Serving Society

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Serving Society

NIH-supported research leads to improvements in health that can bolster the economy, improve productivity, and reduce the costly burden of illness. NIH funding also spurs economic growth, both by supporting jobs in research and by generating biomedical innovations that lead to growth in the biotechnology sector.

Direct Economic Contributions

NIH directly supports the economy through investments in research institutions and job formation.

Research Investment

Image credit: NIH

With an annual budget of more than $47 billion, NIH is the largest single public funder of biomedical and behavioral research in the world. In fiscal year 2023, NIH funding generated an estimated $92.89 billion in economic activity.

- Every state and almost every congressional district received a share of NIH investment.
- Each year, NIH awards over 60,000 grants that directly support more than 300,000 researchers at more than 2,500 different institutions.
- In fiscal year 2023, every $1 of NIH funding generated approximately $2.46 of economic activity.

Patents

Image credit: Daniel Soñé Photography, LLC

For every $100 million of funding, NIH-supported research generates 76 patents. These patents create opportunities for an estimated $598 million in further research and development.

- NIH-funded patents represent significant advances in their fields and produce 20% more economic value than other U.S. patents.
- More than 30% of NIH grants produced a scientific article that is later cited in a commercial patent.

Career Training

Image credit: Photo courtesy of Deep South Center for Environmental Justice

The NIH-funded Environmental Career Worker Training Program empowers individuals in underserved communities with training in environmental cleanup and construction. The program provides a value-added of $1.79 billion in economic benefit while reducing U.S. government expenditures by $717 million.

- From 1995–2013, the program has provided job training to more than 13,000 workers in more than 25 states, teaching the skills necessary to obtain employment in environmental cleanup and construction fields.
- The program increases participants' employment opportunities and promotes engagement in community improvement efforts, while also generating $2.3 million annually in matching funds from local sponsors.
- In 2022, this program was selected to participate in the Justice40 initiative, a White House initiative to tackle climate change.

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Spurring Economic Growth

NIH investment drives growth of the whole biomedical research enterprise, such as the growth of biotech from the foundation of NIH-supported discoveries.

NIH Spurs the Economy

Image credit: Darryl Leja, NHGRI

Discoveries arising from NIH-funded research provide a foundation for the U.S. biomedical industry, which contributes over $69 billion to the U.S. GDP each year and supports over 7 million jobs.

- A $1.00 increase in publicly funded basic research stimulates an additional $8.38 of industry research and development investment after 8 years.
- A $1.00 increase in publicly funded clinical research stimulates an additional $2.35 of industry research and development investment after 3 years.
- NIH-funded basic research fuels the entry of new drugs into the market and provides a positive return of public investment of 43%, by some estimates.

DNA Sequencing

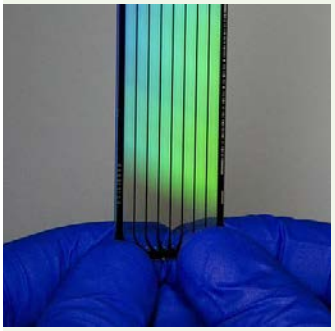

Image credit: Daniel Soñé, NCI

Thanks to the Human Genome Project and subsequent molecular technologies—which received significant NIH support—the field of human genomics now supports over 850,000 jobs, has over $265 billion in total economic impact per year, and yields a return of investment of $4.75 for every $1 spent.

- The Human Genome Project generated the first human genome sequence. The estimated cost for generating the initial human genome sequence was $300 million. Today, the cost to sequence a human genome is less than $1,000.
- These advances in molecular technologies led to integration of genomics into the fabric of biomedical research, medical practice, and society—moving beyond the research lab to both commercial and clinical sectors.
- The field of human genomics supports more than 166,000 direct U.S. jobs and 850,000 indirect jobs.

Collaboration

Image credit: National Cancer Institute, NIH

The NIH Proof of Concept Network supported more than 3,000 academic innovators and entrepreneurs to convert promising scientific discoveries into medical products. This led to the creation of over 100 startup companies and more than $1.58 billion in additional funding.

- By combining entrepreneurial training, product development expertise from the local biomedical ecosystem, and funding and project management for proof of concept studies, NIH has contributed to training a biomedical workforce that is globally competitive in technology development and entrepreneurship.

