

Employment Trends in the BioHealth Industry Cluster



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Executive Summary

- The biohealth cluster consists of 11 industries that manufacture, rent or sell, research and develop, test, or insure biomedical-related products or services. These varied industries include, but are not limited to: direct, health, and medical insurance carriers; medical, dental, and hospital equipment and supplies merchant wholesalers; testing laboratories; research and development in biotechnology; and analytical laboratory instrument manufacturing.
- In 2017, the biohealth cluster's employment of almost 200,000 accounted for 4.3 percent of total Ohio employment. Employment in the biohealth cluster did not decline during the national recession of 2007-2009 as much as total covered employment did statewide. However, it has been slower to recover than Ohio or U.S. total employment.
- Within the biohealth cluster, insurance carriers (NAICS 5241) has the largest share of the workforce, at 33 percent. At 1.52, it is also the only industry in the cluster that has a location quotient above 1.2, which suggests their business extends outside Ohio.
- Five industries in the biohealth cluster are expected to have job growth from 2016 to 2026: scientific research and development services; architectural, engineering, and related services; medical and diagnostic laboratories; insurance carriers; and medical equipment and supplies manufacturing.
- The biohealth cluster has a higher-than-average proportion of workers ages 25 to 64 and fewer workers under 25.
- The typical education requirement at entry for 14 of the 25 largest occupations in the biohealth cluster is a bachelor's degree, and most of the industries in the cluster have more workers with a bachelor's degree or higher than the average Ohio private industry employee.

Introduction

The biohealth industry manufactures, rents, sells, researches, develops, tests, and insures biomedical-related products or services. The biohealth cluster consists of eleven industries: pharmaceutical and medicine manufacturing; commercial and service industry machinery manufacturing; navigational, measuring, electromedical, and control instruments manufacturing; medical equipment and supplies manufacturing; professional and commercial equipment and supplies merchant wholesalers; drugs and druggists' sundries merchant wholesalers; insurance carriers; consumer goods rental; architectural, engineering, and related services; scientific research and development services; and medical and diagnostic laboratories. Figure 1 shows annual employment¹ for the industries in the biohealth cluster, displayed according to their North American Industry Classification System (NAICS) codes. In 2017, the biohealth cluster employed 4.3 percent of Ohio's total private employment, almost 200,000 workers.

Figure 1. > BioHealth Cluster Industries

| NAICS Code | Industry Title | 2017 Employment |
|------------|--|-----------------|
| 3254 | Pharmaceutical and Medicine Manufacturing | 5,251 |
| 3333 | Commercial and Service Industry Machinery Manufacturing | 3,727 |
| 3345 | Navigational, Measuring, Electromedical, and Control Instruments Manufacturing | 10,789 |
| 3391 | Medical Equipment and Supplies Manufacturing | 8,663 |
| 4234 | Professional and Commercial Equipment and Supplies Merchant Wholesalers | 25,445 |
| 4242 | Drugs and Druggists' Sundries Merchant Wholesalers | 7,080 |
| 5241 | Insurance Carriers | 66,537 |
| 5322 | Consumer Goods Rental | 5,984 |
| 5413 | Architectural, Engineering, and Related Services | 42,082 |
| 5417 | Scientific Research and Development Services | 17,141 |
| 6215 | Medical and Diagnostic Laboratories | 6,332 |

Source: Quarterly Census of Employment and Wages

¹ Federal law (the Confidential Information Protection and Statistical Efficiency Act of 2002 and others) prohibits data from being published if the data might identify a company. Throughout this report, data fields marked "NA" have been suppressed for confidentiality.

Industry Employment Concentration

An industry's location quotient (LQ) is a measure of how significant that industry is to a particular region's economy. Figure 2 lists the biohealth industries and their corresponding location quotients for Ohio. Values greater than 1.2 mean the industry's concentration of employment in Ohio is significantly greater than the U.S. average. This suggests these establishments serve biohealth needs beyond Ohio. In 2017, one biohealth industry had a location quotient greater than 1.2: insurance carriers (LQ 1.52).

