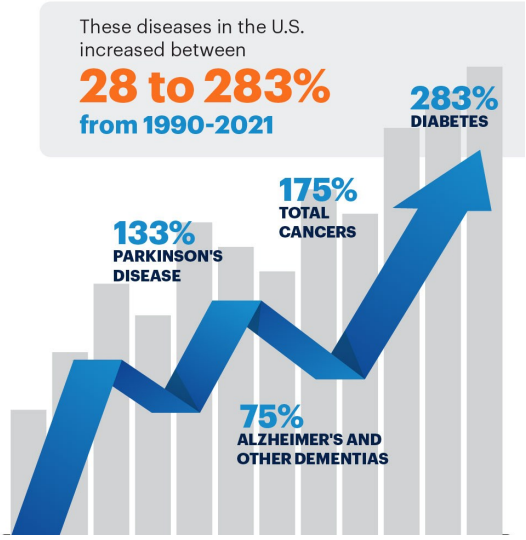
Funding Environmental Health Research is Critical to Tackling Skyrocketing Chronic Disease in the U.S.

Summary and Recommendation

Chronic diseases including cancer, diabetes, Parkinson's Disease, chronic respiratory disease, and childhood neurodevelopmental disorders **have increased dramatically in the United States** over the past few decades.* Research shows that these diseases are linked to environmental factors such as air pollution, microplastics, and harmful chemical exposures. It is therefore urgent that we expand our ability to reduce and prevent chronic disease to make America healthy.



NIEHS Research is Essential to Protecting and Improving Health

NIEHS is at the forefront of conducting research that protects public health by revealing how environmental factors impact health and disease and supporting communities in responding to environmental disasters such as chemical spills and extreme weather events like hurricanes. **NIEHS P30 environmental health research centers are at the core of this mission by advancing scientific understanding, addressing emerging public health threats, improving community health, and reducing health care costs.**

NIEHS research is varied: some studies analyze how chemicals, pollutants, and mold in the air, water, and things people touch affect health. Others consider what happens to the body as it processes chemicals or reacts to influences like diet and stress. **The research explores all life stages**, from fetal development to childhood, adolescence, adulthood, and advanced age, documenting the benefits of reduced exposure to contaminants and developing ways to prevent disease and disability and promote health.

NIEHS Research is an Economic Driver

NIH's $47 billion investment in research in 2023 resulted in nearly double the economic activity, at $92 billion. NIEHS' 2025 budget request is only 2 percent of this total, about **$917 million**. But the return on these dollars far exceeds this small investment. NIEHS has routinely delivered scientific breakthroughs and paved the way to reduce toxic burdens in communities – from air pollution to PFAS contamination in water.

Environmental health research also informs public health policy actions, which **can yield $1.25 to $39 for every $1 invested**. Examples of the costs/benefits include:

- The Clean Air Act of 1990 amendment **benefits were estimated at $2 trillion in 2020, 30x greater than the annual cost** of $65 billion.
- The disease burden associated with human exposures to plastics cost $249 billion in the US in 2019 (likely an underestimate) while economic benefits of plastics via sales in the US was roughly $97 billion in 2019; thus **the health costs of plastics are over 2x the economic benefits**.

Environmental research combined with regulatory action saves lives

- Human caused air pollution is estimated to result in the premature deaths of 90,000 – 360,000 Americans every year, yet, the Clean Air Act of 1990 amendment is estimated to prevent 230,000 premature American deaths annually.

Center Achievements Advance Science, Address Public Health Threats

NIEHS P30 centers lead government-funded environmental health research that **advance scientific breakthroughs, explore how pollutants and contaminants impact health, address public health threats and disasters, and guide public policy to improve health**. Their work includes identifying contaminants in air, water, food, and everyday products as well as how chemicals and plastics undermine health. The research informs strategies to mitigate harmful exposures and prevent disease.

