



Papers, Projects, Programs and Portfolios: Peer Review as a Public Health Research Evaluation Tool

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- The findings and conclusions of this presentation are those of the authors and do not necessarily represent the official positions of the National Institutes of Health (NIH) or Centers for Disease Control and Prevention (CDC)



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Approach

- Provide a framework for thinking about how peer review has been used and can best be used for research evaluation
 - Not a systematic review of literature
 - Uses examples drawn mostly from public health
 - Employs familiar research evaluation logic model





Overview

- Background
- Characteristics of Peer Review
- Who Determines Peer Review Process?
- Time Period of Evaluation
- Evaluation of Peer Review Criteria for Research Journals, Grants, Projects, Programs and Portfolios
- Who Qualifies as “Peer” in Peer Review?
- Comparing Peer Review for Grants, Projects, Programs, Portfolios and Publications
- Evaluation Alternatives to Peer Review
- Conclusion



Logic Model for Communicating About Public Health Research Progress and Impacts



Adapted from Pahl, EPA



Background

- Peer review used as evaluation tool
 - Traditionally used for scholarly publications and grant applications
 - More recently used for
 - Individual research projects
 - Programs (collections of related research projects)
 - Large portfolios (collections of related research programs)





Most Peer Review Definitions Reflect Its Traditional Use for Publications or Grants...

“Peer review (also known as refereeing) is the process of subjecting an author's scholarly work, research or ideas to the scrutiny of others who are experts in the same field. Peer review requires a community of experts in a given (and often narrowly defined) field, who are qualified and able to perform impartial review.”

Source: Wikipedia, http://en.wikipedia.org/wiki/Peer_review, extracted 10/19/08



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Characteristics of Peer Review

- Established and accepted method of evaluation
- Relatively easy and inexpensive to conduct
- Conducted by individuals or a panel
- May be formal or informal
- May be single or double blinded
- Qualitative
- Subject to potential bias of reviewers





Who Determines Peer Review Process? - I

- Scientific manuscripts: Established by each journal
- Grants: Set by regulation or funding agency
 - Federal agencies: Often specified by regulations, e.g.,
 - National Institutes of Health (NIH), 42 CFR Part 52h
 - Agency for Healthcare Research and Quality (AHRQ), 42 CFR Part 67
 - Foundations: Formulate their own polices
 - American Cancer Society
 - Wellcome Trust





Who Determines Peer Review Process? - II

- Projects, programs, and portfolios: Often set by funding agency or research performer institution, e.g.,
 - Government: CDC Research and Scientific Program Review Policy
 - Universities: Harvard School of Public Health Visiting Committee, MIT Visiting Committee on Sponsored Research
 - Foundations: Bill and Melinda Gates Foundation

Challenge: To change (improve) process may require revisions to existing regulations or policies