Small Business

Image credit: Daniel Soñé Photography, LLC

Small businesses are a national resource for technological innovation. One NIH institute estimates that their small-business investment has added more than $13 billion to the U.S. economy.

- A National Academies of Sciences, Engineering, and Medicine consensus study reported that the NIH small business investment programs fulfill their broad missions by funding U.S. small businesses to conduct high-quality and commercially relevant research, and this research contributes to U.S. leadership within the biomedical research enterprise.

- An economic impact study on the National Cancer Institute's small-business program found that its efforts have resulted in $26.1 billion in economic output nationwide and a $13.4 billion in value-added to the U.S. economy.

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Societal Benefits of Improved Health

NIH-supported research contributes to health benefits, which in turn result in societal and economic benefits.

Health and Economy

Image credit: Wesley Gilbertson, NLM

Research-related gains in average life expectancy, including those supported by NIH, have an estimated economic impact of approximately $38 trillion per year of extended life.

- Cancer death rates have been dropping by more than 1.5% annually for the past 15 years.
- Each 1% reduction in cancer deaths has a present value of nearly $500 billion to current and future generations of Americans.

Drug Use Disorder Treatment

Image credit: National Institute on Drug Abuse, NIH

Implementing evidence-based interventions for addiction can have a benefit of more than $58 for every $1 spent, thanks in part to NIH-supported initiatives that bridge the gap between the science of substance use disorder treatment and practice in real world settings.

- The NIH National Drug Abuse Treatment Clinical Trials Network has produced dramatic advances in understanding drug use and addiction, leading to the development of an array of new treatments and therapies to help patients with substance use disorders.
- Studies show that every $1 spent on substance use disorder treatment saves $4 in health care costs and $7 in criminal justice costs.

Drug Use Disorder Prevention

Image credit: Daniel Soñé Photography, NCATS

Every $1 spent preventing drug use in adolescents results in an economic benefit of more than $100, and it can produce benefits for communities that outweigh monetary costs, according to NIH research.

- NIH-funded research produced key insights into the importance of adolescence as a period of increased vulnerability to the negative consequences of drug use, and a key period for intervention and prevention efforts that target risk and protective factors at the individual, family, and community levels.
- If implemented nationwide, it is estimated that school-based substance use prevention programs could save $18 per $1 invested, and substance use initiation would decline for 1.5 million youth and be delayed for 2 years on average.

Childhood Interventions

Image credit: National Eye Institute, NIH

Many childhood health interventions can be attributed to NIH-supported research, and these interventions have saved lives and reduced the costly burden of illness. For example, in the U.S., routine vaccinations of children born in 2009 will reduce direct health care costs by at least $13.5 billion over their lifetimes.

- CDC estimates that for children born in 2009, childhood vaccinations will reduce direct health care costs by $13.5 billion and save $68.8 billion in indirect costs over their lifetimes.
- Cochlear implants—developed in part from NIH-supported research—when implanted early, can save more than $30,000 in costs per child.
- NIH supported the development of the haemophilus influenza type b (Hib) vaccine, and this vaccine is estimated to save more than $1.8 billion in direct treatment costs for children born in 2009 alone.

Toxic Waste Cleanup

Image credit: National Institute of Environmental Health Sciences, NIH

By implementing innovative cleanup strategies for hazardous waste sites, NIH-funded research has contributed to more than $100 million in savings for toxic waste clean-up costs.

- NIH-funded multi-disciplinary research projects in environmental health have advanced knowledge and led to additional clinical, public health, policy, and economic benefits.
- A recent assessment found that five technologies developed by NIH-funded research have saved over $100 million in remediation costs.

Lead Restrictions

Image credit: Shutterstock

NIH-supported research on the effects of lead on child development and behavior was key to establishing bans on lead in paint and in gasoline for vehicles. The economic benefit of reducing lead levels among children by preventing lead exposure is estimated at $213 billion per year.

- Research shows that lead exposure early in life irreversibly disrupts brain development, and blood lead levels are associated with adverse neurological effects in children.
- Over the past 45 years, exposure to lead has declined dramatically in the U.S.
- This sustained decline is measured by blood and environmental lead levels and achieved through control of lead sources, emission reductions, federal regulations, and applied public health efforts.

