

Fall 2018

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

2013 - 2017

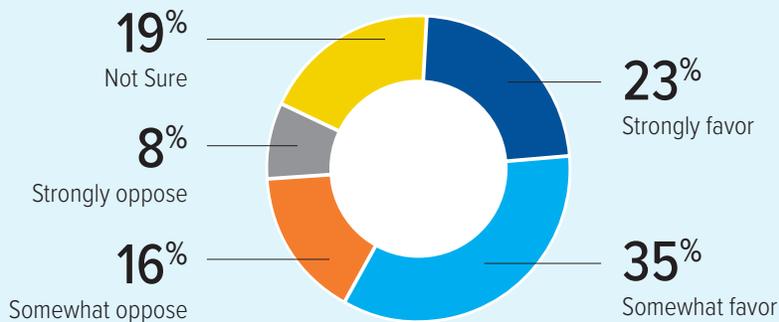


Advocacy has helped bring about five years of much-needed growth in U.S. medical and health research investment. More advocacy is critical now to ensure our nation steps up in response to health threats that we can—we must—overcome.



More Than Half Favor Doubling Federal Spending on Medical Research

Do you favor or oppose doubling federal spending on medical research over the next five years?



Source: A Research!America survey of U.S. adults conducted in partnership with Zogby Analytics in January 2018.

Introduction

Investment¹ in medical and health research and development (R&D) in the U.S. grew by \$38.8 billion or 27% from 2013 to 2017. Industry continues to invest more than any other sector, accounting for 67% of total spending in 2017, followed by the federal government at 22%. Federal investments increased from 2016 to 2017, the second year of growth after a dip from 2014 to 2015. Overall, federal investment increased by \$6.1 billion or 18.4% from 2013 to 2017, but growth has been uneven across federal health agencies. Investment by other sectors, including academic and research institutions, foundations, state and local governments, and voluntary health associations and professional societies, also increased from 2013 to 2017.

Looking ahead, medical and health R&D spending is expected to move in an upward trajectory in 2018 but will continue to fall short relative to the health and economic impact of major health threats. In reality, our nation continues to scratch the surface of scientific potential against health threats that represent the single largest driver of federal spending growth and the most common cause of personal bankruptcy for Americans.

In 2017, the direct medical costs² of just six chronic conditions—heart disease and stroke, cancer, diabetes, dental-related conditions, arthritis, and Alzheimer’s disease—topped \$1.1 trillion, more than six times total medical and health R&D spending that year. Yet, less than 20% of meritorious research grants received National Institutes of Health (NIH) funding in 2017.

Juxtaposed with this reality are three looming issues. First, austerity-level "sequestration" budget caps could return in 2020, which would mean deep cuts in federal funding for priorities like medical and health research. An additional issue is the potential reinstatement of the twice-suspended medical device excise tax, which selectively diverts investment away from diagnostics and other life- and cost-saving medical technologies. Finally, the Patient-Centered Outcomes Research Institute, which is driving improvements in health care and health care delivery, is at risk: it needs to be reauthorized in 2019 to continue its transformative work. Advocacy has helped bring about five years of much-needed growth in U.S. medical and health research investment. More advocacy is critical now to ensure our nation steps up in response to health threats that we can—we must—overcome.

In 2017:

- Total U.S. medical and health R&D spending was **\$182.3 billion**.
- Industry invested **\$121.8 billion** in medical and health R&D, 67% of total spending.
- Federal agencies invested a total of **\$39.5 billion**, with the National Institutes of Health (NIH) accounting for nearly **\$32.4 billion** or 82.1% of federal spending.
- In addition to funding received from federal agencies and industry, academic and research institutions, including colleges and universities, independent research institutes (IRIs), and independent hospital medical research centers dedicated more than **\$14.2 billion** of their own funds to medical and health R&D.
- Other funding sources accounted for 3.7% of total medical and health R&D expenditures. These sources include foundations (**\$2.9 billion**), state and local governments (**\$2.4 billion**), and voluntary health associations and professional societies (**\$1.4 billion**).

¹ Within the context of this report, the terms "funding," "expenditures," "spending," "investments," and "contributions" have all been used interchangeably.

² Direct costs do not include factors such as lost wages and earnings, for patients and caregivers, that results from missed work.

Table 1: Total Health Spending versus Medical and Health R&D Investments (\$ in millions)

	2013	2014	2015	2016	2017 (est.)
Total U.S. Medical and Health R&D Spending	143,492	154,435	162,659	172,078	182,290
Total U.S. Health Spending ³	2,975,861	3,134,704	3,317,023	3,461,656	3,620,941
Medical & Health R&D as % of U.S. Health Spending	4.82%	4.93%	4.90%	4.97%	5.03%

Figure 1: Health Spending versus R&D Investments (\$ in millions)

Total 2017 Health Spending:

