

THE BIOPHARMACEUTICAL INDUSTRY: FUELING THE ECONOMY AND GLOBAL COMPETITIVENESS

The United States is recognized as the global leader of biopharmaceutical innovation. That global leadership is built upon a robust research and development (R&D) and manufacturing ecosystem featuring biopharmaceutical companies that perform and support substantial advanced R&D and manufacturing in the United States. This results in innovative treatments and cures that help patients live longer and healthier lives, a goal which is important now more than ever.

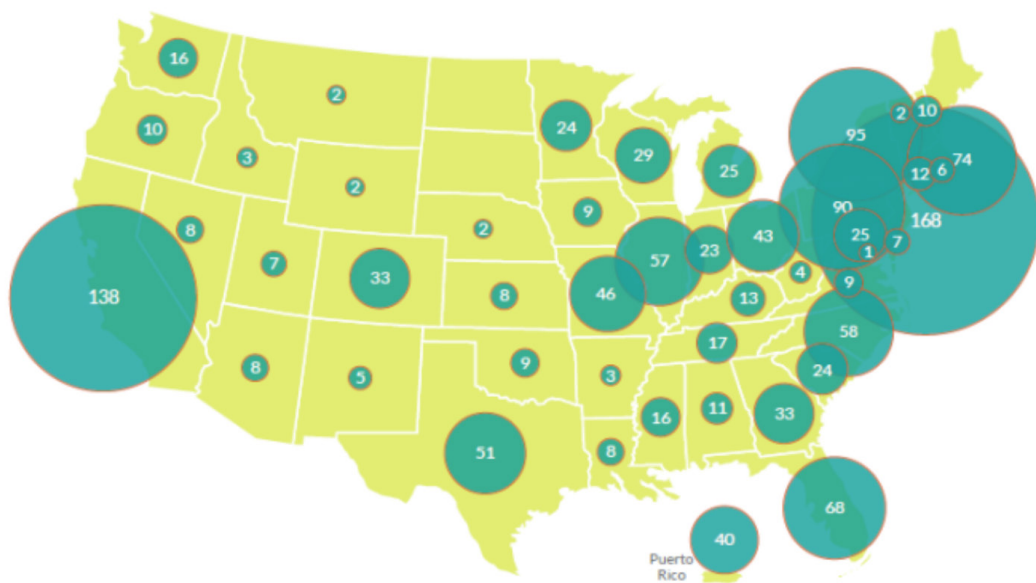
In the midst of a global pandemic, America's biopharmaceutical companies are leveraging decades of scientific research cultivated from experiences with past public health emergencies. Biopharmaceutical companies further have a vast storehouse of knowledge about infectious diseases to develop and test treatments and vaccines that can restore the rhythms of daily life for billions of people. To achieve this goal, companies are researching and developing innovative new treatments and vaccines and exploring whether existing treatments can be used to combat the novel coronavirus. Companies are planning and building manufacturing capacity to ensure that if vaccine or treatment candidates are successful, manufacturing and distribution can occur as rapidly as possible.

Beyond the value that medicines deliver to patients is the profound impact the biopharmaceutical sector has on our local, state and national economies. The economic impact of the biopharmaceutical industry and its robust global supply chains translate into high-wage jobs, substantial tax revenue and growing economic output in our local communities. In fact, the combined effects of biopharmaceutical direct jobs, supply chain and wages and benefits resulted in more than \$1 trillion in economic output and more than 4 million jobs supported in 2017.ⁱ Every direct job in the biopharmaceutical industry supported a total of five jobs across the economy, resulting from the broader impacts of its supply chain and the personal spending of its workforce.ⁱⁱ

One reason for the broad geographic reach of the industry's economic impact is the sheer number of clinical trials sponsored by the industry. In 2017, biopharmaceutical companies sponsored about 4,500 clinical trials in the United States alone, with trials in all 50 states, the District of Columbia and Puerto Rico. These trials involved close to 1 million participants and accounted for nearly \$43 billion in economic activity.ⁱⁱⁱ

The industry's U.S. manufacturing footprint is also extensive, with more than 1,300 facilities across 45 states and Puerto Rico currently manufacturing FDA-approved medicines and related products,^{iv} and employing nearly 120,000 manufacturing workers in high-wage jobs. The share of manufacturing-related jobs to total jobs in the biopharmaceutical sector is double that of the private sector overall.^v

BIOPHARMACEUTICAL MANUFACTURING FACILITIES BY STATE/TERRITORY (JANUARY 2020)



The industry's advanced manufacturing presence is key to maintaining U.S. leadership in innovation. As the complexity of drug development evolves, manufacturing process innovations have become just as important as product innovations themselves. Biopharmaceutical companies are constantly researching, developing and adopting new technologies and processes—such as continuous manufacturing, high-volume cell processing and advanced purification, preservation and distribution modes—which will be essential for manufacturing the next generation of treatments, such as cell and gene therapies.^{vi} Thanks to these innovations in manufacturing production and high functioning global supply chains, companies currently have the capacity to upscale production and broadly disseminate vaccines and treatments to patients worldwide upon the discovery of an effective treatment or vaccine.

