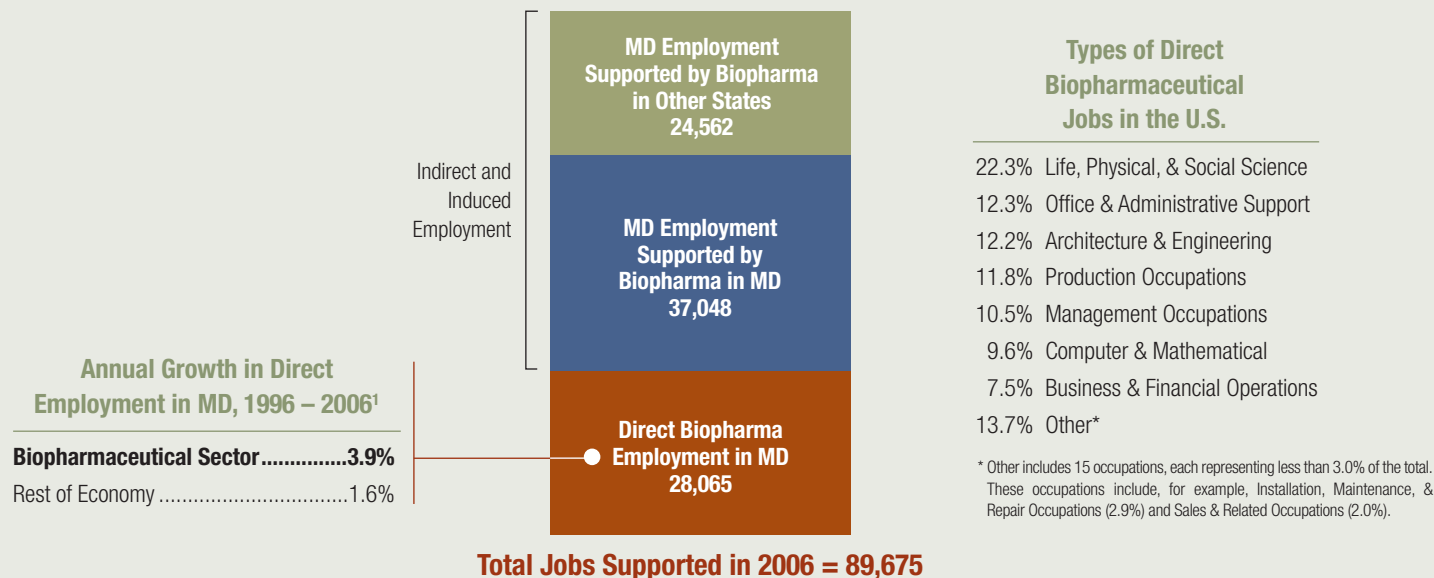


• **OVERVIEW** • This fact sheet presents an analysis of the impact of the biopharmaceutical sector on the economy of Maryland (MD) in 2006, including data on employment, economic output, and research and development activity. The biopharmaceutical sector's economic impact includes not only the **direct** 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 economic activity supported by the spending of direct and indirect employees of the biopharmaceutical sector.

• **SUPPORTING HIGH QUALITY JOBS** •

**Employment** – Biopharmaceutical companies supported a total of 89,675 jobs in Maryland in 2006 – 28,065 directly in the sector and 61,610 in other sectors. Of the jobs outside the biopharmaceutical sector, 37,048 were supported by biopharmaceutical activity within the state, while 24,562 were supported by biopharmaceutical activity in other states.

