Gemelli

Fondazione Policlinico Universitario Agostino Gemelli IRCCS
Università Cattolica del Sacro Cuore

The Gemelli Generator concept: the development, implementation and future perspective

GemelliGenerator
Clinical research beyond tomorrow

CONTENTS

1. Mission & Architecture
2. Research Lines
3. Use Case
4. Future perspective

03 GENERATOR REAL WORL DATA TEAM

Multidisciplinary team:

- Engineers
- Clinicians
- Mathematicians
- Physicists
- Research nurse

04

MISSION

SUPPORT CLINICAL RESEARCH TO DEVELOP PERSONALISED/PRECISION MEDICINE LEVERAGING REAL WORLD EVIDENCE AND DATA SCIENCE METHODS.

HOW

- SCIENTIFIC RESEARCH
- INDUSTRIAL COOPERATION
- DEPLOYMENT IN CLINICAL PRACTICE
- FIELD-SPECIFIC EDUCATION

INDUSTRIAL COOPERATION

SCIENTIFIC RESEARCH

DEPLOYMENT IN CLINICAL PRACTICE

EDUCATION

- PREDICTIVE
- PARTICIPATORY
- PREVENTIVE
- PERSONALIZED

05 GEMELLI GENERATOR REAL WORLD DATA ARCHITECTURE

SKILLS & RESEARCH FOCUS

DATA SCIENCE
STATISTICAL ANALYSIS
MASCHINE LEARNING

DESIGN & DEVELOPMENT OF PATIENT- FOCUSED DIGITAL SOLUTIONS

DISCOVERY THROUGH DATA INTEGRATION & VISUALIZATION

TECHNOLOGIES ENABLEMENTPRIVACY & SECURITY BY DESIGN

MULTI-SOURCE DATA COLLECTION AND VALIDATION

PROJECT TYPES

REAL WORLD EVIDENCE SOLUTIONS (DESCRIPTIVE/PREDICTIVE MODELLING)

DIGITALLY-ENABLED MODELS OF CARE (VIRTUAL COMPANIONSHIP, DTX)

EXPLOITATION

RESEARCH PROJECTS

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INTERNAL RESEARCH+
RESEARCH NETWORKS(HORIZON)

CO-DESIGN & CO-CREATION

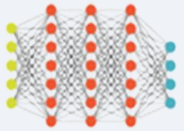
GDMH
Gemelli Digital Medicine & Health
YOUR REAL WORLD KNOWLEDGE COMPANY

INDUSTRIAL PARTNERS

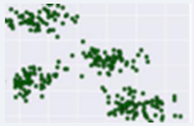
06 GEMELLI GENERATOR REAL WORLD DATA ARCHITECTURE

DATA PRODUCTS FOR RESEARCH & INDUSTRY

DESCRIPTIVE ANALISYS



PREDICTIVE MODELS



SYNTHETIC DATA

PRIMARY RESEARCH ASSET: DISEASE DATAMART

RETROSPECTIVE OBSERVATIONAL COHORT OF PATIENTS CHARACTERIZED BY A DIAGNOSIS / GROUP OF DIAGNOSES WITH DATA FROM STANDARD OF CARE

SARS COV-19 | BREAST CANCER | RECTUM CANCER | MULTIPLE MIELOMA | HEART FAILURE | LUPUS | STROKE DATAMART | DYSLPIDEMIA

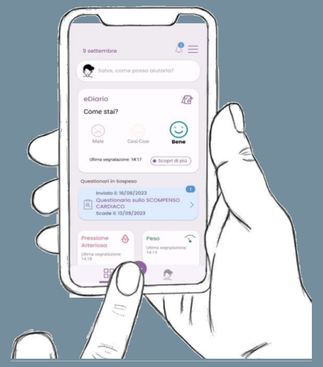
SEARCH ENGINES | DATA COLLECTION TOOLS | ENCRYPTION AND ANONYMIZATION | DATA QUALITY TOOLS | NATURAL LANGUAGE PROCESSING

OTHER RESEARCH REPOSITORIES

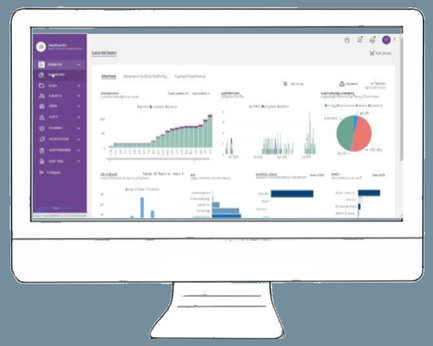
GEMELLI IT SYSTEMS DATAWAREHOUSE

Main e-Health Records; Diagnostic Systems; Laboratory; ER; ICU; ...

