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Impact collaboration – the way forward

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16 November 2017

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Research leads to a wide variety of outputs and potential impacts

Input	Outputs/Outcomes	Impacts (Academic/Economic/Social)
Funding for Research and Training	**Generation of new Knowledge/ publication** **Trained people** **Development of collaborative networks** **Intellectual property/ Licensing** **Research materials/ Technologies** **Influences on policy & practice** **Development of new products/processes** **Dissemination of research**	**Improvements to health** (living longer and with better quality of life) **Academic impact** (effects on further research including other disciplines) **Improving the performance of existing businesses** **Creating new businesses** (that contribute to economic growth and further R&D) **Delivering highly skilled people to the labour market** **Attracting R&D investment** (from global business and non-UK funding sources) **Improving public policy and public services** **Engaging public support for research**

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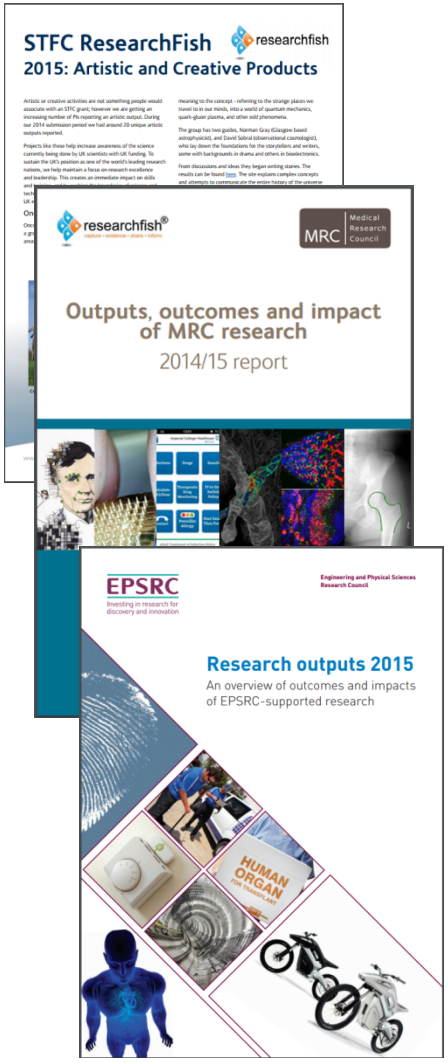
Strategic use of evidence for decision taking



- **Advocacy**
  Justify additional funding and explain research impact
- **Accountability**
  Evidence of delivery
  Answering Parliamentary and other queries
- **Analysis**
  Basis for tracking progress, productivity, quality and impact
- **Allocation**
  Evidence to support prioritisation across different sectors/strategic aims or programmes
- **Efficiency**
  Replacement for final grant reports
  Common across a large number of funders
  Providing data to research organisations to re-use
- **Openness**
  Sharing information via Gateway to Research visibility for business and the public

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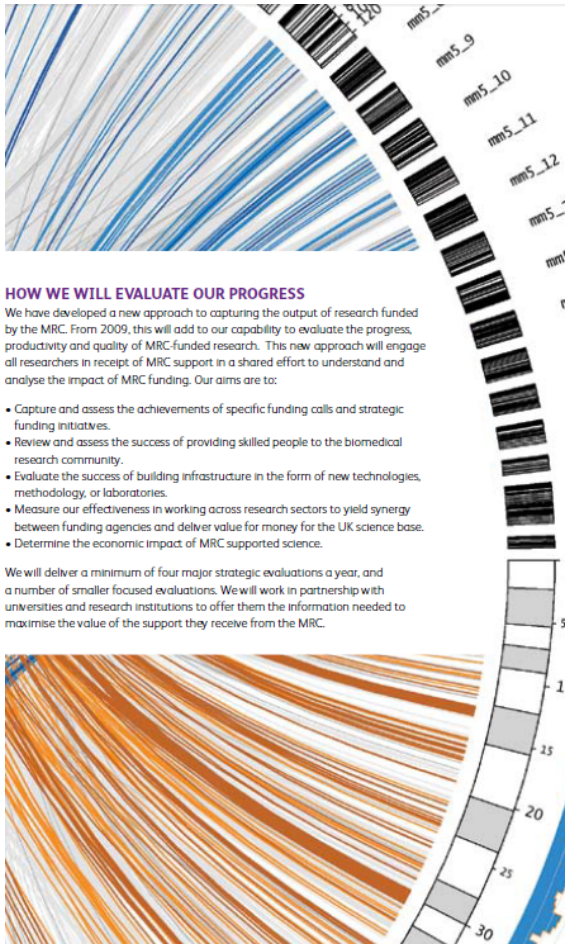
Measurement Challenges



- **Causality** – link between inputs and outputs/impact non-linear and complex (“chain-link”/”payback” models)
- **Attribution** – how much of the benefit results from the specified research input, as opposed to other research and non-research inputs (e.g. marketing, “spillovers” etc.)
- **Cross country effects** – collaboration, co-funding, mobility of researchers
- **Timescales** – research might take decades to lead to impact, premature measurement will over-emphasise policies encouraging research that brings short-term benefit

The Benefits from Publicly Funded Research (Martin and Tang, 2006)
https://www.sussex.ac.uk/webteam/gateway/file.php?name=Fac-BRM-UMIP&site=25

