PERSPECTIVE



Steven A. Wartman AAHC President / CEO

The future of research keeps many academic health center leaders up at night. At a time when NIH funding is losing purchasing power — and is expected to continue to do so for at least the near term — and clinical margins are eroding,

institutions are rightly considering new approaches.

AAHC's Research Metrics Initiative found that an average of 35% of total research expenses for medical schools are funded with internal funds, while the remaining 65% of total research expenditures are funded from external sources. Nearly the same 35:65 ratio appeared when we plotted the actual expenditures of individual medical schools and then calculated the trend line for all schools. For each additional externallyfunded research dollar spent, total research expenditures increased by \$1.52; the difference between the two (\$0.52) represents internally funded expenditures. And, medical schools are not the most highly leveraged of the health professions schools; schools of public health have an even greater reliance on grants and contracts.

In this issue of *Leadership Perspectives*, leaders from three very different institutions present their views on this topic. Vivian Lee, from the University of Utah, contrasts the important value of the individual PI with the observation that the future of research funding hinges on increased collaboration and team approaches. Edward Halperin, of New York Medical College, provocatively suggests that academic health center leaders need to start thinking more like economists and less like physicians. And Lloyd Minor, from Stanford, comments on the necessity of achieving greater value for the research dollars being invested by pooling resources.

In many respects, our research programs are being disrupted by the "perfect storm" as socio-political and economic forces combine with the rise of team science. Indeed, some pundits are questioning whether the single lab, R01-funded PI is becoming a dinosaur.

As if this isn't challenging enough, academic health centers are also facing significant disruption in the informatics arena, including the management of huge data sets and overall "control" of the peerreviewed research enterprise. Are answers to pressing clinical questions, for example, to be found in traditional randomized, controlled clinical trials or will they be outsourced somewhere in the cloud?

Indeed, you can get a headache thinking about all of this, but think about it we must-and act soon.

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ASSOCIATION OF ACADEMIC HEALTH CENTERS

PERSPECTIVES

The Future of Research Funding



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SUMMER 2014 www.aahcdc.org



Association of Academic Health Centers Leading institutions that serve society

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An academic health center exists for the generation, conservation, and dissemination of knowledge about the causes, prevention, and treatment of human disease and disability. NIH funding of biomedical research is a fundamental societal good and a noble way to make tomorrow better than today. But, the facts are that this funding has fallen by about 25 percent in real dollars since 2003.

Physicians too often think that all problems can be solved by introduction, materials and methods, results, and discussion. It is in the best interests of academic health center leaders, when considering research policy, to spend more time thinking like economists and less time thinking like physicians. Economics teach us that people respond to incentives by assessing marginal costs and marginal benefits.

I suppose we could do the usual thing and blame the federal government for not giving academic health centers more research money. However, we are far from faultless in the current crisis of research funding and we would do well to get our own houses in order. To that end, I think we should consider alternatives and reforms.

We should focus on creating and fostering a system of tenure and promotion that favors quality of published science rather than the "count and weigh" technique of publication assessment. Additionally, professors seem to think that almost everything is a suitable topic for investigation except the quality and quantity of their own work. The faculty should be expected to account for their salary by their teaching loads and research productivity and be compensated accordingly.

We could develop academic programs that train scientists (or help people retool) as public school science teachers and industry science workers rather than emphasize training people for research jobs that don't exist. At New York Medical College, for example, we are growing such programs as an MS in biology education and a professional MS for work in the pharmaceutical industry.

Part of developing a broad base of political support for biomedical research is demonstrating that all groups in society have a stake in its outcomes and careers. Historically under-represented minorities in the biomedical sciences should be vigorously recruited into our programs.

> Academic health centers should show meticulous regard for "truth in advertising" when we describe our PhD programs, such as telling prospective applicants what their job prospects are upon graduation. I believe a worthwhile reform would be for accreditation agencies to demand publication of employment data on PhD graduates and, if not, universities ought to have the courage to provide such data voluntarily.

