

# 2023 Rural Report

How Rural States Benefit From Strong **NIH** Funding



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## How Rural States Benefit From Strong NIH Funding

With an annual budget of more than **\$40 billion**, the National Institutes of Health (NIH) is the largest single public funder of biomedical research in the world. The primary mission of the NIH is to improve health, but it also has a significant direct economic impact. Last fiscal year, the **\$36.68 billion** awarded to researchers in the United States generated an estimated **\$96.84 billion** in economic activity nationwide<sup>1</sup>.

**This report looks at the impact of NIH funding in rural states — where the populations and economies are far smaller and there are far fewer organizations conducting biomedical research — and how NIH research funding has an exponential impact in these states.**

Alabama | Arkansas | Kentucky | Maine | Mississippi | New Hampshire | West Virginia

### WHY THESE STATES?

**These states are among the top 10 most rural states in the nation.  
In 2022, they had:**

- ◆ A rural population share of 45.5%, more than **two times** the 18.5% average share of the rest of the states.
- ◆ An average total economic output (GDP) of \$149 billion, just over **one-fourth** of the average GDP of the rest of the states.
- ◆ An average state population of just under 2.9 million, less than **one-half** the average population of the rest of the states.
- ◆ An average total NIH award amount of \$154 million — less than **one-fifth** of the average award amount of the states not included in this report.

See Table 1 

<sup>1</sup>United for Medical Research, NIH's Role in Sustaining the U.S. Economy, 2023, <https://unitedformedicalresearch.org/annual-economic-report>



*The economic analysis for this report was performed by Ronald Horst, Ph.D., Inforum, June 2023.*



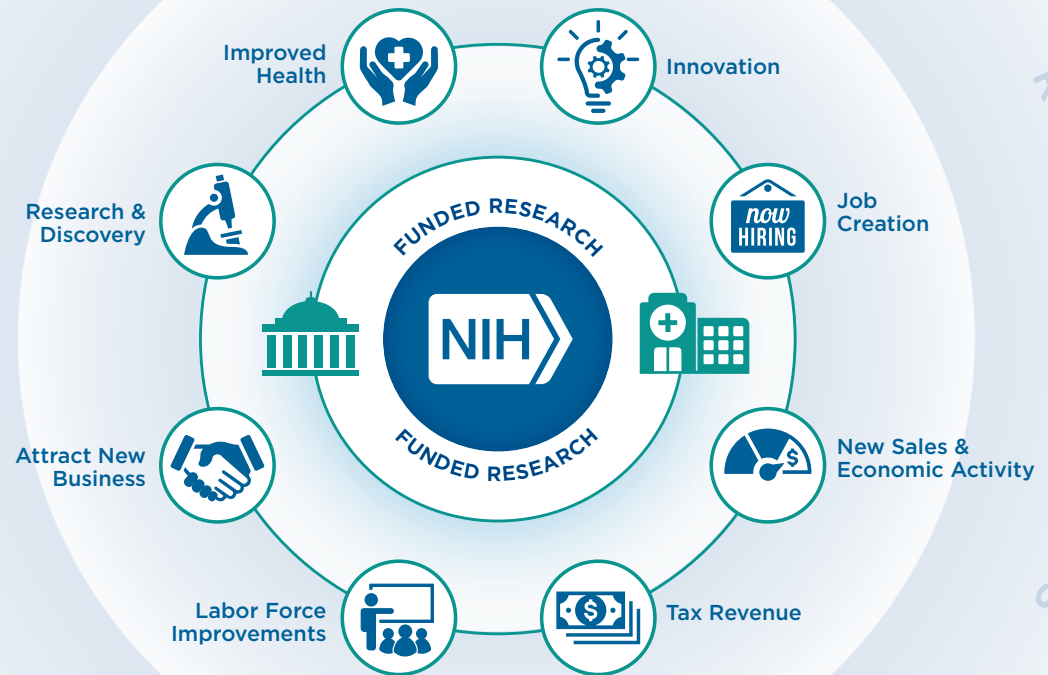
# The Exponential Impact of NIH Research Funding

When researchers and organizations in a state are awarded **NIH funding**, the impact of that funding reaches far beyond its original recipients.

- 1 Medical research improves health and provides hope** for individuals and families affected by disease. When medical research is conducted locally, it may present the opportunity to participate in clinical trials.
- 2 NIH research funding directly supports jobs** in research and research-supporting businesses, helping to boost household earnings.
- 3 The infusion of NIH research funding generates sales** for instate businesses and contributes to state and local economies through taxes and fees. Improved health also contributes to reduced sick days and increased productivity.
- 4 NIH funding helps rural states attract highly skilled workers**, building up the quality of a state's labor force and helping to attract new businesses. This is particularly important in rural states where population growth is slowing or declining.

- 5 Health benefits arising from NIH-funded medical research will have a substantially greater fiscal impact on small, rural states** (regardless of where the research is conducted). In six of the seven states examined, a higher share of the state population was enrolled in Medicare or Medicaid and a higher proportion of the state's budget was spent on these programs than in other states.

