



## InfoBrief

# State Government Agencies' Expenditures for R&D Totaled \$2.6 Billion in FY 2022, an Increase of 5% from FY 2021

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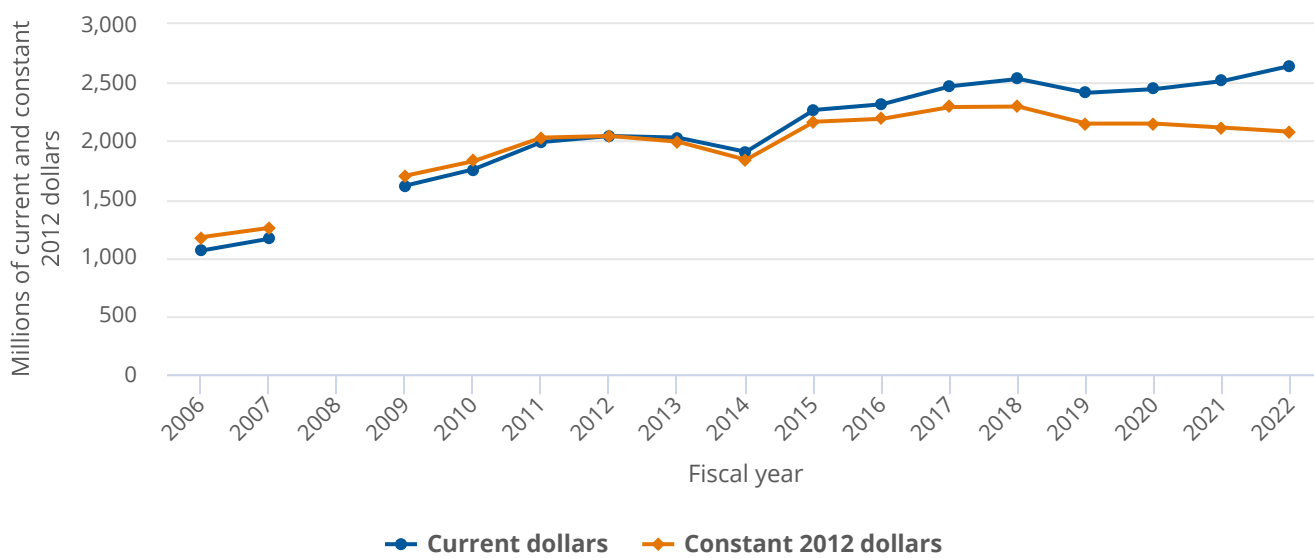
Christopher V. Pece

In FY 2022, state government agencies' expenditures on research and experimental development (R&D) were \$2.644 billion, an increase of 5.2% from FY 2021 expenditures of \$2.513 billion (figure 1 and figure 2). However, when adjusted for inflation,<sup>1</sup> state government agency R&D expenditures totaled \$2.078 billion in FY 2022, a decrease of 1.7% from the FY 2021 adjusted amount of \$2.114 billion and lower than the FY 2015 adjusted amount of \$2.164 billion.

This InfoBrief presents summary statistics from the FY 2022 Survey of State Government Research and Development, sponsored by the National Center for Science and Engineering Statistics (NCSES) within the National Science Foundation. Amounts reported do not include direct appropriations from state legislatures to universities, colleges, and private organizations. Data presented in this InfoBrief are in current dollars unless otherwise noted.

