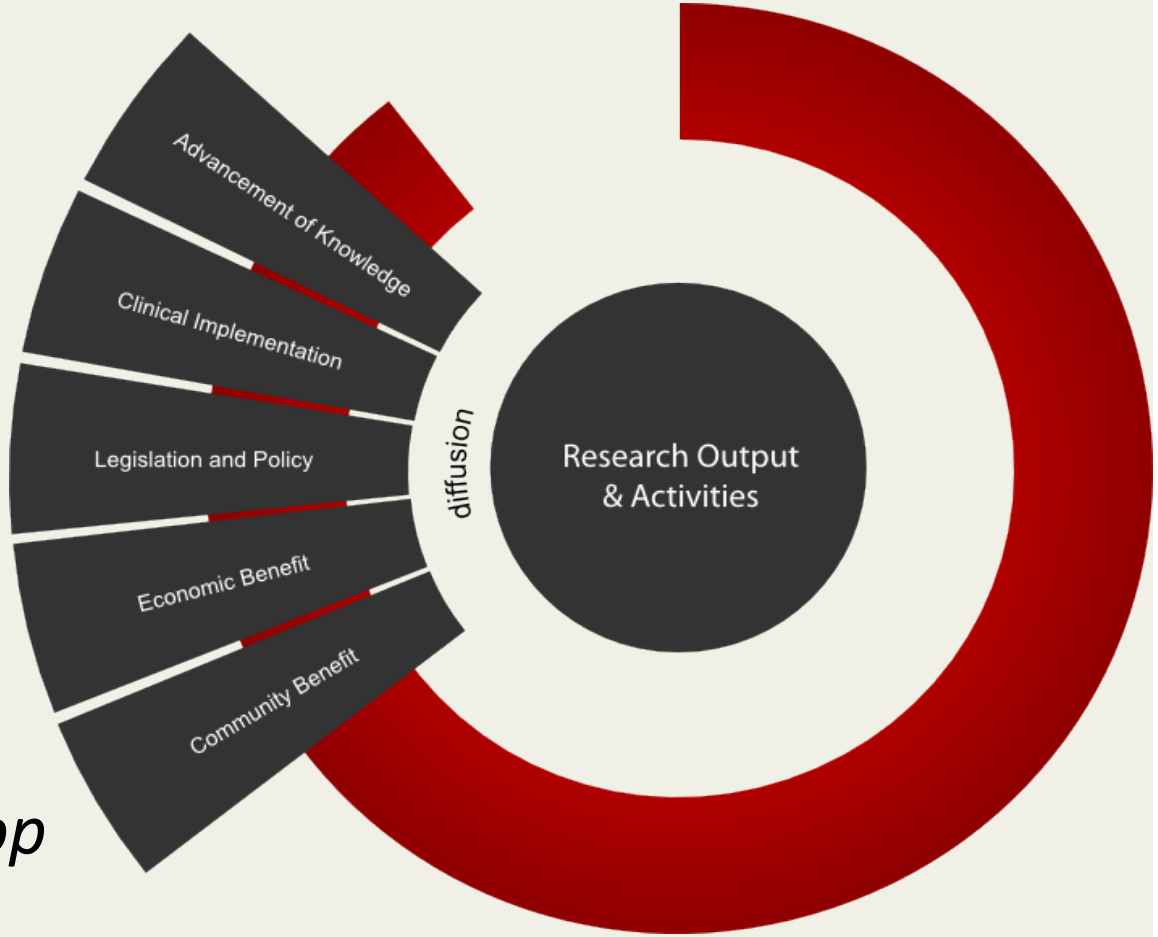
Impact Assessment & Evaluation

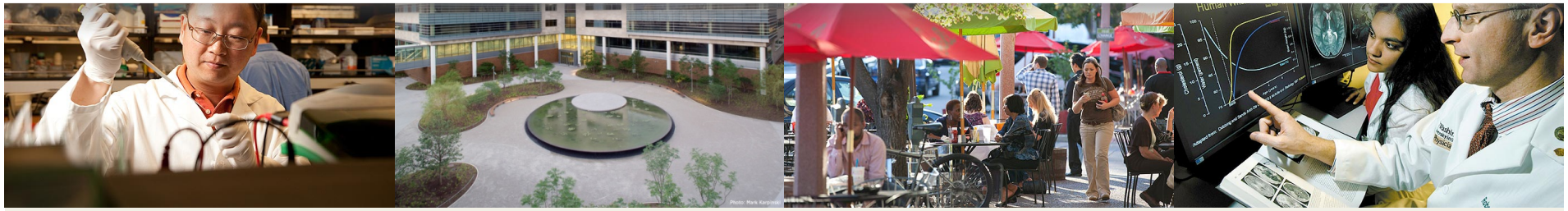
Kristi Holmes, PhD
Washington University ICTS
Becker Medical Library
February 12, 2013