\$3.6 trillion

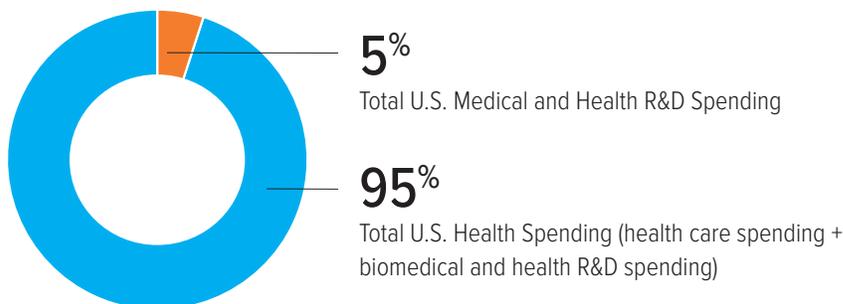
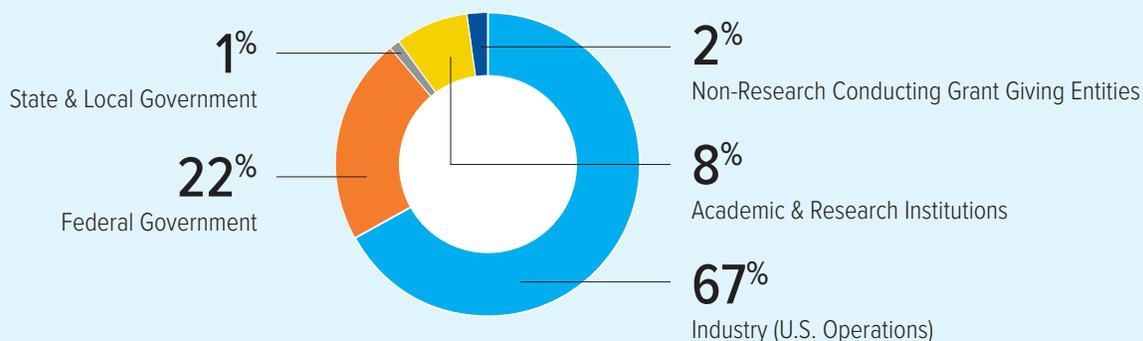


Table 2: Estimated U.S. Medical and Health R&D Expenditures (\$ in millions) and Annual Percentage Change, 2013-2017

Research Segment	2013	'13-'14 Change	2014	'14-'15 Change	2015	'15-'16 Change	2016	'16-'17 Change	2017 (est.)	'13-'17 Change
Industry	92,970	7.86%	100,276	8.22%	108,520	5.40%	114,386	6.50%	121,825	31.04%
Federal Government	33,382	6.81%	35,654	-0.67%	35,414	6.31%	37,648	4.94%	39,507	18.35%
Academic & Research Institutions	11,205	8.05%	12,107	2.30%	12,386	8.27%	13,410	6.25%	14,248	27.16%
Non-Research Conducting Grant Giving Entities	3,873	8.19%	4,190	-4.49%	4,002	6.84%	4,276	0.24%	4,286	10.67%
State & Local Government	2,063	7.04%	2,208	5.81%	2,336	0.94%	2,358	2.79%	2,424	17.50%
Total	143,492	7.63%	154,435	5.32%	162,659	5.79%	172,078	5.93%	182,290	27.04%

Figure 2: U.S. Medical and Health R&D Expenditure by Funding Source, 2017



³ 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 medical and health R&D investment grew 6.5% from 2016 to 2017 and 31% during the five-year reporting period. Industry expenditures totaled \$121.8 billion in 2017, a \$7.4 billion increase over the previous year. From 2013 to 2017, the biopharmaceutical industry increased spending by the largest dollar amount of the four industry categories while the health care services sector⁴ saw the largest⁵ percentage increase, nearly doubling its investment during the reporting period.

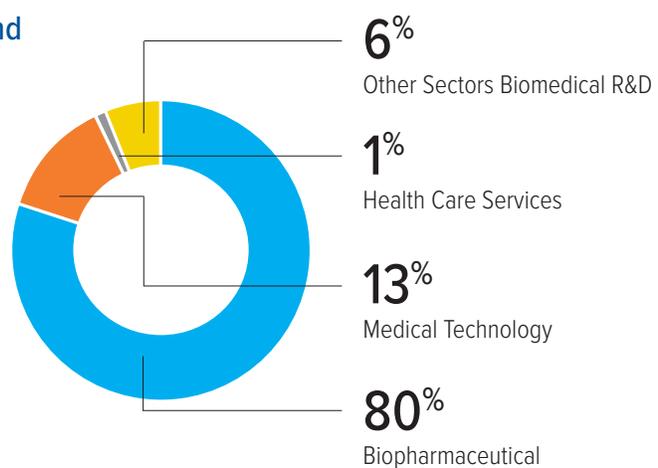
Table 3: Estimated U.S. Medical and Health Research Expenditures (\$ in millions) and Annual Percentage Change, 2013-2017

