#InvestEUresearch

Horizon 2020 Work Programme for Research & Innovation 2018-2020

The societal challenge
'Health, demographic change
and well-being'

Dr Christina Kyriakopoulou

Health Directorate, European Commission

Unit- Innovative tools, technologies and concepts in health research

Research and Innovation

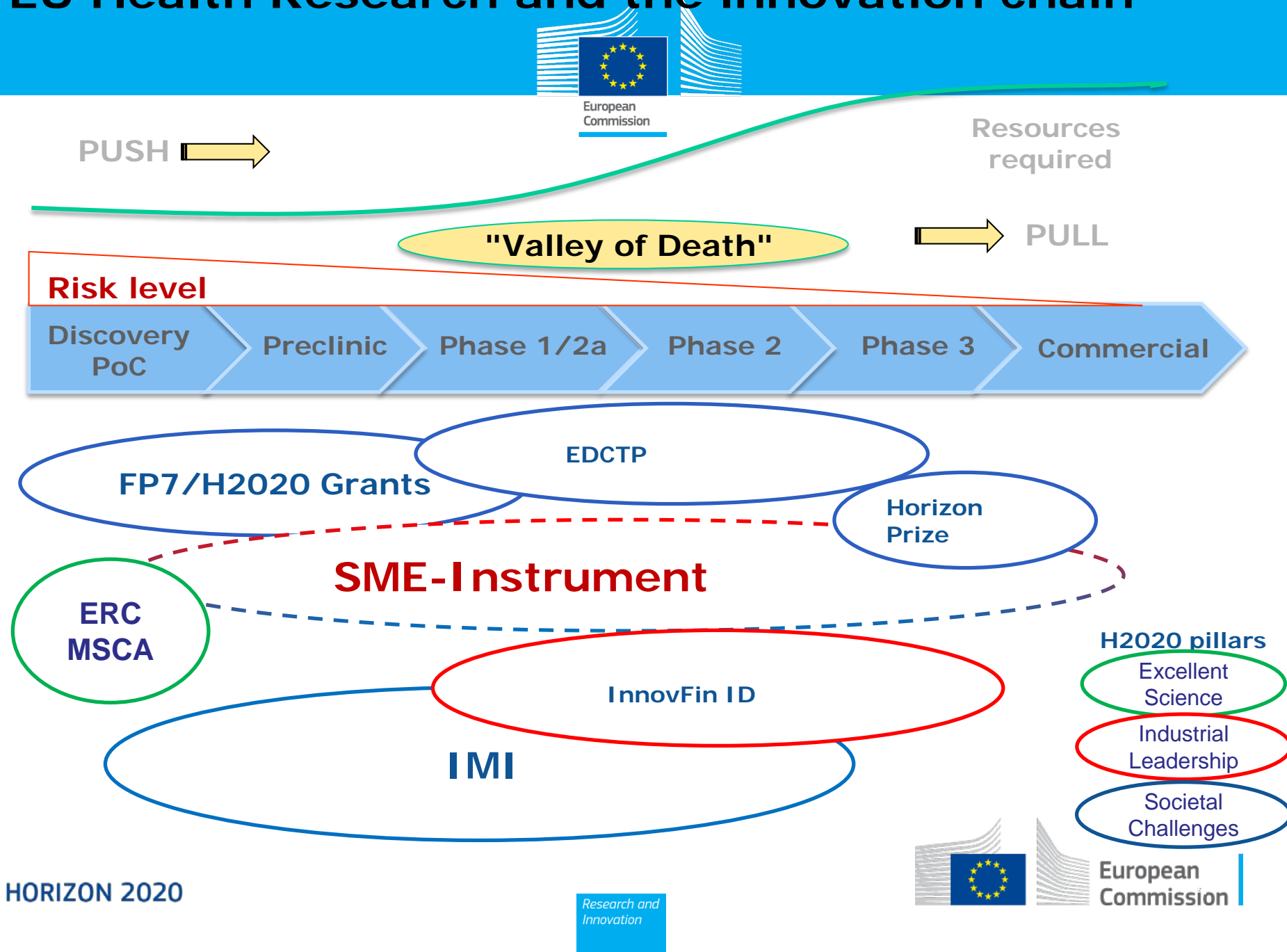# Horizon 2020 (2014-2020)
Three priorities