CTSA Ontology Workshop



The biomedical research enterprise

T1		T2		T3		T4
Potential Application		***Efficacy***		***Effectiveness***		***Population-Based***
Basic Scientific Discovery	⟷	**Potential Clinical Application**	⟷	**Evidence-Based Guidelines**	⟷	**Clinical Care or Intervention**	⟷	**Health of Community or Population**
Basic Knowledge		*Theoretical Knowledge*		*Efficacy Knowledge*		*Applied Knowledge*		*Public Health Knowledge*



Szilagyi PG. Translational research and pediatrics. *Acad Pediatr*. 2009 Mar-Apr;9(2):71-80.

Tracking & Evaluation

- Why measure?
- What things do people typically count?
- What things should you measure?

"It is no longer enough to measure what we can – we need to measure what matters."

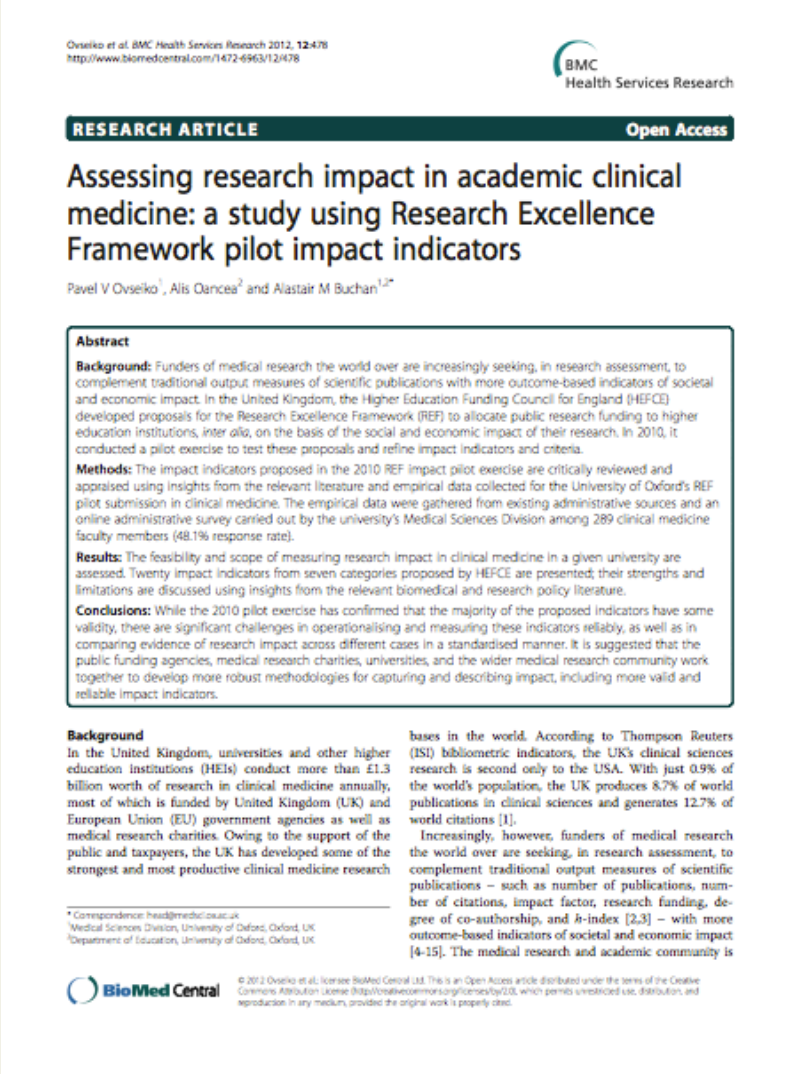
Wells R, Whitworth A. 2007. Assessing outcomes of health and medical research: do we measure what counts or count what we can measure? *Australia and New Zealand Health Policy*, 4:14. http://www.anzhealthpolicy.com/content/4/1/14

Author, article, and journal-level metrics

Going beyond the metrics: The REF

Research Excellence Framework (REF)

