Where the rubber meets the road: some practical thoughts about analysing evaluation data

Nick Smith, Cancer Research UK

Who are Cancer Research UK?

THE LARGEST FUNDRAISING MEDICAL RESEARCH CHARITY IN THE WORLD

THE LARGEST FUNDER OF CANCER RESEARCH IN EUROPE

THE SECOND LARGEST GLOBAL FUNDER OF CANCER RESEARCH

WE ARE ALMOST EXCLUSIVELY FUNDED THROUGH PUBLIC DONATIONS

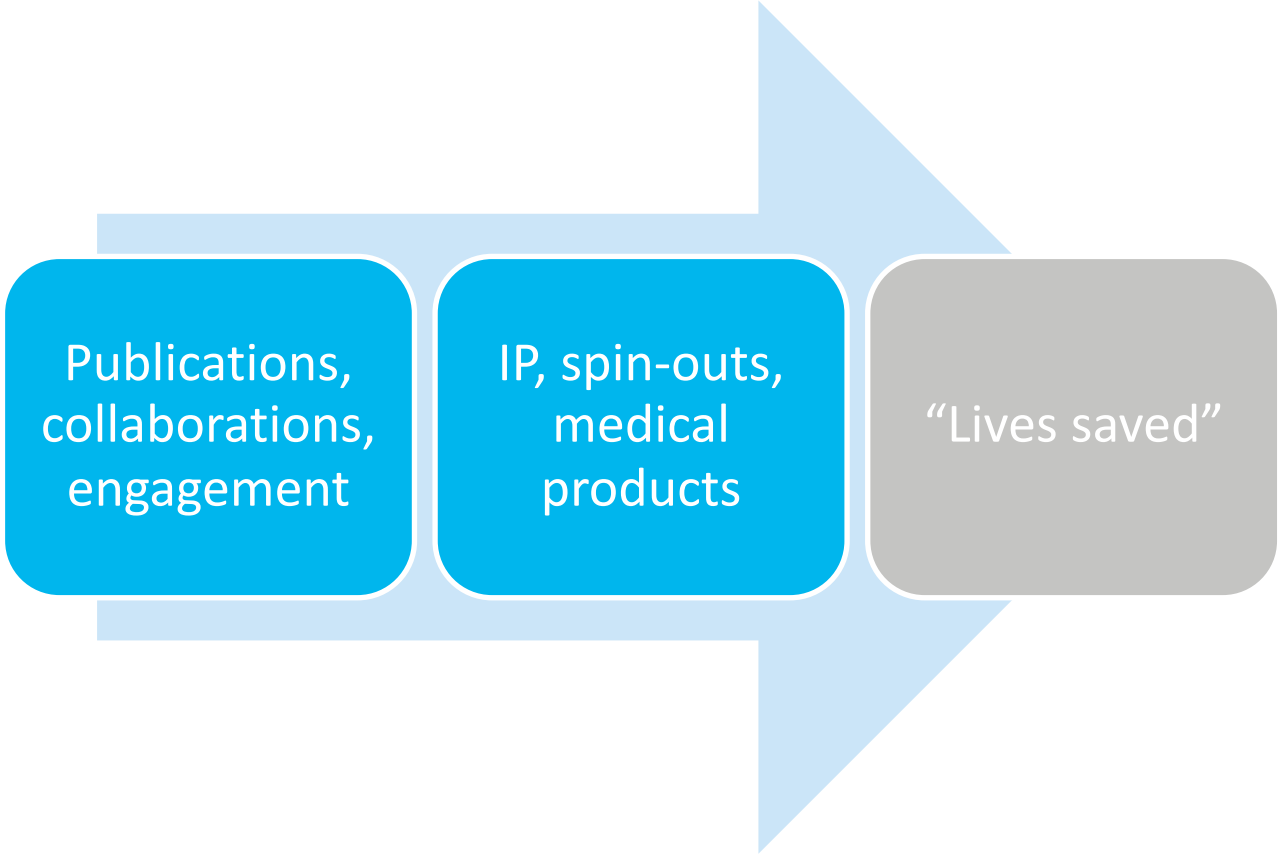
THE MONEY WE RAISE IS SPENT ON RESEARCH, INFORMATION, ADVOCACY AND PUBLIC POLICY