Excellent science

Industrial leadership

Societal challenges

Health Research in Horizon 2020
&
Societal challenge 1 "Health, demographic change & well-being"

EU Health Research and the innovation chain

European Commission

PUSH →

Resources required

"Valley of Death"

→ PULL

Risk level

| Discovery PoC | Preclinic | Phase 1/2a | Phase 2 | Phase 3 | Commercial |

FP7/H2020 Grants

EDCTP

Horizon Prize

SME-Instrument

ERC MSCA

InnovFin ID

IMI

H2020 pillars

Excellent Science

Industrial Leadership

Societal Challenges

HORIZON 2020

Research and Innovation

European Commission

BUDGET: € 3.276 billion
EC: €1.638 bn + EFPIA: €1.425 bn + Associated Partners: €0.213 bn

innovative medicines initiative

- 30 November 2017: Launch of Call 13 (16 topics) – EU contribution: € 124.5m + In-kind contribution from EFPIA &Associated Partners: € 113.5m

- supports health research and innovation, speeding up the development of innovative medicines, particularly in areas of unmet medical need

- covers the full spectrum of drug discovery and development

- facilitates collaboration between universities, research centres, the pharmaceutical and other industries; SMEs, patient organisations, and medicines regulators

- Strategic Research Agenda based on the WHO Priority Medicine Report renewed in July 2013

http://www.imi.europa.eu/get-involved
http://www.imi.europa.eu/apply-funding
http://www.imi.europa.eu/apply-funding/general-overview/tips-applicants

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Horizon 2020 so far

- 2 biannual Work Programmes: WP 2014-2015, WP 2016-2017
- More than € 2.6 billion investment in Horizon 2020 projects

Horizon 2020 – what comes now

- first triennial Work Programme: WP 2018-2020
- the largest budget/year in the history of the EU Framework Programmes – ca. € 700 million/year for collaborative research (excluding IMI, EDTP, and the SME Instrument)
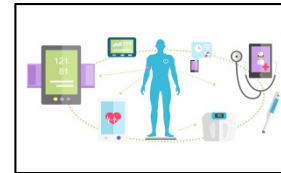- Topics for 2020 in more detail will be published in mid-2018

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European Commission

Health collaborative research –
7 priorities for 2018–2020
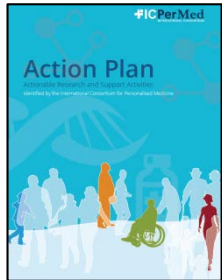
Personalised medicine

Innovative health and care industry

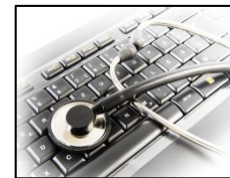Innovative health, and care systems – Integration of care

Decoding the role of the environment for health and well-being

Digital transformation in Health and Care

Infectious diseases and improving global health

Trusted Big Data solutions and Cybersecurity for Health and Care

Personalised Medicine
in Work Programme 2018–2019 (I)

- BHC-03-2018: Exploiting research outcomes and application potential of the human microbiome for personalised prediction, prevention and treatment of disease

- BHC-04-2018: Rare Disease European Joint Programme Cofund

- BHC-05-2018: International flagship collaboration with Canada for human data storage, integration and sharing to enable personalised medicine approaches

- BHC-01-2019: Understanding causative mechanisms in co- and multimorbidities

- BHC-02-2019: Systems approaches for the discovery of combinatorial therapies for complex disorders

