INFORMATICS PROFESSIONALS. LEADING THE WAY.

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Submitted Electronically

Office of Science Policy
National Institutes of Health
6705 Rockledge Drive, Suite 630
Bethesda, MD 20892-7985

Re: NOT-OD-26-087 — Request for Information on Measuring and Rewarding Scientific Impact

The American Medical Informatics Association (AMIA) appreciates the opportunity to respond to NIH's Request for Information on Measuring and Rewarding Scientific Impact. AMIA is the multidisciplinary, interprofessional home for more than 6,000 informatics professionals who use data, information, and knowledge to improve health and healthcare.

AMIA supports NIH's goal of better aligning scientific incentives with rigorous, reproducible, collaborative, and publicly meaningful science. Biomedical and health informatics offers a useful lens for this discussion because many high-impact contributions are not fully captured by publication counts, journal impact factors, or citation metrics. Informatics research often produces datasets, software, algorithms, AI models, clinical decision support tools, implementation guides, interoperability standards, common data models, workflow evaluations, and real-world implementation evidence. NIH should recognize these outputs as meaningful scientific contributions when they improve rigor, reproducibility, transparency, implementation, and health outcomes.

1. Rigor and Reproducibility

AMIA recommends that NIH more explicitly reward research practices that improve rigor, reproducibility, replication, and generalizability. Current incentives often favor novelty and publication volume, while undervaluing replication studies, methods papers, negative or mixed findings, and cross-site validation. NIH defines scientific rigor as the strict application of the scientific method to ensure robust and unbiased design, methodology, analysis, interpretation, and reporting, and NIH recognizes reproducibility as essential to validating scientific findings[1].

This is particularly important in informatics, where AI models, clinical decision support tools, digital health interventions, and workflow changes may perform differently across health

[1] National Institutes of Health. (2024, September 9). *Enhancing reproducibility through rigor and transparency*. NIH Grants & Funding. https://grants.nih.gov/policy-and-compliance/policy-topics/reproducibility

systems, EHR environments, populations, and implementation contexts. AMIA recommends that NIH recognize methods papers, protocols, analytic code, workflow descriptions, model documentation, implementation guides, technical validation reports, and reproducibility packages as important scientific outputs.

NIH should also create dedicated funding opportunities, study sections, or review criteria for replication and reproducibility research. These applications should not be disadvantaged because they are not "novel". Instead, they should be valued for confirming, refining, or challenging prior findings. The Annual Review of Medicine article on reproducibility failure emphasizes that reproducibility problems arise across the conduct, reporting, and review of biomedical research and require interventions aimed at improving research practices and incentives[2].

AMIA also recommends that NIH pilot adversarial collaboration in areas where legitimate scientific disagreement persists despite accumulated evidence. Adversarial collaboration brings investigators with opposing views together to jointly design, analyze, and publish studies, often with a neutral arbiter, and aligns with open science practices such as transparency, preregistration, and shared analysis. NIH could test low-cost adversarial reanalysis of existing clinical trial, cohort, EHR, or claims data using shared protocols and publication commitments regardless of outcome.[3]

2. Data, Software, and Model Sharing

AMIA supports NIH's efforts to incentivize data, software, and model sharing as core components of scientific impact. NIH's Data Management and Sharing Policy recognizes that sharing scientific data accelerates discovery by enabling validation, access to high-value datasets, and reuse for future studies.[4]

However, sharing is not simply a compliance activity. Preparing data, software, and models for meaningful reuse requires infrastructure, documentation, governance, privacy protections, and long-term stewardship. NIH should allow applicants to budget adequately for data curation, software maintenance, repository fees, documentation, privacy-preserving infrastructure, and technical support.

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[2] Haven, T. L., & Ioannidis, J. P. A. (2026). Reproducibility failure in biomedical research: Problems and solutions. Annual Review of Medicine, 77, 537–549. doi:10.1146/annurev-med-050124-050859.
[3] Kent, D. M., & Ioannidis, J. P. A. (2026). Adversarial collaboration as a strategy for credible biomedical science. JAMA, 335(5), 395–396. doi:10.1001/jama.2025.23911.
[4] National Institutes of Health. *Data Management & Sharing Policy Overview*. NIH Grants and Funding. https://grants.nih.gov/policy-and-compliance/policy-topics/sharing-policies/dms/policy-overview.

For informatics, key outputs include well-documented datasets, data dictionaries, open-source software, analytic code, common data models, validated AI models, model cards, implementation guides, APIs, terminology mappings, and reproducible workflows. NIH should recognize these as scholarly contributions when they enable validation, replication, secondary analysis, or future research.

3. Training and Mentorship

AMIA recommends that NIH broaden how it measures training and mentorship impact. Scientific impact includes preparing researchers, clinicians, informaticians, data scientists, implementation leaders, and team-science contributors to conduct rigorous, transparent, and reproducible research.

