



**Euro-CASE**

Academies of Engineering Sciences

*Annual Conference  
Budapest,  
September 23, 2024*

## ***SESSION 2 - Sustainable Healthcare Management: Technical Needs and Engineering solutions***

### **Introduction**

## ***Towards Health&Care 5.0***

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**ITATEC** Founding Member  
*Italian Academy of Engineering and Technology*



# From Medicine 1.0....

1.0

Symptom-based  
*Intuition medicine*



...Symptom(s) corresponding to the disease itself...  
(Galenus, II century AD)

# ...to Medicine 2.0....

1.0

**Symptom-based**  
*Intuition medicine*

2.0

**Interaction-based**  
*Measure medicine*



Theophile Hyacinthe Laennec (1816)

# ...to Medicine 3.0....



Trusted evidence.  
Informed decisions.  
Better health.

Our evidence About us Join Cochrane News and jobs



Our evidence

1.0

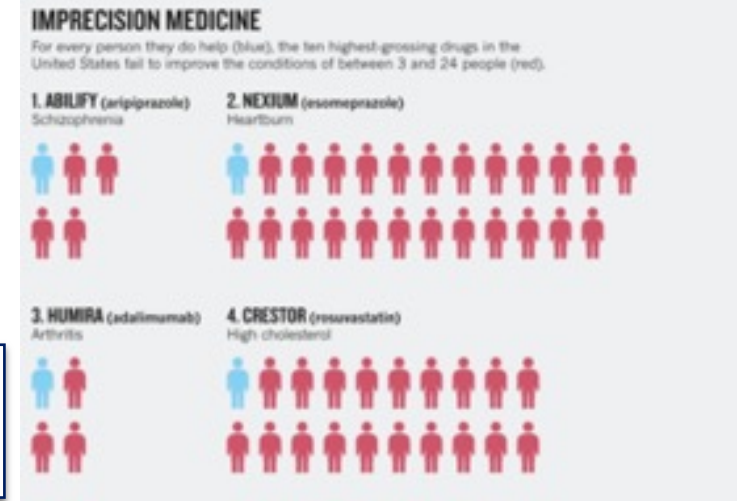
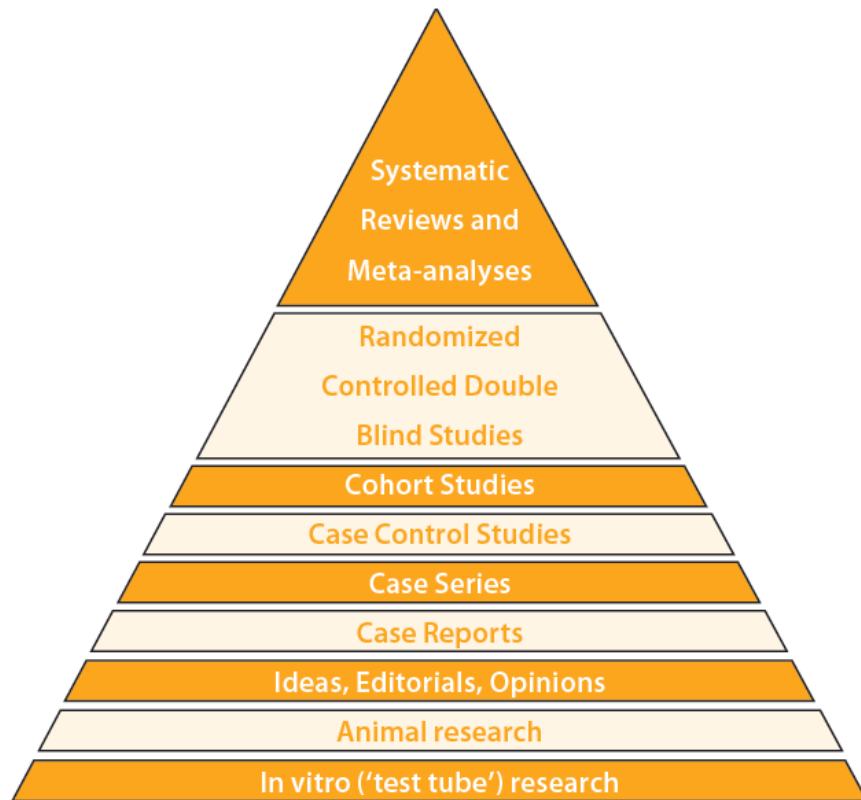
**Symptom-based  
*Intuition Medicine***

2.0

**Interaction-based  
*Measure Medicine***

3.0

**Pattern-based  
*Evidence Medicine***



## Personalized medicine: Time for one-person trials

Nicholas J. Schork

29 April 2015

Precision medicine requires a different type of clinical trial that focuses on individual, not average, responses to therapy, says Nicholas J. Schork.