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Innovative health and care systems – Integration of care in Work Programme 2018–2020

- BHC-23-2018: Novel patient-centred approaches for survivorship, palliation and/or end-of-life care

- BHC-26-2018: HTA research to support evidence-based healthcare

- BHC-22-2019: Mental health in the workplace

- BHC-25-2019: Demonstration pilots for implementation of personalised medicine in healthcare

Coordination and support actions

- HCO-12-2018: Innovation in healthcare – a CSA towards using pre-commercial procurement and public procurement of innovative solutions in healthcare systems

Research and Innovation

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Priority 6
CALL – Digital transformation in Health and Care

- Better access to healthcare and sustainability of health and care systems

- To empower the participation of citizens and facilitate the transformation of health and care services to more digitised, person-centred and community-based care models

- eHealth and mHealth

- ICT for Active and Health Ageing

IMPACT: to maximise the potential of the digital economy in the health and care sectors

POLICY DRIVERS + SUPPORT FOR:

Connected Digital Single Market

European Cloud Initiative

European Free Flow of Data initiative

Silver Economy initiative

European Commission

Digital transformation in Health and Care in Work Programme 2018–2020 (I)

- DTH-03-2018: Adaptive smart working and living environments supporting active and healthy ageing

- DTH-07-2018: Exploiting the full potential of in-silico medicine research for personalised diagnostics and therapies in cloud-based environments

- DTH-08-2018: Prototyping a European interoperable Electronic Health Record (EHR) exchange

- DTH-01-2019: Big data and Artificial Intelligence for monitoring health status and quality of life after the cancer treatment

- DTH-05-2019: Large scale implementation of digital innovation for health and care in an ageing society

- DTH-09-2019: Scaling up the univocal Identification of Medicinal Products

- DTH-10-2019-2020: Digital health and care services

- DTH-11-2019: Large Scale pilots of personalised & outcome based integrated care

Digital transformation in Health and Care in Work Programme 2018–2019 (II)

Coordination and support actions

- HCC-01-2018: Supporting investment in smart living environments for ageing well through certification

- HCC-03-2018: Support to further development of international cooperation in digital transformation of health and care

- HCC-04-2018: Digital health and care services – support for strategy and (early) adoption

- HCC-05-2018: Support to a Digital Health and Care Innovation initiative in the context of Digital Single Market strategy

- HCC-02-2019: Support for the large scale uptake of open service platforms in the Active and Healthy Ageing domain

Priority 7
CALL – Trusted digital solutions and Cybersecurity in Health and Care

- Multidisciplinary technologies and solutions in health and care with a focus on cybersecurity

- Secure and user-driven ICT-based solutions in early risk detection and interventions

- Aggregation of a variety of new and existing data sources

FOCUS AREAS
- Digitising and transforming European industry and services
- Boosting the effectiveness of the Security Union

POLICY DRIVERS + SUPPORT FOR:

Connected Digital Single Market

Big Data in healthcare

European Data Protection Regulation

European Commission

Trusted digital solutions and Cybersecurity in Health and Care in Work Programme 2018–2019

- SU-TDS-02-2018: Toolkit for assessing and reducing cyber risks in hospitals and care centres to protect privacy/data/infrastructures

- SU-TDS-03-2018: Raising awareness and developing training schemes on cybersecurity in hospitals

- DT-TDS-01-2019: Smart and healthy living at home

Topics for 2020
Better Health and care, economic growth and sustainable health systems (I)

Personalised medicine
- BHC-06-2020: Digital diagnostics – developing tools for clinical decisions integrating in vitro and in vivo diagnostics
- HCO-01-2018-2019-2020: Actions in support of the International Consortium for Personalised Medicine
- HCO-03-2020: Improving EU-13 participation in EU-supported health research programmes
- HCO-14-2020: ERA-NET Place holder 2

