

Overview of the European Commission's initiatives in Artificial Intelligence in health and care

Ceri Thompson

*Deputy head of Unit eHealth, Well-being and
Ageing*

European Commission

*DG Communications Networks, Content and
Technology (DG CONNECT)*





Opportunities of artificial intelligence for health and care

- *Empower citizens to better manage their health*
- *Enable faster and more accurate diagnoses*
- *Support clinicians in taking informed decisions*
- *Allow for more precise treatments and personalized medicine*
- *Improve drug testing and clinical trials– improve patient safety*
- *Support functioning of health and care systems*



Artificial intelligence for health and care in Europe

- *Slow uptake - only 16% of healthcare facilities use AI tools*
- *Low confidence among practitioners*
- *Limited access to high quality data to train AI systems*
- *Regulatory issues*
- *High adoption costs*

Digital Transformation of Health and Care





Communication Artificial Intelligence for Europe

- (1) Boost EU's technology and industrial capacity and AI uptake*
- (2) Address AI's socioeconomic impact*
- (3) Ensure an appropriate ethical and legal framework*

COM(2018) 237 final

Around **€2.6 billion**
over the duration of Horizon 2020
on AI-related areas
(robotics, big data, health, transport,
future and emerging technologies).

Artificial Intelligence for Europe

Increase **investment**



Strengthen **R&I**



Make **data** available



Empower **people**



Nurture **talent**



Work **together**



Boost **competitiveness**



Maximise **use**



AI for Europe how?

#DigitalSingleMarket

#AI

"Data Package" of 25 April 2018

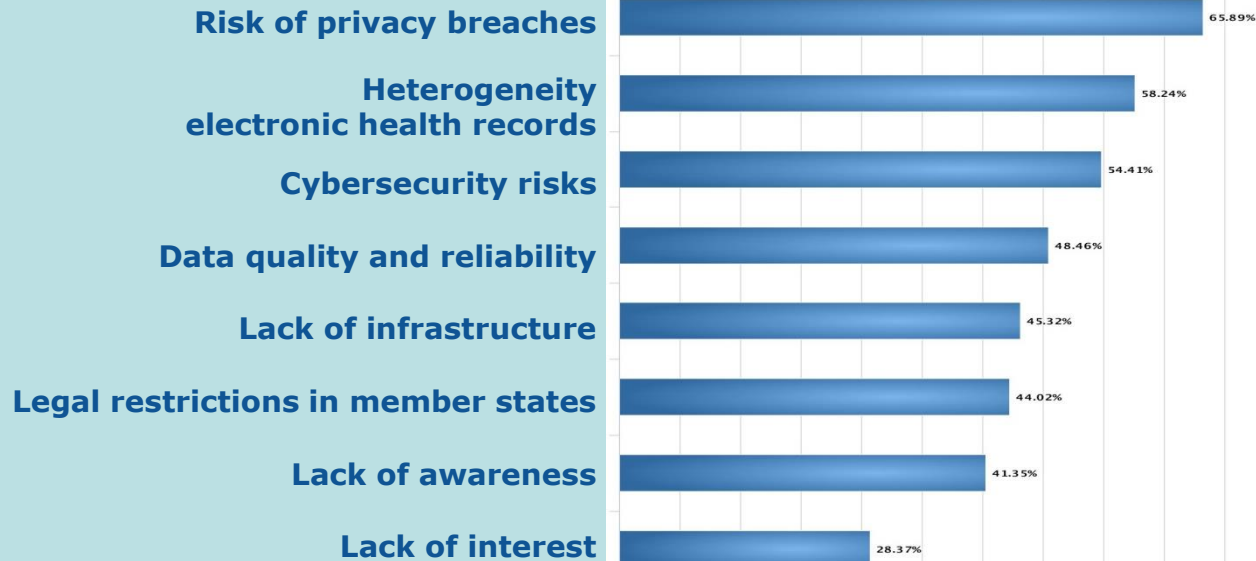
Towards a common data space in the EU for new products and services based on data

Five components

- **Communication on Artificial Intelligence**
- **Communication on digital health and care**
- **Review of the Directive on the re-use of public sector information (PSI)**
- **Results of the evaluation of the Database Directive**
- **Communication on sharing of private sector data**

Open Public Consultation

"What are the major barriers to electronic sharing of health data?"



(I) Giving citizens better access to their health data



Recommendation

European Electronic Health Record exchange format



DAVIDE IS A 59-YEAR OLD ITALIAN NATIONAL WHO HAS LIVED AND WORKED IN FRANCE FOR THE LAST 30 YEARS.