Figure 1

State government expenditures for R&D: FYs 2006–22

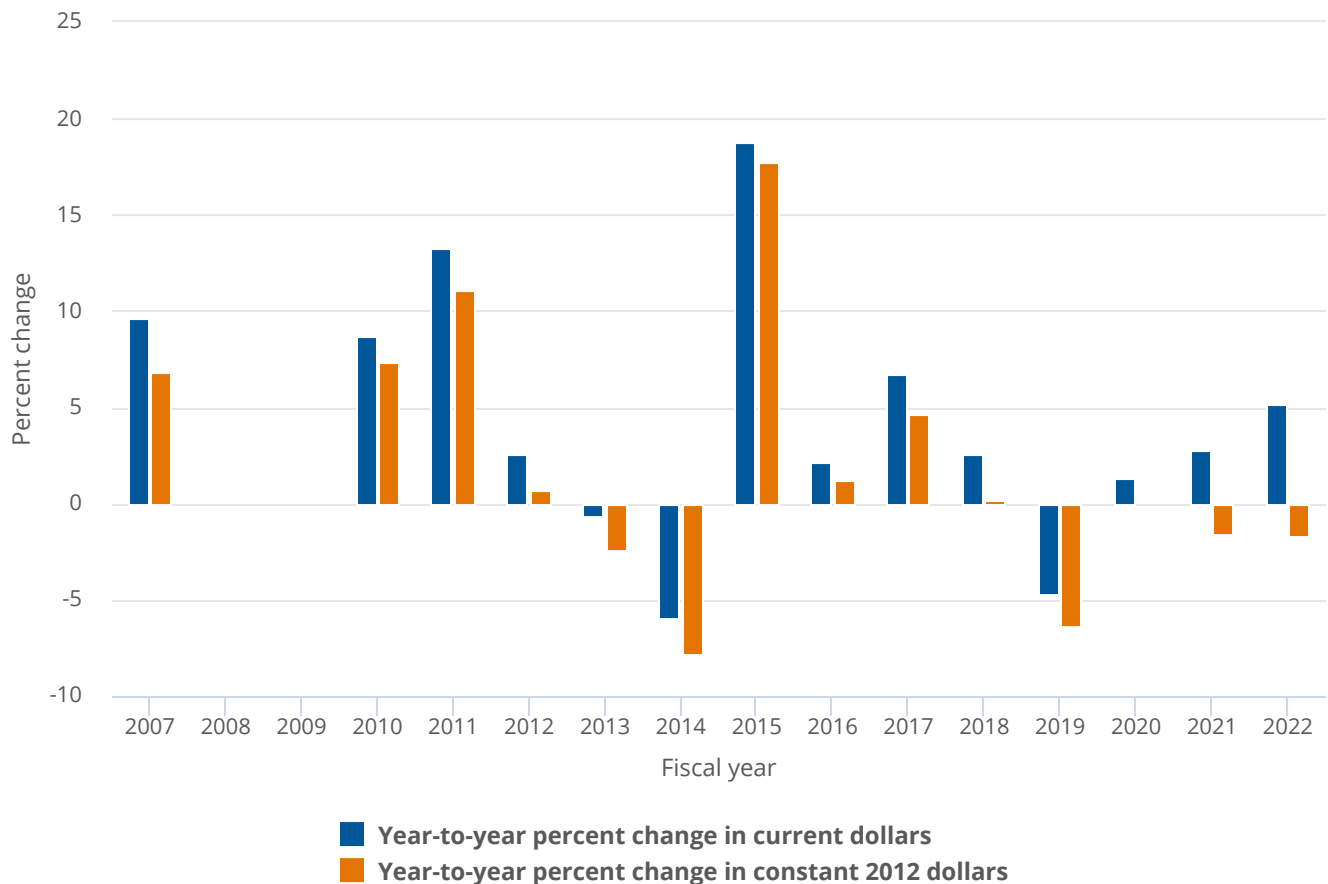


**Note(s):**

No survey was conducted for FY 2008. State R&D totals can display considerable volatility between survey years due to several national and state-specific factors. Large changes are not unusual, especially for discretionary spending items such as R&D.

**Source(s):**

National Center for Science and Engineering Statistics, Survey of State Government Research and Development.