Industry (U.S. Operations)	2013	'13-'14 Change	2014	'14-'15 Change	2015	'15-'16 Change	2016	'16-'17 Change	2017 (est.)	'13-'17 Change
Biopharmaceutical	72,294	9.01%	78,810	8.21%	85,282	6.09%	90,475	7.21%	97,001	34.17%
Medical Technology	14,399	4.48%	15,045	0.32%	15,092	2.37%	15,450	4.59%	16,160	12.23%
Health Care Services	442	8.14%	478	2.30%	489	66.26%	813	2.95%	837	89.37%
Other Sectors ⁶ Biomedical R&D	5,834	1.89%	5,944	28.82%	7,657	-0.13%	7,647	2.36%	7,827	34.17%
Subtotal	92,970	7.86%	100,276	8.22%	108,520	5.40%	114,386	6.50%	121,825	31.04%

Figure 3: 2017 Industry Investment in Medical and Health R&D, by Funding Sector

Total 2017 Industry Investment:

\$121.8 billion



⁴ "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).
⁵ Growth primarily driven by internally-funded R&D activities of major testing companies. This sector is also the recipient of significant funding from other industry sectors for clinical research organization-related activities.
⁶ "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 \$39.5 billion in medical and health R&D in 2017, accounting for 21.7% of total U.S. medical and health R&D funding. As shown in Figure 4, 82.1% of total federal investment is through the National Institutes of Health (NIH). With the exception of near flat funding from 2014 to 2015, overall federal funding grew on an annual basis from 2013 to 2017 with overall growth of 18.4%. This growth, however, has not been uniform across all agencies.

Table 4: Estimated U.S. Medical and Health Research Expenditures (\$ in millions) and Annual Percentage Change, 2013-2017

Federal Government Agencies	2013	'13-'14 Change	2014	'14-'15 Change	2015	'15-'16 Change	2016	'16-'17 Change	2017 (est.)	'13-'17 Change
National Institutes of Health (NIH)	28,215	4.20%	29,400	-1.77%	28,880	6.30%	30,698	5.61%	32,419	14.90%
Department of Defense (DoD) ⁷	1,111	62.26%	1,803	-3.15%	1,746	21.47%	2,121	-0.90%	2,102	89.17%
Centers for Medicare and Medicaid Services (CMS) ⁸	656	51.98%	997	-2.61%	971	19.05%	1,156	11.94%	1,294	97.26%
National Science Foundation (NSF)	697	-0.78%	692	11.23%	769	-0.64%	764	6.67%	815	16.97%
Department of Veterans Affairs (VA)	604	-8.37%	553	16.25%	643	5.28%	677	4.09%	705	16.74%
Agency for Healthcare Research and Quality (AHRQ)	430	1.40%	436	1.61%	443	-3.39%	428	0.00%	428	-0.47%
Food and Drug Administration (FDA)	361	7.90%	389	-3.46%	376	29.34%	486	-4.29%	465	28.95%
Centers for Disease Control and Prevention (CDC) ⁹	430	0.81%	434	37.16%	595	-44.73%	329	-15.73%	277	-35.60%
Patient-Centered Outcomes Research Institute (PCORI) ¹⁰	17	657.53%	132	79.71%	238	0.69%	239	3.13%	247	1313.65%
Other Federal Agencies ¹¹	860	-4.90%	818	-7.89%	754	-0.52%	750	0.61%	754	-12.32%
Total	33,382	6.81%	35,654	-0.67%	35,414	6.31%	37,648	4.94%	39,507	18.35%

⁷ Changes reflect an increase to the Congressionally-Directed Medical Research Program (CDMRP) within the DoD.

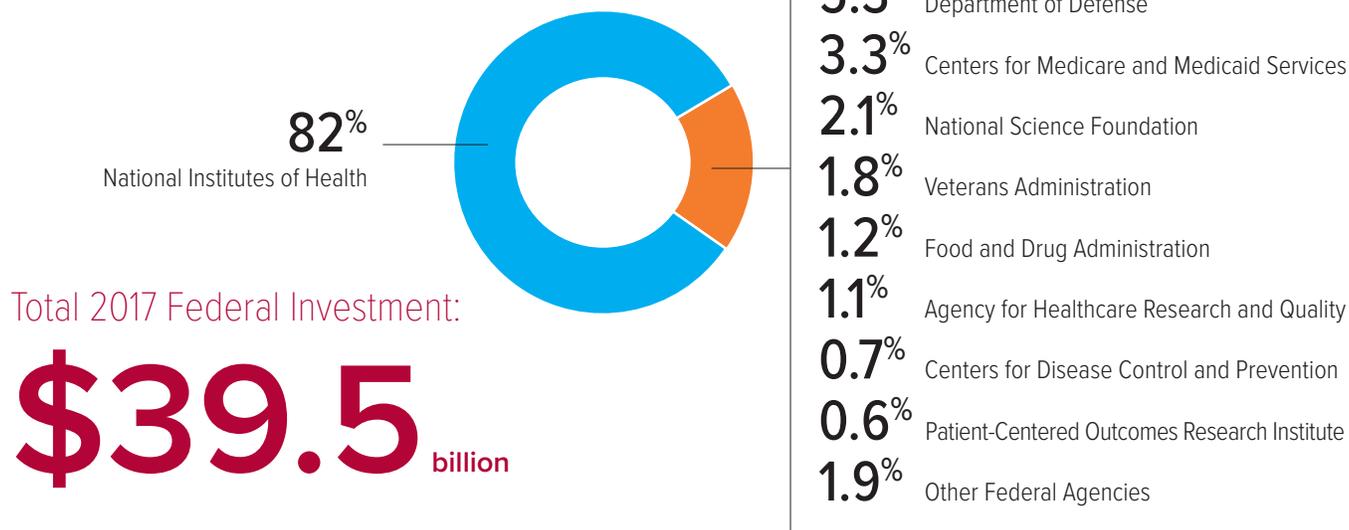
⁸ Increases reflect ramp up in the CMS Center for Medicare & Medicaid Innovation (CMMI) activities following its establishment in the Affordable Care Act (ACA).

