

# New report indicates annual economic impact of human genetics/genomics

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Human genetics and genomics contributed \$265 billion to the U.S. economy in 2019 and has the potential to drive significant further growth given major new areas of application, according to a new report issued today by the American Society of Human Genetics (ASHG). The findings indicate that this research and industry sector has seen its annual impact on the U.S. economy grow five-fold in the last decade and

outlined at least eight areas of expanding impact for human health and society. ASHG commissioned and funded the report and is grateful for generous additional contributions from Invitae and Regeneron. Neither company had any direct input into the analyses or report content.

"Twenty years after the Human Genome Project produced the first draft of the human genome sequence, we are seeing in more and more areas the very profound benefits of genetics and genomics to [human health](#)," said ASHG President Gail Jarvik, MD, Ph.D. "This report also reveals the significant benefit to the American economy and outlines future areas of functional application and impact for the field."

The report finds that [human genetics](#) and genomics research in 2019 yielded a substantial \$4.75 return on every federal dollar invested in it. This determination reflects, in part, an estimated \$3.3 billion in 2019 federal funding specifically for human genetics and genomics research, largely at the National Institutes of Health (NIH), in comparison to the \$15.5 billion that the field generated and supported in federal tax revenues that year.

"While the report uses a conservative \$3.3 billion figure, we were surprised to learn in this analysis that nearly half of all NIH funding has a [genetic/genomic](#) component, if not as the focus, then as a tool to support other biomedical research," said Lynn B. Jorde, Ph.D., Chair of ASHG's Government and Public Advocacy Committee. "It demonstrates how foundational genetics is for [biomedical research](#) today."

The impact on job creation is equally robust. Human genetics and genomics research enabled and supported a total of 850,000 jobs in 2019, including direct and indirect employment. This number included 152,000 industry jobs across core private-sector genetics/genomics companies (more than 89,000 jobs) and in extended industries such as major pharmaceutical and medical testing/diagnostics companies where

human genetics plays an increasingly important role (nearly 63,000 jobs).

According to Jarvik, all medical science produces great returns to individuals and to society, and human genetics and genomics research is an enormous contributor in both respects. "This field is perhaps one of the best examples of the value of scientific research to our entire economy and of the case for continuing to build on that investment," she said.

To illustrate the scope of current uses of genetics or genomics, the report highlights eight major categories for emerging or future medical application: minable big data, identification of genetic predisposition to diseases and disorders, diagnosis of diseases, rational drug development that relies on [genetic information](#) to target molecules in drug design, pharmacogenomics (or personalized medicine), gene editing and gene therapy, human-microbe genetic interactions, and human-environment metagenome interactions. In addition, it describes non-medical applications as diverse as forensic science, anthropology and evolutionary biology, ancestry testing, and paternity testing.

"The report relied on 2019 data, but 2020 showed us the enormous value of genomic sequencing for viruses alone, with the creation of mRNA-based COVID-19 vaccines in an unprecedented timeframe," said Simon Tripp, a Principal and Senior Director at TEconomy Partners, and co-author of the report. "In another example, we can see that genomics-based precision medicine is not only growing in applications for [cancer treatment](#), it is also advancing applications in the treatment of heart disease, rheumatoid arthritis, Alzheimer disease, multiple sclerosis, and many other conditions." Tripp also notes that the field of genetics and genomics is absolutely essential in developing diagnostics and treatments for thousands of rare diseases, which collectively affect more than 25 million people in the U.S. and 250 million worldwide.

**More information:** [www.ashg.org/wp-content/uploads/... act-Report-Final.pdf](http://www.ashg.org/wp-content/uploads/2021/05/act-Report-Final.pdf)

Provided by American Society of Human Genetics

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