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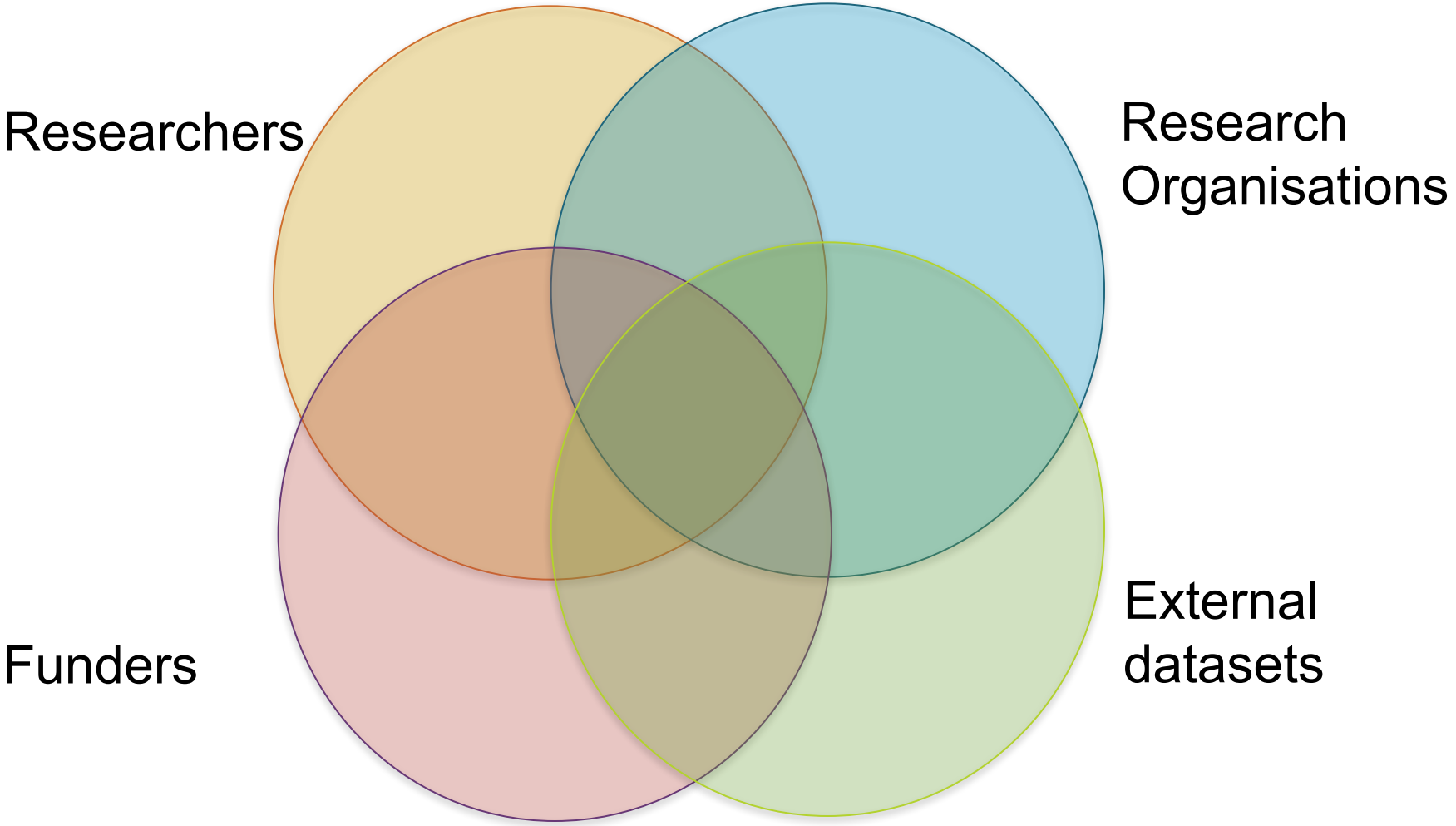
Stakeholders



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- Researchfish has helped individual funders track research progress toward impact
- Sharing this data has helped address some of the evaluation measurement challenges
- Only through collaboration between the key stakeholders will we be able to better understand what leads to impact

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What has changed?

Before Researchfish (2008/09)	After Researchfish (now)
Final grant reports	Annual feedback online
Single point in time	Updated at any time and long-term follow up
Unstructured information (Expensive to analyse)	Structured dataset (Cost effective to analyse)
Each funder has own process	60+ funders share process (built to be scaled)
Outputs rarely linked to grant references	Wide variety of outputs linked to accurate funding data
Researcher time – anything from a few hours to 1-2 days	Researchers spent an average of 45 mins logged into Researchfish last year
Information not open or accessible	Outputs published on Gateway to Research linked to award details
No linkage to other data sources	Extensive linkage to other datasets (bibliographic, patent, clinical trials etc.)

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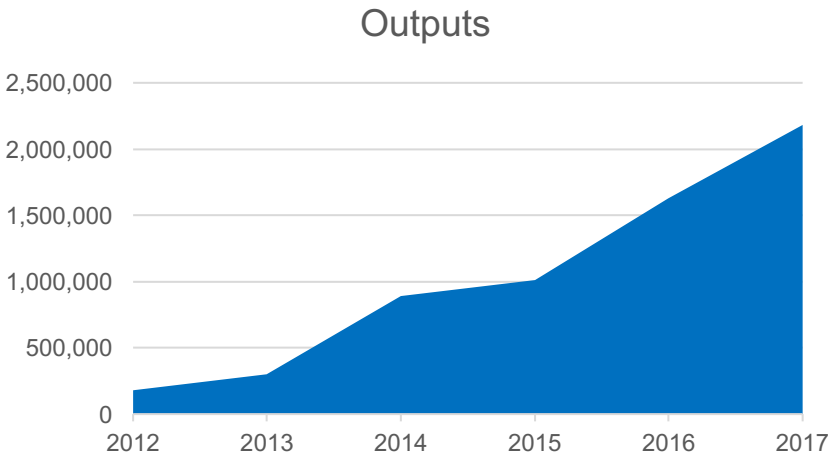
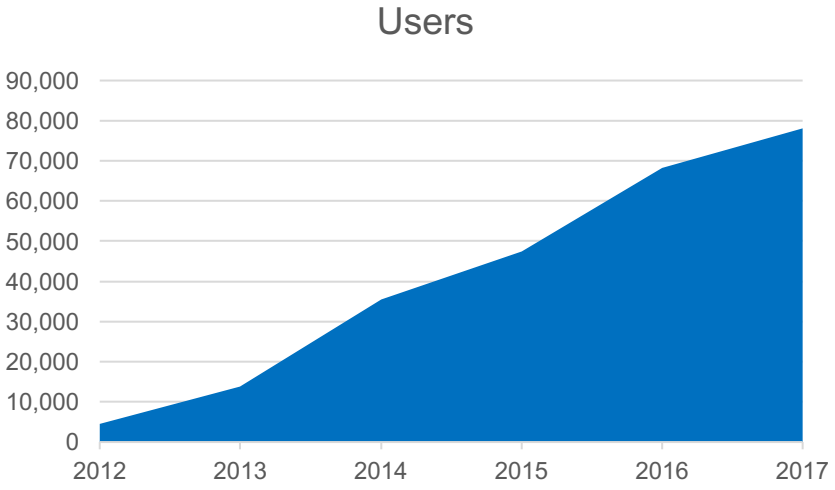
What has been collected?





