Systemising the adoption of Artificial Intelligence in public healthcare systems: the Catalan approach

Generalitat de Catalunya

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Context: **Health/AI Program creation**

MISSION

Creation of an enabling environment for innovation in the field of Health through the development and implementation of AI solutions to **improve care for citizens and support Healthcare Professionals**

VISION

Lead the implementation of AI solutions to contribute to the improvement of **Healthcare Quality** and the **Sustainability** of the Healthcare system, valuing the generated knowledge.

VALUES

Transparency, efficiency, innovation, commitment, participation, respect, sustainability.

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Context: **Benefits**

ECOSYSTEM

Promote the AI ecosystem in Health by fostering research and innovation and facilitating the transfer of knowledge to the Healthcare System

EFFICIENCY

The development of these solutions at the systemic level will make it possible to look for efficiencies between all the centers of the System

Programa Salut/IA · Programa Salut/IA ·

DATA QUALITY

Participate in the promotion of the improvement in the quality of the information of the Health System

ALIGNMENT

It allows a strategic alignment of all medical centers in response to global health policies

EQUITY

Guarantee access to AI solutions by all citizens, avoiding inequalities between centers and homogenizing the quality of care

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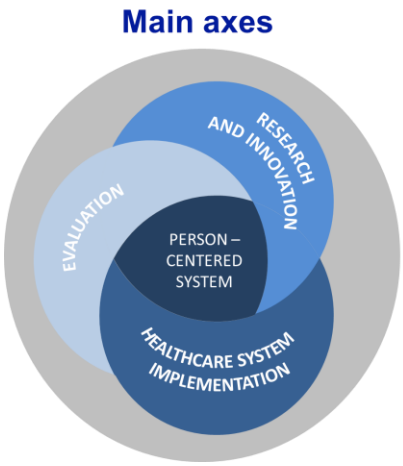
Main axes of the AI Strategy of Catalonia

The Program embraces the entire life cycle of AI tools; from its conceptualization to its implementation:



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HEALTH/AI PROGRAM - INNOVATION

Launching AI Challenges

Cover the needs of the Healthcare System, expressed through the Ministry of Health, that can be solved through the application of AI.

- **Diabetic Retinopathy** classification
- Identification of main findings in **Chest X-Ray** radiographs
- Identification of main findings in imaging tests in **Dermatology**
- Provision of reliable information in the scope of **drug prescription and medicines**

Supporting local AI initiatives

Promoting those initiatives in the Catalan ecosystem that represent a high value for the Health System.

- Mentoring during **project definition and execution**
- Definition of technical, ethical and legal requirements.
- Publication of **good practices guidelines**

Soon CE Mark guideline

Soon Data Protection guideline

Health AI Observatory

Observing the deployment of AI for Health and act as a radar of the latest innovations in the field.

- **Register of AI tools** to analyse the level of implementation of AI, the maturity of the solutions and identify solutions that could become systemic
- **Radar of the latest innovations in AI** in the field of Health at an international level: trends, regulations, reference documentation, dissemination of knowledge...

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Challenges of the Salut/IA program

1. S/ Needs identification

2. Challenge proposal development
- State-of-the-art review
- Use case definition
- Data identification
- Expert team definition
- Planning and budget estimation

D1-D2

3. Proposal approval and definition of the procurement process and executing entity.

4. Working group and experts constitution

5. Procurement process
- Preliminary market consultation
- Tender Planning
- Preparation of the specifications
- Publication of the specifications

D3-D5

6. Evaluation of the proposals and validation of the algorithms

7. Adjudication

D6

8. S/ Definition and initiation of deployment

9. Tracking

S/ Evolution of the solutions

S/ Monitoring

Continuous assessment

HEALTHCARE SYSTEM DATASETS

The solutions will be **validated** and subsequently **retrained** on the datasets.

Responsible entities:
- AQuAS
- Salut/IA Program Executive Committee.
- Fundació TIC Salut Social
- S/ Catalonia Healthcare System
- Other possible entities based on the challenge

Associated documentation:
- **D1** State-of-the-art study
- **D2** Challenge proposal
- **D3** CPM guidelines
- **D4** CPM final report
- **D5** Tender specifications
- **D6** Tender resolution

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HEALTH/AI PROGRAM – INNOVATION

Supporting local AI Initiaves

Mentoring during project definition and execution

- Identification of projects that represent a high value for the Health System
- Main needs identification
- Solution proposals
- Project's evolution tracking.