- Complement traditional output measures of scientific publications with more outcome-based indicators of societal and economic impact.
- Assessing the quality of research in UK higher education institutions
- Twenty impact indicators from seven categories
- Strengths and limitations are discussed



Ovseiko et al. BMC Health Services Research 2012, 12:478
http://www.biomedcentral.com/1472-6963/12/478

BMC Health Services Research

RESEARCH ARTICLE Open Access

Assessing research impact in academic clinical medicine: a study using Research Excellence Framework pilot impact indicators

Pavel V Ovseiko[1], Alis Oancea[2] and Alastair M Buchan[1,2*]

Abstract

Background: Funders of medical research the world over are increasingly seeking, in research assessment, to complement traditional output measures of scientific publications with more outcome-based indicators of societal and economic impact. In the United Kingdom, the Higher Education Funding Council for England (HEFCE) developed proposals for the Research Excellence Framework (REF) to allocate public research funding to higher education institutions, *inter alia*, on the basis of the social and economic impact of their research. In 2010, it conducted a pilot exercise to test these proposals and refine impact indicators and criteria.

Methods: The impact indicators proposed in the 2010 REF impact pilot exercise are critically reviewed and appraised using insights from the relevant literature and empirical data collected for the University of Oxford's REF pilot submission in clinical medicine. The empirical data were gathered from existing administrative sources and an online administrative survey carried out by the university's Medical Sciences Division among 289 clinical medicine faculty members (48.1% response rate).

Results: The feasibility and scope of measuring research impact in clinical medicine in a given university are assessed. Twenty impact indicators from seven categories proposed by HEFCE are presented; their strengths and limitations are discussed using insights from the relevant biomedical and research policy literature.

Conclusions: While the 2010 pilot exercise has confirmed that the majority of the proposed indicators have some validity, there are significant challenges in operationalising and measuring these indicators reliably, as well as in comparing evidence of research impact across different cases in a standardised manner. It is suggested that the public funding agencies, medical research charities, universities, and the wider medical research community work together to develop more robust methodologies for capturing and describing impact, including more valid and reliable impact indicators.

Background

In the United Kingdom, universities and other higher education institutions (HEIs) conduct more than £1.3 billion worth of research in clinical medicine annually, most of which is funded by United Kingdom (UK) and European Union (EU) government agencies as well as medical research charities. Owing to the support of the public and taxpayers, the UK has developed some of the strongest and most productive clinical medicine research bases in the world. According to Thompson Reuters (ISI) bibliometric indicators, the UK's clinical sciences research is second only to the USA. With just 0.9% of the world's population, the UK produces 8.7% of world publications in clinical sciences and generates 12.7% of world citations [1].

Increasingly, however, funders of medical research the world over are seeking, in research assessment, to complement traditional output measures of scientific publications – such as number of publications, number of citations, impact factor, research funding, degree of co-authorship, and *h*-index [2,3] – with more outcome-based indicators of societal and economic impact [4-15]. The medical research and academic community is

* Correspondence: head@medsci.ox.ac.uk
[1]Medical Sciences Division, University of Oxford, Oxford, UK
[2]Department of Education, University of Oxford, Oxford, UK

