



MINISTERSTVO ZDRAVOTNICTVÍ
ČESKÉ REPUBLIKY



Activities on artificial intelligence in the Czech healthcare

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Ministry of Health of the CR

Seminar Health systems in digital transition

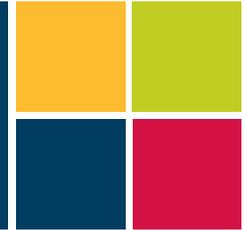
Towards a European Health Data Space

the V4 perspective

2021

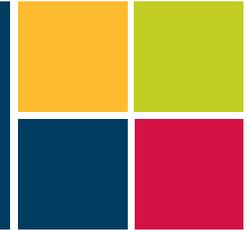
23 November

Agenda



- 1. Healthcare in the Czech Republic and National eHealth Centre**
- 2. Artificial intelligence in the CR since 2018**
- 3. Artificial intelligence in healthcare**
- 4. Artificial intelligence in the context of eHealth development in the CR**

Czech Republic



Healthcare (HC) in the CR

- modified Bismarckian system (grounds established in 19th century).
- national system, mandatory health insurance (like a tax), separated from social insurance, solidarity system
- 7 health insurances, the biggest (VZP) regulates most of the market
30 000 HCP, 188 hospitals
- almost all finance flow in HC (hospitals, clinics, GPs, spas,...) is in the hands of insurances (rare exceptions – e.g. clinics for foreigners, services for corporates)

No research institute for innovations in HC

AI in HC relevant institutions: MoH, Competence centre, Czech Health Research council, Institute of Health Information and Statistics of the Czech Republic, National Institute of Public Health, State Institute for Drug Control, Health insurances, medical societies, patients organizations, universities, agencies

National eHealth Centre

Department of IT and Electronic Healthcare (ITEZ), established in 2019, integral part of MoH, located in Prague, follows National eHealth strategy



- Ensures the competence of the ministry in the area of strategic and conceptual development of digitalization of health
- 2 units:
 - NCEZ - the National Centre for Electronic Health Care
 - Information and Communication Technologies and Cyber Security
- Ongoing discussions about involvement of stakeholders in Electronic healthcare development
- Projects: e.g. Structural Reform Support Programme (SRSP), JADECARE, TEHDAS, X-eHealth
- Support Czech Gov. in V4 eHealth related tasks, e.g. **V4 Position paper on the future of European Health Data Space (EHDS)**

Artificial intelligence since 2018

World: with increased computing speed, improved methods of training of convolutional neural networks, availability of large sets of data, particularly deep learning caused break and AI tools began to perform practical tasks also in healthcare.

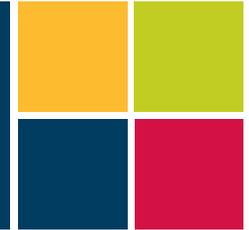
As of the first decade 21. century there are numerous AI development tools and consequently software models aiming at diverse healthcare applications.

EU – intensive coordination and acceleration activities since 2018 (Declaration of cooperation on Artificial Intelligence - 25 countries, 2018), Digital Europe, DSM, Digital Decade - common digital plan towards 2030)

The CR - Academic, basic research of AI dates to 80's of 20. century (general studies of neural networks behaviour)

Czech Republic started to develop national AI strategy – all sectors in 2018, first tentative use of AI solutions for healthcare (cancer, processing of images)

Artificial intelligence in the CR since 2018



National Strategy of AI in the CR: approved by gov. In May 2019 – follows the concept of Digital society and economy – one of three pillars of gov. programme „Digital Czech“ and Innovation strategy 2019-2030.

- **Short term objectives** (2021) - incl. creation of Centre of excellence, TEF, DIH (6, candidates for eDIH)
- **Mid-term objectives** (2027) – full operation of the centres, HPC,...)
- **Long term objectives** (2035) – integrated system of the centres, with V4, the CR attractive for top scientists.

Predominant focus on technical high education and AI in machinery

The objectives in Healthcare:

- involvement in global activities focused on testing, and evaluating data quality, validation and performance of AI applications
- concept of introducing AI applications into healthcare
- pilots in healthcare
- implementing a program for the collection and protection of quality health data
- making data from healthcare available for research purposes

Artificial intelligence in healthcare

I

Preparatory work for concept of AI in healthcare in the CR - categorization of AI apps into 7 domains, identification of their needs, international transferability of practices and solutions

1. Use of AI for sector management and administration, for optimization of internal processes (incl. security, chatbots robots)

Central institutions, healthcare providers (financing, regulation, support)

2. Use of AI in payment and reimbursement processes, performance reporting, cost trends predictions and further processing of financial data

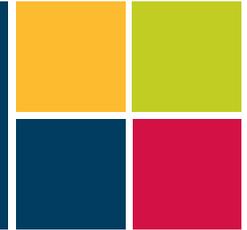
Health Insurances (regulation, DGA, GDPR..., management of healthcare development – MoH)

