Applications of More Personalized Medicine in 2019

Folkert W. Asselbergs

UMC Utrecht

BigData@Heart
Big Data for Better Hearts

Healthcare Data Flow

Originators

EHR Software

Integrated Systems

MEDITECH · Allscripts · Epic · Cerner · athenahealth

Best of Breed

Distribution

CardinalHealth · McKESSON · AmerisourceBergen

Pharmacies

Retail · *Specialty*

Claims Clearinghouses

Labs

Standard · *Genomics*

LabCorp · GRAIL

Wearables

verily · SAMSUNG · AliveCor · fitbit · NOKIA

Information Exchanges

ICAD · apigee · PHILIPS

Enterprise Data Warehousing

Inovalon · virtusa · Infosys · Palantir · accenture

Government Entities

FDA · CMS.gov · CDC

Socioeconomic and Behavioral Data

First Data. · acxiom. · mastercard · LexisNexis · experian. · LiveRamp · IRI

Use Cases

Services for Providers

Revenue Cycle Management · *Patient Engagement* · *Decision Support* · *Pharmacy*

vices for Risk-Bearing Entities

Care and Risk Sharing · *Pricing / Actuarial Analysis* · *Digital Therapeutics*

vices for Biopharmaceuticals

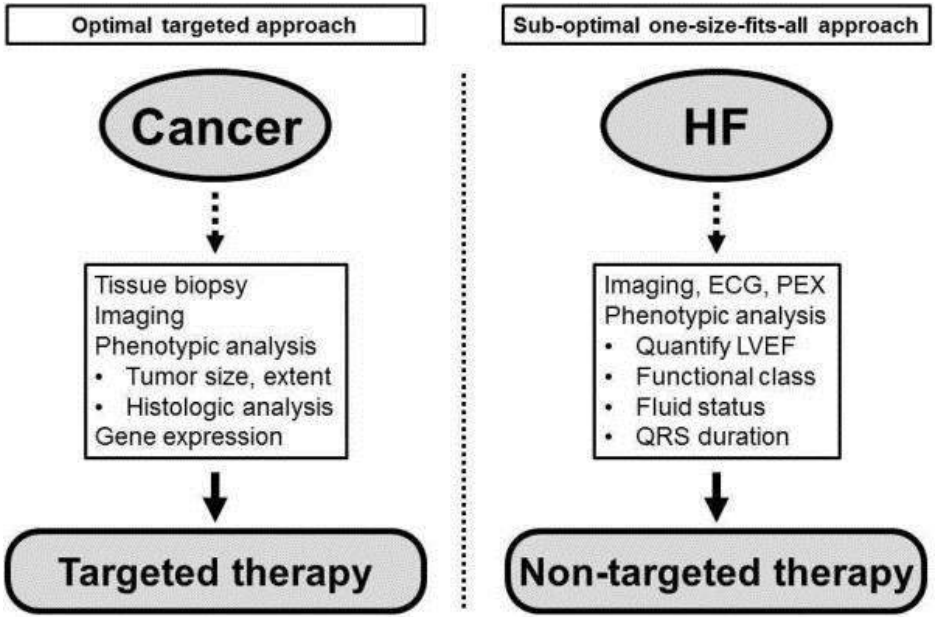
d Evidence · *HEOR* · *Commercial Development* · *Pharmaco-vigilance*