⁹ Large increase in 2015 CDC budget in part due to supplemental emergency funding in response to the Ebola outbreak.

¹⁰ 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.

¹¹ See page 12 for details of "Other Federal Agencies" funding.

Figure 4: 2017 Federal Investment in Medical and Health R&D, by Funding Sector



Academic & Research Institutions

In addition to utilizing federal and industry investment to advance medical and health R&D, colleges and universities, independent research institutes (IRIs), and independent hospital medical research centers dedicated more than \$14.2 billion of their own funds (endowment, donations, etc.) to medical and health R&D in 2017. Both colleges and universities and independent hospital medical research centers grew their investments significantly over the five-year reporting period, increasing medical and health R&D spending by 35.3% and 41.8% respectively from 2013 to 2017.

Table 5: Estimated U.S. Medical and Health Research Expenditures (\$ in millions) and Annual Percentage Change, 2013-2017

Academic & Research Institutions	2013	'13-'14 Change	2014	'14-'15 Change	2015	'15-'16 Change	2016	'16-'17 Change	2017 (est.)	'13-'17 Change
Colleges and Universities	7,130	12.10%	7,992	4.78%	8,375	7.73%	9,022	6.90%	9,644	35.27%
Independent Research Institutes	2,802	0.90%	2,827	-6.08%	2,655	3.61%	2,751	1.70%	2,798	-0.15%
Independent Hospital Medical Research Centers	1,273	1.13%	1,288	5.30%	1,356	20.72%	1,637	10.31%	1,806	41.81%
Total	11,205	8.05%	12,107	2.30%	12,386	8.27%	13,410	6.25%	14,248	27.16%

Foundations, Voluntary Health Associations and Professional Societies

In 2017, foundations invested more than \$2.8 billion, accounting for 1.6% of total U.S. expenditures on medical and health R&D. From 2013 to 2017, foundations' total investment increased by 12.2%. Voluntary health associations and professional societies increased their spending by 7.8% from 2013 to 2017, reaching \$1.4 billion in 2017 and accounting for 0.8% of total U.S. medical and health R&D.

Table 6: Estimated U.S. Medical and Health Research Expenditures (\$ in millions) and Annual Percentage Change, 2013-2017

Non Research-Conducting Grant Giving Entities	2013	'13-'14 Change	2014	'14-'15 Change	2015	'15-'16 Change	2016	'16-'17 Change	2017 (est.)	'13-'17 Change
Foundations	2,543	12.27%	2,855	-7.79%	2,632	7.15%	2,820	1.14%	2,853	12.19%
Voluntary Health Associations & Professional Societies	1,330	0.40%	1,336	2.57%	1,370	6.25%	1,456	-1.51%	1,434	7.76%
Total	3,873	8.19%	4,190	-4.49%	4,002	6.84%	4,276	0.24%	4,286	10.67%

State and Local Governments

State and local governments increased their investment in medical and health R&D by over 17% from 2013 to 2017. Most of this funding took the form of grants to colleges and universities and to other research institutions (e.g. small companies). State and local funding also supports intramural research conducted by state and local health departments. In 2017, state and local government support accounted for 1.3% of total U.S. investment in medical and health R&D.

Table 7: Estimated U.S. Medical and Health Research Expenditures (\$ in millions) and Annual Percentage Change, 2013-2017

State & Local Government	2013	'13-'14 Change	2014	'14-'15 Change	2015	'15-'16 Change	2016	'16-'17 Change	2017 (est.)	'13-'17 Change
State and Local Government Support to Colleges and Universities	1,431	5.02%	1,503	3.71%	1,558	-0.27%	1,554	2.04%	1,586	10.84%
State and Local Government Support to Other Research Institutions	568	5.00%	596	12.80%	672	2.83%	691	4.30%	721	27.03%
State and Local Government State Agency Intramural	64	70.31%	109	-3.56%	105	6.65%	112	3.80%	116	81.83%
State & Local Government Subtotal	2,063	7.04%	2,208	5.81%	2,336	0.94%	2,358	2.79%	2,424	17.50%

Figure 5: Estimated U.S. Medical and Health R&D Expenditures (\$ in millions)