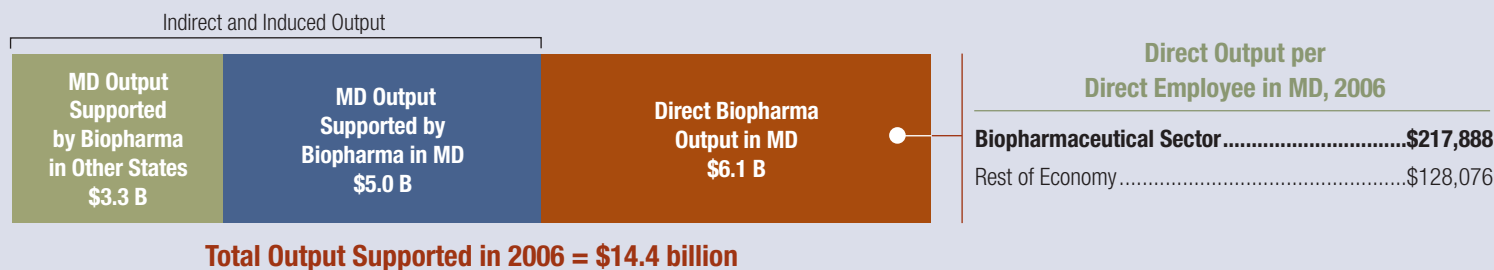


**Wages and Personal Taxes** – Direct biopharmaceutical wages in Maryland were estimated to be \$2.3 billion in 2006, resulting in an estimated \$537.4 million in federal taxes and \$86.4 million in state taxes.

Personal Taxes Paid per Direct Employee in MD, 2006	Federal	State
Biopharmaceutical Sector .....	\$19,150	\$3,080
Rest of Economy .....	\$7,884	\$1,313

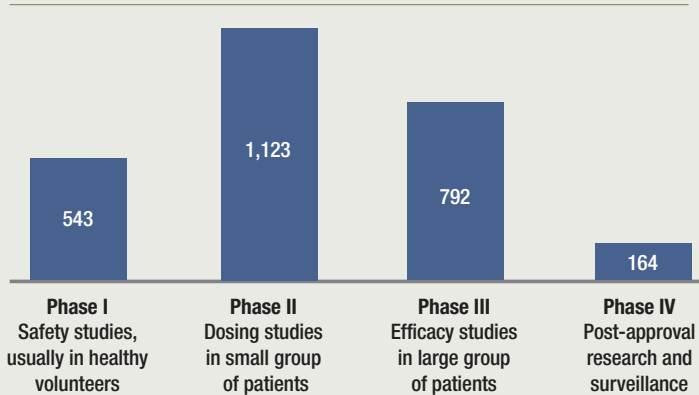
Note: Federal taxes include both income and Social Security taxes; state taxes include income taxes only.

• **CONTRIBUTING TO THE ECONOMY** • Economic output represents the value of goods and services produced by the sector and its ripple effects. In 2006, the Maryland biopharmaceutical sector supported \$14.4 billion in total output.



• **DEVELOPING TOMORROW'S MEDICINES** • In 2008, U.S. scientists and researchers were conducting 21,795 studies to develop medicines targeting cancers, rare diseases, and other important conditions. 3,820 of these trials were active in Maryland.

Active Clinical Trials in MD by Phase, 2008



Note: Values do not add to total number of trials due to omission of trials listed as Phase 0 (exploratory, first in-human studies) and those with no phase specified.

Active Clinical Trials in MD by Selected Conditions, 2008

Selected Conditions	Number of Active Trials
Cancers and Other Neoplasms	1,224
Rare Diseases	591
Behavioral and Mental Disorders	224
HIV / AIDS	222
Heart Disease	167
Respiratory Tract Diseases	112
Diabetes	48
Parkinson's Disease	30
Alzheimer's Disease	15

Note: Some compounds may be studied for more than one condition. Listed conditions represent only a portion of all clinical trials active in the state.

