Metrics on the rise
… their increasing role in research assessment

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Outline of presentation

- Why is the use of metrics increasing?
- A brief discussion of two recent comprehensive reviews of the use of quantitative indicators
- The research agencies capable of supporting the development of enhanced/novel metrics

Why the increase?

- Government directives
- Increased accountability requirements / advocacy
- Peer review overloaded
- Entry of new databases / data sources into the landscape
- Technology advances
- Failure of peer review processes

Recent reviews

Recent comprehensive reviews of the role of metrics in the assessment and/or funding of research:

- OECD workshop on Performance-based Funding for Public Research in Tertiary Education Institutions

- Canadian Academy of Health Sciences – *Making an Impact: A Preferred Framework and Indicators to Measure Returns on Investment in Health Research*. Available at http://www.cahs-acss.ca/wp-content/uploads/2011/09/ROI_FullReport.pdf

- The Council of Canadian Academies *Report of the Expert Panel on Science Performance & Research Funding* (forthcoming)

OECD Workshop

- Workshop held in Paris on 21 June 2010
- Published report covers three commissioned literature reviews which informed the workshop:
  - Models of performance-based research funding systems
  - Performance indicators used in these systems
  - Impacts of the systems
- Report also includes:
  - Detailed country surveys
  - Proceedings of the workshop

Role of metrics in performance-based funding systems

- Panel assessment – primarily peer review
  - UK (RAE and REF), Hong Kong, China
- Panel assessment – expert review with central role for metrics
  - Australia (ERA – science disciplines)
- Formula-based: metrics only
  - Australia (current formulae), Austria, Czech Republic, Denmark, Finland, Norway, Flanders, Sweden, Slovak Republic
- Formula-based: mix of peer review and metrics
  - New Zealand, Italy, Poland

Impacts of funding systems

Report reviewed evidence on the intended and unintended consequences on:

- Funding
- Human resource issues
- Productivity
- Teaching
- Discipline mix
- Focus of research
- Institutional management practices
- Collaboration
- Author behaviour

Headline outcomes

- Policy interest in performance-based funding for research is growing
- Current funding models have numerous goals, including research excellence
- Performance indicators are varied and constantly evolving
- Budgetary impacts also differ across countries
- Evidence-based analysis of impacts is scarce
- International comparative studies of impact would aid policy making

Workshop proceedings can be found at:
http://www.oecd.org/document/25/0,3746,en_2649_34269_46622745_1_1_1_1,00.html

Context of CCA/NSERC review of metrics

- NSERC funds people and programs in natural sciences and engineering in the Canadian tertiary education sector
- Its flagship funding scheme for basic research is the Discovery Grants Program (DGP)
- To enable NSERC to respond to changes in the research environment, a budget reallocation process was introduced in 1994 for the DGP
- A 2007 evaluation of the initiative concluded that the costs were disproportionately high compared to the achieved reallocation of funds
- CCA was commissioned to undertake a review of existing practice and formulate a metrics-based approach

NSERC's brief to CCA

Questions to the expert panel:

1. What existing qualitative and quantitative indicators and metrics are relevant to budget allocation in the context of support for research in the natural sciences and engineering … ?

2. What are international best practices in the construction, methodological review, and use of quantitative and qualitative indicators for research evaluation and budget allocation in support of research in the natural sciences and engineering?

3. Considering the foregoing, and in light of the Government of Canada's Science and Technology Strategy and NSERC's objectives for the support of research, what key considerations … and principles emerge in determining defensible use and balance/ weighting of performance indicators/metrics for budget allocation?

Supporting the development of metrics I

- University units:
  - CWTS – Centre for Science and Technology Studies, Leiden University, Netherlands
  - ECOOM – Centre for R&D Monitoring, Katholieke Universiteit, Leuven, Belgium
  - IWT – Institute of Science and Technology Studies, University of Bielefeld, Germany
  - OST – Observatoire des Sciences et des Technologies, University of Montreal, Canada
  - Library and Information Science and Sociology Departments of various universities (e.g. Loughborough, Wolverhampton, Indiana, Georgia Tech, Arizona State, Amsterdam)

Supporting the development of metrics II

- Government/funding agency research units:
  - iFQ – Institute for Research Information and Quality Assurance, Germany
  - OST – Observatoire des Sciences et des Technologies, France
  - CINDOC – The Centre of Scientific Information and Documentation, Spanish National Research Council
- Government agencies established to provide PRFS data:
  - SOOS (Belgium), ANVUR (Italy), CNEAI (Spain)
- Private sector:
  - Evidence Ltd (UK)
  - ScienceMetrix (Canada)
  - Elsevier, Thomson Reuters, Google

iFQ projects

- Evaluation and evaluation methods
- Development of methods and indicators
- Peer review
- Governance
- Research Information
- Monitoring
- Young researchers and careers
- European Summer School for Scientometrics

Concluding "pleas"

- Use a balanced approach – avoid viewing metrics and peer review as an "either/or" choice
- Use professional bibliometric techniques and analysts, avoiding "amateur bibliometrics"
- Support the conduct of independent, evidence-based, multi-national research projects that investigate the impacts of all forms of research assessment