IQVIA · OEvidera · PPD · ICON · PAREXEL

Professional Services Firms

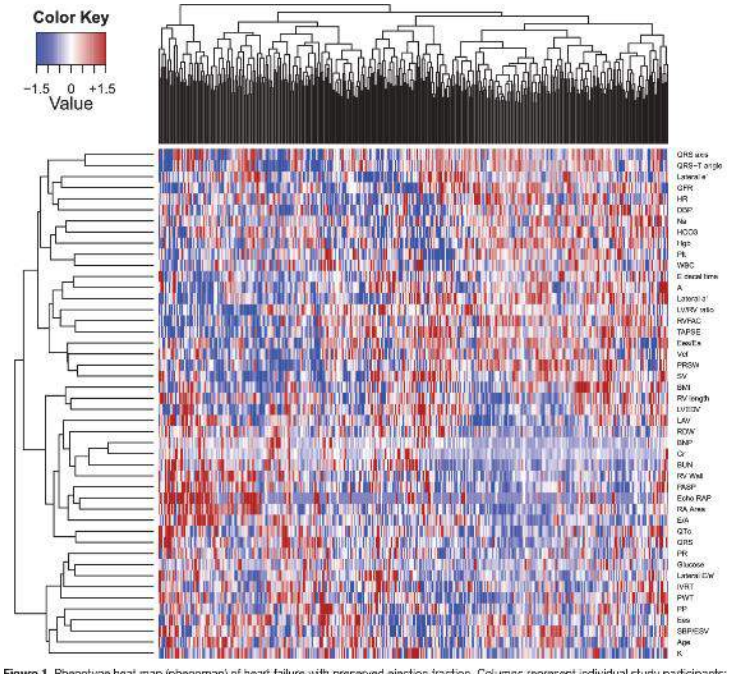
DATAVANT

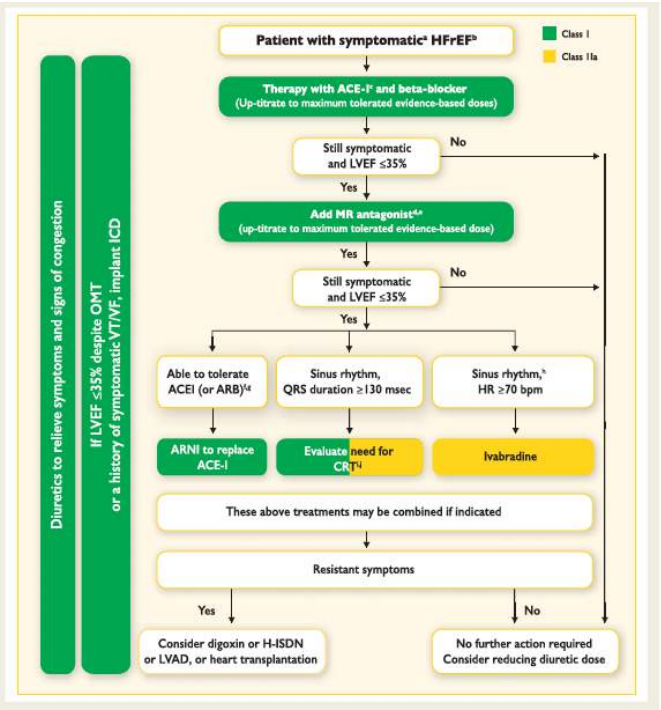
Personalized medicine in Cardiology in 2019



Shah et al, J of Card Translational Research 2017

One-size fits all?





Circulation. 2015;131:269-279

FOUNDATION MEDICINE

GENOMIC TESTING | INSIGHTS & TRIALS | PARTNERSHIPS | PA

FOUNDATION FACTS

>300k patients profiled

>30 biopharma partners

>300 publications

The Relentless Pursuit of Better Insights

WE NEVER GIVE UP. We strive to do more for cancer patients - through richer science, deeper insights, and stronger partnerships - providing better cancer care today, and fueling better cancer care tomorrow.

2

MOLECULAR INSIGHTS

Valuable Insights, Actionable Options

We help match each patient's unique genomic profile to known targeted therapies, immunotherapies and clinical trials and offer decision support services, financial assistance, and technology solutions to help streamline patient care.

