



Investing in Heart Disease and Stroke Research

OVERVIEW

Cardiovascular disease (CVD), including heart disease and stroke, continues to place the highest burden on our nation's health and economy, and it's projected to get worse.¹

- Currently, almost half of American adults (more than 121 million) suffer from CVD.²
- CVD was the primary cause of over 30% of all U.S. deaths 2016.³
- Over 2300 in the US die from CVD each day—1 death every 38 seconds. Although CVD death rates fell more than 18% from 2006 to 2016, the decline has slowed since 2011.⁴

CVD BURDEN

- In the U.S. heart disease and stroke are the first and fifth highest causes of death, respectively.⁵
- In 2015, the direct and indirect costs for CVD were an estimated \$555 billion. By 2035, total annual costs are projected to reach more than \$1 trillion.¹
- Between 2015 and 2035, total direct stroke-related costs are expected to increase from \$66.3 billion to \$142.9 billion. Stroke prevalence is expected to increase by nearly 27%.¹
- In FY 2015, the Center for Medicare and Medicaid Services spent more per capita on stroke (more than \$32,000) and heart failure (nearly \$29,000) than any other chronic condition.⁶

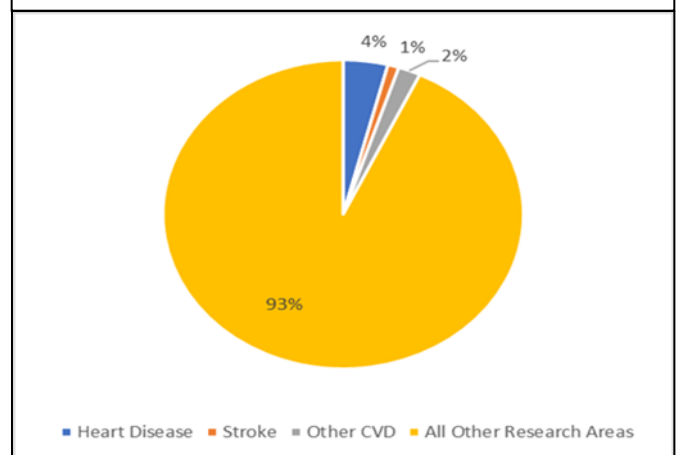
NIH FUNDING VS. CVD BURDEN

Despite a significant return on investment, the National Institutes of Health (NIH) invests a highly disproportionate 4% of its budget on heart disease research, a mere 1% on stroke research, and only 1% on other CVDs (see chart). This funding level is not commensurate with scientific opportunities, the number of people afflicted with CVD, or the physical and economic burden it inflicts on our nation.

NIH HEART AND STROKE RESEARCH BENEFITS THE ECONOMY

- NIH funding supported more than 400,000 jobs and nearly \$70 billion in economic activity nationwide in 2017.⁷
- For every \$1 spent on CVD research, the return on investment is \$30.⁸
- A study estimates the original National Institute of Neurological Disorders and Stroke-funded tPA trial resulted in a 10-year net benefit of \$6.47 billion.⁹
- Since 2005, growth in Medicare spending has slowed substantially due in large part to a slower growth rate in individual-level CVD spending. About half of the reduction in cardiovascular spending is attributable to the greater use of preventative medications and the development of new CVD therapies.¹⁰

Heart Disease, Stroke, and Other CVD Research Funding as a Percent of Total NIH Funding FY 2017



NIH HEART AND STROKE RESEARCH → BETTER PATIENT OUTCOMES

Some of the major advances in heart disease and stroke treatments include the following:

- According to the SPRINT trial, adults over age 50 have a 25% reduced risk of heart attack, heart failure, and stroke, and a 27% less likelihood of all cause death by maintaining a systolic blood pressure of less than 120 mm Hg compared to the previous standard of 140 mm Hg.¹¹
- Developing an ultrasound blood pressure sensor that can be worn as a flexible skin patch.¹²

FACT SHEET: Investing in Heart Disease and Stroke Research

- Developing a collaborative learning model to reduce intubation time for infants post-heart surgery.¹³
- Eating a diet rich in red meat have triple the levels of a chemical called TMAO, which is linked to heart disease.¹⁴ Developing a new surgical procedure that prevents a rare, but often fatal complication during transcatheter aortic valve replacement.¹⁵
- Using a faster and simpler oxygen supply device called a laryngeal tube by EMS teams during cardiac arrests can save thousands of lives and reduce related disabilities.¹⁶ Using data from the DEFUSE 3 trial proves brain imaging can identify patients who will benefit from clot removal up to 16 hours after suffering a major stroke, preventing death or major disability.¹⁷

EMERGING AREAS OF CVD RESEARCH

Although much has been accomplished in treating risk factors, cardiovascular disease is not “cured.” As the population ages, the demand will increase for more and better ways to allow Americans to live free from CVD. Some promising new research opportunities include:

- Determining that smart technology may accurately detect atrial fibrillation.¹⁸
- Adding PCSK9 inhibitors to statin therapy may reduce the risk of heart attack or stroke.¹⁹
- Using a specially-designed clip to repair leaky mitral valves may reduce death rates in heart failure patients.²⁰
- Using forearm arteries for coronary bypass grafting.²¹
- Treating stroke patients with thrombectomy in addition to standard care may increase functional independence 90-days post-discharge compared to just standard care.²²
- Researching the impact of certain paternal genetic factors on the likelihood of developing obesity.²³

THE ASSOCIATION ADVOCATES

The American Heart Association joins the medical research community in seeking robust, sustainable and predictable funding for the NIH. Moreover, we are working to increase funding for NIH heart and stroke research. This will capitalize on NIH’s investment to improve Americans’ health, spur economic growth and innovation, and preserve U.S. leadership in medical research.

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³ Xu, J., et al. (2018). Deaths: Final data for 2016.

⁴ Mensah, G.A., et al. (2017). Decline in cardiovascular mortality: possible causes and implications. *Circulation research*, 120(2), 366-380.

⁵ Center for Disease Control and Prevention. (2015). Deaths: Final Data for 2015. Available at: https://www.cdc.gov/nchs/data/nvsr/nvsr66/nvsr66_06.pdf Accessed on January 21, 2018.

⁶ Center for Medicare and Medicaid Services. 2018. Chronic Conditions Medicare Utilization and Spending State Table: Actual Per Capita Medicare Spending All Fee-for-Service Beneficiaries, 2015. Retrieved from: https://www.cms.gov/Research-Statistics-Data-and-Systems/Statistics-Trends-and-Reports/Chronic-Conditions/CC_Main.html. Accessed on February 30, 2018.

⁷ http://www.unitedformedicalresearch.com/wp-content/uploads/2013/07/UMR-ProsperityReport_071913a.pdf

⁸ Cutler, D.M., & Kadiyala, S. (2003). The return to biomedical research: Treatment and behavioral effects. *Measuring the Gains from Medical Research: An Economic Approach*, 110-62.

⁹ Johnston, S.C, et al. (2006). Effect of a US National Institutes of Health programme of clinical trials on public health and costs. *The Lancet*, 367(9519), 1319-1327.

¹⁰ Cutler D.M, et al. (2019). Explaining The Slowdown In Medical Spending Growth Among The Elderly, 1999-2012. *Health Aff (Millwood)*. 38:222-229.

¹¹ SPRINT Research Group. (2015). A randomized trial of intensive versus standard blood-pressure control. *New England Journal of Medicine*, 373(22), 2103-2116.¹² Wang C, et al. (2018). Monitoring of the central blood pressure waveform via a conformal ultrasonic device. *Nature Biomedical Engineering*. 2(9), 687.

¹³ Mahle WT, et al. (2016). Utilizing a Collaborative Learning Model to Promote Early Extubation Following Infant Heart Surgery. *Pediatr Crit Care Med*. 2016;17:939-947.

¹⁴ Wang Z, et al. (2018). Impact of chronic dietary red meat, white meat, or non-meat protein on trimethylamine N-oxide metabolism and renal excretion in healthy men and women. *Eur Heart J*.

¹⁵ Khan JM, et al. (2018). Transcatheter Laceration of Aortic Leaflets to Prevent Coronary Obstruction During Transcatheter Aortic Valve Replacement: Concept to First-in-Human. *JACC Cardiovasc Interv*. 11:677-689.

¹⁶ Andersen LW and Granfeldt A. (2018). Pragmatic Airway Management in Out-of-Hospital Cardiac Arrest. *JAMA*. 320:761-763.

¹⁷ Albers, G.W., et al. (2018). Thrombectomy for Stroke at 6 to 16 Hours with Selection by Perfusion Imaging. *N Engl J Med* 378(8): 708-718.

¹⁸ Turakhia MP, et al. (2019). Rationale and design of a large-scale, app-based study to identify cardiac arrhythmias using a smartwatch: The Apple Heart Study. *Am Heart J*. 207:66-75.

¹⁹ Schwartz GG, et al. (2018). Alirocumab and Cardiovascular Outcomes after Acute Coronary Syndrome. *N Engl J Med*. 379:2097-2107.

²⁰ Stone GW, et al. (2018). Transcatheter Mitral-Valve Repair in Patients with Heart Failure. *N Engl J Med*. 379:2307-2318.

²¹ Gaudino M, et al. (2018). Radial-Artery or Saphenous-Vein Grafts in Coronary-Artery Bypass Surgery. *N Engl J Med*. 378:2069-2077.

²² Nogueira RG, et al. (2018). Thrombectomy 6 to 24 Hours after Stroke with a Mismatch between Deficit and Infarct. *N Engl J Med*. 378:11-21.

²³ Schmidt E, et al. (2018). LincRNA H19 protects from dietary obesity by constraining expression of monoallelic genes in brown fat. *Nat Commun*. 9:3622.