Fall 2017

U.S. Investments in Medical and Health Research and Development

2013 - 2016

RESEARCH AMERICA

AN ALLIANCE FOR DISCOVERIES IN HEALTH®

Our nation spends less than 5 cents of every health dollar on R&D.

Investment in medical and health research and development (R&D) in the U.S. grew by 20.6% between 2013 and 2016. Industry continues to invest more than any other sector, accounting for 67.4% of total spending in 2016, followed by the federal government at 21.9%. Following a subtle decline between 2014 and 2015, federal investments increased from 2015 to 2016. Other sectors, which include academic and research institutions, foundations, state and local governments, and voluntary health associations and professional societies, experienced modest growth from 2013 to 2016. Despite overall investment growth, medical and health R&D continues to account for a very small fraction of the total $3.5 trillion in U.S. health spending. Our nation spends less than 5 cents of every health dollar on R&D. Policymakers must set their sights higher in pursuit of a healthier tomorrow, empowering our nation's R&D ecosystem to work more quickly to end diseases that rob Americans of health, hope and time.

In 2016:

- Total U.S. medical and health R&D spending was $171.8 billion.
- Industry invested nearly $115.9 billion in medical and health R&D.
- Federal agencies invested a total of $37.6 billion, with the National Institutes of Health (NIH) accounting for nearly $30.5 billion.
- In addition to funding received from federal agencies, academic and research institutions, including universities, independent research institutes (IRIs), and independent hospitals dedicated more than $12.5 billion of institutional funds to R&D.
- Other funding sources accounted for 3.4% of total R&D expenditures. These sources include foundations ($2.7 billion), state and local governments ($1.7 billion), and voluntary health associations and professional societies ($1.4 billion).

Table 1: Healthcare Spending versus R&D Investments ($ in millions)

	2013	2014	2015	2016 (est.)
Total U.S. Medical and Health R&D Spending	$142,504	$153,444	$161,702	$171,802
Total U.S. Health Spending[1]	$2,973,426	$3,136,830	$3,320,544	$3,482,139
Medical and Health R&D as % of U.S. Health Spending	**4.79%**	**4.89%**	**4.87%**	**4.93%**

U.S. Medical and Health R&D Spending **4.9%**

U.S. Healthcare Spending **95.1%**

Total 2016 Health Spending: $3.5 trillion

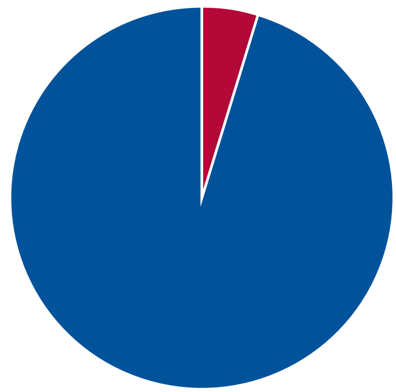
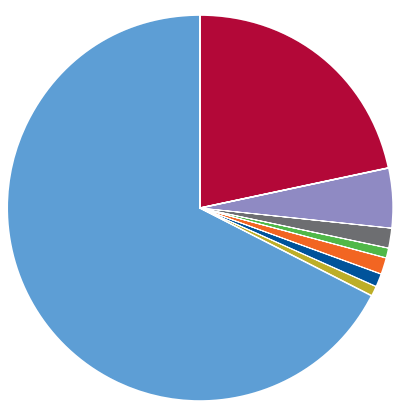


Table 2: Estimated U.S. Medical and Health Research Expenditures ($ in millions) and Annual Percent Change, 2013-2016

Research Segment	2013	2014	% change 2013-2014	2015	% change 2014-2015	2016 (est.)	% change 2015-2016	% change 2013-2016
Industry	$92,970	$100,276	7.86%	$108,520	8.22%	$115,862	6.77%	24.62%
Federal Government	33,382	35,654	6.81%	35,414	-0.67%	37,646	6.30%	12.77%
Academic & Research Institutions	10,742	11,753	9.41%	12,127	3.18%	12,520	3.24%	16.55%
Non-Research Conducting Grant Giving Entities	3,903	4,180	7.10%	4,002	-4.28%	4,088	2.15%	4.72%
State & Local Government	1,506	1,580	4.89%	1,638	3.70%	1,686	2.92%	11.95%
Total	**$142,504**	**$153,444**	**7.68%**	**$161,702**	**5.38%**	**$171,802**	**6.25%**	**20.56%**

Figure 2:
U.S. Medical and Health R&D Expenditure by Funding Source, 2016



21.9% Federal Government
5.0% Universities
1.5% Foundations
0.8% Independent Hospitals
1.5% Independent Research Institutes
1.0% State and Local Government
0.8% Voluntary Health Associations & Professional Societies
67.4% Industry

1 Total U.S. Health Spending = U.S. Healthcare Spending + U.S. Medical and Health R&D Spending

Sector by Sector Analysis

The data captured and discussed in this report represent an estimate of the dollars invested in medical and health R&D performed in the U.S. The data are categorized by funding source, not by the sector that performed the R&D.