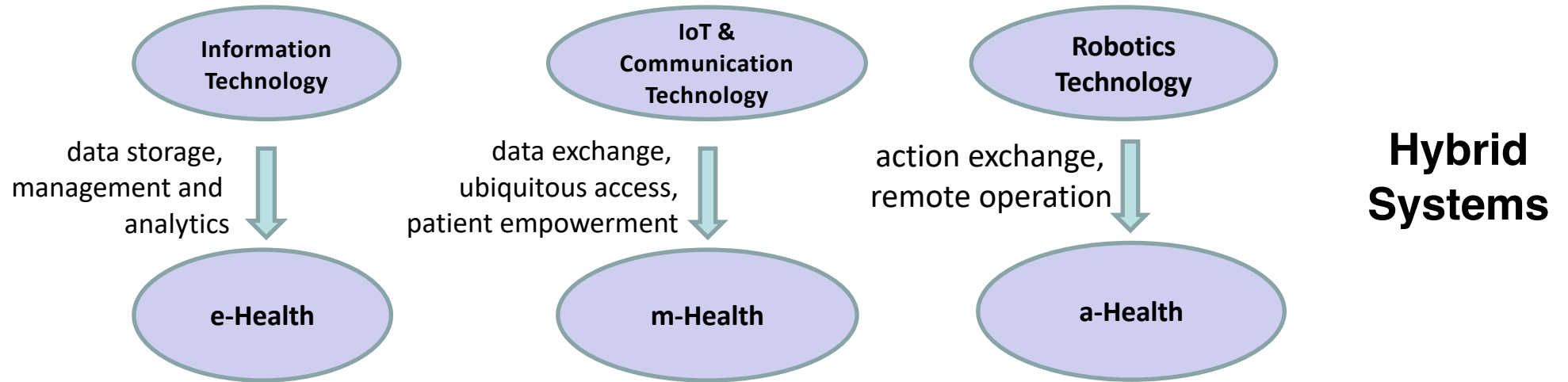
nature



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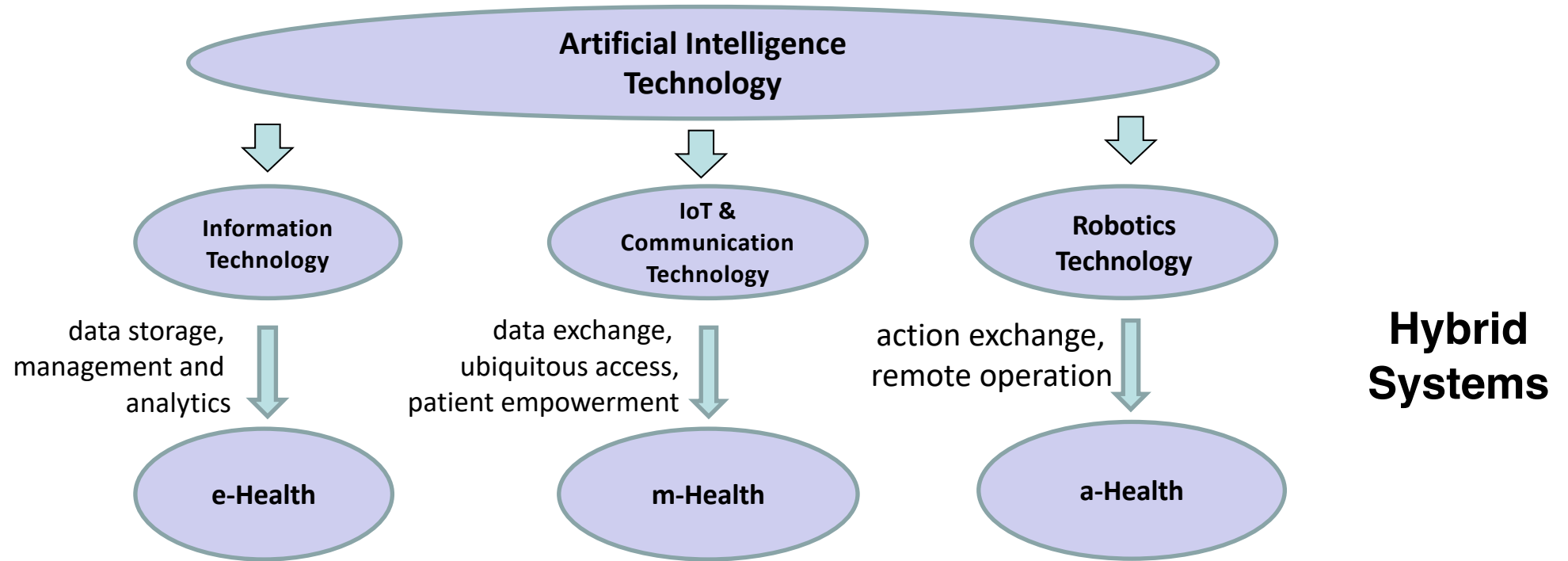


