

NIH Congressional Testimony
Committee on Appropriations Subcommittee on Labor, Health and Human Services, Education
and Related Agencies
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Statement of
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NIH Mission and Facts

Good morning, Mr. Chairman and distinguished Members of the Subcommittee. It is an honor to appear before you today to provide an overview of NIH's critical role in enhancing our nation's health through scientific discovery.

First, I would like to offer my congratulations to Chairman Kingston for assuming leadership of the Subcommittee. I would also like to recognize the new members of the Subcommittee and express my desire to work closely with you in the future. This Subcommittee has a long history of supporting NIH's mission to seek fundamental knowledge about the nature of living systems and apply it in ways that enhance human health, lengthen life, and reduce suffering from illness and disability.

NIH is the leading supporter of biomedical research in the world. NIH-funded basic and translational scientific advances have prompted a revolution in the diagnosis, treatment, and prevention of disease. Due to the significant expansion in scientific and information technologies, we are poised to bring about even more exciting progress in human health and disease prevention. Also, NIH funding has important economic effects that stimulate growth and investment and create high-quality jobs in our communities.

Public Health Impact of NIH Research

Biomedical research funded by NIH has led to new diagnostics, treatments, and prevention strategies that together have improved the public's health and prevented immeasurable human suffering. Let me cite just a few of the benefits of NIH funded research:

- Steady progress in cancer research is paying off. U.S. cancer death rates have been falling about 1 percent each year since the mid-1990s; each 1 percent decline has been estimated to be worth \$500 billion as a result of gains in life expectancy.ⁱ There has also been extraordinary progress against childhood cancers. The five-year survival rate for the most common type, acute lymphocytic leukemia, is now 90 percent.

- Identification of risk factors for cardiovascular disease, the development of statins, and multiple other NIH-supported advances have resulted in a nearly 70 percent reduction in the death rate from heart attack since 1968.
- Death rates from stroke continue to fall and are now 70 percent below what they were in 1950. The 30 percent of stroke victims who promptly receive the only proven stroke treatment, tPA, show no neurological deficit as a result of their strokes.
- HIV/AIDS, once a death sentence, is now compatible with an almost normal life span. And due to the development of effective strategies for HIV/AIDS prevention and treatment, an AIDS-free generation may be within our grasp.
- Older Americans are not just living longer, they are also staying healthy and active. At age 65, Americans today can expect to live 19.2 more years, which is 40 percent longer than in 1950, and the majority of these adults continue to live without any physical activity limitations, a major improvement in just the past 30 years.

NIH Research is a Powerful Economic Engine

NIH invests more than \$31 billion annually in medical research for the American people. In our knowledge-based and global economy, innovation in medical research sparks economic growth, high-quality jobs, and better health and quality of life for all Americans. In fiscal year 2012, approximately 84 percent of NIH's appropriation accounted for extramural grants awarded to investigators throughout the nation. Every state, along with almost every congressional district, benefited. NIH applies stringent critical peer review by outside scientists who are experts in a given field to rank the scientific opportunity and quality represented by the research proposals submitted. This intense competition has always ensured that NIH research is of the highest scientific quality.

According to a report released by United for Medical Research, a coalition of scientific advocates, institutions and industries, in fiscal year 2011, NIH-funded research supported an estimated 432,000 jobs all across the United States, enabled 13 states to experience job growth of more than 10,000 jobs, and generated more than \$62 billion in new economic activity.ⁱⁱ

The economic impact of NIH does not end there. It has been estimated that every \$1 of NIH funding generates about \$2.21 in local economic growth.ⁱⁱⁱ Also, discoveries arising from

NIH-funded research serve as a foundation for the entire U.S. biotech, pharmaceutical, and biomedical industries. Long considered the world's leader in innovation, that sector exports an estimated \$90 billion in goods and services annually and employs 7.5 million U.S. citizens.^{iv,v}

I had the privilege of leading the International Human Genome Project, where the return on investment has recently been calculated – and is spectacular. As quoted by the President just three weeks ago, the U.S. government's \$4 billion investment in the Human Genome Project spurred an estimated \$796 billion in economic growth from 2000-2010—a 141-fold return on investment, even after adjusting for inflation.^{vi}

Dramatic as these economic gains are, the main reason the public supports NIH is to advance human health. And the promise of biomedical research has never been greater.

Future Promise, Future Hope

Recent scientific advances have altered the way scientists and clinicians study and treat disease. Consider a disease that strikes many, and is feared by all: cancer. Cancer is not one disease, but a group of diseases characterized by uncontrolled cellular growth and the spread of these abnormal cells. Cancer is influenced by both environmental and genetic factors, and while we are all at risk for developing cancer, the risk increases as we age. In fact, nearly 80 percent of cancers are diagnosed in people over the age of 55.