Industry

Total industry R&D investment grew significantly during the reporting period, with an annual growth rate peaking between 2014 and 2015 at 8.2%. Industry expenditures totaled $115.9 billion in 2016, a $7.3 billion increase over the previous year. From 2013 to 2016, the biopharmaceutical industry increased spending by the largest dollar amount of the four industry categories, while the "Other Sectors" category increased the most on a percentage basis.

Table 3: Estimated U.S. Medical and Health Research Expenditures ($ in millions) and Annual Percentage Change, 2013-2016

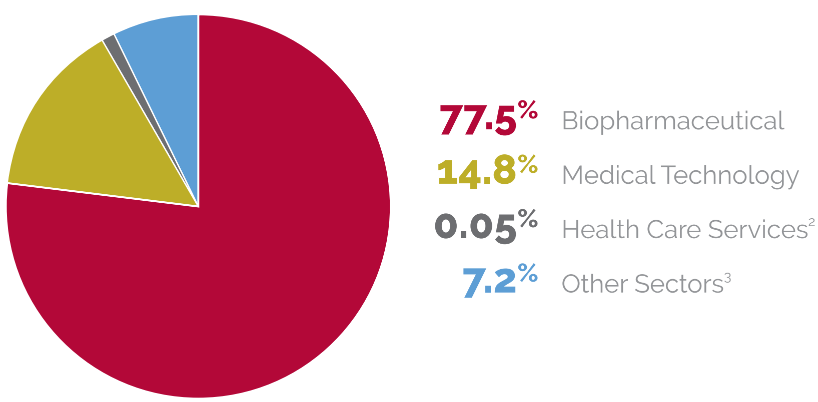
Industry (U.S. Operations)

	2013	2014	% change 2013-2014	2015	% change 2014-2015	2016 (est.)	% change 2015-2016	% change 2013-2016
Biopharmaceutical	$72,294	$78,810	9.01%	$85,282	8.21%	$89,828	5.33%	24.25%
Medical Technology	14,399	15,045	4.48%	15,092	0.32%	17,188	13.89%	19.36%
Health Care Services[2]	442	478	8.14%	489	2.30%	545	11.50%	23.36%
Other Sectors[3]	5,834	5,944	1.89%	7,657	28.82%	8,301	8.41%	42.29%
Total	**$92,970**	**$100,276**	**7.86%**	**$108,520**	**8.22%**	**$115,862**	**6.77%**	**24.62%**

Figure 3:

2016 Industry Investment in Medical and Health R&D, by Funding Sector

Total 2016 Industry Expenditures: $115.9 billion



2 "Health Care Services" represents research conducted by companies that perform services ancillary to the direct provision of care (e.g., R&D expenditures by diagnostic testing companies and electronic medical record firms).

3 "Other Sectors" includes medical and health-related R&D expenditures by firms not typically included in the medical and health industry (e.g., health-related R&D performed by software and computer firms).

Federal Government

Federal agencies invested a total of $37.6 billion in medical and health R&D in 2016, accounting for 21.9% of total U.S. medical and health R&D funding. As shown in Figure 4, 81% of total federal investment is channeled through the National Institutes of Health (NIH). Over 6.0% growth between both 2013-2014 and 2015-2016 offset virtually flat funding from 2014-2015, resulting in 12.8% growth in federal R&D spending during the reporting period (2013-2016). However, this growth was not uniform across all federal agencies.

Table 4: Estimated U.S. Medical and Health Research Expenditures ($ in millions) and Annual Percentage Change, 2013-2016