## Big Data, IoT and Robotics for the Future of Medicine



*From electronic-Health and mobile-Health to..... **automated-Health***

## Big Data, IoT, AI and Robotics for the Future of Medicine



*From electronic-Health and mobile-Health to..... **automated-Health***

# ...to Medicine 4.0....

1.0

**Symptom-based  
*Intuition Medicine***

2.0

**Interaction-based  
*Measure Medicine***

3.0

**Pattern-based  
*Evidence Medicine***

4.0

**Algorithm-based  
*Precision Medicine***



INDUSTRY HORIZONS // SPRING 2017

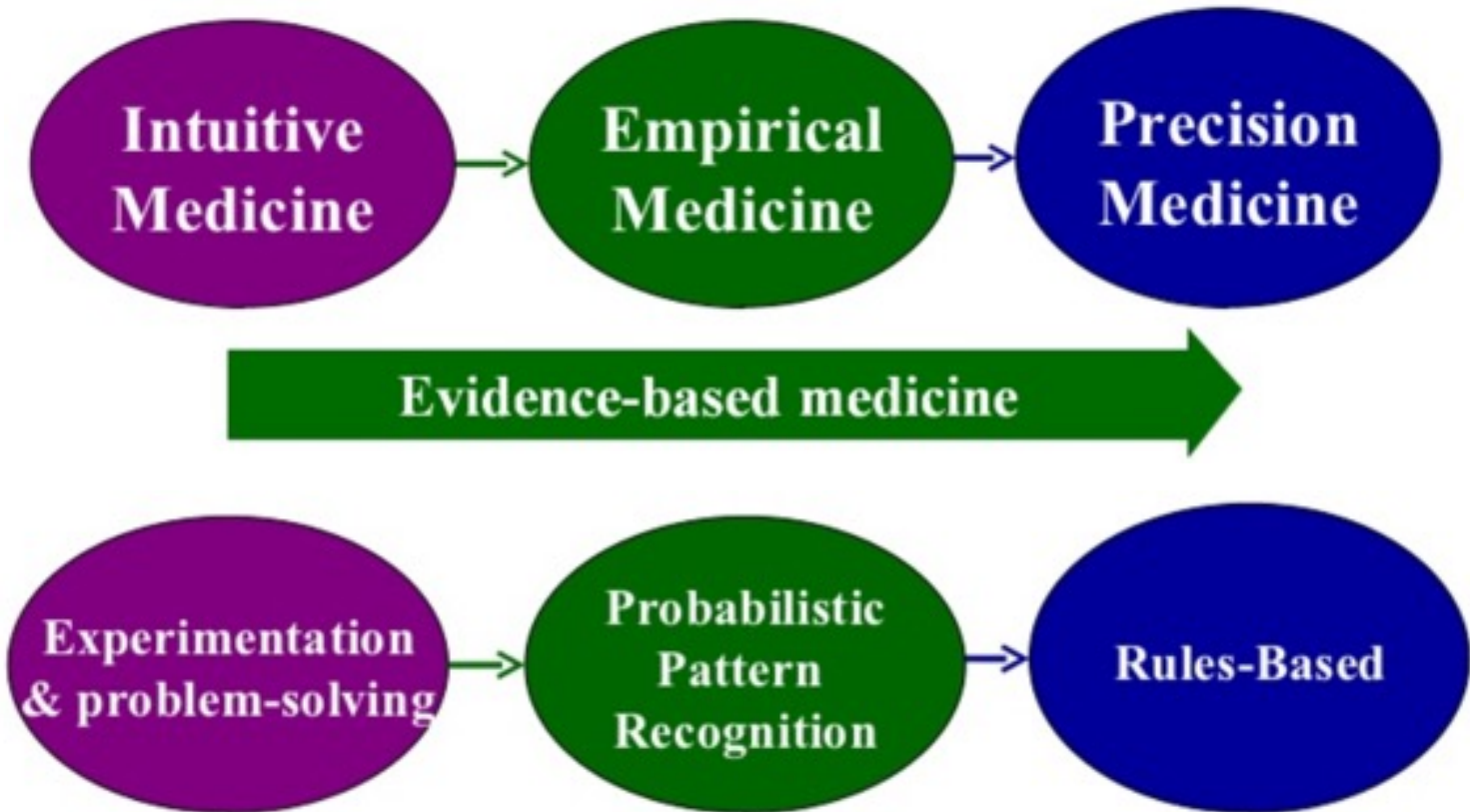
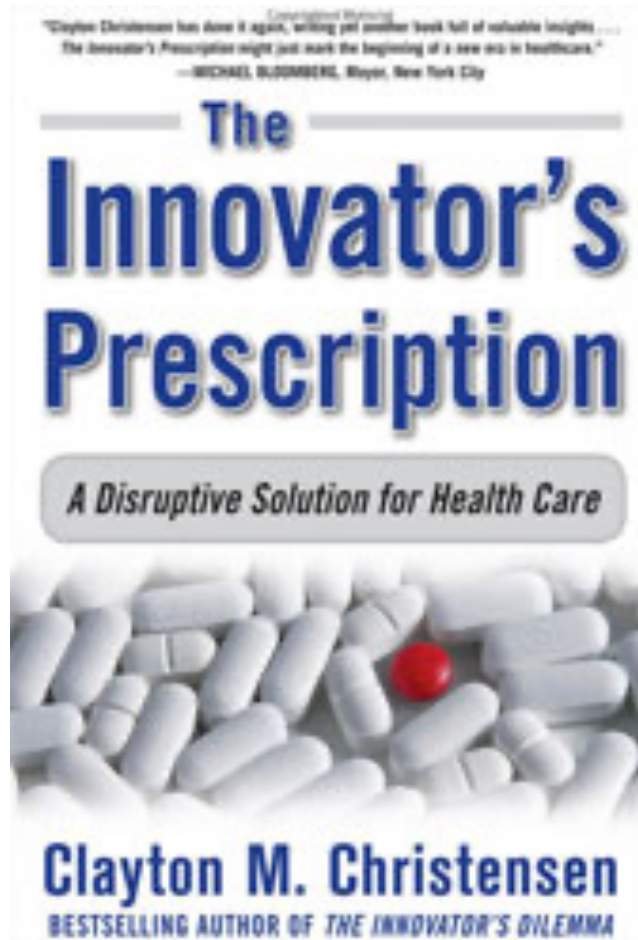
## How Disruptive Innovation Can Finally Revolutionize Healthcare