Figure 2. > Industry Location Quotients, 2017

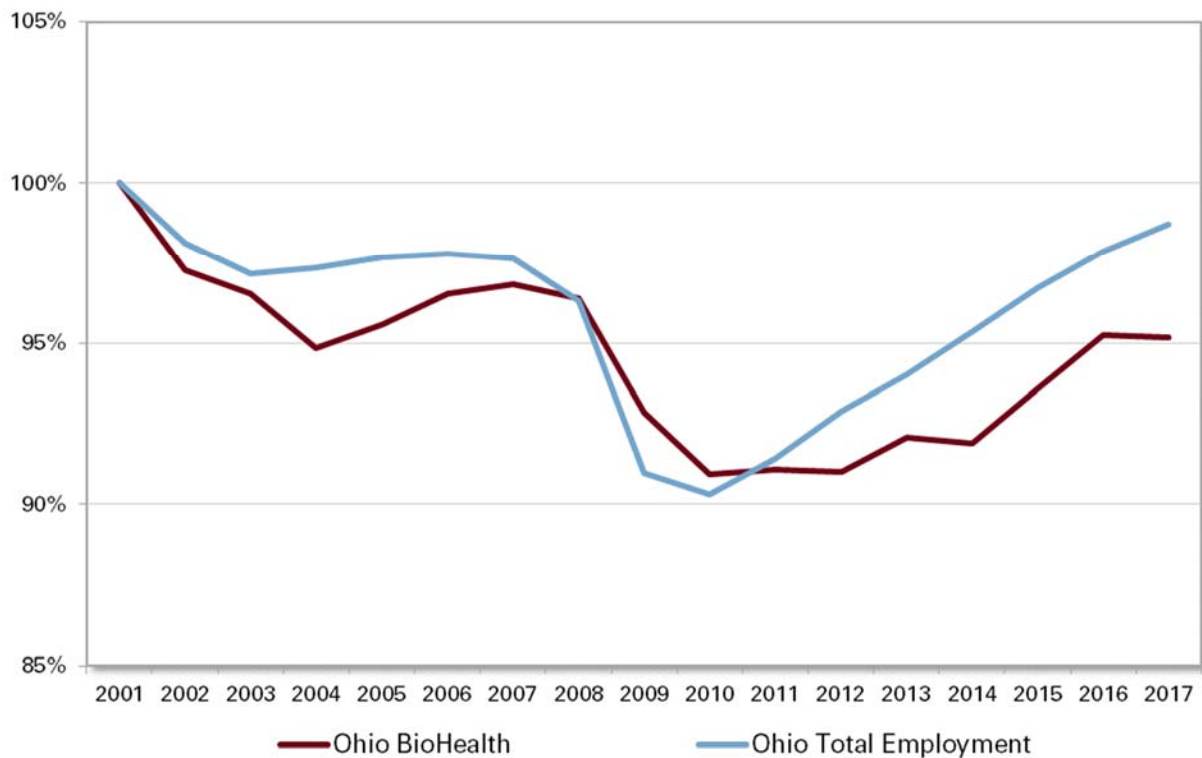
| NAICS Code | NAICS Title | Location Quotient |
|------------|--|-------------------|
| 3254 | Pharmaceutical and Medicine Manufacturing | 0.48 |
| 3333 | Commercial and Service Industry Machinery Manufacturing | 1.11 |
| 3345 | Navigational, Measuring, Electromedical, and Control Instruments Manufacturing | 0.72 |
| 3391 | Medical Equipment and Supplies Manufacturing | 0.75 |
| 4234 | Professional and Commercial Equipment and Supplies Merchant Wholesalers | 1.10 |
| 4242 | Drugs and Druggists' Sundries Merchant Wholesalers | 0.94 |
| 5241 | Insurance Carriers | 1.52 |
| 5322 | Consumer Goods Rental | 1.05 |
| 5413 | Architectural, Engineering, and Related Services | 0.79 |
| 5417 | Scientific Research and Development Services | 0.70 |
| 6215 | Medical and Diagnostic Laboratories | 0.63 |