WE FUND 45% OF CANCER RESEARCH ACTIVITY IN THE UK

About me & the CRUK evaluation team

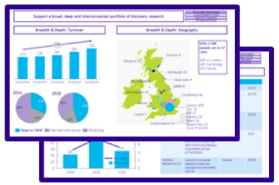
- A team of 4.5 people, which sits alongside the wider strategy team
- I have worked with the team for the last year, running the Researchfish submission and analysis and leading the production of strategic progress dashboards
- Bring a human and sociological perspective to research evaluation data
- Today I want to speak with you about my experience “where the rubber meets the road” in evaluation at CRUK

Interested in near-to-medium term outputs



Research Strategy Evaluation Dashboards

Evaluation Framework



Detailed background analysis

Approach Level Dashboard (x9)

Overall summary dashboard indicating RAG in each of CRUK's strategic research priorities

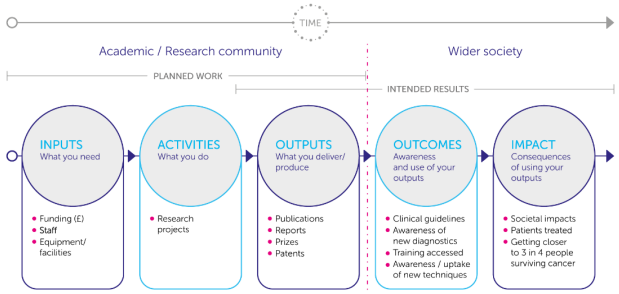
- Framework outlining strategy (need good strategy for good evaluation)
- Supports evaluation of progress (need "data culture")
- Uses input, activity and outcome data as measures of progress
- Summary dashboard = quick comparison of strategy areas
- Complements expert review

Existing guides to analysing research evaluation data are numerous but have limitations

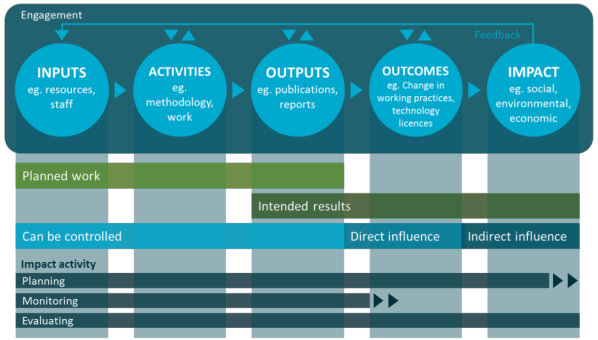
- ISRIA
- Metric Tide/ Responsible Metrics
- Snowball Metrics
- Leiden Manifesto
- REWARD
- Funder initiatives
- AMRC & Wellcome events
- Technical literature, e.g. Cronin and Sugimoto's edited volume, *Beyond Bibliometrics: Harnessing Multidimensional Indicators of Scholarly Impact*

Schematics can be over-complicated (but also not complex enough)

