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The Effects of Politics on the Efficacy and Efficiency of Research

Emily Jennings

The long shadow of global terrorism has been an almost incessant feature of American media coverage for the last decade, even though the chance of dying in the United States as a result of a terrorist attack was only 1 in 20 million from 2007-2011 (Time Magazine 2013). In contrast, the number one cause of death in the United States, heart disease, has garnered substantial media coverage only a couple of times each year. Accounting for 1 in every 4 deaths and a total of 600,000 deaths every year in the United States, heart disease is one of the biggest public health issues our nation has faced to date (Centers for Disease Control 2014). The rising cost of healthcare only serves to exacerbate the problem.

Coronary heart disease alone costs the U.S. $108.9 billion each year (Centers for Disease Control 2014). Many other diseases also contribute greatly to costs in money and health: Alzheimer's disease cost the United States $150 billion in 2014 and is estimated to affect 5.2 million Americans (Alzheimer's Association 2014); cancers are projected to cost the United States $158 billion in 2020 (National Institutes of Health 2011).

The numbers alone demonstrate quite obviously how much more harmful and costly disease is to the average American than terrorism. Despite this, the 2015 United States Fiscal Year Budget included only $135.4 billion proposed for federal research and design (White House Office of Science and Technology 2014), while $495.6 billion was proposed for the Department of Defense. The latter figure is second only to the $710 billion proposed for the Small Business Administration (White House Office of Management and Budget 2014). The purpose of these facts is not to say that the lives of some Americans—those lost to disease rather than defense issues—are more important than others. Rather, given the responsibility of politicians to represent the general public and lead the country with their best interests in mind, it is to point out that more Americans are directly affected by issues related to health and science than by those related to defense, and thus that American spending is in many ways out of line with the realities of the dangers that Americans face. For this reason, it is important that science is adequately represented to politicians.

Scientific investigation is the first step to solving the problems that affect many Americans, because it is through scientific research that medical advances are achieved, reducing the number of Americans affected by diseases as well as the costs of treatment. New treatments and knowledge that result from scientific research, however, do not appear overnight; it takes years of data collection, analysis, and failed experiments to make a scientific breakthrough. Billions of dollars (federal and private) put into research may disappear quickly, but the philanthropic contributions and grants are not wasted. Though not all research leads to new forms of treatment or other breakthroughs, it is precisely the unpredictability and slowness of progress that demands a continuous and patient stream of funding (Dobrunz 2014). This is where the role of a researcher in relation to scientific advances needs a closer look.

An aerial view of the Mark O. Hatfield Clinical Research Center on the Bethesda, MD main campus of the National Institutes of Health. The NIH, which supports much biomedical research in the United States, has had to contend with stagnant budgets in recent years.

Many scientific investigators spend much more time writing grants than they do working in the lab. An interview with Dr. Lynn Dobrunz, a neurobiologist at UAB's Evelyn McKnight Brain Institute, revealed that it has become significantly more difficult to obtain funding within the last 15 years, as the percentage of grant applications funded has dropped from an estimated 25-30 % to an estimated 10 % nationally. This decrease in the chance of receiving funding has caused researchers to spend ever more time writing and refining grant applications. According to Stuart Campbell, a bioengineering professor at Yale University, grant applications must be "basically perfect" to stand a chance in the competition today (Gersten 2014). Dr. Dobrunz agreed with this statement, adding that some researchers dedicate more than half of their time to the grant application process, because multiple grants must be applied for in order to increase the chance of funding.

To further increase the chance of receiving funding, some scientists even go so far as to change the interests of their labs. For example, an article posted by *Yale Daily News* noted that a genetics and dermatology professor at the Yale School of Medicine switched from her interest in researching cancer pathology to researching cancer treatment, an area that was not necessarily where her passion lay, but one in which more funding is available (Gersten 2014). According to Dr. Dobrunz, similar instances have occurred at UAB, including in her own lab: "We started out as a lab studying how the brain works, but are now more focused on disease models, which is still somewhat studying how the brain works, and is still fun." Though some researchers can adapt in this way, a system that forces such homogenization of approaches is not in the best interests of society; history has shown that progress often comes from unexpected directions and basic, curiosity-driven explorations.

Many scientists are willing to sacrifice time spent working in the lab for the purpose of writing grants, while others are not as inclined to step away from the bench. According to Dr. Dobrunz, some scientists decide to find employment at pharmaceutical companies (which can pull the plug on their employees' projects and switch them to new ones at any time) just to avoid spending the majority of their time writing grants. Although these scientists are free from applying for funding, they are often deprived of their intellectual freedom (Dobrunz 2014). Despite the continuous decrease in funding for research, Dr. Dobrunz assures that, "these things are cyclic. When I was in grad school, funding was reduced, but it increased again a few years later."

Although the funding trend is cyclic, the current situation may not follow the previous cycles. According to Dr. Dobrunz, "The problem with this downturn of funding is that it has lasted for so long, and does not seem to be headed toward improving anytime soon." Many talented scientists have either switched to new interests or working environments or left the scientific community for good before they would otherwise have retired, as a pathology professor and the director of graduate admissions for Yale's microbiology program did this past June (Gersten 2014).

The United States can afford neither to lose scientists nor to limit their imaginations and efforts. Scientists need to remain in academia in order to train the next generation of investigators, and they need to be able to devote more time to guiding their lab's research in person if it is to be its most efficient. More funding would solve both of these problems and reduce the pressure towards homogenization. As Dr. Dobrunz explains, "If researchers are spending more time in their labs than writing grants, the research will be more efficient." Now, with a population that is aging and suffering from skyrocketing rates of issues such as obesity and diabetes, it is as critical as ever that politicians be aware of the problems facing America's researchers and patients. For many Americans, quality and length of life depends on it.

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