Eye Diseases and Treatments

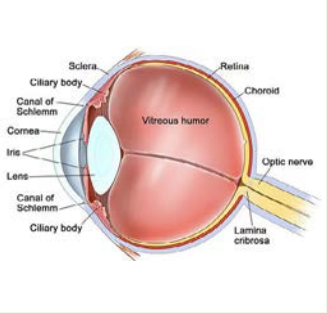

Image credit: Terese Winslow, NCI

NIH-supported research on drug development for eye diseases has saved $28.5 billion in health care costs over 10 years and reduced wet age-related macular degeneration (AMD)-related legal blindness by 50%.

- In wet AMD, abnormal blood vessels appear in the eye, leading to vision loss.
- Vascular endothelial growth factor (VEGF) is a protein responsible for normal blood vessel formation, and it can cause abnormal blood vessels to develop in the eye as a part of disease.
- NIH supported the development of drugs that reduce VEGF activity, and these drugs are now standard therapies for vascular diseases of the retina, such as diabetic retinopathy and wet AMD.

Justice Settings

Image credit: National Institute on Drug Abuse, NIH

Thanks to NIH-funded research, changes in public policies have expanded access to medications for opioid use disorder (OUD) among incarcerated people, helping them recover and avoid becoming incarcerated again.

- People who have been incarcerated are 10 times more likely to have OUD than those not justice-involved, and they face 130 times higher risk of overdose.
- NIH-supported research found that providing medications for OUD to incarcerated people can reduce their risk of overdose and reentry into the criminal justice system in the years following release.
- This research helped lead to policy changes that improved access to medications for OUD, including Medicaid coverage within 90 days prior to release, and expanding opioid treatment programs across the federal prison system.

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Societal Benefits from Research

NIH-supported research findings result in changes that benefit society and the economy.

Neighborhoods and Health

Image credit: Jonathan Bailey, NHGRI

NIH-supported research shows that children who move from a high-poverty neighborhood to a low-poverty neighborhood are more likely to attend college and earn over 30% more as young adults. This has prompted changes in policies at the U.S. Department of Housing and Urban Development and other U.S. agencies.

- Individuals living in low-poverty neighborhoods have improved health and employment compared to individuals living in high-poverty neighborhoods.
- Moving from a high-poverty neighborhood to a low-poverty neighborhood resulted in improved well-being, mental health, and physical health, such as increased rates of employment, decreased substance use and exposure to neighborhood violence, and reduced prevalence of extreme obesity and diabetes.
- This evidence led policymakers to begin reducing systemic barriers for families to live in areas with more opportunities and lower levels of poverty.

Importance of Sleep

Image credit: National Institute of Child Health and Human Development, NIH

NIH-funded research shows the importance of sleep in boosting productivity at work and school. For example, a later school start time increases sleep duration and can lead to a 4.5% increase in grades. Because of this research, some states already enacted laws mandating later school start times.

- NIH-funded research shows that workplaces with health promotion programs have increased employee sleep duration and subsequent increased daytime performance.
- Similarly, in school settings, later school start times can increase students' median sleep time by 34 minutes and improve school attendance, resulting in a 4.5% rise in median grades.
- A 60-minute delay in school start times also reduces car crash rates by 16.5%, as young drivers have a higher crash risk when sleep deprived.

Air Pollution and Health

Image credit: Elisabeth De la Rosa, University of Texas Health Science Center, NCATS

NIH-funded research found strong associations between exposure to air pollution and mortality. This research contributed to new Clean Air Act regulations in 1990, which resulted in air quality improvements that reached an economic value of $2 trillion by 2020 and prevented 230,000 early deaths in 2020 alone.

- The net improvement in economic welfare due to new Clean Air Act regulations is projected to occur because cleaner air leads to better health and productivity for American workers, as well as savings on medical expenses for air pollution-related health problems.
- The beneficial economic effects of better health and savings on medical costs alone are projected to more than offset the expenditures for pollution control.

