



# Health research and innovation: opportunities for EU- Russia cooperation



Press Centre of the Medical Research &  
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# Overview

- Introduction to Horizon 2020
- Societal challenge 'Health, demographic change and well-being'
  - Infectious diseases
  - Personalised medicine
  - Regenerative medicine
  - ICT for health
- Innovative Medicines Initiative
- International cooperation
- Towards FP9

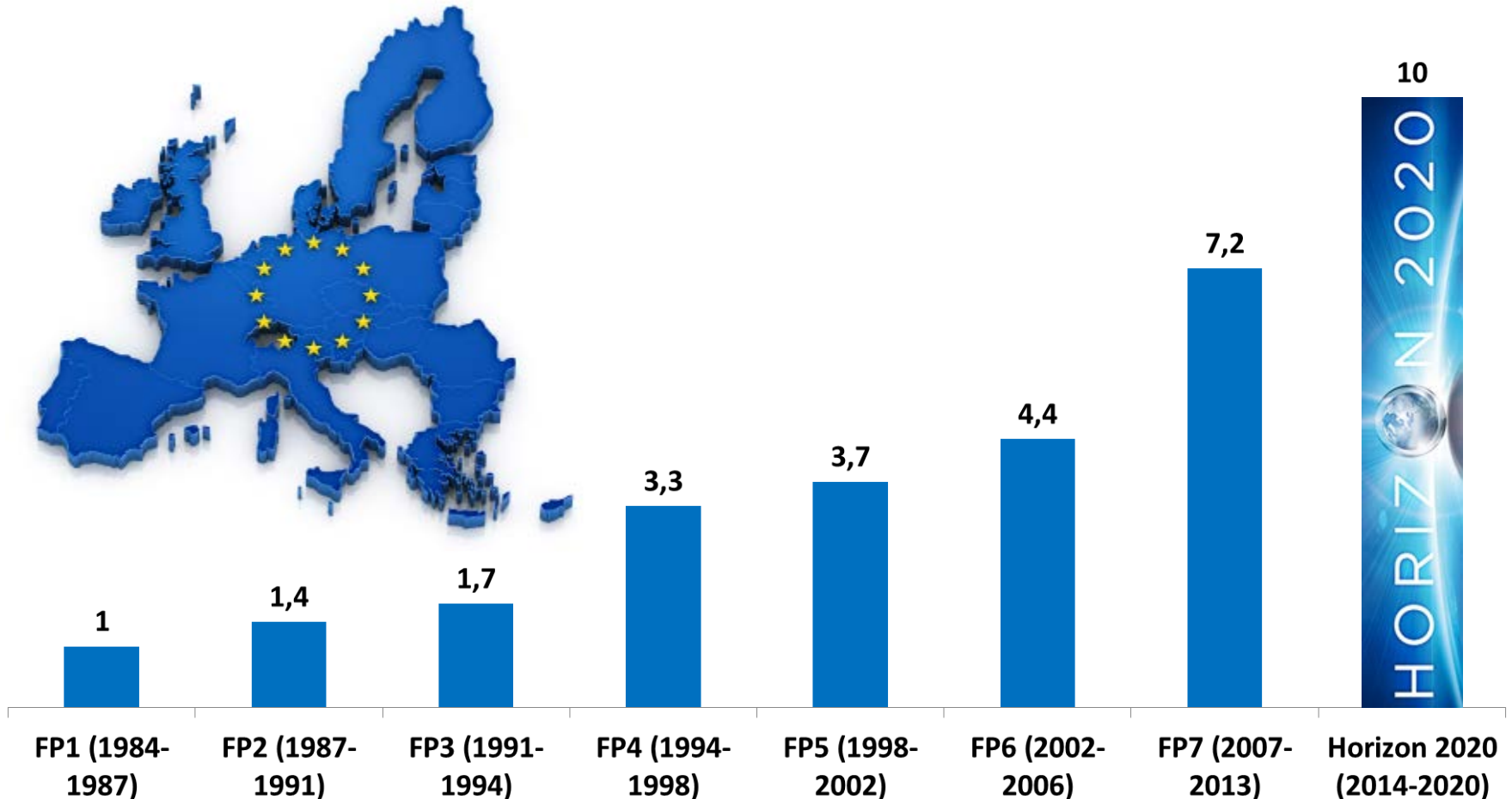


# H2020 SC1: A short introduction



European  
Commission

# 30 years of EU funded R&I



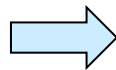
Amount in billions € per year

Research and  
Innovation

# Research and innovation – a growing priority for the EU



- Jobs, growth and investment
- Digital single market
- Energy Union and Climate
- Stronger Global Actor



- Couple research to innovation
- European industrial leadership and competitiveness
- Provide evidence-base for addressing societal challenges, supporting EU policies and better regulation
- Strengthen research capacities and innovation strategies across all Member States
- Multidisciplinarity and synergies
- Address people's concerns

## 3 Os of Commissioner Moedas



*"As I see it, European success now lies in sharing as soon as possible, (...). The days of open science have arrived."*

*Speech at "Presidency Conference Open Science", 04 of April, 2016, Amsterdam*



**Carlos Moedas**  
**EU Commissioner for Research,  
Science and Innovation**



# H2020: Funding processes

- Overall **research priorities** defined in the "Framework Programmes" – currently Horizon 2020 (2014-2020). Published work-programmes with list of topics.
- **Annual calls for proposals** on topics defined jointly by Commission and Member States (PC) upon input from the scientific advisory board and the scientific community regularly consulted
- **Evaluation of applications** by panels of independent experts (3 evaluation criteria: Science & Technology; Expected Impact, Implementation & Management)
- From call for proposal to **grant signature**: Max 8 months
- Financial commitments/disbursements: Pre-financing followed by annual disbursements (on costs incurred).
- **Monitoring projects** activities by EC staff (with addition of independent experts if necessary)

# Horizon 2020 pillars

- European Research Council
- Future and Emerging Technologies
- Marie Skłodowska Curie Actions
- Research Infrastructures

**1- Excellent science**

7 societal challenges, of which SC1 'Health, demographic change and wellbeing'

- Leadership in enabling and industrial technologies
- Access to risk finance
- Innovation in SMEs

**2- Industrial leadership**

**3- Societal challenges**





# Societal challenge 'Health, Demographic change and Well-being' (SC1)



## Collaborative research

Real-life solutions based  
on joint problem-solving



## Public-private partnerships

Investing together for  
next generation medicines  
and treatments



## Global co-operation

One world, one team  
working to solve  
common health challenges



## Public partnerships

Harnessing global  
expertise to fight  
poverty-related diseases

# EU health research

# One societal challenge, many instruments



# Our priorities



## Personalised medicine

Call 2014-15:  
EUR 1.3 B

Call 2016-17:  
EUR 1.4 B



Healthy ageing  
(2014-2017)



Health ICT  
(2014-2017)



*Infectious Diseases*  
(2014-2017)

Human  
biomonitoring  
(2016-2017)






Research and  
Innovation



Maternal and child  
health  
(2016-2017)



