

The Economic Impact of the U.S. Biopharmaceutical Industry:

2024 NATIONAL AND STATE ESTIMATES

September 2026

Prepared by TEConomy Partners, LLC

Prepared for the Pharmaceutical Research and Manufacturers of America

PhRMA
RESEARCH • PROGRESS • HOPE

TECONOMY
PARTNERS LLC

TEConomy Partners, LLC is a global leader in research, analysis, and strategy for innovation-driven economic development. Today we're helping nations, states, regions, universities, and industries blueprint their future and translate knowledge into prosperity.

The Pharmaceutical Research and Manufacturers of America (PhRMA) represents the country's leading innovative biopharmaceutical research companies, which are focused on developing innovative medicines that transform lives and create a healthier world. Together, we are fighting for solutions to ensure patients can access and afford medicines that prevent, treat and cure disease. PhRMA member companies have invested more than $900 billion in the search for new treatments and cures over the last decade, supporting nearly five million jobs in the United States.



TEConomy Partners, LLC (TEConomy) endeavors at all times to produce work of the highest quality, consistent with our contract commitments. However, because of the research and/or experimental nature of this work, the client undertakes the sole responsibility for the consequence of any use or misuse of, or inability to use, any information or result obtained from TEConomy, and TEConomy, its partners, or employees have no legal liability for the accuracy, adequacy, or efficacy thereof.

Table of Contents

Executive Summary **1**

Introduction: The Innovative Biopharmaceutical Industry **3**
Biopharmaceuticals—Driven by Research, Development, and Innovation 4

Continued Growth of the U.S. Biopharmaceutical Industry **5**
Defining the U.S. Biopharmaceutical Industry 5
Comparative Employment Growth of the U.S. Biopharmaceutical Industry 7
Geographic Structure of the U.S. Biopharmaceutical Industry 8
High-Wage and High-Quality Jobs from a High-Value Industry 10
Occupationally Diverse Workforce 11
The Economic Impact of the U.S. Biopharmaceutical Industry 18
Economic Impacts Across the Biopharmaceutical Industry's U.S. Supply Chain 19
Nationwide Employment and Impacts of the U.S. Biopharmaceutical Industry 21

Discussion **23**
Important Driver of Innovation and Economic Impacts 23
Sizeable and Growing Employment 23
High-Wage, High-Quality, and High Productivity Jobs 23

Appendix A: Methodology **25**
Data Sources 25
The Structure of the U.S. Biopharmaceutical Industry 27
Biopharmaceutical Manufacturing 27
Biopharmaceutical R&D 28
Biopharmaceutical Distribution 28
Biopharmaceutical Corporate Offices 28
Additional Refinements 29
Final Biopharmaceutical Industry and Sector Employment Estimates 29
Total Economic Impact of the Biopharmaceutical Industry 30

Appendix B **31**
State-Level Data and Estimates 31

Executive Summary

The U.S. biopharmaceutical industry is a global leader in innovation and powerful driver of U.S. economic growth, supporting millions of highly skilled, productive, and well-paying jobs in every state across the nation.

This global leadership was built on a strong foundation of policies that encourage investment in research and development, protect intellectual property protections, and support a rigorous and evidence-based regulatory system.

To quantify the industry's economic impact, TEConomy Partners, LLC, analyzed its contributions to employment and economic activity in 2024 across all 50 states, the District of Columbia, and Puerto Rico.

This analysis finds that the U.S. biopharmaceutical industry:

- **Contributed nearly $1 trillion to U.S. GDP in 2024, representing 3.3% of the nation's economy.** This includes the industry's direct contribution of 1.5% of GDP and the additional economic activity it supports across other sectors.

- **Generated more than $1.74 trillion in economic output (i.e., total value of goods and services produced) in 2024, accounting for 3.4% of total U.S. economic output.** This includes direct industry output exceeding $835 billion and an additional $900 billion in output from the ripple effects on other industries. For every $1.00 in output produced by the biopharmaceutical industry, an additional $1.08 in output is generated in other sectors of the U.S. economy.

- **Supported more than 4.8 million jobs.** The industry directly employed more than one million workers, and another nearly 3.8 million additional U.S. jobs in other industries across the economy.

- **Increased direct employment by 34.4% between 2015 and 2024,** providing important growth and stability to both the production of life saving medicines and to the U.S. and regional economies despite periods of economic downturn.

- **Paid an average of $170,000 in wages and benefits in 2024—more than twice the national average.** That's over $60,000 more than the average U.S. manufacturing job, highlighting the industry's role in creating high-paying American jobs.

- **Generated nearly $414,000 in economic productivity per employee**—more than twice that of the U.S. average manufacturing worker and more than three times the average U.S. worker.

Introduction: The Innovative Biopharmaceutical Industry

Among U.S. industries, the biopharmaceutical industry is defined by and stands out as a leader in research and innovation—a unique industry driven by innovation that has been investing in this ability for many years.

With its high levels of investment in R&D, multi-sectoral structure, significant employment, and broad occupational requirements, the U.S. biopharmaceutical industry brings significant employment and economic impacts to every corner of the nation. To measure the size and extent of the U.S. biopharmaceutical industry, the Pharmaceutical Research and Manufacturers of America (PhRMA) engaged TEConomy to develop an independent estimate of the size of the U.S. biopharmaceutical industry and its total economic impacts on the U.S. and individual state economies (including the District of Columbia and Puerto Rico).

This report provides estimates of the total number of biopharmaceutical industry jobs in the U.S. in 2024—the most recent year for which complete employment data are available from the U.S. Bureau of Labor Statistics. This effort also develops and provides economic impact measures of the U.S. biopharmaceutical industry, including total economic output, wages and benefits, and personal taxes. These measures capture the direct economic impacts of the biopharmaceutical industry, the indirect economic impacts on other sectors of the economy that supply the biopharmaceutical industry through its broad supply chain, and the induced economic activities of its employees.





Biopharmaceuticals—Driven by Research, Development, and Innovation

The biopharmaceutical industry is a major component of the U.S. innovation-driven industrial base, which also includes industries such as aerospace, motor vehicles, semiconductors, and others. Analyzing the most recent NSF business R&D survey results (primarily 2023 data) and additional estimations performed by TEConomy (estimating 2024 and 2025 data) provides insights into the position of the biopharmaceutical industry's R&D activities in comparison to overall U.S. medical and health R&D investment and overall U.S. industrial R&D.

The domestic biopharmaceutical industry continues to be a leader in overall U.S. industrial R&D activities and investment.[1]

- The U.S. biopharmaceutical industry accounts for 23.2 percent of all domestic U.S. business R&D performance in 2024.
- The biopharmaceutical industry, estimated to include 213,000 domestic R&D employees in 2023, has more R&D workers than any U.S. industry, including the semiconductor manufacturing industries (113,000), automotive/motor vehicles manufacturing (108,000), and aerospace/navigational instruments manufacturing (96,000).
- In 2023, the U.S. federal government funded less than 1% of commercial domestic biopharmaceutical R&D, compared to 49% for the aerospace industry.
- The U.S. biopharmaceutical industry devotes approximately 20 percent of its total domestic employment to R&D functions, more than two times larger than the U.S. all industry average.

The biopharmaceutical industry is the leader in U.S. medical and health R&D activities and investments.[2]

- The biopharmaceutical industry's estimated 2025 domestic R&D investment of $152.9 billion accounts for 77.7 percent of all U.S. industry funded medical and health R&D.

Continued Growth of the U.S. Biopharmaceutical Industry

Defining the U.S. Biopharmaceutical Industry

The U.S. biopharmaceutical industry is a highly complex industry that includes large, vertically integrated biopharmaceutical companies with their own research and manufacturing facilities; small and start-up research-focused companies that have not yet produced a medicine approved by the Food and Drug Administration; clinical development and research organizations that provide a range of services to support drug development and manufacturing; and distributors who provide logistics support to deliver prescription medicines across the country and around the world. For the purposes of this analysis, all 50 states, the District of Columbia, and Puerto Rico are included in the U.S. geographic definition.

Assigning Biopharmaceutical Industry Sector

"Sector" is based on the NAICS code assigned to each establishment (i.e., the business location) captured in the BLS data and is assigned based on the predominant activity at that location. Because all jobs within an establishment are assigned to the establishment's NAICS code, sector-based job counts may overstate or understate job functions to the extent multiple activities occur at a single establishment (e.g., co-located R&D and manufacturing). The total employment estimate is not affected, however.

The core value-adding activities of the U.S. biopharmaceutical industry — biopharmaceutical research and development, manufacturing, and distribution—are used to define and produce estimates of the size and structure of the U.S. industry. These activities are found in U.S. federal data sources within all or parts of three "sectors" of the U.S. economy as defined by the federal government in the North American Industrial Classification System (NAICS). Employment data were developed by carefully identifying and estimating the share of each of the sectors' employment attributable to the biopharmaceutical industry. A fourth sector, biopharmaceutical corporate offices, captures significant and identifiable standalone corporate administrative operations (e.g., headquarters, executive offices, financial, marketing, legal, etc.) not already captured in the other sectors. **Appendix A** provides the specific NAICS codes used to define the industry sectors, and describes the data and methodology used to produce the U.S. and state-level employment estimates included in this report.

In 2024, total employment in the U.S. biopharmaceutical industry exceeded one million employees, reaching 1,079,380 jobs (**Table 1**). The biopharmaceutical R&D sector accounts for most of the industry's employment growth and an increasing share of the share of the industry's employment, increasing from 39 percent in 2022 to 43 percent in 2024 or an increase of nearly 55,000 jobs since 2022 (Figure 1). Biopharmaceutical manufacturing accounts for approximately 34 percent of total employment, on par with its share in 2022, but still shows an actual increase of more than 2,500 jobs in 2024.

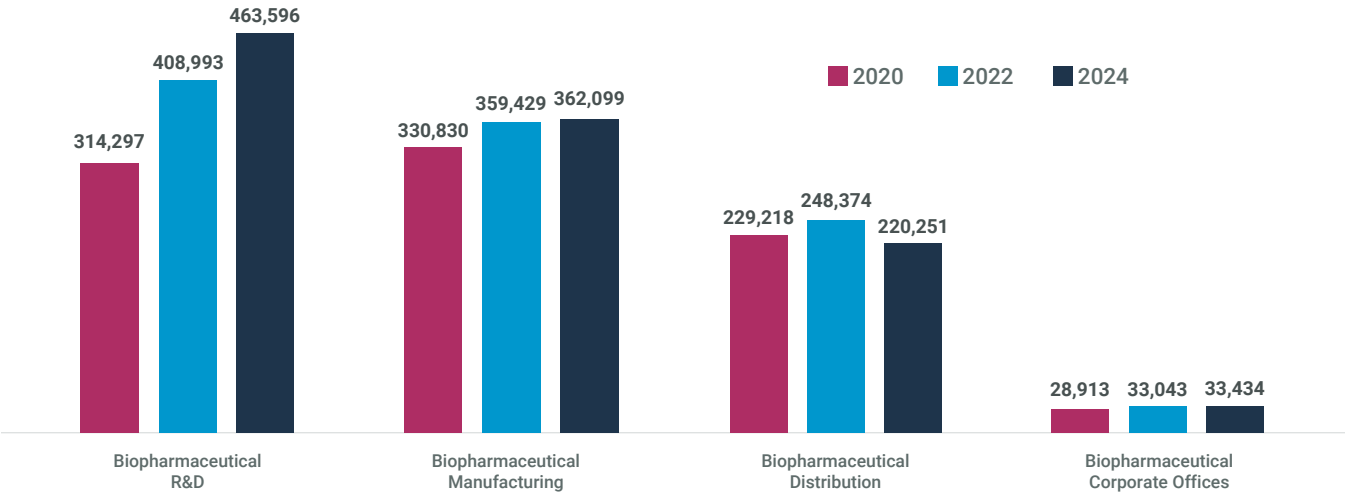
Table 1: U.S. Biopharmaceutical Industry Employment by Sector, 2024

Biopharmaceutical Sector	Estimated Sector Employment	Share of Total Industry Employment
Biopharmaceutical R&D	463,596	43.0%
Biopharmaceutical Manufacturing	362,099	33.5%
Biopharmaceutical Distribution	220,251	20.4%
Biopharmaceutical Corporate Offices	33,434	3.1%
Total	1,079,380	100.0%

Source: 2024 Bureau of Labor Statistics (BLS), Quarterly Census of Employment and Wages (QCEW) and Current Population Survey (CPS) Employment Data; TEConomy analysis, calculations, and estimations.