Housing and COVID-19

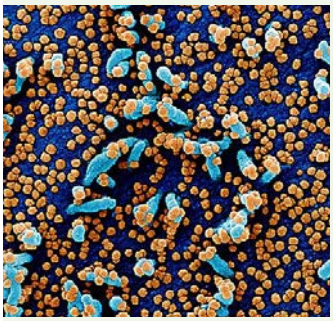

Image credit: National Institute of Allergy and Infectious Diseases, NIH

NIH-funded research supported federal policies that prevented evictions during the COVID-19 pandemic, reducing the spread of COVID-19 and preventing excess deaths.

- Lifting eviction moratoria in the spring and summer of 2020 was associated with 433,700 excess COVID-19 cases and 10,700 excess deaths. These findings were cited in decisions by other U.S. federal agencies to extend eviction moratoria.
- CDC cited NIH research when extending the federal eviction moratorium in January 2021, and in subsequent extensions, which may have had positive downstream impacts on productivity, employment, housing, and health costs.

Dietary Guidelines

Image credit: Nancy Krebs University of Colorado Anschutz Medical Campus, Aurora, CO

Thanks to NIH-supported research, our understanding of how dietary intake contributes to health outcomes has expanded, and a more accurate way to measure metabolism in humans is now available. This has informed dietary guidelines for all Americans, including guidance on school lunches and labels for food and menus.

- NIH-supported research has improved our understanding of the relationships between dietary intake, human development, and risk of chronic diet-related health conditions in the U.S.
- The development of doubly labeled water (DLW)—a safe, non-invasive way to measure energy expenditure in humans—was funded by NIH and has revolutionized the measurement of metabolism in humans.
- DLW is essential for the establishment of dietary reference intakes, which are the basis for updating dietary guidelines for all Americans.

Taxes for Public Health

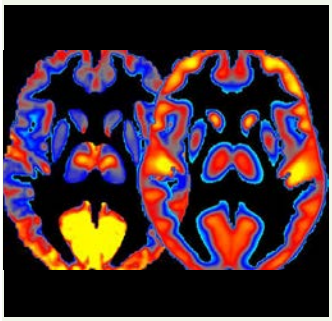

Image credit: Dr. Ehsan Shokri Kojori, NIAAA

Several U.S. cities have imposed a tax on sugar-sweetened beverages, based on research funded by NIH. In Berkeley, CA, this tax resulted in more than $9 million of revenue from 2015-2019, for public health campaigns and promotion for the city.

- Implemented in 2015, the Berkeley tax on sugar-sweetened beverages impacted consumer spending, leading to a 10% drop in purchases of unhealthy beverages within a year.
- It also supported a public health intervention that led to improved health outcomes.

Nusing Education

Image credit: John Powell

NIH-supported research showed that a more educated nurse workforce is associated with improvements in patient outcomes in hospitals. This informed recommendations from the National Academy of Medicine on nurse education, leading to an almost 10% increase in nurses with a bachelor's degree or higher from 2011-2019.

- NIH-supported research showed that for every 10% increase in nurses with bachelor's degrees, there is a related 5-7% decrease in the likelihood of death for patients in hospitals.
- This research contributed to the 2011 National Academy of Medicine (formerly the Institute of Medicine) recommendation that 80% of nurses hold a bachelor's degree by 2020.
- Since these recommendations, the proportion of nurses in the U.S. with a bachelor's degree or higher increased from 50% in 2011 to 59% in 2019.

Nurse Workload

Image credit: National Institute of Arthritis and Musculoskeletal and Skin Diseases, NIH

NIH research demonstrated that when hospital nurses' workloads are increased, there are higher rates of death for patients in that hospital. This research has informed proposed or passed legislation in almost 25 states that addresses nurse staffing levels, reduces workloads, and saves lives.

- NIH-supported research found that each patient added to a nurse's workload was associated with a 7% increase in patient mortality.
- This research has guided state-mandated nurse-to-patient ratios in California hospitals. After these guidelines went into effect, NIH researchers found that when compared to states without mandated nurse staffing levels, California nurse workloads were lower, which was associated with fewer patient deaths.

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1. Article: Nurse staffing and education linked to reduced patient mortality: https://www.nih.gov/news-events/news-releases/nurse-staffing-education-linked-reduced-patient-mortality.
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