# Various instruments

-  Pillar 1
-  Pillar 2
-  Pillar 3

Commercial Development

**Commercial deployment**

**Financing pilot, dvlpt, demo, manufact.**

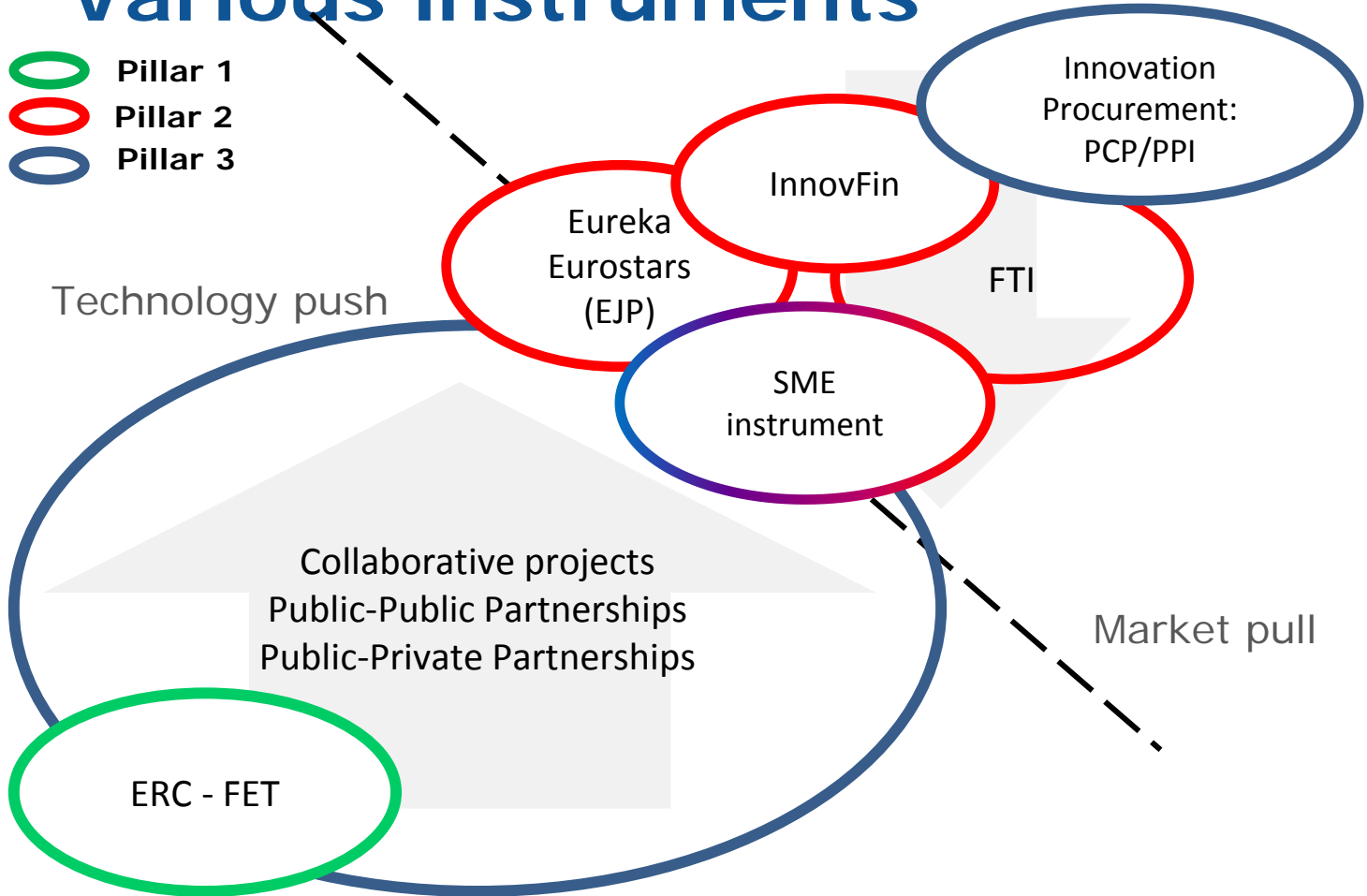
**Business model and initial financing**

**Early phase/basic research, patent protection**

Technology push

FTI

Market pull



Basic research

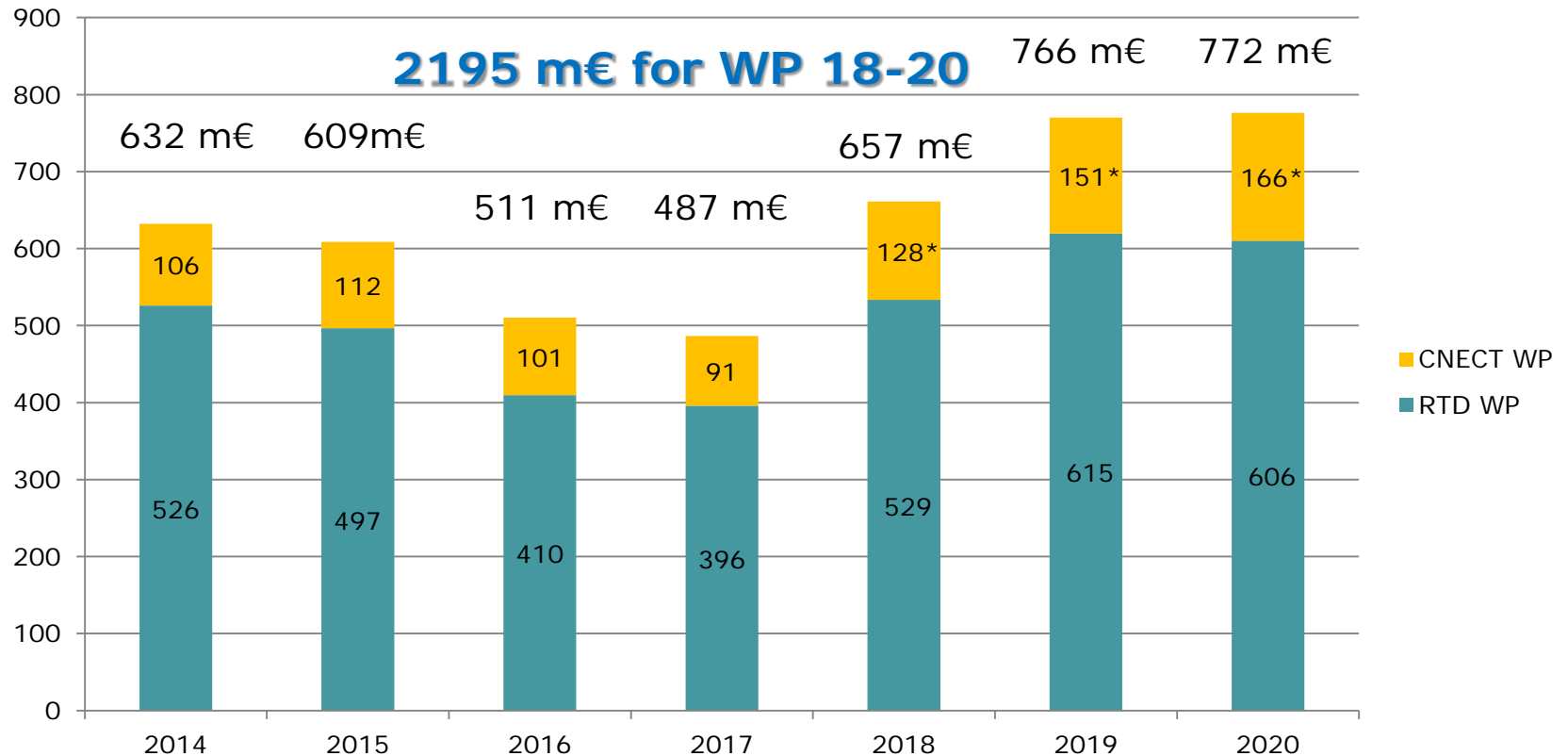
Proof of concept

Tech. devpt, demonstration

System launch & operationd

Technological Development

# SC1 work programme budgets



**Sources:** 2014 and 2015 – Committed funds  
 2016 – 2017 - Published Work Programme  
 2018 to 2020 – *Provisional Budgets*