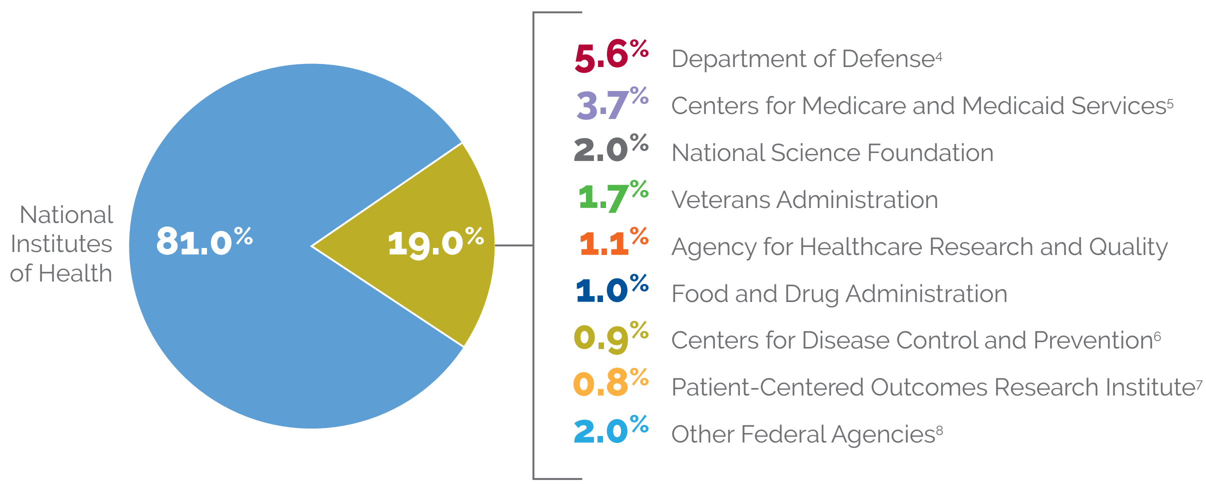
Federal Government Agencies

	2013	2014	% change 2013-2014	2015	% change 2014-2015	2016 (est.)	% change 2015-2016	% change 2013-2016
National Institutes of Health (NIH)	$28,215	$29,400	4.20%	$28,880	-1.77%	$30,490	5.57%	8.06%
Department of Defense (DoD)[4]	1,111	1,803	62.26%	1,746	-3.15%	2,121	21.50%	90.92%
Centers for Medicare and Medicaid Services (CMS)[5]	656	997	51.98%	971	-2.61%	1,408	45.01%	114.63%
National Science Foundation (NSF)	697	692	-0.78%	769	11.23%	764	-0.64%	9.66%
Department of Veterans Affairs (VA)	604	553	-8.37%	643	16.25%	655	1.78%	8.43%
Agency for Healthcare Research and Quality (AHRQ)	430	436	1.40%	443	1.61%	428	-3.39%	-0.47%
Food and Drug Administration (FDA)	361	389	7.90%	376	-3.46%	394	4.96%	9.34%
Centers for Disease Control and Prevention (CDC)[6]	430	434	0.88%	595	37.13%	328	-44.86%	-23.73%
Patient-Centered Outcomes Research Institute (PCORI)[7]	17	132	657.53%	238	79.71%	302	26.99%	1628.79%
Other Federal Agencies[8]	860	818	-4.90%	754	-7.89%	755	0.17%	-12.25%
Total	**$33,382**	**$35,654**	**6.81%**	**$35,414**	**-0.67%**	**$37,646**	**6.30%**	**12.77%**

Figure 4:

2016 Federal Investment in Medical and Health R&D, by Funding Agency

Total 2016 Federal Expenditures: $37.6 billion



4 Changes reflect an increase to the Congressionally-Directed Medical Research Program (CDMRP) within the DoD.

5 Increases reflect ramp up in the CMS Center for Medicare & Medicaid Innovation (CMMI) activities following its establishment in the Affordable Care Act (ACA).

6 Large increase in CDC budget in part due to supplemental emergency funding in response to the Ebola outbreak.

7 PCORI is not technically a federal agency, but rather a Congressionally- authorized, non-governmental, independent organization funded through the federal appropriations process. However, for this report's purposes, it was categorized as a federal agency due to its funding source. PCORI was authorized in 2010, leading to substantial annual increases as the agency established funding priorities in the subsequent years.

8 See page 13 for a break out of "Other Federal Agencies" funding.

Academic & Research Institutions

In addition to performing most federally-funded research, universities, independent research institutes (IRIs) and independent hospitals dedicated more than $12.5 billion of their own funds (endowment, tuition, donations, etc.) to medical and health R&D in 2016. Universities grew their investments substantially over the four-year period, increasing R&D spending by over 20% from 2013 to 2016.

Table 6: Estimated U.S. Medical and Health Research Expenditures ($ in millions) and Annual Percentage Change, 2013-2016

Academic & Research Institutions

	2013	2014	% change 2013-2014	2015	% change 2014-2015	2016 (est.)	% change 2015-2016	% change 2013-2016
Universities	$7,149	$8,014	12.10%	$8,402	4.84%	$8,604	2.40%	20.34%
Independent Research Institutes	2,335	2,456	5.16%	2,392	-2.60%	2,528	5.70%	8.27%
Independent Hospitals	1,258	1,283	2.00%	1,333	3.91%	1,388	4.10%	10.33%
Total	**$10,742**	**$11,753**	**9.41%**	**$12,127**	**3.18%**	**$12,520**	**3.24%**	**16.55%**

Foundations and Voluntary Health Associations & Professional Societies

In 2016, foundations invested nearly $2.7 billion, accounting for 1.5% of total U.S. expenditures on medical and health R&D. From 2013 to 2016, foundations' total investment increased by 3.4%. Voluntary health associations and professional societies increased their spending by 7.3% between 2013 and 2016, reaching $1.4 billion in 2016 and accounting for 0.8% of total U.S. R&D.

