



From the American College of Epidemiology

Commentary: the role of epidemiologists in funding biomedical education and research



Melissa J. Perry ScD, MHS, FACE*

Department of Environmental and Occupational Health, Milken Institute School of Public Health, The George Washington University, Washington, DC

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ABSTRACT

Melissa Perry served as the president of the American College of Epidemiology from September 2014 to September 2015. This is a written version of her Presidential Address at the 2015 Annual Meeting. Her speech was inspired by a 2014 *Wall Street Journal* commentary by Dr. Ferric Fang of the Washington University School of Medicine and Dr. Arturo Casadevall of the Albert Einstein College of Medicine of Yeshiva University. They likened the process of submitting a research proposal to the National Institutes of Health to playing the Powerball lottery. In her speech, Dr. Perry argued for the urgent need for epidemiology researchers to reach out to policymakers and the public in support of our field to ensure the continuation of research projects that can help improve the health of citizens everywhere.

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Melissa J. Perry, ScD

Commentary

In an April 2014 commentary appearing in the *Wall Street Journal*, respected health researchers Ferric C. Fang and Arturo Casadevall likened the process of submitting a research proposal to the National Institutes of Health (NIH) to that of playing the Powerball lottery [1]. Their opinion piece referenced a landmark study published in *Circulation Research* that analyzed nearly 1500 successful grants and found no correlation between the productivity of a project, as measured by the citations of grant-supported research and its score [2]. The opinion piece states that “chronic underfunding of science gambles with society’s future.” Contending that

NIH peer reviewers fare no better than random chance when it comes to predicting how well grant recipients will perform, it concludes with a suggestion: Until research funding is restored to levels that allow all deserving research projects to proceed, using a Powerball-esque approach to identifying grant recipients might be a better use of taxpayer dollars.

As epidemiologists, we often rely on funding from the NIH and other government sources. These sources of funding still suffer the blows of the budget sequestration and are more constrained now than ever. Federal budgets are not a game of chance, and we have an important role in ensuring that important projects get funded. We must raise awareness among policymakers and the general public about the significance and value of epidemiology. All of us are highly aware of our field’s importance and what a vast impact it has on the health of our society, but many outside our field, including those who decide the fate of many funding streams, cannot even define what epidemiology means, much less understand, or appreciate the significance of epidemiological research. Have you written, blogged, tweeted, or otherwise communicated something about epidemiology’s importance to people outside the research community, particularly those involved in government, in the last year?

Epidemiologists can and should make important contributions to dialogues at all levels about epidemiologic research. This may involve stepping outside our comfort zones, but it is important because some of the most influential voices in discussions about policy may not be well-grounded in the science. Actress Jenny McCarthy is an example of a vocal opponent to childhood vaccines due to fears of autism. Her observations are discussed in policy

* Corresponding author. Department of Environmental and Occupational Health, Milken Institute School of Public Health, The George Washington University, 950 New Hampshire Avenue, Washington, DC 20052.

E-mail address: mperry@gwu.edu.

circles as well as in publications that are packaged as research journals [3]. If we do not use our knowledge to advocate for good science, the dialogue can be led by self-proclaimed “experts” whose positions are based on their emotions and fears. If we fail to advocate strongly, funding will become more like a game of chance.

If we want policymakers and the public to rely on us for data and information about important issues, we cannot only be trusted experts; we must be known and easily accessible.

Take the example of Harold Varmus, the Nobel Prize–winning scientist whose lobbying on behalf of public health played a major role in doubling the National Institutes of Health’s budget in the 1990s while he served as the agency’s director. Varmus published high-profile opinion pieces in journals such as *Science*, testified before the U.S. Congress, and made the case for increased research funding as an invited speaker at numerous events.

The current situation is a dramatic departure from the second half of the 20th century, when scientists worked under a logical assumption that politicians would provide adequate funding for projects that advanced human health. Back then, the budgets of the NIH and the U.S. National Science Foundation (NSF) generally increased at or above the level of inflation [4]. According to the NIH’s Office of Budget, the agency’s budget doubled between 1998 and 2003, but its purchasing power has declined by about 20% since then [5].

Funding has changed for the worse for two reasons. One is the global economic recession and the associated deficits and declines in tax revenues. The second reason is more insidious. The use of anti-science positions by politicians is on the rise on both sides of the aisle regarding issues such as autism, climate change, and evolution [6]. During times of scarce funding, the use of anti-science is particularly alarming.