CRUK

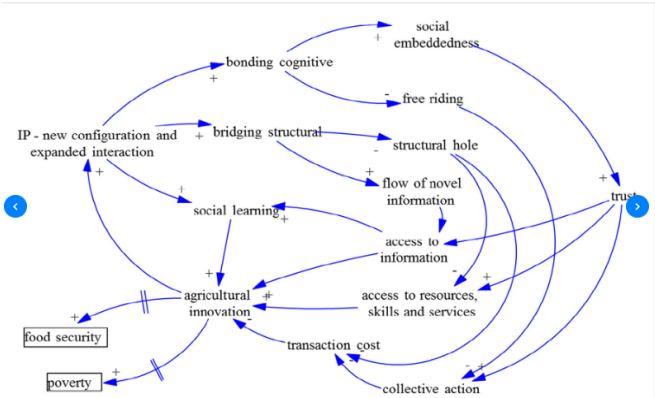


CSIRO



Impact Framework *derived from the work of the W.K. Kellogg Foundation*

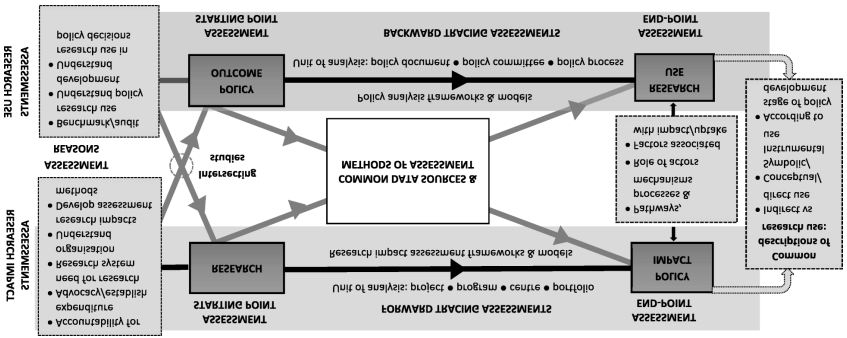
Theory of Change Perspective on Agricultural Development Interventions



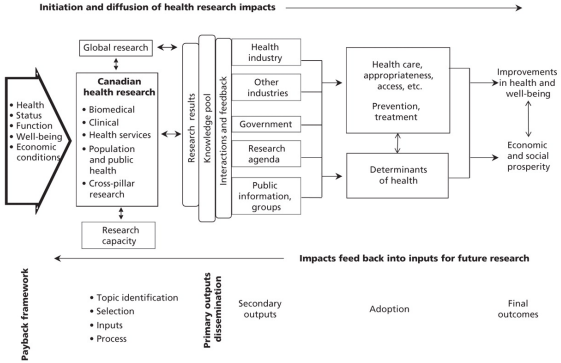
Social impact mediated impact pathway (source: authors).

Source publication

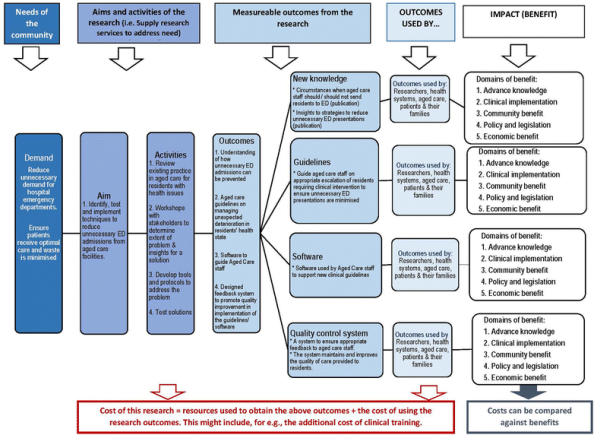
(Health) Payback Framework



(Health) Payback Framework



Framework To Assess the Impact from Translational (FAIT)



Productive Interactions (SIAMPI)