REAL WORLD DATA FROM OUTPATIENTS MONITORING AND CONTINUOUS CARE
Remote Data Capturing, Wearable, Patient Support App



MOBILE APP FOR PATIENT SELF-REPORTING, COMMUNICATION AND SELF-CARE



CLINICAL DASHBOARD FOR CLINICAL STAFF MONITORING, ADVISE TO PATIENT, PREVENTION AND INTERVENTION

INTEGRATED CARE PROTOCOL

GUIDELINES, STANDARD OPERATING PROCEDURES, TECHNICAL INSTRUCTION AND SUPPORT

USER-CENTERED DESIGN AND CO-DESIGN PROCESSES

ANALYSIS OF THE STATE OF THE ART: NEEDS AND OPPORTUNITIES

DESIGN AND IMPLEMENTATION OF THE CARE PATHWAY

ITERATIVE AND INCREMENTAL

FEEDBACK

CONTINUOUS IMPROVEMENTS

UX STUDY

TECH PLATFORM SETUP
TOOLS CREATION
CLINICAL TEAM TRAINING
.

CLINICAL STUDY

ENROLLMENT & ONBOARDING

PERSONALIZED CARE PLAN

DTX

PATIENT SELF-MANAGEMENT

REMOTE MONITORING BASED ON INTEGRATED CARE PROTOCOL

RESEARCH ACTIVITY

50 TOT PROJECTS

68% RESEARCH RWD

14% INDUSTRY CO-FUNDED

14% EU PROJECTS

10% DIGITAL PLATFORM

ONCOLOGY 15

- CERVIX, RT
- BREAST, RT
- PROSTATE, RT
- INTERVENTIONAL RT
- PANCREAS
- LUNG

COVID-19 2

- VACCINE ADVERSE EVENTS
- VACCINE IN IPF PT
- LONG COVID
- RADIOTHERAPY
- PROCESS SUPPORT FOR EMPLOYEES

CARDIOLOGY 5

- HEART FAILURE
- HYPERTENSION

PNEUMOLOGY 1

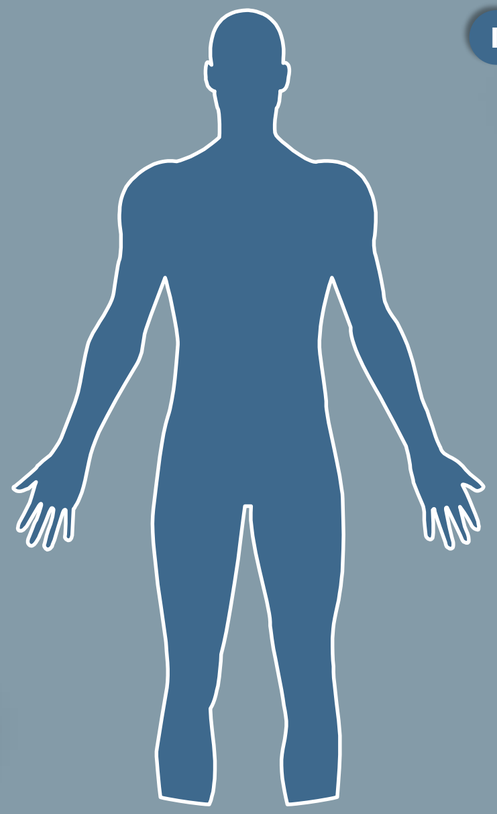
- COPD

PEDIATRICS 1

- SMA
- FETAL BRAIN

DERMATOLOGY & REUMATOLOGY 1

- SMA, FETAL BRAIN



INFECTIOUS DISEASES 3

- BSI, HIV

GASTROENTEROLOGY 5

- LIVER
- NAFLD
- DIABETES