RURAL STATE IMPACTS



**As the NIH budget has grown, rural states have benefitted**

By increasing the overall amount of money available for NIH research from 2016–2022, congressional efforts have had a major, beneficial impact on smaller, rural states.

**On average, each state benefited from \$2.2 billion of new economic activity during this period.**

## Economic Impact of NIH Funding on Selected States

As NIH funding is awarded to researchers in individual states, that funding supports employment and the purchase of research-related goods, services and materials. The income generated from these operational expenditures, along with that from capital asset expenditures (e.g., building, equipment, machinery, sophisticated software) cycles through the economy to produce new economic activity.

In 2022, that funding supported an average of **2,300 jobs** and **\$353 million in new economic activity** per state, or \$2.3 dollars of economic activity for each dollar of NIH research funding.

See Table 2 

Every **\$1** NIH Funding = **\$2.3** of Rural State Economic Activity



### Household Impact

Economic activity includes household spending, which is also positively impacted by NIH research funding. **The collective impact on households in each of the seven states in 2022 was an average of \$112 million.**

See Table 11 



### State and Local Revenue

While many NIH-funded institutions are non-profits, their employees, their vendors and the in-state businesses patronized by these vendors and employees pay a wide range of taxes and fees. Also captured as part of the total economic activity number is **an average of \$31 million in tax and fee revenue** flowing to state and local government entities in each of the selected states.

See Table 13 

### ABOUT THESE NUMBERS

This report differs from UMR's annual report, NIH's Role in Sustaining the U.S. Economy, in that it includes in-state capital expenditures and does not include interstate effects in the "total" impact numbers. Focusing only on **intrastate** effects, including capital expenditures, allows this report to best single out the impact of NIH money that is awarded to researchers in the target states.



**2022**  
**DIRECT ECONOMIC IMPACT**  
AVERAGE PER STATE

**\$353M**  
New Economic Activity

**2,300**  
Jobs Supported

**\$112M**  
Total State Household Impact

**\$31M**  
Tax and Fee Revenue





## THE RURAL COHORT STUDY

Funded by NIH, the Risk Underlying Rural Areas Longitudinal (RURAL) Cohort Study is a health research project in 10 rural counties throughout Alabama, Kentucky, Louisiana and Mississippi. The study aims to address critical gaps in knowledge about heart and lung disorders in rural counties in the southeastern United States.

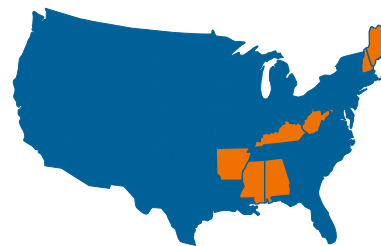
Study findings will promote the health of rural communities by identifying unique factors contributing to health disorders in these communities along with potential solutions. [Learn more](#)

## Public Health Impact

Any health benefits arising from NIH-funded medical research (whether conducted in a rural state or elsewhere) will have a substantially greater fiscal impact on small, rural states.

### Reducing States' Fiscal Burden

In most U.S. states, public health spending is generally second only to public education as the largest item in state and local budgets. When NIH-funded medical research results in improved treatment of disease, it helps ease this portion of states' fiscal burden. This is particularly true for small rural states like the seven states in this report.



7 STATE AVERAGE

REST OF US

44%

41%

Enrollment in Medicare and Medicaid

8%

6%

GDP spent on public health programs



In 2020 — the most recent year for which state-specific data are available — the seven states considered in this report generally had lower average expenditures per enrollee for both Medicaid and Medicare than for the remaining states. **Yet, with the exception of New Hampshire, enrollees in these states account for a higher share of their states' populations, and the cost of the benefits they receive amount to a higher share of their state's GDPs compared to other states. See Table 3**

Residents of the rural states examined have a lot to gain from medical research that provides new insights for the prevention, detection and treatment of disease.



Mary Ann Morrison Cumming is a breast cancer survivor and Maine resident. [Read her story.](#) ➡


**STATE RANK ON SELECT HEALTH INDICATORS AMONG ADULTS**

STATE	LIFE EXPECTANCY 2020		CHRONIC CONDITIONS				DEATHS BY			
	Life Expectancy (Lowest)	Infant Mortality (Highest)	Obesity 2021	Diabetes 2020	Cardiovascular Disease	Alzheimer's 2019	Cancer 2021	Heart Disease 2021	Opioid Overdose 2021	Suicide 2021
Alabama	4	6	3	3	4	3	12	3	31	22
Arkansas	7	3	6	9	2	6	6	5	30	10
Kentucky	5	13	2	10	3	29	3	8	5	17
Maine	37	15	35	39	6	25	11	25	6	14
Mississippi	1	1	5	1	4	2	2	2	33	21
New Hampshire	45	41	41	47	20	30	31	39	22	25
West Virginia	2	4	1	1	1	11	1	7	1	10
SOURCE	<a href="#">CDC</a>	<a href="#">CDC</a>	<a href="#">CDC</a>	<a href="#">CDC</a>	<a href="#">KFF</a>	<a href="#">Alz Assn</a>	<a href="#">CDC</a>	<a href="#">CDC</a>	<a href="#">KFF</a>	<a href="#">CDC</a>

## Labor Force Impact

NIH-funded research plays an important role in the ability to recruit and attract highly skilled workers to a state, which is important in states where population growth is declining.