Informatics training is especially important because modern biomedical research increasingly depends on data quality, interoperability, AI, software, workflow design, human factors, privacy, implementation science, and responsible data stewardship. NIH should reward mentorship that prepares trainees to work in collaborative, data-driven research environments and to apply reproducible methods across settings.

Mentorship impact should not be measured only by the number of trainees who obtain academic faculty positions. NIH should also recognize trainees who contribute to health systems, public health agencies, government, industry, standards organizations, nonprofit research settings, community-based organizations, and science policy roles.

4. Collaboration

AMIA recommends that NIH better reward collaboration and team science. Informatics research often depends on multidisciplinary teams that include clinicians, informaticians, data scientists, statisticians, software developers, implementation scientists, standards experts, patients, caregivers, public health professionals, and health system leaders.

Traditional authorship and citation metrics may not capture essential team contributions such as data engineering, software maintenance, workflow redesign, standards development, implementation leadership, governance, patient engagement, and cross-site coordination. NIH should encourage applicants and reviewers to identify and value these contributions.

AMIA also recommends that NIH support multi-site studies and implementations that improve generalizability and reproducibility. In informatics, a tool that works in one institution may not work elsewhere unless it is tested across different data systems, populations, clinical workflows, and organizational contexts.

NIH should also consider adversarial collaboration as a structured form of team science for contested questions. A recent JAMA Viewpoint notes that adversarial collaboration is most valuable where scientific disagreement is genuine and consequential and where existing studies are perceived as biased or inadequate. Such collaborations may include joint meta-analyses, mutually accepted reanalysis of large datasets, codesigned prospective studies, or modeling projects that test how conclusions shift under different assumptions.[5]

5. Entrepreneurship and Translation

AMIA recommends that NIH define translation broadly to include not only commercialization, but also implementation into clinical care, public health, research infrastructure, policy, standards, and health system operations.

In informatics, translation may include deployment of clinical decision support, adoption of interoperability standards, implementation of AI governance frameworks, integration of patient-facing digital tools, use of common data models, or incorporation of research findings into health system workflows. These activities may not always result in patents or products, but they can have substantial public value.

NIH should reward research that demonstrates whether innovations work safely, effectively, equitably, and sustainably in real-world settings. For AI and digital health tools, translation should include external validation, workflow integration, usability, safety monitoring, bias assessment, patient and clinician experience, and evidence of sustainability over time.

6. Foundational Scientific Exploration

AMIA recommends that NIH continue to reward foundational research, including high-risk and infrastructure-focused work whose impact may take years to become visible. In informatics, foundational contributions often include data standards, terminology systems, common data models, software platforms, knowledge representation methods, evaluation frameworks, and methods for measuring data quality, bias, provenance, and interoperability.

These contributions may not produce immediate clinical outcomes, but they enable future discovery, replication, implementation, and translation. NIH should ensure that impact assessment does not undervalue foundational informatics work simply because its benefits are indirect, distributed, or long-term.

[5] Kent, D. M., & Ioannidis, J. P. A. (2026). Adversarial collaboration as a strategy for credible biomedical science. JAMA, 335(5), 395–396. doi:10.1001/jama.2025.23911.

AMIA also recommends that NIH support greater standardization of outcome reporting in informatics. Meta-analysis remains underused in the field partly because studies often use inconsistent definitions, measures, outcomes, and implementation descriptions. NIH states that common data elements enhance data interoperability and reproducibility, supporting more consistent data collection across studies and sites.

7. Public Impact

AMIA recommends that NIH measure public impact in ways that reflect both near-term and long-term value. Public impact should include contributions to health outcomes, clinical practice, public health, patient safety, accessibility, trust, health equity, economic value, workforce capacity, and responsible use of technology.

In informatics, public impact may include safer clinical decision support, more transparent AI, improved data exchange, reduced documentation burden, better patient access to health information, improved public health reporting, stronger data quality, or tools that help clinicians and patients make better decisions.

NIH should recognize that public impact often takes time to emerge. Foundational work in data standards, software, methods, infrastructure, and reproducibility may enable future breakthroughs even if immediate outcomes are difficult to measure. NIH should therefore avoid relying only on short-term metrics.

Conclusion

AMIA appreciates NIH's leadership in reassessing how scientific impact is measured and rewarded. NIH should move beyond publication counts and citation metrics toward incentives that recognize rigorous methods, replication, reproducibility, multi-site validation, adversarial collaboration where appropriate, data and software sharing, team science, standardized outcome reporting, mentorship, and long-term real-world value.

A modernized framework would better reflect how informatics advances biomedical research and healthcare: through trustworthy data, reproducible methods, collaborative infrastructure, transparent tools, and implementation evidence that improve health over time.

Sincerely,

Eileen Koski
Chair, AMIA Public Policy Committee