GINECOLOGY 3

- OVARIAN CANCER

EMATOLOGY 4

- LYMPHOMA
- MULTIPLE MYELOMA

GERIATRICS 4

- COMPLEX PATIENTS

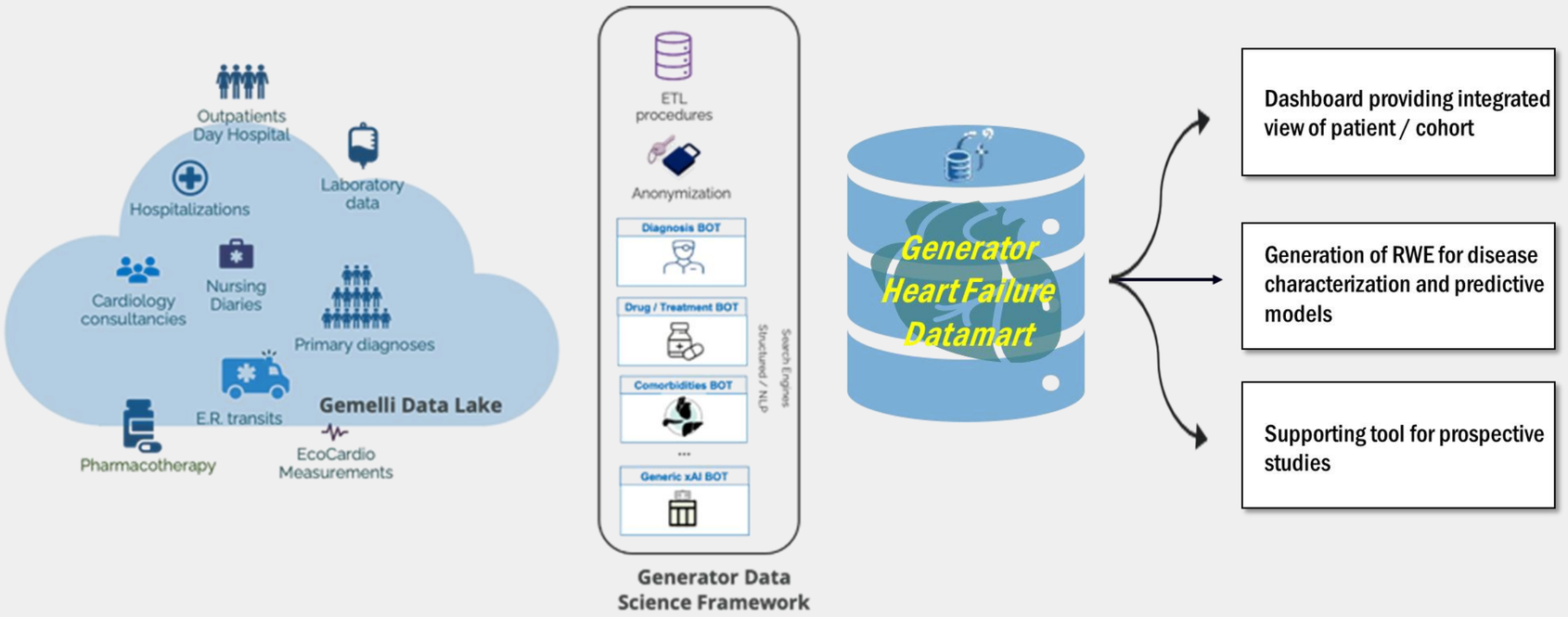
STROKE & ALZHEIMER 6

- READMISSION

USE CASE

HEART FAILURE PROGRAM

OVERVIEW OF RESEARCH PROGRAM ON HEART FAILURE

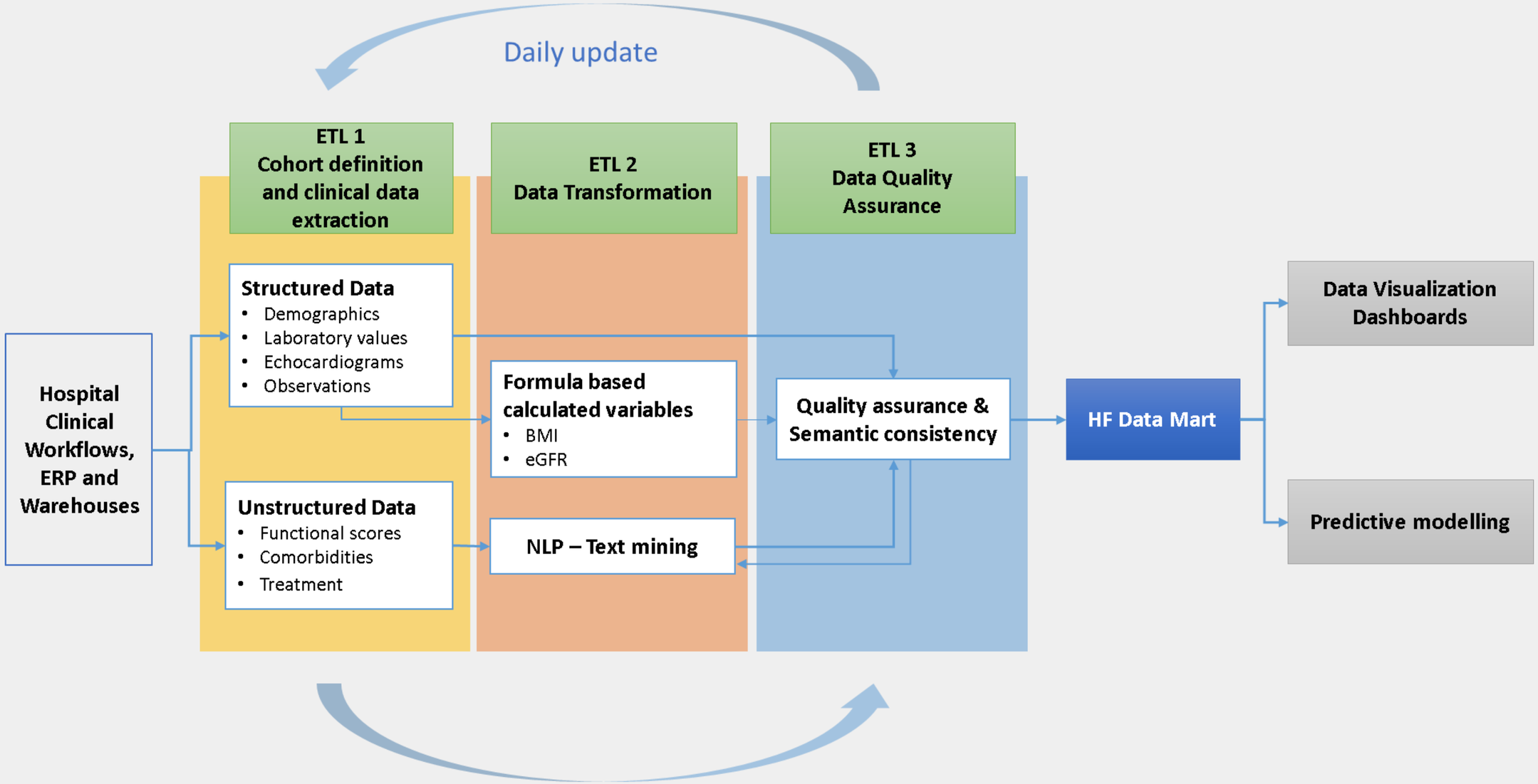


EXPLOITATION AREAS

- HEART FAILURE DATAMART BUILD AND CONTINUOUS UPDATE
- CLINICAL RESEARCH PROJECTS
- DIGITALLY ENABLED CARE MODEL: AZIMUTH
- HORIZON CONSORTIUM: DATATOOLS4HEART EU PROJECT

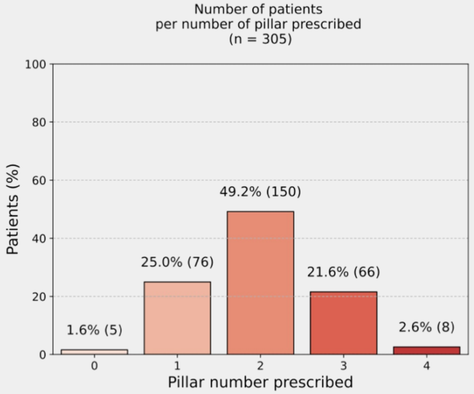
D'Amario, Domenico, et al. "GENERATOR HEART FAILURE DataMart: An integrated framework for heart failure research." *Frontiers in Cardiovascular Medicine* 10 (2023): 1104699