A combination of consolidations and productivity increases likely led to a decline of more than 28,000 jobs in the biopharmaceutical distribution sector from 2022 to 2024. This decline reduces the sector's share of the industry by 3.3 percentage points to 20.4 percent. Distinct biopharmaceutical corporate offices employment showed a slight increase and accounts for just over 3 percent or 33,434 jobs in 2024.

Figure 1: Changes in Biopharmaceutical Industry Sector Employment, 2020, 2022, 2024



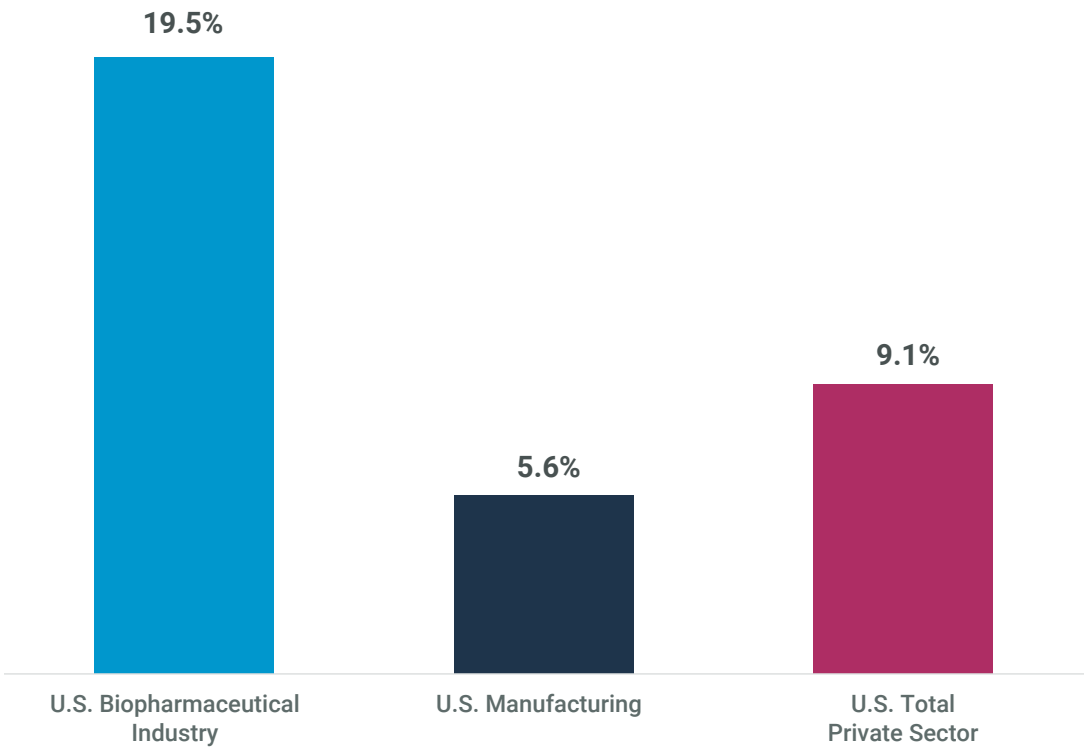
Source: TEConomy analysis, calculations, and estimations.



Comparative Employment Growth of the U.S. Biopharmaceutical Industry

An important and defining characteristic of the U.S. biopharmaceutical industry has been its ability to weather economic downturns providing important stability to both the production of life saving medicines and to the U.S. and regional economies in which they operate. **Figure 2** provides a comparison among the U.S. biopharmaceutical industry, overall U.S. manufacturing, and the overall U.S. private sector employment from 2020 to 2024 reflecting the recent employment growth success of the U.S. biopharmaceutical industry coming out of the COVID-19 pandemic.

Figure 2: Comparative Industry Employment Change, 2020 – 2024

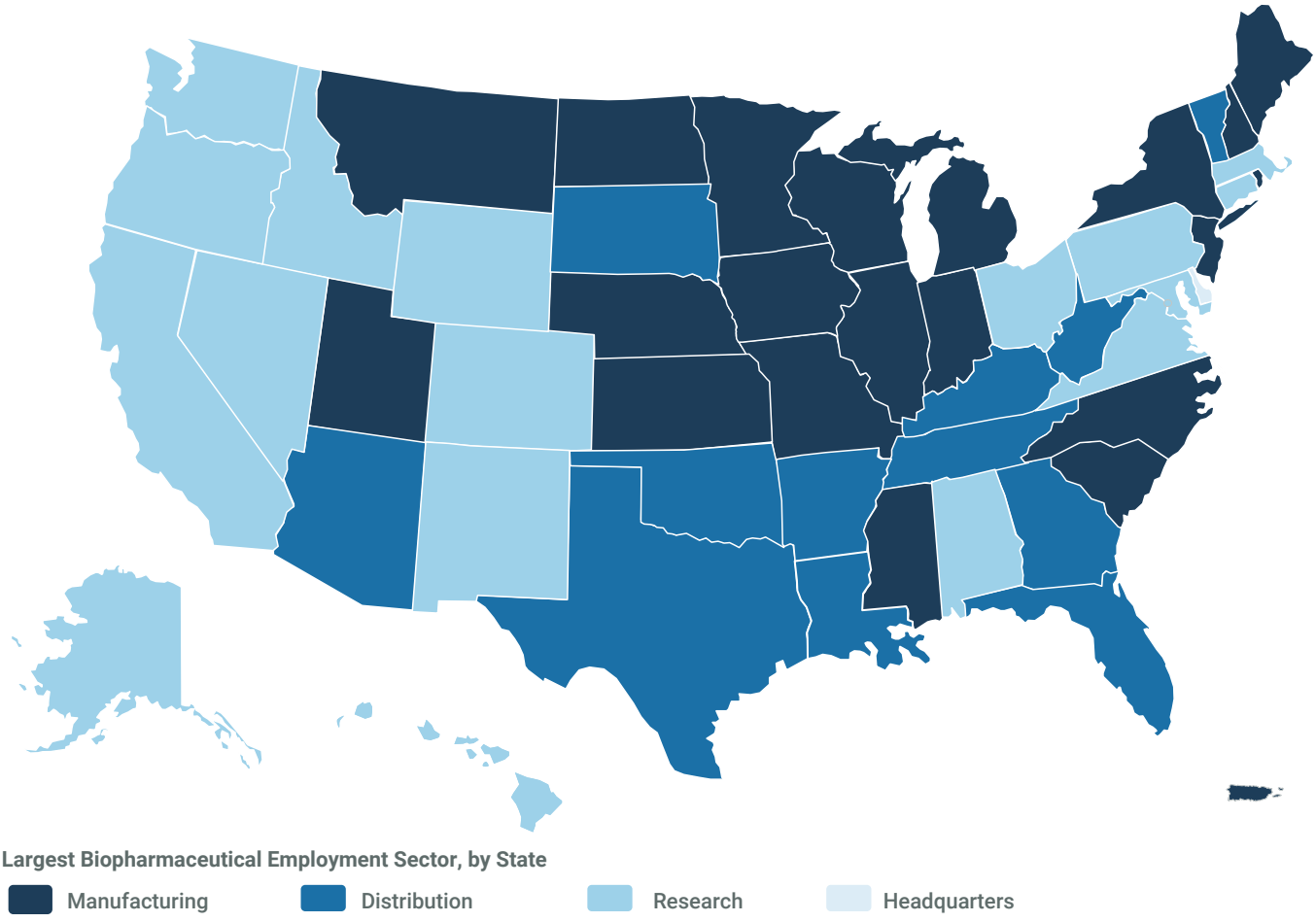


Source: TEConomy analysis, calculations, and estimations; BLS Data.

Geographic Structure of the U.S. Biopharmaceutical Industry

The total employment size of the biopharmaceutical industry varies by state with the sectoral distribution of the industry also varying widely. While many of the leading overall states have significant employment in all four biopharmaceutical industry sectors, there is significant and important geographic variation when we examine each state's largest sector (**Figure 3**). For the first time, the biopharmaceutical corporate offices sector rises the the largest sector within a state with Delaware in 2024. With the increases in the biopharmaceutical R&D sector and the decline in the biopharmaceutical distribution sector, a number of states shifted to new "dominant" sectors including Nevada, Oregon, and Ohio shifting from distribution to research, and Colorado and New Mexico shifting from manufacturing to research, among others.

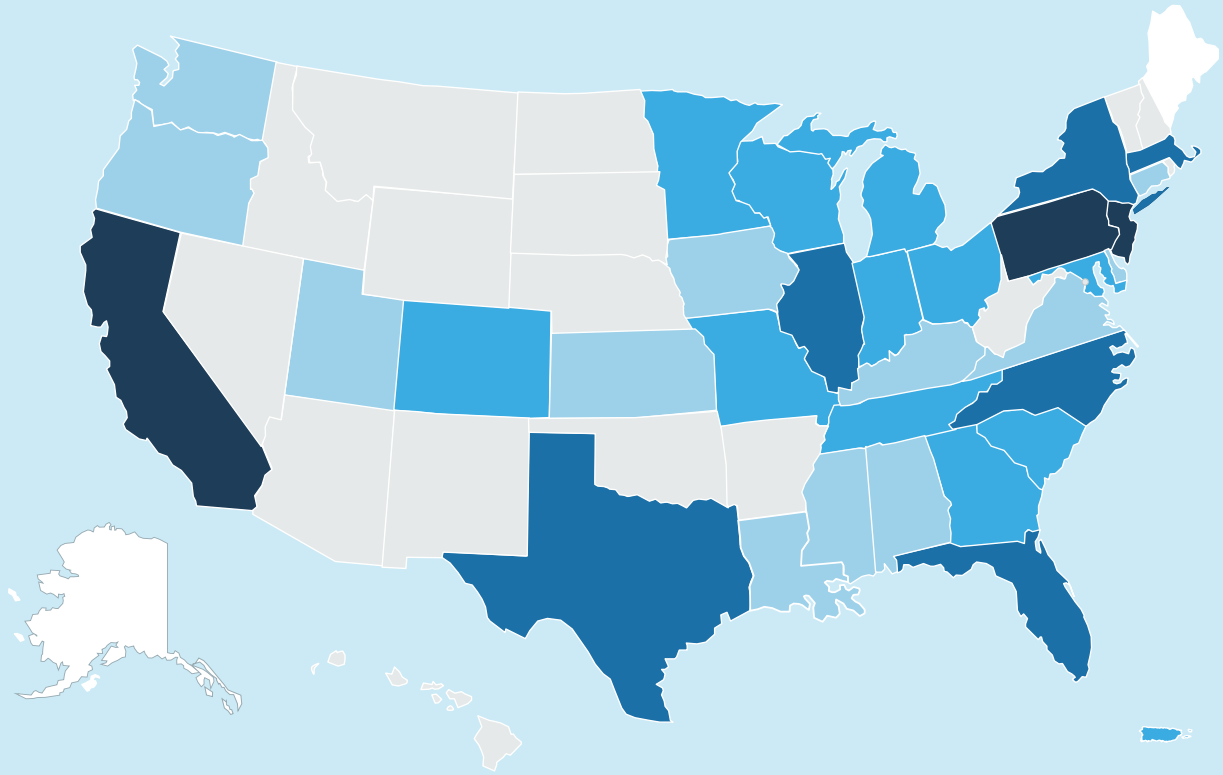
Figure 3: Geographic Distribution of Largest Biopharmaceutical Industry Sector by Employment, 2024



Source: TEConomy data, calculations and analysis.

FDA-Registered Biopharmaceutical Manufacturing Establishments Across the Nation

Beyond employment, another approach to examining the geographic footprint of the biopharmaceutical industry is by assessing the number of locations in each state that are manufacturing or performing another production-related operation (e.g., sterilization, packaging, labeling) involving one or more FDA-regulated biopharmaceutical product.



U.S. Biopharmaceutical FDA Registered Production Locations, April 2022

100+ locations | 50-99 locations | 25-49 locations | 10-24 locations | 1-9 locations | No Registered Locations

In 2026, the most recent year available, there are 1,527 facilities across the country involved in the manufacturing and production of FDA-approved human-use products under current Good Manufacturing Practice regulations.

