

# EMBL-EBI Impact Assessment

Value for money

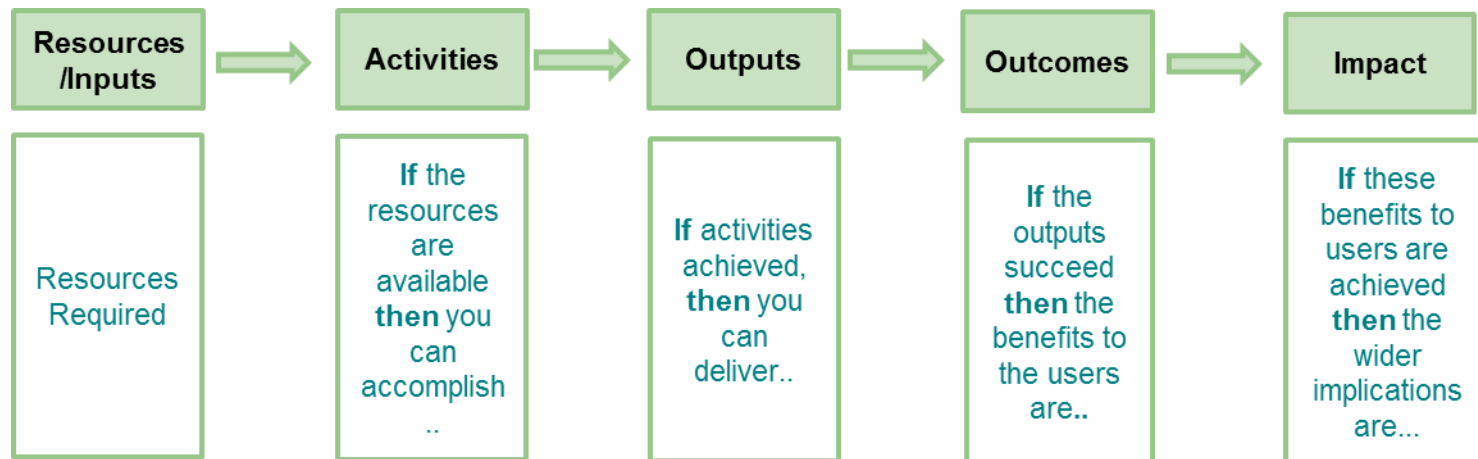
Mary Barlow

Head of Strategic Project Management Office,  
EMBL-EBI

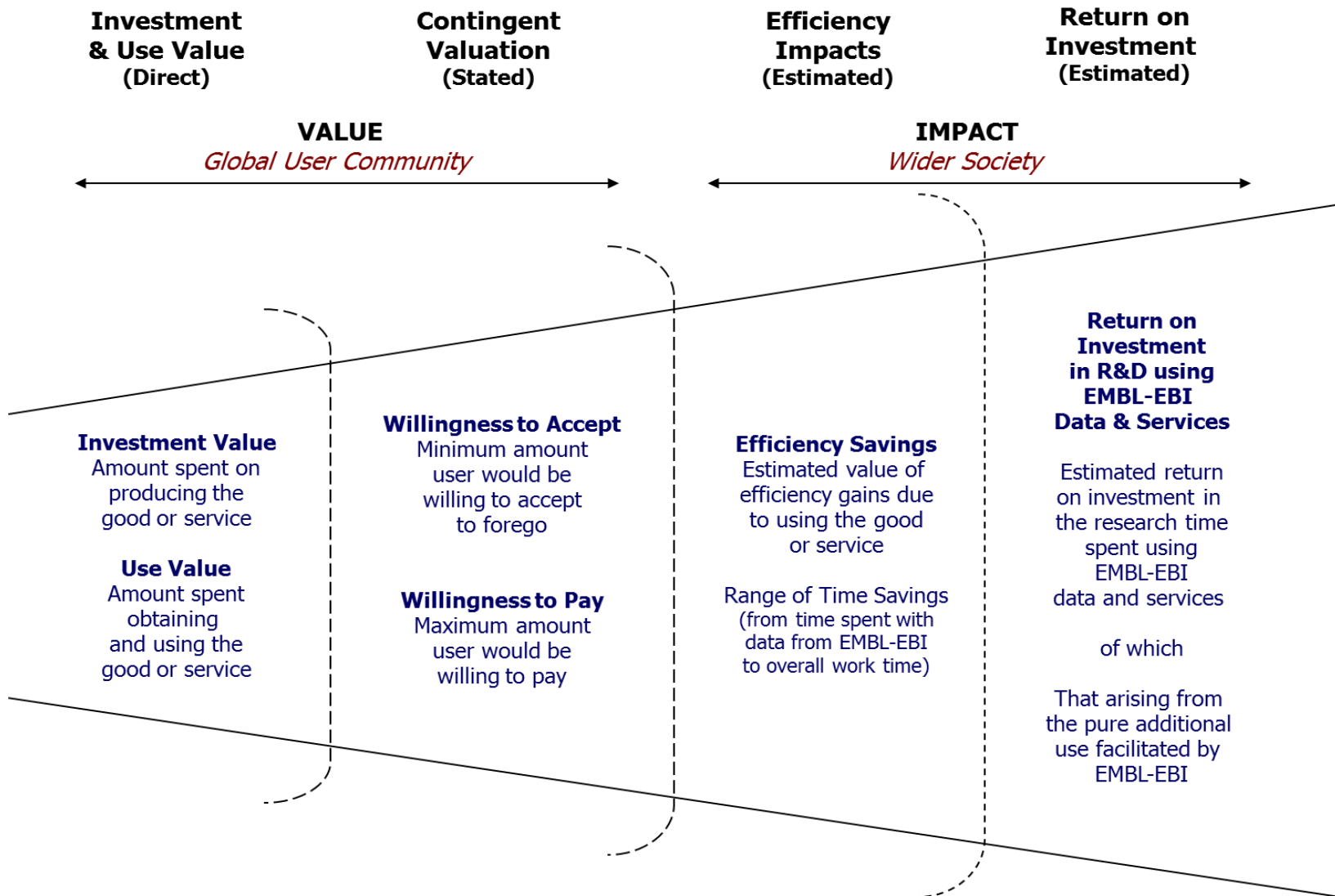
[www.ebi.ac.uk](http://www.ebi.ac.uk)