Source: U.S. Bureau of Labor Statistics

Cluster Employment Trends

Figure 3 shows the percent change in annual employment for the biohealth cluster and Ohio total employment from 2001 to 2017. Both declined following the 2001 national recession. The recession had a greater impact on the biohealth cluster than on total employment. From 2001 to 2004, Ohio's total employment declined by 2.6 percent, while the biohealth cluster declined 5.1 percent. Both declined following the recession that began in 2007, as well. From 2007 to 2010, Ohio's total employment declined by 7.5 percent, and the biohealth cluster declined 6.1 percent. While total Ohio employment has recovered since the latest recession, the biohealth cluster has rebounded more slowly. In 2017, Ohio total employment was 98.7 percent of its 2001 employment level; the biohealth cluster was 95.2 percent of its 2001 employment.

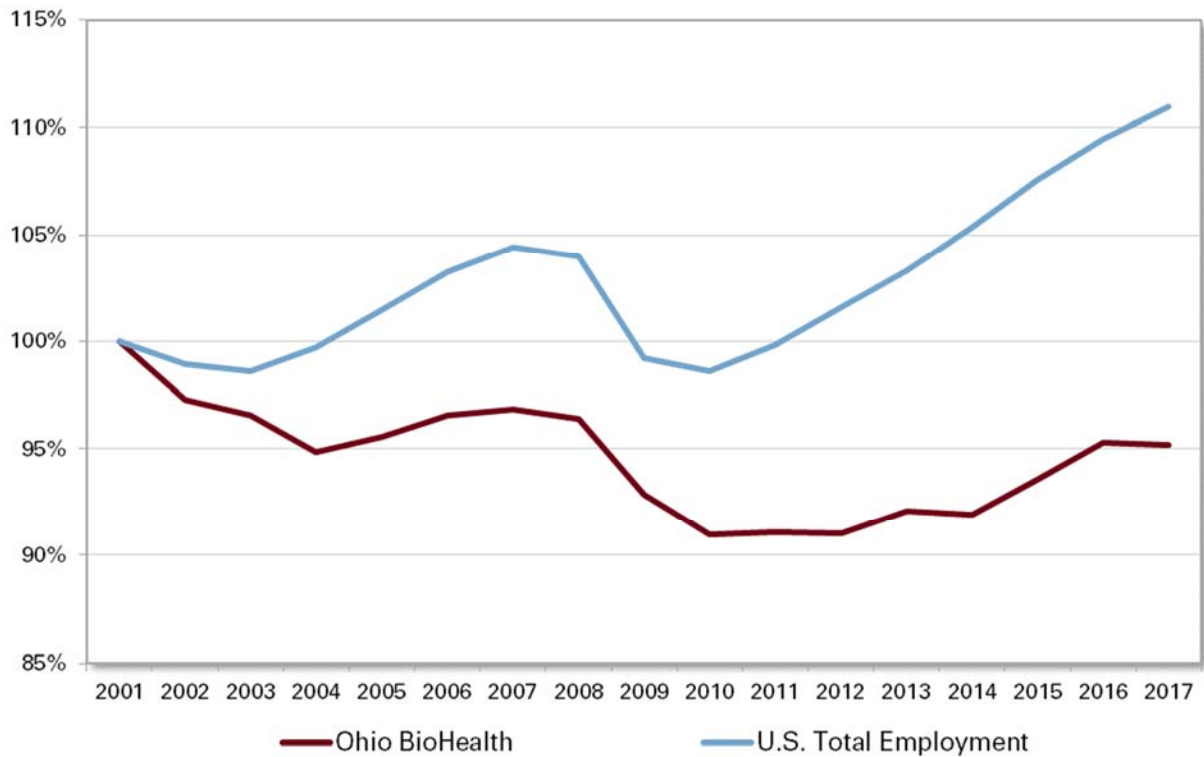
Figure 3. Ohio BioHealth Cluster and Ohio Total Employment as a Percentage of 2001 Employment, 2001 - 2017



Source: Quarterly Census of Employment and Wages

Figure 4 shows the percent change in annual Ohio biohealth cluster employment and U.S. total employment from 2001 to 2017. From 2004 through 2008, Ohio biohealth employment grew at a slower pace (1.6 percent) than U.S. total employment (4.3 percent). Ohio biohealth employment also grew at a slower pace (4.6 percent) than U.S. total employment (12.5 percent) from 2010 to 2017. U.S. total employment has completely recovered from recent recessions and surpassed its 2001 employment level, while Ohio biohealth lags behind its 2001 employment level. In 2017 Ohio biohealth cluster employment was 95.2 percent of its 2001 employment level; U.S. total employment was 111.0 percent of its 2001 employment.