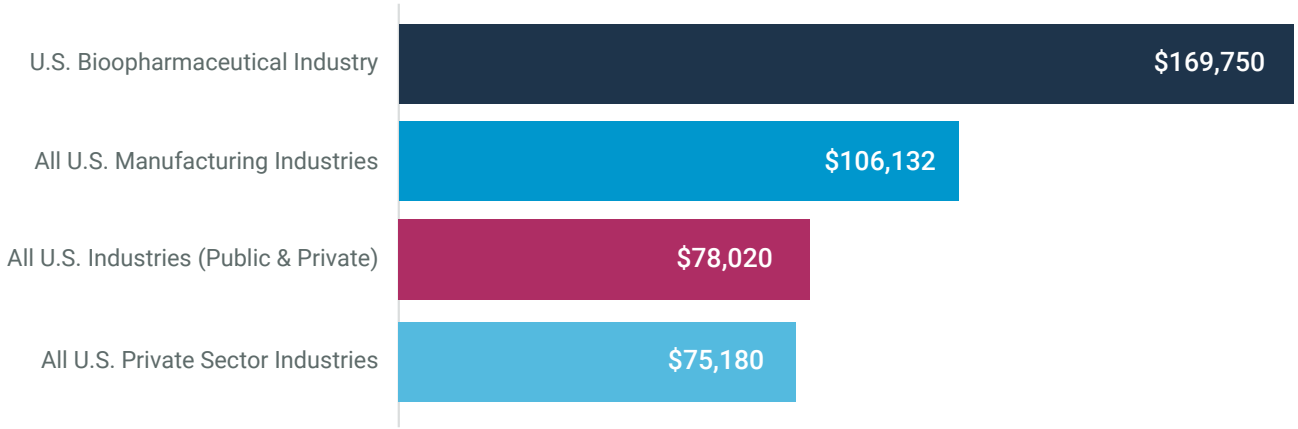
- These facilities are spread across 48 states and Puerto Rico.
- 32 states and Puerto Rico have 10 or more facilities manufacturing FDA- approved medicines.
- Three states – New Jersey, California, and Pennsylvania – have 100 or more registered locations with 187, 146, and 100, respectively.

Source: NDP Analytics for PhRMA, 2026 FDA U.S. Pharmaceutical Establishments Analysis, February 2026.

High-Wage and High-Quality Jobs from a High-Value Industry

The biopharmaceutical industry, whether in its manufacturing, R&D, distribution, or corporate office sectors, is a generator of high-wage and high-quality jobs. For 2024 the 1.08 million U.S. biopharmaceutical industry jobs generated more than $183 billion in total personal income (including both wages and benefits; also referred to as total compensation)—averaging nearly $170,000 in annual compensation per worker (**Figure 4**). This is more than twice the national private sector average of $75,180 and the national all employment (including public sector jobs) average of $78,020. Furthermore, as a driver of the U.S. economy the biopharmaceutical industry average compensation is significantly higher than the U.S. manufacturing average of $106,132—a robust indication of the high quality jobs that the biopharmaceutical industry provides to U.S. workers.[3]

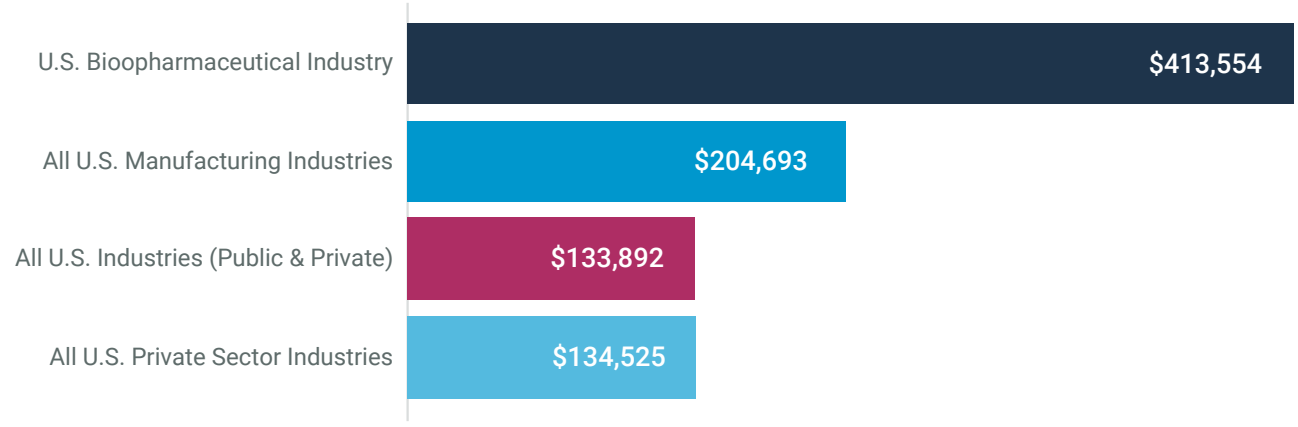
Figure 4: Comparative Average Annual Employee Compensation, 2024



Source: TEConomy estimations of 2024 Industry Employment and Total Labor Income using IMPLAN models.

This significant level of employee compensation, made possible by the value-added nature of U.S. biopharmaceutical industry, is also reflected in an extremely high productivity measure for the industry, exceeding $413,000 in value added per worker in 2024, compared to a value-added per worker of nearly $205,000 for overall U.S. manufacturing and a measure of approximately $134,000 per worker across all U.S. industries (**Figure 5**). [4]

Figure 5: Comparative Average Productivity, 2024



Source: TEConomy estimations of 2024 Industry Employment and Value Added using IMPLAN models.

Occupationally Diverse Workforce

The U.S. biopharmaceutical industry relies on skilled talent across a range of job titles, occupational categories and educational levels, including those with skills, education, and training in science, technology, engineering, and math (STEM) and those with capabilities in business, management, and finance. The diverse set of jobs and occupations required by the industry can range from those requiring a graduate degree, such as positions in R&D and senior management, to jobs in skilled labor positions such as manufacturing technicians and other production, logistics, and support personnel, requiring significant levels of on-the-job training.

Developing the U.S. Biopharmaceutical Industry Occupational Structure

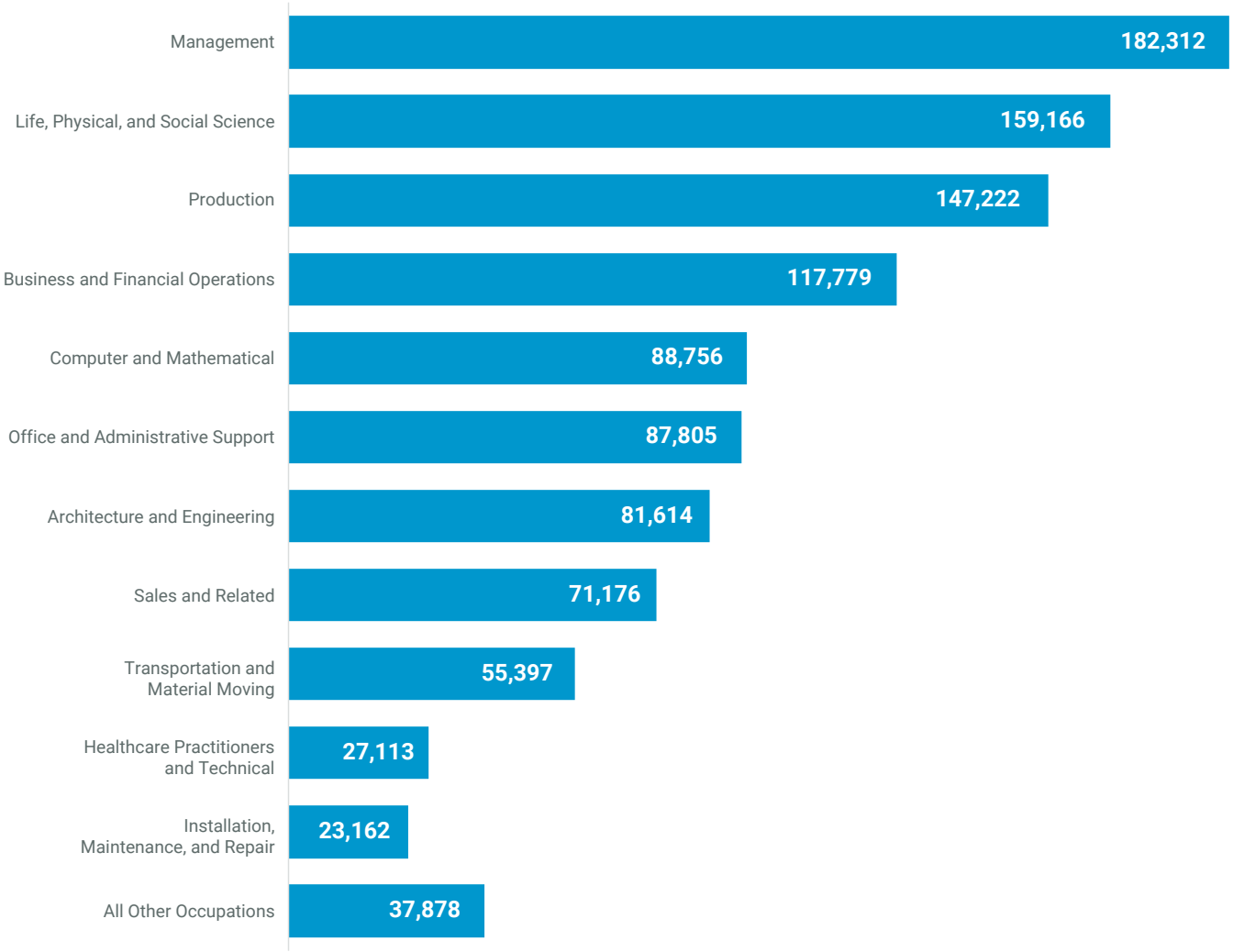
Using U.S. Bureau of Labor Statistics 2024 Occupational Employment by Industry data and the individual biopharmaceutical sector employment totals, weighted shares of U.S. occupational employment by major category are calculated for this analysis.

Using NAICS-specific occupational information from the U.S. Bureau of Labor Statistics, a composite 2024 occupational profile is developed for the overall U.S. biopharmaceutical industry based upon the occupational requirements of each of the four biopharmaceutical industry sectors. **Figure 6** shows the estimated biopharmaceutical industry employment across key occupational categories and **Figure 7** compares the occupational structure of the U.S. biopharmaceutical industry to overall U.S. manufacturing, and U.S. total private sector occupational employment.

As shown in **Figure 6**, the biopharmaceutical industry employs more than 100,000 workers in each of four occupational categories: management (182,312), life, physical, and social science (159,166), production (147,222), and business and financial operations (117,779). When compared to the similar 2022 occupational data, all the occupations showed growth in 2024 numbers except Office and Administrative Support (down approximately 9 percent) and Sales and Related occupations (down approximately 7 percent).



