Health Data in Germany – treasure or trap?

German Data Science Days | Dr. Nils Hellrun
Medical knowledge is growing exponentially

The medical world will never change as slowly as it is now

Time period for medical knowledge to double

1950: 50 yrs
1980: 7 yrs
2010: 3.5 yrs
2020: 73 days
Digital Health is on the Rise worldwide

Digital health is paving the path for individual data to be collected, stored, integrated and analyzed by sophisticated and accurate algorithms in the cloud, enabling doctors to identify trends that can not only treat diseases but predict and prevent them. Driven by the mammoth growth prospects that digital health industry is characterized by, medical care stakeholders are putting in massive efforts to advance the expansion of this business space. With the pervasive presence of wearable devices, cell...
A stubborn problem: the exchange of data and knowledge

Background image: Medical treatise by the Roman doctor Galenus (approx. 2,000 years old) on the subject of “hysterical apnea”

“In health care communication becomes a problem, when information has to be presented where it is needed and when it is needed.

Synchronization and integrity of the various data pools is necessary for proper functioning and in order to avoid repetitive data capture and update.”

Peter L. Reichertz, 1984
Health data is trapped in proprietary systems today

Systems are not built for data exchange or re-use of data

The promise “More data = better healthcare“ is fallacy today.
Only 22% of data is "understood" semantically correct when exchanged across different systems from more than one vendor. So most of the data in patient records today is not interoperable.
The dominant business model in health IT: dependency

Due to proprietary systems, hospitals are hardly able to innovate.

- No independent process adjustments
- No access to own data
- High costs for interfaces
- No best of breed ecosystem
Is there a solution?
Think about Lego

• There are 2,500 variants of Lego bricks in production
• They can all be combined in an infinite number of combinations
• Why?
About openEHR

- openEHR is a non-profit organization (and international community!) that publishes technical standards for an EHR platform along with domain-developed clinical models to define content.
- The principal architectural concepts include the lifelong, patient-centric shared health record, future-proof data and clinical process support.
- All openEHR IP is published under either Apache 2.0 or CC-BY licenses.

https://openehr.org/about_us
What is openEHR good for?

- Building standards-based clinical data repositories (CDRs)
- Modelling and standardizing clinical concept models (archetypes)
- Creating complex data sets using combinations of standardized models (templates)
- Building applications on data schemas generated from templates (operational templates)
- Persisting clinical data in a standardized way (compositions)
- Predictably retrieving clinical data (AQL)
Open data models

Physicians, not computer scientists, have the data model in their hands.
Blood pressure: 120/80
Weight: 77 kg
Height: 188 cm
Vaccinations: Diphtheria, Tetanus
Batch No.: 12345, vaccinated on: 12.5.2018
openEHR Platform Approach

- Data Modelling is a fundamental activity in openEHR
- The domain models defined by clinical experts are directly used inside the platform
- Software artifacts in the platform (database, forms, data validation, queries) are derived from the models and contain their semantics
- Applications share the domain models and platform architecture, thereby becoming interoperable
Catalan Health Service (CatSalut)

- The Catalan Information System Master Plan: Building a digital health strategy for Catalonia
- Establishment of a shared platform for the whole region of Catalunya
- Phase 1: Primary care sector shares one record based on openEHR
- A transactional system for up to 70,000 healthcare professionals
Karolinska

- Top 15 University Hospital in Europe and most renowned hospital in Sweden
- Transformation of the hospital information system towards openEHR
- Close alignment between research and care systems to enable data-driven decision making
One London

• shared care record across the city of London
• provision of an „Urgent Care Plan“ (End of Life Care) across multiple organizations and healthcare professionals
• Commissioned by NHS London
  • 5 integrated care centers
  • 40 NHS trusts
  • 1.400 general practices
• „openEHR enforces a standardised approach to capturing information through a modern platform“
HiGHmed

- 10 German University Hospitals
- 4 additional non-university hospitals
- An open platform to build innovative apps and exchange data on care and research
- Complements the hospital information system
- Funded by the German government (Federal Ministry of Science and Education)
Data-centric open health platform by vitagroup

HIP CDR

- Patientenportale, Mobile Apps, KI-Applikationen und andere
- Standardisierte REST API
- Sicherheit | Zugriffssteuerung | Monitoring
- Vendor Neutral Data Persistency
- Event Trigger & ETL Prozess
- Analytics & BI Process Mining
- Process-automation
- Archiv

Legacy systems

KIS, PACS, LIS, eMPI, Komm. Server

CDR Bridge

gematik

ISIK, KBV Basisprofile, MIOs, IdP, ePA, KIM

KIS, PACS, LIS, eMPI, Komm. Server

HL7 CDA, HL7 FHIR, DICOM, IHE, HL7 V2

Komm. Server
Thank you.