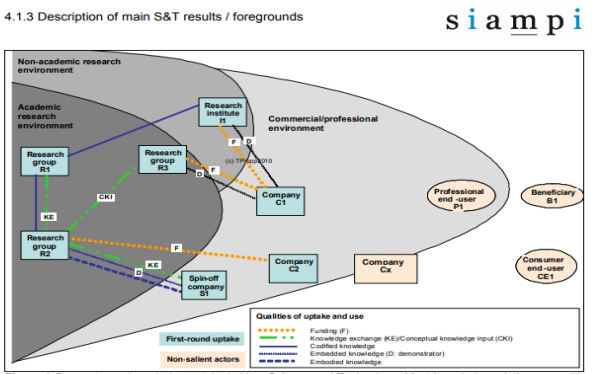
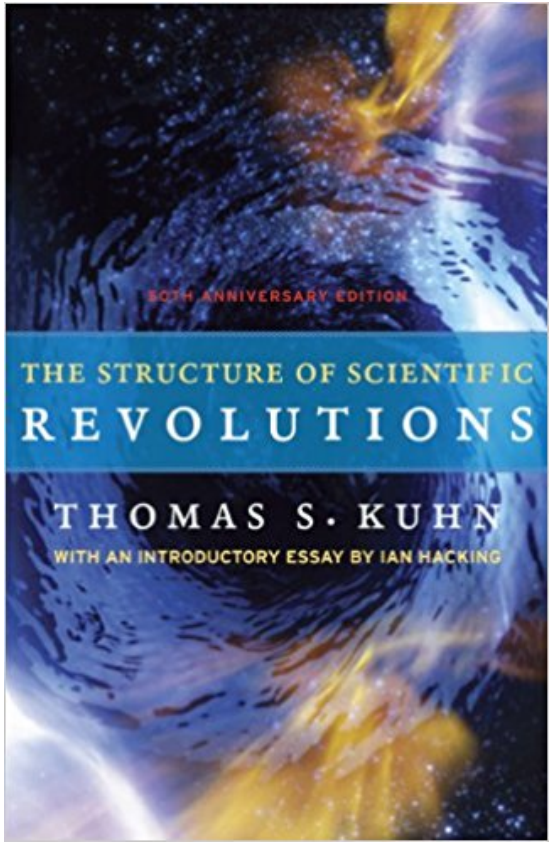
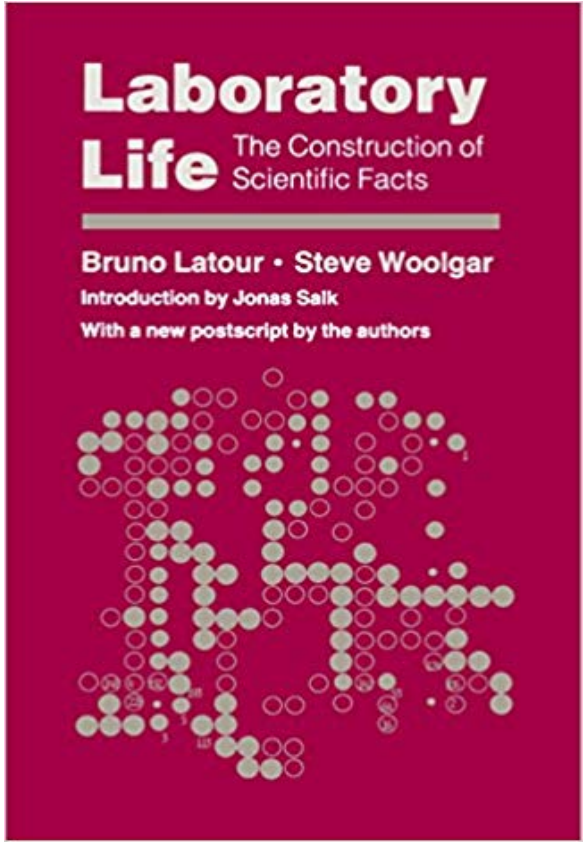


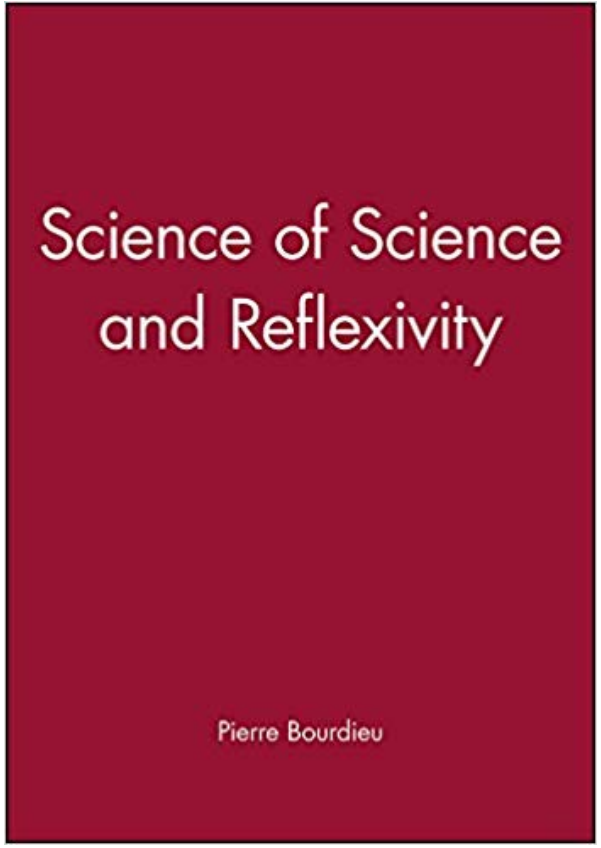
Figure 1 *Down stream knowledge uptake in NanoScience and Technology. Most knowledge relations are with stakeholders with a strong R&D profile. Relations with end users, beneficiaries and consumers in the lighter areas are only indirect and outside the realm of the researchers.*