# Work programme 2018-2020

5 priorities

**Personalised Medicine**  
€330 million

**Innovative Health and Care Industry**  
€380 million

**Infectious Diseases and Global Health**  
€300 million

**Innovative Health and Care Systems**  
€190 million

**Decoding the role of the environment for health and well-being**  
€140 million

Digital Transformation in Health and Care

Trusted Digital Solutions and Cybersecurity in Health and Care

5 missions

Moving towards personalised health and care solutions to benefit citizens

Turning innovative technologies into applications

Tackling infectious diseases and the health of vulnerable groups

Sustainable health interventions and integrated care systems

Assessing the impact of environment and climate change on health

key impacts

Improved health outcomes for the citizen

Stimulating the healthcare industry

Prevent, detect and treat priority diseases worldwide

More sustainable and resilient health systems

Improved risk assessment and mitigation measures

## Timetable for WP 2018-20

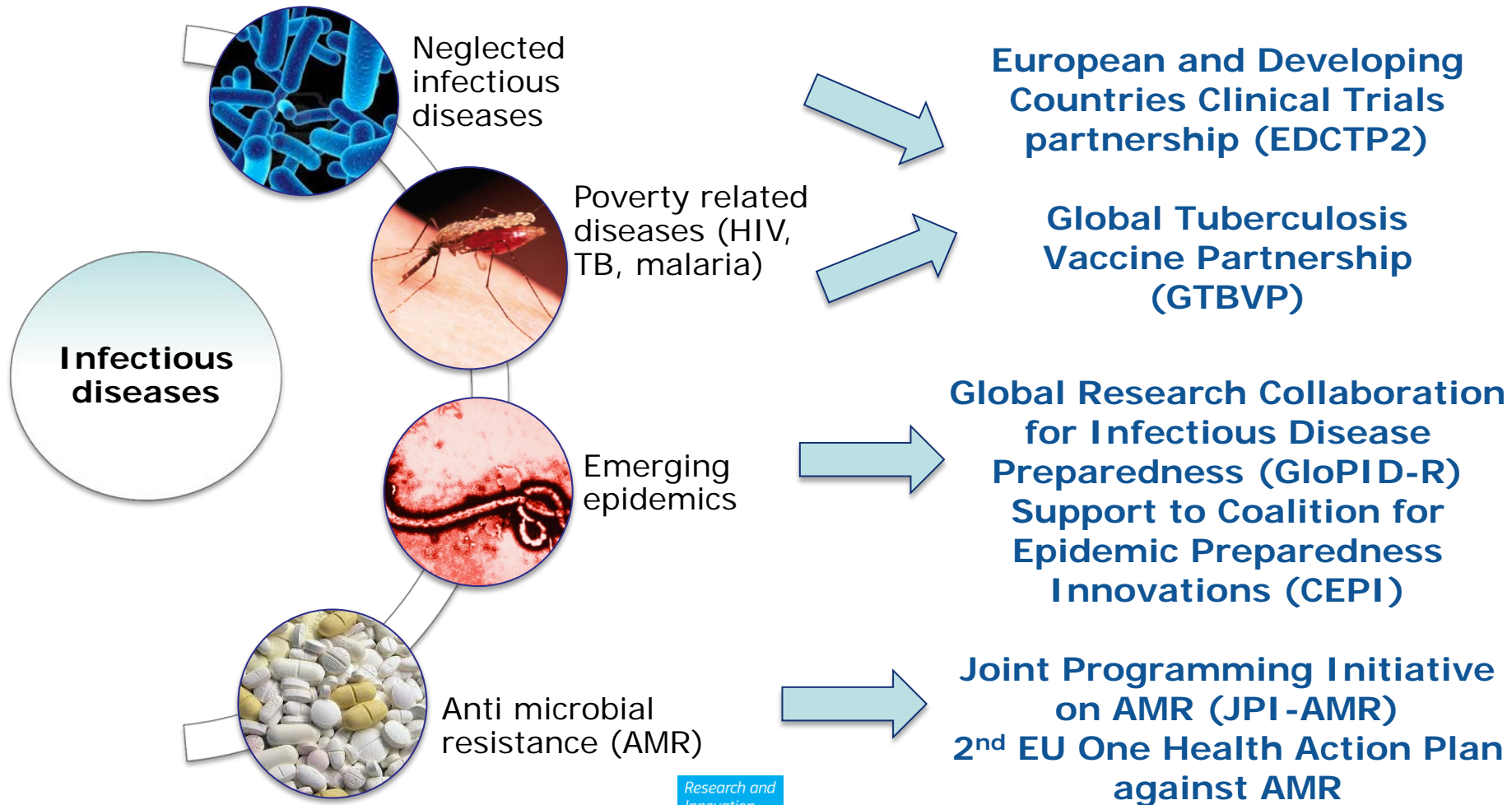
- ❖ 2016: Advisory Group produced a report, which was made public for consultation
- ❖ End 2016: EC published 'scoping papers', consulted with Programme Committee
- ❖ 2017: Consultation with Programme Committee; internal consultation; publication around November 2017
- ❖ 2018: Update for 2019
- ❖ 2019: Update and financing decision for 2020





# SC1: infectious diseases

# Main initiatives on infectious diseases



# Some 2018-2020 topics on infectious diseases

- Research on HIV, tuberculosis and/or hepatitis C in patients with mono-, co-infections or comorbidities in the context of the collaboration between the European Union and the Russian Federation
- New anti-infective agents for prevention and/or treatment of neglected infectious diseases (NID)
- Horizon Prize on novel solutions to reduce the spread of AMR in the environment



# SC1: Personalised Medicine



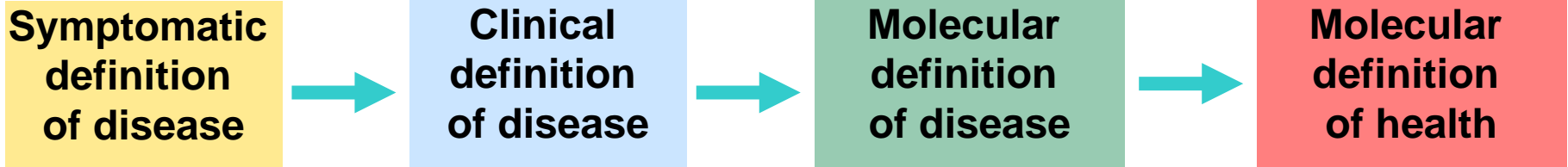
# Definition of Personalised Medicine

**Personalised medicine** is a medical model using characterisation of individuals' phenotypes and genotypes for tailoring the right therapeutic strategy for the right person at the right time, and/or to determine the predisposition to disease and/or to deliver timely and targeted prevention

**See Council Conclusions**  
(2015/C 421/03)

# Personalised Medicine: Moving from 'Sickcare' to genuine Healthcare

*Enormous quantity of accumulating data  
need for translation from basic to clinical research and practice  
better understanding of health and disease*



*Changing the focus from isolated treatment and cure  
to include early diagnosis, prediction and prevention*

## In a nutshell...

Personalised medicine is about making healthcare **smarter** and **better by**:

- using multiple information sources about the person, his/her environment and lifestyle
- focusing on prediction and prevention
- shifting from treating disease to managing health



# Main past activities on personalised medicine at EU level

- 2010: Preparatory workshops (-omics, biomarkers, clinical trials/regulatory, uptake)
- 2011: European Perspectives conference
- 2013: Commission Staff Working Document on "use of '-omics' technologies in the development of personalised medicine"
- 2015: Council conclusions on Personalised Medicine
- 2016: Personalised Medicine Conference (June)
- 2016: Establishment of ICPeMed (November)