This benefit extends beyond the institutions where the research is conducted to the various operational and capital vendors who support that work.

Using the R&D services sector as a proxy for NIH-funded institutions in each state, it is clear that **NIH research-funded jobs are contributing to a significant improvement in the labor forces of the selected states.** The R&D sector has significantly **HIGHER PAY** and **JOB GROWTH** rates than the other sectors in these states. **See Table 4** 

- ◆ In 2022, average annual pay in the R&D sector was almost **2X** the average of the other sectors in every state. **The average pay ratio ranged from 1.3 in West Virginia to 2.0 in Alabama and Kentucky.**
- ◆ From 2016–2022, job growth was significantly higher for the R&D sector for all states. **Average R&D job growth across the seven states was 36%.**
- ◆ All sectors saw pay growth between 2016–2022. **Average pay growth in the R&D sector was 28%.**

Rural America lost population over the past decade for the first time in history. Nationally, just 33.1% of rural counties gained population between 2010 and 2020, compared to 53.2% in the prior decade. [Learn more](#)



**TOP NIH-FUNDED INSTITUTIONS 2022**

	ALABAMA	ARKANSAS	KENTUCKY	MAINE	MISSISSIPPI	NEW HAMPSHIRE	WEST VIRGINIA
1	University of Alabama at Birmingham	University of Arkansas for Medical Science	University of Kentucky	Jackson Lab	University of Mississippi Medical Center	Dartmouth College	West Virginia University
2	University of Alabama in Tuscaloosa	Arkansas Children's Hospital Research Institute	University of Louisville	MaineHealth	University of Mississippi	Dartmouth-Hitchcock Clinic	Marshall University
3	Tuskegee University	Intervexion Therapeutics, LLC	Enepret, Inc.	Mount Desert Island Biological Lab	Mississippi State University	University of New Hampshire	Modulation Therapeutics, Inc.
4	University of South Alabama	University of Arkansas at Fayetteville	Naprogenix, Inc.	University of New England	University of Southern Mississippi	Celdara Medical, LLC	Wheeling Jesuit University
5	Auburn University	Nephropathology Associates	Fetal Life, LLC	University of Maine Orono	Jackson State University	Lodestone Biomedical, LLC	



# What If?

The benefit to these rural states of NIH funding in fiscal year 2022 is clear, but these states have also benefited tremendously over the past seven years.

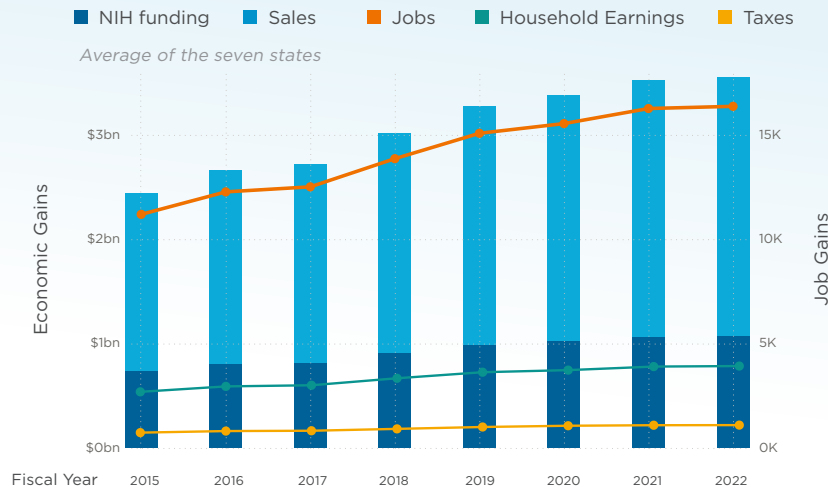
During this period, the NIH budget saw strong annual increases and the NIH was able to increase the amount of funds distributed in competitive awards to researchers in all states.

## But what if this had not happened?

It is possible to measure the economic impact on these rural states — both in terms of what was **GAINED** due to a growing NIH budget, and what would have been **LOST** if the NIH budget had instead stayed flat from 2016 to 2022.

### RURAL STATE GAINS 2016-2022

By increasing the overall amount of money available for NIH research from 2016-2022, congressional efforts had a significant, beneficial impact on these smaller, rural states.