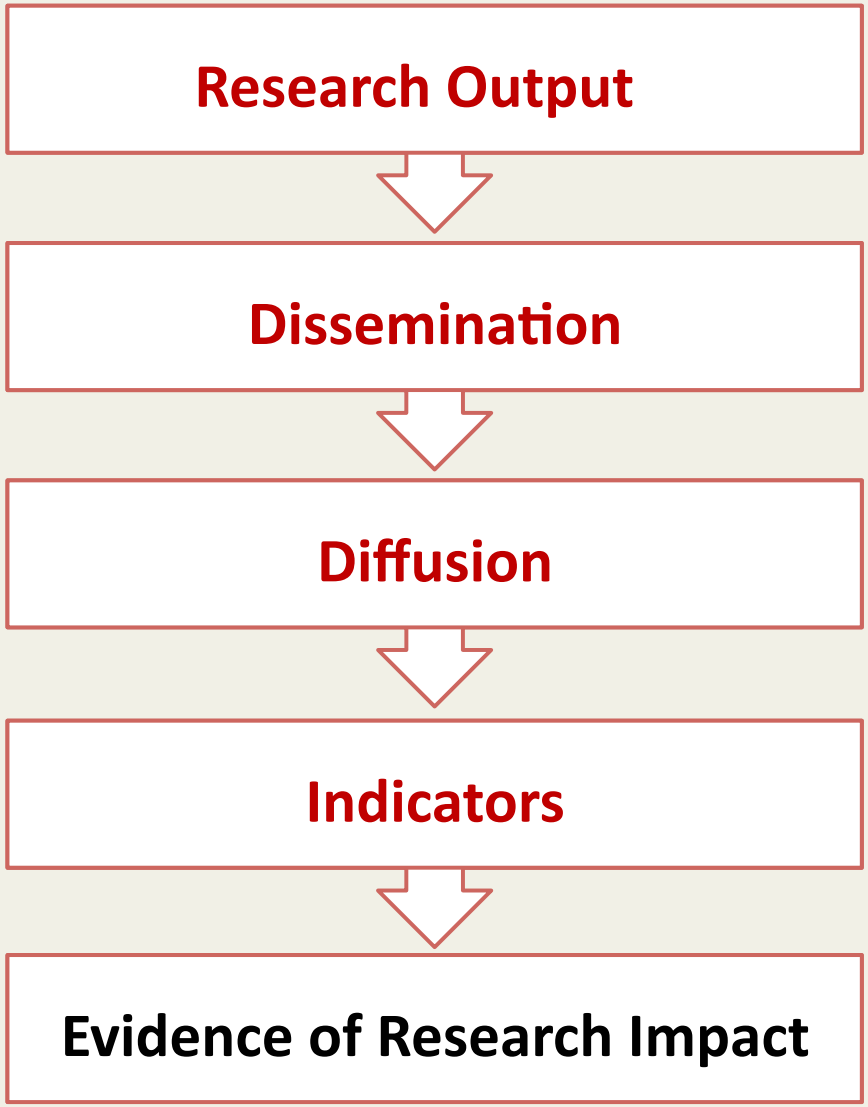
BioMed Central © 2012 Ovseiko et al.; licensee BioMed Central Ltd. This is an Open Access article distributed under the terms of the Creative Commons Attribution License (http://creativecommons.org/licenses/by/2.0), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

BMC Health Services Research 2012, doi:10.1186/1472-6963-12-478

Going beyond the metrics: The Becker Model

A Hybrid Solution: The Becker Model

The Becker Model involves tracking research outputs that have been disseminated/diffused to locate indicators that demonstrate evidence of research impact.



Pathways

- ✓ Advancement of Knowledge
- ✓ Clinical Implementation
- ✓ Legislation and Policy Enactment
- ✓ Economic Benefit
- ✓ Community Benefit

