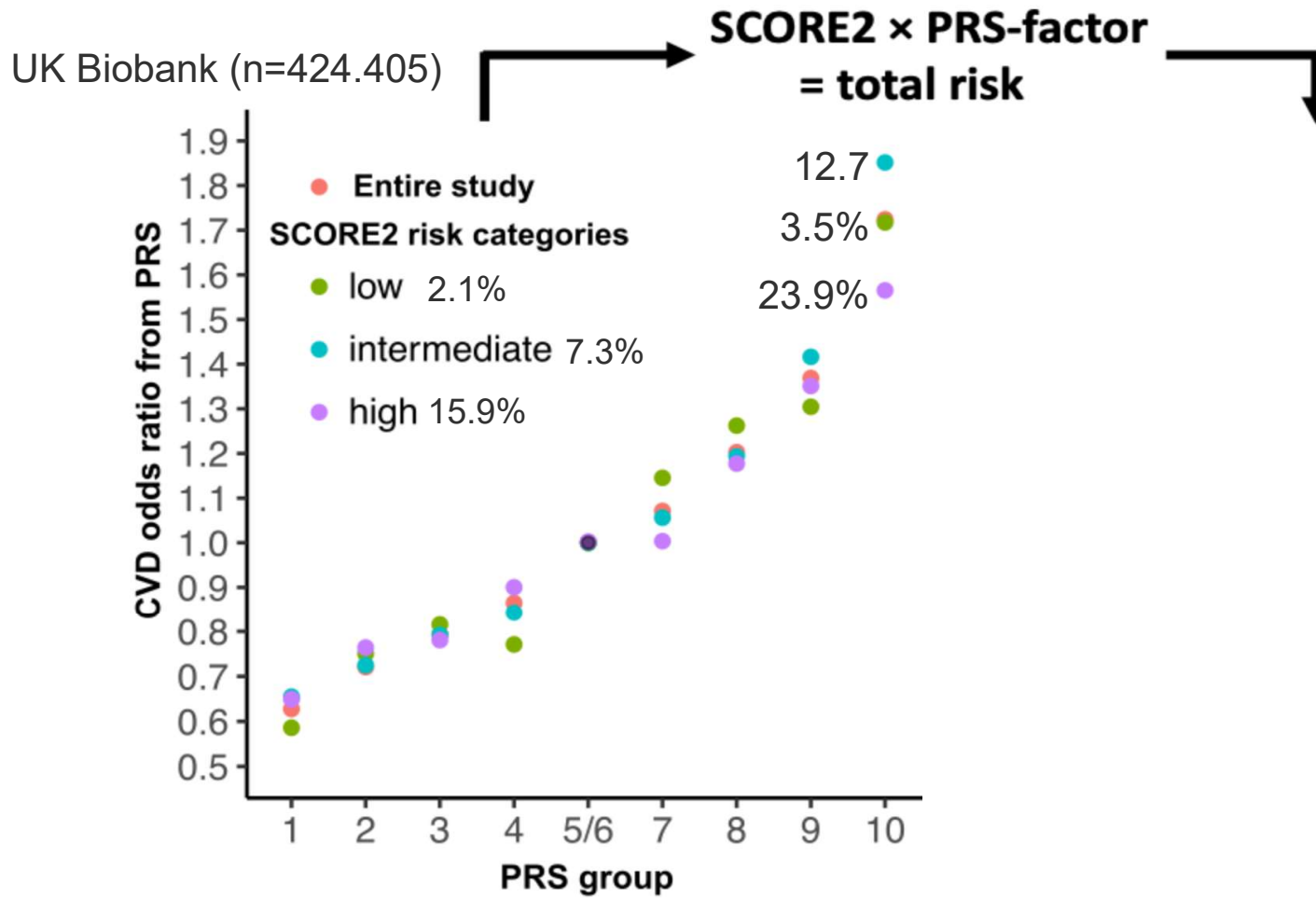
DigiMed Bayern – Résumé



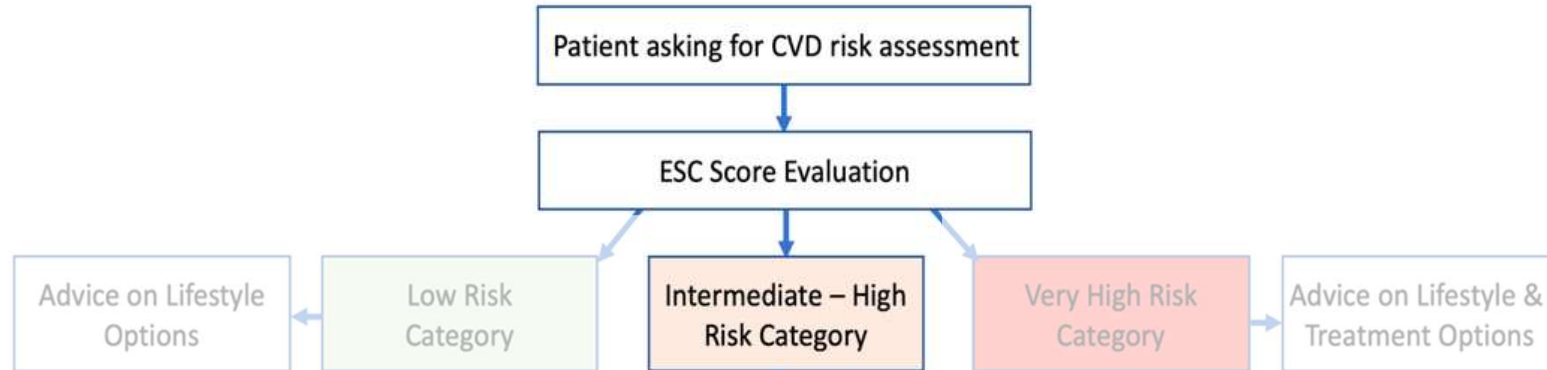
Understanding atherosclerosis through digital integral consideration of individual patient profiles