Innovative health and care industry
- BHC-08-2020: New therapies for Non Communicable Diseases
- BHC-11-2020: New, animal-free regulatory test methods for human safety testing at the horizon of 2030
- BHC-12-2020: Boosting the translation of results of health research into validated, innovative applications

Topics for 2020
Digital Transformation in Health and Care

- DTH-02-2020: Personalised early risk prediction, prevention and intervention, RIA
- DTH-04-2020: International cooperation in digital solutions and robotics for independent living
- DTH-06-2020: Accelerating the uptake of in-silico methods for testing medicines with dermatological use
- DTH-10-2019-2020: Digital health and care services
- HCC-06-2020: Support to eHealth Innovation ecosystems in Europe
- HCC-07-2020: Support for European eHealth Interoperability roadmap deployment
- HCC-08-2020: Scaling up innovation for active and healthy ageing
- HCC-09-2020: Supporting deployment of eHealth in developing countries for better health outcomes

Digital Transformation in Health and Care

- DT-ICT-12-2020: The smart hospital of the future
- DT-TDS-04-2020: Demonstrating the potential and benefits of a European Digital Health Infrastructure for Personalised Medicine

European Commission

- **Data sharing platforms-portals**

- **Big-data analytics**

- **Bioinformatics tools**

- **Advanced statistical analysis (network analysis)**

- **Predictive Computational/Mathematical models**

- **Systems biology/systems medicine disease models**

- **In-silico tools & multiscale models**

- **Mobile health/sensors**

European Commission

Work Programme 2014

PHC 26 – 2014: Self-management of health and disease: citizen engagement and mHealth

Scope:

Proposals shall enable individuals to become co-managers of their health and wellbeing (including physical and mental wellbeing, equality, health literacy, life style factors such as nutrition and smoking) with the help of ICT, tools and personalised services...

Proposals should focus their research on mhealth application development for disease management…

myAirCoach

- To develop a holistic mHealth personalised asthma monitoring system empowering patients to manage their own health by providing user friendly tools to increase the awareness of their clinical state and effectiveness of medical treatment

- To develop an ergonomic, compact and efficient sensor-based inhaler that will be in continuous communication with a mobile device

- The myAirCoach framework will be validated with carefully designed patient cohorts of patients in different sites

- a "personal mHealth guidance system" will empower patients to customize their treatment towards personalised guidelines, either automatically or driven by healthcare professional in a telemedicine manner.

PHC-02-2015: Understanding disease: systems medicine

Scope: Proposals should focus on new avenues for understanding the complexity of clinical phenotypes in multifactorial diseases and/or their co-morbidities. This should entail the development/optimisation and/or application of systems medicine approaches, and integration of biomedical and clinical data to produce or refine disease models using advanced statistical, computational and mathematical approaches. The predictive value of such models should be validated in well-phenotyped patient cohorts, taking due account of gender, and their clinical potential thoroughly investigated.

EuroPOND

European Commission

www.europond.eu
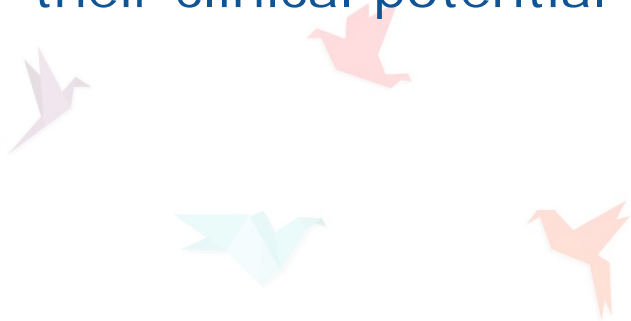
Project outcomes

- **Computational models/algorithms predictive of the disease progression in individual patients**