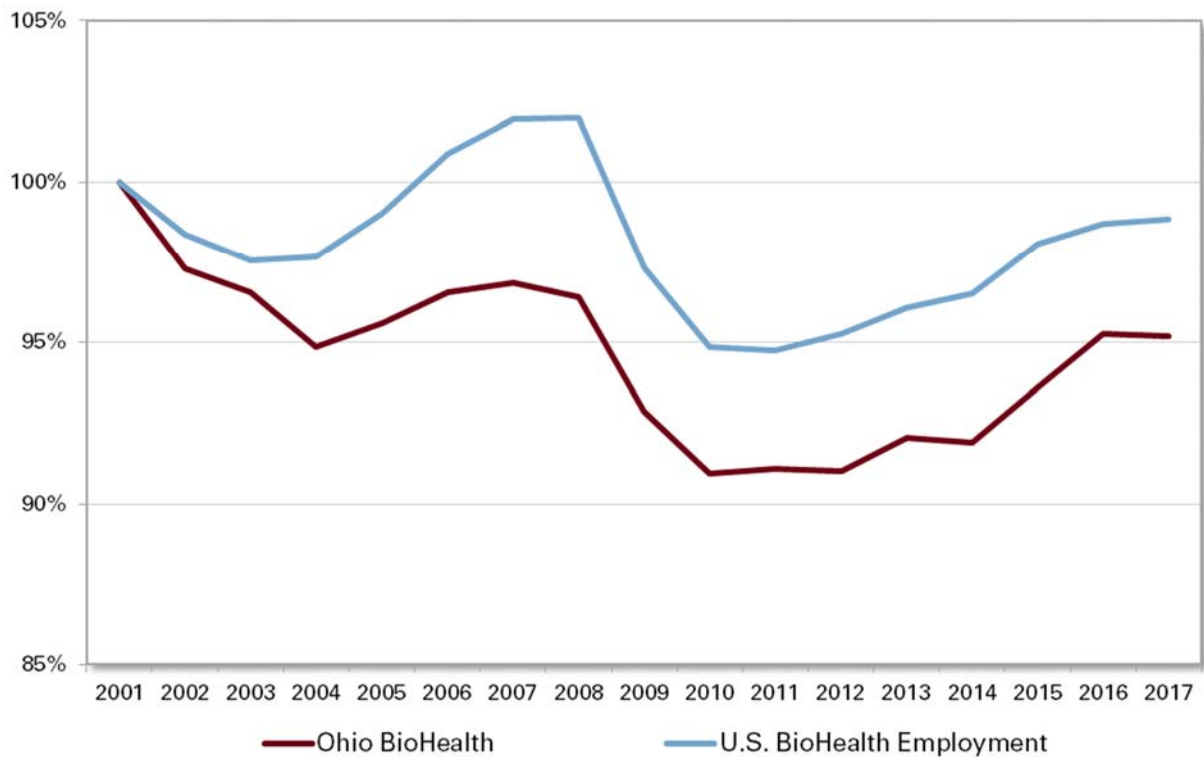
Figure 4. Ohio BioHealth Cluster and U.S. Total Employment as a Percentage of 2001 Employment, 2001 - 2017



Source: Quarterly Census of Employment and Wages

Figure 5 shows the percent change in annual employment from 2001 to 2017 for the Ohio biohealth cluster and the U.S. biohealth cluster. Both declined following the 2001 national recession, but the recession had a greater impact on the Ohio biohealth cluster than on the U.S. biohealth cluster. From 2001 to 2004, the Ohio biohealth cluster declined by 5.1 percent, while the U.S. biohealth cluster declined 2.4 percent. By 2007, only the U.S. biohealth cluster had recovered. Both declined following the recession that began in 2007 as well. From 2007 to 2010, the Ohio biohealth cluster declined by 6.1 percent, while the U.S. biohealth cluster declined 6.9 percent. In 2017 Ohio biohealth cluster employment was 95.2 percent of its 2001 employment level; the U.S. biohealth cluster was 98.9 percent of its 2001 employment.