## Some 2018-2020 topics on personalised medicine

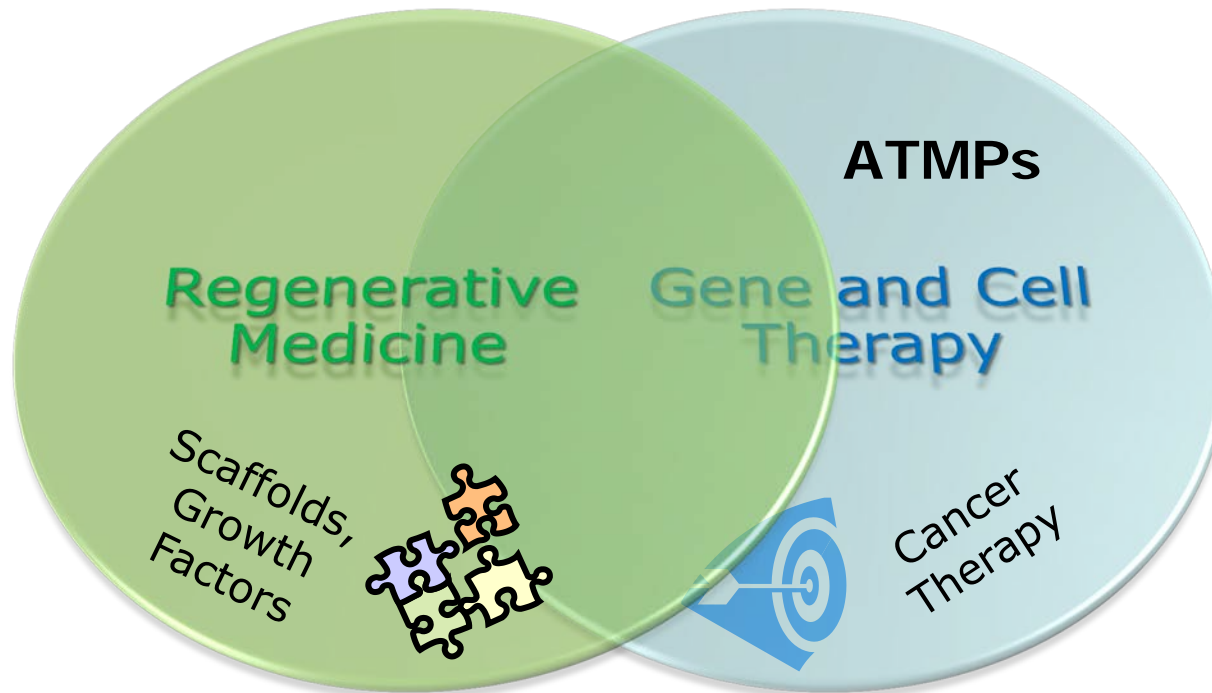
- International flagship collaboration with Canada for human data storage, integration and sharing for developing personalised medicine approach
- Stratified host-directed approaches to improve prevention and/or treatment of infectious diseases
- Understanding causative mechanisms in co- and multimorbidities



# SC1: Regenerative Medicine

# New therapies - overlapping fields vision

(not to scale)





# Why is the EU supporting new therapies research?

- Offers hope for untreatable disease and quality of life, ageing population, etc
- Reduce cost of expensive treatments (eg, enzyme replacement therapy – storage disorder, or blood transfusion – thalassemia)
- Collaborative research across borders to:
  - Avoid duplication
  - Share facilities
  - Assemble multi-disciplinary team
  - Access to patient population
  - Obtain more robust results



# What are we doing in regenerative medicine?

so far 24 projects  
€141 Million

- **Prominent in SC1 decision**
- **Different parts of the innovation chain, now the clinic**
  - Parkinson's, heart, bone, etc. Phase I, II and III
  - Many hurdles: control of differentiation and proliferation, standard product
  - Academic medical centres; big industry largely absent
- **Links to**
  - 'Disease-in-dish' modelling, understanding development, organ transplantation
- **Field moving fast – science and therapy, eg cells don't implant**
- **Hype and hope**
  - Stem cell tourism

# H2020 Regenerative Medicine clinical research projects - observations

- Most projects severely underestimate time and efforts to obtain cell manufacturing and clinical trial authorisations, and recruiting patients
- Wide range of conditions tackled but few on major degenerative diseases, neuro, muscle, etc.
- Limited innovation; heavy concentration on MSCs
- Mostly Phase II; 2 Phase IIIs
- If successful, few projects likely to result in commercial products – most likely to be used via Hospital Exemption



# H2020 Other gene and cell therapy projects - observations

- Mainly rare diseases and cancer
- More gene therapy/gene modified cells (4 projects)
- Technology projects
- Some clinical trials

## Some 2018-2020 topics on regenerative medicine

- New therapies for Non Communicable Diseases
- Regenerative medicine: from new insights to new applications
- Innovation platforms for advanced therapies of the future





# SC1: Information and Communication Technologies (ICT)

# ICT: EU Health and Ageing landscape



1. Boosting Jobs, Growth and Investment

**Health policy**

**Long term Care Strategy**

**Ageing policy**



2. A Connected Digital Single Market

**eHealth 2020, mHealth, Silver Economy Strategy**

European Innovation Partnership on Active and Healthy Ageing EIP-AHA

Horizon 2020 Societal Challenge 1 Health, Demographic Change and Wellbeing

**1.1 BC**

Active Assisted Living Joint Programme (AAL)

European Institute of Technology- KIC on Health and Ageing

Health & wellbeing

Integrated care

Disease management

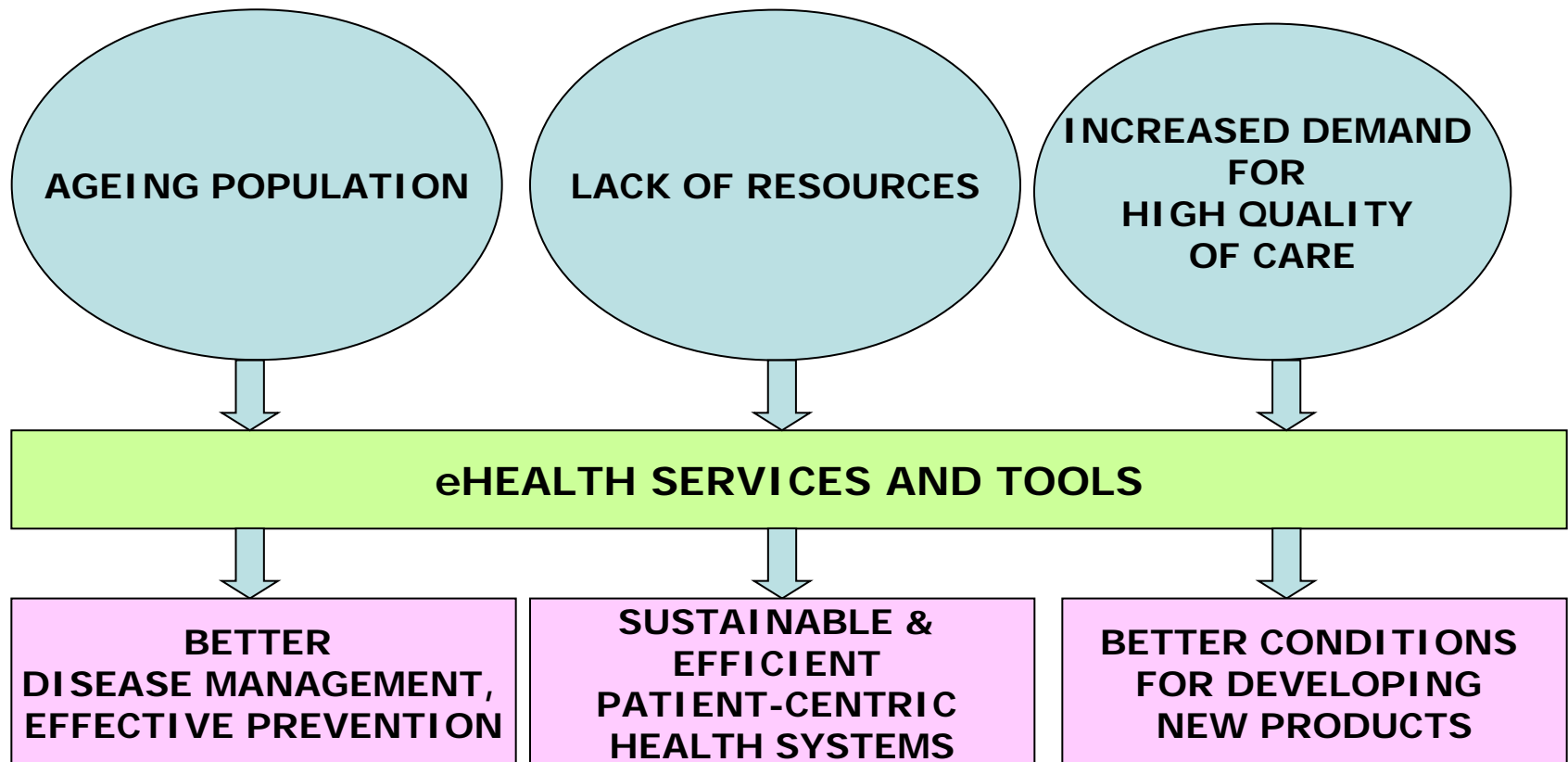
In-Silico Modelling

Independent living & Active Ageing

Early Risk Detection & Prevention

Legal & market conditions

# Need for changes in Healthcare



# H2020, Longer Term Research Areas

- Open Service Platforms for Health & Care  
(Open Source IoT middleware for service, device, data integration)
- Service robotics within smart living environments
- Early risk detection & intervention
- Advanced ICT for Integrated Care
- Self-management of health and disease based on predictive computer modelling used by the patient
- Digital representation of health data to improve disease diagnosis and treatment