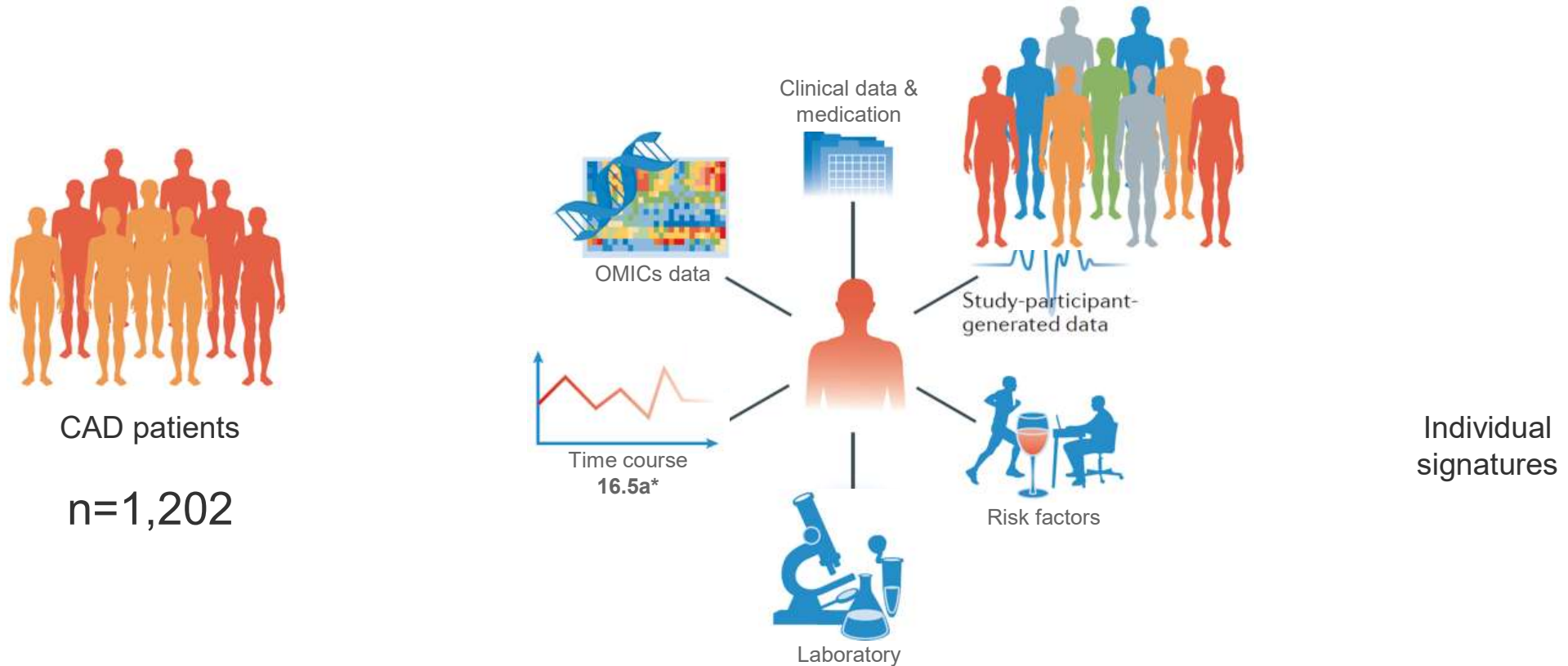
DigiMed Bayern – Résumé



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PRECAD Cohort – MultiOmics in CAD



*comprising: CV-outcomes, risk factors, personal data, medication etc.