Figure 5. Ohio and U.S. BioHealth Employment as a Percentage of 2001 Employment, 2001 - 2017



Source: Quarterly Census of Employment and Wages

Industry Employment Trends

This section presents annual employment data from 2001 to 2017 for each industry in the cluster. The nation experienced two recessions during this period, one in 2001 and one from late 2007 to mid-2009, and each industry in the cluster responded to the recessions differently. Since 2010, employment in the cluster increased, while the number of establishments decreased.

Pharmaceutical and Medicine Manufacturing: NAICS 3254

This industry comprises establishments primarily engaged in one or more of the following: (1) manufacturing biological and medicinal products; (2) processing (i.e., grading, grinding, and milling) botanical drugs and herbs; (3) isolating active medicinal principals from botanical drugs and herbs; and (4) manufacturing pharmaceutical products intended for internal and external consumption in dose forms, such as ampoules, tablets, capsules, vials, ointments, powders, solutions, and suspensions. From 2001 to 2017, employment in this industry grew by 870 jobs (19.9 percent) and gained seven establishments.

Figure 6. Pharmaceutical and Medicine Manufacturing

| Year | Establishments | Employment |
|-----------------------|----------------|--------------|
| 2001 | 54 | 4,381 |
| 2002 | 46 | 4,277 |
| 2003 | 52 | 4,732 |
| 2004 | 50 | 4,746 |
| 2005 | 50 | 5,016 |
| 2006 | 48 | 5,332 |
| 2007 | 41 | 5,074 |
| 2008 | 38 | 5,105 |
| 2009 | 38 | 5,170 |
| 2010 | 39 | 5,308 |
| 2011 | 41 | 5,221 |
| 2012 | 44 | 5,579 |
| 2013 | 47 | 5,741 |
| 2014 | 45 | 4,984 |
| 2015 | 51 | 4,743 |
| 2016 | 51 | 4,846 |
| 2017 | 61 | 5,251 |
| Net Change | 7 | 870 |
| Percent Change | 13.0% | 19.9% |

Source: Quarterly Census of Employment and Wages

Commercial and Service Industry Machinery Manufacturing: NAICS 3333

This industry comprises establishments primarily engaged in manufacturing commercial and service machinery, such as optical instruments, photographic and photocopying equipment, automatic vending machinery, commercial laundry and dry-cleaning machinery, office machinery, automotive maintenance equipment (except mechanics' handtools), and commercial-type cooking equipment. Between 2001 and 2010, the industry lost 4,363 jobs (-57.6 percent) and 24 establishments. However, between 2010 and 2017, the industry added 517 jobs (16.1 percent) and six establishments.

Figure 7. Commercial and Service Industry Machinery Manufacturing

| Year | Establishments | Employment |
|-----------------------|----------------|---------------|
| 2001 | 126 | 7,573 |
| 2002 | 121 | 7,093 |
| 2003 | 116 | 6,521 |
| 2004 | 113 | 5,309 |
| 2005 | 111 | 4,659 |
| 2006 | 110 | 3,751 |
| 2007 | 117 | 3,762 |
| 2008 | 108 | 3,722 |
| 2009 | 105 | 3,243 |
| 2010 | 102 | 3,210 |
| 2011 | 100 | 3,344 |
| 2012 | 92 | 3,307 |
| 2013 | 94 | 3,514 |
| 2014 | 91 | 3,660 |
| 2015 | 96 | 3,850 |
| 2016 | 107 | 3,685 |
| 2017 | 108 | 3,727 |
| Net Change | -18 | -3,846 |
| Percent Change | -14.3% | -50.8% |