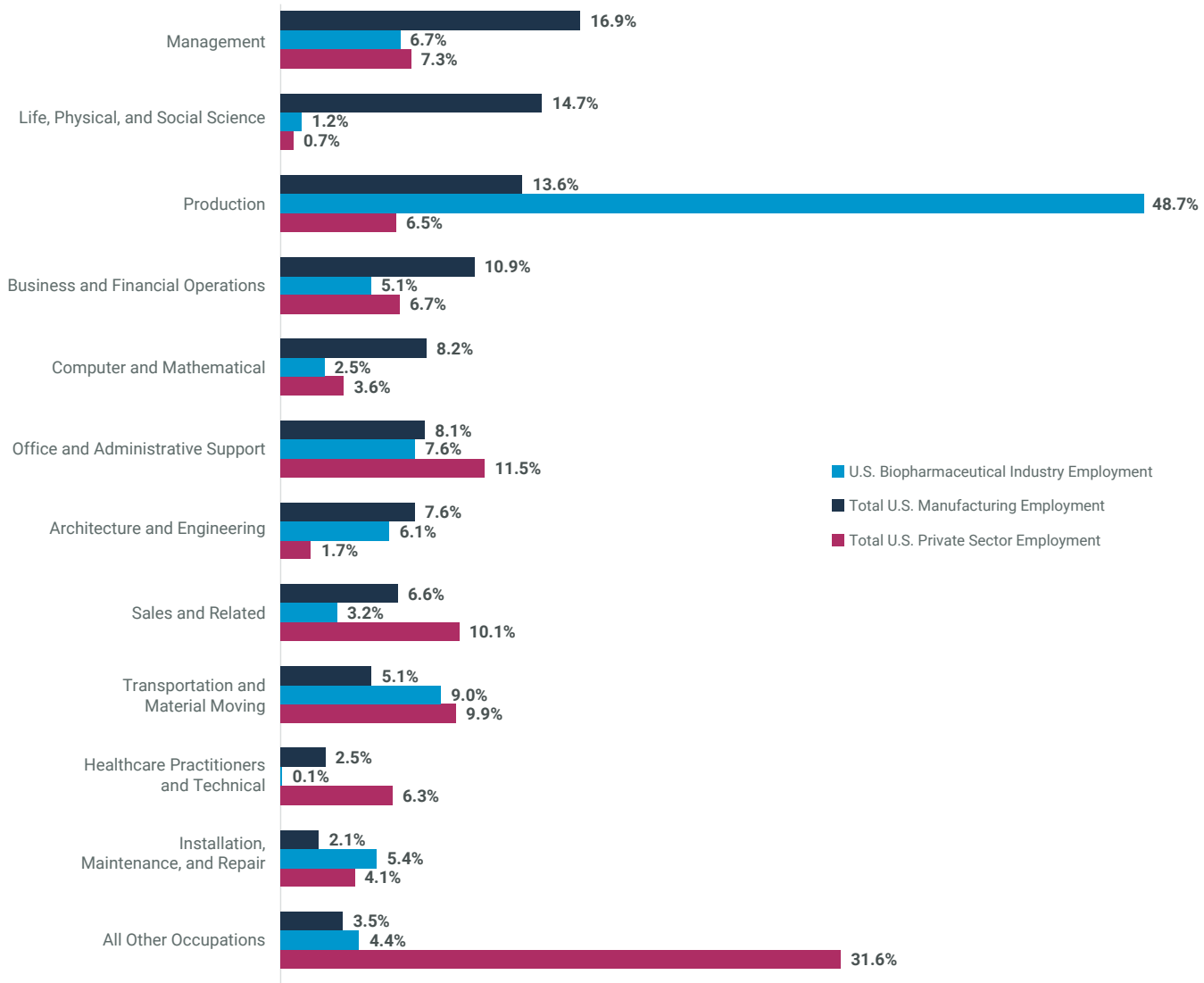
Figure 6: U.S. Biopharmaceutical Industry Estimated Employment by Major Occupational Category, 2024



Source: TEConomy estimations using U.S. Bureau of Labor Statistics (BLS) Occupational Employment by Industry, 2024

Comparatively, **Figure 7** shows that in 2024 16.9 percent of biopharmaceutical industry employment is classified into the management occupational category (that includes many individuals, educated and skilled in other occupations, that have moved into a managerial role). As should be expected, life, physical, and social science occupations account for a significantly higher proportion than both manufacturing and overall private sector employment, reaching 14.7 percent. Production occupations, occurring primarily within the biopharmaceutical manufacturing sector, account for 13.6 percent of the biopharmaceutical industry's total employment. The biopharmaceutical industry also provides significant employment in other broad areas with diverse educational and skill requirements. Business, financial, and sales-related occupations are spread throughout the four subsectors and combine for 10.9 percent of the biopharmaceutical industry's total employment. Taken together computer and mathematical occupations and architecture and engineering occupations account for a combined 15.8 percent of the industry's workforce. Office and administrative workers spread across the industry account for 8.1 percent of the workforce. Transportation and material moving occupations, related to receiving supplier inputs and shipping finished products, account for 5.1 percent of total employment.

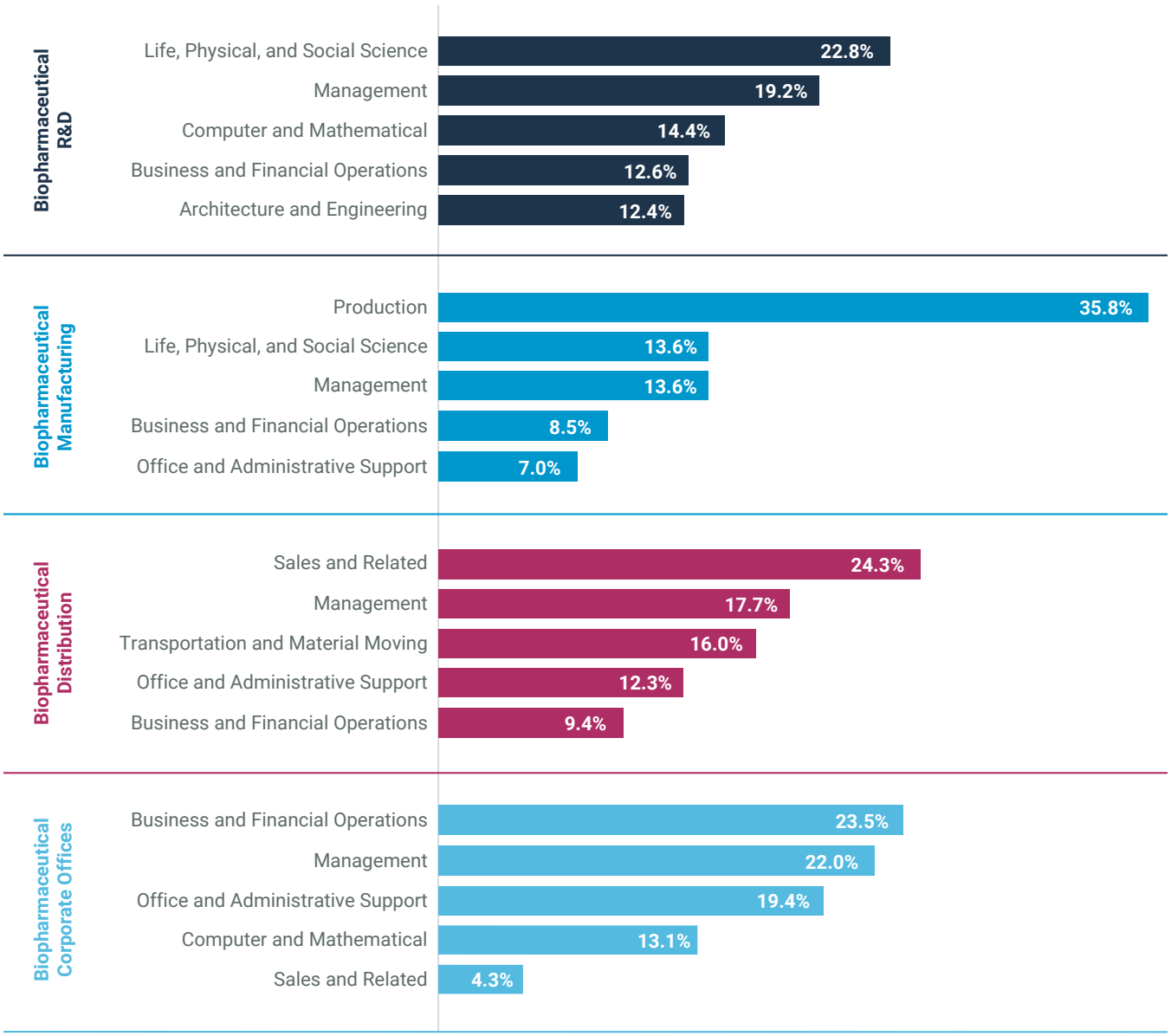
Figure 7: Comparative Occupational Profile (Percent of Jobs), 2024



Source: U.S. Bureau of Labor Statistics (BLS) Occupational Employment by Industry, 2024, and TEConomy estimations.
"All Other Occupations" includes Arts & Design, Construction, Healthcare Support, Legal, and more.

Figure 8 provides additional details of the key (top five) occupational groups within each of the four sectors of U.S. biopharmaceutical industry. For each of the biopharmaceutical sectors, the key occupational categories account for roughly 80% of that biopharmaceutical sector's employment. Of note, is that the life, physical, and social science occupational category is among the key occupations for two biopharmaceutical industry sectors: R&D and manufacturing. Also of note is that both management and business and financial operations are key occupations across all four biopharmaceutical industry sectors: R&D, manufacturing, distribution, and corporate offices.

Figure 8: Key Occupations by U.S. Biopharmaceutical Sector (Percent of Jobs), 2024



Source: U.S. Bureau of Labor Statistics (BLS) Occupational Employment by Industry, 2024, and TEConomy estimations.

From a state industry perspective, management occupations account for 15 percent or more of the state's biopharmaceutical employment in every geography except Puerto Rico, with this occupation accounting for approximately 20 percent of the workforce in Delaware. Life, physical, and social science occupations account for 15 percent or more of the industry workforce in 16 states including New Mexico where this occupational category accounts for approximately 21 percent of the state's workforce. Production workers account for 15 percent or more in 23 states and account for approximately 29 percent of the industry workforce in Puerto Rico. *Details of key occupational shares, by state, are provided in* ***Appendix B***.

To provide further occupational-related details, **Table 2** shows key (top five) detailed occupations and example job titles found among recent U.S. biopharmaceutical industry job postings. This table highlights both the diversity of employment opportunities within the industry, but also the interconnected nature of these occupations. For example, while the management occupational group continues to increase in size over the last decade, this structure corresponds with growth in manager numbers across many distinct occupational groups (e.g., production, sciences, engineering) and job titles (e.g., clinical research coordinator, strategic operations manager, oncology medical director, manufacturing supervisor). Similarly, though the sales and related occupational group is only a top five occupation within biopharmaceutical distribution it also shows that while considered a more "business" function, employed individuals often have biomedical focus areas that typically require some level of scientific, technical, or engineering education and/or background (e.g., oncology account manager, pharmaceutical sales representative).

Table 2: U.S. Biopharmaceutical Industry: Top Five Occupations and Example Job Titles, 2024

U.S. Biopharmaceutical Sector	Detailed Occupations – Top 5 by Share of Jobs	Example Job Titles
Biopharmaceutical R&D	Medical Scientists, Except Epidemiologists	Principal Scientist, Director of Pharmacology, Pharmaceutical Development Scientist
	Software Developers	Application Developer, Full Stack Web Developer, Application Architect
	Natural Sciences Managers	Clinical Research Coordinator, Principal Investigator, Program Portfolio Manager
	General and Operations Managers	Site Director, Strategic Operations Manager, Director of Commercial Operations
	Biological Technicians	Research Associate, Research Pharmacologist, Process Development Associate

U.S. Biopharmaceutical Sector	Detailed Occupations – Top 5 by Share of Jobs	Example Job Titles
Biopharmaceutical Manufacturing	Packaging and Filling Machine Operators	Packaging Technician, Aseptic Technician, Packaging Operator
	Chemical Equipment Operators	Lead Manufacturing Technician, Filling Technician, Formulators
	Inspectors, Testers, Sorters, Samplers, and Weighers	Quality Control Technician, Quality Assurance Specialist, Regulatory Technician
	First-Line Supervisors of Production and Operating Workers	Manufacturing Supervisor, Planning/Scheduling Manager, Packaging Supervisor
	Chemists	Analytical Scientist, Principal Scientist, Production Chemist
Biopharmaceutical Distribution	Sales Representatives	Pharmaceutical Sales Representative, Account Director, Oncology Account Manager
	General and Operations Managers	Director of Operations, Strategic Partnership Executive, Optimization Manager
	Laborers and Freight, Stock, and Material Movers	Warehouse Associate, Shipping Material Handler, Warehouse Equipment Operator
	Stockers and Order Fillers	Receiving Team Lead, Pharmacy Support Specialist, Inventory Manager
	Customer Service Representatives	Customer Support Specialist, Order Management Representative, Customer Integration Manager
Biopharmaceutical Corporate Offices	General and Operations Managers	Brand Operations Manager, Director of Strategy and Operations, Area Business Manager
	Customer Service Representatives	Capacity Management Specialist, Customer Solutions Specialist, Customer Care Associate
	Accountants and Auditors	Accounting Manager, Global Compliance Director, Regulatory Compliance Auditor
	Software Developers	Data Visualization Specialist, Computational Biologist, Process Integration Manager
	Financial Managers	Accounts Receivable Managers, Forecasting Manager, Manufacturing Finance Manager

Source: U.S. Bureau of Labor Statistics (BLS) Occupational Employment by Industry, 2020, Lightcast Job Posting Data and TEConomy estimations.

Key Driver of U.S. Innovation Economy

The U.S. biopharmaceutical industry, while part of a global biopharmaceutical industry, is the world leader in the development of new small-molecule drugs, large molecule biologics, vaccines, diagnostics, and other products.

While these efforts provide significant health and quality of life benefits to U.S. (and global) citizens, it also contributes to the biopharmaceutical industry being one of the nation's most innovative industries, while generating significant activity and contributions within the U.S. economy.