Table 7: Estimated U.S. Medical and Health Research Expenditures ($ in millions) and Annual Percentage Change, 2013-2016

Non Research-Conducting Grant Giving Entities

	2013	2014	% change 2013-2014	2015	% change 2014-2015	2016 (est.)	% change 2015-2016	% change 2013-2016
Foundations	$2,573	$2,843	10.51%	$2,627	-7.60%	$2,661	1.27%	3.41%
Voluntary Health Associations & Professional Societies	1,330	1,337	0.49%	1,374	2.79%	1,427	3.84%	7.25%
Total	**$3,903**	**$4,180**	**7.10%**	**$4,002**	**-4.28%**	**$4,088**	**2.15%**	**4.72%**

State and Local Governments

State and local governments increased their investment in medical and health research by nearly 12.0% between 2013 and 2016. Most of this funding was invested in R&D through grants to universities. Over 5% of state and local funding is used to support intramural research conducted by public local agencies such as state departments of health. State and local government support accounts for 1.0% of total U.S. investment in medical and health research.

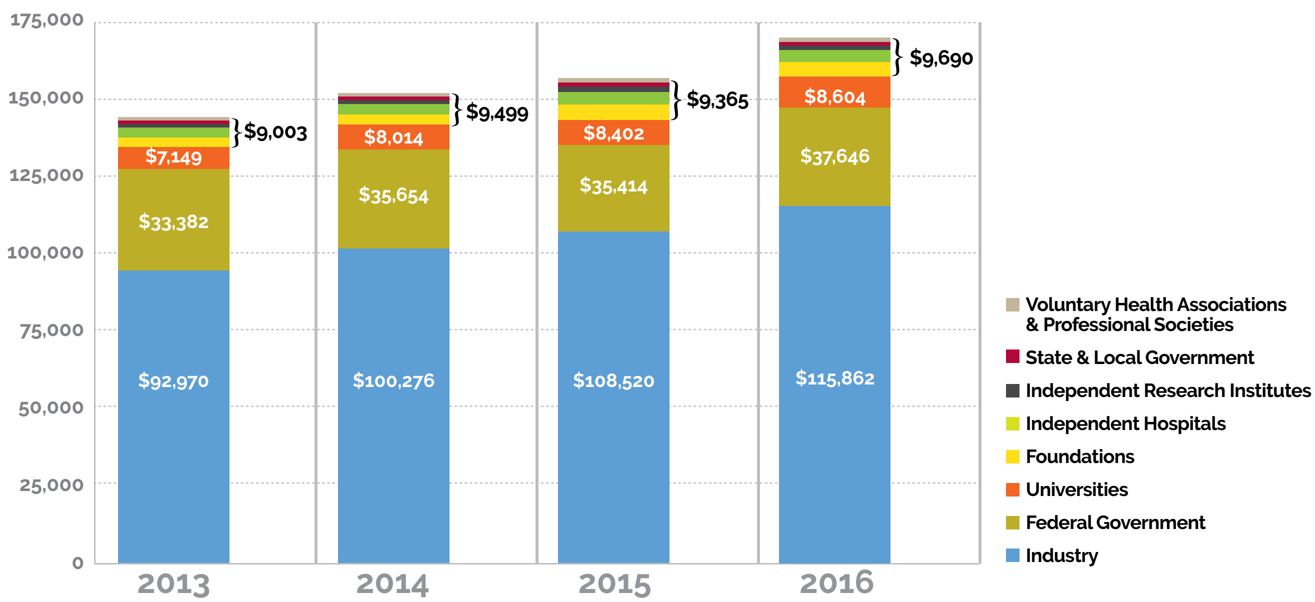
Table 8: Estimated U.S. Medical and Health Research Expenditures ($ in millions) and Annual Percentage Change, 2013-2016

State & Local Government

	2013	2014	% change 2013-2014	2015	% change 2014-2015	2016 (est.)	% change 2015-2016	% change 2013-2016
Support to Universities	$1,414	$1,487	5.19%	$1,546	3.96%	$1,593	3.06%	12.70%
State Agencies, Intramural	93	93	0.20%	92	-0.32%	93	0.66%	0.54%
Total	**$1,506**	**$1,580**	**4.89%**	**$1,638**	**3.70%**	**$1,686**	**2.92%**	**11.95%**

Figure 5:

Estimated U.S. Medical and Health Research Expenditures



Discussion

Industry, which includes biopharmaceutical, medical technology and health care services companies, accounts for more than two-thirds of all medical and health research expenditures in the U.S. In 2016, all industry sectors increased their research expenditures. However, total industry growth between 2015 and 2016 (6.8%) was lower than the annual rates observed between 2013 and 2015 (7.9% and 8.2%, respectively). It is likely that a combination of factors, including merger and acquisition (M&A) activity, foreign competition, challenges in the research pipeline and uncertainty regarding the status of the Affordable Care Act (ACA), contributed to the slower rate of growth.

