Evidence-Based Funding: A Funder’s Perspective

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Disclosures: None
Opinion: Celebrating R and D expenditures badly misses the point

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akin to an airline proclaiming, “we use more gasoline than any other airline!” or “we spend more per year transporting our passengers!” Consider the appearance and potential con-
“… same Mission and Purpose as we did in 1971 – to deliver People where they want to go, safely, on time, with their bag, and with a smile ... With low fares and no hidden fees.”

Gary Kelly
CEO

http://swamedia.com/magazine
Quantitative Meaning!

- Where they want to go: % non-stops
- Safely: 0% major incidents
- On time: % of flights on time
- With their bag: % of checked bags lost
- With a smile: rate of complaints
- Low fares: comparable measure
What Should Our Metrics Be?

A New Finish Line

Current finish line

Proposal → Grant Award → Trial/study Completion → Publish → Citations

Optimal finish line

Shapiro D, Vrana K. PNAS 2015;112:9496-7
A Personal Metrics Story Starts 4+ Years Ago…

“A Threat to Medical Innovation

“The … current situation … is putting truly excellent laboratories out of business. In the spirit of ‘never waste a good crisis,’ a serious evaluation of … NIH … policies and programs is warranted. They include … large collective funding efforts [like] expensive clinical and epidemiological research.”

Rosbash M. Science 2011; 333:136
Publication of NIH funded trials registered in ClinicalTrials.gov: cross sectional analysis

Joseph S Ross assistant professor of medicine, Tony Tse program analyst at ClinicalTrials.gov, Deborah A Zarin director of ClinicalTrials.gov, Hui Xu postgraduate house staff trainee, Lei Zhou postgraduate house staff trainee, Harlan M Krumholz Harold H Hines Jr professor of medicine and professor of investigative medicine and of public health.
The New England Journal of Medicine

SPECIAL ARTICLE

Publication of Trials Funded by the National Heart, Lung, and Blood Institute

David Gordon, M.D., Ph.D., Wendy Taddei-Peters, Ph.D., Alice Mascette, M.D., Melissa Antman, Ph.D., Peter G. Kaufmann, Ph.D., and Michael S. Lauer, M.D.

ABSTRACT

BACKGROUND
Rapid publication of clinical trials is essential in order for the findings to yield maximal benefits for public health and scientific progress. Factors affecting the speed of publication of the main results of government-funded trials have not been well characterized.

METHODS
We analyzed 244 extramural randomized clinical trials of cardiovascular interventions that were supported by the National Heart, Lung, and Blood Institute (NHLBI). We selected trials for which data collection had been completed between January 1, 2000, and December 31, 2011. Our primary outcome measure was the time between completion of the trial and publication of the main results in a peer-reviewed journal.
Confirmation … With a Twist

Unadjusted rate ratio, 5.47 (95% CI, 3.74–7.98); P=0.001
Adjusted rate ratio, 2.11 (95% CI, 1.26–3.53); P=0.004

Cumulative Publication Rate

Months after Trial Completion

No. at Risk
Surrogate end points 199
Clinical end points 45

Reactions ...

When It Comes to Trials, Do We Get What We Pay For?

P.J. Devereaux, M.D., Ph.D., and Salim Yusuf, M.B., B.S., D.Phil.

Barrier: Not enough large trials focused on clinical endpoints.

Solutions: Change priorities of funders; appreciation from review panels for the importance of [clinical endpoint] trials.

Devereaux PJ, Yusuf S. N Engl J Med 2013;369:962-
Publication and reporting of clinical trial results: cross sectional analysis across academic medical centers

**Fig 2** | Rates of dissemination of clinical trial results (publication of results or reporting of results on ClinicalTrials.gov) within 24 months across academic institutions. Of 4347 completed clinical trials, this figure excludes trials without dissemination of results (n=1455) as well as those with publication date and results reporting date <0 (n=216)

Krumholz H et al. BMJ 2016;352:i637
Academic Medical Centers Get An F In Sharing Research Results

http://www.npr.org/sections/health-shots/2016/02/23/467712481/academic-medical-centers-get-an-f-in-sharing-research-results
“The popular conception seems to be that scientists solve problems ... I don’t think this is true at all ... Finding problems ... good problems, important problems ... that’s what a good scientist does.”
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Optimal finish line

Let’s Find More Problems...

Shapiro D, Vrana K. PNAS 2015;112:9496-7
Early career investigators

Distribution of funding

Efficiency

Academic business model

Stability and sustainability

Optimizing education

Maximizing chances for discoveries

Reproducibility

Peer review

Diversifying Research

Size of workforce

Promoting creativity and innovation

Are trainees students or workforce?

Scientific rewards system

Post-doc. holding tank

Thanks to Jon Lorsch
Maximizing the return on taxpayers’ investments in fundamental biomedical research

Jon R. Lorsch
National Institute of General Medical Sciences, National Institutes of Health, Bethesda, MD 20892

Changing our funding metric

“A question that at first glance may seem trivial but is, I believe, a significant one is whether our key metric for how ... we invest in biomedical research should be the number of grants we award or the number of investigators we support.”

Lorsch JR. Mol Biol Cell 2015;26:1578-82
Thanks to OER DPEA and SARB
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An Important Problem?

• Investigators receiving RPGs:
  – All RPGs: No change
  – R01’s: Down
  – P’s: Down
  – R21’s: Up

• Meanwhile capacity rises …

Thanks to OER DPEA and SARB
“It is a scandal that billions of dollars are spent on research without knowing the best way to distribute that money.”

John Ioannidis

Azoulay P.  Nature 2012;484:31-32
Ioannidis J.  Nature 2011; 477:529-31
 NIH Objectives

- Science of science
- Outputs, outcomes
- Workforce analyses
- Review peer review
- Rigor, reproducibility
- Administrative burden
- Risk management
Looking Forward to Open Dialogue ...

Open Mike

Helping connect you with the NIH perspective, and helping connect us with yours

Updates on Addressing Rigor in Your NIH Applications

Posted on January 11, 2016 by Mike Lauer

As NIH moves ahead with implementing measures to enhance rigor, transparency and reproducibility in NIH-supported research, I’d like to give a brief update on these efforts, and highlight some important timeline changes for implementation in applications for institutional training grants (T), institutional career development awards (K12), and individual fellowships (F). .... Continue reading →

http://nexus.od.nih.gov/all/category/open-mike/