The economic impacts, or more precisely the revenue and expenditure impacts, of the U.S. biopharmaceutical industry can be estimated and measured using the well-established regional economic analysis technique of input-output (I-O) analysis. I-O analysis tracks the revenues of an industry, the related economic activity of purchases from its suppliers, and the spending of employees within the economy. For this analysis a customized 2024 IMPLAN I-O model is used to quantify and estimate the interrelationships between the U.S. biopharmaceutical industry, as defined in this report, and the remaining sectors of the U.S. economy.[5] Additionally, 2024 state IMPLAN models are used to capture economic activities at the state level. See ***Appendix A*** for a detailed discussion of data sources and methodology.

Definition of Impact Variables

Employment: The number of individuals whose employment is due, totally (direct employment) or in part (indirect or induced employment) to the economic effects of the industry.

Labor (Personal) Income: Salaries, wages, and the full cost of benefits including non-cash payments received by individuals in the economy. Includes employee compensation and sole proprietor income.

Value-Added: The difference between an industry's total output and the cost of its intermediate inputs; sometimes referred to as the industry's "Contribution to Gross Domestic Product (GDP)".

Output: The dollar value of industry production (e.g., sales or revenue).

Personal Tax Revenue: The dollar value of taxes generated due to the creation of personal income; includes both individual and company paid portion of social security taxes.

Economic impacts consist of three types: ***direct effects*** (the specific employment and economic activity stemming from the biopharmaceutical industry production and revenues), ***indirect effects*** (the impact of biopharmaceutical industry purchases from its suppliers and from these suppliers as they purchase inputs to meet the biopharmaceutical industry's demand), and ***induced effects*** (the additional economic activity generated by the spending of biopharmaceutical industry employees and suppliers' employees in the economy that can

be attributed to the biopharmaceutical industry expenditures). Taken together, these three economic effects combine to form the ***total impacts*** of the U.S biopharmaceutical industry. In other words, the I-O analysis models the "ripple effect" throughout the economy that originates from direct biopharmaceutical industry revenues and expenditures, flows through industry suppliers as they buy additional inputs, and through industry and supplier workers who spend their wages in their state and U.S. economies.

The Economic Impact of the U.S. Biopharmaceutical Industry

The U.S. biopharmaceutical industry's total output impact, often referred to as "total economic impact" totaled nearly $1.74 trillion in 2024.[6] This total industry impact includes $838 billion of biopharmaceutical businesses sales (direct output effect) and $902 billion in indirect and induced output effects. These values generate a biopharmaceutical industry output multiplier of 2.08—meaning that every $1.00 in output produced by the biopharmaceutical industry supports an additional $1.08 in output in other sectors of the U.S. economy (**Table 3**).

The operations and sales revenue of the biopharmaceutical industry is responsible for supporting more than 4.8 million jobs throughout the U.S. economy. These jobs consist of the nearly 1.1 million U.S. biopharmaceutical industry jobs detailed earlier in this report and the 3.8 million indirect and induced jobs supported by the industry in 2024. For every one biopharmaceutical industry job, the industry supports an additional 3.49 jobs in the U.S. economy, for a total employment multiplier of 4.49.

Table 3: Economic Impacts of the U.S. Biopharmaceutical Industry, 2024 ($ in billions)

Impact	Employment	Labor Income	Value Added	Output	State & Local Personal Tax Revenue	Federal Personal Tax Revenue
Direct Effect	1,079,380	$183.23	$446.38	$837.68	$4.70	$37.46
Indirect Effect	1,559,659	$142.06	$232.20	$431.02	$3.30	$29.47
Induced Effect	2,204,508	$149.05	$278.42	$470.81	$3.47	$30.84
Total Impacts	**4,843,547**	**$474.33**	**$957.00**	**$1,739.51**	**$11.46**	**$97.77**
Multiplier	4.49	2.59	2.14	2.08		

Source: TEConomy data, calculations and analysis; IMPLAN 2024 U.S. model.

The biopharmaceutical industry's direct value added of more than $446 billion represents 1.5 percent of U.S. Gross Domestic Product (GDP) in 2024. The total value added impacts generated and supported by the industry across the economy reached $957 billion, or 3.4 percent of total U.S. GDP.[7]

Together, the biopharmaceutical industry employees and the workforce of its suppliers and other impacted segments of the U.S. economy received over $474 billion in combined wages and benefits (also known as labor income or total compensation) in 2024. Through this total compensation the biopharmaceutical industry employees and its supplier employees are an important generator of federal, state, and local government tax revenues. The impact analysis estimates that this combined total compensation generates over $109 billion in personal taxes in 2024 — more than $11 billion in state and local personal tax revenues and nearly $98 billion in federal personal tax revenues.

Economic Impacts Across the Biopharmaceutical Industry's U.S. Supply Chain

The biopharmaceutical industry requires a vast array of inputs and suppliers for research, operations, production, and distribution. The demand interrelationship with the industry's supply chain is captured within the indirect effects, as a part of the overall economic impacts. The I-O analysis assesses the product and service input demands of the U.S. biopharmaceutical industry on every other sector in the U.S. economy and estimates the industry-specific impact for each supplier sector. **Table 4** provides a detailed characterization of the major supply chain inputs (using grouped IMPLAN industry sectors for simplicity and clarity) to the U.S. biopharmaceutical industry as determined by, and ordered by, the size of the indirect output effects. As expected, the 2024 IMPLAN models reflect some more recent and important changes to the U.S. biopharmaceutical supply base. For example, while the 2022 data showed real estate services as the largest supplier sector in terms of value, that position has been diminished (now ranked 4th) as microelectronics have become an increasingly important component of both actual products (e.g., smart drug injector pens) and distribution (e.g., RFID for logistics and chain of custody control). The microelectronics sector now supplies the biopharmaceutical industry with $56 billion in input value. Both business support and related services and financial services are also now larger inputs than real estate services. The industry also purchased nearly $24 billion in software, computer services, and internet connectivity/hosting. From a product input perspective, beyond microelectronics various organic/inorganic chemical inputs (such as raw materials, excipients, or in some instances active pharmaceutical ingredients) accounted for more than $16 billion in direct production demand and likely a significant share of the $6 billion in inputs from the wholesale - miscellaneous nondurable goods sector as well.

Table 4: Supply Chain Inputs to the U.S. Biopharmaceutical Industry – Sectors, Jobs, and Sales, 2024

Biopharmaceutical Industry Key Supplier Sectors	Supplier Jobs	Supplier Sales ($B)
Microelectronics (e.g., sensors, RFID tags)	59,109	$55.99
Business Support & Related Services	60,931	$38.72
Financial Services	95,229	$33.96
Real Estate Services	153,439	$31.33
Software, Computer Services, and Internet	45,033	$23.94
Marketing, Advertising, & Public Relations Services	55,142	$18.01
Organic/Inorganic Chemical Inputs	7,587	$16.48
Other R&D Services	52,086	$15.64
Electric Power Utilities	9,347	$12.58
Wholesale - Electric/Electronic Equipment	16,360	$12.27
Legal Services	47,996	$11.55
Facility & Operational Services	90,433	$10.46
Management Consulting Services	61,591	$9.74
Architectural & Engineering Services	46,965	$8.99
Employment Services	94,616	$8.84
Truck Transportation	40,009	$7.87
Environmental & Other Technical Services	31,811	$7.51
Intellectual Property Management & Licensing	1,035	$7.05
Warehousing & Storage	73,184	$6.62
Wholesale - Miscellaneous Nondurable Goods	22,025	$6.32
Plastics/Plastic Packaging	12,674	$6.27
Couriers & Express Parcel Delivery	126,151	$5.20
Commercial/Industrial Equipment Repair	35,341	$4.97
Printing	21,571	$4.38
Accounting Services	25,262	$3.60
Paper/Cardboard Packaging	5,511	$3.55
Telecommunication Services	5,245	$3.50
Repair/Remodel Construction	16,575	$3.23
Wholesale - Other Durable Goods	7,366	$2.53
Wholesale - Miscellaneous Machinery & Equipment	7,667	$2.35
Logistics & Support Activities	23,361	$2.25
Key Food-Related Inputs (e.g., starches, whey, proteins, cellulose, alcohols, flavorings)	2,217	$2.12
Wholesale - Commercial/Industrial Equipment	6,062	$1.78
Commercial/Industrial Equipment Leasing	3,450	$1.64
Industrial, Processing, & Control Equipment	2,003	$0.80
Natural Gas, Water, & Other Utilities	1,093	$0.72
Other Packaging	812	$0.43
Laboratory Equipment	895	$0.30
Telecommunications Equipment	343	$0.20
Computer Equipment, Storage, and Peripherals	127	$0.12
All Other Suppliers	192,007	$37.24
Total Indirect (Supply Chain) Impacts	1,559,659	$431.02

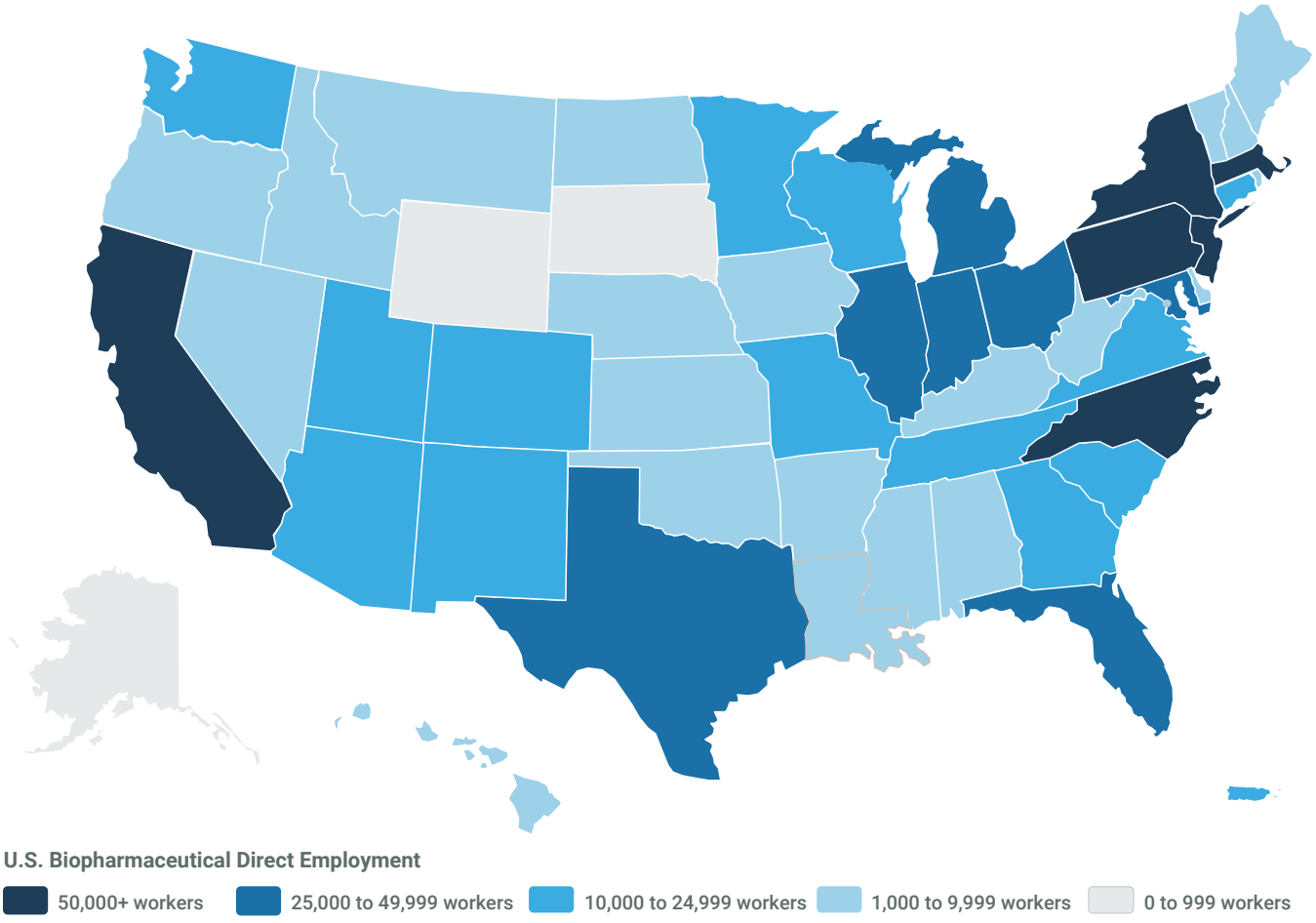
Source: TEConomy data, calculations and analysis; IMPLAN 2024 U.S. Model.