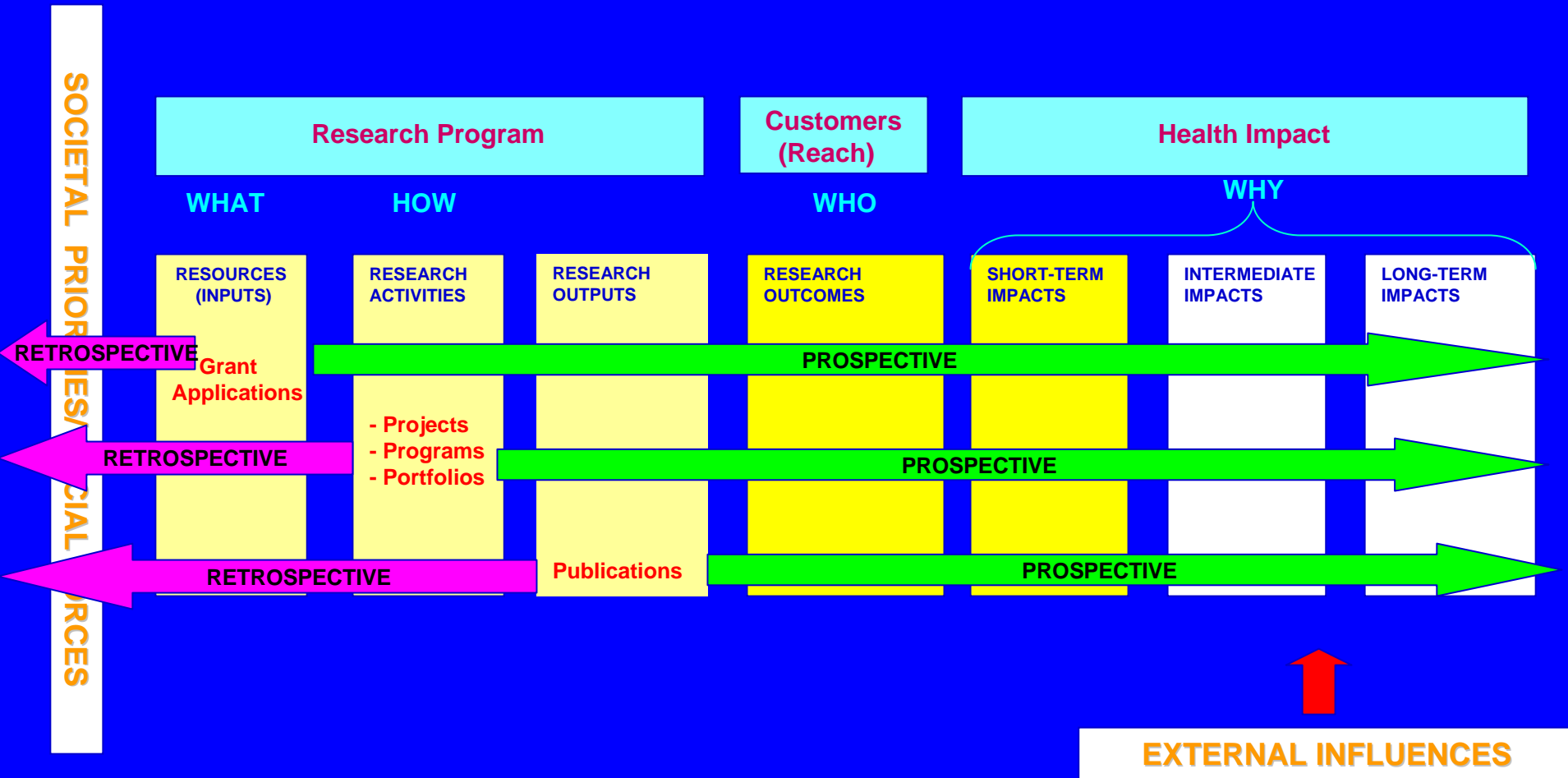


Time Period of Evaluation

- Peer review may be retrospective or prospective
 - Prospective reviews evaluate potential research achievements and thus are less certain than retrospective reviews of actual accomplishments
- Which research phase is retrospectively or prospectively reviewed depends on what is being evaluated (e.g., grants, publications, or programs)
 - Demonstrate this with logic model for research evaluation



Retrospective v. Prospective Review of Research Phase Depends on What Is Being Evaluated





Evaluation of Peer Review Criteria for Health Research Journals

- Evaluated peer review criteria of top 10 Impact Factor ranked journals for 2 journal categories
 - Obtained desired information from journal websites or emails from journal for 14 of 20 target journals
 - 12 journals had specific review criteria
 - 2 journals published invited review articles, so did not do peer review
 - For the 12 journals requiring peer review, identified and classified their specific review criteria to research phase in logic model





Journals Whose Review Criteria Were Evaluated

Impact Factor Rank	Journal Category	
	Medicine, General & Internal	Public, Environ & Occup Health
1	New England J Med	Annual Review Public Health
2	Lancet	Environ Health Perspectives
3	JAMA	Epidemiol Reviews
4	Annals Internal Med	American J Epidemiology
5	Annual Review Med	Epidemiology
6	PLOS Med	WHO Technical Reports Series
7	British Medical J	International J Epidemiology
8	Archives Internal Med	Cancer Epidem Biomarkers & Prev
9	Canadian Med Assoc J	Bulletin WHO
10	Annals of Med	American J Public Health