Biomarkers of Aging Challenge Phase 2 - Mortality Prediction

Principle

- Participating teams from all over the world
- Training data had to be obtained by oneself

EVALUATION

C-Index on left-out dataset

- Ours: 0.8442
- Best-existing method: 0.8216

VALIDATION

Our positive top-3 proteins are known mortality-associated proteins

- NEFL¹, GDF15², CST3³

¹ Ciardullo S, Muraca E, Bianconi E, et al. Serum neurofilament light chain levels are associated with all-cause mortality in the general US population. *J Neurol*. 2023;270(8):3830-3838. doi:10.1007/s00415-023-11739-6

² Bao X, Borné Y, Xu B, et al. Growth differentiation factor-15 is a biomarker for all-cause mortality but less evident for cardiovascular outcomes: A prospective study. *Am Heart J*. 2021;234:81-89. doi:10.1016/j.ahj.2020.12.020

³ Shlipak MG, Wassel Fyr CL, Chertow GM, et al. Cystatin C and mortality risk in the elderly: the health, aging, and body composition study. *J Am Soc Nephrol*. 2006;17(1):254-261. doi:10.1681/ASN.2005050545

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Moritz von Scheidt:



Home Für Betroffene ▾ Für Ärzte & Forscher ▾



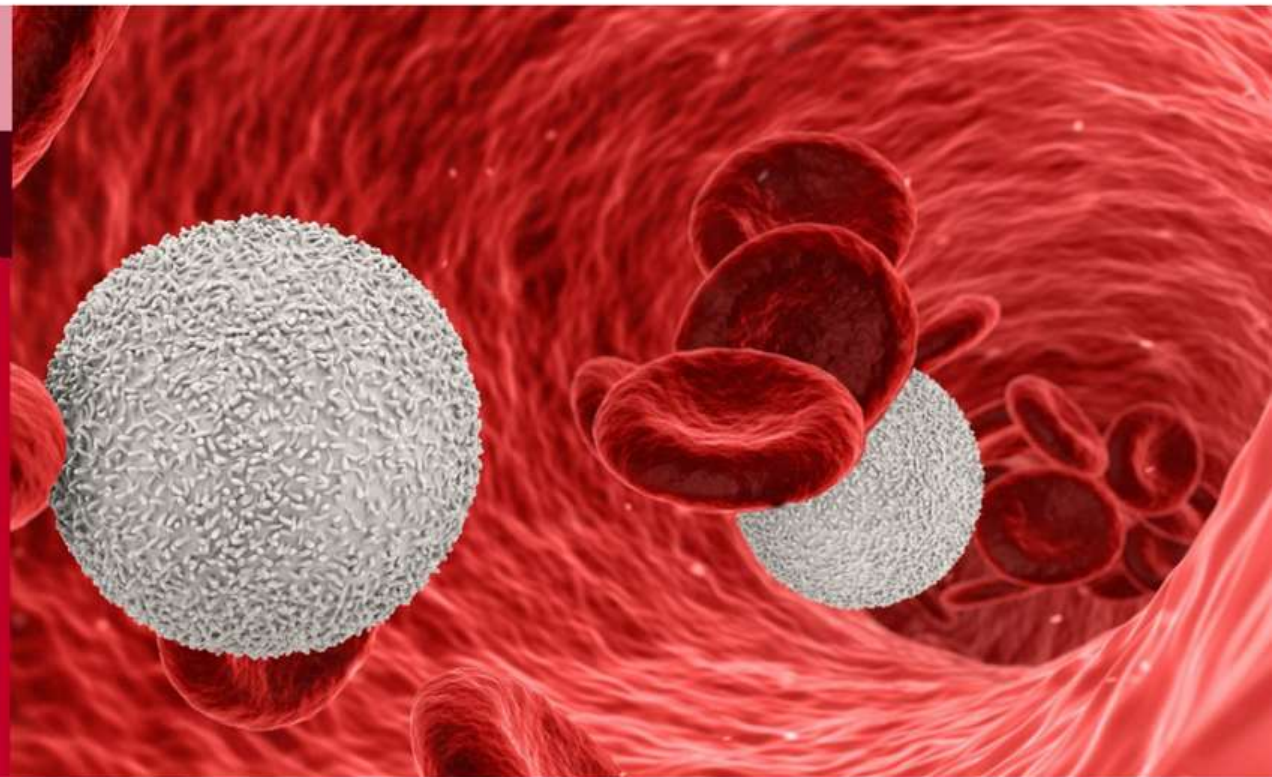
Anmeldung

Herzlich Willkommen

Deutsches CHIP Register e.V.

Alle Informationen für Betroffene, Ärzte und Wissenschaftler.
Erfassung longitudinaler Daten zum Verlauf von CHIP.
Einfache Anmeldung und individuelle Betreuung.