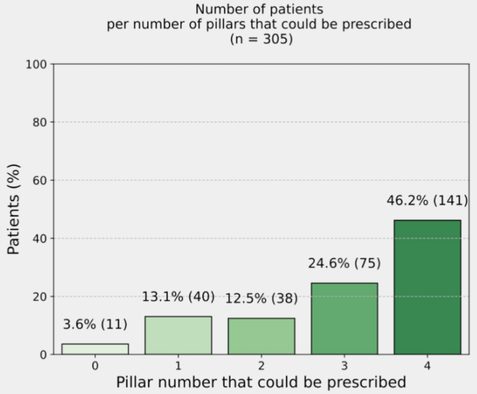
HEART FAILURE DATAMART DAILY UPDATE PROCEDURES

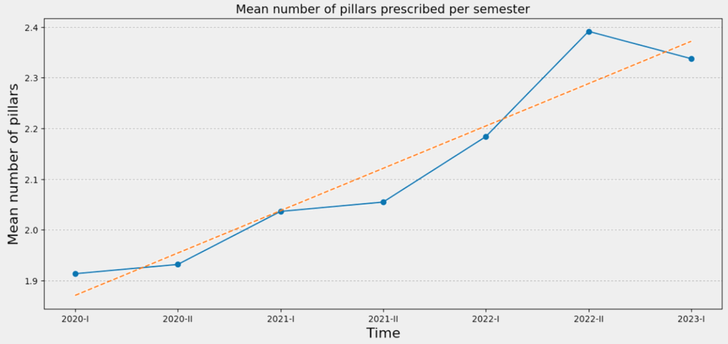


D'Amario, Domenico, et al. "GENERATOR HEART FAILURE DataMart: An integrated framework for heart failure research." *Frontiers in Cardiovascular Medicine* 10 (2023): 1104699

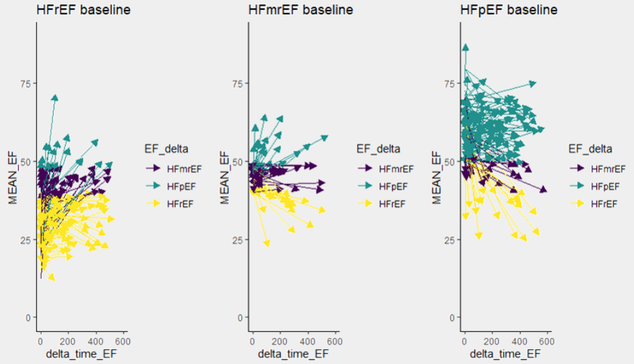
ELIGIBILITY FOR THE 4 PHARMACOLOGICAL PILLARS IN HEART FAILURE WITH REDUCED EJECTION FRACTION AT DISCHARGE



