

# UK Research and Innovation and Next Generation Infrastructure

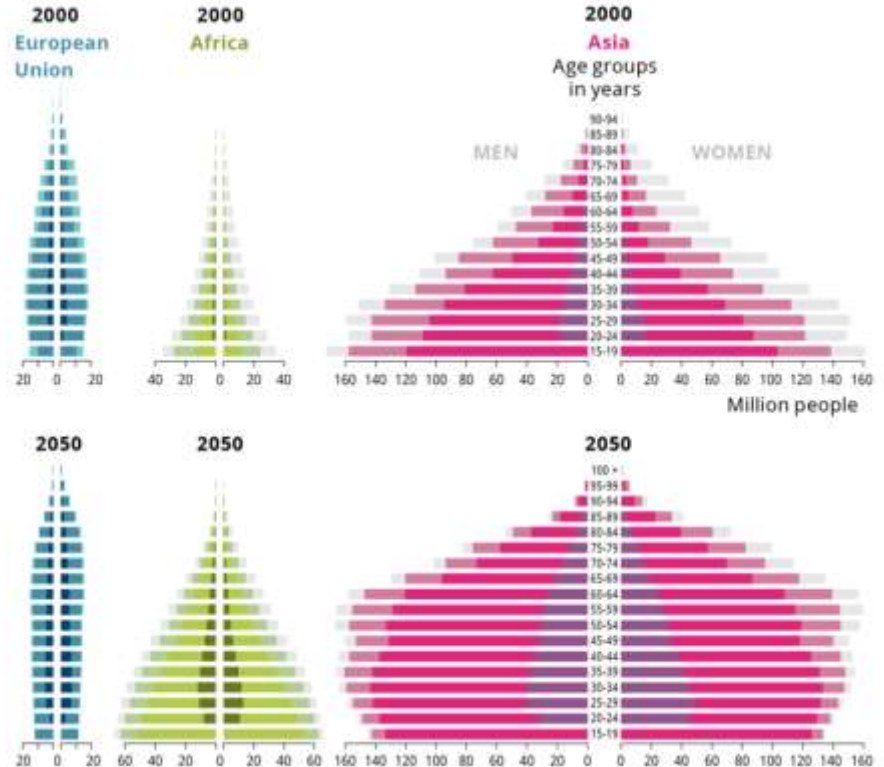
**Sir Mark Walport**

UK Research and Innovation

12 September 2017

# The world is changing

- Population growth
- Changing demographics
- Migration
- Anthropocene



# Advising government

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- Health, wellbeing, security & resilience
- Knowledge translated to economic advantage
- The right science for emergencies
- Underpinning policy with evidence
- Advocacy and leadership for science



# Infrastructure underpins health, wellbeing, security & resilience

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- Built, engineered, information and telecommunications infrastructure
- Natural infrastructure
- Social infrastructure



Image: I-90 Light Trails by Justin Faulkner

# Built infrastructure



Image: Chiralun, flickr, <https://www.flickr.com/photos/69057297@N04/35350384145>



Image: Crossrail, <http://www.crossrail.co.uk/construction/building-information-modelling>

# Natural infrastructure

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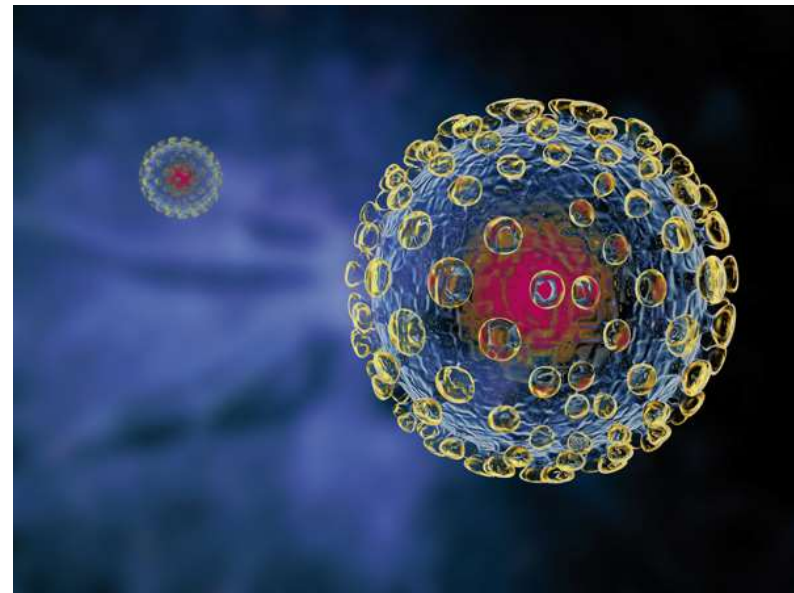


Image: Novartis AG, flickr

# Social infrastructure

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# Infrastructure as a “System of systems”

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- Complex and critical interdependencies
- Power of data, IoT, ubiquitous sensing
- Machine learning and artificial intelligence
- Emergence of platforms
  - eg transport as a service