Biopharmaceutical companies contributed the largest share of funding within the industry sector, accounting for more than half (52.3%) of total U.S. R&D expenditures in 2016. At least seven biopharmaceutical industry members spend more than $1 billion each on R&D annually in the U.S. The medical technology sector showed an increase in 2016 R&D levels, a year in which several large medical technology firms ramped up their R&D activities. It is likely the two-year suspension of the medical device tax, which went into effect in 2016, contributed to this increase in investment.

The growth in R&D investments within health care services firms appears to reflect increasing R&D within diagnostic testing companies. In the "Other Sectors" category, industry members not traditionally involved in medical and health R&D, like those specializing in software, semiconductors, and transportation equipment, are increasing investments, likely as an iterative effect of investment growth in the medical technology sector or diversification strategies for these firms.

Federal policymakers faced budget challenges over the 2013-2016 reporting period attributable to a law passed in 2011, the Budget Control Act (BCA). The BCA-imposed budget caps have been subject to two different forms of "sequestration." The first, which took place in 2013, reduced total federal spending by $85.3 billion via across-the-board budget cuts.[9] After 2013, sequestration took the form of an annual reduction in the caps themselves, which has given Congress more flexibility to prioritize funding across agencies and programs. The American Taxpayer Relief Act (ATRA) and the Bipartisan Budget Act (BBA), which were signed into law in January and December of 2013 respectively, provided partial and temporary relief from the austerity level BCA-imposed sequestration budget caps.

Against this backdrop, counter-veiling forces undoubtedly helped prevent worse outcomes for federally-supported medical and health research. Congressional leaders championed NIH-funded medical and health research, providing annual increases for the Institutes and passing the 21st Century Cures Act,[10] which provided supplemental NIH funding. However, there was uneven growth across the sector as a whole. While NIH was able to "bounce back" between 2015 and 2016 after flat funding the previous year, the Centers for Disease Control and Prevention (CDC) experienced a significant 44.9% cut to research funding as supplemental funds tied to the Ebola outbreak dwindled and flat funding likely engendered difficult budgetary tradeoffs within the agency.

Looking ahead, growth in total federal R&D funding is anticipated to increase in FY17, largely due to another $2 billion increase in NIH funding. However, federal medical and health R&D funding beyond FY17 remains uncertain. The current Administration has recommended large cuts to federal research funding as part of deep cuts across the non-Defense funding spectrum. Both the House and Senate proposed another major increase for NIH in FY18, but this funding hinges on the ability of Congress to pass another bipartisan budget deal, like the ATRA and the BBA, to raise the sequestration budget caps.

Universities, independent research institutes and independent hospitals conduct the lion's share of federally-supported medical and health research. Because federal grants do not cover the full costs of

9 Center for Budget and Policy Priorities

10 The 21st Century Cures Act was signed into law in December 2016. The bill aims to speed medical progress in part by providing $6.3 billion in supplementary funding to NIH and FDA over 10 years.

research, these institutions supplement federal funds. Funding in this category also reflects "bridge funding" for projects and researchers facing temporary lapses in federal support between grant cycles, and for other R&D purposes. These targeted and strategic uses of institutional funds fill gaps in the R&D pipeline that could otherwise result in researchers leaving the field or worthwhile projects being shelved.

Academic and other research institutions ramped up their R&D investment substantially over the four-year period, increasing their spending by 16.6%. It is important to note that, while the funding academic and other research institutions devote to research is crucial, it does not and realistically cannot supplant federal funding; such investment stretched to $12.5 billion in 2016 compared to $37.6 billion in federal investment.

Private grant-giving entities, including foundations, voluntary health associations and professional societies, accounted for a relatively small (2.4% of total R&D funding), but vitally important component of U.S. research investment, providing crucial seed funding to encourage young investigators and supporting high-risk, high-reward research, among other important contributions. Some have argued these private grant-giving entities are a promising source of funding to replace federal funding of research. Realistically, however, private grant-giving entities' investment capacity is not large enough to compensate for significant reductions in federal funding.

State and local government investment has grown steadily between 2013 and 2016, reaching nearly $1.7 billion in 2016. This increased investment suggests a growing awareness among states of the importance of medical and health research to their local communities and economies.

In total, our nation spends less than 5 cents of each health dollar on R&D. We must consider whether this level of investment is adequate to address the formidable health challenges before us.