- **Speed-up early diagnosis and better match treatments for patients' needs**
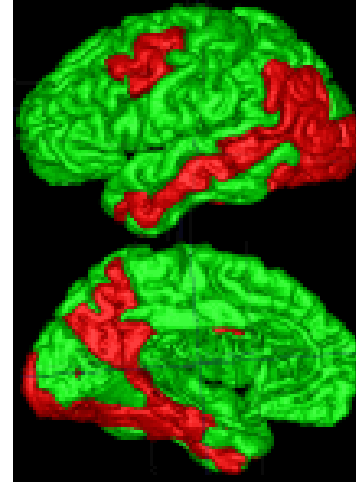
Highly interdisciplinary team

- **Computer scientists**
- **Statisticians**
- **Neuroimaging experts**
- **Neurologists**
- **Epidemiologists**

EuroPOND
European Progression Of
Neurodegenerative Disease initiative

SC1-PM-16—2017: In-silico trials for developing and assessing biomedical products

Scope: Proposals will develop innovative scientific and technological in-silico trials solutions for product design, development and assessment of drugs and other biomedical products (including products used in nuclear medicine, bioactives and medical foods). The proposals will foresee also the proofs of concepts and methods to demonstrate the capabilities of these solutions to be used in practice...

INSIST

- To develop *in-silico* clinical stroke trials in which stroke and treatment are modeled.

- To generate virtual populations of stroke patients, generate and validate in silico models for intra-arterial thrombectomy, thrombosis and thrombolysis, and microvascular perfusion and neurological deterioration after stroke

- The *in-silico* models and virtual populations will be combined to simulate clinical trials and validated by simulating and comparing finalized and currently running trials.

European Commission

European Commission

Digital Single Market

LAW | 25 April 2018

Communication on enabling the digital transformation of health and care in the Digital Single Market; empowering citizens and building a healthier society

- *Citizens' secure access to their health data, also across borders;*

- *Personalised medicine through shared European data infrastructure;*

- *Citizen empowerment with digital tools for user feedback and person-centred care.*

Research and Innovation

EC Communication Health and Care in the Digital Single Market (April 2018)

Personalised medicine:

- Coordination of stakeholders to share data and infrastructure;

- Development of technical specifications for secure access and cross-border exchange of health datasets;

- Pilot actions to demonstrate benefits.

European Open Science Cloud (EOSC)
Digital Single Market

Providing European science, industry and public authorities with world-class digital infrastructure

Staff Working Document SWD(2018)83; March 2018 Strategic Implementation Roadmap; May 2018