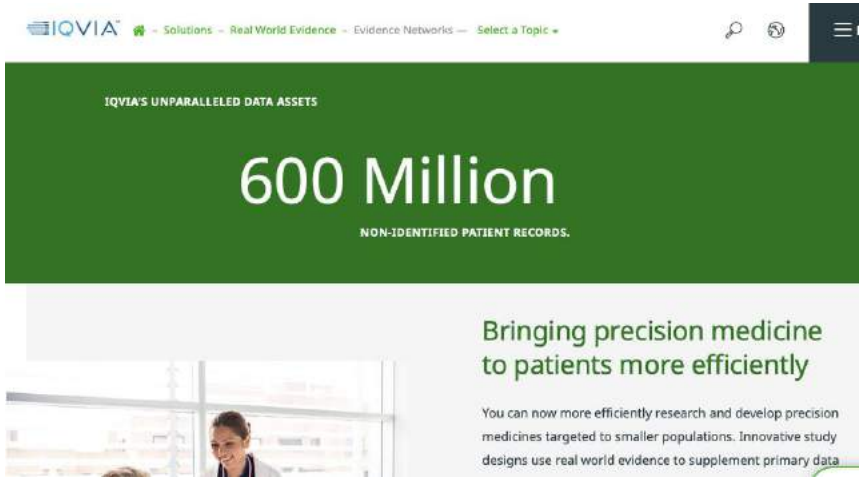
flatiron

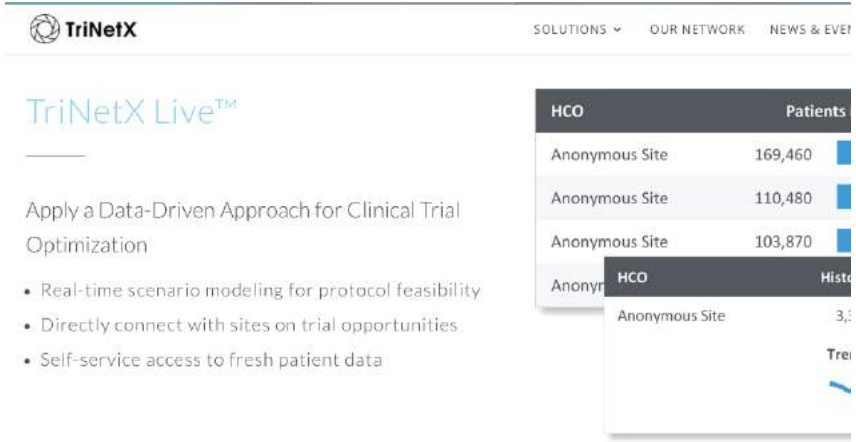
A collaboration with the FDA: new insights using real-world evidence

This latest study estimates real-world survival rates of immunotherapy-treated patients in the first year following regulatory approval in lung cancer, illustrating real-world performance of a new therapy class...

U.S. FDA APPROVES IBRANCE® (PALBOCICLIB) FOR THE TREATMENT OF MEN WITH HR+, HER2- METASTATIC BREAST CANCER

Approval of expanded indication based predominately on real-world data

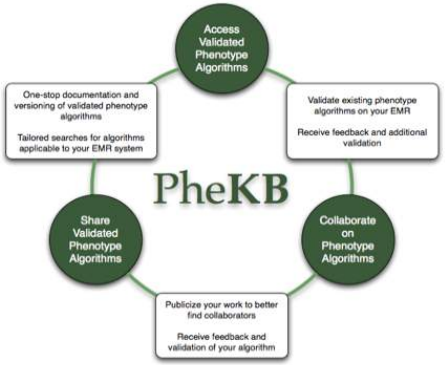




PheKB a knowledgebase for discovering phenoty from electronic medical records

Home | Phenotypes | Resources | Contact Us

What is the Phenotype KnowledgeBase?



Health Data
increasing i
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website, Ph
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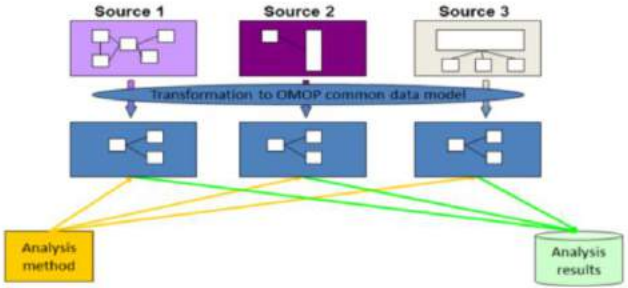
OMOP Common Data Model

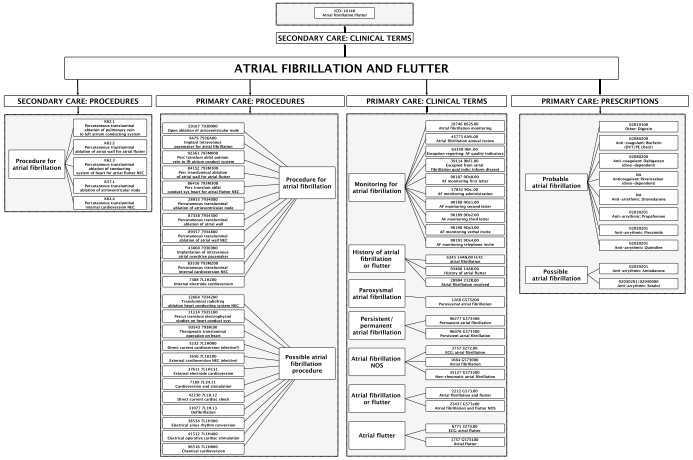


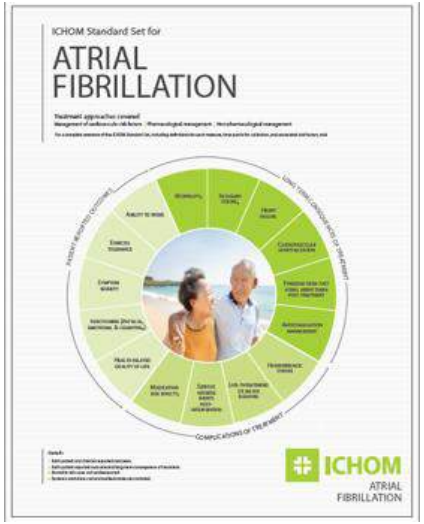
Welcome to CALIBER!