Image: CityVerve



# Infrastructure as a “System of systems”

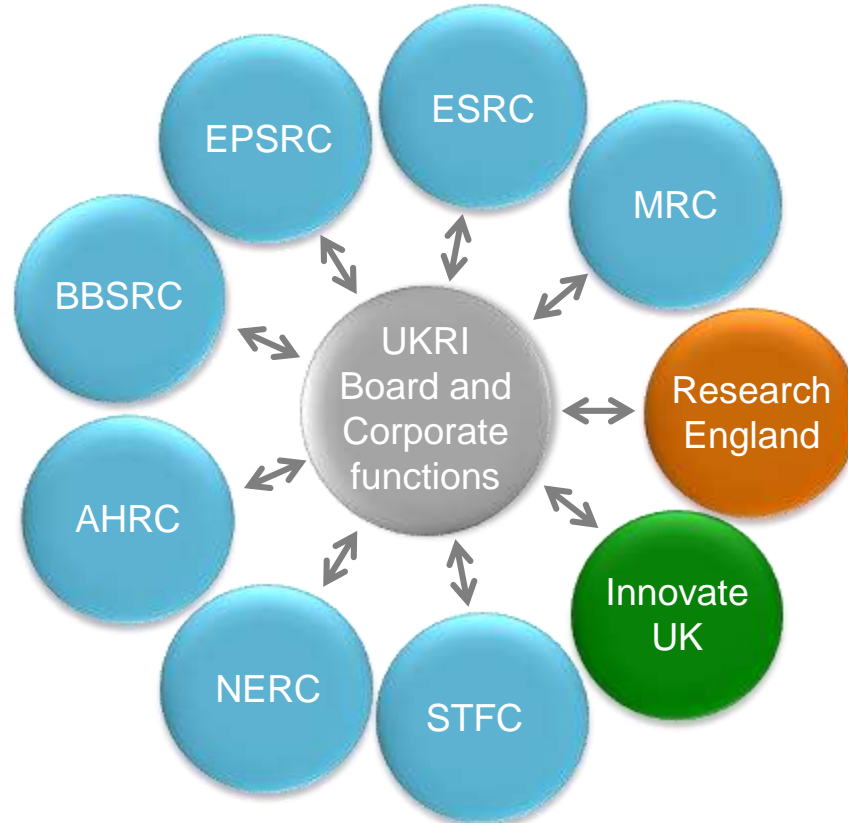
- Who owns the data?
  - Privacy
  - Monopolies
- Importance of standards
  - e.g. security by design
- Winner takes all?
- New vulnerabilities
  - Cyber
  - Cascading failures
- Risks of exclusion



Image: CityVerve

# What is UK Research and Innovation?

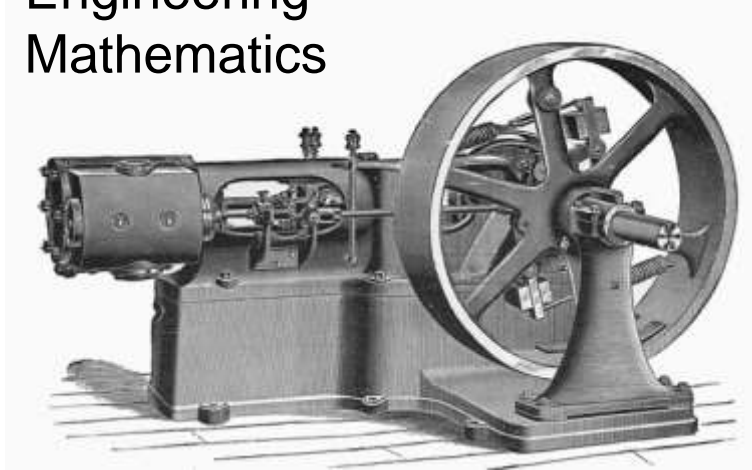
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# Integration – from Steam to STEAM

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Science  
Technology  
Engineering  
Mathematics



Art and design  
Humanities  
Social sciences



# Opportunities

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- Increased funding:
  - £4.7 billion additional funding to 2021
  - Strong commitment to science and research
- Industrial Strategy Challenge Fund
- Newton Fund
- Global Challenges Research Fund



# Tackling important problems

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- Fundamental questions
- Needs of society – working with government
- Advancing the UK economy
- Research and innovation as a key element of UK's place in the world



# Needs of society

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- Hydrology and meteorology
- Air quality
- Infectious diseases
- Ageing
- Security
- Economy



# Advancing the UK economy

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## Industrial Strategy Challenge Fund

- First wave of challenges includes:
  - Batteries
  - Autonomous vehicles
  - Robotics in hazardous environments
- Second wave announced later this year



Image: EPSRC

# The UK's place in the world

## Global Challenges Research Fund

- Focus areas:
  - Equitable access to sustainable development
  - Sustainable economies and societies
  - Human rights, good governance and social justice

## Global research





# What should be our research and innovation strategy for infrastructure?

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- UKRI committed to consultation and working with academia, government and industry
- National and international partnerships
- Importance of growth, productivity and place
- Context of industrial strategy and Infrastructure UK





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