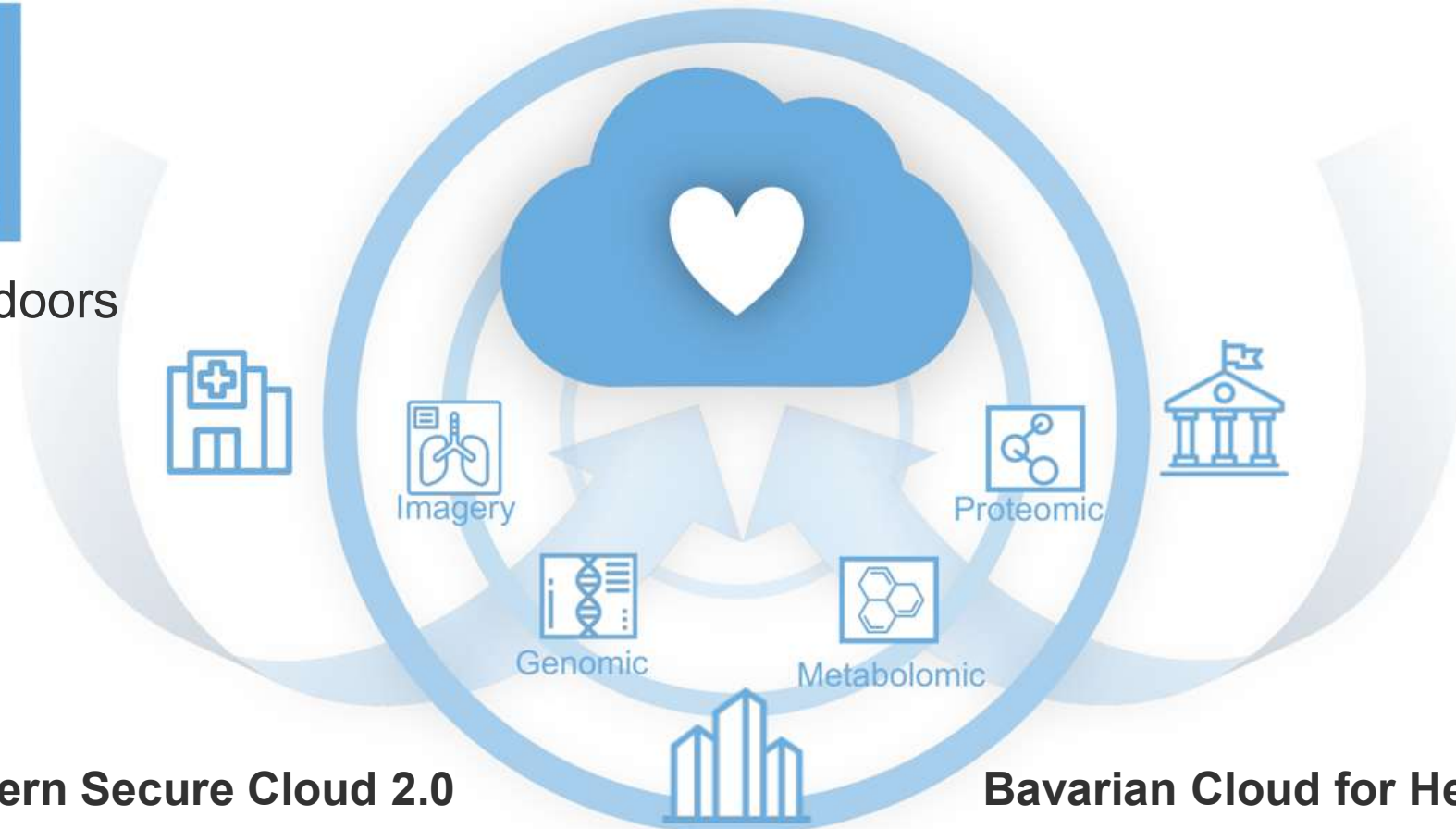
Mehr erfahren



Infrastructure – DigiMed Cloud



Opened the doors



DigiMed Bayern Secure Cloud 2.0

Bavarian Cloud for Health Research



Bayerisches Staatsministerium für
Gesundheit und Pflege

Bayerisches Staatsministerium für
Wissenschaft und Kunst



personalised, preventive

> 500 pediatricians



> 28.000 children screened



> 1000 children LDL >130 mg/dl



252 children with FH mutation



personalised, preventive



DGK.

Deutsche Gesellschaft für Kardiologie
German Cardiac Society



Bundesministerium
für Gesundheit



Deutsche
Herzstiftung

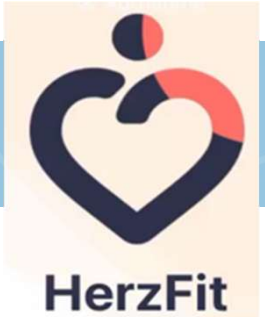
1. Verbesserung der Früherkennung bei Kindern und Jugendlichen

- Einführung eines Lipid-Screenings (mit Fokus auf Familiäre Hypercholesterinämie) bei der Früherkennungsuntersuchung U9 (mit anschließendem Kaskadenscreening von Familienangehörigen)
→ Festlegung der Untersuchungsinhalte durch die medizinischen Fachgesellschaften