# H2020, Applied Research

- *Active and Assisted Living Joint Programme (co-financed with EU Member States)*
  - 160+ close to market projects funded until now
  - Transforming proven research ideas into new products and services across Europe
  - Close links with investors



Call 1: Chronic Conditions



Call 2: Social Interaction



Call 5: "Home Care"



Call 3: Self-Serve Society



Call 4: Mobility



Call 6 Occupation in Life



Call 7: Care of the Future



Call 8: Active and independent living

<http://www.aal-europe.eu>



# H2020, Innovation Agenda

## **Large scale pilot projects**

- *Piloting ICT solutions for independent living with cognitive impairments (4 pilots starting)*
- *Piloting Integrated Care solutions (3 pilots running)*

## ***European cooperation in innovative public procurement***

- *Pre-commercial Procurement of service robotics solutions (Silver project) and Patient Empowerment*
- *Public Procurement of innovative health and care services (Stop and go project)*  
*Public procurement of innovative eHealth services*

## Some 2018-2020 topics on ICT

- Adaptive smart working and living environments supporting active and healthy ageing
- International cooperation in digital solutions and robotics for independent living
- eHealth and care services



# Innovative Medicines Initiative 2 (IMI2)



# IMI – Europe's partnership for health

## IMI1: 2008-2013

€2 billion budget  
59 projects



## IMI2: 2014-2020

€3.3 billion budget  
More ambitious  
More open  
Greater scope






# IMI 2 Strategic agenda

- Antimicrobial resistance
- Osteoarthritis
- Cardiovascular diseases
- Diabetes
- Neurodegenerative diseases
- Psychiatric diseases
- Respiratory diseases
- Immune-mediated diseases
- Ageing-associated diseases
- Cancer
- Rare/Orphan Diseases
- Vaccines



The right prevention and treatment  
for the right patient at the right time  
Strategic Research Agenda for  
Innovative Medicines Initiative 2

**Aligned with  
WHO priorities**

# Why do we need IMI?

Because drug development is very...

complex

risky

inefficient

lengthy

expensive

Because...

- Biological mechanisms underlying disease are complex
- Clinical trial designs need to be adapted to scientific knowledge
- Regulatory pathways need be adapted in certain cases



# How is IMI addressing the challenges in drug development?

*Through projects IMI is are trying to...*

- put patients at the centre
- share risk (among public & private players)
- increase efficiency (by developing common tools)
- reduce duplication of effort (esp. at early stages)
- reduce timelines (by using a personalised medicine approach)
- integrate the latest science into drug development
- use data and knowledge management to work more effectively

**We do this by creating a neutral platform where all involved in drug development – academics, industry, SMEs, patients, regulators, others – can engage in open collaboration on shared challenges.**



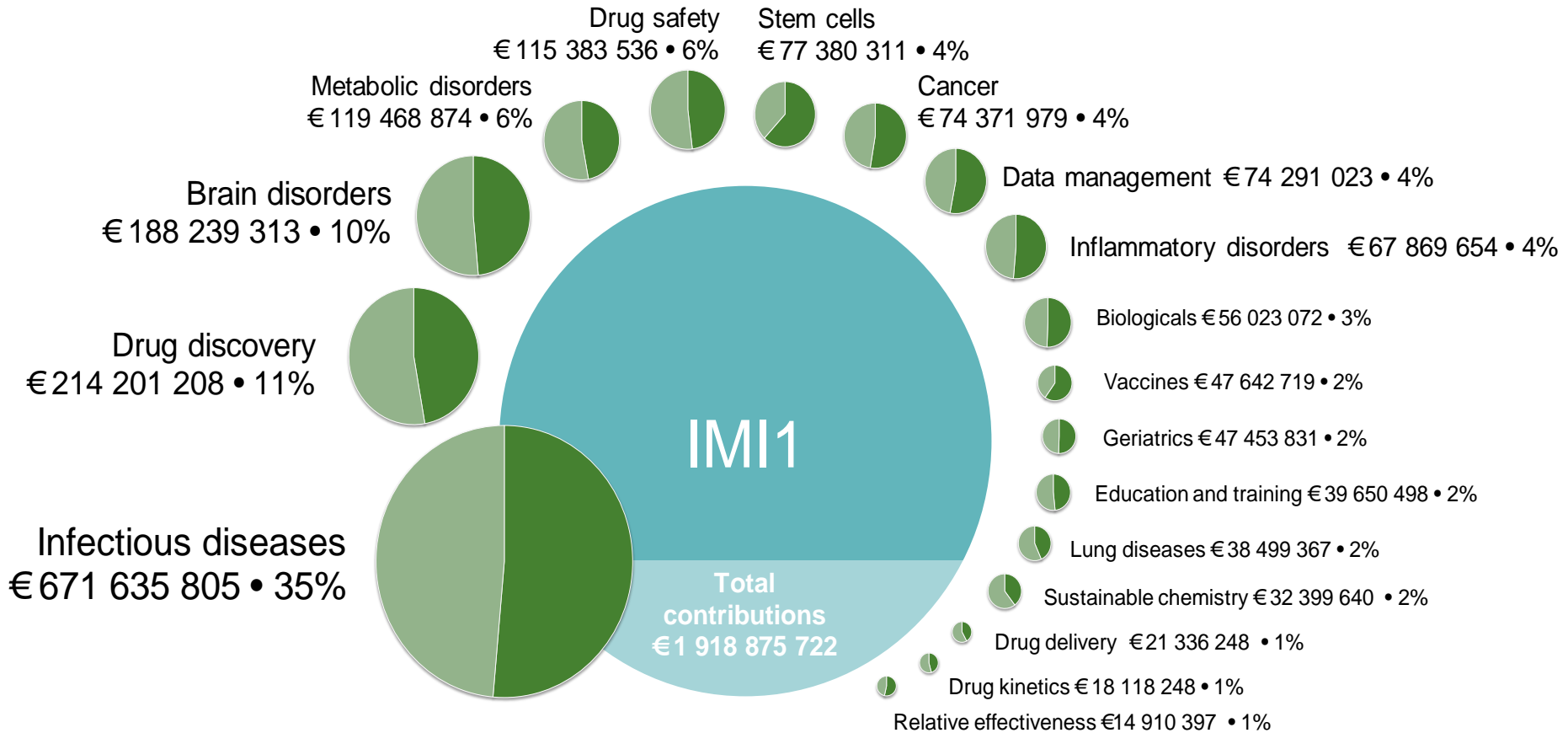
# An international, cross-sector community



- *Over 9 000 researchers working for:*
  - open collaboration
  - improved R&D productivity
  - innovative approaches to unmet medical needs