#### 7-Year Cumulative Impact

Each state **BENEFITTED** from an average total of:

**Nearly \$1B**

NIH Research Awards

**\$2.2B+**

New Economic Activity (sales)

**14,557**

Jobs

**Nearly \$700M**

Statewide Household Earnings

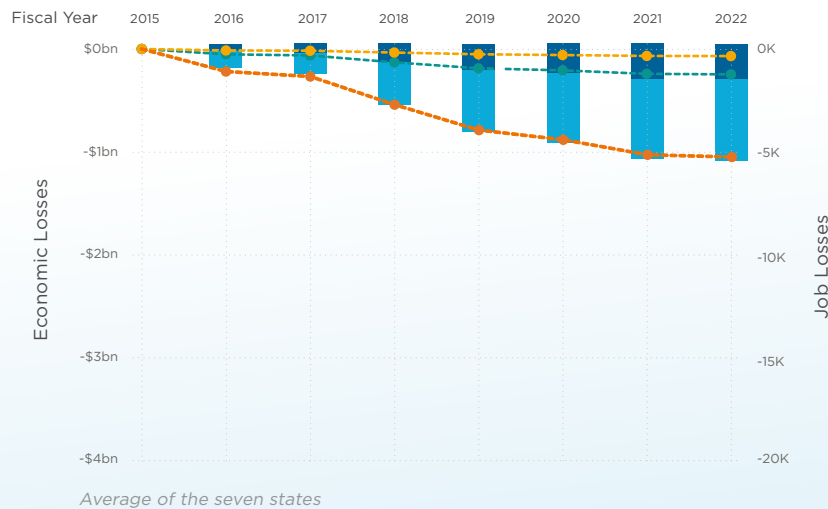
**\$194M**

Tax and Fee Revenue

See Tables 5, 7, 9, 11, 13

### RURAL STATE LOSSES 2016-2022

However, had NIH funding remained flat at 2015 levels, there would have been a significant negative impact on these rural states.



#### 7-Year Cumulative Impact

Each state would have **LOST** an average total of:

**\$220M**

NIH Research Awards

**\$500M+**

New Economic Activity (sales)

**3,364**

Jobs

**\$161M**

Statewide Household Earnings

**\$44M**

Tax and Fee Revenue

See Tables 6, 8, 10, 12, 14

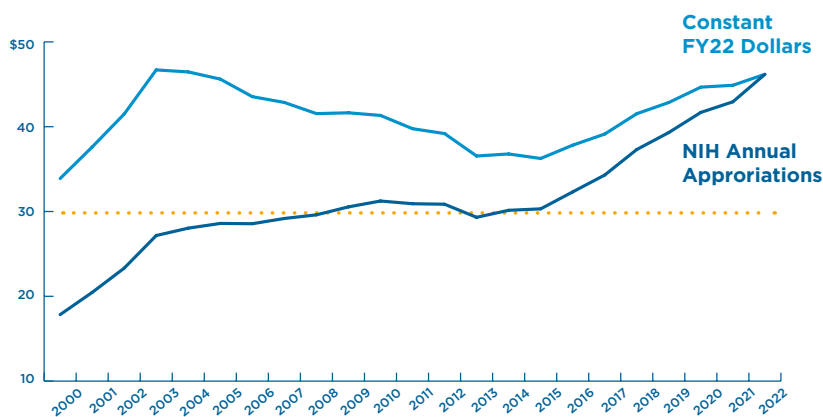
## Maintaining a Strong NIH Budget

This report illustrates the very positive impact that a strong NIH budget has on smaller, rural states — even when those states may receive less NIH research funding relative to other states.

### A Recovering NIH Budget

Recent increases to the NIH budget, provided with the bipartisan support of Congress, have been instrumental in helping the agency to regain lost ground during a long period of flat funding from 2004 to 2015. Factoring in inflation, NIH’s actual purchasing power decreased significantly during that period with an untold impact on research, innovation and public health.

#### NIH APPROPRIATIONS 2000–2022



Source: [Congressional Research Service](#)

When looking at NIH funding adjusted for inflation, the agency’s purchasing power peaked in FY03 and then declined for more than a decade. Funding increases in FY16 through FY22 have restored most of that purchasing power. **However, funding in FY22 was still 1.1% below the peak FY03 level.**

Maintaining the recent budget momentum, and ensuring a strong NIH, are crucial to the health and economic well-being of rural communities everywhere.



Team members of the University of Arkansas for Medical Sciences Center for Musculoskeletal Disease Research, which received an **\$11.5 million** Centers of Biomedical Research Excellence (COBRE) Phase 2 grant from the NIH.

COBRE funding aims to help establish multidisciplinary, collaborative and synergistic research centers in states with lower rates of federal research funding.