- 2 million “outputs”
- Details of wide range of outputs/outcomes and impacts
- Linked to public and charity funding
- Across all research disciplines
- Tracking £45 billion of investment
- £4.5 billion added every year
- Almost 80,000 users

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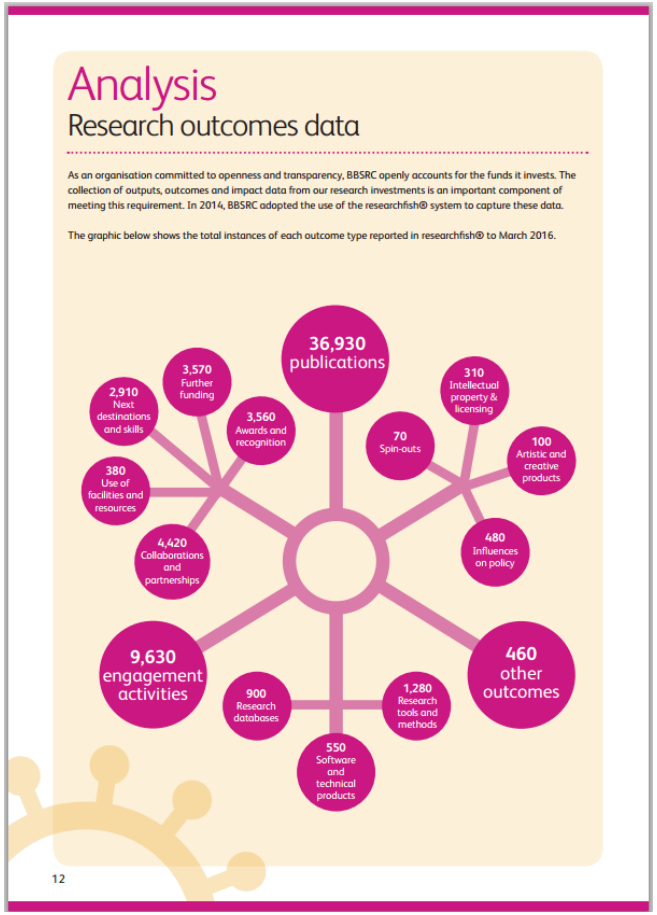
Use of output data by research councils



- **Economic impact reports – all seven research councils presented data from Researchfish in their annual impact reports**
- **Output data is central to populating a set of common metrics agreed with BEIS for performance reporting**
- "We gather evidence of our impact in many ways, but **one of the most important is via researchfish®**, the Research Councils' outcomes collection system. Information submitted to researchfish® by BBSRC funded researchers helps us understand and demonstrate the high quality of the research we fund as well as its broader impact, forming the basis of many of the indicators and case studies in the pages that follow." BBSRC CEO, February 2017

http://www.bbsrc.ac.uk/documents/impact-report-2016-pdf/

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Examples of MRC research outcomes & impacts 2017

Publications (with a citation impact of 2.1 times world average, 60% of these papers are openly accessible in Europe PubMed Central)

100,000

Patents (30% of which have been licensed to others)

849

Products, interventions and clinical trials (~150 have reached the market)

>1300

Policy influences (Huge range reported from very small to highly significant. 45% have impact wider than the UK)

>8000

Further Funding. (non-MRC follow on funding, approximately 35% from outside the UK)

>£6.7billion

Spin outs (creating an estimated 1,500 new jobs

139

Researchers report progress with, and outcomes/impacts from their MRC-funded research via Researchfish®. Since 2006 data has been collected from 7,300 MRC awards, with a total value of £6.1billion.

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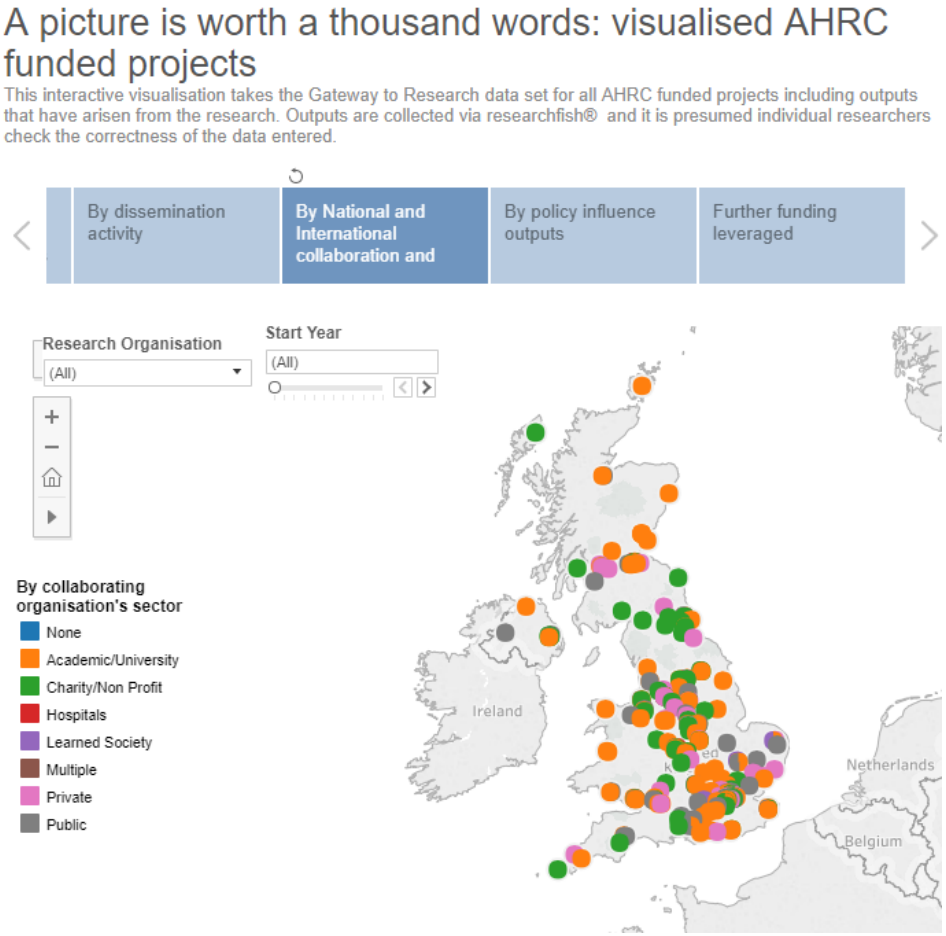
Publishing and visualising the results