*Figures from June 2016*

# Distribution of funding – IMI 1



EFPIA contributions

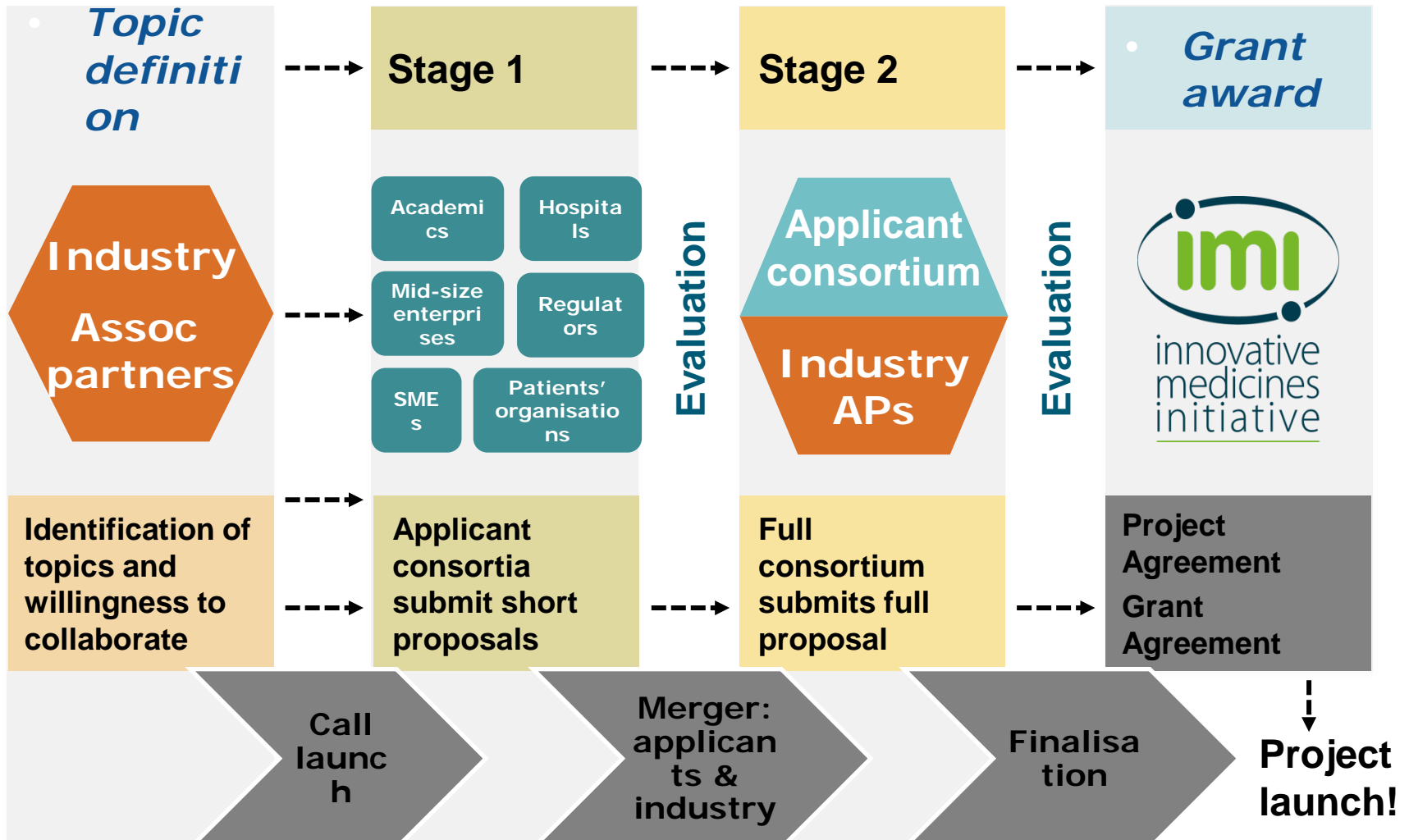


IMI contributions

# IMI 2 and Third countries

- **As BENEFCIARY:**
  - **IMI 2 is open to participation from legal entities in Third countries (Universities, Research centres, SMEs etc.)**
  - **Funding possible in *exceptional situations***
- **As IN-KIND CONTRIBUTOR:**
  - **Either as an EFPIA organisation or as a non-EFPIA organisation, BUT non-EFPIA organisations become Associated Partners to IMI 2**
  - **At IMI 2 programme level, the total in-kind incurred by Third countries cannot exceed 30% of the total in-kind**

# Typical IMI project life cycle





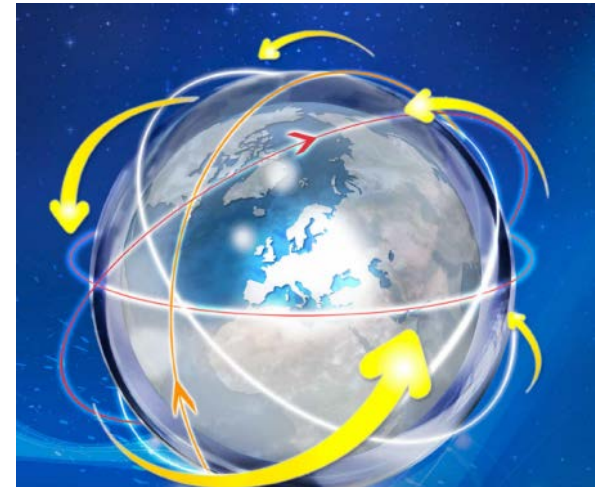


# International cooperation in Societal challenge 1

# Horizon 2020: open to the world

## General opening

Horizon 2020 is fully open to participation of entities from across the globe



## Targeted opening

Many topics are flagged as specifically relevant for international cooperation, identifying upfront the targeted area and partner country or region

