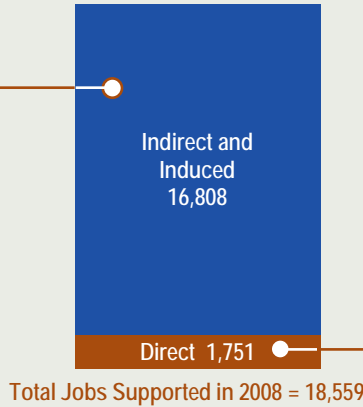


• **OVERVIEW** • This fact sheet presents an analysis of the impact of the biopharmaceutical sector on the economy of Oklahoma (OK) in 2008, including data on employment, economic output, and research and development activity. The biopharmaceutical sector's economic impact includes not only the *direct* impact of its companies, but also the ripple effects that the sector has throughout the rest of the economy. These ripple effects include both the *indirect* impact, the economic value of the goods or services used to support biopharmaceutical companies, and the *induced* impact, the value of the economic activity supported by the spending of the direct and indirect employees of the biopharmaceutical sector.

• **SUPPORTING HIGH QUALITY JOBS** •

Employment – Biopharmaceutical companies supported a total of 18,559 jobs in Oklahoma in 2008 – 1,751 directly in the sector and 16,808 in other sectors. Of the jobs outside the biopharmaceutical sector, 2,418 were supported by biopharmaceutical activity within the state, while 14,390 were supported by biopharmaceutical activity in other states.

Types of Indirect and Induced Jobs in OK, 2008
 These types of jobs range from contract research organizations and construction to day care and restaurants



Types of Direct Biopharmaceutical Jobs in OK, 2009*

- 34.7% Life, Physical, and Social Science
- 18.2% Office & Administrative Support
- 14.2% Management Occupations
- 8.5% Computer & Mathematical Science
- 7.4% Architecture & Engineering
- 4.5% Business & Financial Operations
- 12.5% Other**

* Includes jobs data from NAICS code 5417 only
 ** Other includes 7 other occupation(s), each representing less than 3.0% of the total. These occupations include, for example, Sales & Related Occupations (2.3%) and Building and Grounds Cleaning & Maintenance (2.3%).

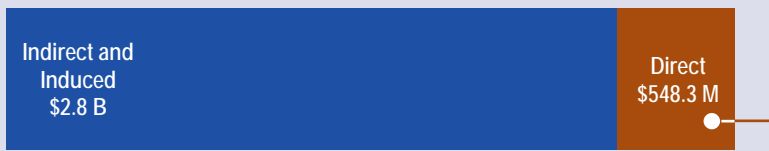
Wages and Personal Taxes – Direct biopharmaceutical wages in Oklahoma were estimated to be \$64.2 million in 2008, resulting in an estimated \$12.8 million in federal taxes and \$2.1 million in state taxes.

Personal Taxes Paid per Direct Employee, 2008	State	Federal	Total	Legend
Biopharmaceutical Sector.....	\$1,791	\$10,937	\$12,727	■ Biopharmaceutical Sector ■ Rest of Economy
Rest of Economy.....	\$707	\$5,848	\$6,556	

Personal Taxes Paid per Direct Employee in 2008

Note: Federal taxes include both income and Social Security taxes; state taxes include income taxes only.

• **CONTRIBUTING TO THE ECONOMY** • Economic output represents the value of the goods and services produced by the sector and its ripple effects. In 2008, the Oklahoma biopharmaceutical sector supported \$3.4 billion in total output.



Total Output Supported in 2008 = \$3.4 B

Direct Output per Direct Employee, 2008

Biopharmaceutical Sector	\$313,120
Rest of Economy	\$149,925

• **DEVELOPING TOMORROW'S MEDICINES** • In 2010, U.S. scientists and researchers were conducting 15,134 studies to develop medicines targeting cancers, rare diseases, and other important conditions. In Oklahoma, there were 994 active trials.

Active Clinical Trials in Oklahoma by Selected Conditions¹, 2010

Selected Conditions	Number of Trials	Selected Conditions	Number of Trials
Alzheimer's and Other Dementias	14	HIV / AIDS	7
Cancers	466	Mental and Behavioral Disorders	42
Cardiovascular Diseases	64	Rare Diseases**	235
Diabetes Mellitus	55	Respiratory Disorders	106

** Rare diseases are those that affect 200,000 or fewer people in the U.S.

• **INVESTING IN RESEARCH AND DEVELOPMENT** • Nationally, biopharmaceutical companies invested approximately \$51.0 billion in U.S. research and development in 2008, or \$77,860 per direct employee. In Oklahoma, biopharmaceutical companies invested \$17.4 million in R&D in 2008. Other indicators of investment in Oklahoma biopharmaceutical research include:

Selected Other Research and Development Indicators of Investment in Oklahoma, 2008