Gesetzentwurf - Kabinettsbeschluss

Früherkennung und Versorgung von Herz-Kreislauf-Erkrankungen

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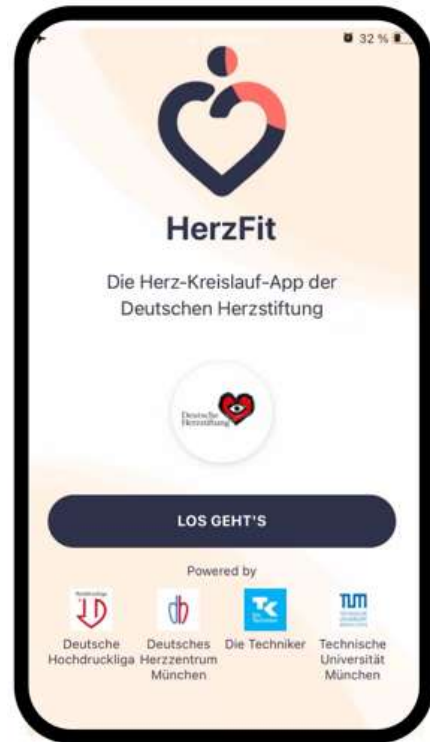


Herzinfarkt-Risiko-Test

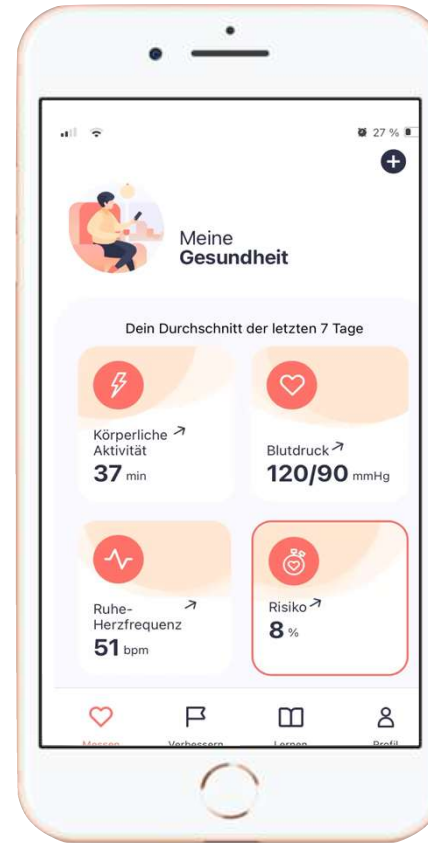


>30.000 clicks/month

HerzFit App – Personalized companion

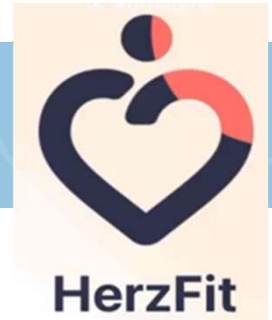


>200.000 downloads

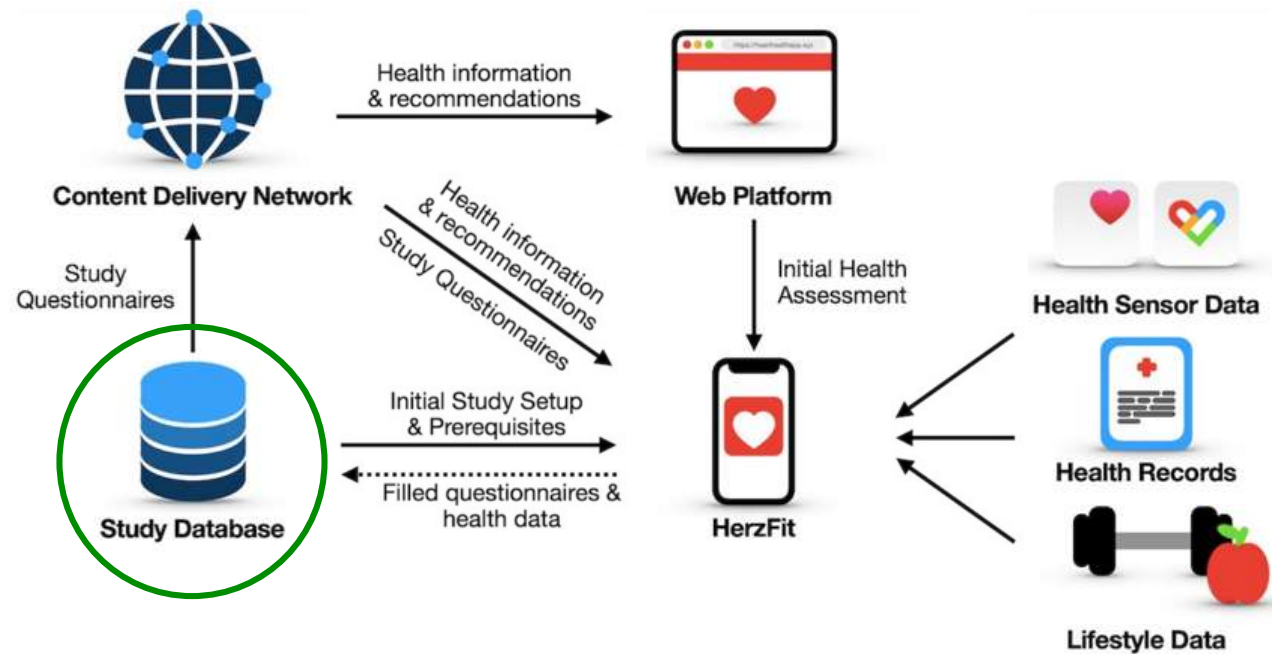
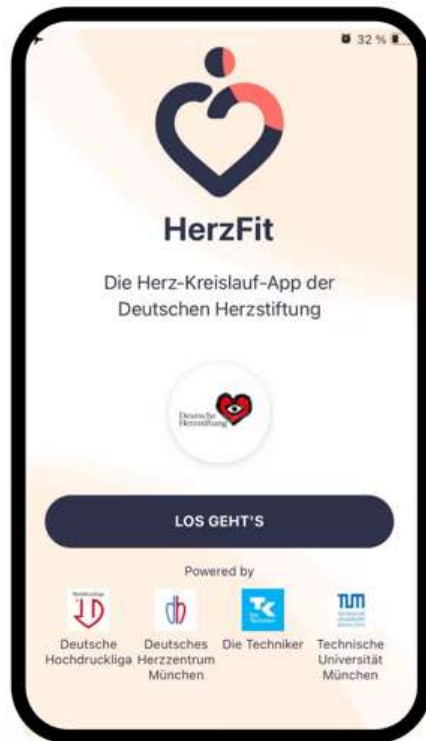