# Global challenges for global responses

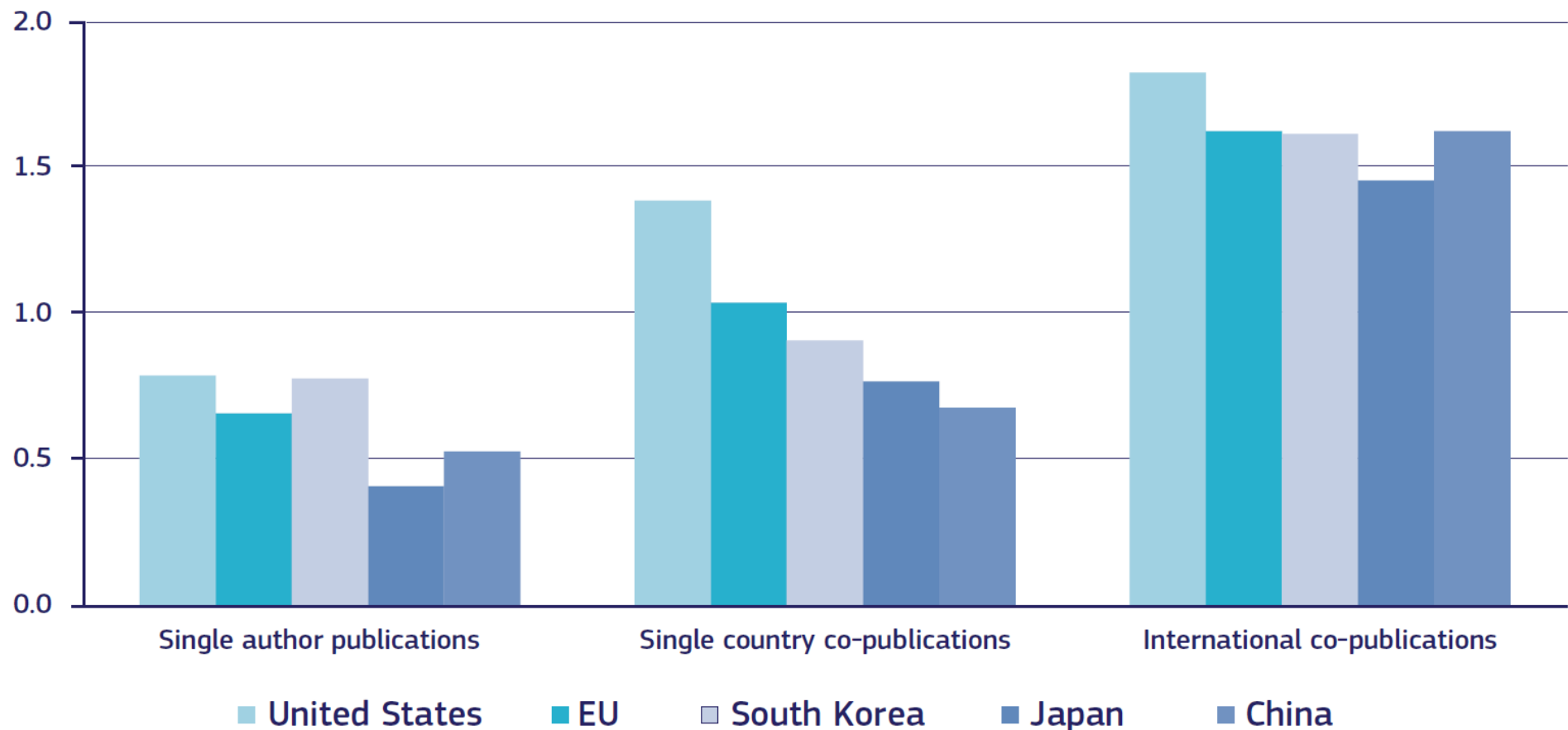


- ✓ Engaging in international cooperation is essential to attract talent, access knowledge and markets, thus increasing EU competitiveness
- ✓ Horizon 2020 is a vehicle to work together with the best worldwide



**International Cooperation Strategy**  
enhancing and focusing EU  
international cooperation  
in research and innovation

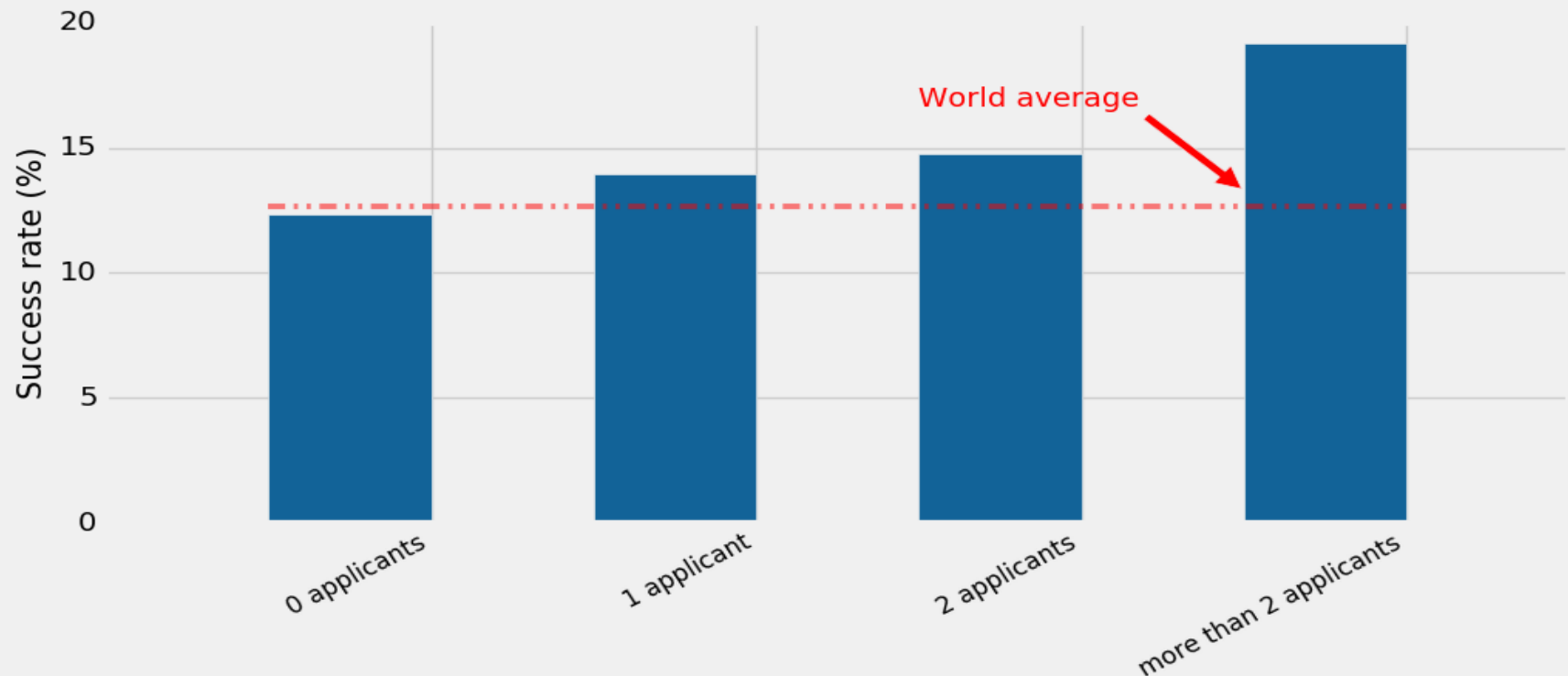
# International cooperation increases quality



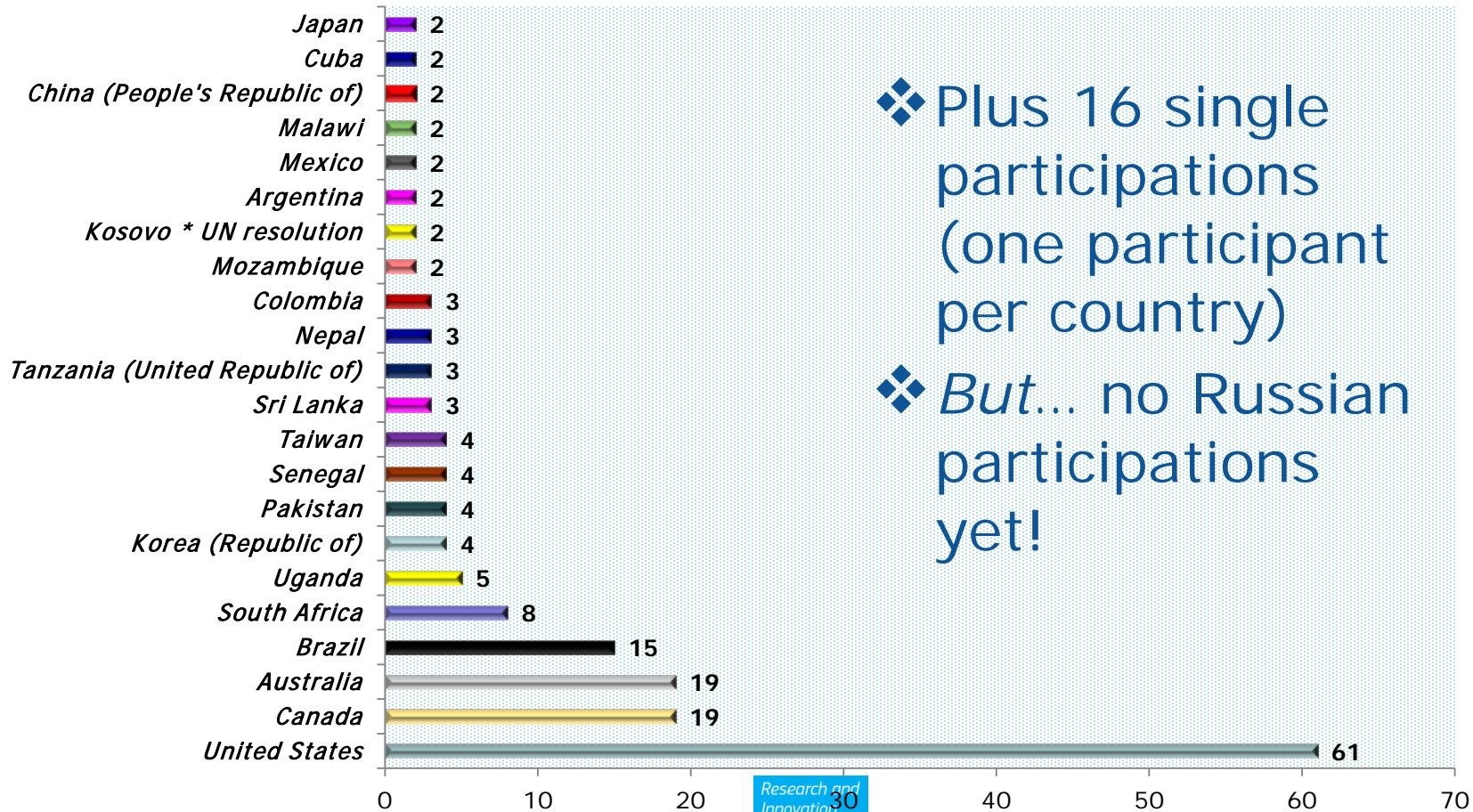
**Average Relative Citations (ARC) of publications by type of co-operation, 2010**