National Institutes of Health Dollars Awarded ²	\$73.0 million
National Science Foundation Dollars Awarded for Biological Science Research ³	\$5.9 million
Small Business Innovation Research (SBIR) / Small Business Technology Transfer (STTR) Dollars Awarded ⁴	\$3.0 million
Venture Capital Dollars Invested in Biotechnology ⁵	\$1.2 million
Number of Bioscience-Related Degrees Conferred (Associates through Doctorate Level) ⁶	2,073
Number of PhD Degrees Conferred in the Biological, Medical, and other Life Sciences ⁷	65
High-Tech Share of Businesses (2006) ⁸	8.2%

Biopharmaceutical Sector Research and Development Investment, 2008

Research and Development Investment in the United States	\$51.0 billion
Research and Development Investment in Oklahoma	\$17.4 million

Methodology

Unless otherwise noted, the data presented in this fact sheet is based on original analyses conducted by Archstone Consulting. The analyses measured the absolute impact of the biopharmaceutical sector rather than its marginal impact. An absolute approach considers all economic activity (i.e., direct, indirect, and induced) that is attributable to a sector's presence; by contrast, a marginal approach acknowledges that a certain portion of this economic activity would still exist in the absence of that sector, and thus only measures the additional economic activity that is unique to the sector's presence in a given area.

Estimates of number of jobs and economic output were based on a multiplier effect analysis using Minnesota IMPLAN Group (MIG) software and 2008 data. 2008 was the most recent year for which the most complete set of data was available at the time analyses were completed. Number of jobs was used as a proxy for number of employees. Data on types of direct biopharmaceutical jobs was obtained from the U.S. Bureau of Labor Statistics (BLS) (2008 Occupational Employment Statistics for NAICS codes 3254 and 54171), and is based on participating company reported data. When comparing the "biopharmaceutical sector" to "rest of economy," the latter is defined as all sectors combined less the biopharmaceutical sector. Total wages were calculated from BLS employment and MIG employment data. Federal and state tax estimates were generated using BLS employment and wages data, MIG employment data, and National Bureau of Economic Research software (TAXSIM 9.0 Simulator). State tax figures were estimated using only the number of direct employees in states for which income taxes apply. Please note that totals may not be equal to the sum of individual components due to rounding. Data on clinical trials was based on The Lewin Group analysis of ClinicalTrials.gov data (downloaded in December 2010). National research investment per employee was estimated using Burrill & Company and PhRMA data (2006 R&D expenditures from PhRMA 2008 Pharmaceutical Industry Profile) and MIG employment data. Research investment per state was estimated using Burrill & Company and PhRMA data, National Science Foundation data (Survey of Industrial Research & Development estimates by state), and BLS employment data. For a more detailed methodology and complete source citation, see the full methodology that accompanied the 2008 report "The Biopharmaceutical Sector's Impact on the U.S. Economy: Analysis at the National, State, and Local Levels."

Endnotes

- 1 Except where noted, data obtained from Adis R&D Insight Database, Wolters Kluwer Health, October 19, 2010. Data for Alzheimer's and Other Dementias is from PhRMA, "Medicines in Development for Alzheimer's Disease," November 2010. Data for Rare Diseases is from PhRMA, Medicines in Development for Rare Diseases, January 2010.
- 2 United States Department of Health & Human Services (National Institutes of Health). Office of Extramural Research. (2010). NIH Extramural Awards by State and Foreign Site, 2008 Award Data. Available at: <http://report.nih.gov/award/state/state08.cfm> (Accessed: January, 2011). Bethesda, MD: NIH.
- 3 National Science Foundation. Budget Division: Office of Finance, Budget & Award Management. (2010). Budget Internet Information System [database], Award Summary: by State/Institution, FY2008 (V. Ross, Ed.). Available at: <http://delweb.bfa.nsf.gov/AwdLst2/default.asp> (Accessed: January, 2011). Arlington, VA: NSF.
- 4 United States Department of Health & Human Services (National Institutes of Health). Office of Extramural Research. (2010). SBIR/STTR Award Data, 2008. Available at: http://grants.nih.gov/grants/Funding/award_data.htm (Accessed: January, 2011). Bethesda, MD: NIH.
- 5 PriceWaterhouseCoopers. National Venture Capital Association. (2010). MoneyTree Report - Historical Trend Data, 2008. Available at <https://www.pwcmoneytree.com/MTPublic/hs/nav.jsp?page=historical> (Accessed: January, 2011). New York, NY: PwC.
- 6 BioTechnology Industry Organization and Battelle. (2010). Battelle/BIO State Bioscience Initiatives 2010. Available at <http://www.bio.org/local/battelle2010/> (Accessed: January, 2011). Washington, D.C.: BIO.
- 7 National Science Foundation. Division of Science Resource Statistics. (2010). WebCASPAR Integrated Science and Engineering Resources Data System: Survey of Earned Doctorates [database], 2008 data (M. Fiegner, Ed.). Available at: <http://caspar.nsf.gov/> (Accessed: January, 2011). Arlington, VA: NSF.
- 8 National Science Foundation. Division of Science Resource Statistics. (2010). Science and Engineering Indicators: 2010. Available at: <http://www.nsf.gov/statistics/seind10/c8/c8s7.htm> (Accessed: January, 2011). Arlington, VA: NSF.