A comprehensive, open-access resource providing the research community with information, tools and phenotyping algorithms for UK electronic health records data.

EHR Phenotypes

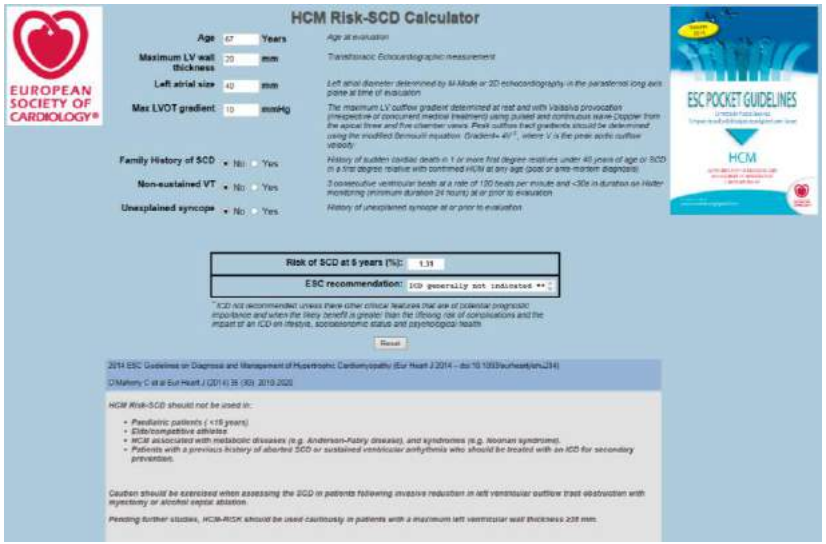
Rule-based phenotyping algorithms using four national structured UK EHR data sources: primary care (CPRD), hospitalizations (HES) and mortality (ONS). Phenoypes have been extensively validated by generating six layers of evidence: aetiological, prognostic, case-note review, genetic, cross-EHR and cross-country replication.