**Figure 2****State government expenditures for R&D: FYs 2007–22****Note(s):**

No survey was conducted for FY 2008. State R&D totals can display considerable volatility between survey years due to several national and state-specific factors. Large changes are not unusual, especially for discretionary spending items such as R&D.

**Source(s):**

National Center for Science and Engineering Statistics, Survey of State Government Research and Development.

**Summary of State Government R&D Totals**

State governments' FY 2022 expenditures for both R&D and R&D plant totaled \$2.676 billion (table 1).<sup>2</sup> R&D accounted for 98.8% of these expenditures at \$2.644 billion. R&D plant accounted for just \$32 million. State governments served as the largest source of funds for agency R&D at \$1.953 billion (73.9%), while federal funds accounted for \$691 million (26.1%). In FY 2021, expenditures from state government funds accounted for 75.8% and federal funding accounted for 24.2% of all state R&D expenditures.

**Table 1****State government expenditures for R&D and R&D plant: FYs 2021–22**

(Thousands of current dollars)

Characteristic	FY 2021	FY 2022	Percent change
All R&D and R&D plant expenditures	2,542,503	2,675,831	5.2
All R&D plant expenditures	29,270	31,840	8.8
All R&D expenditures	2,513,233	2,643,991	5.2
Source of funds			
Federal government	608,778	691,149	13.5
State government and other nonfederal sources	1,904,456	1,952,842	2.5
Performer			
Intramural <sup>a</sup>	675,326	696,625	3.2
Extramural	1,837,907	1,947,367	6.0
Higher education institutions	987,411	1,032,713	4.6
Companies and individuals	508,736	454,746	-10.6
Other	341,761	459,908	34.6
Intramural by type of R&D			
Basic research	120,427	121,065	0.5
Applied research	506,204	535,739	5.8
Experimental development	48,695	39,821	-18.2
R&D project by government function			
Agriculture	119,860	127,264	6.2
Energy	410,274	327,116	-20.3
Environment and natural resources	428,067	540,876	26.4
Health	1,077,324	1,100,992	2.2
Transportation	300,353	290,871	-3.2
Other <sup>b</sup>	177,356	256,873	44.8

<sup>a</sup> Intramural performers include employees within the same state department or agency and services performed by others in support of internal R&D projects.

<sup>b</sup> Includes government functions for corrections, criminal justice, education, forensic sciences, labor, public safety, and social services.

**Note(s):**

Detail may not add to total because of rounding. R&D plant includes acquisition of land, facilities, major equipment, and major building renovations intended primarily for R&D use.

**Source(s):**

National Center for Science and Engineering Statistics, Survey of State Government Research and Development.

Of the six functional categories of state agency R&D expenditures, health-related R&D remained the largest with over \$1.101 billion in expenditures, increasing 2.2% from FY 2021. Environment and natural resources–related R&D remained the second-largest functional category with \$541 million, while energy-related R&D followed with \$327 million. Transportation-related R&D totaled \$291 million, while agricultural-related R&D totaled \$127 million. Other R&D, a combination of activities including but not limited to corrections, criminal justice, education, forensics, labor, public safety, and social services, totaled \$257 million in FY 2022.