Source: Quarterly Census of Employment and Wages

Navigational, Measuring, Electromedical, and Control Instruments Manufacturing: NAICS 3345

This industry comprises establishments primarily engaged in manufacturing navigational, measuring, electromedical, and control instruments. Examples of products made by these establishments are aeronautical instruments, appliance regulators and controls (except switches), laboratory analytical instruments, navigation and guidance systems, and physical properties test equipment. Between 2001 and 2010, the industry lost 4,560 jobs (-32.8 percent) and 15 establishments. However, between 2010 and 2017, the industry has added 1,448 jobs (15.5 percent) and 16 establishments.

Figure 8. Navigational, Measuring, Electromedical, and Control Instruments Manufacturing

| Year | Establishments | Employment |
|-----------------------|----------------|---------------|
| 2001 | 303 | 13,901 |
| 2002 | 303 | 12,500 |
| 2003 | 299 | 11,937 |
| 2004 | 282 | 10,283 |
| 2005 | 279 | 9,824 |
| 2006 | 268 | 9,534 |
| 2007 | 275 | 10,179 |
| 2008 | 273 | 10,087 |
| 2009 | 286 | 9,533 |
| 2010 | 288 | 9,341 |
| 2011 | 296 | 9,652 |
| 2012 | 294 | 9,958 |
| 2013 | 297 | 9,862 |
| 2014 | 291 | 10,078 |
| 2015 | 298 | 10,798 |
| 2016 | 293 | 10,709 |
| 2017 | 304 | 10,789 |
| Net Change | 1 | -3,112 |
| Percent Change | 0.3% | -22.4% |

Source: Quarterly Census of Employment and Wages

Medical Equipment and Supplies Manufacturing: NAICS 3391

This industry comprises establishments primarily engaged in manufacturing medical equipment and supplies. Examples of products made by these establishments are surgical and medical instruments, surgical appliances and supplies, dental equipment and supplies, orthodontic goods, ophthalmic goods, dentures, and orthodontic appliances. Between 2001 and 2017, the industry lost 2,138 jobs (-19.8 percent) and 126 establishments.

Figure 9. Medical Equipment and Supplies Manufacturing

| Year | Establishments | Employment |
|-----------------------|----------------|---------------|
| 2001 | 458 | 10,801 |
| 2002 | 461 | 11,205 |
| 2003 | 462 | 11,421 |
| 2004 | 456 | 11,269 |
| 2005 | 452 | 11,487 |
| 2006 | 448 | 10,876 |
| 2007 | 431 | 9,850 |
| 2008 | 430 | 10,384 |
| 2009 | 425 | 9,843 |
| 2010 | 419 | 9,496 |
| 2011 | 427 | 10,020 |
| 2012 | 424 | 10,436 |
| 2013 | 394 | 10,147 |
| 2014 | 385 | 9,641 |
| 2015 | 358 | 9,182 |
| 2016 | 335 | 8,748 |
| 2017 | 332 | 8,663 |
| Net Change | -126 | -2,138 |
| Percent Change | -27.5% | -19.8% |

Source: Quarterly Census of Employment and Wages

Professional and Commercial Equipment and Supplies Merchant Wholesalers: NAICS 4234

This industry group comprises establishments primarily engaged in the merchant wholesale distribution of photographic equipment and supplies; office, computer, and computer peripheral equipment; and medical, dental, hospital, ophthalmic, and other commercial and professional equipment and supplies. Between 2001 and 2017, the industry lost 2,480 jobs (-8.9 percent) and 133 establishments.