Advance Scientific Understanding

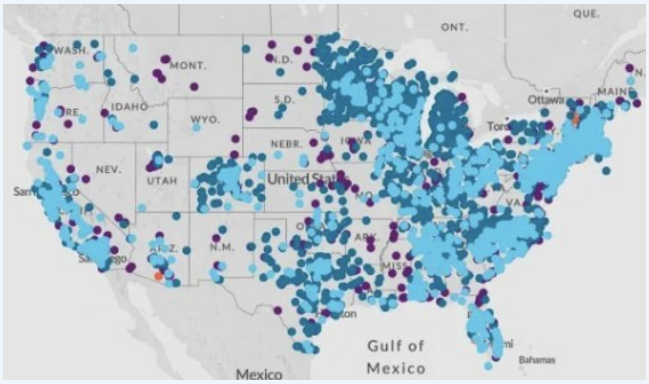
- Identified links between **PFAS exposure and cancer** and reduced fertility in women.
- Found links between **microplastics and cancer and infertility**, and discovered microplastics in human brains and testes; also discovered that brain tissue from people diagnosed with dementia had up to 10x more plastic than other brains.
- Discovered links between **air pollution and cancer** and an increased risk of autism in early childhood.
- Identified 55 never-before-reported chemicals in pregnant women and newborns, and **revealed that harmful chemicals can cross the placenta and harm fetal development**.
- Found exposure to phthalates – hormone-disrupting chemicals used in many personal care and household products – **increases risk of preterm birth**.
- NIEHS-funded research also discovered evidence that exposure to high levels of radio frequency **radiation**, emitted by 2G and 3G cellphones, **resulted in tumors** in the hearts of male rats.

Reduce Health Care Costs

- The Kentucky P30 Center launched a new radon communication strategy using geologic map data to encourage homeowners to test and mitigate radon exposure. This strategy reduced harmful radon exposures in 1 year, **preventing premature lung cancer death** with an economic benefit of **$3.4 to $8.5 million in healthcare cost savings** (2016 USD).
- Launched initiative to **educate adolescents** about the health risks of e-cigarettes and vaping **to prevent cancer** (which cost patients $158 billion for treatment in 2020) and related costs.
- Identified **links between exposures to pesticides and** other agricultural exposures and chronic diseases including **cancer and respiratory conditions**; these findings have contributed to policies that reduce disease burden, lower healthcare costs for farmers, and improve agricultural worker productivity.

Address Emerging Public Health Threats and Disasters

- Leading the way to engineer solutions to **remove PFAS from drinking water, which has contaminated drinking water in every state in the U.S.** (see map)
  - P30 Center in NC has found that every child born in North Carolina has PFAS in their body, which is expected to cost billions in health care costs. Data from the NC P30 Centers was part of NIEHS research that led to EPA policy changes.



- Developed a **new method to predict lead exposure risk** and employed citizen science to identify communities most in need of remediation.
- Found evidence of a **link between lead exposures and developmental impairment in children** which led to significant changes in testing, remediation and regulations to reduce emissions from battery and lead processing facilities to better protect children.
- **Developed methods that can detect over 1,500 chemicals** in real-time from environmental exposures like **wildfires**.
- Created an online resource to help communities **navigate complex environmental cleanups** and are investigating potential long-term health effects following a hazardous train derailment.

NIEHS Training Supports Emergency Response, Return on Investment

The NIEHS Environmental Career Worker Training Program (ECWTP) prepares workers for careers in environmental cleanup, construction, hazardous waste removal, and emergency response.

According to an economic impact study**, the ECWTP resulted in a **$100 million return on a $3.5 million annual investment** from the federal government. This resulted in an estimated total return on investment of $1.79 billion (from 1995 to 2013).

* Source: Global Burden of Disease Study Results. Institute for Health Metrics and Evaluation. Accessed October 24, 2024. https://vizhub.healthdata.org/gbd-results
** Source: www.niehs.nih.gov/careers/hazmat/wtp_ecwtp_report_508.pdf

P30 Centers by the Numbers

- **26** P30 environmental health research centers leading NIEHS research and training
- **1,682** publications in 2023 with **4,411** citations
- **1,946** member scientists
- **223** career development recipients with ~**135** pilot awards and over **2600** publications (2017-2024)
- Over **228** NIH grants awarded
- **338** written and educational materials