## State Government R&D Performance

### Overview

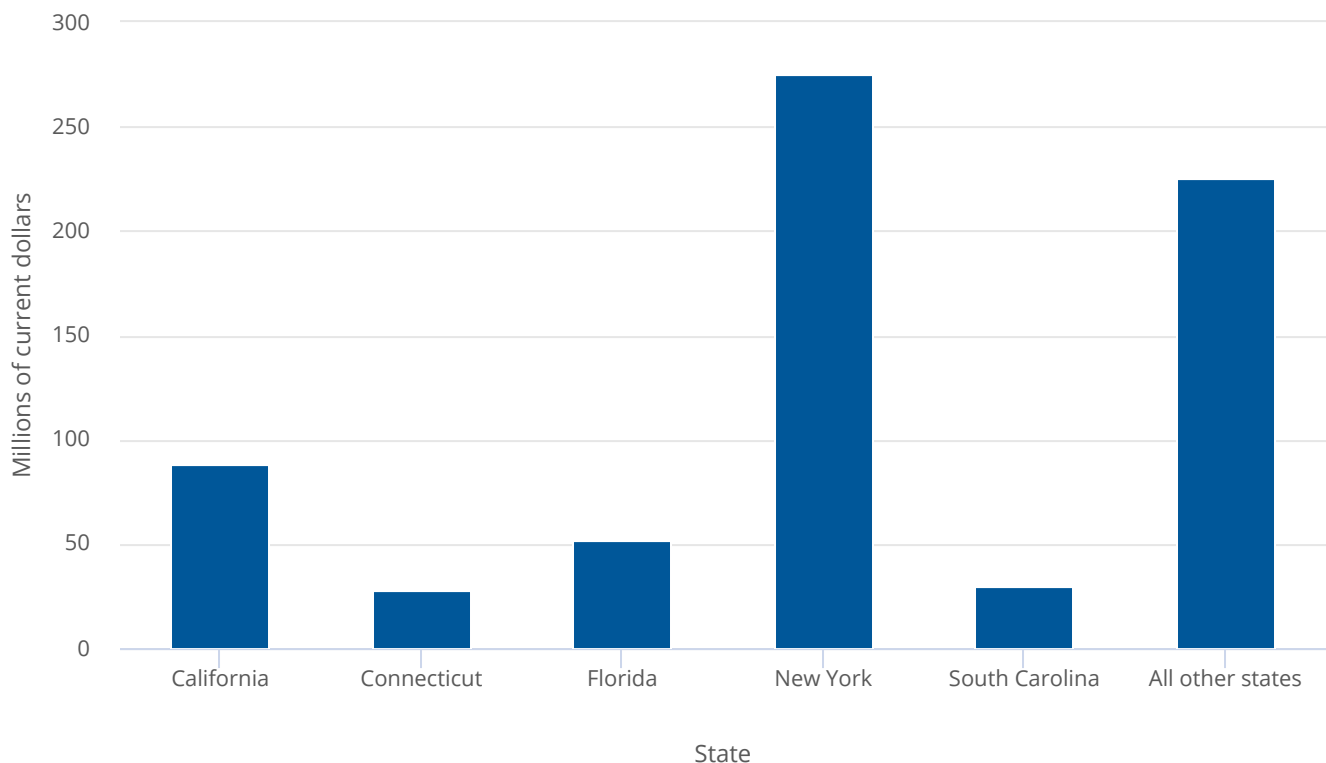
Although state governments are both funders and performers of R&D, the majority (73.7%) of their expenditures support extramural R&D (i.e., performers other than state agencies). Higher education institutions were the primary recipients of these expenditures, receiving 53.0% of all extramural funding, followed by companies and individuals (23.4%). All other extramural performers, including nonprofit organizations or other governments, accounted for 23.6%. Intramural performers of R&D, the state agencies themselves, totaled \$697 million in FY 2022, an increase of 3.2% from \$675 million in FY 2021.

### Intramural R&D Performance

Five states accounted for 67.7% of the \$697 million in total expenditures for intramural R&D performed by state agencies in FY 2022: New York (\$275 million), California (\$88 million), Florida (\$51 million), South Carolina (\$30 million), and Connecticut (\$28 million) (figure 3). New York State's own intramural R&D expenditures accounted for nearly 39.5% of all state governments' intramural R&D and were larger than the sum of all other state governments minus California, Connecticut, Florida, and South Carolina.<sup>3</sup> In FY 2022, 50.1% (\$349 million) came from each state's own funds, while 44.7% (\$311 million) of all state agency intramural R&D performance was supported by federal funds (figure 4). New York State accounted for 48.8% (\$152 million) of all intramural R&D expenditures sourced from federal funds across all states.<sup>4</sup>