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Obtained specific criteria

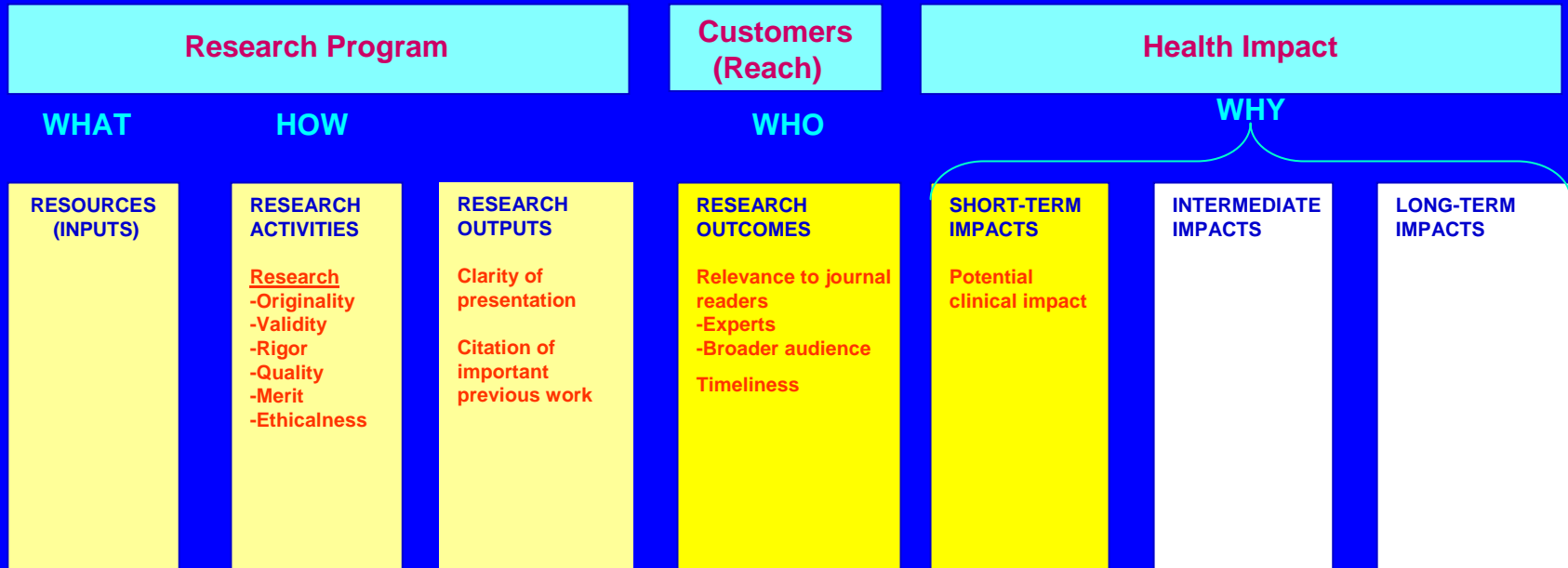
Invited papers, not peer reviewed

Criteria not obtained

Journal Peer Review Criteria by Research Phase

Importance or significance of problem
Impact on future biomedical research

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Evaluation of Peer Review Criteria for Research Grant Applications

- Evaluated peer review criteria of 3 U.S. public health agencies, NIH, AHRQ and CDC
 - All 3 agencies use dual peer review system
 - 1st level review - provides judgment of scientific merit
 - 2nd level review - assesses program priorities, and makes funding recommendations
 - Classified specific criteria for 1st level review (in red) and 2nd level review (in purple) to research phase in logic model



Research Grants Peer Review Criteria by Research Phase

Significance
(importance of
problem)
Funding agency
program priorities

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New Emphasis for Grants Peer Review Criteria: Shift to Impact

- ‘Significance’ criterion has evolved over time to include health impact (e.g., NIH 2004 revision)
- In future, NIH review criteria will focus more on impact
 - Result of NIH Peer Review Enhancement study begun in Summer 2007
 - Implementation of recommendations underway
 - “Modify the rating system to focus on specific review criteria, with less emphasis on methodological details and more emphasis on potential scientific impact”