A plan for incumbents and startups to build a future of better health and lower costs

*By Clayton Christensen, Andrew Waldeck and Rebecca Fogg*



# ...to Medicine 4.0....



**General Hospitals** ➡ **Decentralization**



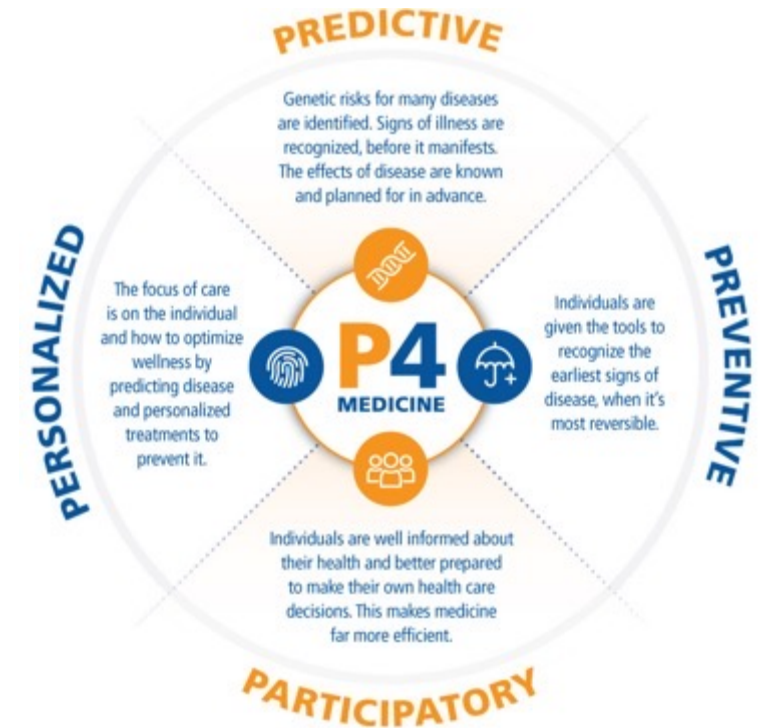
# From Medicine 4.0...to P4.0 Medicine...