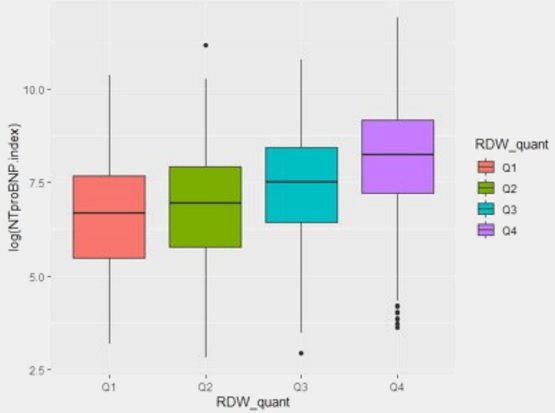


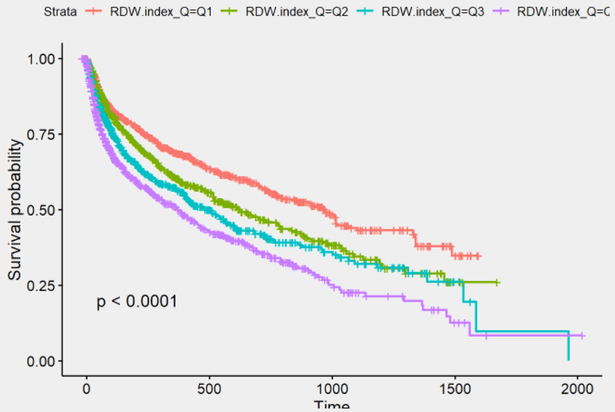


LONGITUDINAL TRAJECTORIES OF EJECTION FRACTION PHENOTYPES



RED BLOOD CELL DISTRIBUTION WIDTH AND PROGNOSIS IN PATIENTS WITH CHRONIC HEART FAILURE





SCIENTIFIC PRODUCTION:

- 2 PUBLISHED
- 4 IN PROGRESS

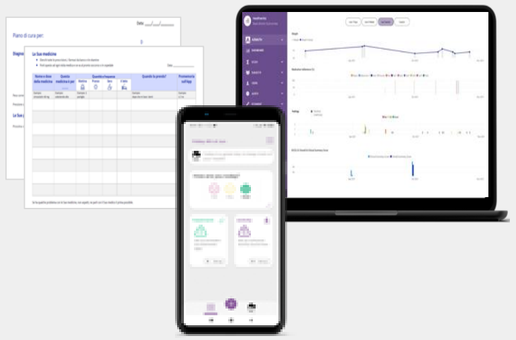
AZIMUTH

AZIMUTH IS A MODEL OF CARE THAT ENABLES:

TO PERFORM THE PHYSICIAN AN EARLY CLINICAL ACTION ON THE BASIS OF RWD TO THE PATIENT TO BETTER SELF-MANAGE AND STAY IN CONTACT WITH THE CLINICAL TEAM

PERDIODIC VISIT / HOSPITAL DISCHARGE

- CARE PLAN CUSTOMIZATION WITH CARE PLAN CANVAS
- PATIENT TRAINING ON HEALTHENTIA APP
- CARE PLAN ENTERED INTO THE CLINICAL PLATFORM (AFTER THE VISIT)