Research council outputs published via Gateway to Research

Collaborations reported via Researchfish® attributed to AHRC funding, by location in UK and by type

https://public.tableau.com/profile/sar1122#!/vizhome/AHRC-GTR/Story1

Impact case studies

- In 2015, MRC-funded scientists identified a new form of a bacterial gene in China which confers resistance to the last-resort antibiotic, colistin. The resistant bacteria were identified in animals eaten by humans.
- These results moved the Chinese government to introduce a ban on adding antibiotics to animal feed in 2016, a policy aimed at combatting the spread of antibiotic resistance.

UK-China collaboration informs animal feed antibiotic ban

Withdrawal of more than 8,000 tonnes of colistin as a growth promoter from the Chinese veterinary sector

- An Oxford spin out company (Oxford Nanopore), based on MRC research launched a DNA sequencer the size of a USB stick.
- Technology was used in the Ebola epidemic and has been tested in the International Space Station.
- In 2015 the MRC funded a project to collect Zika virus samples and genotype them in Brazil - the project's chosen technology was the Oxford Nanopore sequencer.

Using the Oxford Nanopore MinION device in front of the minibus lab in Joao Pessoa, Brazil (photo by Ricardo Funari)

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DNA sequencing technology used in MRC-funded Zika project

World's first nanopore sequencer launched in 2015, based on MRC funded work of Hagan Bayley in 2008. Oxford Nanopore employs 300 staff and has raised £351M investment

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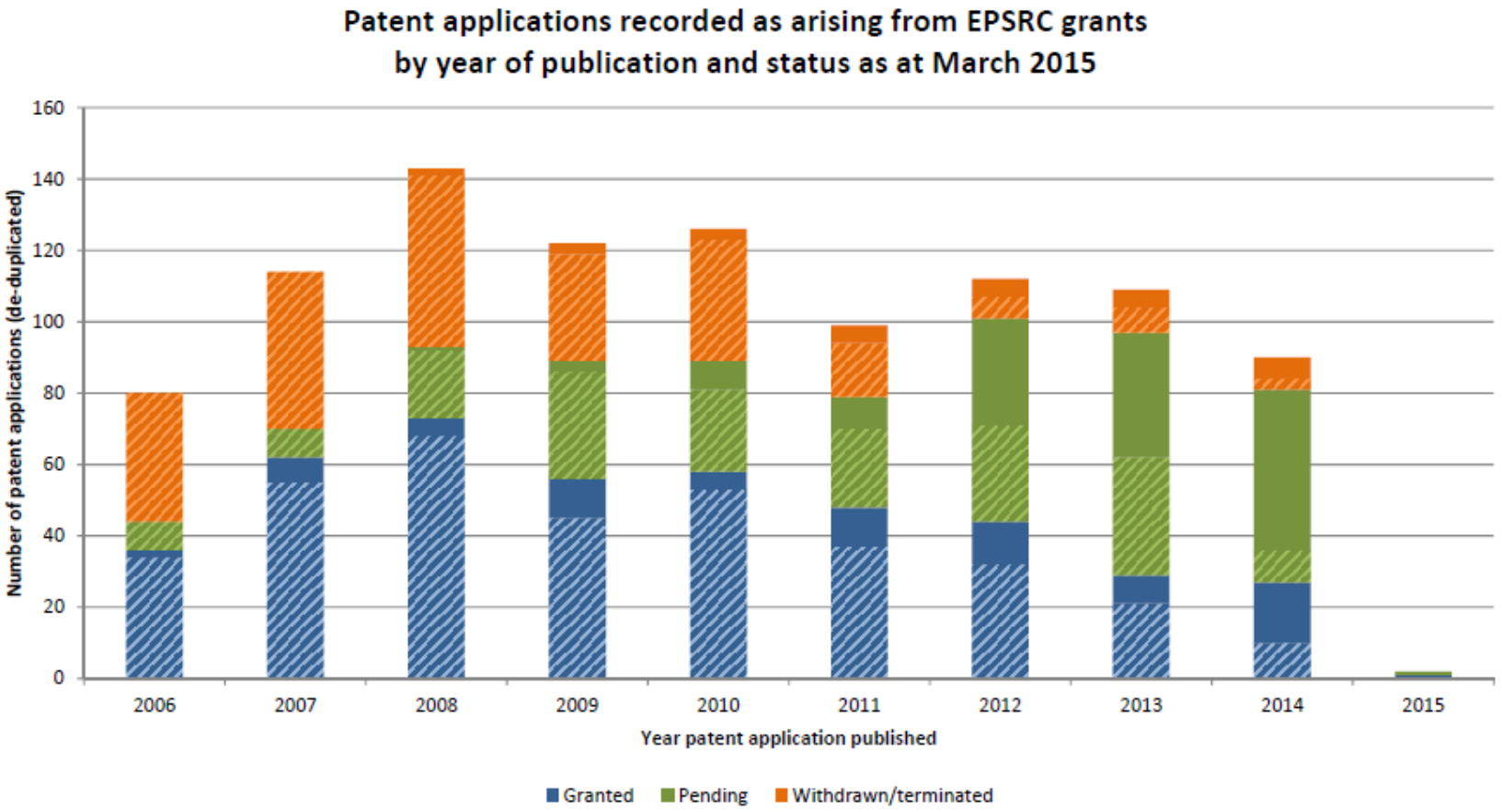
How complete is the data?