Opioid Spotlight

The significance of sustaining a robust medical and health R&D ecosystem in the U.S. is never more apparent than when a public health crisis strikes. The opioid epidemic is emblematic: every day, 178 Americans die from an opioid overdose.[11] According to CDC estimates, the total economic burden of the opioid epidemic surpasses $78 billion dollars annually.[12]

Research into opioid addiction has resulted in the development of two of the most effective tools currently available to combat this crisis: opioid overdose reversal emergency injections and medication-assisted therapies (MATs). However, it is clear more must be done. Since 1999, the number of deaths related to opioids has quadrupled.

Robust investments in research to improve the prevention and treatment of addiction are necessary to bring this epidemic to an end. The 21st Century Cures Act included $1 billion in state grants over two years to address opioid abuse and addiction. While most of these resources will go to treatment facilities, a limited amount may fund specific research.

As outlined by the NIH director, Dr. Francis Collins, and the director of the National Institute of Drug Abuse, Dr. Nora Volkow, in the *New England Journal of Medicine*, we must capitalize on the power of research to end the opioid epidemic by searching for non-addictive treatments for pain, interventions to treat opioid addiction, and new overdose reversal methods.[13] Research remains a largely underutilized resource to address this escalating threat.

11 CDC. Vital Statistics Rapid Release, Provisional Drug Overdose Death Counts. Atlanta, GA: CDC, National Center for Health Statistics; 2016.

12 The Economic Burden of Prescription Opioid Overdose, Abuse, and Dependence in the United States, 2013. Florence CS, Zhou C, Luo F, Xu L. Med Care 2016 Oct; 54(10):901-6.

13 The Role of Science in Addressing the Opioid Crisis. Nora D. Volkow, M.D., and Francis S. Collins, M.D., Ph.D. N Engl J Med. 2017; 377:391-394.

Americans' Views on Research and Innovation

Americans recognize the critical role of public and private sector research to the health and economic prosperity of our nation and global competitiveness. According to public opinion surveys commissioned by Research!America, a majority of Americans (79%) say research investments are important to job creation, technological breakthroughs and economic growth, and more than half of Americans (52%) are willing to pay $1 per week more in taxes to ensure the U.S. remains a world leader in medical research.[14]

Nearly 60% of Americans say medical research has improved their family's health — 23% say it has not and 18% say not sure.[15] But only 30% of those surveyed say the U.S. has the best health care system in the world — 54% say it does not and 16% say not sure.[14] Similarly, when asked if we are making enough progress developing new medicines, 32% said yes, 48% said no and 21% said not sure.[15]

Americans agree that robust federal support for research is key to addressing current and emerging health challenges. A large majority of respondents say the federal government should play a role in: ensuring that existing medical treatments are safe and effective (75%); identifying new ways to prevent illness and disabling conditions (63%); working to prevent and respond to global health threats like Ebola (60%); and ensuring that research is supported adequately to speed medical progress (60%).[14]

Sixty percent of Americans say it is important for Congress to provide tax incentives to the private sector to develop new medicines and medical technologies, and more than two-thirds (67%) say that public policies should be based on the best available science.[14]

A plurality of Americans (45%) agree that prescription pain medication abuse and addiction is a major problem in their communities, and about 60% support increased funding for research to better understand and combat opioid addiction.[14]

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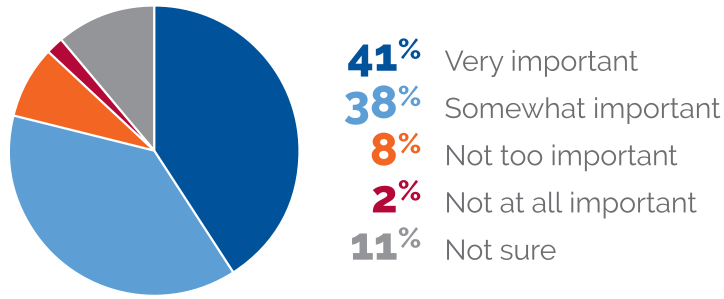
14 A Research!America survey of U.S. adults conducted in partnership with Zogby Analytics in January 2017.

15 A Research!America survey of U.S. adults conducted in partnership with Zogby Analytics in June 2016.

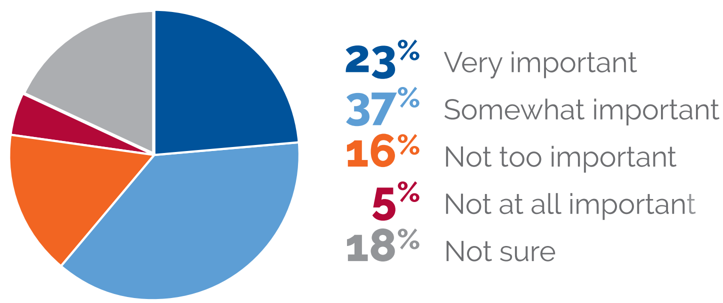
Research Investment Important for Economic Growth