Publication of Good practices guidelines

Published guidelines
https://iasalut.cat/en/suport-a-iniciatives/

Good Practices for code development in AI for health

Explainability in Artificial Intelligence Guideline

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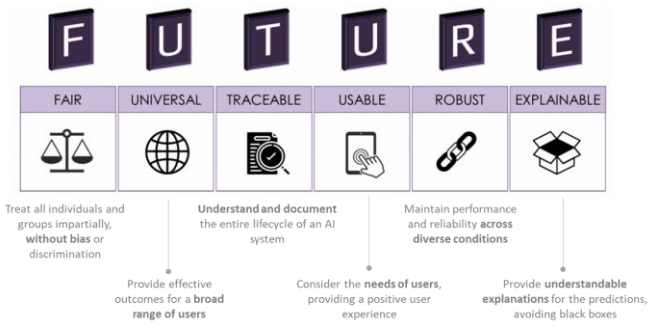
HEALTH/AI PROGRAM – INNOVATION

Supporting local AI Initiaves. Trustworthy AI framework

Definition of requirements for the implementation of trustworthy AI tools (ethical, legal and robust).
Definition of the technical, ethical and legal requirements: FUTURE principles



Data scientists
Clinicians
Ethicists
Social scientists
Legal experts

www.future-ai.eu

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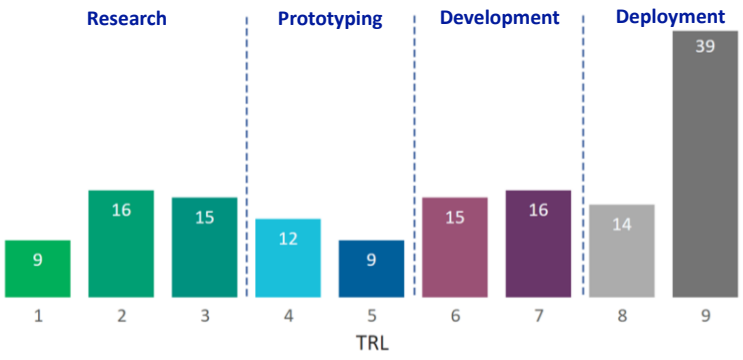
AI Observatory Indicators

145 AI tools registered

79 different entities

Technology Readiness Level (TRL)



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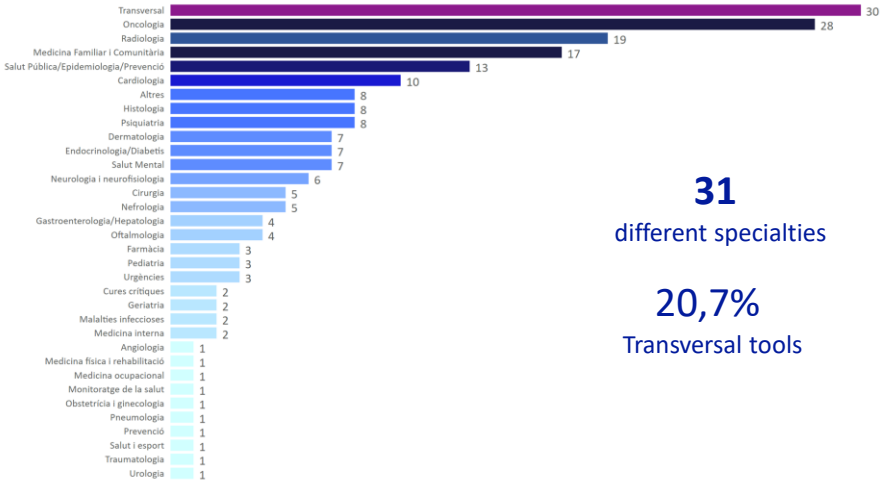
AI Observatory Indicators

Medical specialties



31
different specialties

20,7%
Transversal tools

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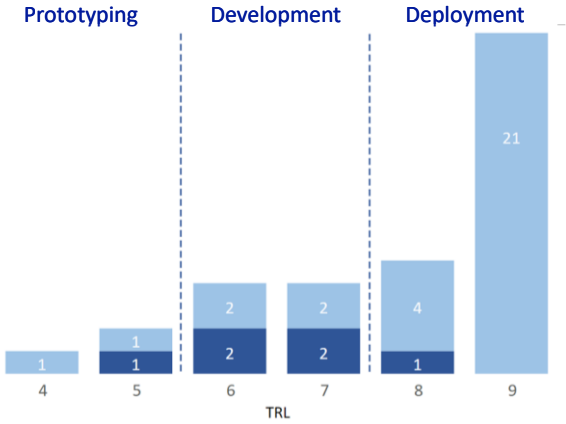
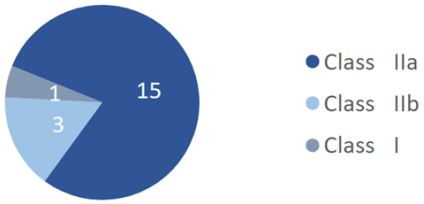
AI Observatory Indicators