**Figure 3**

State government expenditures for R&D for intramural performers, by state and source of funds: FY 2022



**Note(s):**

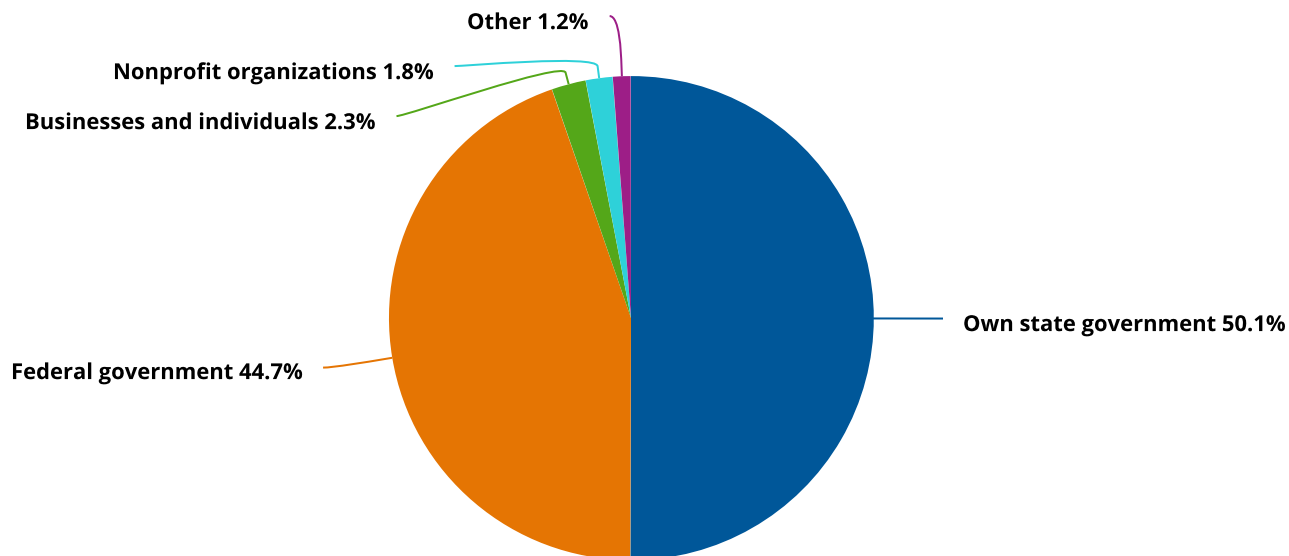
Intramural performers include a department's or agency's own employees who perform R&D and services performed by others in support of an internal R&D project.

**Source(s):**

National Center for Science and Engineering Statistics, Survey of State Government Research and Development, FY 2022.

**Figure 4**

**State government expenditures for R&D for intramural performers, by source of funds: FY 2022**

**Note(s):**

Intramural performers include a department's or agency's own employees who perform R&D and services performed by others in support of an internal R&D project. Other includes both higher education institutions and other state or local governments. Details may not add to total because of rounding.