How important is investing in research to job creation, technological breakthroughs and economic growth? [14]



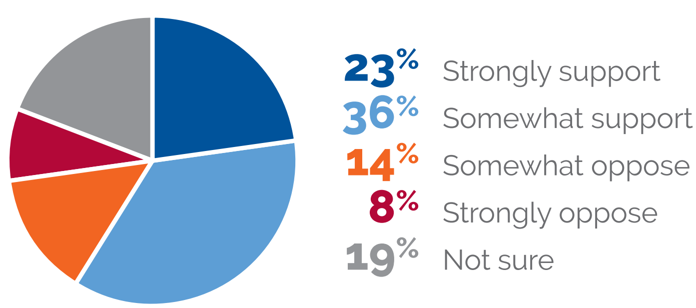
Important for Congress to Provide Tax Incentives for Developing New Medicines

How important is it for Congress to provide tax incentives to the private sector to develop new medicines and medical technologies? [14]



More Than Half Support Increased Funding to Combat Opioid Addiction

Do you support or oppose increased funding for research to better understand and combat the opioid addiction? [14]



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Other Sectors[3]	5,834	5,944	7,657	8,301
Industry Total	**$92,970**	**$100,276**	**$108,520**	**$115,862**
Federal Government				
National Institutes of Health (NIH)	$28,215	$29,400	$28,880	$30,490
Department of Defense (DoD)	1,111	1,803	1,746	2,121
Centers for Medicare and Medicaid Services (CMS)	656	997	971	1,408
National Science Foundation (NSF)	697	692	769	764
Department of Veterans Affairs (VA)	604	553	643	655
Agency for Healthcare Research and Quality (AHRQ)	430	436	443	428
Food and Drug Administration (FDA)	361	389	376	394
Centers for Disease Control and Prevention (CDC)	430	434	595	328
Patient-Centered Outcomes Research Institute (PCORI)	17	132	238	302
Department of Energy (DoE)	284	304	290	284
National Aeronautics and Space Administration (NASA)	147	149	142	145
Environmental Protection Agency (EPA)	126	128	124	123
Health Resources and Services Administration (HRSA)	37	38	41	40
Department of Commerce (DoC)	31	31	32	34
Department of Homeland Security (DHS)	26	36	32	33
Department of Transportation (DoT)	58	49	25	28
U.S. Agency for International Development (USAID)	75	41	24	24
Department of Agriculture (USDA)	56	21	22	23
Other Health and Human Services (Other HHS)	21	21	21	21
Federal Government Total	**$33,382**	**$35,654**	**$35,414**	**$37,646**
Academic & Research Institutions, Institution Funds				
Universities	$7,149	$8,014	$8,402	$8,604
Independent Research Institutes	2,335	2,456	2,392	2,528
Independent Hospitals	1,258	1,283	1,333	1,388
Academic & Research Institutions Total	**10,742**	**11,753**	**12,127**	**12,520**
Non-Research Conducting Grant Giving Entities				
Foundations	$2,573	$2,843	$2,627	$2,661
Voluntary Health Associations & Professional Societies	1,330	1,337	1,374	1,427
Non-Research Conducting Grant Giving Entities Total	**$3,903**	**$4,180**	**$4,002**	**$4,088**
State & Local Government				
Support to Universities	$1,414	$1,487	$1,546	$1,593
State Agency, Intramural	93	93	92	93
State & Local Government Total	**$1,506**	**$1,580**	**$1,638**	**$1,686**
Total U.S. Medical and Health R&D Spending	**$142,504**	**$153,444**	**$161,702**	**$171,802**

Methodology

The total U.S. medical and health R&D data developed and discussed in this report represents an estimate of the full amount of medical and health R&D investment performed in the U.S. over a four-year period (2013-2016). The data is categorized by the originating source of the investment whether industry, the federal government or other contributors to the pool of resources, including foreign-parents of U.S.-located facilities. These data are distinct from data capturing the performance of R&D which align the resources with where they are spent (e.g., NIH research grants would be captured within universities or other research institutes who received the NIH award).

Within the context of this report the terms "funding," "expenditures," "spending," "investments," and "contributions" have all been used interchangeably, all in reference to U.S.-based medical and health R&D expenditures. To the extent that the data and estimates in this report rely on publicly available data sources, the most current data available is used for all data years presented. Due to corrections and restatements within these data, values presented in this current report are deemed to be more accurate and supersede previously released data.