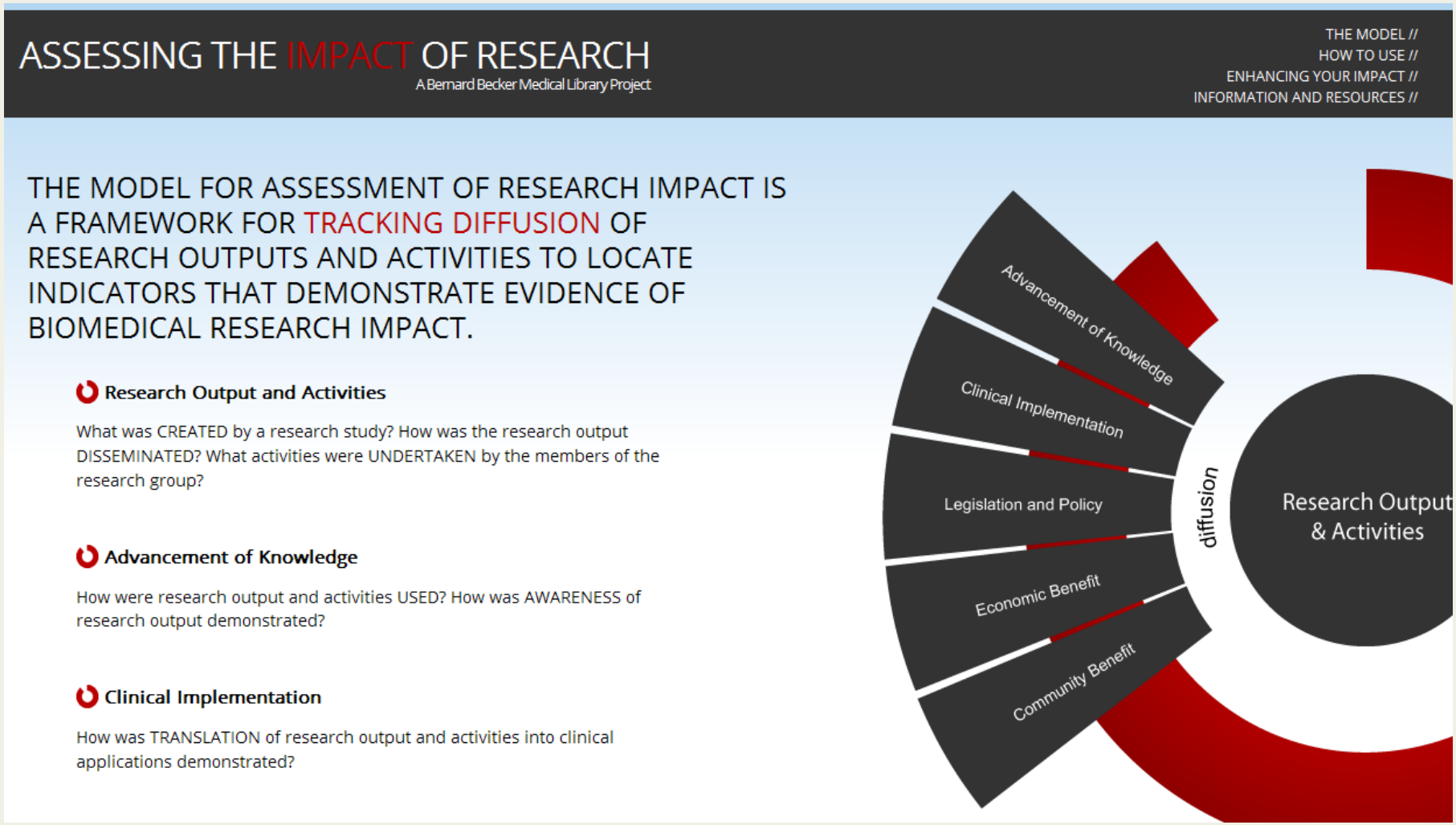
Evidence of Research Impact: examples

- Advancement of Knowledge: License agreement granted for use of intellectual property generated by the research study
- Clinical Implementation: Creation of Current Procedural Terminology (CPT) codes
- Legislation and Policy Enactment: AIA *Guidelines for Design and Construction of Health Care Facilities*
- Economic Benefit: The polio vaccine has reduced the burden of polio by over 99%.
- Community Benefit: A blood test for detection of damage to the heart muscle leads to early treatment for myocardial infarctions, a leading cause of death worldwide.

The Becker Model

- Provides a supplement to publication analysis to provide a more robust and comprehensive perspective of biomedical research impact.
  - reporting templates, glossary of resources and terms, examples of relevant indicators of impact across the research process, readings, and a sample of a completed report
- Straightforward framework for tracking diffusion of research outputs and activities to locate indicators that demonstrate evidence of biomedical research impact
  - individual, core, and institutional-level
- Guidance for quantifying and documenting research impact as well as resources for locating evidence of impact.
- Strategies for *enhancing* the impact of research.

