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Meaningful Lives As We Age

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National Institutes of Health Office of Science Policy

Re: Request for Information on Measuring and Rewarding Scientific Impact (NOT-OD-26-087)
Submitted electronically via https://osp.od.nih.gov/comment-form-measuring-and-rewarding-scientific-impact/

Dear Colleagues at the NIH Office of Science Policy:

On behalf of the Gerontological Society of America (GSA), the nation's oldest and largest interdisciplinary organization devoted to the study of aging, I am pleased to submit these comments in response to NOT-OD-26-087. GSA's more than 6,000 members span the biological, behavioral, social, and health sciences and include researchers, clinicians, and educators working across the full spectrum of the aging enterprise. This response also draws on input from GSA-affiliated researchers with direct experience in NIH-funded science and policy. We commend NIH for undertaking this reflection and for seeking input from the community that will ultimately be governed by any new indicators.

Aging research is an instructive test case for this effort. It is inherently longitudinal, team-based, and translational, and it sits at the intersection of nearly every discipline NIH supports. Citation and publication counts, in particular, can be poorly correlated with genuine improvements in health and longevity. Alzheimer's disease research offers a cautionary example: for many years, imaging of amyloid plaques was treated as the gold standard for staging disease, and publications and citations surged as more researchers gained access to imaging facilities. Over time, however, the field learned that small soluble amyloid fibrils (monomers and dimers of amyloid protein), rather than the plaques themselves, appear to be the more direct driver of disease progression, and that multiple genetic and biological pathways contribute to the disease.

More recently, blood-based biomarkers for Alzheimer's disease have been developed. Blood has the advantage that many markers can be assessed simultaneously, offering the potential to build a pattern of markers that better signals disease progression and suggests causal pathways in ways the amyloid plaque signal that long dominated the field could not. Yet if success continues to be measured through publication counts and citations, it is still the older imaging research on amyloid plaques that dominates the top of those tables.

A single dominant metric, in other words, can crowd out messier but more accurate science for years at a time. We believe any new framework for measuring and rewarding scientific impact should be built with, not around, fields like ours, and should be designed with an eye toward this kind of risk. We offer the following comments organized around the categories identified in the notice.

Rigor and Reproducibility

Much of the foundational evidence base in aging research comes from long-running cohort studies, some spanning decades, involving older adults with heterogeneous health trajectories, multiple comorbidities, and evolving diagnostic criteria. Standard replication metrics developed with single-endpoint, short-duration studies in mind may not fit this reality well. We also note a structural weakness in replication as currently practiced: replication attempts are frequently motivated by an initial challenge to a finding, and successful replications are less likely to be published than failures to replicate, which can distort the literature over time. We recommend that NIH:

- Reframe replication initiatives as replication-and-generalization initiatives, incentivizing researchers to test how far an effect extends to other models, populations, or contexts rather than only whether it can

be repeated under near-identical conditions. This shifts the incentive from simply challenging a finding to understanding how far it extends, and treats generalization across clearly defined populations of older adults, including by age cohort, sex, health status, care setting, socioeconomic conditions, geography, and, where relevant to the scientific question, race and ethnicity, as an important contribution to rigorous science.

- Support harmonization and re-analysis studies across existing longitudinal cohorts (e.g., the Health and Retirement Study, the National Health and Aging Trends Study, the Baltimore Longitudinal Study of Aging) as a cost-effective and high-value form of reproducibility work.
- Require or strongly encourage sharing of unpublished as well as published replication attempts, to counteract the file-drawer problem in which only failures to replicate see print.
- Clarify how causal inference will be defined and credited in observational aging research, where randomized designs are frequently infeasible or unethical, so that rigorous quasi-experimental and natural-experiment approaches are not disadvantaged relative to trial-based work.

Data, Software, and Model Sharing

GSA members rely heavily on shared infrastructure such as the National Archive of Computerized Data on Aging and public-use files from federally supported cohort studies, and NIH's sustained investment in that infrastructure has been invaluable. The harder challenge lies in incentivizing sharing of individually developed data, software, and models, where researchers may reasonably see career or financial risk in releasing materials before they have fully mined them. We encourage NIH to:

- Require that investigator biographical sketches identify, for each listed publication, where associated data, models, or software can be accessed. Applied consistently over time, this would normalize sharing as a routine expectation of being an NIH-funded researcher rather than a special favor.
- Credit the sustained curation, documentation, and technical support that keep shared aging datasets usable over decades, not only the initial act of data deposit.
- Continue and periodically revisit NIH's work on standardized outcome measures that allow results to be combined or compared across studies, recognizing that instruments and research directions evolve and that standard measures need scheduled review rather than indefinite fixity.
- Ensure any new incentive structure accounts for the additional privacy, consent, and re-identification safeguards required when sharing data on older adults, particularly those with cognitive impairment or residing in long-term care settings.