Industry Figures

Industry medical and health R&D expenditures were developed using the NSF- National Center for Science and Engineering Statistics (NCSES) Business Research, Development, and Innovation Survey (BRDIS) data as the baseline. Industry components captured include pharmaceuticals, electromedical devices, medical equipment and supplies, scientific R&D (apportioned to the biopharmaceutical and medical technology sectors using data from BRDIS and the 2012 U.S. Economic Census), health care services and firms in other industry sectors. Extensions and approximations to these data to develop the 2016 estimates relied on additional data 10K (annual) reporting to the U.S. Securities and Exchange Commission (SEC) of key firms in the bioscience industry.

Federal Government Figures

Department specific medical and health research expenditures were primarily developed using the NSF-NCSES Survey of Federal Funds for Research and Development (SFFRD). Research funding within the medical sciences discipline was the primary field used in this analysis. Based upon individual agency missions and efforts, other disciplines were also included such as biological sciences, other life sciences, other engineering (which includes biomedical engineering) and psychology, as appropriate. This process was supplemented or replaced for NSF, CDC, DoE, PCORI and CMS, where profiles, operations, and budget documents where used. The DoD value was derived from AAAS budget analysis.

State and Local Government Figures

The NSF-NCSES Higher Education Research and Development (HERD) Survey data was used to estimate R&D funding from state and local governments to colleges and universities. The NSF-NCSES Survey of State Government Research and Development was used to capture state funding for intramural research. State entities may provide support for R&D through tax incentives and matching funds to industry-related research efforts. However, given the limited specificity and availability of detailed information on these resources, to the extent medical and health firms used these resources for research, the value would likely be captured within the industry funding metrics.

Academic & Research Institutions, Institutional Funds

College and University Figures

The NSF-NCSES HERD Survey was used to estimate institutional internal funding (including direct institutional funding from budgets and endowments and waived indirect expenses on research grants). Combined data for all U.S. higher education institutions in the medical sciences, biological sciences, other (non-agricultural) life sciences, bioengineering, and psychology fields were used for 2013, 2014, and 2015, with an estimate developed for 2016.

Independent Research Institutes (IRI) Figures

Using a sample of independent research institutes drawn from the NIH RePORT database and crosschecked against/supplemented by data provided by the Association of Independent Research Institutes (AIRI), a calculation was made for each research institute to determine their total expenses (including research and any other expenses), net of contributions/grants and program service revenue, and where applicable, increased by an amount equal to additional annual internal funds (income/revenue from internal investments, endowments, or related organizations) as the basis for an annual "funding" estimate. Having developed these sample-based values for 2013-2016, a statistical approach was used to increase the combined annual values based upon the relationship of these sample institutions to the total list of NIH-funded research institutes.

Independent Hospital Research Center Figures

These Research Centers are incorporated within independent stand-alone hospitals (e.g., not as a research center or affiliate of a university, including many Childrens' Hospitals). Key institutions captured within this category include the Mayo Clinic and St. Jude's Children's Research Hospital. Data for these institutions was develop similarly to the Independent Research Institutes using the NIH RePORT database to identify non-academic medical centers receiving substantial NIH research funding. Once identified, a sample of all such institutions receiving $5 million or more in NIH funding in 2016 was used to drive this analysis and estimates. To estimate the additional research resources of these Research Centers (often through numerous, small individual donations) we focused, conservatively, on the Net Community Benefit Research as captured in IRS 990s for Hospitals, with corrections made for post-2013 IRS guidelines. Having developed these sample-based values for 2013-2016, a statistical approach was used to increase the combined annual values based upon the relationship of these sample institutions to the total list of independent hospitals receiving NIH research funding.

Non-Research-Conducting Grant Giving Entities

Foundation Figures

Organizations included in this segment are philanthropic grant-awarding bodies filed as foundations with the U.S. government on official tax documents. Baseline medical and health R&D funding was developed using data from the Foundation Center's Foundation Maps grants and recipient database with additional information gathered from the GuideStar nonprofit information database. Using historical data from the Foundation Center, and more recent and complete financial reporting (both annual financial reports and IRS form 990's), estimates were developed, with emphasis on the funding efforts of key major foundations (e.g., the Bill & Melinda Gates Foundation, the Eli & Edythe Broad Foundation, and the Leona M. and Harry B. Helmsley Charitable Trust) that historically have accounted for a significant majority of medical and health-related R&D funding. All funding meeting the search and estimation criteria from these U.S.-based foundations was included, regardless of where, globally, the recipients of the funding were located.

Voluntary Health Association and Professional Society Figures

Funding estimates for U.S. Voluntary Health Associations and Professional Societies were developed from a continually updated master list of such associations developed by Research!America and based in part from data provided by the Health Research Alliance. Data was built using specified research grant funding expenditures (distinct from education, patient advocacy, or other types of expenditures) as identified within the association's annual reports and/or IRS form 990's. Data consistency and funding magnitude was also checked against both grants received and granting activities (via the Foundation Center database and IRS form 990's).

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