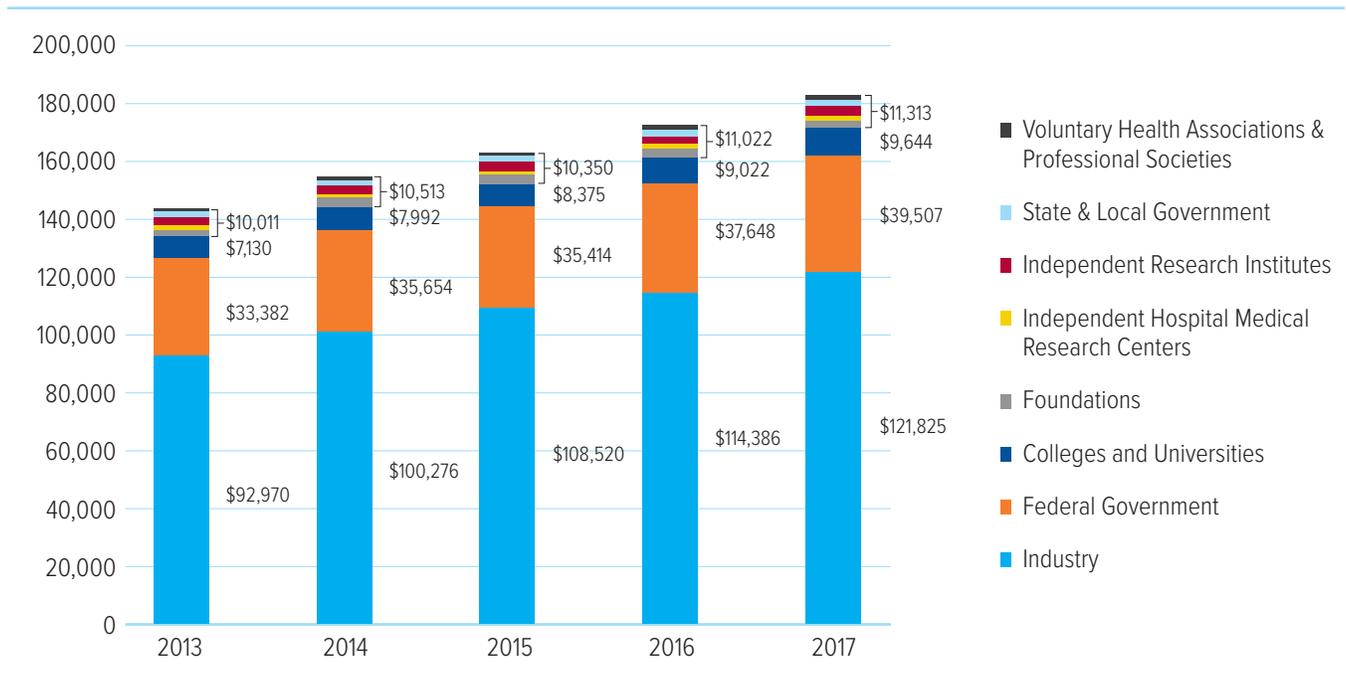
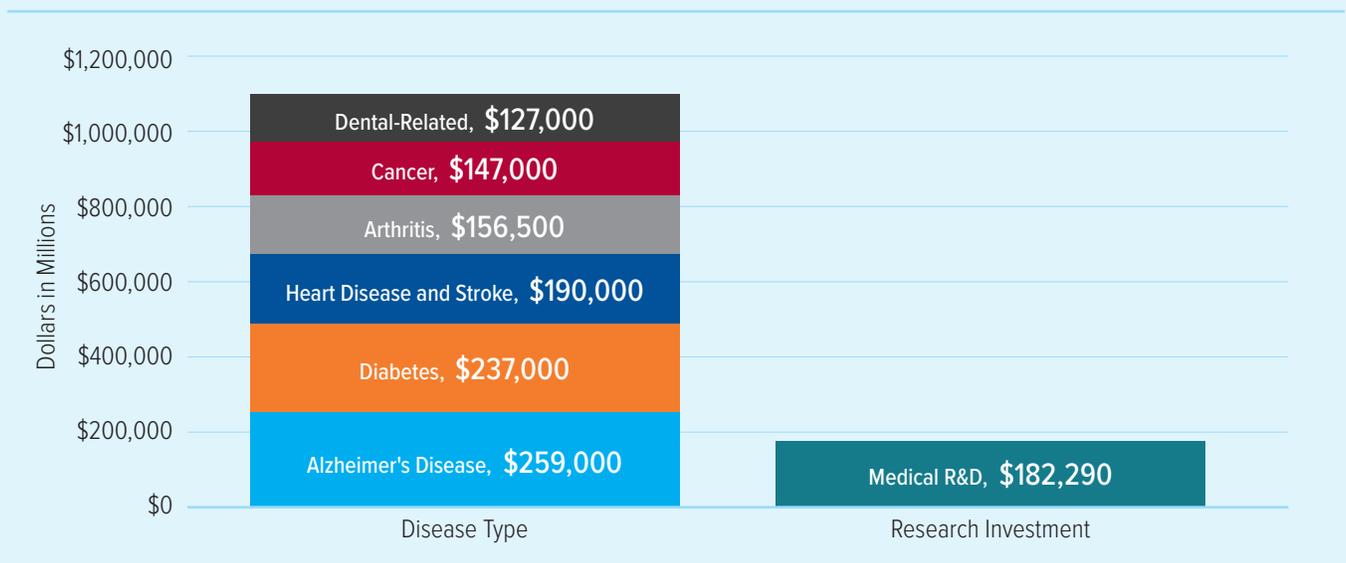


Figure 6: 2017 Estimated Direct Medical Costs of Six Chronic Health Conditions Compared to Total U.S. Medical and Health Research Expenditures (\$ in millions)¹²



^{13, 14, 15, 16, 17, 18}

¹² Direct costs do not include factors such as lost wages and earnings, for patients and caregivers, that results from missed work.

