How can AI provide benefits to citizens and contribute to building the data culture for society?

Barış Erdoğan, PhD
Chief Executive Officer

Switzerland
November 29, 2022
How can citizens support AI?
Al needs to be trained and validated on data.

Why would a citizen need AI in healthcare?

- For the early detection of diseases.
- Understanding more about disease risks and causes.
- Developing new treatments and preventing from diseases.
- Improving diagnosis and avoiding mis-diagnosis
- Improving individual care and allowing personalized treatments.
Healthcare Data Collaboration is Challenging

FACT: Healthcare AI Algorithms need to be trained and validated on citizen data.

Standards
Curating data from different EMR systems at multiple hospitals is a very costly option.

Privacy & Ethics
Different countries have different privacy laws and ethical approval standards for working with healthcare data.

Limited Solutions
Projects focus on ONE large hospital with sufficient data for AI research, limiting applicability to other countries.
Patient-Centered Technologies Needed

- Technology: Federated Network / Distributed Cloud
- Technology: De-Identification
- Patient Data: connectors for further digital data

- Query Designer
- Site Finder
- Patient Finder
- AI Infrastructure

- Installation Partners
  - Technology Partners
  - Network-Building Partners
  - Data Partners

- Technologies

- Privacy By Design
  - Technological Data Protection
  - Operational Data Protection
  - Design of Software Processes
  - Physical Security

- Solutions

- Patients

- Eco-System of Partners and Hospitals

- Patient Data
  - Hospital Network
  - >5 dimensions of patient EMR data
  - Live / Real-time

- Hospital Diagnoses (e.g. ICD10, SNOMED)
- Laboratory Results (e.g. LOINC)
- Medication (e.g. ATC code)
- Procedures
- Demographics
Case study: the Federated Query System (FQS) of the Swiss Personalized Health Network (SPHN)

- Operates across all five of Switzerland’s university hospitals
- Enables AI model training and queries for multisite data-driven research projects on clinical data in all hospitals, simultaneously
- >70 million data elements from >450’000 patients: a (consented) subset of patients from the five hospitals
- Fully anonymized, complies with privacy requirements, only aggregated search results are shared with users and small patient numbers are obfuscated to prevent potential re-identification
- Hospitals to retain full control over their data

- Centre hospitalier universitaire Vaudois – CHUV (Lausanne University Hospital)
- Hôpitaux Universitaires de Genève – HUG (Geneva University Hospitals)
- Inselspital, Universitätsspital Bern – INSEL (University Hospital of Bern)
- Universitätsspital Basel – USB (University Hospital of Basel)
- Universitätsspital Zürich – USZ (University Hospital of Zürich)
Realising International Data Access Through Data Collaborations
European Pharmaceutical Contractor
Publication date: February, 2019

Finding and Treating Rare Disease Patients in a Global Digital Haybale
Journal for Clinical Studies
Publication date: September, 2020

AI/ML to Generate Medical Insights ... While Maintaining Patient Data Security and Privacy
Journal for Clinical Studies
Publication date: February, 2022

Possibilities to increase number and scope of trials in Poland
Chapter in Industry Clinical Trials In Poland, by the Polish Association of Innovative Pharmaceutical Companies (INFARMA) & Polish Association for Employers of Contract Research Organizations (POLCRO)
Publication date: February, 2022

An Electronic Data Model for a More Efficient Health System in Latin America
Clinical Research Insider
Publication date: May, 2021

Why Do We Need Patient Diversity in Clinical Trials?
Journal for Clinical Studies
Publication date: October, 2022
Authority guidance on the use of Data

Use of Electronic Health Record Data in Clinical Investigations

Guidance for Industry

A vision for use of real-world evidence in EU medicines regulation

News 24/11/2021

Enabling the use of real-world evidence (RWE) and establishing its value for regulatory decision-making on the development, authorisation and supervision of medicines in Europe by 2025: this is the vision of European regulators as outlined in an article from Peter Arlett, Head of Data Analytics and Methods at EMA, Jesper Kjær, Director of Data Analytics Centre at the Danish Medicines Agency, Karl Broich, President of the Federal Institute for Drugs and Medical Devices (BfArM), and Emer Cooke, EMA’s Executive Director, published in Clinical Pharmacology & Therapeutics.
## Role of Data Intermediaries

<table>
<thead>
<tr>
<th><strong>Sponsor</strong></th>
<th><strong>Hospitals</strong></th>
<th><strong>Intermediary</strong>*</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Real-world data and evidence-based research and publications</td>
<td>- Insights on own patient cohorts</td>
<td>- Enablement and maintenance of innovative platforms as part of the collaboration</td>
</tr>
<tr>
<td>- Actionable insights for medical affairs division</td>
<td>- Treatment improvement for involved patients</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Possibility for clinical trials with sponsor</td>
<td></td>
</tr>
</tbody>
</table>

* Bridge between the industry and the healthcare providers.
AI Models to Predict COVID Progression

Real-time patient metrics and mapping

COVID-19, virus identified (ICD10 - U07.1)
AI&Data Use Cases

Longevity

Increase survival rates even for lethal diseases with early detection.

Covid Pandemic opened up a new era on data and AI:

- Online symptom checkers and e-triage
- Detecting high-risk patients before critical stage and start preventive treatment
- Diagnosing rare disease patients which are often mis/un-diagnosed
- Identifying eligible patients for Clinical Trials for innovative treatments
- Creating synthetic control arms and speeding up the new therapy development being available
Thank you