THE PATIENT AT HOME

THE PATIENTSHARES QUESTIONNAIRES AND VITALS PARAMETERS

REQUIRED DATA:
- MONTHLY: KCCQ-23
- WEEKLY: MMAS-8
- ONCE DAILY: BLOOD PRESSURE AND WEIGHT

+ OPTIONAL FUNCTIONS, VIRTUAL CHATBOT, MESSAGING WITH HOSPITAL

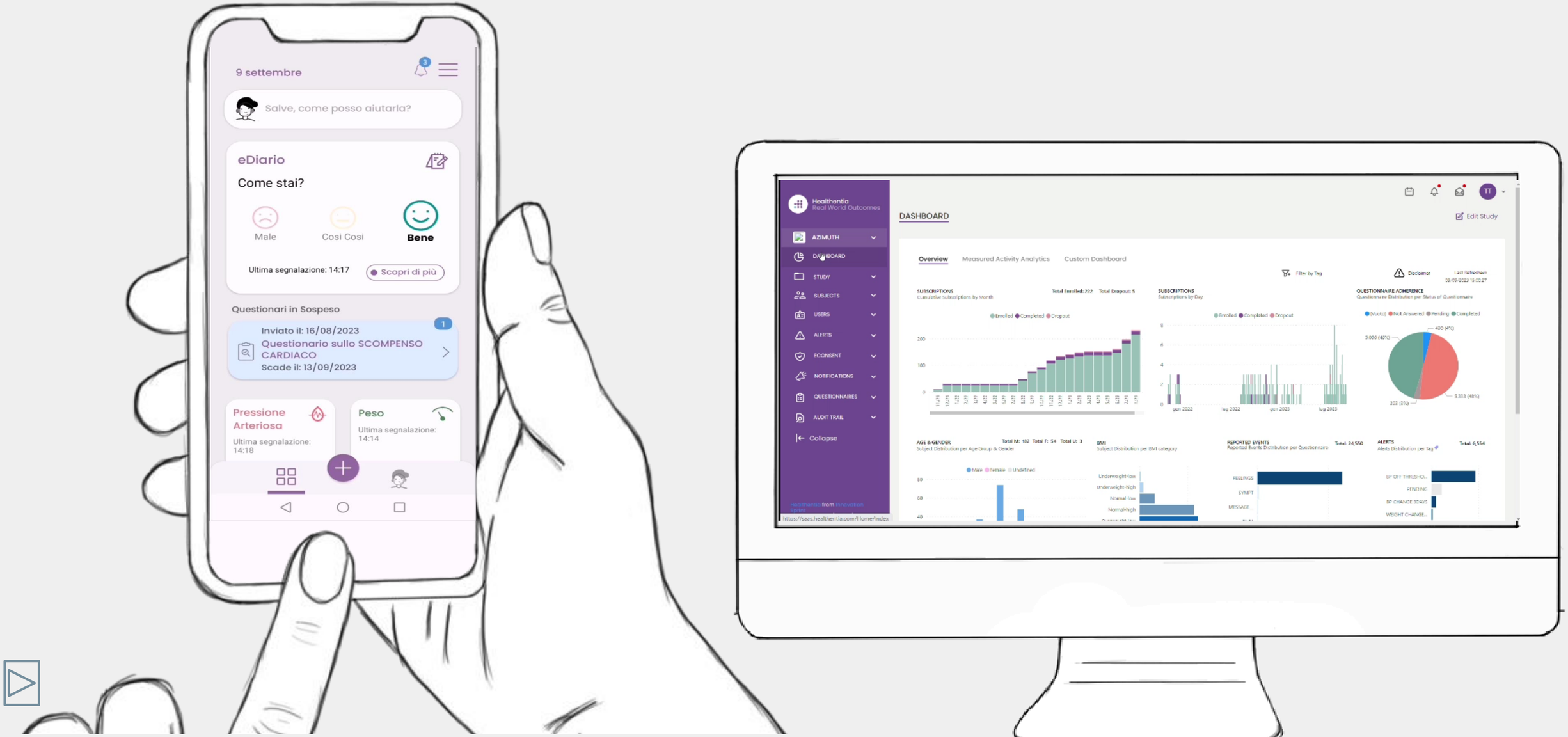
REMOTE MONITORNING

PATIENT SITUATION REVIEW:

LIST WITH PRIORITIZED PATIENTS > PATIENT CARD AND DIRECT PATIENT COMMUNICATION (MESSAGE/VIDEO) > ACTION AS NEEDED SUPPORT TO PATIENT REQUESTS VIA MESSAGING (CLINICAL AND TECHNICAL)

FOR EMERGENCY SITUATIONS PATIENTS HAVE EMAIL AND PHONE CONTACT, NOT A 24H/7DAYS MONITORING TOOL, WITH DIRECT INTERVENTION BY THE CLINICAL TEAM. APPROPRIATE LIABILITY RELEASE DOCUMENT SIGNED BY PATIENT AT ENROLLMENT.

AZIMUTH


9 settembre
Salve, come posso aiutarla?
eDiario
Come stai?
Male
Cosi Cosi
Bene
Ultima segnalazione: 14:17
Scopri di più
Questionari in Sospeso
Inviato il: 16/08/2023
Questionario sullo SCOMPENSO CARDIACO
Scade il: 13/09/2023
Pressione Arteriosa
Ultima segnalazione: 14:18
Peso
Ultima segnalazione: 14:14
Healthentia
Real World Outcomes
DASHBOARD
Edit Study
AZIMUTH
DASHBOARD
STUDY
SUBJECTS
USERS
ALERTS
FCONSENT
NOTIFICATIONS
QUESTIONNAIRES
AUDIT TRAIL
Collapse
Overview
Measured Activity Analytics
Custom Dashboard

11 GENERATOR REAL WORL DATA FUTURE PERSPECTIVE

- CERTIFICATION OF THE DATA MINING PIPELINE BY BLOCKCHAIN

- MAPPING OF DATA SOURCES TO INTERNATIONAL STANDARDS (SUCH AS OMOP, FHIR)

- STARDARDIZATION AND VALIDATION OF EXTRACTION PROCEDURES FROM CLINICAL REPORTS

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THANK YOU!

carlotta.masciocchi@policlinicogemelli.it

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