There is an opportunity for evaluators to move beyond performance

- As evaluators working with evaluation data alone, we risk treating researchers as ciphers
- How does the way researchers work, as people, affect research outcomes?
- A social scientific approach to the data helps unlock meaning and value and move beyond performance and towards understanding complexity


50TH ANNIVERSARY EDITION
THE STRUCTURE OF SCIENTIFIC
REVOLUTIONS
THOMAS S. KUHN
WITH AN INTRODUCTORY ESSAY BY IAN HACKING


Laboratory
Life
The Construction of
Scientific Facts
Bruno Latour • Steve Woolgar
Introduction by Jonas Salk
With a new postscript by the authors

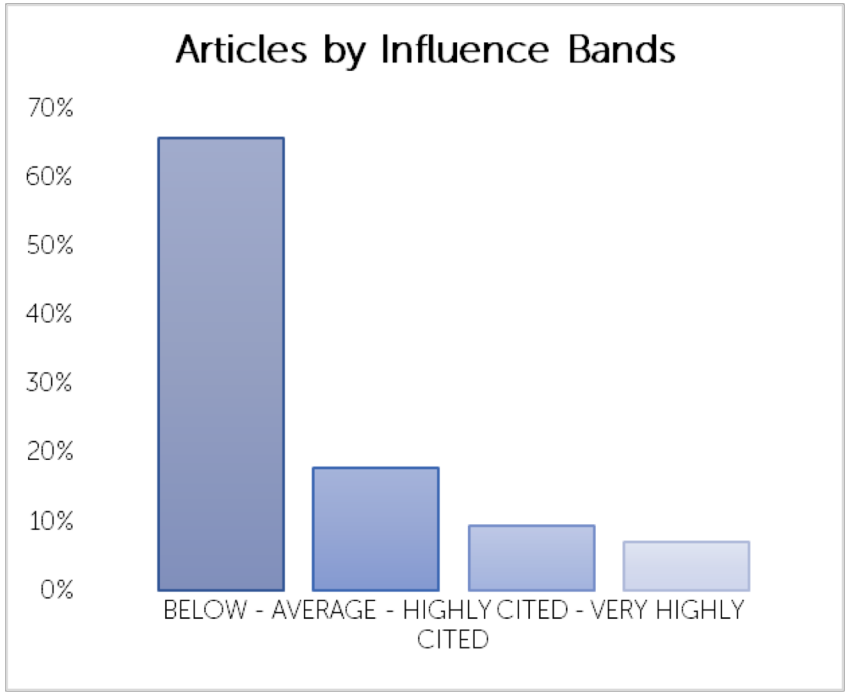

Science of Science
and Reflexivity
Pierre Bourdieu

The added value of a social scientific approach

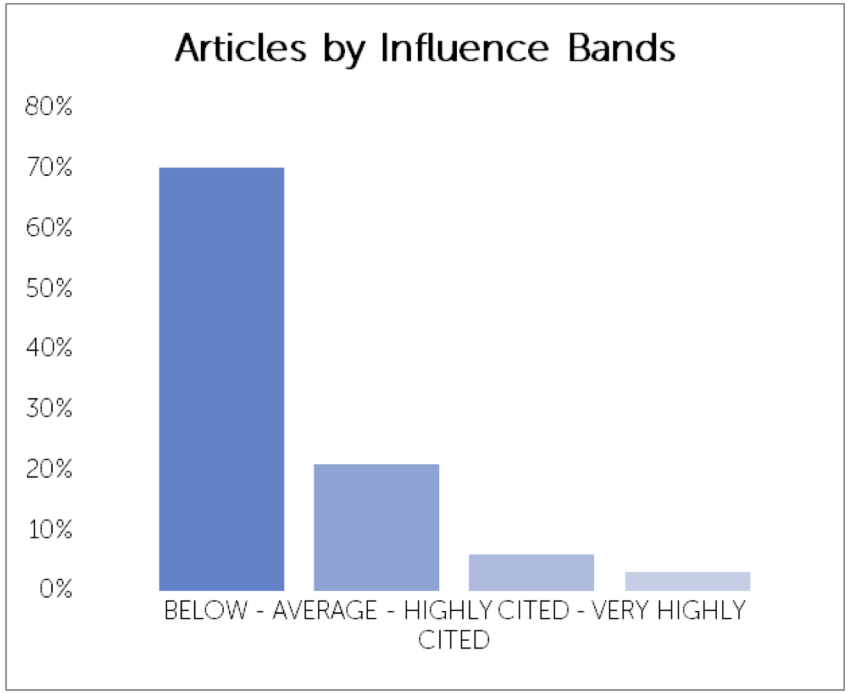
- Can handle complex, takes account of the human dimension
- Helps us move beyond evaluating purely for performance
- Informs the generation of meaningful questions and hypotheses
- Hypotheses help us generate nuanced findings about the dynamics of research that are relevant to the concerns and aims of our organisations

Normalised bibliometric data is fairer, but trickier to interpret

CRUK



"Average" for all scientific publications



There is a lot more in the publications (and collaborations) data than performance

- Finding more than the good, the bad and the indifferent means asking more probing questions
- Can we find evidence for social scientific theories and models about the mechanics of science in our datasets?
- E.g. do we under-value “average” papers? Can funders measure their researchers slow and steady progress in a field? Can we identify paradigm-shifting papers?

Conclusion

- Move beyond counts and volume-based measures of performance
- Engage social science literature on the sociology and anthropology of science to develop organisationally relevant hypotheses to investigate in the data
- Design new measures and combinations of measures that speak to a more complex understanding of the scientific system
- Produce a rich bank of information on our impact on the research landscape and how to modify our impact to achieve organisational priorities