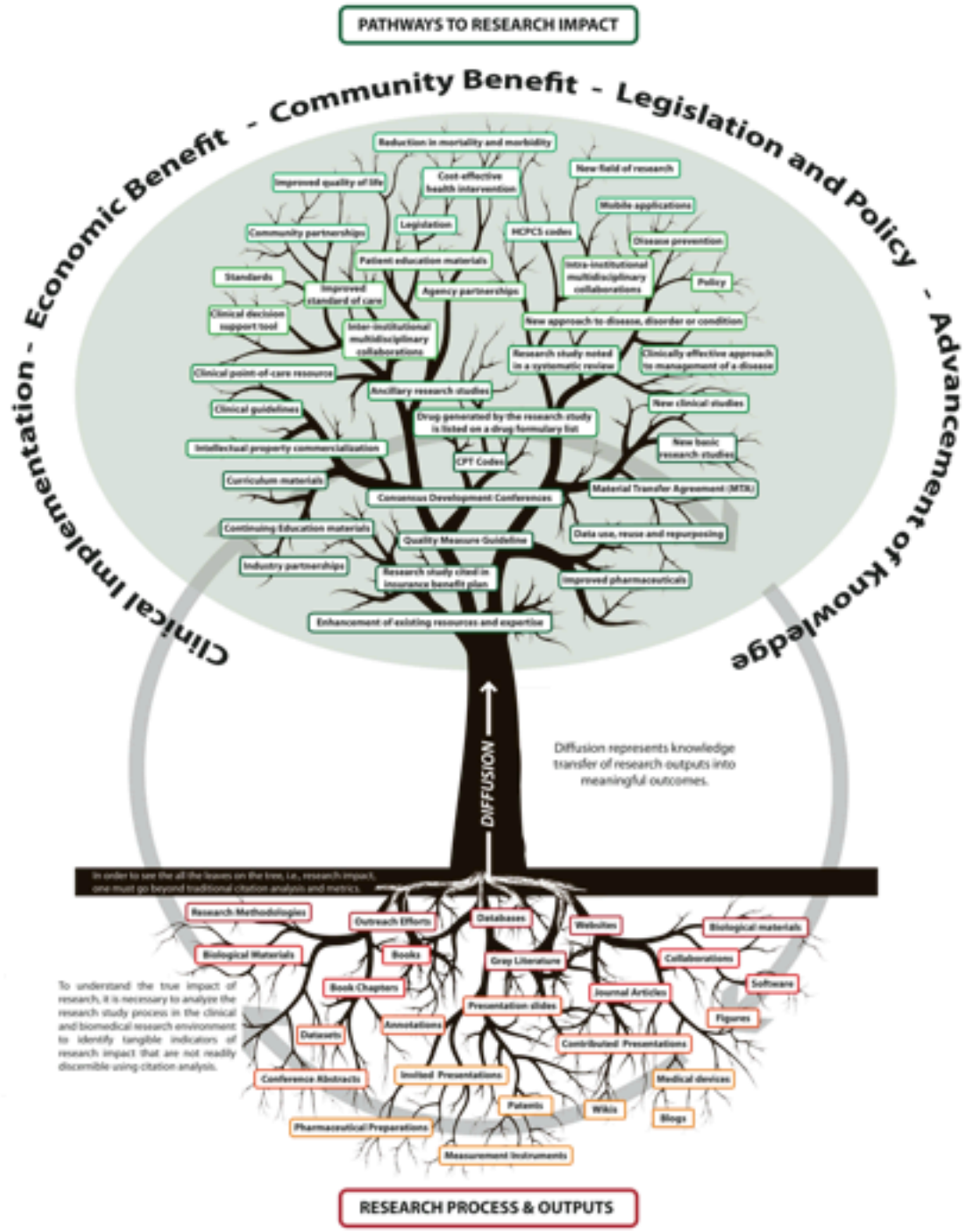
Project Website



https://becker.wustl.edu/impact-assessment

The Washington University in St. Louis Institute of Clinical and Translational Sciences Tracking and Evaluation (T&E) Program

The Becker Model



General Issues & Challenges

- Time lag between research discovery and translational applications.
- Optimal timeframe for starting assessment is unknown.
- Supporting documentation may not be publicly available.
- Difficult to establish a direct correlation from a specific research output.
- Not a linear process; frustrating at times.
- Difficult to operationalize and measure indicators reliably
- Difficult to compare evidence of research impact across different areas in a standardized manner

BMC Health Services Research 2012, doi:10.1186/1472-6963-12-47
J Med Libr Assoc 2010, doi: 10.3163/1536-5050.98.1.008.

The value of curating oneself

The value of structured data

Next steps

- Identify indicators
- Operationalize

Fifteen Most Promising Clinical Research Processes and Outcomes Metrics from Evaluation KFC Annual Meeting

- Time from IRB submission to approval
- Studies meeting accrual goals
- Time from notice of grant award to study opening (e.g., investigator initiated studies)
- Number of technology transfer products
- Volume of investigators who used services
- Volume of types of services used
- Satisfaction/needs assessment
- Time to publication
- Influence of research publication (e.g., observed/expected citations)
- Researcher collaboration (e.g., team science; collaboration index)
- ROI of pilot and KL2 scholars
- Time from publication to a research synthesis
- Career development
- Career trajectory (e.g., K-R transition)
- Institutional collaboration (public-private; cross-institutional; community)

https://www.ctsacentral.org/sites/default/files/documents/EvaluationF2F_Summary_20121018.pdf

VIVO
2013
Continue the discussion…
- Workshop
- Sessions
August 14 -16, 2013
St. Louis, Missouri • vivoweb.org/conference

Acknowledgements

- **Cathy Sarli, MLS, AHIP**
- Washington University ICTS
- Becker Medical Library

Questions/Follow-up:

- holmeskr@wustl.edu
- **Twitter:** @kristiholmes
- **VIVO:** http://vivo.wustl.edu/display/n4754

Funding:

- Washington University Institute of Clinical and Translational Sciences, NIH award UL1 RR024992