Research Outputs 2015 (EPSRC) https://www.epsrc.ac.uk/newsevents/pubs/research-outputs-2015-report/

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National Prevention Research Initiative

NPRI ran from 2004-14 involved 16 funding agencies and committed £34M across 74 projects

Successor is the National Prevention Partnership which will commit at least £50M

Professor Sir John Savill, MRC CEO, stated: "NPRI has been an enduring and effective partnership of Research Councils, government and charities which led the way in strengthening prevention research and supported novel impactful work".

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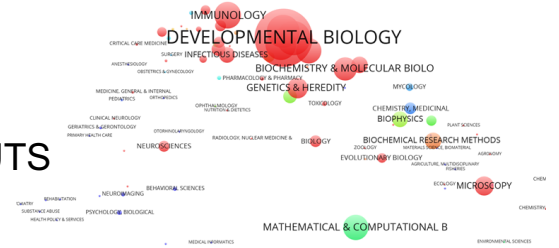
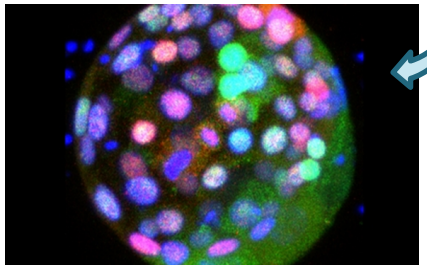
Francis Crick Institute

INPUTS



Bibliometric analysis of fields of research for combined LRI/NIMR – baseline data for benefits realisation at the Francis Crick Institute

The Francis Crick Institute © Justin Piperger Photography/Wadsworth3d



OUTPUTS

Embryo with OCT4 gene highlighted in green. Credit: Francis Crick Institute

- More than ten years in the planning
- Opened in 2015
- Founding partners MRC, CRUK, Wellcome, University College London, Imperial College, and Kings College London
- 1500 researchers
- £650M to establish and resource to make a major impact

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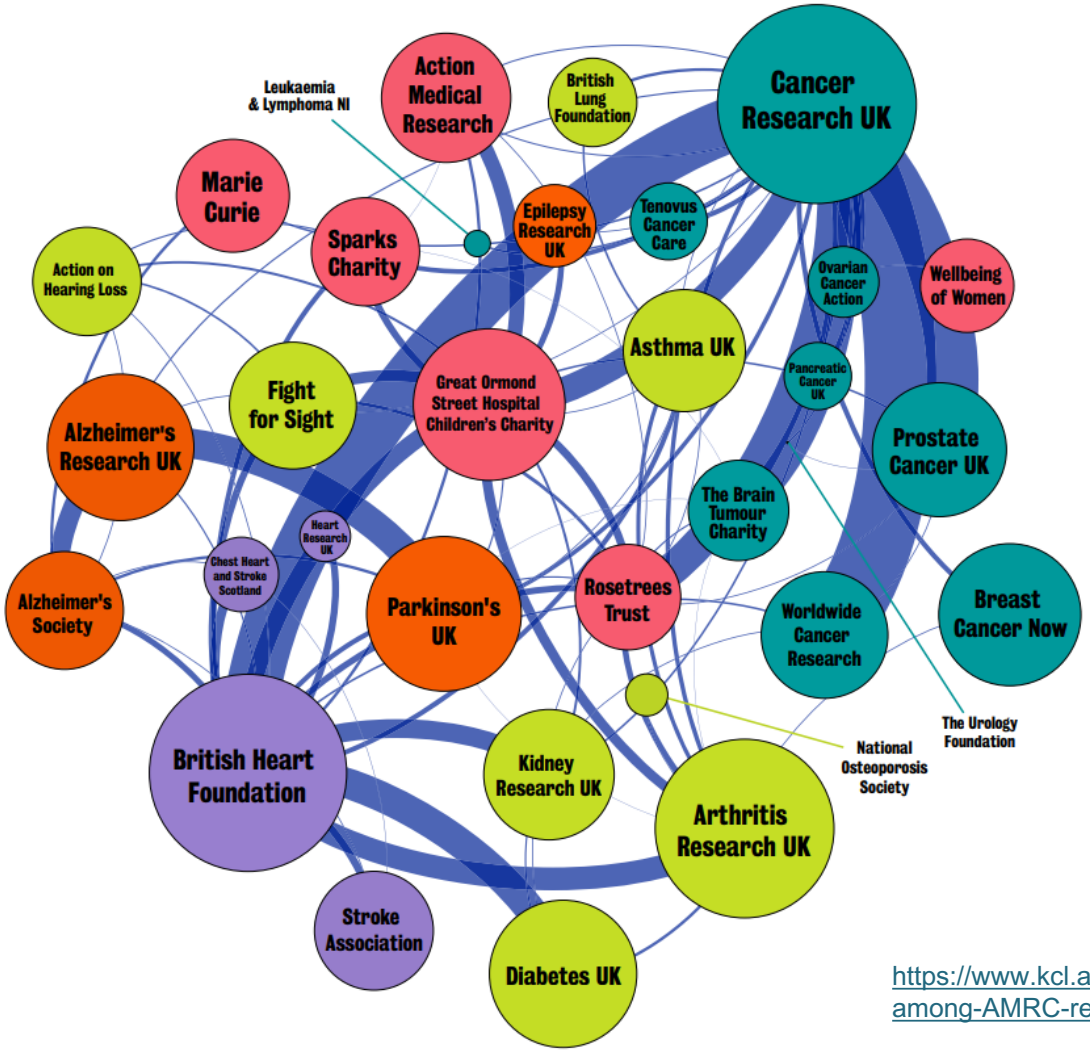
Sharing information between funders