Figure 10. Professional and Commercial Equipment and Supplies Merchant Wholesalers

| Year | Establishments | Employment |
|-----------------------|----------------|---------------|
| 2001 | 2,118 | 27,925 |
| 2002 | 2,160 | 26,249 |
| 2003 | 2,104 | 25,091 |
| 2004 | 2,083 | 24,899 |
| 2005 | 2,135 | 24,555 |
| 2006 | 2,142 | 24,954 |
| 2007 | 2,178 | 25,272 |
| 2008 | 2,117 | 25,030 |
| 2009 | 2,037 | 24,038 |
| 2010 | 1,992 | 23,646 |
| 2011 | 1,947 | 23,460 |
| 2012 | 1,907 | 23,084 |
| 2013 | 1,855 | 23,775 |
| 2014 | 1,846 | 23,988 |
| 2015 | 1,844 | 24,864 |
| 2016 | 1,912 | 25,055 |
| 2017 | 1,985 | 25,445 |
| Net Change | -133 | -2,480 |
| Percent Change | -6.3% | -8.9% |

Source: Quarterly Census of Employment and Wages

Drugs and Druggists' Sundries Merchant Wholesalers: NAICS 4242

This industry comprises establishments primarily engaged in the merchant wholesale distribution of biological and medical products; botanical drugs and herbs; and pharmaceutical products intended for internal and external consumption in dose forms, such as ampoules, tablets, capsules, vials, ointments, powders, solutions, and suspensions. Between 2001 and 2007, the industry gained 1,354 jobs (16.5 percent) and 92 establishments. From 2007 to 2017, however, the industry lost 2,458 jobs (-25.8 percent) while gaining 31 establishments.

Figure 11. Drugs and Druggists' Sundries Merchant Wholesalers

| Year | Establishments | Employment |
|-----------------------|----------------|---------------|
| 2001 | 315 | 8,184 |
| 2002 | 311 | 8,590 |
| 2003 | 324 | 8,497 |
| 2004 | 347 | 8,722 |
| 2005 | 363 | 8,975 |
| 2006 | 382 | 9,339 |
| 2007 | 407 | 9,538 |
| 2008 | 426 | 8,623 |
| 2009 | 426 | 8,171 |
| 2010 | 402 | 8,095 |
| 2011 | 403 | 7,523 |
| 2012 | 382 | 7,316 |
| 2013 | 368 | 7,267 |
| 2014 | 366 | 6,760 |
| 2015 | 375 | 7,076 |
| 2016 | 406 | 7,056 |
| 2017 | 438 | 7,080 |
| Net Change | 123 | -1,104 |
| Percent Change | 39.0% | -13.5% |

Source: Quarterly Census of Employment and Wages

Insurance Carriers: NAICS 5241

This industry group comprises establishments primarily engaged in underwriting annuities and insurance policies and investing premiums to build up a portfolio of financial assets to be used against future claims. Between 2001 and 2012, the industry lost 2,690 jobs (-4.2 percent) and 461 establishments. Between 2012 and 2017, however, employment has rebounded, gaining 5,583 jobs (9.2 percent), but losing another 257 establishments.

Figure 12. Insurance Carriers

| Year | Establishments | Employment |
|-----------------------|----------------|--------------|
| 2001 | 1,736 | 63,644 |
| 2002 | 1,523 | 62,450 |
| 2003 | 1,551 | 62,913 |
| 2004 | 1,627 | 62,178 |
| 2005 | 1,647 | 62,866 |
| 2006 | 1,677 | 63,669 |
| 2007 | 1,663 | 64,097 |
| 2008 | 1,444 | 63,920 |
| 2009 | 1,351 | 63,633 |
| 2010 | 1,292 | 62,306 |
| 2011 | 1,299 | 61,814 |
| 2012 | 1,275 | 60,954 |
| 2013 | 1,247 | 61,933 |
| 2014 | 1,239 | 61,956 |
| 2015 | 1,016 | 63,616 |
| 2016 | 1,037 | 65,697 |
| 2017 | 1,018 | 66,537 |
| Net Change | -718 | 2,893 |
| Percent Change | -41.4% | 4.5% |

Source: Quarterly Census of Employment and Wages

Consumer Goods Rental: NAICS 5322

This industry group comprises establishments primarily engaged in renting personal and household-type goods. Establishments classified in this industry group generally provide short-term rental although in some instances, the goods may be leased for longer periods of time. Between 2001 and 2017, the industry lost 6,419 jobs (51.8 percent) and 561 establishments.