**Table 1** | Overview of Selected States 2022

STATE	NIH AWARDS		GDP		POPULATION		RURAL POPULATION	
	\$M	Rank	\$M	Rank	Total	Rank	Percent	Rank
Alabama	385	23	277,818	27	5,074,296	24	42.3	8
Arkansas	104	39	165,221	34	3,045,637	33	44.5	6
Kentucky	241	29	260,304	28	4,512,310	26	41.3	10
Maine	113	38	84,498	44	1,385,340	42	61.4	2
Mississippi	61	42	138,740	37	2,940,057	34	53.7	4
New Hampshire	122	37	105,414	40	1,395,231	41	41.7	9
West Virginia	49	44	95,588	42	1,775,156	39	55.4	3
<b>7-STATE AVERAGE</b>	<b>154</b>		<b>149,012</b>		<b>2,875,432</b>		<b>45.4</b>	
<b>REST OF U.S. AVG</b>	<b>\$809M</b>		<b>\$554,992M</b>		<b>7,117,262</b>		<b>18.5</b>	

**Table 2** | Jobs and New Economic Activity Resulting from NIH Research Funding 2022, \$M

STATE	OPERATIONAL-RELATED			CAPEX-RELATED		TOTAL IMPACT		MULTIPLIER
	NIH Awards \$M	Intrastate Economic Activity \$M	Intrastate Jobs	Intrastate Economic Activity \$M	Intrastate Jobs	Intrastate Economic Activity \$M	Intrastate Jobs	\$1 NIH =
Alabama	385	764	4,977	153	995	917	5,973	2.4
Arkansas	104	184	1,322	37	264	221	1,586	2.1
Kentucky	241	466	3,119	93	624	560	3,743	2.3
Maine	113	213	1,575	43	315	255	1,890	2.3
Mississippi	61	109	774	22	155	131	929	2.2
New Hampshire	122	241	1,314	48	263	289	1,577	2.4
West Virginia	49	84	560	17	112	101	672	2.1
<b>7-STATE AVERAGE</b>	<b>154</b>	<b>294</b>	<b>1,949</b>	<b>59</b>	<b>390</b>	<b>353</b>	<b>2,338</b>	<b>2.3</b>
<b>7-STATE TOTAL</b>	<b>1,075</b>	<b>2,061</b>	<b>13,641</b>	<b>413</b>	<b>2,728</b>	<b>2,474</b>	<b>16,370</b>	

See individual **State Snapshots** for state-specific impacts 



**Table 3** | Fiscal Burden of Medicare and Medicaid 2020

STATE	MEDICAID \$ PER ENROLLEE	MEDICARE \$ PER ENROLLEE	% POPULATION ENROLLED MEDICARE & MEDICAID	MEDICARE & MEDICAID SPENDING % GDP
Alabama	5,229	12,010	44	8
Arkansas	6,990	11,289	50	10
Kentucky	7,209	11,653	52	10
Maine	8,974	10,352	51	9
Mississippi	6,658	12,416	45	11
New Hampshire	10,130	10,098	37	6
West Virginia	6,552	11,534	57	12
<b>7-STATE AVERAGE</b>	<b>6,837</b>	<b>11,568</b>	<b>48</b>	<b>9</b>
<b>REST OF U.S. AVG</b>	<b>7,792</b>	<b>12,324</b>	<b>41</b>	<b>6</b>
<b>7 TO REST RATIO</b>	<b>88</b>	<b>94</b>	<b>117</b>	<b>148</b>

**Table 4** | Human Capital Impacts

STATE	AVERAGE PAY 2022, \$			% EMPLOYMENT GROWTH 2016-2022		% AVERAGE PAY GROWTH 2016-2022	
	R&D	All Sectors	Ratio	R&D	All Sectors	R&D	All Sectors
Alabama	116,312	56,770	2.0	40	7	22	29
Arkansas	82,646	54,157	1.5	20	6	41	31
Kentucky	114,180	56,027	2.0	45	5	37	28
Maine	84,228	58,371	1.4	38	4	31	39
Mississippi	88,173	46,845	1.9	36	3	37	26
New Hampshire	144,053	73,966	1.9	46	5	20	36
West Virginia	67,349	52,903	1.3	-1	-1	21	30
<b>7-STATE AVERAGE</b>	<b>108,631</b>	<b>56,162</b>	<b>1.9</b>	<b>36</b>	<b>5</b>	<b>28</b>	<b>30</b>

**TABLE 4 NOTES**

- 7-State average values are calculated as total wages/total employment; this is equivalent to a weighted average of the state-level pay rates.
- The 7-State average depends on the relative size of employment in each state. The weighted average is similar to, but different than, the unweighted mean of the state-level values.
- Alabama, Kentucky and New Hampshire have substantial R&D employment shares, together with high wage rates; this pushes up the employment-weighted average wage rate for all rural states.