Nationwide Employment and Impacts of the U.S. Biopharmaceutical Industry

A key measure of its importance and significance of the U.S. biopharmaceutical industry is its **diverse geographic representation—with every state, the District of Columbia, and Puerto Rico having some direct biopharmaceutical industry employment and experiencing some level of economic impact from the industry.**

Figure 9 illustrates direct biopharmaceutical industry employment across all 50 states, the District of Columbia, and Puerto Rico. The industry has its largest presence in seven states—California, Massachusetts, New Jersey, New York, Pennsylvania, North Carolina, and Texas—each having more than 50,000 biopharmaceutical industry workers across research, manufacturing, distribution and corporate functions. In total, 26 states and Puerto Rico have more than 10,000 biopharmaceutical industry workers, with seven more states having between 5,000 and 10,000 industry jobs.

Figure 9: Geographic Distribution of U.S. Biopharmaceutical Industry Direct Employment, 2024



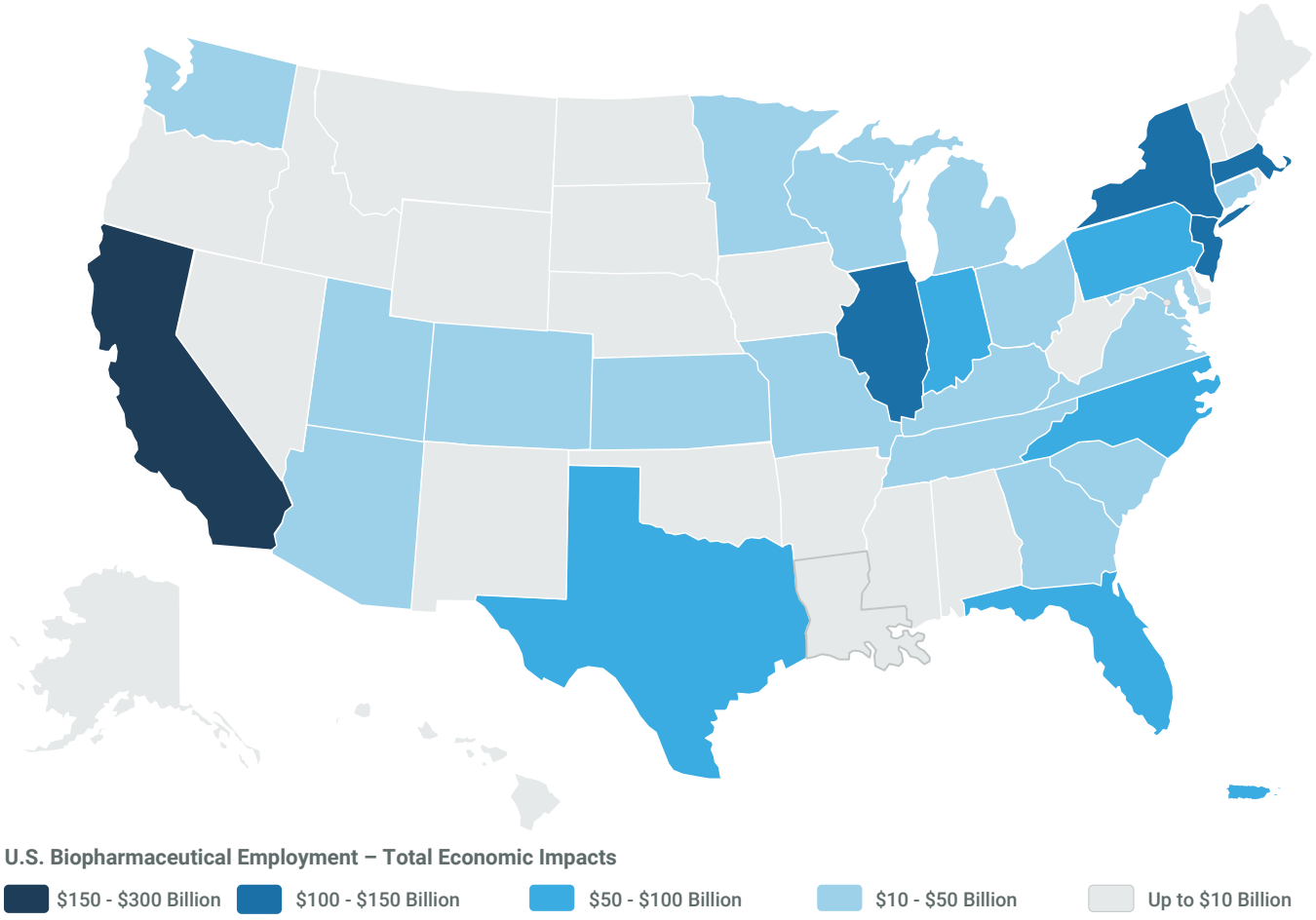
Source: TEConomy data, calculations and analysis.

The distribution of the U.S. biopharmaceutical industry's total employment impacts reflects, in part, the large-scale, geographically dispersed, supply chain. For suppliers (indirect employment), there are nine states where the industry supports more than 50,000 supplier jobs, and another twelve states and Puerto Rico with between 20,000 and 50,000 supplier jobs.

Combining direct, indirect, and induced employment, the biopharmaceutical industry generates and supports more than 350,000 jobs in three states—California, Massachusetts, and New Jersey—and includes six additional states with more than 200,000 jobs—Texas, Pennsylvania, New York, North Carolina, Florida, and Illinois. Overall, 33 states and Puerto Rico each have more than 20,000 jobs generated and supported by the biopharmaceutical industry.

California by far generates the single largest geographic component of U.S. biopharmaceutical economic impact—accounting for more than $290 billion, or 17 percent of the U.S. total output impacts (**Figure 10**). Additionally, nine states—New Jersey, Massachusetts, New York, Texas, Illinois, Pennsylvania, North Carolina, Florida, Indiana—and Puerto Rico, also obtain total biopharmaceutical industry economic impacts of $50 billion or more. Fully 48 states, and Puerto Rico, exceed $1 billion in total U.S. biopharmaceutical industry driven economic impact. ***Appendix B*** provides biopharmaceutical industry employment and total impact estimates by state.

Figure 10: Geographic Distribution of U.S. Biopharmaceutical Industry Total Economic (Output) Impacts, 2024



Source: TEConomy data, calculations and analysis; IMPLAN 2022 U.S., 50 States, District of Columbia, and Puerto Rico Models.

Discussion

The U.S. biopharmaceutical industry and the forward-looking policies that have historically supported industry growth and fostered R&D have resulted in the nation being the global leader in biopharmaceutical innovation. This industry consists of an extensive research, manufacturing, and distribution infrastructure that generates and supports significant impacts on economies across the country.

Important Driver of Innovation and Economic Impacts

- The U.S. biopharmaceutical industry reaches $838 billion in direct output in 2024, and with the ripple effect of this production throughout the U.S. economy, supports an additional $900 billion in output through its suppliers and other sectors of the economy. This combined, total output impact represents 3.4 percent of total U.S. output.
- Through its research, production, and overall operations, $446 million in value added from the U.S. biopharmaceutical industry directly contributes 1.3 percent of U.S. GDP and including indirect and induced effects supports a total $957 billion in value added impact, or 3.4 percent of U.S. GDP.

Sizeable and Growing Employment

- Direct employment of nearly 1.08 million workers and a substantial employment multiplier of 4.49, the U.S. biopharmaceutical industry supports more than 3.76 million additional U.S. jobs for a total employment impact of over 4.84 million jobs in 2024, an increase of 19.5 percent since 2020.
- The U.S. biopharmaceutical industry employment growth rate is more than twice the U.S. private sector growth rate and three times the overall U.S. manufacturing growth rate during this 2020-2024 period. This recent growth continues to demonstrate what makes the industry a key driver of the U.S. economy.

High-Wage, High-Quality, and High Productivity Jobs

- The average U.S. biopharmaceutical job had a total compensation level of nearly $170,000 per year in 2024—over $60,000 more than the average U.S. manufacturing job, and more than twice the U.S. average across all employment—biopharmaceutical industry jobs are both high-wage and high-quality.
- From an overall productivity perspective, the combined sectors of the U.S. biopharmaceutical industry, generates a productivity level of more than $413,000 per employee—more than twice that of the U.S. average manufacturing worker and more than three times the average U.S. worker.
- In 2024, the U.S. biopharmaceutical industry employed more than 100,000 workers in each of four occupational categories: Management (182,000+), Life, Physical, and Social Science (159,000+), Production (147,000+), and Business and Financial Operations (117,000+).

The U.S. biopharmaceutical industry is a major driver of innovation and economic growth both within the U.S. and globally. The industry's continued growth and resilience is reflected in the significant numbers of jobs for highly skilled, highly productive, and highly compensated workers across the country. But this unique industry and its substantial workforce cannot be taken for granted. To sustain this important driver of the U.S. economy, the U.S. biopharmaceutical industry must be supported by robust innovation policies including strong intellectual property protections and a pricing structure that rewards the industry's innovation and risk taking, a well-functioning and evidence-based regulatory system, support for research and development, and other policies that recognize both the societal and economic impacts of biopharmaceutical innovation.

Appendix A: Methodology

The following narrative provides an overview of the approach used to develop the 2024 biopharmaceutical industry employment and economic impact estimates at the national and state levels. This approach is similar to that used by TEConomy for prior studies for PhRMA.

Data Sources

Estimates of biopharmaceutical industry employment were derived by combining several widely used public and private data sources.

2024 Quarterly Census of Employment and Wages: Employment data for all relevant components of the biopharmaceutical industry were obtained from the U.S. Bureau of Labor Statistics (BLS) Quarterly Census of Employment and Wages (QCEW) for 2024. QCEW establishment, employment, and wage data is captured by each state as part of corporate unemployment insurance data collection efforts performed by their Labor Market Information (LMI) office and coordinated with and reported nationally to the BLS. QCEW employment data are categorized into the industry sectors using the North American Industrial Classification System (NAICS), which is the standard used by Federal statistical agencies to classify business establishments.

A single company in the biopharmaceutical industry may have many establishments (locations) throughout the U.S., and each of that company's establishments can be classified into different NAICS categories. For example, a biopharmaceutical company with three establishments may have a manufacturing facility in one location, an R&D facility in another location, and corporate offices in a third location. At the same time, companies often have these functions co-located, for example R&D and manufacturing in the same location. In these instances, the establishment is generally assigned to the NAICS category associated with the primary activity at that location.

U.S. and state-level (including the District of Columbia and Puerto Rico) biopharmaceutical industry employment is estimated by aggregating employment across all establishments belonging to the biopharmaceutical industry based on their NAICS classification, with refinements, using the approach described later in this Appendix.

2024 Current Population Survey: The BLS Current Population Survey (CPS) is a national-level survey that estimates the total employment spectrum of the U.S. including public and private sector wage and salary employees, corporate and self-employed workers, and unpaid family workers. While the QCEW data captures nearly all industry employment (approximately 98 percent of all U.S. jobs), it does not capture sole proprietors, consultants, contract employees, representatives, and other "non-corporate" or "self-employed" private sector employment. CPS data were used to adjust the QCEW data upwards to estimate the full spectrum of biopharmaceutical industry employment.

2022 Economic Census: Every five years the U.S. Census Bureau performs the national economic census to examine the detailed economic activities of U.S. industry, with the 2022 Economic Census the most recent. Changes in the release and availability of data from the Economic Census, has eliminated much of the state level detail by industry used in past analyses, forcing the current analysis to use the U.S. values as a proxy for each state. The U.S. data are collected at the NAICS code level across a set of North American Product Classification System (NAPCS) codes to detail what each industry produces. These values then allow for a determination of what share of a biopharmaceutical-related NAICS code's output is specifically biopharmaceutical-related. This share is then applied to the specific NAICS code's employment to estimate the employment attributable to the biopharmaceutical industry.

Corporate Headquarter Employment Data: With specific corporate sites and addresses to work from, individual biopharmaceutical-related headquarters locations were examined using data from Dun & Bradstreet and LinkedIn Talent Insights tool to better understand these locations' employment structure and head count. For those establishments that appeared to be dedicated to management activities only, additional work was performed including examination of corporate websites for additional information regarding these administrative locations. Based upon this analysis, employment was estimated for a set of key establishments for inclusion as part of the overall biopharmaceutical industry in the separate Biopharmaceutical Corporate Office sector. While every attempt is made to specifically identify these corporate and administrative office locations, the number of sites and employment values used in this analysis are likely conservative in nature.