**Source(s):**

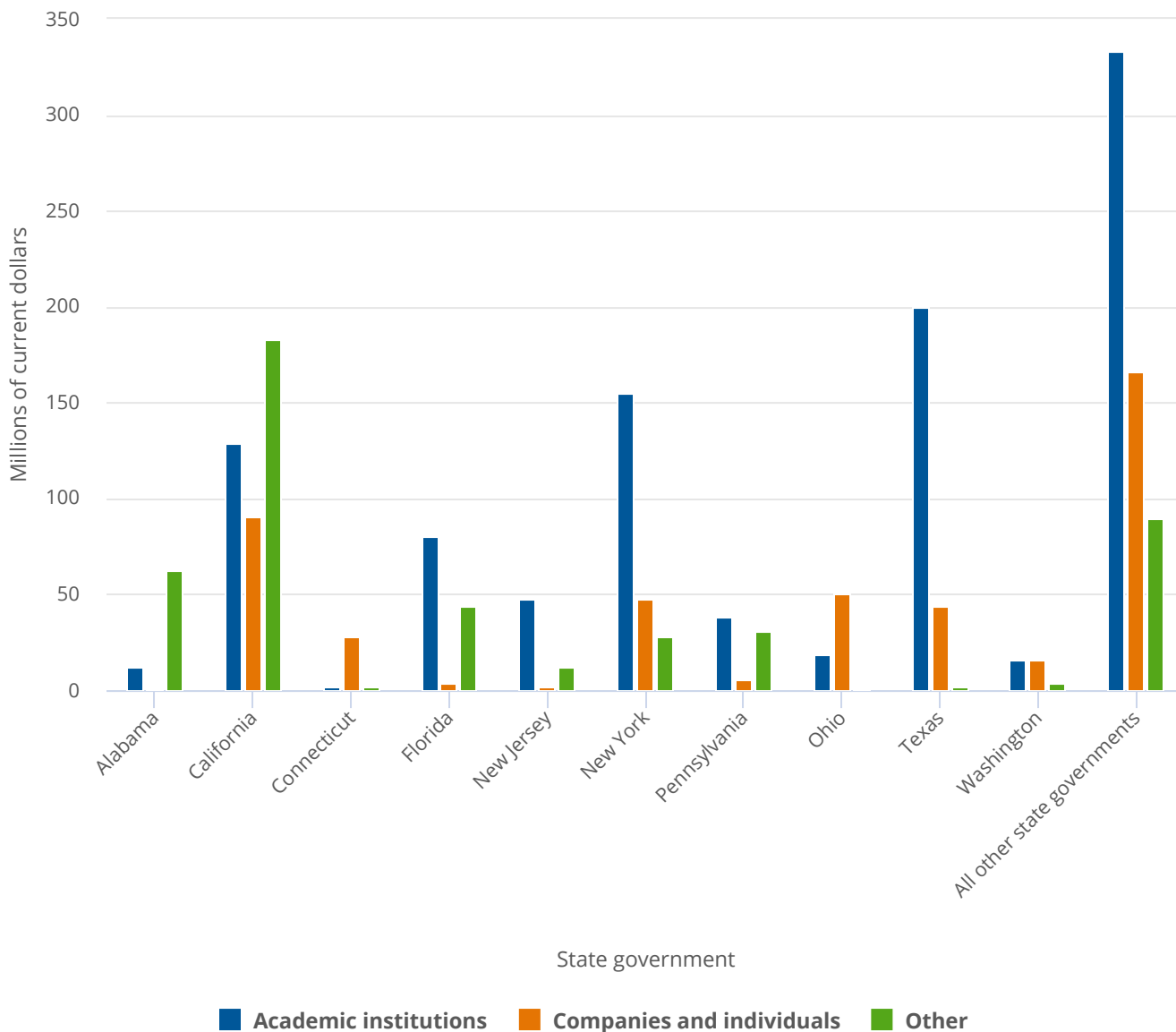
National Center for Science and Engineering Statistics, Survey of State Government Research and Development, FY 2022.

## Extramural R&D Performance

In FY 2022, all state government expenditures for extramural performance of R&D totaled \$1.947 billion. The ten states with the largest amount of extramural R&D expenditures—California (\$402 million), Texas (\$245 million), New York (\$231 million), Florida (\$129 million), Alabama (\$76 million), Pennsylvania (\$76 million), Ohio (\$69 million), New Jersey (\$62 million), Washington (\$36 million), and Connecticut (\$32 million)—combined accounted for \$1.359 billion or 69.8% of all extramural R&D ([figure 5](#)).