EUROPEAN OPEN SCIENCE CLOUD
BRINGING TOGETHER CURRENT AND FUTURE DATA INFRASTRUCTURES

A trusted, open environment for sharing scientific data

Open and seamless services to analyse and reuse research data

Linking data

Connecting across borders and scientific disciplines

Connecting scientists globally

Improving science

Long term and sustainable
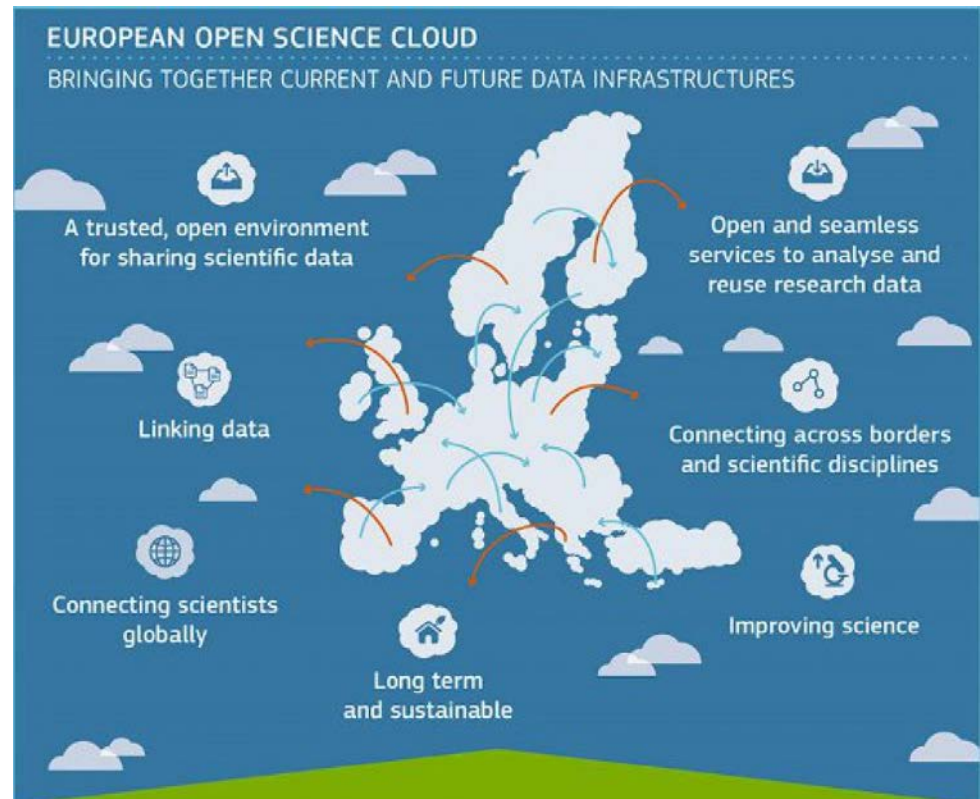
A. The EOSC will allow for universal access to data and a new level playing field for EU researchers

Researcher

EOSC
1. Access to all European research data
2. Access to world-class data services
3. Clear rules of use and service provision
4. FAIR data tools, training and standards
5. Sustainable after the grant

CERN, EMBL, ELIXIR, etc.

Institutional repository

Member State Infrastructure

New provider/ service
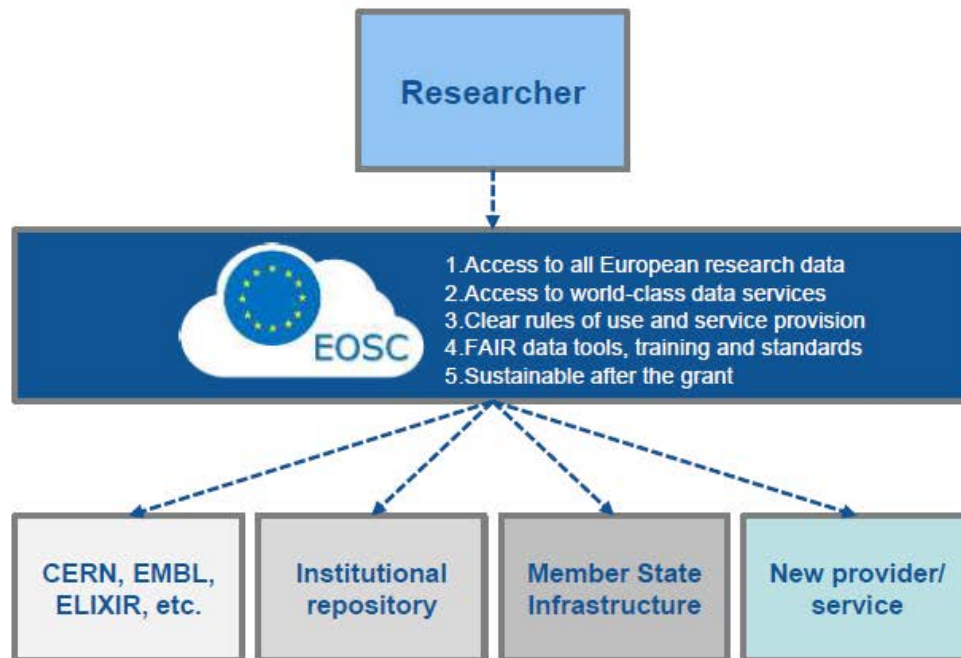
- Easy access through a universal access point for ALL European researchers
- Cross-disciplinary access to data unleashes potential of interdisciplinary research
- Services and data are interoperable (FAIR data)
- Data funded with public money is in principle open (as open as possible, as closed as necessary)
- EOSC will help increase recognition of data intensive research and data science