2024 IMPLAN Models: The wider economic impact of the biopharmaceutical industry was estimated using the well-established regional economic analysis technique of input–output analysis (I-O), using custom I-O models from IMPLAN. The I-O analysis produces estimates of the economic impacts of the biopharmaceutical industry in the U.S., states, District of Columbia, and Puerto Rico economy, on jobs, personal income and related federal, state, and local taxes.

The IMPLAN models' data matrices track the flow of commodities to industries from producers and institutional consumers within the nation or within individual states. The data also model consumption activities by workers, owners of capital, and imports. The inter-industry trade flows built into the model permit estimating the impacts of one sector on all other sectors with which it interacts within the specified geography. For the U.S., 50 states, and the District of Columbia the 2024 models are the most current ones available at the time of this analysis. Due to additional times lags with source data, the Puerto Rico impact analysis is performed using the 2023 Puerto Rico IMPLAN model. All impact results are generated and reported in 2024 dollars.

The Structure of the U.S. Biopharmaceutical Industry

The biopharmaceutical industry's wide range of activities is spread across a set of different NAICS codes reflecting its presence within the U.S. economy. For purposes of this analysis, these NAICS codes are grouped into four industry subsectors: biopharmaceutical manufacturing, biopharmaceutical distribution, biopharmaceutical R&D, and biopharmaceutical corporate offices (**Table A1**).

Table A1: 2022 NAICS Structure Relevant to 2024 Biopharmaceutical Industry

Biopharmaceutical Manufacturing
325411 Medicinal and botanical manufacturing
325412 Pharmaceutical preparation manufacturing
325413 In-vitro diagnostic substance manufacturing
325414 Biological product (except diagnostic) manufacturing
Biopharmaceutical Distribution
424210 Drugs and druggists' sundries merchant wholesalers*
Biopharmaceutical R&D
541713 R&D in nanotechnology (including nanobiotechnology)*
541714 R&D in biotechnology (except nanobiotechnology)
541715 R&D in the physical, engineering, and life sciences (except nanotech and biotech)*
541720 R&D in the social sciences and humanities*
Biopharmaceutical Corporate Offices
551114 Corporate, subsidiary, and regional managing offices*

*Indicate NAICS codes that include both biopharmaceutical and non-biopharmaceutical employment and therefore require additional refinement and specification.

Biopharmaceutical Manufacturing

Biopharmaceutical manufacturing is defined to include 100 percent of the employment within the four six-digit industries within the encompassing NAICS 3254. While a very small portion of the manufacturing activity of companies falling into these codes may be for products not considered drugs or pharmaceuticals, the intent of these codes is to capture the manufacturers of all medicines, vaccines, diagnostics, and related biopharmaceuticals.

Biopharmaceutical R&D

The nature of biopharmaceutical R&D as a key and critical component of overall U.S. scientific R&D and a pipeline for innovation and new discoveries for the entire U.S. biopharmaceutical industry. Unfortunately, the 2022 vintage NAICS code structure, like previous structures, captures biopharmaceutical R&D, at some level, across all four six-digit industries under the encompassing NAICS 5417. Furthermore, discrepancies between the Economic Census (U.S. Census) and the QCEW data (U.S. BLS) in terms of the size of the six-digit NAICS industries 541713, 541714, 541715, and 541720 required additional adjustments to the estimation process. For each NAICS code, 2022 Economic Census data was used to capture a conservative share of the U.S. industry's output relevant to the biopharmaceutical industry including basic and applied R&D in biotechnology, biological sciences, and pharmacology and pharmaceutical sciences. R&D activities and employment within locations classified as biopharmaceutical manufacturing, distribution, or corporate offices are not captured within Biopharmaceutical R&D but are captured within the employment estimates for those distinct sectors.

Biopharmaceutical Distribution

The increasing importance of firms involved in the logistics and distribution of biopharmaceutical products, both in managing large and complex supply chains and as a source for industry innovation is acknowledged through their inclusion in this value-chain approach to estimating the size and impacts of the biopharmaceutical industry.

To succinctly specify a biopharmaceutical industry-related employment estimate from within NAICS 424210 (Drugs and druggists' sundries merchant wholesalers), an estimate are made of the size of these non-biopharmaceutical activities (e.g., "druggist sundries", miscellaneous medical supplies and equipment, and other retail consumer product distribution) using U.S. data from the 2022 Economic Census. This NAICS employment level is then reduced by this same percentage across the U.S. and all states.

Biopharmaceutical Corporate Offices

A characteristic at the core of the NAICS classification scheme is to allow for the classification of individual establishments based upon the functions occurring within a particular establishment. As with all large, multinational industries such as automotive and aerospace, a meaningful share of biopharmaceutical industry employment is captured within Management of Companies and Enterprises (NAICS 5511). TEConomy develop a special assessment and estimation process, as described previously, to capture, as best as possible these administrative locations and impacts.

It is important to recognize that employment within these four defined biopharmaceutical sectors is based on establishment-level data collection where a single NAICS code is assigned to the establishment (i.e., the physical business location) and all employment at that establishment is assigned to that NAICS code. The specific NAICS code is determined by the predominant or primary business activity occurring within the location and is typically determined by factors such as relative share of production costs, revenue, value of shipments, and in some instances employment. Due to this coding process sector-based job counts may over- or under-state actual functional employment to the extent multiple activities occur at a single establishment (e.g., collocated R&D and manufacturing). The total employment estimate is not affected, however.

Additional Refinements

For three of the four biopharmaceutical sectors – biopharmaceutical manufacturing, biopharmaceutical distribution, and biopharmaceutical R&D – CPS data are used to adjust the employment estimates to reflect the inclusion of self-employed workers. The CPS provides an estimate of the ratio of "self-employed" workers to the number of "private sector wage and salary workers" or corporate employment for each biopharmaceutical sector's grouping of NAICS codes. This share ranges from 0.3 percent in biopharmaceutical manufacturing to 2.2 percent in biopharmaceutical distribution in 2024. This share ratio is applied to the QCEW-based biopharmaceutical sector employment to arrive at a final biopharmaceutical sector employment estimate. Biopharmaceutical corporate office employment, given the process by which it is estimated is not adjusted in this fashion.

Final Biopharmaceutical Industry and Sector Employment Estimates

A summary of the NAICS-based employment for the components of the biopharmaceutical industry is provided in **Table A2**. The data entries show the estimated share of employment within that sector (four-digit NAICS code) that is attributed to the biopharmaceutical industry, the 2024 employment estimate, and the subsector's share of total biopharmaceutical industry employment.

Table A2: U.S. Biopharmaceutical Industry Sector Estimates, 2024

Biopharmaceutical Sector	NAICS Codes (4 Digit)	Total NAICS Employment	Biopharma Share of Sector	Biopharma-Related Sector Employment	Share of Total Biopharma Employment
Biopharmaceutical Manufacturing	3254 Pharmaceutical and medicine manufacturing	362,099	100.00%	362,099	43.0%
Biopharmaceutical Distribution	4242 Drug and druggist sundries wholesale	261,453	82.24%	220,251	33.5%
Biopharmaceutical R&D	5417 Scientific research and development (R&D)	928,069	49.95%	463,596	20.4%
Biopharmaceutical Corporate Offices	5511 Management of companies and enterprises	2,631,112	1.27%	33,434	3.1%
Total U.S. Biopharmaceutical Industry			1,079,380	100.0%	

Source: TEConomy analysis, calculations and estimations using 2024 BLS QCEW and CPS Employment Data for all 50 States, the District of Columbia, and Puerto Rico.

Total Economic Impact of the Biopharmaceutical Industry

The economic impact of the biopharmaceutical industry was estimated using the well-established economic analysis technique of input-output analysis (I-O), using custom I-O models from IMPLAN for each state, the District of Columbia, and Puerto Rico, as well as a U.S. national model. The IMPLAN models' data matrices track the flow of commodities to industries from producers and institutional consumers within the specific region. The data also model consumption activities by workers, owners of capital, and imports. The inter-industry trade-flows built into the models permit estimating the impacts of one sector on all other sectors with which it interacts.

The biopharmaceutical industry sector employment estimates described above serve as the inputs to drive the resulting impacts within the U.S. and individual state I-O models. The models, using the additional data embedded within the IMPLAN models, convert these employment estimates into localized income and expenditures. The estimation of ripple effect of these expenditures (including the spending of worker wages) generates the impact measures reported in this report. These measures include direct, indirect, and induced job creation, associated personal incomes, business value added, and output, and associated personal income tax generation to federal, state and local taxing authorities.

Appendix B

State-Level Data and Estimates

Table B1: U.S. and State Total Biopharmaceutical Industry Employment, 2024

State	Employment
U.S. Total (incl. District of Columbia & Puerto Rico)	1,049,839
Alabama	5,779
Alaska	247
Arizona	13,714
Arkansas	2,751
California	175,443
Colorado	16,367
Connecticut	12,015
Delaware	5,239
District of Columbia	2,389
Florida	41,826
Georgia	12,050
Hawaii	1,098
Idaho	3,897
Illinois	45,037
Indiana	30,286
Iowa	6,681
Kansas	7,930
Kentucky	6,446
Louisiana	3,189
Maine	5,951
Maryland	30,746
Massachusetts	99,494
Michigan	24,090
Minnesota	11,755
Mississippi	2,572
Missouri	15,832

State	Employment
Montana	1,309
Nebraska	4,442
Nevada	4,446
New Hampshire	4,400
New Jersey	76,644
New Mexico	11,550
New York	67,651
North Carolina	57,205
North Dakota	1,102
Ohio	26,752
Oklahoma	3,316
Oregon	6,033
Pennsylvania	58,098
Rhode Island	2,606
South Carolina	10,346
South Dakota	817
Tennessee	14,401
Texas	54,804
Utah	16,817
Vermont	1,231
Virginia	16,117
Washington	23,981
West Virginia	2,137
Wisconsin	13,576
Wyoming	268
Puerto Rico	16,507

Source: TEConomy data, calculations and analysis

Table B2: U.S. and State Total Impacts, 2024

State	Total Impacts						
	Employment	Labor Income ($M)	Value Added ($M)	Output ($M)	State/Local Personal Tax Revenue ($M)	Federal Personal Tax Revenue ($M)	Total Personal Tax Revenue ($M)
U.S. Total (incl. D.C. & Puerto Rico)	**4,843,547**	**$474,331.4**	**$957,001.4**	**$1,739,506.0**	**$1,062.7**	**$10,396.3**	**$97,768.6**
Alabama	21,240	$1,579.4	$3,013.7	$6,452.5	$1.7	$27.0	$310.4
Alaska	702	$57.1	$96.2	$206.4	$0.0	$0.2	$10.4
Arizona	69,256	$5,699.4	$10,621.1	$22,001.2	$4.9	$53.8	$1,173.8
Arkansas	13,120	$958.2	$2,193.1	$4,506.3	$0.3	$15.3	$195.5
California	790,941	$86,907.4	$173,816.7	$291,420.5	$63.9	$3,192.4	$17,995.8
Colorado	78,330	$7,197.6	$12,410.9	$24,671.4	$5.6	$107.7	$1,476.1
Connecticut	45,418	$4,994.8	$9,545.2	$16,517.6	$8.0	$131.7	$1,101.7
Delaware	18,688	$1,845.5	$5,695.3	$9,120.8	$0.0	$43.5	$365.7
District of Columbia	5,665	$915.9	$1,588.0	$2,527.7	$14.6	$0.0	$133.7
Florida	243,856	$19,498.3	$38,121.5	$76,648.2	$3.7	$12.1	$4,632.1
Georgia	60,554	$4,895.2	$10,260.6	$19,636.1	$4.3	$98.4	$984.1
Hawaii	3,989	$321.9	$584.0	$1,218.2	$0.5	$8.9	$62.1
Idaho	14,694	$1,102.0	$1,874.6	$3,973.1	$0.0	$29.9	$227.0
Illinois	243,223	$25,787.2	$55,726.4	$95,160.1	$0.3	$546.8	$5,300.1
Indiana	136,726	$14,293.5	$37,508.3	$61,654.3	$55.0	$252.1	$2,829.1
Iowa	24,813	$2,287.8	$4,453.1	$8,638.9	$1.4	$44.1	$438.1
Kansas	30,101	$2,533.0	$5,093.2	$10,939.9	$2.4	$52.4	$504.7
Kentucky	28,896	$2,429.5	$5,088.6	$10,202.2	$20.4	$45.6	$452.2
Louisiana	14,740	$1,137.0	$2,340.2	$4,982.6	$0.0	$21.0	$211.7
Maine	24,034	$1,927.5	$3,545.8	$7,591.4	$2.1	$45.0	$388.0
Maryland	112,495	$11,145.6	$21,353.5	$37,180.1	$174.4	$215.0	$2,278.5
Massachusetts	394,226	$46,417.7	$81,823.5	$133,549.3	$27.9	$1,407.5	$9,578.9
Michigan	107,692	$8,959.5	$16,960.1	$34,982.9	$15.7	$154.6	$1,829.1
Minnesota	59,844	$5,943.6	$10,139.5	$19,621.2	$4.3	$172.6	$1,183.9
Mississippi	10,034	$671.4	$1,390.4	$3,325.3	$0.6	$10.1	$134.1