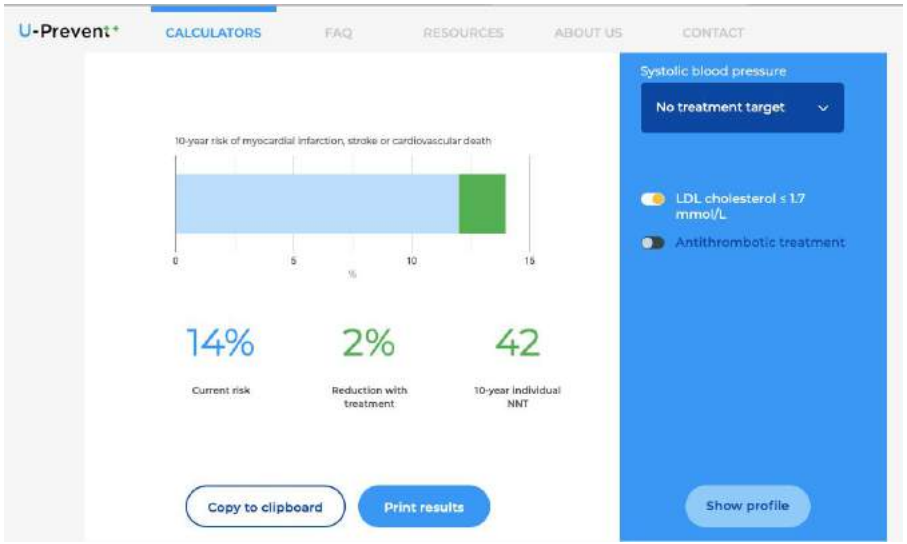




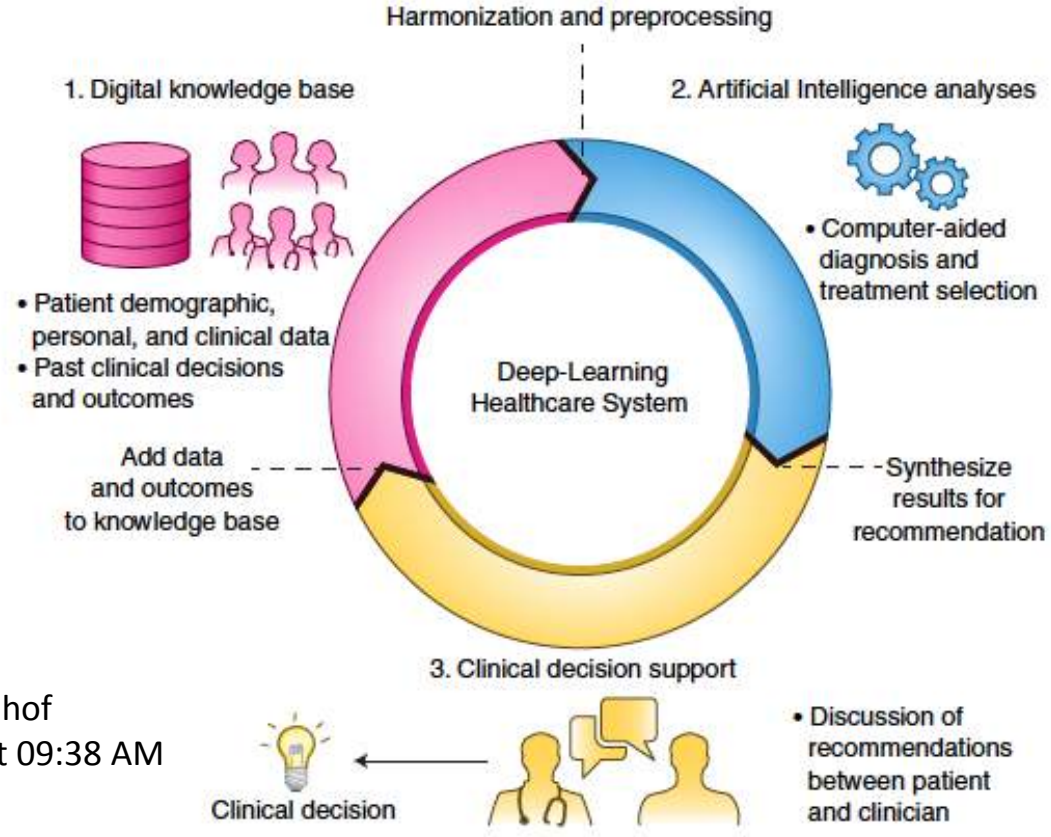
ESC

Precision medicine in cardiology today





Probably past as considered medical device..



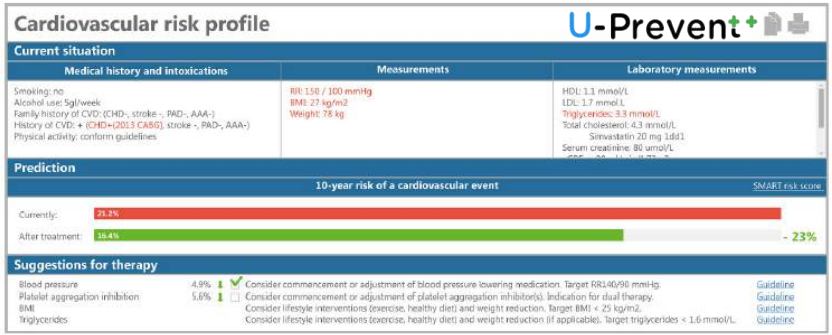
Katrien Groenhof
Sunday 06 Oct 09:38 AM
Digital Arena

Nature Medicine; 25: 14

Clinical decision support

Uniform data collection in routine clinical practice in cardiovascular patients for optimal care, quality control and research: The Utrecht Cardiovascular Cohort

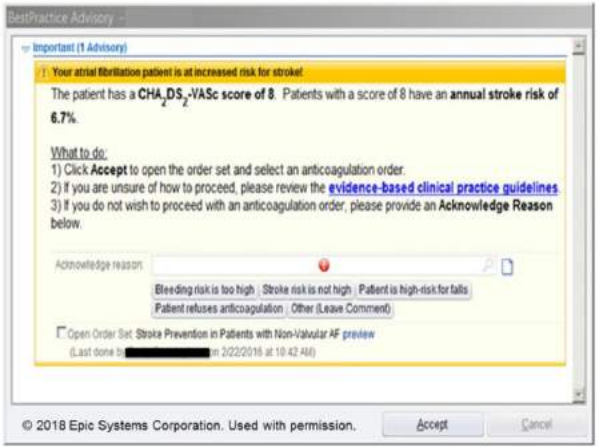
Eur J Prev Cardiol. 2017 May;24(8):840-847