Source: “Report on Enhancing Peer Review at NIH, Implementation Plan,” 6/08





Evaluation of Research Project, Program and Portfolio Peer Review - I

- Peer review of projects, programs and portfolios share many features, e.g., retrospective or prospective
- Often focus on later phases of logic model: research outcomes or impacts
 - To properly evaluate later phases, peer reviewers need quantitative analyses of outcomes or impacts, e.g., bibliometrics, economic analyses
 - Long-term health impact harder to demonstrate for chronic conditions with long lag between exposure and illness, so may instead evaluate shorter-term impacts such as reduction of risk factors





Evaluation of Research Project, Program and Portfolio Peer Review - II

- Long-term health impact (e.g., reducing mortality) harder to demonstrate for single project than for a large research portfolio but....
- Major methodological challenges exist to aggregating impact of individual projects/programs comprising a research portfolio
- Examples: Program evaluation programs and guidance
 - PHS Evaluation Set-Aside Program
 - “CDC Research and Scientific Program Reviews: Guidance for CDC Programs and Boards of Scientific Counselors,” 9/08 – *includes non-research*



CDC Research and Scientific Program Review Criteria by Research Phase

Relevance to Program Mission

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Who Qualifies as “Peer” in Peer Review?

- Scientific quality/merit review *usually* restricted to highly specialized scientific experts, with exceptions, e.g.,
 - American Cancer Society grants peer review panels include cancer “stakeholders”
- Review for mission relevance, program priorities and funding decisions *sometimes* include stakeholder representatives, e.g.,
 - NIH second level grants peer review by external advisory councils often include health advocates or affected members of public





When Might Broadening Definition of “Peer” Improve Review Outcome?

- Innovative research: Less specialized reviewers with diverse disciplinary backgrounds may be needed to fully appreciate potential and impact of high risk work
- Interdisciplinary research: Experts from multiple disciplines may be needed to fully evaluate work
- Research impacts: Social scientists, economists, ethicists, disease advocates, lay public and other stakeholders may be needed to fully evaluate societal impacts even for highly specialized research
 - And governments are increasingly interested in demonstrating research impacts





Comparing Peer Review for Grants, Projects, Programs, Portfolios and Publications - I

- Grant application peer reviews are the most prospectively focused since none of the research activities have begun when evaluated
 - Traditionally focused on evaluation of known research inputs and (relatively) near term future research activities
 - Shift to greater focus on research impacts may require new tools or quantitative analyses to support peer review





Comparing Peer Review for Grants, Projects, Programs, Portfolios and Publications - II

- Project, program, and portfolio reviews are prospective and/or retrospective depending on when evaluated (start, middle or end of research)
 - Evaluating on-going research allows for mid-course improvements but less certain assessments of future research impacts
 - Evaluating completed research – especially with sufficient lag time to observe impacts – is necessary to measure actual health impact and advance research evaluation field
 - Should be supplemented with quantitative research evaluation methods to provide complete assessment





Comparing Peer Review for Grants, Projects, Programs, Portfolios and Publications - III

- Publication reviews were predominantly retrospective assessments of completed scientific work
- Assessing scientific merit was conducted primarily by expert peers for publications and grant applications, whereas more diverse reviewers were sought for program reviews emphasizing downstream impacts
 - Are there benefits to including a broader array of stakeholders even for assessment of scientific merit?
 - For grants, this might require changes to federal regulations and funding agency policies





Evaluation Alternatives to Peer Review

- Many other choices for research evaluation, e.g.,
 - Qualitative methods: Surveys, Case studies, Historical tracing
 - Quantitative: Econometrics, Bibliometrics, Network Analysis, Cost-Benefit Analysis, Indicators
- Choice of methods depends on evaluation question, e.g., network analysis measures collaboration
- Integrating other methods into peer review provides multiple dimensions and strengthens assessment, but may increase costs and time needed
- For details, see “Overview of Evaluation Methods for R&D Programs,” R. Ruegg and G. Jordon, 3/07





Conclusion

- Peer review can play an important role in ensuring research investments are optimized to deliver maximum health impact
 - Opportunities exist to increase emphasis on health impact, especially in publication and grant reviews
 - This is best achieved by integrating quantitative research evaluation methods into peer reviews
 - To make this more feasible, faster, cheaper methods to measure impact are needed – and will ultimately advance the research evaluation field





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Thank You!

QUESTIONS?



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