Links between AMRC member funded projects via co-authored papers. Data collected via Researchfish® across 30 UK charities

https://www.kcl.ac.uk/sspp/policy-institute/publications/Collaborations-among-AMRC-research-funding-organisations.pdf

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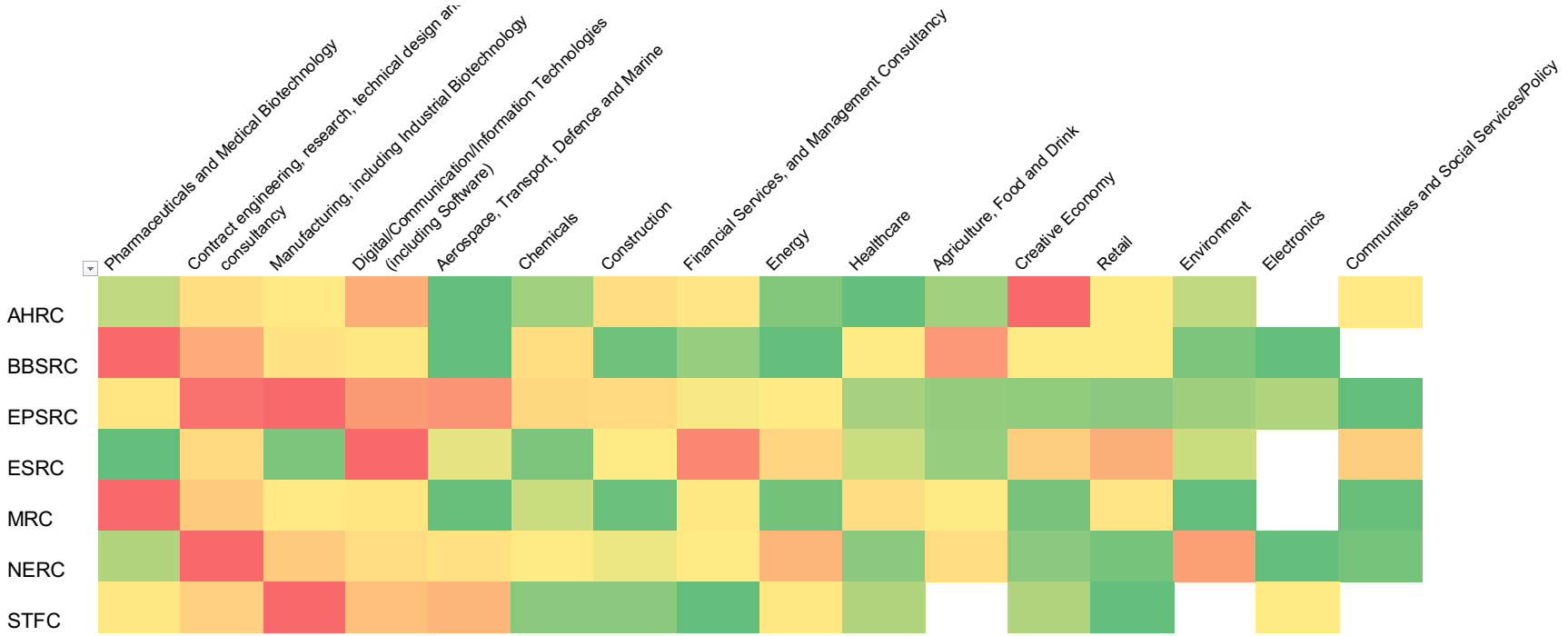
Industry sectors for UK-based company collaborations



7,500 private sector collaborations involving UK-based companies. SIC codes used to determine sectors for 3,000 unique companies

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Research organisations are interested in research outputs too

- Manage research portfolio
- Reputation, promotion & impact
- Accountability
- Benchmarking
- Analyze relationship between funding and outputs
- Digital asset management
- Policy compliance

Adapted from RCUK/Research organisation/Researchfish regional meetings 2016
http://www.rcuk.ac.uk/documents/documents/rfroadshowslides-pdf/

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Sharing information between Universities to benchmark performance

Snowball Metrics

- Metrics agreed across institutions and made openly accessible
- Data provided by institutions to a metrics exchange
- Metrics (not raw data) shared across contributing institutions

https://www.snowballmetrics.com/

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Growing collaboration between funders and research organisations

- "Interoperability" refers to the exchange of data between systems to promote "enter information once and re-use widely"

- The aim is to reduce…
  - Duplication of effort
  - Errors
  - Frustration

- This is more complicated than it sounds!
  - Questions and definitions must exactly match in both systems
  - How do you tell if two people are talking about the same thing?
  - Unique identifiers are **a** solution