1.0  
**Symptom-based  
*Intuition Medicine***

2.0  
**Interaction-based  
*Measure Medicine***

3.0  
**Pattern-based  
*Evidence Medicine***

4.0  
**Algorithm-based  
*Precision (4P) Medicine***



# HORIZON EUROPE STRATEGIC VISION...

## Strategic Plan 2025 – 2027 - Cluster 1 – Health



**Italian Delegate: Eugenio Guglielmelli**



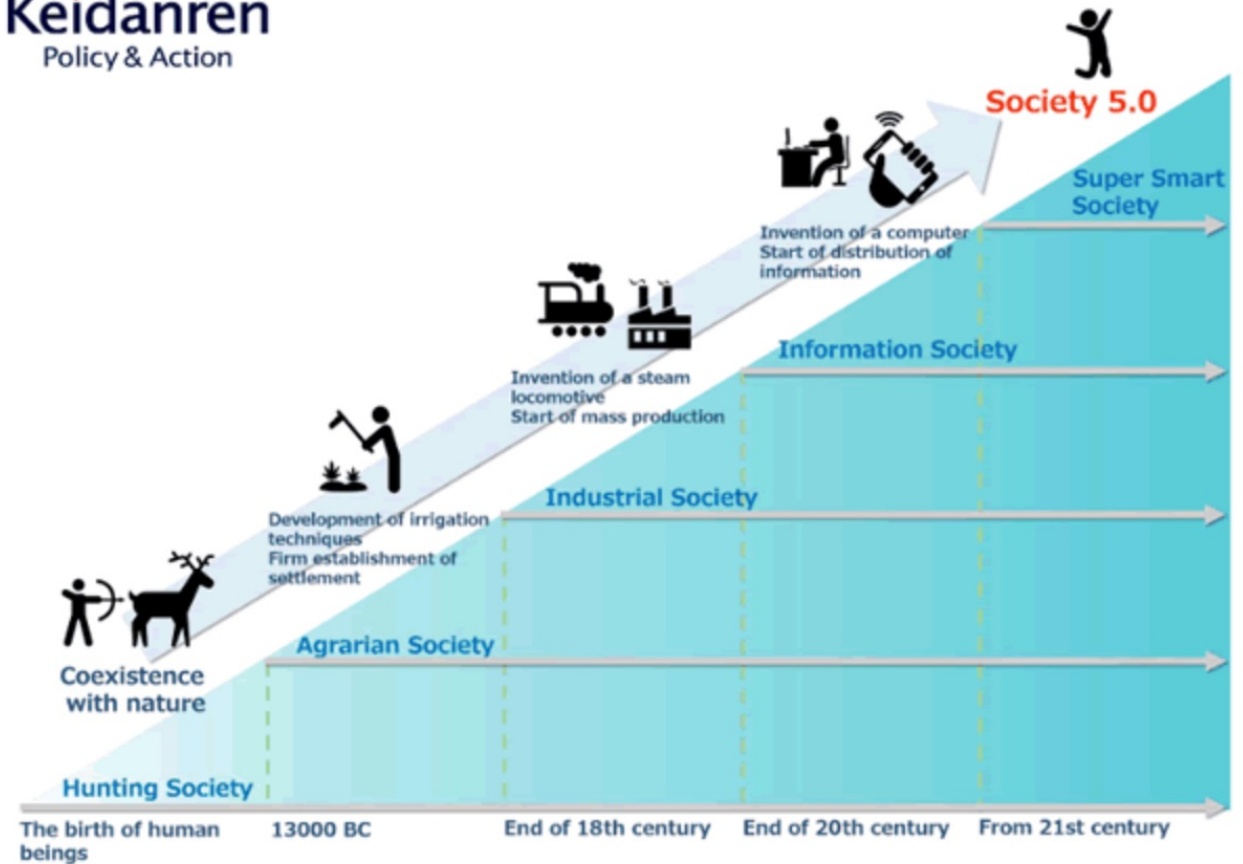
- Healthcare systems more inclusive, accessible, sustainable and resilient
- Impacts of climate change and environmental stressors on people's health and well-being
- New technologies and digital solutions to improve healthcare and safe health systems
- Reducing the burden of illnesses and disabilities on individuals and communities
- To prevent, detect and rapidly respond to cross-border health emergencies
- To increase the resilience and long-term sustainability of EU Member States' and Associated Countries' healthcare systems

# Towards Society 5.0...

The challenge of governing new technologies for a more *and more* inclusive Society



Keidanren  
Policy & Action



The evolutionary aspect of the Society 5.0 concept as introduced in the 5th Science and Technology Basic Plan of Japan – source [Keidanren paper \(PDF opens\)](#)



# The death valley



Butler, Nature 2008

# BE READY

European Partnership for  
Pandemic Preparedness



Funded by  
the European Union

EXSCALATE  
4COV

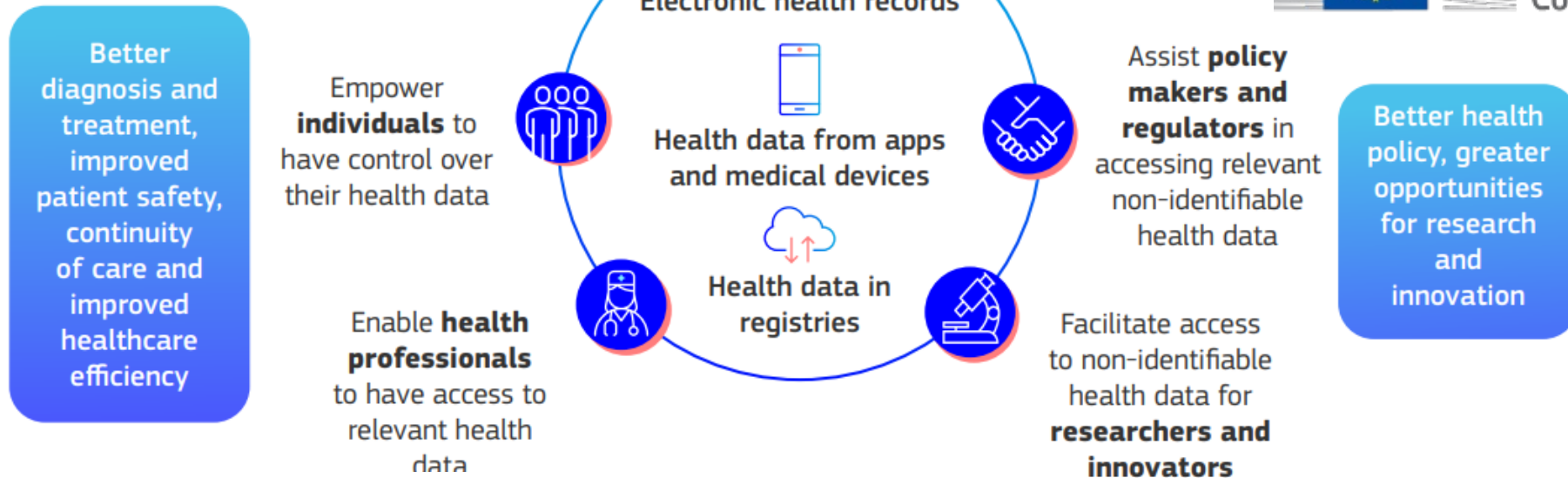
Home Science DrugBox Consortium Board League Results Open Access  
News Contacts

E4C is the public-private consortium backed by the European Commission's H2020 program. It currently represents the most advanced center of competence aimed at fighting the coronavirus by combining the best supercomputing resources and artificial intelligence with state of the art experimental facilities up through clinical validation.





