Health Digital Twin
to predict risks, prevent and trigger actions

The role of a Health Public Data Space in a pandemic
DIGITALEUROPE Webinar

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COVID-19 patient pathway\(^1\)
Emphasizing the challenge of data integration and interpretation

1) This pathway is for illustration purposes only.
Precise predictions and evidence-based decisions
Priority in a pandemic to detect and get right treatment at right time

Predict & Improve diagnostic accuracy
High quality diagnostic data (laboratory, imaging and molecular). Rich patient insights at the point of decision.

Reduce unwarranted variations
Diagnostic consistency through patient adaptation, automation and assisted decision making.

Personalize when it matters
Personalized care leveraging “omics”, imaging and laboratory data integration and insights.

Advance treatment outcomes
Effective risk stratification and triaging, best treatment option.
Empowered by digital representation - Digital Twin
AI-powered personalized bio-physiological model of the patient

Aggregate large amount of curated data
Train multiple deep neural networks
to build individual parts of a model

Together they form a holistic AI-powered digital twin of a human

This feature is based on research, and is not commercially available. Due to regulatory reasons its future availability cannot be guaranteed.
The vision of “Health Digital Twin” to serve as agent to predict risks, prevent sickness and trigger actions

**Healthcare System Level**
- **Vision:** Population health data, anonymized on larger scale, accessible in decentralized setting with proper consent management

**Individual Level**
- **Vision:** Personalized computational model continuously updated with new health data, vital signs, exams, health conditions

**Continuous Monitoring** → **Sickness** → **Continuous Coaching** → **Sickness** → **Continuous Actions** → **Health outcome**

**Digital Twin**
- Lifelong Digital Twin
- Electronical Patient Record

**Real Patient**
Need for new models of data ownership and management, incl. privacy and open decentralized approaches

Challenges to be addressed by Rules & Guidance

Challenges to be addressed by Infrastructure

Integration
Ownership & Access
Trust
Security & Privacy

Use case- and stakeholder-specific

Actionable insights and decision support
What we need to establish
The new structure.

- Data ownership - patients apps, HDT, owned and controlled by each individual citizen
- New forms of collaboration between various stakeholders (research between HC providers and industry (Medtech, digital, biotech,...)
- Decentralized data handling and storing with clear rules and guidance
- Federated learning for use of AI in health and clinical decision making

Infrastructure
- Privacy-By-Design solutions
- GDPR conformity & data usage transparency
- Technology base of data platforms to interact and to interface for data access and sharing
Thank you for your attention!

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