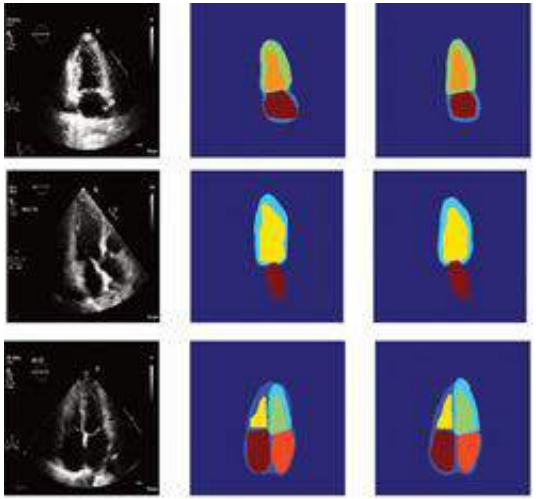
Neth Heart J (2019) 27:435–442

ESC European Society of Cardiology
European Heart Journal (2019) 0, 1–11
doi:10.1093/eurheartj/ehz385
CLINICAL RESEARCH
Vascular medicine

Alert-based computerized decision support for high-risk hospitalized patients with atrial fibrillation not prescribed anticoagulation: a randomized, controlled trial (AF-ALERT)

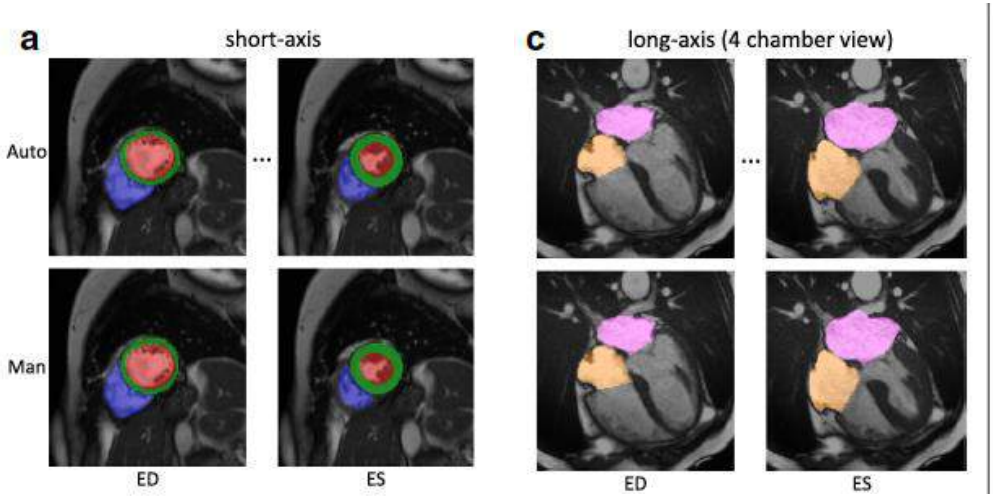


Big data in cardiology today



npj Digital Medicine (2018) 1:59
Circulation. 2018;138:1623

94% accuracy echoview
91% accuracy LVH
93% accuracy HCM
87% accuracy cardiac amyloidosis

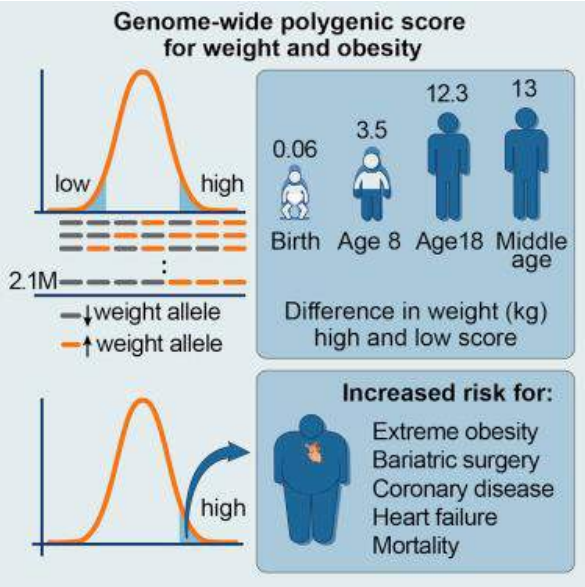


J Cardiovasc Magn Reson. 2018; 20: 65.