**Figure 5**

**State government expenditures for extramural R&D, by state and type of performer: FY 2022**



**Note(s):**  
Detail may not add to total because of rounding.

**Source(s):**  
National Center for Science and Engineering Statistics, Survey of State Government Research and Development, FY 2022

However, states varied in how they distributed extramural R&D. For example, Texas state agencies directed \$200 million of the state’s total extramural R&D of \$245 million toward academic institutions, compared with \$44 million to companies and individuals. By comparison, California’s distribution of extramural R&D funding is more balanced across the three sectors, with \$129 million directed toward academic institutions, \$91 million toward companies and individuals, and \$183 million toward other performers.<sup>5</sup>

## R&D by State Government Functions

Whether performed by state agencies themselves or by other performers outside the agency, most states reported a broad mix of R&D projects related to state government functions: agriculture, energy, environment and natural resources, health, and transportation ([table 2](#)). Health-related R&D expenditures accounted for the largest share (41.6%) of state agencies' R&D. R&D expenditures related to environment and natural resources and to energy accounted for 20.5% and 12.4%, respectively, of total state government R&D expenditures in FY 2022. The shares of total R&D expenditures related to transportation, agriculture, and all other functions in FY 2022 were 11.0%, 4.8%, and 9.7%, respectively.

**Table 2**

**Individual state government agency expenditures for R&D, by total R&D and function, for the 20 largest agencies by expenditures: FY 2022**

(Thousands of current dollars)

State government agency	Total	Agriculture	Energy	Environment and natural resources	Health	Transportation	Other
United States <sup>a</sup>	2,643,991	127,264	327,116	540,876	1,100,992	290,871	256,873
Cancer Prevention and Research Institute (Texas)	208,262	0	0	0	208,262	0	0
Mental Health, Office of (New York)	170,676	0	0	0	170,676	0	0
Energy Commission (California)	130,400	0	130,400	0	0	0	0
Institute for Regenerative Medicine (California)	122,808	0	0	0	122,808	0	0
Economic Development, Department of (New York)	103,874	0	3,150	0	8,096	0	92,628
Health, Department of (Florida)	91,361	0	0	0	91,361	0	0
Roswell Park Comprehensive Cancer Center (New York)	71,563	0	0	0	71,563	0	0
Commerce, Department of (Alabama)	63,420	0	0	62,000	1,420	0	0
Public Utilities Commission, Executive Division (California)	61,375	0	61,375	0	0	0	0
Health, Department of (New York)	58,241	301	0	1,808	56,132	0	0
Development, Department of (Ohio)	57,980	0	9,316	43,975	0	0	4,689
Energy Research and Development Authority (New York)	56,621	0	52,923	330	0	3,367	0
Fish and Wildlife Conservation Commission (Florida)	55,428	0	0	55,428	0	0	0
Health, Department of (Pennsylvania)	46,484	0	0	0	46,484	0	0
Health, Department of (New Jersey)	45,344	0	0	0	45,344	0	0
Transportation, Department of (California)	39,260	0	0	0	0	39,260	0
Innovation Inc. (Connecticut)	28,919	0	2,920	0	13,988	0	12,011
Natural Resources, Department of (South Carolina)	26,581	0	0	26,581	0	0	0
Education, Department of (Tennessee)	26,245	0	0	0	0	0	26,245
Transportation, Department of (Texas)	24,982	0	0	0	0	24,982	0
All other agencies	1,154,166	126,962	67,033	350,753	264,858	223,262	121,300

<sup>a</sup> U.S. total reflects all 50 states and the District of Columbia.

**Note(s):**

Includes state agency funding from all sources for both intramural and extramural performance. Detail may not add to total because of rounding.

**Source(s):**

National Center for Science and Engineering Statistics, Survey of State Government Research and Development, FY 2022.