Deutsche Herzstiftung





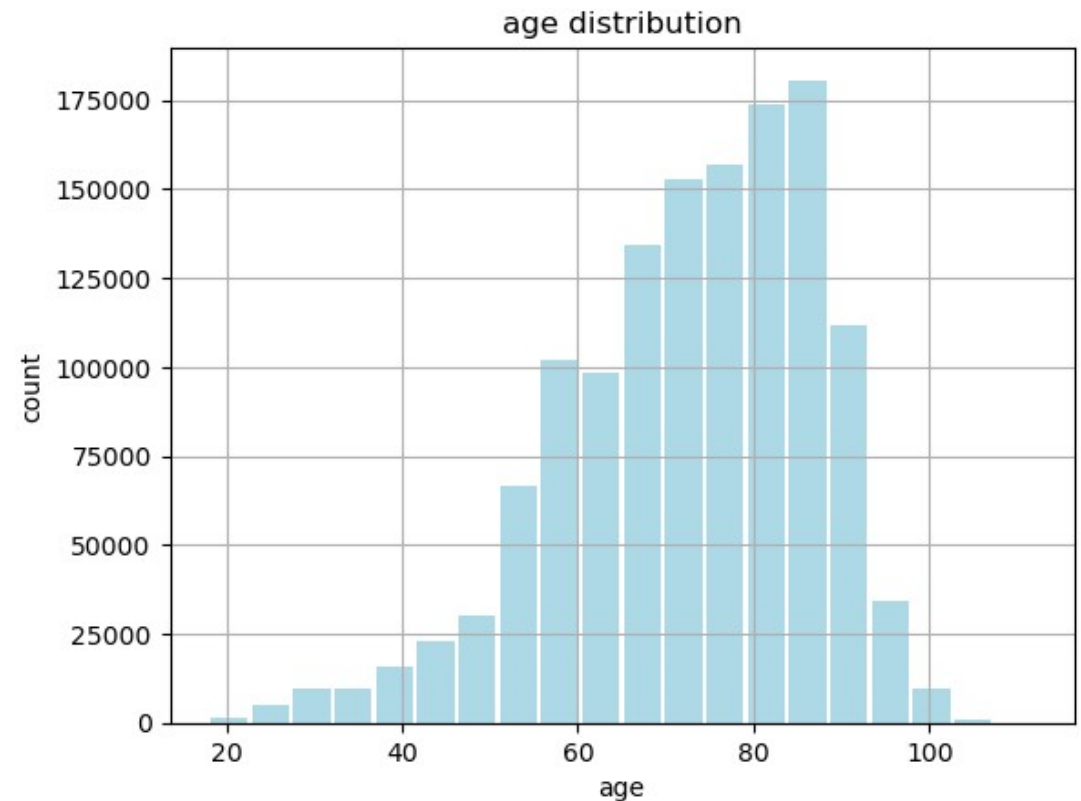
predictive, participatory



➤ Personalized long-term risk assessment
motivating companion and research tool



- Individuals with atherosclerosis (n = 6 mio, sex distribution 1:1)
- Follow-Up period 2012-2021
- CV-relevant data (demographics, ICD10, OPS, medication, ...)