DAVIDE SUFFERS FROM A PARTICULAR HEART CONDITION, AND WOULD LIKE HIS DOCTORS IN ITALY TO HAVE ACCESS TO HIS FULL MEDICAL RECORDS BUILT-UP IN FRANCE OVER THE LAST 30 YEARS. BUT CURRENTLY THIS IS NOT POSSIBLE.

(II) Connecting health data for research and personalised medicine

- *Policy coordination, linking resources*
- *Common standards*



IN 2015 ANNE-KELLY WAS BORN IN DUBLIN, IRELAND. DOCTORS RECORDED AN ABNORMALLY SMALL HEAD AND FACE, AS WELL AS A SLOW DEVELOPMENT RATE. IT WAS IMPOSSIBLE TO PINPOINT THE CAUSE OF ANNE-KELLY'S SLOW DEVELOPMENT BASED ON NATIONAL DATA ALONE.

ADVANCED DATA ANALYTICS THROUGH A EU-FEDERATED PLATFORM MADE IT POSSIBLE TO FIND A SECOND CASE WITH SIMILAR SYMPTOMS AND THE SAME MUTATION IN SPAIN, AND THEREFORE REACH AN ACCURATE DIAGNOSIS FOR ANNE-KELLY'S CONDITION.



Declaration for delivering cross-border access to **genomic database**

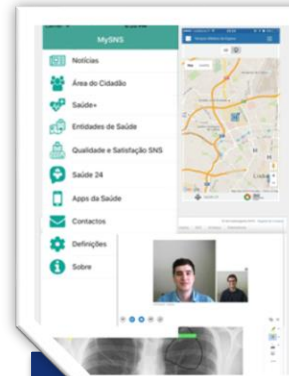
- 1 million **genomes accessible** in the EU by 2022
- **Linking access** to existing and future genomic database across the EU
- Providing a sufficient scale for **new clinically impactful** results in research



(III) Digital tools to foster citizen empowerment and person-centred care



- *Deployment of digital services, capacity building*
- *Common principles for validation and certification*
- *Mobilise investments*



PEDRO FROM LISBON HAS SUFFERED A RIB INJURY PLAYING FOOTBALL WITH HIS COLLEAGUES AFTER WORK. THANKS TO THE "MY SNS" MOBILE HEALTH APPLICATION, PEDRO CAN CHECK ESTIMATED WAITING TIME FOR TREATMENT IN HOSPITALS AROUND HIS LOCATION.

WHEN HE ARRIVES AT THE HOSPITAL, HE COULD ACCESS HIS ELECTRONIC HEALTH WALLET IN "MY SNS" – WITH RECORDS OF HIS PREVIOUS TREATMENTS.

AFTER HE WAS TREATED, HE COULD USE "MY SNS" TO PROVIDE FEEDBACK ON QUALITY / SATISFACTION WITH THE SERVICES PROVIDED. PEDRO IS NOW RECOVERING AT HOME AND CAN MAKE USE OF THE SNS PLATFORM TO CONNECT BY TELECONSULTATION WITH HIS GP.



EC funding for AI-based research projects in health and care

- *Modelling and prediction of disease and in-silico clinical trials*
- *Decision Support Systems for diagnostics and treatments*
- *Intelligent health and care advice systems (choice of drugs, devices, procedures, interventions, diagnostics methods, etc.)*
- *AI-based solutions for independent living*



Examples of funded projects

- **PULSE** uses AI and big data to predict the onset of diabetes and asthma



- **BD2Decide** uses AI and big data to support clinicians treating head and neck cancer



- **REPO-TRIAL** develops an in silico-based approach to improve drug repurposing trials



- **CAPTAIN** uses micro projectors to provide a smart home assist for the elderly



Key challenges

- **Transparency and accountability** – explain AI, mitigate bias, increase trust
- **Data protection and security** – consent, protect sensitive data
- **Safety and liability** – ensure data quality, increase reliability, sort out responsibilities
- **Ethics and governance** – ensure privacy and adequate management of data and processes
- **Expertise and digital skills** – train workforce and digital literacy



EU contribution

- **Research & innovation** – H2020, CEF, Horizon Europe, DEP
- **Support data infrastructure** – cross-border interoperability and data linking/pooling for research
- **Legislative Framework** – links with data protection, liability, safety of medical devices

Conclusions

- *AI is an area of strategic importance for Europe*
- *AI-based solutions can speed up the digital transformation of health and care in Europe*
- *The Commission supports AI solutions for health in care through research, shared data infrastructure and legislative frameworks*
- *Multi-stakeholder approach*



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