Training and Mentorship

The biomedical and behavioral aging research workforce is not growing quickly enough to meet the needs of an aging population, and current challenges facing early-career investigators make sustained, high-quality mentorship more important, and more strained, than at any point in recent memory. Mentorship of the kind that produces strong independent researchers takes substantial time, yet it carries no direct financial reward and competes with grant-writing, supervision of research staff, and administrative demands. We recommend that NIH:

- Work with academic and institutional partners to formally recognize mentoring of junior researchers as part of the teaching role for senior investigators with established research records, giving institutions a concrete mechanism to protect mentors' time rather than relying on goodwill alone.
- Track the career outcomes of trainees and mentees over time, including retention in aging-focused research, rather than relying solely on point-in-time productivity counts.

- Credit mentors for sustained, longitudinal investment in early-career investigators, including those supported through T32 and K-series awards, and for mentoring across career stages and disciplinary boundaries, including clinician-scientists and other dual-role trainees whose paths to independence differ from PhD-only investigators.

Collaboration

Advancing the science of aging almost always requires integrating biological, clinical, behavioral, and social science expertise, and NIH has taken real steps to recognize this through the multiple-PI mechanism and collaboration-focused review criteria. Recognition at the point of reward, however, still accrues overwhelmingly to individuals rather than teams: NIH's signature individual-investigator honors, such as MERIT and Director's Pioneer awards, have no team-based counterpart. We recommend that NIH:

- Establish a team-based analogue to its flagship individual awards, recognizing that the most consequential advances increasingly emerge from social and scientific interaction among researchers rather than from any single investigator working alone.
- Develop team-science metrics that credit distinct forms of contribution (e.g., cohort stewardship, biostatistical design, implementation science, community engagement) rather than defaulting to author-order or single-PI conventions poorly suited to large, multidisciplinary teams.
- Pilot early-career-stage convenings, organized around career stage rather than shared topic, that bring together researchers from different fields and departments with substantial unstructured time for discussion. Topic-focused workshops tend to draw researchers who already share interests and language; career-stage convenings are more likely to spark collaborations across genuinely different fields.
- Recognize contributions to practice-translation collaboratives that bring researchers together with health systems and community-based organizations, such as models built on frameworks like the Age-Friendly Health Systems initiative's 4Ms (What Matters, Medication, Mentation, and Mobility).

Entrepreneurship and Translation

Translation in aging research is not limited to commercial products, and even when a researcher successfully develops a genuine practical advance, a host of non-scientific obstacles can still keep it from reaching patients or consumers, from market access barriers to entrenched competitors. We encourage NIH to broaden its definition of translational impact to include the adoption of evidence-based practices, care models, and clinical workflows by health systems, payers, and community organizations, not only patents, licenses, or start-up formation, which will otherwise systematically undercount translational work in geriatrics, gerontology, and long-term services and supports. We also encourage NIH to consider a modest expansion of program staff capacity dedicated to post-discovery translation, distinct from core review responsibilities, whose role would be to identify research portfolios nearing practical application and connect investigators with the business, regulatory, or dissemination expertise needed to carry findings the rest of the way.

Foundational Scientific Exploration

Basic biology of aging research, including work on the hallmarks of aging and geroscience, exemplifies high-risk, high-reward science with a long horizon to clinical relevance, and scientific curiosity should remain a legitimate driving force in what NIH funds. At the same time, some subfields within aging research, caregiving research among them, show signs of having grown repetitive as available tools and paradigms are exhausted. NIH's existing High-Risk/High-Reward program is well positioned to help revitalize such areas, and we recommend NIH consider expanding it along two lines particularly relevant to aging research: a multiple-PI variant requiring senior investigators from different fields, intended to spark new approaches through the collision of disciplinary

perspectives; and a dedicated early-stage-investigator track, since researchers earlier in their careers are often less invested in established research pathways and better positioned to pursue genuinely novel directions.

Public Impact

Loss of public trust in biomedical research, most visibly around vaccine science in recent years, is among the most serious challenges facing the research enterprise, and it is a challenge NIH cannot address through communications alone. GSA has invested substantially in this space through our National Center to Reframe Aging, which applies peer-reviewed communications science to help the public and policymakers understand the value of aging research and correct persistent misconceptions about aging and older adults. We believe NIH can extend this kind of public-facing translation down to the level of the individual grant, and recommend that NIH:

- Require grant applications to describe a plan for sharing findings with the public, whether through social media, community presentations, or other direct engagement, and require progress reports and renewals to report on audience reach, engagement, and any resulting feedback.
- Recognize measurable shifts in public or provider understanding, adoption of research-informed communications by other organizations, and downstream effects on health outcomes, cost of care, and public trust in science as legitimate indicators of scientific impact in their own right.

Closing

GSA appreciates NIH's commitment to modernizing how scientific impact is measured and rewarded, and we would welcome the opportunity to serve as a resource as this work continues. If you have any questions or want any additional information, please contact Patricia D'Antonio, VP, Policy & Professional Affairs at pdantonio@geron.org.

Respectfully submitted,

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