State	Total Impacts						
	Employment	Labor Income ($M)	Value Added ($M)	Output ($M)	State/Local Personal Tax Revenue ($M)	Federal Personal Tax Revenue ($M)	Total Personal Tax Revenue ($M)
Missouri	70,764	$5,889.6	$11,544.4	$23,507.5	$15.7	$103.9	$1,156.7
Montana	4,756	$369.3	$653.2	$1,472.9	$0.2	$12.5	$80.5
Nebraska	20,212	$1,971.7	$3,960.1	$7,291.7	$2.9	$33.3	$375.8
Nevada	18,751	$1,469.1	$2,829.2	$5,970.7	$1.1	$1.7	$326.5
New Hampshire	16,751	$1,710.4	$3,189.0	$5,903.4	$1.6	$3.7	$360.7
New Jersey	375,362	$42,261.1	$77,612.8	$135,807.4	$0.0	$871.3	$9,092.5
New Mexico	32,962	$2,520.8	$4,100.0	$8,511.0	$0.2	$53.3	$491.7
New York	263,991	$28,308.8	$61,345.7	$106,886.3	$283.3	$746.4	$5,834.7
North Carolina	247,350	$21,370.1	$44,287.3	$84,482.5	$16.3	$459.8	$4,369.5
North Dakota	3,306	$294.4	$490.6	$1,100.8	$0.0	$2.9	$56.5
Ohio	128,269	$10,082.7	$20,252.1	$39,845.0	$101.0	$155.7	$2,003.0
Oklahoma	14,807	$1,084.6	$2,188.6	$4,829.6	$0.2	$19.3	$205.6
Oregon	27,997	$2,438.4	$4,304.5	$8,690.2	$0.2	$77.8	$497.2
Pennsylvania	280,030	$27,878.6	$52,103.9	$92,693.5	$200.3	$482.6	$5,643.5
Rhode Island	11,159	$1,026.2	$1,904.2	$3,806.1	$1.5	$22.6	$218.1
South Carolina	37,258	$2,802.2	$5,711.8	$13,131.0	$3.7	$49.7	$592.2
South Dakota	3,215	$264.7	$488.4	$1,035.7	$0.1	$0.7	$51.1
Tennessee	69,378	$6,258.8	$11,892.2	$23,479.8	$1.0	$5.6	$1,233.7
Texas	289,624	$25,034.4	$51,401.3	$98,858.0	$9.0	$40.2	$5,011.4
Utah	71,463	$5,453.9	$10,250.5	$22,571.7	$1.4	$120.4	$1,091.0
Vermont	4,991	$417.3	$730.8	$1,678.8	$0.0	$10.0	$85.0
Virginia	64,864	$5,700.9	$10,688.9	$20,321.8	$8.1	$126.3	$1,164.6
Washington	86,841	$9,245.0	$17,470.7	$30,608.3	$2.3	$71.6	$1,950.2
West Virginia	8,543	$705.4	$1,469.2	$3,040.0	$0.4	$14.9	$132.9
Wisconsin	54,956	$4,561.1	$8,575.9	$18,009.8	$0.2	$107.5	$958.3
Wyoming	807	$52.9	$98.8	$262.9	$0.1	$0.7	$11.7
Puerto Rico	81,865	$5,652.7	$32,213.8	$68,981.5	$0.0	$114.4	$977.5

Source: TEConomy data, calculations and analysis; 2024 IMPLAN U.S., State, D.C. and Puerto Rico models.

Table B3: U.S. and State Occupational Share Estimates, 2024

State	Management	Life, Physical, and Social Science	Production	Business and Financial Operations	Office and Administrative Support	Computer and Mathematical	Architecture and Engineering	Sales and Related	Transportation and Material Moving	Healthcare Practitioners and Technical	Installation, Maintenance, and Repair	All Other Occupational Categories
U.S. Total (incl. District of Columbia & Puerto Rico)	**17%**	**15%**	**14%**	**11%**	**8%**	**8%**	**8%**	**7%**	**5%**	**3%**	**2%**	**4%**
Alabama	17%	16%	11%	11%	9%	8%	8%	7%	5%	3%	2%	4%
Alaska	18%	18%	5%	12%	11%	7%	10%	6%	4%	3%	1%	4%
Arizona	16%	12%	16%	10%	6%	9%	6%	10%	8%	3%	2%	3%
Arkansas	17%	8%	10%	10%	5%	10%	4%	16%	11%	4%	2%	3%
California	18%	17%	10%	11%	10%	8%	9%	5%	4%	2%	2%	4%
Colorado	17%	15%	13%	11%	8%	8%	8%	7%	6%	3%	2%	3%
Connecticut	18%	13%	11%	12%	9%	9%	7%	8%	6%	3%	2%	4%
Delaware	20%	8%	6%	17%	11%	13%	5%	6%	4%	3%	2%	5%
District of Columbia	19%	19%	4%	12%	12%	7%	10%	6%	3%	3%	1%	4%
Florida	17%	11%	14%	10%	6%	9%	6%	11%	8%	3%	2%	3%
Georgia	17%	13%	13%	10%	7%	8%	7%	9%	7%	3%	2%	3%
Hawaii	18%	15%	4%	11%	10%	9%	8%	10%	7%	3%	1%	4%
Idaho	18%	19%	6%	12%	11%	7%	10%	5%	3%	3%	1%	4%
Illinois	16%	12%	20%	10%	6%	9%	6%	7%	6%	2%	3%	3%
Indiana	15%	13%	27%	10%	5%	8%	6%	5%	6%	2%	3%	3%
Iowa	15%	14%	22%	10%	6%	8%	7%	6%	6%	2%	3%	3%
Kansas	15%	13%	22%	9%	5%	8%	6%	7%	6%	2%	3%	3%
Kentucky	16%	10%	14%	10%	5%	10%	5%	13%	10%	3%	2%	3%
Louisiana	17%	8%	12%	10%	5%	10%	4%	15%	11%	3%	2%	3%

State	Management	Life, Physical, and Social Science	Production	Business and Financial Operations	Office and Administrative Support	Computer and Mathematical	Architecture and Engineering	Sales and Related	Transportation and Material Moving	Healthcare Practitioners and Technical	Installation, Maintenance, and Repair	All Other Occupational Categories
Maine	16%	14%	18%	10%	6%	8%	7%	7%	6%	2%	3%	3%
Maryland	17%	19%	12%	11%	10%	7%	10%	3%	3%	2%	2%	4%
Massachusetts	19%	19%	6%	12%	12%	7%	11%	3%	2%	3%	1%	5%
Michigan	16%	15%	18%	10%	7%	8%	7%	6%	5%	2%	2%	3%
Minnesota	16%	13%	18%	10%	6%	8%	6%	8%	6%	2%	3%	3%
Mississippi	16%	11%	18%	10%	5%	9%	5%	11%	8%	3%	3%	3%
Missouri	16%	13%	18%	10%	6%	8%	6%	8%	7%	3%	2%	3%
Montana	16%	14%	18%	10%	7%	8%	7%	7%	6%	2%	2%	3%
Nebraska	15%	12%	22%	9%	5%	8%	6%	8%	7%	2%	3%	3%
Nevada	17%	14%	13%	10%	7%	8%	7%	9%	6%	3%	2%	3%
New Hampshire	16%	14%	18%	10%	7%	8%	7%	6%	5%	2%	2%	3%
New Jersey	17%	12%	16%	12%	7%	9%	6%	7%	6%	2%	2%	3%
New Mexico	19%	21%	4%	12%	13%	6%	12%	2%	1%	2%	1%	5%
New York	17%	13%	15%	11%	7%	9%	7%	8%	6%	3%	2%	3%
North Carolina	16%	15%	17%	11%	8%	8%	8%	5%	5%	2%	2%	3%
North Dakota	15%	14%	22%	10%	6%	7%	7%	5%	5%	2%	3%	3%
Ohio	17%	12%	12%	12%	8%	10%	6%	9%	7%	3%	2%	4%
Oklahoma	17%	11%	13%	10%	6%	9%	5%	13%	9%	3%	2%	3%
Oregon	17%	14%	10%	11%	8%	9%	7%	10%	7%	3%	2%	3%
Pennsylvania	17%	16%	14%	11%	9%	8%	8%	5%	4%	2%	2%	4%
Rhode Island	16%	14%	19%	10%	7%	8%	7%	6%	5%	2%	3%	3%
South Carolina	15%	14%	24%	9%	5%	7%	7%	5%	5%	2%	3%	3%
South Dakota	18%	13%	6%	11%	8%	9%	6%	12%	8%	3%	2%	3%

State	Management	Life, Physical, and Social Science	Production	Business and Financial Operations	Office and Administrative Support	Computer and Mathematical	Architecture and Engineering	Sales and Related	Transportation and Material Moving	Healthcare Practitioners and Technical	Installation, Maintenance, and Repair	All Other Occupational Categories
Tennessee	17%	11%	11%	10%	7%	9%	6%	12%	9%	3%	2%	3%
Texas	17%	12%	12%	11%	7%	9%	6%	10%	7%	3%	2%	3%
Utah	16%	15%	18%	10%	7%	8%	8%	6%	5%	2%	2%	3%
Vermont	16%	11%	16%	10%	5%	9%	5%	11%	8%	3%	2%	3%
Virginia	18%	16%	9%	11%	10%	8%	9%	7%	5%	3%	2%	4%
Washington	18%	18%	8%	11%	11%	7%	10%	5%	3%	3%	2%	4%
West Virginia	16%	10%	16%	10%	5%	9%	5%	12%	9%	3%	2%	3%
Wisconsin	16%	14%	19%	10%	6%	8%	7%	7%	6%	2%	3%	3%
Wyoming	17%	13%	11%	10%	7%	9%	7%	10%	7%	3%	2%	3%
Puerto Rico	14%	12%	29%	9%	3%	8%	5%	6%	7%	2%	3%	2%

Source: U.S. Bureau of Labor Statistics 2024 Occupational Employment Survey data; TEConomy Partners data, calculations, and analysis.

Endnotes

1 *National Center for Science and Engineering Statistics, National Science Foundation, Business Enterprise Research and Development Survey, 2023; TEConomy Partners, LLC analysis. For these comparative data the biopharmaceutical industry is captured using a combination of the pharmaceutical manufacturing and biotechnology NAICS codes. Domestic includes the combination of U.S. and Puerto Rico and U.S. operations of foreign-based biopharmaceutical firms.*

2 *U.S. Investments in Medical and Health Research and Development 2021-2025, September 2026, TEConomy Partners, LLC for Research!America.*

3 *For an even more "apples-to-apples" comparison the biopharmaceutical manufacturing sector had a 2024 personal income average of $199,177 per worker.*

4 *Similar to personal income, for an even more "apples-to-apples" comparison the biopharmaceutical manufacturing sector had a 2024 productivity value of $600,173 (measured as value added per employee).*

5 *IMPLAN (**www.implan.com**) is a regional economic analysis software application that is designed to estimate the impact or ripple effect (specifically backward linkages) of a given economic activity within a specific geographic area through the implementation of its Input-Output and Social Accounting Matrix model.*

6 *2024 is the most current year available for the IMPLAN I-O data and models.*

7 *Total U.S. output and value-added as estimated by the 2024 U.S. IMPLAN model. Note: value-added corresponds most closely to U.S. GDP.*


TECONOMY
PARTNERS LLC