**Table 5** | Annual NIH Funding to Institutions in the Seven States 2016–2022, \$M

STATE	2016	2017	2018	2019	2020	2021	2022	TOTALS
Alabama	295	298	351	392	383	388	385	2,492
Arkansas	97	57	58	58	77	91	104	542
Kentucky	164	188	208	229	244	255	241	1,529
Maine	76	89	100	112	104	110	113	704
Mississippi	54	53	51	42	46	59	61	366
New Hampshire	99	109	107	121	121	115	122	794
West Virginia	24	28	35	36	46	49	49	267
<b>7-STATE AVERAGE</b>	<b>115</b>	<b>118</b>	<b>130</b>	<b>141</b>	<b>146</b>	<b>152</b>	<b>154</b>	<b>956</b>
<b>7-STATE TOTAL</b>	<b>809</b>	<b>822</b>	<b>910</b>	<b>990</b>	<b>1,021</b>	<b>1,067</b>	<b>1,075</b>	<b>6,694</b>

**Table 6** | NIH Funding Loss if NIH Funding Was Flat 2016–2022, \$M

**DIFFERENCE IN NIH AWARDS FROM 2015 ACTUAL**

STATE	2015 Actual	2016	2017	2018	2019	2020	2021	2022	TOTALS
Alabama	280	-15	-18	-71	-112	-103	-108	-105	-532
Arkansas	39	-58	-18	-19	-19	-38	-52	-65	-269
Kentucky	161	-3	-27	-47	-68	-83	-94	-80	-402
Maine	84	8	-5	-16	-28	-20	-26	-29	-116
Mississippi	48	-6	-5	-3	6	2	-11	-13	-30
New Hampshire	103	4	-6	-4	-18	-18	-12	-19	-73
West Virginia	21	-3	-7	-14	-15	-25	-28	-28	-120
<b>7-STATE AVERAGE</b>	<b>105</b>	<b>-10</b>	<b>-12</b>	<b>-25</b>	<b>-36</b>	<b>-41</b>	<b>-47</b>	<b>-48</b>	<b>-220</b>
<b>7-STATE TOTAL</b>	<b>736</b>	<b>-73</b>	<b>-86</b>	<b>-174</b>	<b>-254</b>	<b>-285</b>	<b>-331</b>	<b>-339</b>	<b>-1,542</b>

**Table 7** | New Economic Activity/Sales Resulting from NIH Research Funding 2016–2022, \$M

STATE	2016	2017	2018	2019	2020	2021	2022	TOTALS
Alabama	702	710	835	932	913	923	917	5,932
Arkansas	205	121	123	124	164	193	221	1,151
Kentucky	380	437	483	532	566	594	560	3,552
Maine	171	202	226	254	236	248	255	1,592
Mississippi	114	113	108	90	99	125	131	780
New Hampshire	233	257	254	285	285	273	289	1,876
West Virginia	49	58	73	73	94	101	101	549
<b>7-STATE AVERAGE</b>	<b>265</b>	<b>271</b>	<b>300</b>	<b>327</b>	<b>337</b>	<b>351</b>	<b>353</b>	<b>2,205</b>
<b>7-STATE TOTAL</b>	<b>1,854</b>	<b>1,898</b>	<b>2,102</b>	<b>2,290</b>	<b>2,357</b>	<b>2,457</b>	<b>2,474</b>	<b>15,432</b>

**Table 8** | Net Economic Activity/Sales Loss if NIH Funding Was Flat 2016–2022, \$M

**DIFFERENCE IN NEW ECONOMIC ACTIVITY FROM 2015 ACTUAL**

STATE	2015 Actual	2016	2017	2018	2019	2020	2021	2022	TOTALS
Alabama	667	-35	-43	-168	-265	-246	-256	-250	-1,263
Arkansas	84	-122	-38	-40	-40	-81	-110	-137	-568
Kentucky	374	-7	-64	-109	-158	-193	-221	-186	-938
Maine	190	19	-12	-35	-63	-46	-58	-65	-260
Mississippi	101	-12	-12	-7	11	3	-24	-29	-70
New Hampshire	244	11	-13	-9	-40	-41	-28	-45	-165
West Virginia	43	-6	-15	-30	-30	-50	-58	-58	-247
<b>7-STATE AVERAGE</b>	<b>243</b>	<b>-22</b>	<b>-28</b>	<b>-57</b>	<b>-84</b>	<b>-93</b>	<b>-108</b>	<b>-110</b>	<b>-502</b>
<b>7-STATE TOTAL</b>	<b>1,703</b>	<b>-153</b>	<b>-196</b>	<b>-398</b>	<b>-586</b>	<b>-654</b>	<b>-755</b>	<b>-770</b>	<b>-3,512</b>



**Table 9** | Jobs Resulting from NIH Research Funding 2016–2022, \$M

STATE	2016	2017	2018	2019	2020	2021	2022	TOTALS
Alabama	4,575	4,625	5,440	6,074	5,948	6,015	5,973	38,650
Arkansas	1,474	871	887	890	1,179	1,387	1,586	8,274
Kentucky	2,544	2,924	3,228	3,558	3,787	3,973	3,743	23,757
Maine	1,267	1,498	1,670	1,876	1,750	1,838	1,890	11,789
Mississippi	808	804	769	640	700	890	929	5,540
New Hampshire	1,273	1402	1,382	1,552	1,554	1,487	1,577	10,227
West Virginia	330	388	486	488	625	675	672	3,664
<b>7-STATE AVERAGE</b>	<b>1,753</b>	<b>1,787</b>	<b>1,980</b>	<b>2,154</b>	<b>2,220</b>	<b>2,324</b>	<b>2,338</b>	<b>14,557</b>
<b>7-STATE TOTAL</b>	<b>12,271</b>	<b>12,512</b>	<b>13,862</b>	<b>15,078</b>	<b>15,543</b>	<b>16,265</b>	<b>16,370</b>	<b>101,901</b>