Interoperability and standards



CE marking



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CE marked tools

AI Observatory Indicators

42% of the tools use
Explainability techniques

Combinations	Variable importance	CAM or similar	LIME	SHAP	Others	Number of tools
1	X					10
2		X				3
3	X		X	X		1
4	X				X	1

Most tools use **images** as input data
and some of them combine them with
tabular data

Combinations	Image	Tabular data	Text	Sound	Other	Number of tools
1	X					11
2	X	X				11
3					X	8
4		X				7
5		X	X			2
6	X		X			2
Other combinations						4

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HEALTH/AI PROGRAM - EVALUATION

Evaluation before implementation

Methodology for AI tools evaluation

Evaluation of tools before implementation at a systemic level

- Descriptive evaluation
- Impact evaluation
- Technical evaluation

Monitoring

Continuous evaluation of the implemented AI tools in the Catalan Healthcare System

- Design of a **monitoring system** for the implemented tools via AI Challenges.
- **Indicators report** for each implemented solution
- **Periodical retraining** of implemented tools

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Context

Main axes of the AI Strategy of Catalonia

1. Research and Innovation
   - AI Challenges
   - Supporting local AI initiatives
   - Health AI Observatory
2. Evaluation
3. **Implementation**

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HEALTH/AI PROGRAM - IMPLEMENTATION

Technological Integration

- **Integrate solutions** into healthcare professionals workstations and into Information Systems
- **Data Governance**

Training of Healthcare Professionals

- Development of an **AI Training Plan** depending on the needs and the profile: physicians, managers, researchers, patients...
- **Change management**

Communication

- **New website design for the Health/AI Program**
- **Visual identity design**
- **Participation in Congresses**
- **Events organization**

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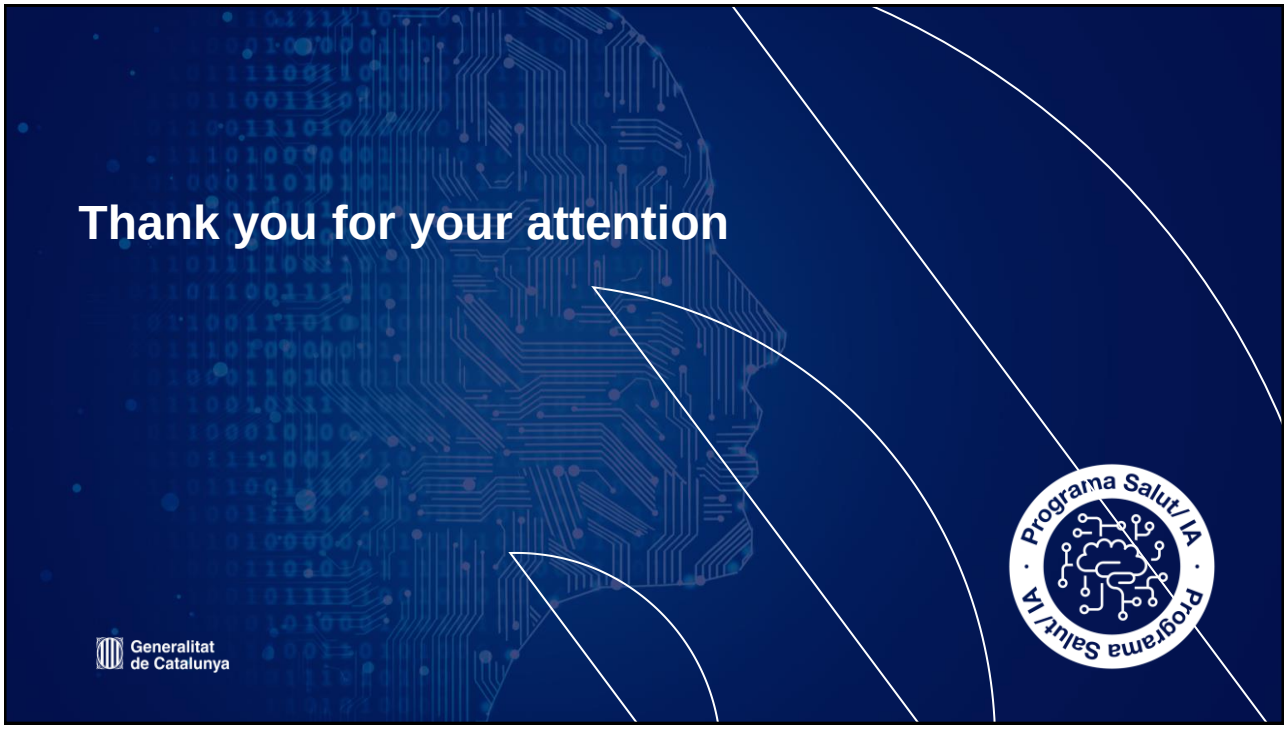
Thank you for your attention
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