Adapted from RCUK/Research organisation/Researchfish regional meetings 2016
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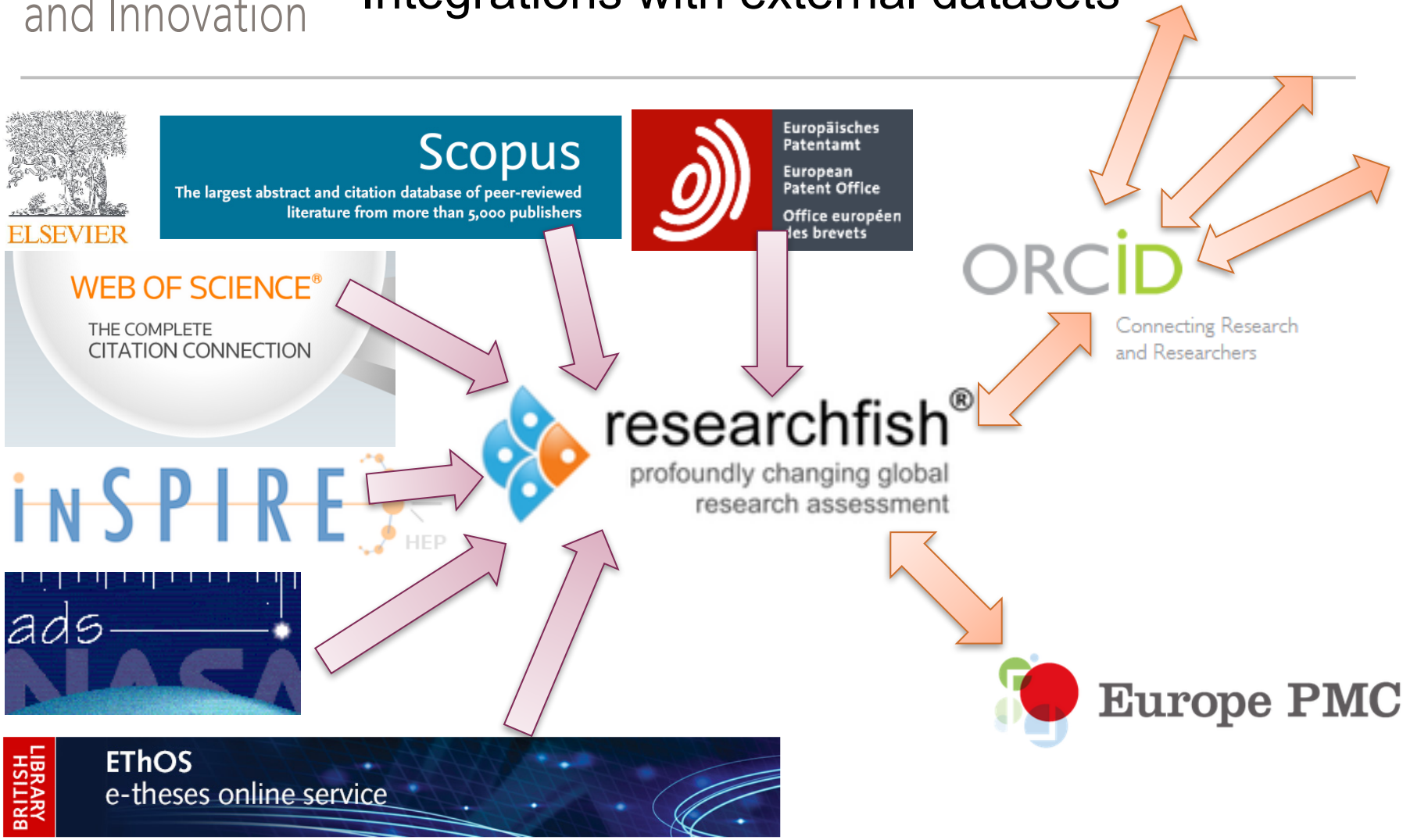
Integrations with external datasets



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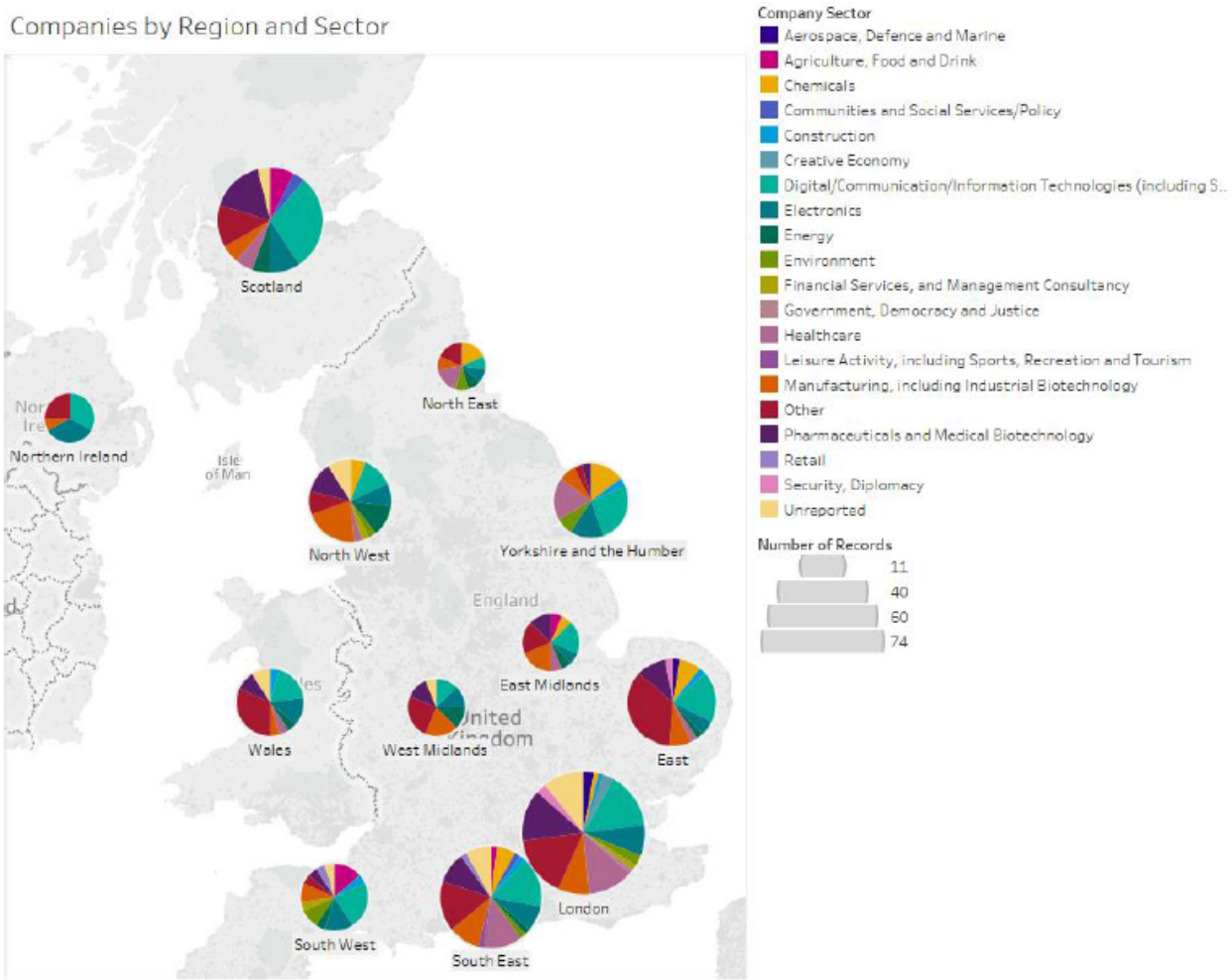
Record linkage essential