# Why measure impact?

- Accountability: Research/project aims: (Milestones, KPI's)
- Steering: Outcomes are following current strategy, or informing future strategy (Strategic plans, Logic Model)
- Advocacy: Proving if current research or future research is a worthwhile investment, or attracting more investment (Impact Statement, Return On Investment)



# Beagrie/Houghton Report: methods of assessment



# Community value

Measures *investment* by users who access data and services

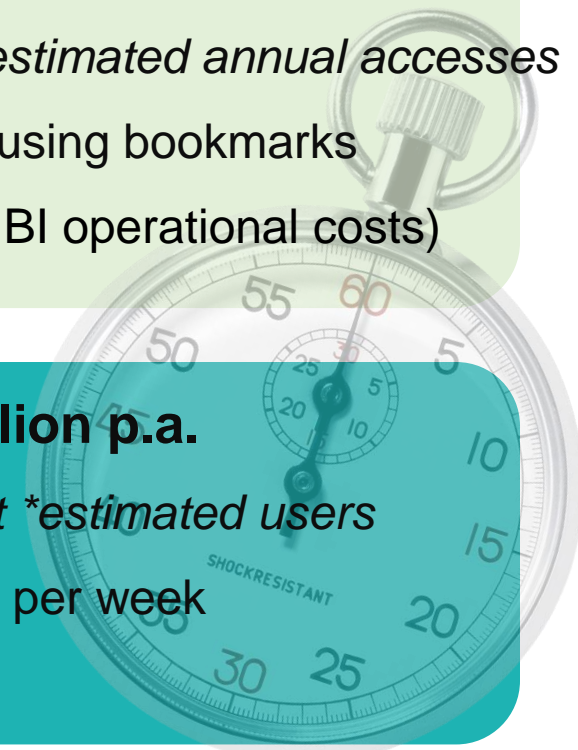
Suggests minimum amount data and services are worth to them

**Access value** (time to find the data): **£270 million p.a.**

- *(median time of last access \* mean hourly cost) \* estimated annual accesses*
- Most users (median) found data in 5 minutes, e.g. using bookmarks
- Represents 6-7 fold return on investment (EMBL-EBI operational costs)

**Use time** (time users spend with the data): **£2.3 billion p.a.**

- *Mean time with EMBL-EBI data \* mean hourly cost \* estimated users*
- Mean response time spent on research = 34 hours per week
- 20% of that time with data from EMBL-EBI



# Productivity Impact

The value of the efficiency impacts of EMBL-EBI data and services among their user community can be estimated from questions about the times spent on research and the share of that time working with data, and estimates of the efficiency time savings experienced by survey respondents.