Health insurance (big) data



The NEW ENGLAND JOURNAL of MEDICINE

ORIGINAL ARTICLE

Ticagrelor or Prasugrel in Patients with Acute Coronary Syndromes

BACKGROUND

The relative merits of ticagrelor as compared with prasugrel in patients with acute coronary syndromes for whom invasive evaluation is planned are uncertain.

METHODS

In this multicenter, randomized, open-label trial, we randomly assigned patients who presented with acute coronary syndromes and for whom invasive evaluation was planned to receive either ticagrelor or prasugrel. The primary end point was the composite of death, myocardial infarction, or stroke at 1 year. A major secondary end point (the safety end point) was bleeding.

RESULTS

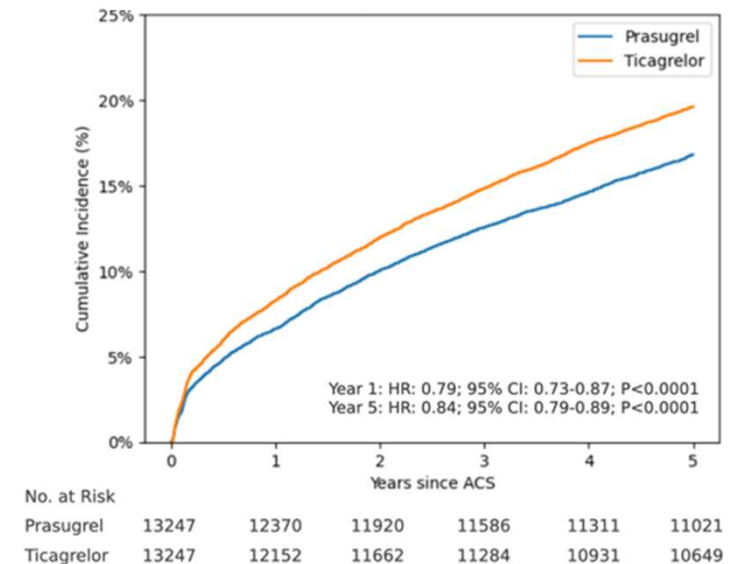
A total of 4018 patients underwent randomization. A primary end-point event occurred in 184 of 2012 patients (9.3%) in the ticagrelor group and in 137 of 2006 patients (6.9%) in the prasugrel group (hazard ratio, 1.36; 95% confidence interval [CI], 1.09 to 1.70; $P=0.006$). The respective incidences of the individual compo-

- **Prasugrel was superior to ticagrelor in ACS patients to prevent MACE within 1 year.**