Appendix

Existing guides

Leiden Manifesto

1) Quantitative evaluation should support qualitative, expert assessment
2) Measure performance against the research missions of the institution, group or researcher
3) Protect excellence in locally relevant research (allow for variation across academic cultures, e.g. English vs. other language publications)
4) Keep data collection and analytical processes open, transparent and simple
5) Allow those evaluated to verify data and analysis.
6) Account for variation by field in publication and citation practices (normalize)
7) Base assessment of individual researchers on a qualitative judgement of their portfolio
8) Avoid misplaced concreteness and false precision
9) Recognize the systemic effects of assessment and indicators (don't create perverse incentives)
10) Scrutinize indicators regularly and update them

The Metric Tide

- Robustness: basing metrics on the best possible data in terms of accuracy and scope
- Humility: recognising that quantitative evaluation should support – but not supplant – qualitative, expert assessment
- Transparency: keeping data collection and analytical processes open and transparent, so that those being evaluated can test and verify the results
- Diversity: accounting for variation by field, and using a variety of indicators to support diversity across the research system
- Reflexivity: recognising systemic and potential effects of indicators and updating them in response.

ISRIA

Challenges

- Time lags
- Attribution and contribution
- Understanding high and low impact when the differences are small and there isn't consensus on what good looks like
- Ensuring evaluation offers added value
- Identifying the correct unit of assessment when research is multi-disciplinary and has impact in a variety of fields
- Scale: what is the level at which a particular mode of assessment is appropriate.

Solutions

- mixed methods and multi-data sources
- the responsible selection of indicators and metrics
- ISRIA suggests triangulating data sources, using multiple or baskets of data points to highlight a finding.