¹³ "U.S. Dental Expenditures," American Dental Association

¹⁴ "The Cost of Arthritis in U.S. Adults," Centers for Disease Control and Prevention

¹⁵ "Financial Burden of Cancer Care," National Cancer Institute

¹⁶ "Health and Economic Costs of Chronic Disease," Centers for Disease Control and Prevention

¹⁷ "The Cost of Diabetes," American Diabetes Association

¹⁸ "2017 Alzheimer's disease facts and figures," Alzheimer's Association

Discussion

Industry, which includes biopharmaceutical, medical technology, health care services companies, and the medical and health R&D of other industry sectors (e.g. software and computer firms not typically included in the medical and health industry) accounts for the largest percentage of U.S. investment in medical and health R&D. The industry sector was responsible for more than two thirds of all medical and health R&D expenditures in the U.S. In 2017, all industry sectors increased their medical and health R&D expenditures, continuing a stable trend across the full five-year reporting period.

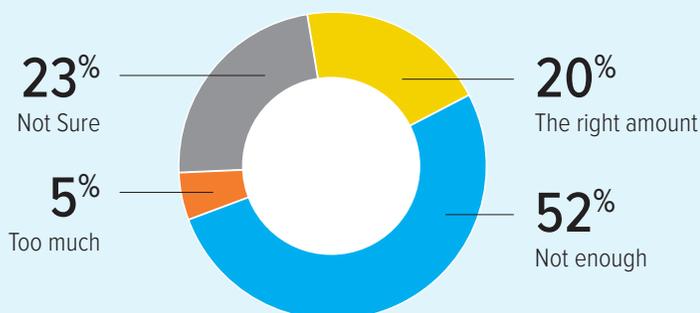
Biopharmaceutical companies contributed the largest share of funding within the industry sector, accounting for over 53% of total U.S. medical and health R&D expenditures in 2017. Of the top 25 U.S.-based pharmaceutical firms in terms of R&D investment, 17 increased their spending. Of these, eight U.S.-based firms each spent more than \$1 billion on pharmaceutical R&D in 2017. In the medical technology sector, 23 of the top 25 U.S.-based companies increased their medical and health R&D from 2016 to 2017. Investment growth in this sector may be reflective of suspension of the medical device excise tax from 2016 to 2018. Another two-year suspension of that tax took effect in 2018, which is anticipated to contribute to future growth.

The growth in medical and health R&D investment within the health care services sector was primarily driven by R&D activities at major diagnostic testing companies. With respect to the “Other Sectors” category, growth from 2015 to 2016 dipped marginally, but rebounded and grew slightly from 2016 to 2017. This return may be attributable to the expansion of medical and health R&D efforts in fields such as digital health and health IT, driven in part by investments made by firms outside the traditional medical technology sector.

Federal investment in health and medical research funding saw nearly 5% growth from 2016 to 2017. This increase was driven primarily by a \$2 billion increase in NIH funding. NIH accounts for more than 80% of the federal investment in health and medical R&D and 17.8% of the nation’s total investment in medical and health R&D. Looking ahead, Congress passed a \$3 billion increase in NIH funding for 2018, which should produce another year of net growth in federal medical and health R&D.

More Than Half Say U.S. Doesn't Spend Enough on Research

The U.S. spends about 5 cents of each health dollar on research to prevent, cure and treat disease and disability. Do you think that this is too much, the right amount or not enough?



Source: A Research!America survey of U.S. adults conducted in partnership with Zogby Analytics in January 2018.

Federal investment growth during the 2013-2017 reporting period was impacted by the 2011 Budget Control Act (BCA), which imposed budget caps subjected to two forms of “sequestration.” In 2013, total federal spending was reduced by \$85.3 billion in across-the-board budget cuts.¹⁹ After 2013, sequestration took the form of an annual reduction in the overall caps, enabling Congress to choose which agencies received cuts. The Bipartisan Budget Act of 2013 and 2015 provided partial and temporary relief from the austerity level BCA-imposed sequestration budget caps.

In February of 2018, the Bipartisan Budget Act of 2018 was signed into law, again providing temporary relief (for fiscal years 2018 and 2019) from the budget caps. Overall, federal medical and health R&D investment can reasonably be expected to increase, in large part due to FY18 and FY19 increases of \$3 billion and \$2 billion respectively in NIH funding. However, absent another agreement to modify the sequestration budget caps, both Defense and non-Defense spending face deep cuts in 2020, jeopardizing federal medical and health R&D investment.