## Efficiency Impacts:

**£1 billion and possibly up to £5 billion p.a.**

*((estimated users \* mean hourly cost) \* share of time with data) \* efficiency impact)*

# Wider societal impact: Return on Investment

One indicator on the potential wider and longer term impacts of EMBL-EBI resources is the **impact of the research to which they contribute**.

Using a modified Solow-Swan macro economic model and an average 40% return on R&D expenditure.

**Return on Investment: £920 million p.a. £6.9 billion over 30 years NPV**

*((((mean time with EMBL-EBI data per week \* mean hourly cost) \* weeks pa) \* estimated users) \* average return to R&D)*

**Counter-factual:** some 45% of users said they could not have obtained the data they last used elsewhere nor could they have created/collected it themselves.

**Additional Use: £330 million annually £2.5 billion over 30 years NPV**

*(((time with EMBL-EBI data pa / frequency of use) \* hourly cost) \* average returns to R&D) \* additional share of total use)*

# Additional info

- For information only – will not be presented



# EMBL-EBI Economic Impact Assessment 2015

UK Government provide guidance via the 'Magenta Book' on how they would \*like\* large investments and policies to be evaluated.

In a 2013 review of 'Big Science and Innovation' no large RI had used the recommended analysis.

Independent Consultants: Charles Beagrie Ltd (Neil Beagrie & John Houghton)

- Recognised as 'Best Practice' in the 2013 review
- Combine quantitative and qualitative methodologies

Large-scale survey: basis of quantitative evaluation

Direct interviews: basis of qualitative evaluation

Case Studies: Show direct stories of impact.



# Beagrie/Houghton Report: User population

- User survey provided 'clean' responses from 4185 users
- Total user population estimate: 198,000 unique, actual direct users
  - (13% of life-science researchers, based on OECD figures)
- How 'actual direct users' were estimated from web stats:
  - Unique host log of 10.8 million (Annual figure for 2014) adjusted to reflect key considerations:
    - People behind unique IPs in web stats usually over-estimated by a factor of 7 (Formitchev, 2010)
    - EMBL-EBI accessed by organisational IPs (survey: 4185 responses from 3622 unique IPs): Factor in 1.16 per unique IP
    - Respondents accessed 9 services on average – 10.8 million figure captured across EMBL-EBI resources

# Hypothetical value: Contingent Valuation

The contingent value of a non-market good or service is the amount users are willing to pay for it and/or are willing to accept in return for giving it up.

**Willingness to Pay:** (bound by budget) **£322 million p.a.**

*(mean willingness to pay \* estimated users)*

Scaling suggests an overall willingness to pay around £262 million per annum – equivalent to some 5.5 times operational costs.

**Willingness to Accept:** (not restricted) **£125 000 per user p.a.**

Wide range of responses for £0- £1million with Open data principles cited and others suggesting that research could not be done without it.

# Qualitative ‘Numbers’:

The qualitative analysis as part of the economic analysis supported the picture of the value and impact of EMBL-EBI data and services.

EMBL-EBI Annual user survey also asks two ‘Impact’ questions which:

1. use Thurstone Scaling to track the perceived ‘utility’ of EMBL-EBI
2. use ‘to what extent’ questions to track the validity of some of our logic model assumptions

This allows us to track the trends of our services and have up to date information to pass onto funders.

Essential to research  
84%

More than half (55%) of respondents to an independent survey said that not having access to EMBL-EBI services and resources would have a ‘major’ or ‘severe’ impact on their work or study. A further 29% said it would have a ‘moderate’ impact.



“EMBL-EBI services reduced **duplication** of effort.”



EMBL-EBI services improved the **quality** of data used within their research.