## Agency-Specific R&D Details

Of the 502 state agencies that responded to the survey in FY 2022, the largest 20 state agencies, by total expenditures, accounted for 56.3% of all agency R&D expenditures. To illustrate how concentrated expenditures are for health-related R&D, these 20 agencies accounted for \$836 million of the \$1.101 billion in state agency health R&D, or 75.9% of the funding for total health-related R&D. Although many states invested in health-related R&D, these expenditures are still highly concentrated in the top states. For example, the five largest health agencies reporting R&D expenditures in FY 2022 constitute 60.4% of all state government health-related R&D. State expenditures for energy-related R&D are even more highly concentrated; the California Energy Commission alone accounted for 39.9% of all state agencies' energy-related R&D expenditures.

## Data Sources, Limitations, and Availability

All 50 states, the District of Columbia, and Puerto Rico participated in the FY 2022 survey; 502 of the 505 selected agencies responded to the survey. Puerto Rico is not included in the U.S. total due to its classification as a U.S. territory. Data for the FY 2022 survey were collected for NCSSES by the Census Bureau under an interagency agreement.

For most states, the fiscal year begins on 1 July and ends the following 30 June. For example, FY 2021 begins on 1 July 2020 and ends on 30 June 2021. There are, however, five exceptions to the 30 June fiscal year end: New York (ends 31 March); Texas (ends 31 August); and Alabama, Michigan, and the District of Columbia (all end 30 September). Data presented in this InfoBrief are for each of the respective fiscal year periods as defined by the states.

Terms such as state, state government, and state agencies have equivalent meaning and are used interchangeably throughout this InfoBrief. The amounts reported here are for R&D expenditures of state government departments, agencies, public authorities, commissions, and other dependent entities that operate separately or somewhat autonomously from the central state government. State government R&D totals can display considerable volatility between survey years due to several national and state-specific factors. Large changes are not unusual, especially for discretionary spending items such as R&D. R&D plant expenditures can be highly variable year to year and will increase or decrease as capital projects begin or end.

Amounts reported do not include direct appropriations from state legislatures to universities, colleges, and private organizations. As a result, the \$1.0 billion in FY 2022 expenditures reported by state agencies to support R&D performance by academic institutions differs from the figure reported by universities and colleges in the NCSSES Higher Education R&D Survey for expenditures on R&D activities funded from state and local government sources because the latter includes direct state appropriations.

Although this survey is a census of state government agencies that fund R&D and there is no sampling error, survey data are still subject to some degree of unmeasurable nonsampling error, which may include errors in classification or measurement of certain aspects of an agency's R&D. For additional information see the Survey Quality Measures within the technical notes of the survey.<sup>6</sup>

State- and agency-specific data not available in this InfoBrief are available in the full set of data tables from this survey in the report *State Government Research and Development: FY 2022* at <https://nces.nsf.gov/surveys/state-government-research-development/2022#data>. For more information, please contact the author.

## Notes

**1** In this report, dollars adjusted for inflation (i.e., constant dollars) are based on the gross domestic product (GDP) implicit price deflator (currently in 2012 dollars) as published by the Bureau of Economic Analysis at [https://www.bea.gov/iTable/index\\_nipa.cfm](https://www.bea.gov/iTable/index_nipa.cfm), accessed on 25 May 2023. Note that GDP deflators are calculated on an economy-wide scale and do not explicitly focus on R&D.

**2** Expenditures for R&D do not include expenditures for R&D plant because the two are separate funding activities.

**3** Detailed data on intramural R&D by state are available in data table 5, available at <https://nces.nsf.gov/surveys/state-government-research-development/2022#data>.



4 Data on intramural R&D by source of funds are available in data table 5, available at <https://nces.nsf.gov/surveys/state-government-research-development/2022#data>.

5 “Other” extramural performers includes nonprofit organizations, including foundations; federal government departments and agencies; other departments or agencies within the state; other state governments; county, city, special district, or regional local governments.

6 Survey technical notes are available at <https://nces.nsf.gov/surveys/state-government-research-development/2022#technical-notes>.

## Suggested Citation

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