Advances in treatments have raised the five-year survival rate for all cancers diagnosed in the first decade of this century to 68 percent, up from the 49 percent rate in the 1970s. This improvement in survival reflects both our progress in diagnosing cancers at an earlier stage and our success in developing new treatments. But cancer still inflicts tremendous suffering on our society. It will kill more than 580,000 Americans this year.^{vii}

The hopeful news is that cancer research has utterly transformed our understanding of the disease in the last few years. NIH's commitment to scientific research provides us with a promising therapeutic strategy for a deadly form of lung cancer. Non-small cell lung cancer (NSCLC) accounts for 80 percent of all lung cancer cases and patients, including non-smokers, are often diagnosed at advanced stages of the disease. In August 2011, the Food and Drug Administration granted accelerated approval for crizotinib for the treatment of patients with advanced NSCLC whose tumors have a specific genetic mutation in a gene called ALK as detected by an FDA-approved test. Historically, crizotinib treatment results in a dramatic reduction in tumors, including complete tumor eradication in some cases, but the disease almost always returns. NIH-supported research discovered that mutations in other key genes, such as the EGFR gene, can fuel cancer cell progression after treatment with crizotinib. The National Cancer Institute's Center for Cancer Research is currently testing combination therapies in clinical trials to target both ALK and EGFR mutations. Crizotinib represents how scientists apply knowledge gained from NIH-supported research to develop new therapies.

As our population ages, cancer is just one of the health challenges our nation faces. The number of people afflicted with Alzheimer's disease and other forms of dementia is projected to increase dramatically in the coming decades. Alzheimer's is the most common form of dementia, slowly destroying memory and cognitive ability and eventually even the ability to carry out the simplest tasks of daily life. Although treatment can help manage symptoms in some people, currently there is no cure for this devastating disease. According to the Alzheimer's Association, it costs nearly \$44,000 a year to care for a person with Alzheimer's, adding up to \$200 billion in overall health care costs last year. The annual treatment figure is projected to spike to \$1.1 trillion in 2050.^{viii} We must invest now in the critical research we need

to develop new strategies for diagnosing, treating, and preventing Alzheimer's disease that are both effective and affordable.

Despite these staggering dollar amounts, progress is accelerating toward understanding the pathogenesis of Alzheimer's. In just the last two years, scientists found five new genes associated with Alzheimer's disease, which provides new hope for developing therapies. Scientists have also discovered a genetic mutation that may play a protective role in preventing Alzheimer's disease, providing a natural model of the kind of protection we hope to develop through drug therapy. The use of induced pluripotent stem (iPS) cells derived from patients with Alzheimer's disease is giving new insights into the molecular causes of the disease and providing a powerful new platform to screen drugs without putting patients at risk. And a drug developed for a rare type of cancer has shown dramatic benefit in the best mouse model of Alzheimer's disease, and human trials have just begun. Discoveries like these are not only going to improve the health of Americans, but they will also improve the health of the American economy.

We have never witnessed a time of greater promise for advances in medicine than right now. NIH is prepared to continue our long tradition of leading the world in the public support of biomedical research. Successful development of prevention strategies, diagnostics, and therapeutics will require bold investments in research across the spectrum from basic science to clinical trials, as well as new partnerships between the public and private sectors. With your support, we can promise continuing advances in health, creation of new economic opportunities, and stimulation of American global competitiveness in science, technology, and innovation.

Mr. Chairman and Members of the Subcommittee. I appreciate the opportunity to provide this overview of the NIH mission and contribution to our Nation, and would be pleased to answer any questions you may have.

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- ⁱ Murphy, K.M., & Topel, R.H. (2006). The value of health and longevity. *Journal of Political Economy*, 114(5), 871-904.
- ⁱⁱ Ehrlich, Everett. NIH's Role in Sustaining the U.S. Economy: A 2011 Update, *United for Medical Research* (2012).
- ⁱⁱⁱ In Your Own Backyard: How NIH Funding Helps Your State's Economy, *Families USA* (2008).
- ^{iv} Ehrlich, Everett. An Economic Engine: NIH Research, Employment and the Future of the Medical Innovation Sector, *United for Medical Research* (May 2011).
- ^v Technology Talent and Capital: State Bioscience Initiatives 2008, *Battelle, BIO, SSTI* (2008).
- ^{vi} Economic Impact of the Human Genome Project, *Battelle Technology Partnership Practice* (2011).
- ^{vii} Cancer Facts & Figures 2013, *American Cancer Society* (2013).
- ^{viii} 2012 Alzheimer's Disease Facts and Figures, *Alzheimer's Association* (2012).