Predictive modelling

Cell

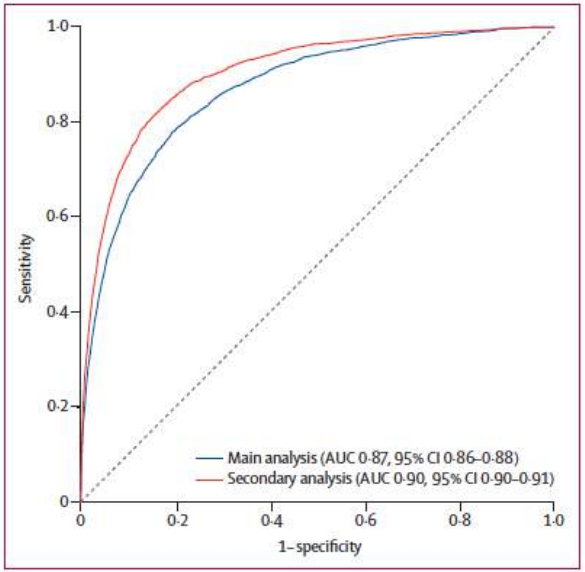
Polygenic Prediction of Weight and Obesity Trajectories from Birth to Adulthood



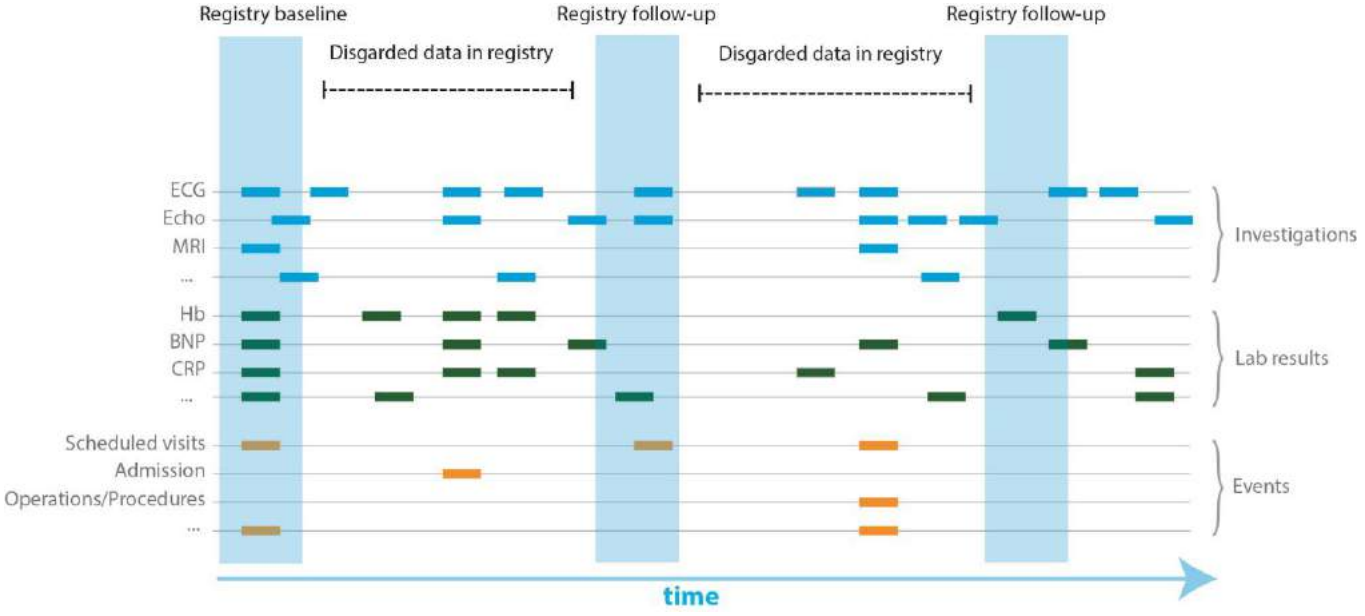
Khera et al., 2019, Cell 177, 587–596

An artificial intelligence-enabled ECG algorithm for the identification of patients with atrial fibrillation during sinus rhythm: a retrospective analysis of outcome prediction

Zachi I Attia, Peter A Noseworthy*, Francisco Lopez-Jimenez, Samuel J Asirvatham, Abhishek J Deshmukh, Bernard J Gersh, Rickey E Carter, Xiaoxi Yao, Alejandro A Rabinstein, Brad J Erickson, Suraj Kapa, Paul A Friedman* Lancet. 2019 Aug 1