3. Use of AI in the provision of health services

Healthcare providers (regulation, CE Marking, guidelines for manufactures, AI act, DGA, GDPR, health data availability, quality, standards, financing, sustainability, trustworthy AI, ethic, credibility, performance, benchmarking of AI apps., AI projects, citizens view, staff, cybersecurity)

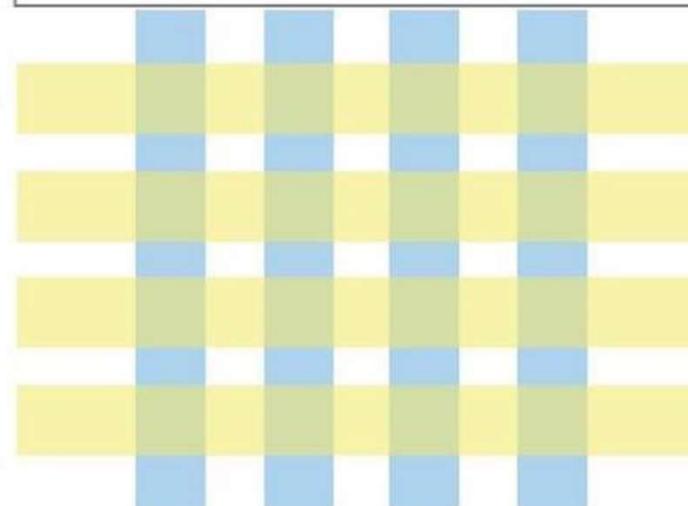
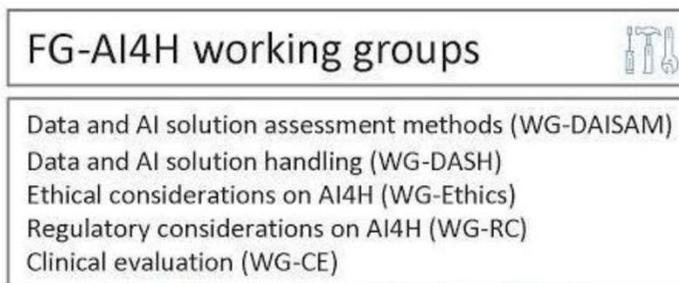
Czech originated AI apps: e.g. Automated Detection and Quantitation of Langerhans Islets in Pancreatic Tissue, image segmentation using convolutional neural networks - Liver Surgery Analyzer (Czech DIGI@MED Award)

Benchmarking of AI apps in HC



Despite the accuracy reported for many AI for health models, there is a lack of data on effectiveness (particularly comparative effectiveness), cost effectiveness, or safety in a clinical setting.

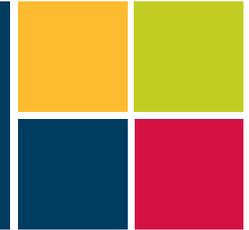
The ITU/WHO Focus Group on “AI for Health” (FG-AI4H) was established in July 2018 to develop international evaluation standards for AI solutions in health.



*MCH: maternal and child health

Artificial intelligence in healthcare

II



4. Use of AI in the administration of medicinal products and medical devices

Healthcare providers, State Institute for Drug Control

5. Use of AI in science and research.

Professionals in healthcare

Special group: pharmaceuticals – advanced experts in AI, secondary use of health data demand

Agencies for research and innovation support (TACR, GACR, CzechInvest)

A new Concept of Medical Research 2022-2030 for research in the field of Digitization of Healthcare is elaborated in 2021, incl. AI/big data

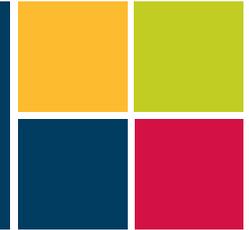
6. The use of AI in the education of health professionals at all levels of education

Education of Pre- and post-graduates

7. The use of AI in support of the development of health services with the application of statistical data

MoH, IZIG (health policy support, prediction)

AI in the context of eHealth development in the CR



Until 2016, besides hospital and clinical information systems and PACSs there were only pilots, patchy (experim.) implementations of ICT in healthcare

Priority – to build infrastructure for eHealth (esp. Identific., registries, cyber secur.)

No national EHR system exists, national standard for Patients summary (EU format) and IHE profile – ongoing work in 2021

Only partial electronic sharing of health data between HCP (due to fragmented ownerships, differences in standards and lack of economic incentives)

Act on electronization of healthcare – approved in 2021

ePrescription – widely used; elect. drug records not so widely used yet

Electronic sick certificate in operation

Health Information Portal NZIP.CZ – general information only (in 2021)

National recovery program (EU) – in negotiation, 14 topics, closest to AI is: Secondary use of health data (public awareness, mapping of needs, governance, legislation, basic infrastructure), data to be



Thank you for attention

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