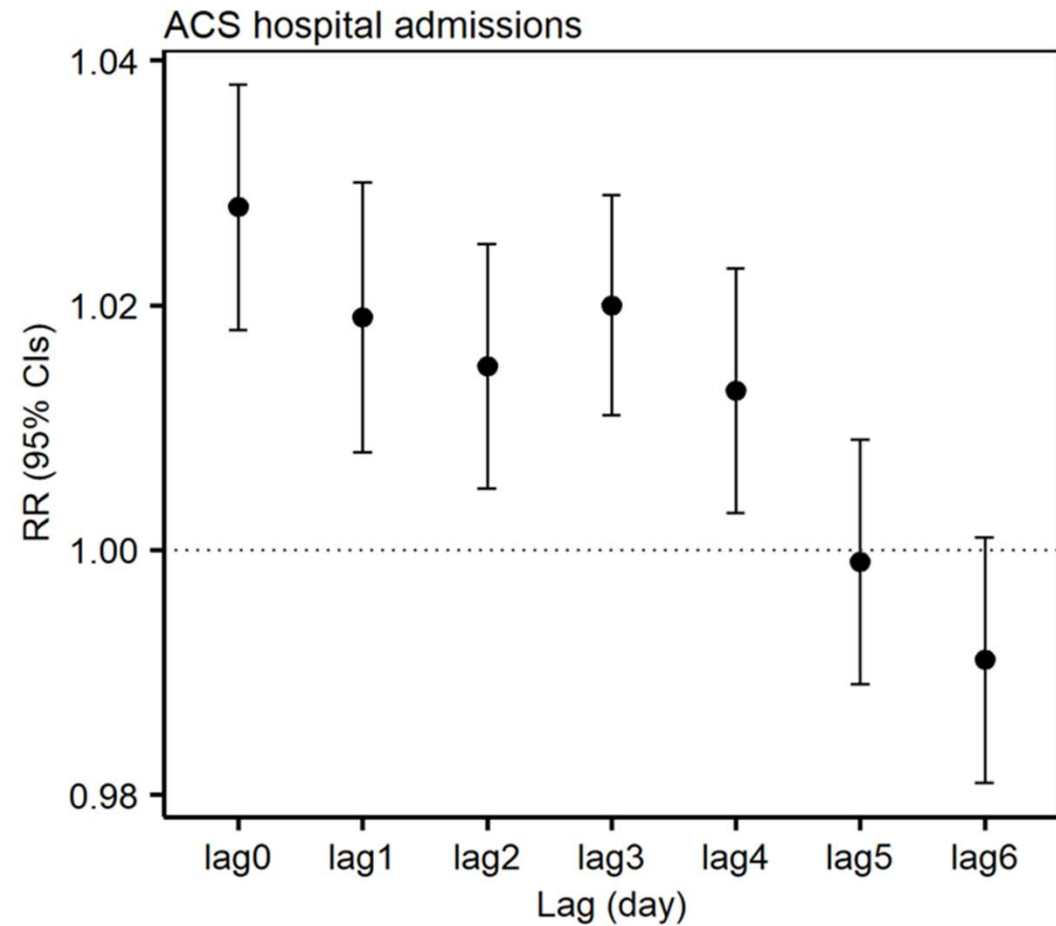
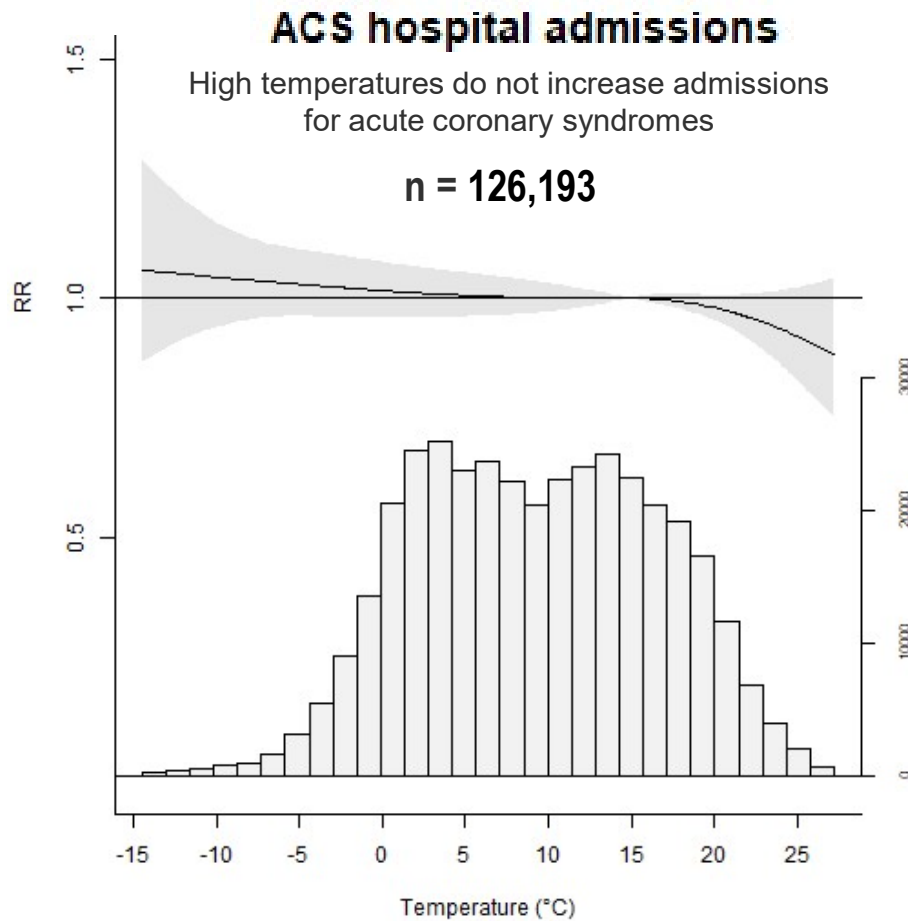
37k ACS patients → 26k after propensity matching

	Ticagrelor	Prasugrel
Average Age	61.57 ± 11.19	61.93 ± 10.30
Male	10259 (75.60%)	10182 (75.03%)
Female	3311 (24.40%)	3388 (24.97%)

(MI, stroke, death)



Health insurance data on 1.3 Mio. patients followed for 9 years

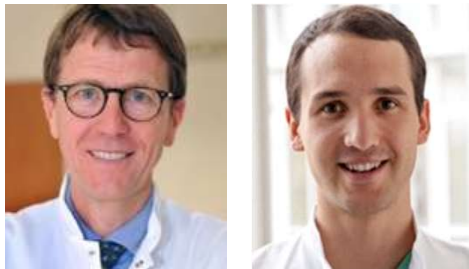


- Comprehensive (multiomics) data sets for **personalised, preventive, predictive, participatory medicine** have been generated
- Technological, ethical, legal and social **challenges of P4 medicine** have been addressed.
- Research and public tools for P4 medicine of **atherosclerosis** have been generated.
- German laws for prevention have been inspired.
- Insights and structures have been created within the health system, in particular, an exemplary and **transferable integrated digital infrastructure for health care data** (BCHR).

DigiMed Bayern – Project board



Scientific lead (DHM)



Non-profit Management (BioM)



The Bavarian State Ministry of Health and Care supports *DigiMed Bayern* with 25 million euros to fight atherosclerosis (2019-2024).



Bayerisches Staatsministerium für
Gesundheit und Pflege



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