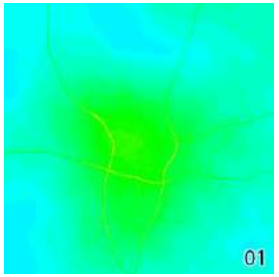


Real-time Predictive modelling within routine care

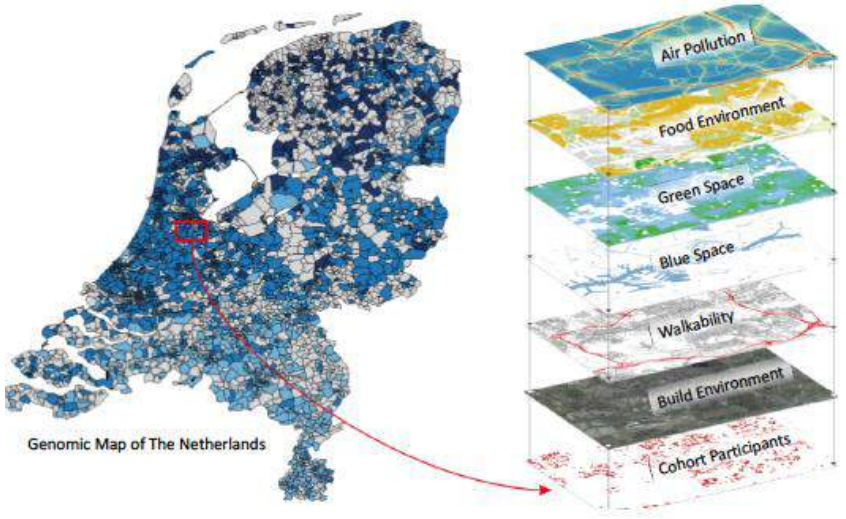


Digital Arena Saturday 14:06
Arjan Sammani
Unravelrdp.nl

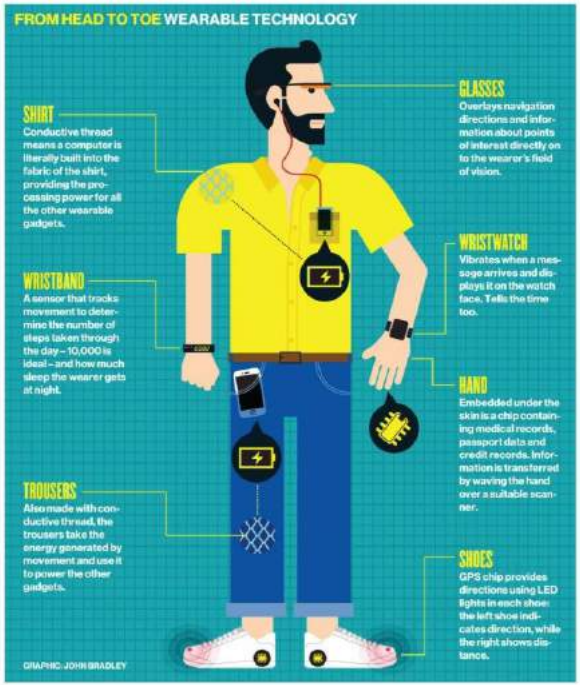
Exposome


01


GIS-BASED EXPOSURE SURFACES
WEARABLES
PICTURES
QUESTIONNAIRES
EXPOSURE MARKERS IN BIOLOGICAL MEDIA
BIG DATA
-OMICS DATA
BUILT ENVIRONMENT
LIFESTYLE
CHEMICAL
SOCIAL


Genomic Map of The Netherlands
Air Pollution
Food Environment
Green Space
Blue Space
Walkability
Build Environment
Cohort Participants

Sensors



But what then? Where is the evidence?

Big Data for Personalized medicine: challenges today

Routine care data

Registration

Uniformisation (OMOP)

Data analytics

Extractability

Missing data

Actionable insights

Uptake in care

Big data for personalized medicine: big possibilities

- Molecular diagnosis to design future trials to provide targeted therapy
- AI analytics of real-world data for prediction and diagnostic yield will lead to actionable insights
- However, it is all about phenotype, phenotype, phenotype (new and old)
- Harmonization of clinical care pathways, data models, coding key for success (external validation)
- Multi-disciplinary collaboration essential

Klaske Siegersma
Sunday – October, 6th
Artificial Intelligence 2 – 8:45-9:25
Digital Arena

This work has received support from the EU/EFPIA Innovative Medicines Initiative [2] Joint Undertaking BigData@Heart grant n° 116074