Seamless environment, enabling interdisciplinary research

Commission proposal for
Horizon Europe

**THE NEXT EU RESEARCH & INNOVATION
PROGRAMME (2021 – 2027)**

#HorizonEU

European
Commission

Research and
Innovation

Horizon Europe

is the Commission proposal for a **€100 billion** research and innovation funding programme for seven years (2021-2027)

to strengthen the EU's scientific and technological bases

to boost Europe's innovation capacity, competitiveness and jobs

to deliver on citizens' priorities and sustain our socio-economic model and values

€4.1 billion are proposed to be allocated for defence research, in a separate proposal for a European Defence Fund

European Commission

While benefiting from world–class research and strong industries…

Our knowledge and skills are our main resources.

→ **7%** of the world's population

→ **20%** of global R&D

→ **1/3** of all high-quality scientific publications
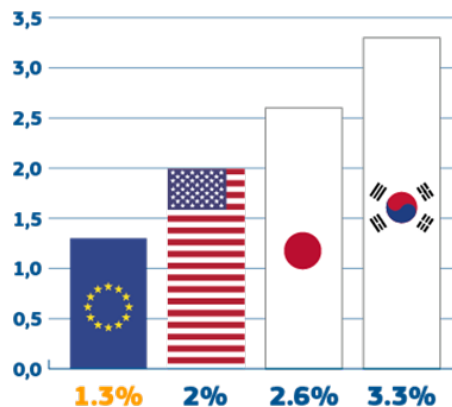
1.3%
EU business
R&D investment

1.3% 2% 2.6% 3.3%

…Europe fails to transform leadership in science into leadership in innovation and entrepreneurship

European Commission

Horizon Europe: evolution not revolution

Specific objectives of the Programme

Support the creation and diffusion of high-quality knowledge	Strengthen the impact of R&I in supporting EU policies	Foster all forms of innovation and strengthen market deployment

Optimise the Programme's delivery for impact in a strengthened ERA

Pillar 1
Open Science

- European Research Council
- Marie Skłodowska-Curie Actions
- Research Infrastructures

Pillar 2
Global Challenges and Industrial Competitiveness

Clusters
- Health
- Inclusive and Secure Society
- Digital and Industry
- Climate, Energy and Mobility
- Food and natural resources

Joint Research Centre

Pillar 3
Open Innovation

- European Innovation Council
- European innovation ecosystems
- European Institute of Innovation and Technology

Strengthening the European Research Area

Sharing excellence	Reforming and Enhancing the European R&I system

European Commission

Budget: €100 billion*

€billion
In current prices

€2.1

€2.4

€25.8

€52.7

€13.5

- Open Science
- Global Challenges & Ind. Competitiveness
- Open Innovation
- Strengthening ERA
- Euratom

* This envelope includes EUR 3.5 billion allocated under the InvestEU Fund.

European Commission

Lessons Learned
from Horizon 2020 Interim Evaluation

Support breakthrough innovation

Create more impact through mission-orientation and citizens' involvement

Strengthen international cooperation

Reinforce openness

Rationalise the funding landscape

Key Novelties
in Horizon Europe

European Innovation Council

R&I Missions

Extended association possibilities

Open science policy

New approach to Partnerships

European Commission

Next steps

Ongoing
Parliament and Council negotiations on Union budget 2021-2027, including budget for Horizon Europe

From 7 June
Parliament and Council negotiations on the basis of the Commission proposal for Horizon Europe

2nd half 2018/2019
Strategic planning to prepare first work programmes under Horizon Europe, including co-design of missions and setting up of partnerships

1 January 2021
Envisaged start of Horizon Europe

European Commission