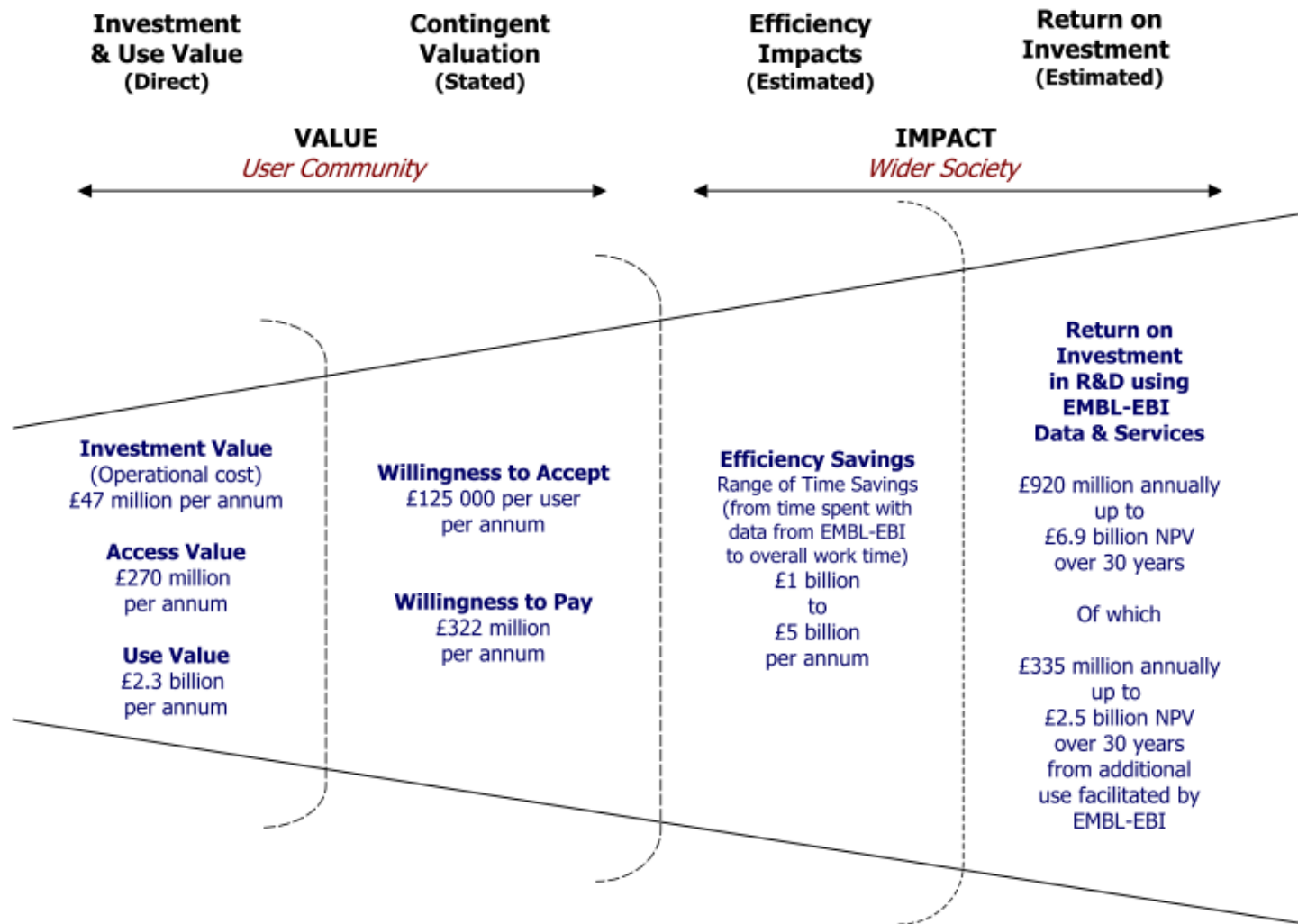


“EMBL-EBI services enabled me to **go ahead with research** I could not otherwise have pursued.”

# Conclusions

- Multiple approaches and a counter-factual provide a degree of cross-validation.
- Difficulties and critical points for economic analysis included:
  - Limited knowledge of real user populations
  - Survey sample and survey design
  - Value attribution, sunk costs, flow-through, and secondary use issues
  - Complexity of mature data services and their resources
  - "Costs of inaction" data - counter-factuals for new or emerging, as well as mature services

# The Value and Impact of EMBL-EBI



# Further Information

## EMBL-EBI Value and Impact Study

Executive Summary only <http://www.beagrie.com/EBI-impact-summary.pdf>

Full Report <http://www.beagrie.com/EBI-impact-report.pdf>

Other Beagrie/Houghton value and impact studies for Archaeology Data Service, British Atmospheric Data Centre, Economic and Social Data Service <http://bit.ly/1j0oi69>

Costs, Benefits, and ROI for research data services <http://bit.ly/2ln7T4n>

## Rand Health Research Evaluation Frameworks

[http://www.rand.org/content/dam/rand/pubs/technical\\_reports/2008/RAND\\_TR629.pdf](http://www.rand.org/content/dam/rand/pubs/technical_reports/2008/RAND_TR629.pdf)

## Treasury Magenta Book

[https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/220542/magenta\\_book\\_combined.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/220542/magenta_book_combined.pdf)