Regional analysis of 221 spin-out companies linked to Research Council funded work, employing staff in 2016

Used in the research council response to Government Industry Strategy Green Paper

Relies on linkage to company house data

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Are researchers interested in reporting output?

- Researchers are the primary source of feedback on the progress of their research
- As researchers have to interact with multiple systems, let's make this as painless as possible – record once, re-use widely
- Research outputs may be published and so read by others (potential research collaborators, students etc.) – researcher reputation
- Healthy to reflect and review progress
- Funders and research organisations can signal outcomes they are interested in
- Researchers are interested in how their data is used (was it worth the time and effort?), but there are challenges to communicating this effectively

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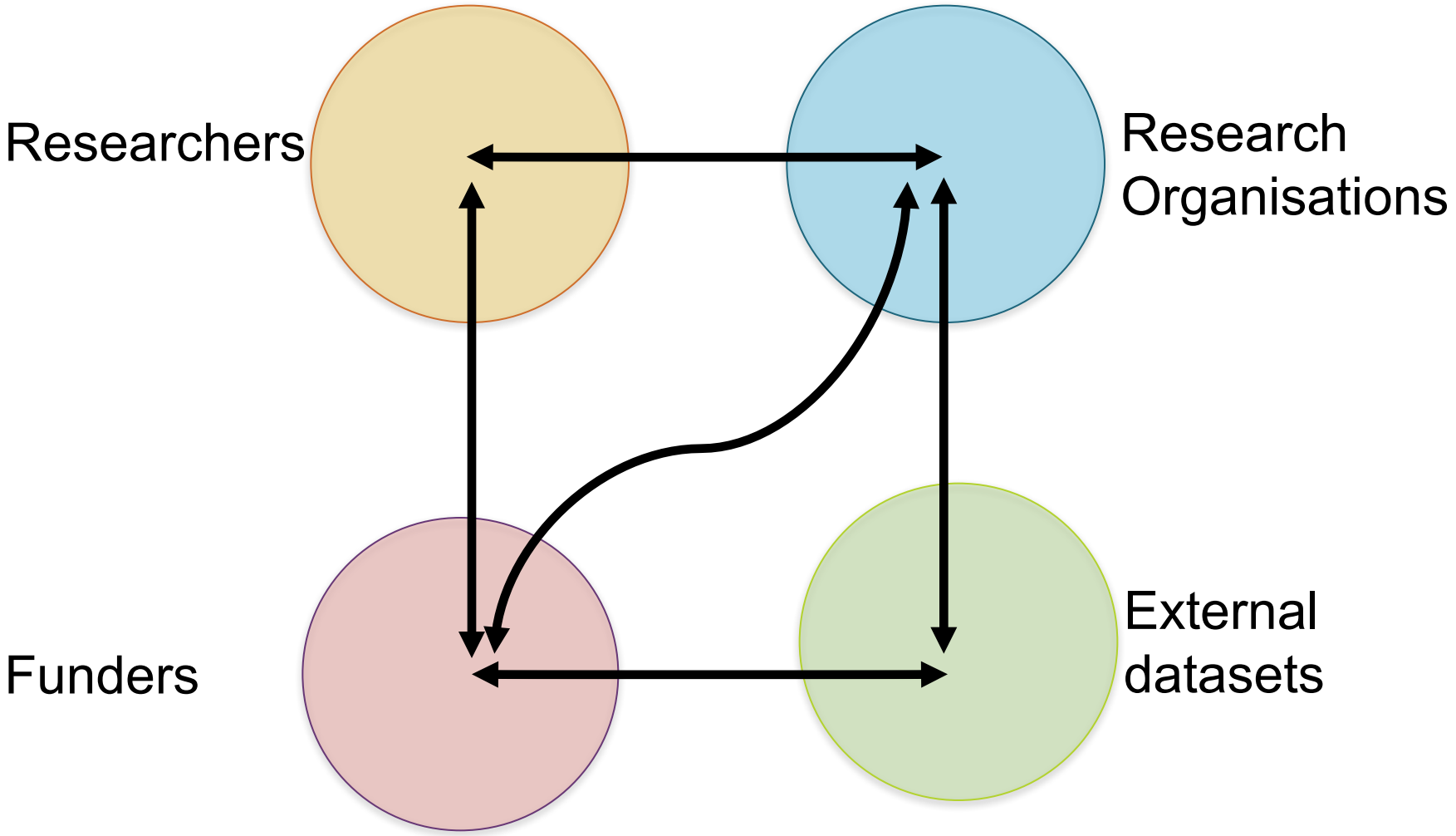
Collaborations



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Other issues for consideration

- International dimension
- Completeness of inputs
- Quality control of output/outcome/impact reports
- Person vs project

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Encouraging collaboration

- Regular discussion and trust
- Sharing
- Collaborative advantage – benefits for all partners
- Good governance – keeping things on track
- Long-term

THANK YOU