Epidemiologists are among many scientists who are finding funding more difficult to obtain in recent years. In survey of members of the American Association for the Advancement of Science (AAAS) conducted in 2014, 83% of the responding scientists reported that obtaining federal research funding is harder today than it was 5 years ago [7]. More than four in ten respondents said the same about industry funding (45%) and private foundation funding (45%), compared with 5 years ago. When asked to consider each of seven potential issues as a “serious problem for conducting high quality research today,” 88% of AAAS scientists said that a lack of funding for basic research is a serious problem, substantially more than any of the other issues considered.

Research funding difficulties are contributing to a worrying trend documented in recent NSF reports. Unemployment for recent PhD graduates in health has been on the rise. In 2010, total unemployment among this elite cadre reached 2.4%, up nearly a percentage point from 2008 [8]. The latest figures (2013) available for graduates in the biological, agricultural, environmental, and life sciences show that unemployment for people with doctoral degrees in these fields has not improved as much as for PhDs in other fields [9]. For bright students who have invested many years in specialized education and training, the outlook is discouraging.

The relatively high unemployment rate for life sciences graduates is particularly concerning in light of the rising numbers of public health graduates [10].

In contrast, despite tough economic times, many other countries are increasing their support for medical research. Several European and Asian countries are investing heavily in their research and offering better incentives for innovation [11]. If present trends continue, China’s financial commitment to biomedical research will be twice that of the United States’ in the next few years. While growth in high-wage, high-skill jobs in the life sciences sector is flat-lining in the United States, employment in other countries, like Germany and France, shows consistent growth [12].

An overarching issue that feeds into all the previously mentioned issues is the importance of science, engineering, technology, and mathematics (STEM) education for helping the U.S. maintain our status as a country that produces world-class research. The World Economic Forum ranks the United States 52nd in the quality of mathematics and science education. We rank fifth (and declining) in overall global competitiveness [13]. Our country ranks 27th among developed nations in the proportion of college students receiving undergraduate degrees in science or engineering [14]. There are more foreign students than U.S. students studying in U.S. graduate schools [15]. The views of the scientists polled in the Pew Survey mentioned earlier show a lack of enthusiasm for K-12 STEM education: 16% say it is the best or above average; 38% say it is average; and 46% say it is below average [7].

Considered together, all these issues threaten our country’s leadership in the global health sciences industry and make us vulnerable to growing international competition. There are many reasons for all these trends, and although they may not be easy to address, action can be taken.

To create change, we must educate policymakers and the general public about the importance of epidemiology and epidemiologic studies. As threats that range from Ebola to obesity show us, our world does not react to thorny public health problems with an automatic mechanism for generating funds to ameliorate them.

Much that is good and valuable in our nation’s medical and scientific research is underappreciated by the public and its elected representatives. Some of this is due to the very nature of research, which can take an indeterminate length of time and involve setbacks to explore competing hypotheses. Scientific advancement often takes place in small increments, and many developments take place outside public view. It can be understandably difficult for the nonscientist to appreciate the years and even decades of work and resources required to carry out a good prospective cohort study, for example. While scientists strive for accuracy, thinly sourced information with attention grabbing headlines commands the internet. “Do This and Avoid Cancer.” “One Neat Trick to Cut Belly Fat.” If only reliable facts were that easy to convey and execute.

Among recent presidents, President Obama is one of the more supportive of science. However, we are short of science champions in the U.S. Congress, the governmental branch that decides how much money to appropriate for all federal programs. Only two scientists are currently members of Congress, according to the *Wall Street Journal* [16]. Additionally, very few scientists hold elected positions at the state level, which is often a starting point toward an elected federal position.

There are many reasons why we don’t speak out for public health science and the value of research:

- We may be fortunate to live and work in a major urban center that is already represented by a highly supportive member of Congress.
- We may feel intimidated by the prospect of interacting with an elected official.
- An individual may think that her or his single voice cannot make a difference.
- We may believe such advocacy takes important time away from work.
- We feel a need to devote more time to finding funding for research.
- We may believe that advocating for science is unbecoming or self-serving.

Please know that as someone who is passionate about what you do, you are the best person to explain your work’s value to others. We have arrived at our hour of need, and we must act individually

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