# European Health Data Space



**5.5 billion €**

In savings for the EU over ten years from better access and exchange of health data in **healthcare**



**20-30%**

Additional growth of the digital health market



**5.4 billion €**

In savings for the EU over ten years from better use of health data **for research, innovation and policy making**

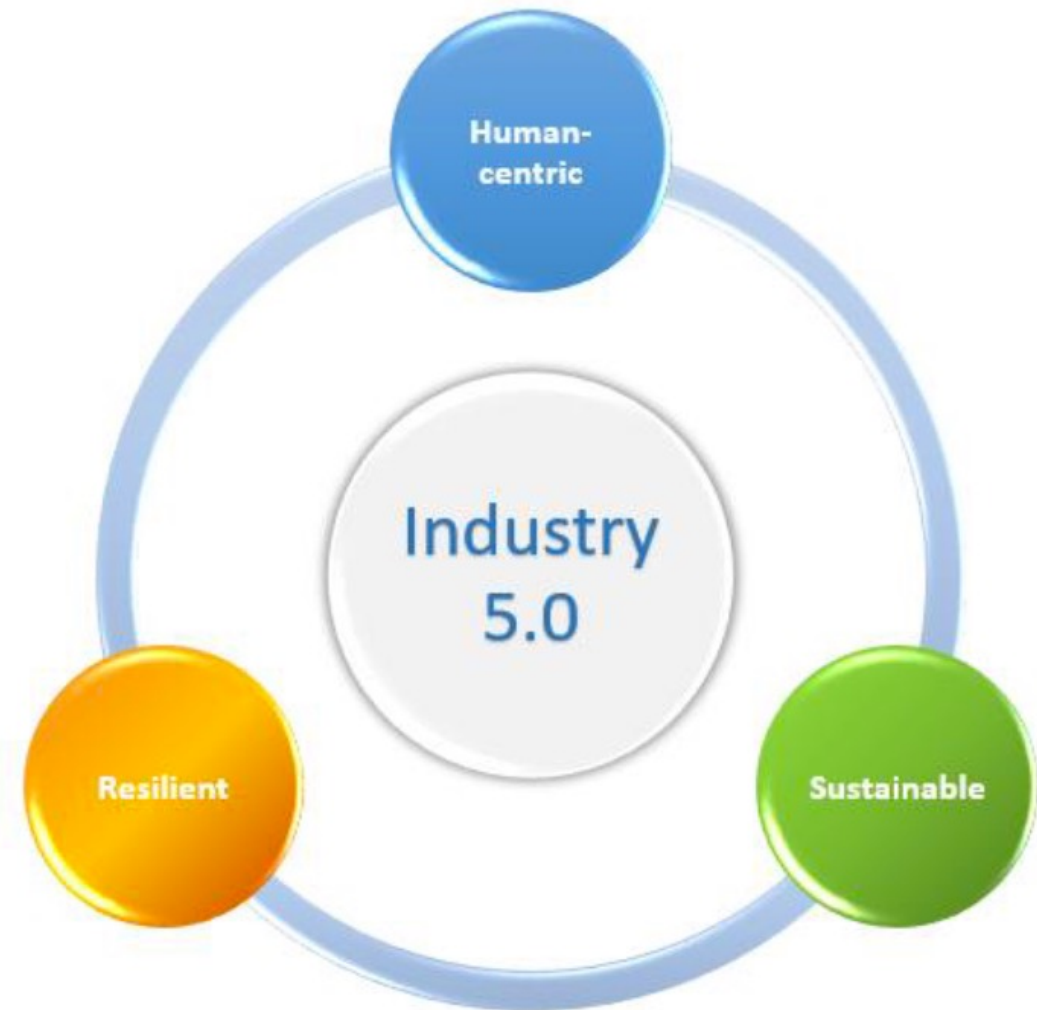
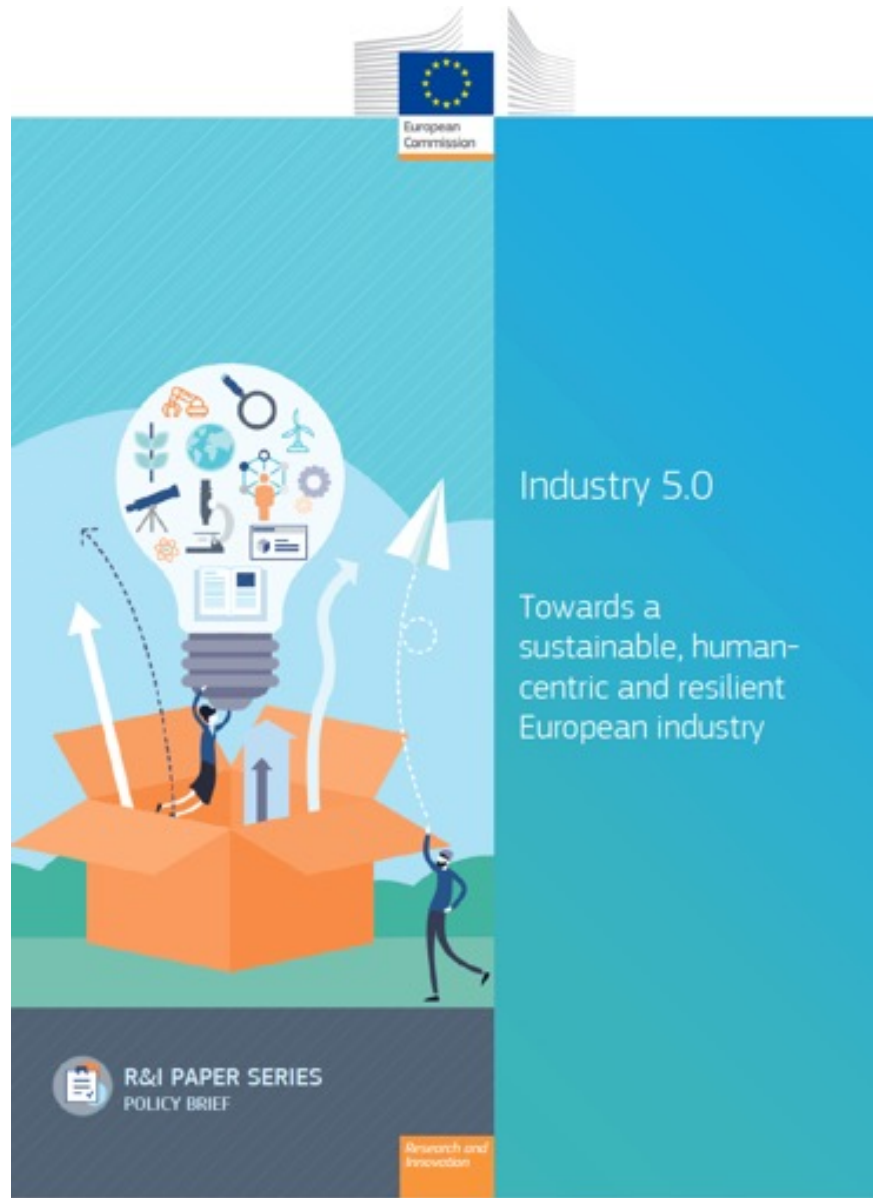