**Table 10** | Net Job Loss if NIH Funding Was Flat 2016–2022, \$M

**DIFFERENCE IN JOB CREATION FROM 2015 ACTUAL**

STATE	2015 Actual	2016	2017	2018	2019	2020	2021	2022	TOTALS
Alabama	4,345	-230	-280	-1,095	-1,729	-1,603	-1,670	-1,628	-8,235
Arkansas	600	-874	-271	-287	-290	-579	-787	-986	-4,074
Kentucky	2,498	-46	-426	-730	-1,059	-1,289	-1,474	-1,244	-6,268
Maine	1,410	142	-88	-260	-467	-340	-428	-480	-1,921
Mississippi	721	-88	-83	-48	81	21	-169	-208	-494
New Hampshire	1,331	59	-70	-51	-221	-222	-155	-245	-905
West Virginia	288	-42	-100	-198	-201	-337	-387	-384	-1,649
<b>7-STATE AVERAGE</b>	<b>1,599</b>	<b>-154</b>	<b>-188</b>	<b>-381</b>	<b>-555</b>	<b>-621</b>	<b>-724</b>	<b>-739</b>	<b>-3,364</b>
<b>7-STATE TOTAL</b>	<b>11,193</b>	<b>-1,079</b>	<b>-1,318</b>	<b>-2,669</b>	<b>-3,886</b>	<b>-4,350</b>	<b>-5,072</b>	<b>-5,176</b>	<b>-23,550</b>

**Table 11** | Statewide Household (HH) Earnings from NIH Funding 2016–2022, \$M

STATE	2016		2017		2018		2019	
	NIH Awards	Total HH Impact	NIH Awards	Total HH Impact	NIH Awards	Total HH Impact	NIH Awards	Total HH Impact
Alabama	295	228	298	230	351	271	392	302
Arkansas	97	67	57	39	58	40	58	40
Kentucky	164	116	188	133	208	147	229	162
Maine	76	57	89	67	100	75	112	84
Mississippi	54	36	53	36	51	35	42	29
New Hampshire	99	71	109	78	107	77	121	86
West Virginia	24	15	28	18	35	23	36	23
<b>7-STATE AVERAGE</b>	<b>115</b>	<b>84</b>	<b>118</b>	<b>86</b>	<b>130</b>	<b>95</b>	<b>141</b>	<b>104</b>
<b>7-STATE TOTAL</b>	<b>807</b>	<b>589</b>	<b>823</b>	<b>602</b>	<b>910</b>	<b>667</b>	<b>989</b>	<b>726</b>

STATE	2020		2021		2022		TOTALS
	NIH Awards	Total HH Impact	NIH Awards	Total HH Impact	NIH Awards	Total HH Impact	
Alabama	383	296	388	300	385	297	1,924
Arkansas	77	53	91	63	104	72	374
Kentucky	244	172	255	180	241	170	1,080
Maine	104	79	110	83	113	85	530
Mississippi	46	31	59	40	61	42	249
New Hampshire	121	86	115	82	122	87	567
West Virginia	46	29	49	32	49	32	172
<b>7-STATE AVERAGE</b>	<b>146</b>	<b>107</b>	<b>152</b>	<b>111</b>	<b>154</b>	<b>112</b>	<b>699</b>
<b>7-STATE TOTAL</b>	<b>1,021</b>	<b>747</b>	<b>1,067</b>	<b>779</b>	<b>1,075</b>	<b>785</b>	<b>4,896</b>

**TABLE 11 NOTES**

- Represents the total dollar change in earnings of all households employed by all industries within the state for each additional dollar of output delivered to final demand by the selected industry.
- Earnings consist of wages and salaries and of proprietors' income, which is the net earnings of sole proprietors and partnerships. Employer contributions for health insurance are also included.
- Personal contributions to social insurance, such as Social Security and Medicare, and employee pension plans are excluded to reflect only the portion of personal income that is available to spend.