Congressional champions of NIH-supported medical and health research, empowered by supplemental funding provided by the 21st Century Cures Act,²⁰ have driven growth during the five-year reporting period. This growth has not been even across the sector, however. Agencies such as the Centers for Disease Control and Prevention (CDC), which saw more than a 35% decrease in medical and health R&D investment from 2013 to 2017, are stretched dangerously thin in the face of ongoing and emerging health threats.

Colleges and universities, independent research institutes, and independent hospital medical research centers conduct the majority of federally-supported medical and health research. However, federal grants do not cover the total costs of research; recipient institutions must rely on other sources of funding to help support these projects. Increases in medical and health R&D expenditures at colleges and universities, independent research institutes and independent hospital medical research centers may be attributable to continued endowment growth and increases in individual contributions.

Academic and other research institutions increased their medical and health R&D investment by 27.2% in the five-year period from 2013 to 2017. In 2017, this funding category accounted for 7.8% of total investment in medical and health R&D. This growth may well reflect important synergies between sectors, as increased federal and industry investment expands scientific opportunity.

Just as in 2016, private grant-giving entities, including foundations, voluntary health associations and professional societies, accounted for 2.4% of total medical and health R&D funding in 2017. Of the top 20 voluntary health organizations, 17 increased research funding in 2017. It is important to note that fluctuations in this category can be influenced by individual actions by a relatively small number of large investors, and do not necessarily signal an emerging trend in the investment environment.

State and local government investment grew from 2016 to 2017, bringing total investment to \$2.4 billion. This sector has had steady growth from 2013 to 2017 with a 17.5% increase during that five-year period. The growth likely reflects overall improvements in state budgets, which allow for increased research grant support, as well as increased investment in internal research conducted by state departments of health.

Our nation continues to spend just 5 cents of each health dollar on medical and health R&D. In light of the toll deadly and debilitating health threats exact—the ever-growing number of lives cut short, the lost productivity, the threat to our fiscal future—we must carefully examine whether we are assigning the fight for faster medical and public health progress the priority it deserves.

¹⁹ Center for Budget and Policy Priorities

²⁰ 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.

Estimated U.S. Medical and Health Research Expenditures (\$ in millions), 2013-2017

Research Segment	2013	2014	2015	2016	2017 (est.)
Industry (U.S. Operations)					
Biopharmaceutical	72,294	78,810	85,282	90,475	97,001
Medical Technology	14,399	15,045	15,092	15,450	16,160
Health Care Services	442	478	489	813	837
Other Sectors Biomedical R&D	5,834	5,944	7,657	7,647	7,827
Industry Total	92,970	100,276	108,520	114,386	121,825
Federal Government					
National Institutes of Health (HHS)	28,215	29,400	28,880	30,698	32,419
Department of Defense (DoD)	1,111	1,803	1,746	2,121	2,102
Centers for Medicare and Medicaid Services (CMS)	656	997	971	1,156	1,294
National Science Foundation (NSF)	697	692	769	764	815
Department of Veterans Affairs (VA)	604	553	643	677	705
Food and Drug Administration (FDA)	361	389	376	486	465
Agency for Healthcare Research and Quality (AHRQ)	430	436	443	428	428
Department of Energy (DOE)	284	304	290	284	296
Centers for Disease Control and Prevention (CDC)	430	434	595	329	277
Patient Centered Outcomes Research Institute (PCORI)	17	132	238	239	247
National Aeronautics and Space Administration (NASA)	147	149	142	145	140
Environmental Protection Agency (EPA)	126	128	124	122	118
Health Resources and Services Administration (HRSA)	37	38	41	42	41
Department of Transportation (DoT)	58	49	25	32	35
Department of Homeland Security (DHS)	26	36	32	34	34
Department of Commerce (DoC)	31	31	32	31	31
Department of Agriculture (USDA)	56	21	22	23	25
Other Health and Human Services (Other HHS)	21	21	21	21	18
U.S. Agency for International Development (USAID)	75	41	24	16	16
Federal Government Total	33,382	35,654	35,414	37,648	39,507
Academic & Research Institutions, Institution Funds					
Colleges and Universities	7,130	7,992	8,375	9,022	9,644
Independent Research Institutes	2,802	2,827	2,655	2,751	2,798
Independent Hospital Medical Research Centers	1,273	1,288	1,356	1,637	1,806
Academic & Research Institutions Total	11,205	12,107	12,386	13,410	14,248
Non-Research Conducting Grant Giving Entities					
Foundations	2,543	2,855	2,632	2,820	2,853
Voluntary Health Associations & Professional Societies	1,330	1,336	1,370	1,456	1,434
Non-Research Conducting Grant Giving Entities Total	3,873	4,190	4,002	4,276	4,286
State & Local Government					
State and Local Government Support to Colleges and Universities	1,431	1,503	1,558	1,554	1,586
State and Local Government Support to Other Research Institutions	568	596	672	691	721
State and Local Government State Agency Intramural	64	109	105	112	116
State & Local Government Total	2,063	2,208	2,336	2,358	2,424
Total U.S. Medical and Health R&D Spending	143,492	154,435	162,659	172,078	182,290

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 five-year period (2013-2017). The data is categorized by the originating source of the investment rather than by where the dollars are spent (for example, NIH is captured under "NIH," not under NIH-grant recipient categories.)