**My health @ EU**  
**eHealth Digital Service Infrastructure**  
A service provided by the European Union

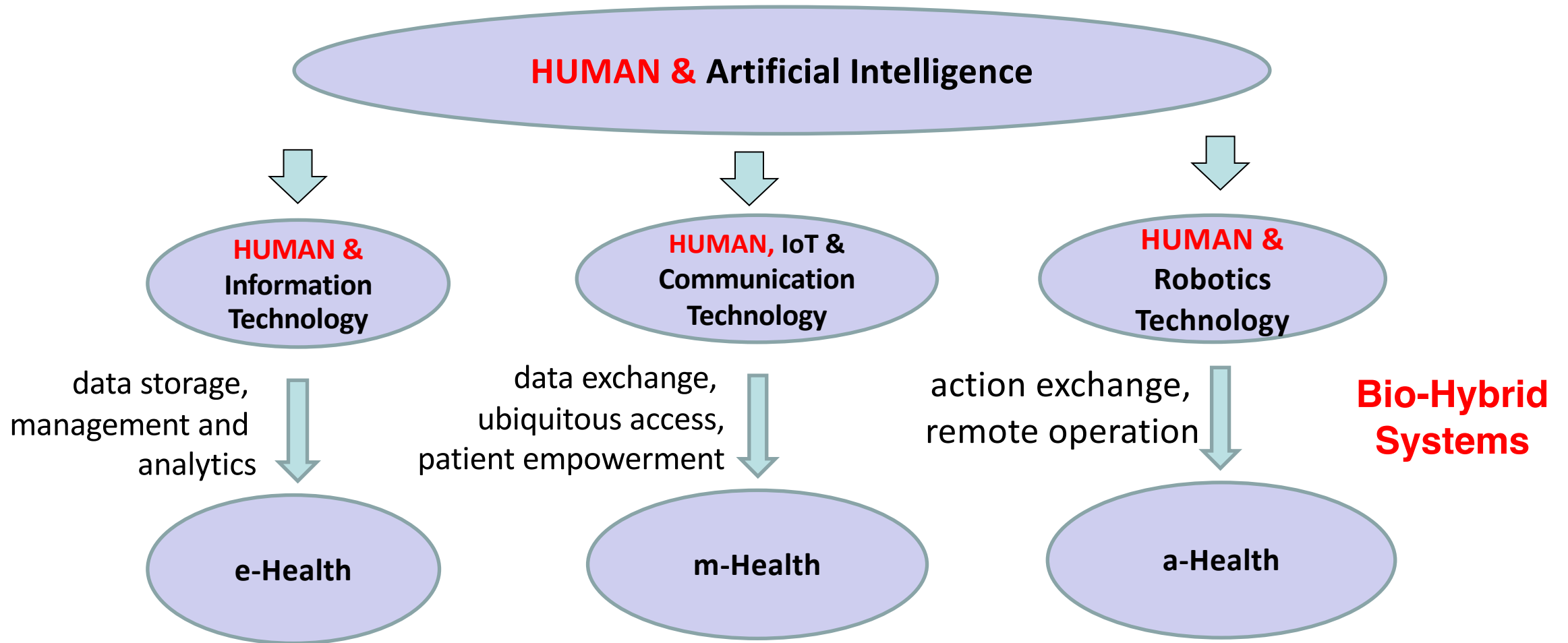




# Towards Society & Industry 5.0...

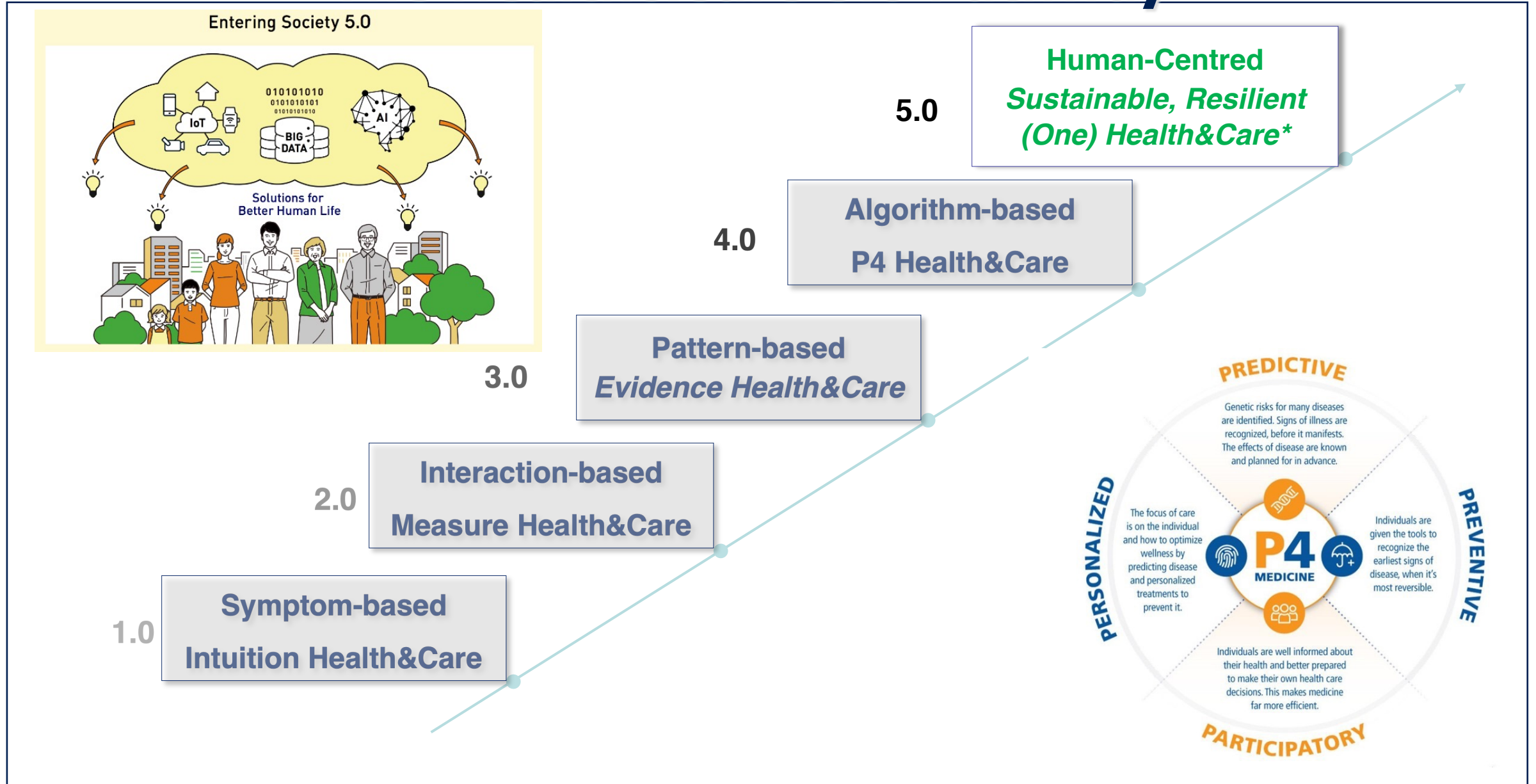


# Towards Health&Care 5.0...



*From electronic-Health and mobile-Health to.....**automated-Health***

# The Health&Care 5.0 Pathway



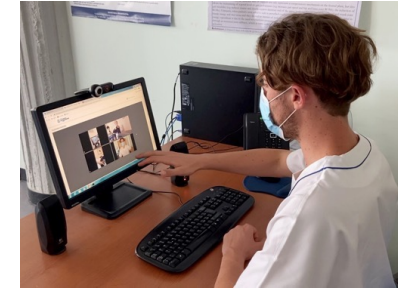


From Bio-Safety&Security...

...and Bio-Cooperative Health...

...to Bio-Synergy...

...and up to Bio-Symbiosis





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**THANK YOU**