# International participation increases H2020 success rate

Success Rates for different numbers  
of Non-Associated Third Country applicants



# Participation of Third countries in SC1: collaborative projects





# Open to the world

## Multi-lateral health research activities



# Global Research Collaboration for Infectious Diseases Preparedness (GloPID-R): Objectives

- Facilitate **exchange of information** in outbreak situations
- Establish a **response plan** and a **strategic agenda** for a coordinated and rapid research response
- **Address** scientific, legal, ethical and financial **challenges** to a rapid response
- **Connect** infectious disease research networks
- **Supports** public health decision-making
- Is **NOT a new funding organisation**



# GloPID-R Members



Observer Status: World Health Organization (WHO)

# GloPID-R Priorities 2017

- ❖ Links with antimicrobial resistance
- ❖ Creating network of social science researchers
- ❖ Establishment of an Industry Stakeholder Group
- ❖ Forming a long-term scientific research agenda
- ❖ New working group of clinical research networks
- ❖ Continuing work on Zika and data sharing



# Flagships for international cooperation in WP 2018-2020

- Objective: bring international cooperation to at least FP7 level
- Topics should be:
  - specifically devoted to international cooperation
  - be of large scale
  - be recognised in political dialogues
- Russia, Canada and CELAC

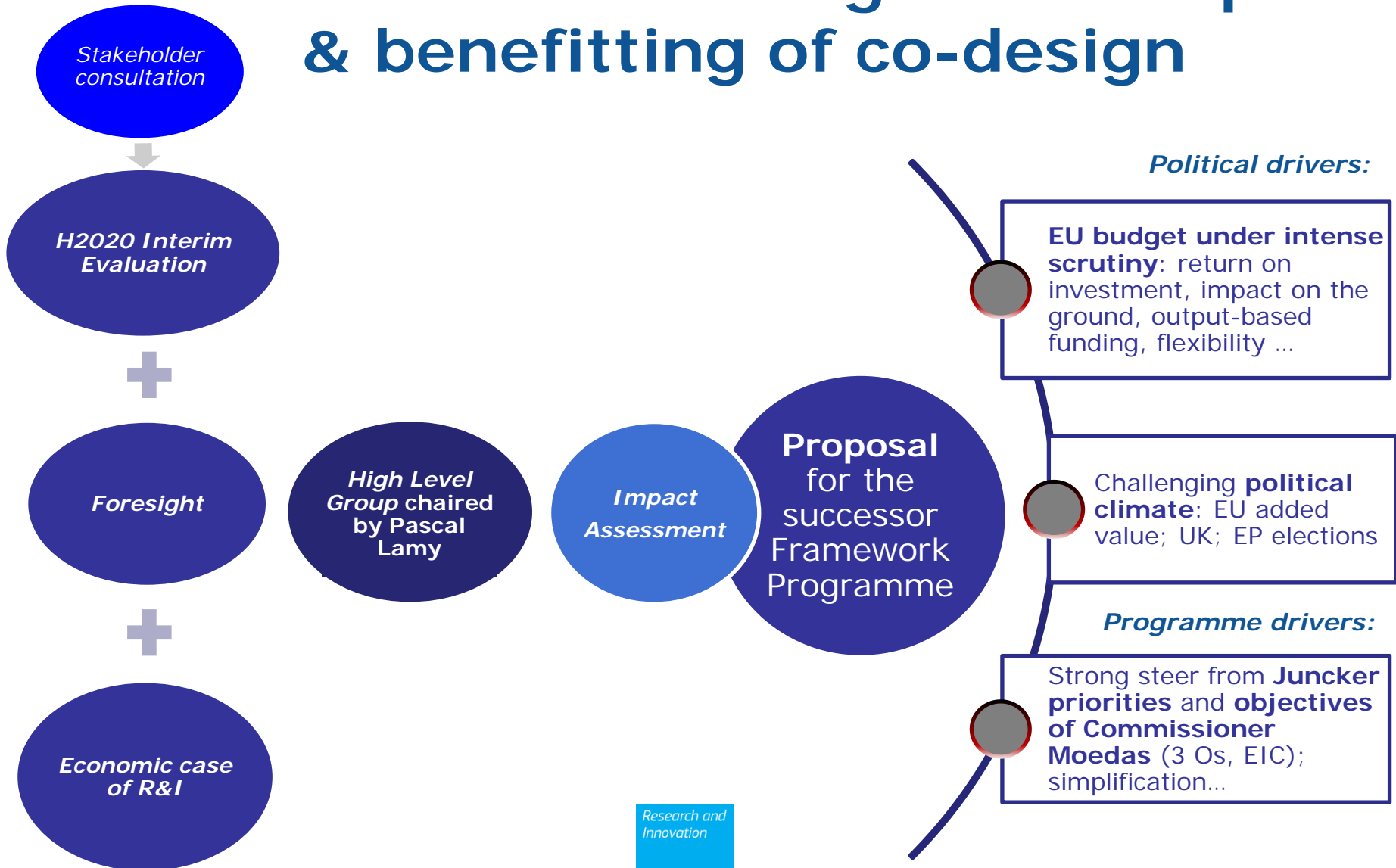


# Towards FP9: Process, Key Questions



European Commission

# Towards FP9: learning from the past & benefitting of co-design



# Horizon 2020 Interim Evaluation - timeline

<b>2016</b>	
December	High Level Group in the context of the Interim Evaluation (chair: Pascal Lamy)
20/10-15/01	Public stakeholder consultation
<b>2017</b>	
May	Publication of EC Staff Working Document (evidence base)
June	Publication of HLG report (vision for maximising impact of FPs) Stakeholder conference on Horizon 2020 Interim Evaluation
October	Publication of Commission Communication
<b>2018</b>	
	Impact Assessment and proposal for FP9

# Stakeholder consultation

## First inputs received

- Continuity with Horizon 2020: "an evolution and not a revolution"
- Continue with the societal challenge-based approach
- Support both research and innovation
- Continue with simplification



# Some key questions for shaping FP9

Excellence vs. cohesion

Continuity vs. breaking with the past

Top-down vs. bottom-up

Output-based vs. cost-based

Grants vs. loans

International vs. European only

Incremental vs. disruptive

Single beneficiaries vs. collaborative

All businesses eligible vs. focus predominantly on SMEs

Include defence vs. only civil / dual research





**Thank you for your  
attention!**

## More info @

### ➤ Participant portal

- <http://ec.europa.eu/research/participants/portal/desktop/en/home.html>

### ➤ Societal challenge 1

- <http://ec.europa.eu/programmes/horizon2020/en/h2020-section/health-demographic-change-and-wellbeing>

### ➤ Research & Innovation – shaping our future: 7 July 2017

- <http://ec.europa.eu/research/index.cfm?pg=events&eventcode=032132EF-D4BD-39B3-6C981F6EB7F3D7C4>