AMERICA'S BIOPHARMACEUTICAL INDUSTRY IS THE MOST RESEARCH INTENSIVE

The tremendous investments America's biopharmaceutical companies make to research and develop new medicines are what drive the far-reaching economic impacts of the industry. The biopharmaceutical industry is the global leader in R&D, and its research intensity is unparalleled in the U.S. economy.^{vii} Relative to other manufacturing industries, the biopharmaceutical industry invests 12 times more in R&D per employee and employs the largest share of all manufacturing R&D workers in the United States.^{viii, ix} The industry also invests more in R&D relative to sales than all but one other manufacturing industry—over 20%, more than six times the average for the manufacturing sector as a whole.^x

As a result, U.S.-based biopharmaceutical companies invested \$102 billion in R&D in 2018,^{xi} with most of these investments made directly in the United States. In fact, according to the National Science Foundation, the sector accounts for the single largest share of all U.S. business R&D, representing one out of every six dollars (17%) spent on domestic R&D by U.S. businesses.^{xii} The biopharmaceutical industry is the single largest funder of medical and health R&D in the United States, accounting for half of all such research in the United States—far more than the National Institutes of Health, other private industries or other sources.^{xiii}

THE U.S. BIOPHARMACEUTICAL INDUSTRY IS THE GLOBAL LEADER IN BIOMEDICAL INNOVATION

America's robust R&D enterprise is the envy of the world. Not only does the United States lead in both overall clinical trial activity and early stage clinical research, but it also claims the intellectual property (IP) of nearly 60% of all new medicines.^{xiv} Likewise, it is not surprising that almost three-quarters of worldwide venture capital investments in biopharmaceutical startups are made in the United States, where the biopharmaceutical R&D enterprise thrives.^{xv}

Thanks to the system in place in the United States, biopharmaceutical innovators had a head start on potential solutions when the COVID-19 pandemic hit. Much of the work under way has built upon knowledge and research capacity developed over many years and has been made possible with the support of robust intellectual property protections and a strong science-based regulatory system. Continued U.S. global leadership and investment in new treatments and cures for all patients will depend on having the right public policies in place to support biopharmaceutical R&D and manufacturing.

ⁱ TEconomy Partners; for PhRMA. The Economic Impact of the US Biopharmaceutical Industry 2017: National and State Estimates.

ⁱⁱ TEconomy Partners; for PhRMA. The Economic Impact of the US Biopharmaceutical Industry 2017: National and State Estimates.

ⁱⁱⁱ TEconomy Partners; for PhRMA. Biopharmaceutical Industry-Sponsored Clinical Trials. April 2019.

^{iv} NDP Analytics; for PhRMA. Analysis of the US FDA's Drug Establishments Current Registration Site. January 2020.

^v TEconomy Partners; for PhRMA. The Economic Impact of the US Biopharmaceutical Industry 2017: National and State Estimates.

^{vi} TEconomy Partners; for PhRMA. Biopharmaceutical Manufacturing in the U.S.: Making Cutting-Edge Medicines Today and Leading the Way on Medicines of Tomorrow. March 2019.

^{vii} M Muro et al. America's advances industries: New trends. Brookings Institute. August 2016.

^{viii} NDP Analytics. IP-intensive manufacturing industries: driving US economic growth.

^{ix} NSF, National Center for Science and Engineering Statistics. Table 50: worldwide, domestic, and foreign total and R&D employment, by industry and company size: 2015. August 30, 2018.

^x NDP Analytics. IP-Intensive Manufacturing Industries: Driving US Economic Growth. Washington, DC: NDP Analytics. September 2017.

^{xi} Research!America, U.S. Investments in Medical and Health Research and Development, 2013-2018, 2019.

^{xii} Wolfe RM; National Science Foundation, National Center for Science and Engineering Statistics. Businesses spent \$375 billion on R&D performance in the United States in 2016. InfoBriefs. NSF 18-312. Published September 2018.

^{xiii} Research!America, U.S. Investments in Medical and Health Research and Development, 2013-2018, 2019.

^{xiv} NSF, National Science Board. Science and Engineering Indicators 2018. Chapter 8 Appendix Table 8-13: USPTO patents granted in pharmaceuticals, by region, country, or economy: 2000-16.

^{xv} TEconomy; for PhRMA. Analysis of Pitchbook data. April 2019.