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Increasingly, we are finding that while we may not have the margins from our clinical practices to support research through funds transfers, successful academic health centers will be able to leverage their clinical enterprises in other ways—in the areas of clinical and translational research, enhanced clinical trials, health services research, and health systems redesign.

The ability to generate new intellectual property and, through royalty and licensing agreements, to generate new sources of revenue is a huge opportunity for us. We haven't fully tapped into our wealth of creative and innovative energy, both within the health sciences and in other parts of our universities-though some of us have started to nurture vital, crossdisciplinary collaborations. For example, we have a terrific initiative at the University of Utah, called Bench 2 Bedside (B2B), in which graduate students in our engineering school, business school, and the health sciences collaborate around device innovation and, increasingly, software and app development. Last year, at our fourth annual B2B event, more than 200 students participated. We had 46 new inventions, and our event at the Utah State Capitol drew great interest—and financial support—from venture capital.

Most academic health centers are also seeing a significant growth in partnerships with industry. These partnerships, of course, should be handled very carefully because of conflict of interest concerns at both the PI and the institutional level. But, there are some real advantages to looking toward our industry counterparts. Commercialization opportunities ensure that our discoveries are made accessible to patients directly, and these kinds of partnerships can help speed up that process of translation.

With record-setting wealth transfers currently happening among the baby-boomer generation, opportunities to tap into philanthropic support for research have never been better. Institutionally and collectively, it is incumbent upon us to articulate a clear vision of what can be achieved with increased funding, and to ensure that our scientists are able to clearly communicate about the importance of their work. We must steward this channel carefully, in close partnership with development leadership and staff.

Given the general complexity of science and the development of advanced technologies, very few individuals will succeed alone. Future success in



research will clearly hinge on increased collaboration and team approaches to science. That said, it is likely that the ways in which we recruit and build our programs will remain fundamentally focused on spotting talented and passionate individual PIs. At the same time, we will need to create and nurture an environment in which investment in shared resources and core facilities outweighs individual allocations. Such an environment will be conducive to collaboration and team approaches. It will be a delicate balance, and together we will succeed.

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Philanthropy is a major source of support at Stanford. We engage the volunteers who care deeply about Stanford in a discussion about how federal research dollars, in terms of real spending power, have been decreasing, and how that means that we have to look at other sources to fund research. We have a local and global community of people who care deeply about Stanford and who want to support us and see us succeed in our mission.

We are also looking at relationships with industry. Where it makes sense and where there is a faculty member who can engage in a meaningful collaboration with industry in ways that promote the research mission of that faculty member and of Stanford, we want to lessen the barriers to industry-related collaborations and interactions. We are certainly mindful of the conflicts that have to be managed in those types of relationships, but we believe they can be managed.

Another way that we are seeking to achieve greater value for the research dollars that we invest is by pooling resources to provide core service centers that can be shared by multiple faculty members.

An investigator, or a small group of investigators, in passionate pursuit of new truths and discoveries still most commonly performs the fundamental research leading to groundbreaking, transformative breakthroughs. I don't see that changing, and I don't see our commitment to that waning in any way. It really does come back to mission. Our mission includes a strong focus on research in an atmosphere that enables paradigm-shifting research to take place and that shepherds the translation of these discoveries into the care we provide to patients. Indeed, I think that mission is now more important than it ever has been in the past.

ahead.

Stanford has always focused on recruiting highly accomplished people who build research careers in transformative ways. Are we rethinking our commitment to doing outstanding, innovative, groundbreaking research? Absolutely not. Are we looking at other ways to fund research in addition to federal research funds? Yes. But, we are not backing away from our research-intensive focus.

Comprised of the School of Medicine, Stanford Hospital and Clinics, and Lucile Packard Children's Hospital Stanford, Stanford Medicine remains focused on its three-part mission-research, teaching, and clinical care—and is unified in identity, purpose, and a commitment to excellence. This alignment is required for us to leverage the interactions between and among our mission areas and is of critical importance as we move forward to address the challenges and opportunities that lie



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