**Table 12** | Lost Statewide Household Earnings with Flat NIH Funding 2016–2022, \$M

**DIFFERENCE FROM 2015 ACTUAL, \$M**

STATE	2015 Earnings	2016	2017	2018	2019	2020	2021	2022	TOTALS
Alabama	216	-12	-14	-55	-86	-80	-84	-81	-412
Arkansas	27	-40	-12	-13	-13	-26	-36	-45	-185
Kentucky	113	-3	-20	-34	-49	-59	-67	-57	-289
Maine	63	+6	-4	-12	-21	-16	-20	-22	-89
Mississippi	32	-4	-4	-3	+3	+1	-8	-10	-25
New Hampshire	74	+3	-4	-3	-12	-12	-8	-13	-49
West Virginia	13	-2	-5	-10	-10	-16	-19	-19	-81
<b>7-STATE AVERAGE</b>	<b>77</b>	<b>-7</b>	<b>-9</b>	<b>-19</b>	<b>-27</b>	<b>-30</b>	<b>-35</b>	<b>-35</b>	<b>-161</b>
<b>7-STATE TOTAL</b>	<b>540</b>	<b>-52</b>	<b>-63</b>	<b>-130</b>	<b>-188</b>	<b>-208</b>	<b>-242</b>	<b>-247</b>	<b>-1,130</b>



**Table 13 |** State and Local Taxes & Fees Generated by NIH Research Funding 2016-2022, \$M

STATE	2016		2017		2018		2019	
	Intrastate Econ Act	Taxes & Fees	Intrastate Econ Act	Taxes & Fees	Intrastate Econ Act	Taxes & Fees	Intrastate Econ Act	Taxes & Fees
Alabama	702	54	710	54	835	64	932	73
Arkansas	205	20	121	12	123	12	124	12
Kentucky	380	33	437	38	483	41	532	46
Maine	171	20	202	23	226	26	254	31
Mississippi	114	11	113	11	108	11	90	9
New Hampshire	233	19	257	21	254	22	285	23
West Virginia	49	5	58	6	73	7	73	7
<b>7-STATE AVERAGE</b>	<b>265</b>	<b>23</b>	<b>271</b>	<b>24</b>	<b>300</b>	<b>26</b>	<b>327</b>	<b>29</b>
<b>7-STATE TOTAL</b>	<b>1,856</b>	<b>163</b>	<b>1,899</b>	<b>165</b>	<b>2,101</b>	<b>182</b>	<b>2,290</b>	<b>201</b>

**TABLE 13 NOTES**

- Available tax data end in 2020. For 2021 and 2022, the effective tax rate for 2019 was used, as 2020 rates likely are distorted by pandemic effects.
- Effective tax rates are calculated as the portion of state and local “General revenue from own sources” that are Taxes, divided by state GDP.

STATE	2020		2021		2022		TOTALS
	Intrastate Econ Act	Taxes & Fees	Intrastate Econ Act	Taxes & Fees	Intrastate Econ Act	Taxes & Fees	
Alabama	913	75	923	72	917	71	463
Arkansas	164	16	193	19	221	22	113
Kentucky	566	51	594	52	560	49	310
Maine	236	29	248	30	255	31	190
Mississippi	99	10	125	13	131	13	78
New Hampshire	285	23	273	22	289	23	153
West Virginia	94	9	101	10	101	10	54
<b>7-STATE AVERAGE</b>	<b>337</b>	<b>30</b>	<b>351</b>	<b>31</b>	<b>353</b>	<b>31</b>	<b>194</b>
<b>7-STATE TOTAL</b>	<b>2,357</b>	<b>213</b>	<b>2,458</b>	<b>218</b>	<b>2,473</b>	<b>220</b>	<b>1,362</b>

**Table 14** | Lost Net Loss Taxes & Fees if NIH Funding Was Flat 2016-2022, \$M

STATE	DIFFERENCE FROM 2015 ACTUAL								TOTALS
	2015 Actual	2016	2017	2018	2019	2020	2021	2022	
Alabama	50	-3	-3	-13	-21	-20	-20	-19	-99
Arkansas	8	-12.1	-3.7	-3.9	-4.0	-7.9	-10.8	-13.5	-56
Kentucky	32	-0.6	-5.5	-9.4	-13.8	-17.3	-19.3	-16.3	-82
Maine	22	2.2	-1.4	-4.0	-7.6	-5.7	-7.0	-7.8	-31
Mississippi	10	-1.2	-1.2	-0.7	1.2	0.3	-2.5	-3.0	-7
New Hampshire	20	0.9	-1.1	-0.8	-3.3	-3.3	-2.3	-3.6	-14
West Virginia	5	-0.6	-1.4	-2.8	-3.0	-5.0	-5.8	-5.8	-24
<b>7-STATE AVERAGE</b>	<b>21</b>	<b>-2</b>	<b>-2</b>	<b>-5</b>	<b>-7</b>	<b>-8</b>	<b>-10</b>	<b>-10</b>	<b>-44</b>
<b>7-STATE TOTAL</b>	<b>147</b>	<b>-14</b>	<b>-17</b>	<b>-34</b>	<b>-51</b>	<b>-59</b>	<b>-68</b>	<b>-69</b>	<b>-312</b>

**TABLE 14 NOTE**

- Lost state and local taxes and fees = Lost economic activity x Effective tax rate