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 2017 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

NIH research spending data was provided by the NIH Office of Budget. The DoD value was derived from AAAS budget analysis. Beyond NIH and DoD, many department-specific medical and health research expenditures were 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 were used.

State and Local Government Figures

The NSF-NCSES Higher Education Research and Development (HERD) Survey data were 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 (SSGRD) was used to capture state funding for other (non-university) research institutions and for government agency intramural research. Funding for other research institutions is a combination of both health mission-specific (e.g., a state department of health funding required research with an external consultant) and supportive (e.g., a state department of economic development's industry research grant program or a signature research effort such as the California Institute for Regenerative Medicine). The SSRGD data also allow for an estimation of the amount of medical and health-related research performed by state agency employees (intramural). Though the three sources of state and local funding described above are significant, additional state support for R&D through tax incentives is not captured in these values. However, to the extent medical and health firms use these tax incentives to increase the amount of research performed, the increased value would be captured within increased industry funding metrics.

Academic & Research Institutions

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 the years 2013–2016 with an estimate developed for 2017.

Independent Research Institutes (IRI) Figures

Using a sample of IRI 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 with an estimate developed for 2017.

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 Children’s Hospitals throughout the U.S.). Key institutions captured within this category include the Mayo Clinic and St. Jude’s Children’s Research Hospital. Data for these institutions was developed 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 2017 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.

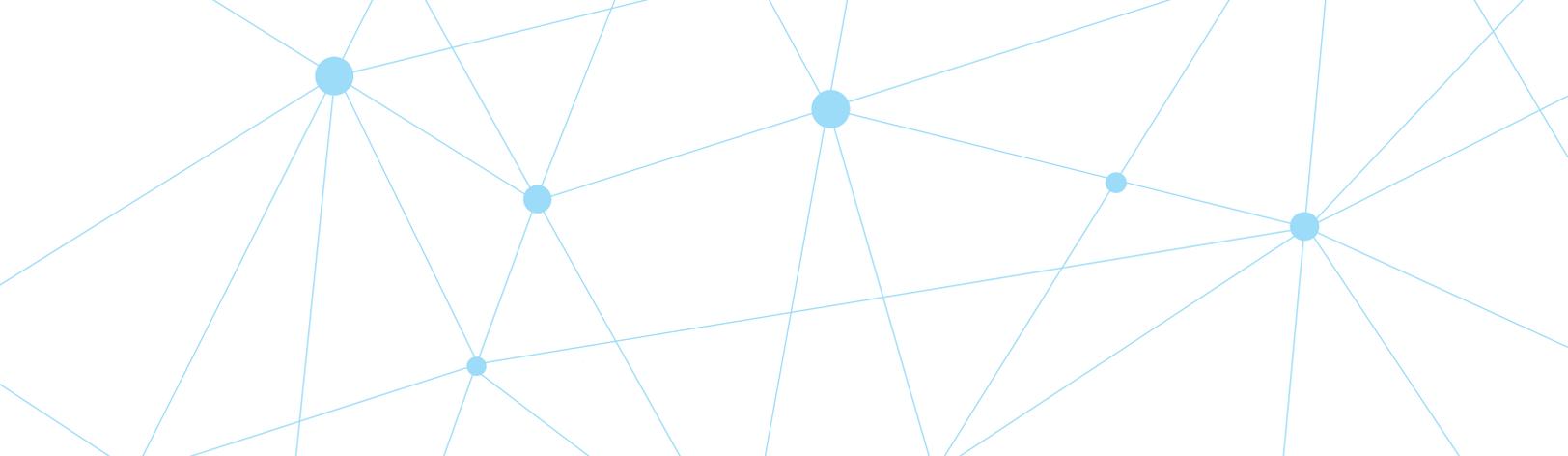
Voluntary Health Association and Professional Society Figures

Funding estimates for U.S. Voluntary Health Associations and Professional Societies were developed from a continually updated master list of such associations and societies 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).

Chronic Health Conditions Estimates

The source of chronic health conditions listed is the "Health and Economic Costs of Chronic Disease" webpage from the Center for Disease Control and Prevention's National Center for Chronic Disease Prevention and Health Promotion. Supplemental sources, specified in the footnotes, were used to ensure the most current estimates available. Only direct medical costs (the costs of healthcare, excluding other costs such as transportation and lost productivity) were included. When 2017 estimates were not available, the most current available data was converted to 2017 estimates using a medical inflation adjustor²¹.

²¹ Medical cost inflation adjustor



The data for U.S. medical and health R&D were developed and estimated by TEconomy Partners, LLC (www.teconomypartners.com) under contract to Research!America.



241 18th Street South, Suite 501
Arlington, Virginia 22202

703.739.2577

www.researchamerica.org