• **INVESTING IN RESEARCH AND DEVELOPMENT** • Nationally, biopharmaceutical companies invested approximately \$44.9 billion in U.S. research and development in 2006, or \$65,381 per direct employee; additionally, the National Institutes of Health awarded an estimated \$22.8 billion in grants for medical research at universities and other research institutions across the nation.<sup>2</sup> **In Maryland, biopharmaceutical companies invested \$1.2 billion in R&D in 2006.** Other indicators of investment in Maryland biopharmaceutical research include:

Indicators of Investment in MD Biopharmaceutical Research, 2006

National Institutes of Health Dollars Awarded <sup>3</sup>	\$1.7 billion
Small Business Innovation Research (SBIR) / Small Business Technology Transfer (STTR) Dollars Awarded <sup>4</sup>	\$40.0 million
National Science Foundation Dollars Awarded for Biological Science Research <sup>5</sup>	\$14.8 million
Venture Capital Dollars Invested in Biotechnology <sup>6</sup>	\$248.0 million
Number of Bioscience-Related Degrees Conferred (Associates through Doctorate Level) <sup>7</sup>	2,693
Number of PhD Degrees Conferred in the Biological, Medical, and Other Life Sciences <sup>8</sup>	354

#### 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 2006 data. 2006 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 (2006 Occupational Employment Statistics for NAICS codes 3254 and 54171), and is based on participating company-reported data. Employment growth was calculated from U.S. Bureau of Labor Statistics (BLS) data (1996 and 2006 Quarterly Census of Employment and Wages). Total wages were calculated from BLS employment and wages data 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 8.0 Simulator). Data on clinical trials was based on The Lewin Group analysis of ClinicalTrials.gov data (downloaded in September 2008). Chart labels characterizing each clinical trial phase are shorthand and represent the typical case. Trials classified as in-between phases by ClinicalTrials.gov were grouped into earlier phase (e.g., trials listed as Phase I/II are shown as Phase I). 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 the "Indicators of Investment in Biopharmaceutical Research" table, this sheet does not include those data points studied that were either not available or were equal to zero for this state. When comparing the "biopharmaceutical sector" to "rest of economy," the latter is defined as all sectors combined less the biopharmaceutical sector.

Please note that totals may not be equal to the sum of individual components due to rounding. For more detailed methodology and complete source citations, see full report at <http://www.archstoneconsulting.com/biopharma>

#### Endnotes

<sup>1</sup> Indicates compound annual growth rate, which measures year-over-year growth during a multiple-year period. Job growth rates and 2006 job estimates were obtained from different data sources.

<sup>2</sup> United States Department of Health & Human Services (National Institutes of Health). Office of Extramural Research. (2008). *NIH Extramural Awards by State and Foreign Site, 2006 Award Data*. Available at: <http://report.nih.gov/award/state/state06.cfm> (Accessed: November, 2008). Bethesda, MD: NIH.

<sup>3</sup> Ibid.

<sup>4</sup> United States Department of Health & Human Services (National Institutes of Health). Office of Extramural Research. (2008). *SBIR/STTR Award Data, 2006*. Available at: [http://grants.nih.gov/grants/Funding/award\\_data.htm](http://grants.nih.gov/grants/Funding/award_data.htm) (Accessed: November, 2008). Bethesda, MD: NIH.

<sup>5</sup> National Science Foundation. Budget Division: Office of Finance, Budget & Award Management. (2008). *Budget Internet Information System [database], Award Summary: by State/Institution, 2006* (V. Ross, Ed.). Available at: <http://dellweb.bfa.nsf.gov/AwdLst2/default.asp> (Accessed: December, 2008). Arlington, VA: NSF.

<sup>6</sup> PricewaterhouseCoopers and the National Venture Capital Association. (2008). *MoneyTree Report. Historical Trend Data [database], 2006 data*. Available at: <https://www.pwcmoneytree.com/MTPublic/ns/nav.jsp?page=historical> (Accessed: October, 2008).

<sup>7</sup> Biotechnology Industry Organization and Battelle. (2008). *Technology, Talent and Capital: State Bioscience Initiatives 2008*. Available at: <http://www.bio.org/local/battelle2008/> (Accessed October, 2008). Washington, D.C.: BIO.

<sup>8</sup> National Science Foundation. Division of Science Resource Statistics. (2008). *WebCASPAR Integrated Science and Engineering Resources Data System: Survey of Earned Doctorates [database], 2006 data* (M. Fiegenger, Ed.). Available at: <http://caspar.nsf.gov/> (Accessed: December, 2008). Arlington, VA: NSF.