Figure 13. > Consumer Goods Rental

| Year | Establishments | Employment |
|-----------------------|----------------|---------------|
| 2001 | 1,386 | 12,403 |
| 2002 | 1,312 | 11,837 |
| 2003 | 1,294 | 11,393 |
| 2004 | 1,243 | 11,386 |
| 2005 | 1,330 | 11,158 |
| 2006 | 1,313 | 10,467 |
| 2007 | 1,273 | 10,070 |
| 2008 | 1,195 | 9,337 |
| 2009 | 1,167 | 8,886 |
| 2010 | 1,080 | 8,088 |
| 2011 | 968 | 7,453 |
| 2012 | 882 | 6,826 |
| 2013 | 841 | 6,557 |
| 2014 | 793 | 6,418 |
| 2015 | 773 | 6,180 |
| 2016 | 856 | 6,470 |
| 2017 | 825 | 5,984 |
| Net Change | -561 | -6,419 |
| Percent Change | -40.5% | -51.8% |

Source: Quarterly Census of Employment and Wages

Architectural, Engineering, and Related Services: NAICS 5413

This industry group comprises establishments primarily engaged in providing architectural, landscape architectural, engineering, drafting, building inspection, surveying, mapping, and analytical testing services. Between 2001 and 2010, the industry lost 5,428 jobs (-12.5 percent) and 152 establishments. From 2010 to 2017, however, the industry has gained 4,192 jobs (11.1 percent) and 293 establishments.

Figure 14. Architectural, Engineering, and Related Services

| Year | Establishments | Employment |
|-----------------------|----------------|---------------|
| 2001 | 3,715 | 43,318 |
| 2002 | 3,685 | 41,396 |
| 2003 | 3,738 | 40,699 |
| 2004 | 3,594 | 40,272 |
| 2005 | 3,589 | 40,642 |
| 2006 | 3,615 | 41,740 |
| 2007 | 3,652 | 42,490 |
| 2008 | 3,641 | 42,397 |
| 2009 | 3,615 | 38,648 |
| 2010 | 3,563 | 37,890 |
| 2011 | 3,633 | 39,025 |
| 2012 | 3,615 | 39,172 |
| 2013 | 3,681 | 39,698 |
| 2014 | 3,707 | 40,455 |
| 2015 | 3,732 | 40,291 |
| 2016 | 3,785 | 40,996 |
| 2017 | 3,856 | 42,082 |
| Net Change | 141 | -1,236 |
| Percent Change | 3.8% | -2.9% |

Source: Quarterly Census of Employment and Wages

Scientific Research and Development Services: NAICS 5417

This industry group comprises establishments engaged in conducting original investigation undertaken on a systematic basis to gain new knowledge and/or the application of research findings or other scientific knowledge for the creation of new or significantly improved products or processes. Between 2001 and 2017, the industry gained 5,043 jobs (41.7 percent) and 73 establishments.

Figure 15. Scientific Research and Development Services

| Year | Establishments | Employment |
|-----------------------|----------------|--------------|
| 2001 | 566 | 12,098 |
| 2002 | 576 | 12,256 |
| 2003 | 594 | 12,893 |
| 2004 | 574 | 12,802 |
| 2005 | 585 | 13,954 |
| 2006 | 620 | 15,079 |
| 2007 | 563 | 14,635 |
| 2008 | 606 | 15,423 |
| 2009 | 623 | 15,501 |
| 2010 | 639 | 15,426 |
| 2011 | 683 | 15,460 |
| 2012 | 694 | 16,343 |
| 2013 | 679 | 16,577 |
| 2014 | 683 | 16,784 |
| 2015 | 696 | 17,829 |
| 2016 | 733 | 19,649 |
| 2017 | 639 | 17,141 |
| Net Change | 73 | 5,043 |
| Percent Change | 12.9% | 41.7% |

Source: Quarterly Census of Employment and Wages

Medical and Diagnostic Laboratories: NAICS 6215

This industry comprises establishments known as medical and diagnostic laboratories primarily engaged in providing analytic or diagnostic services, including body fluid analysis and diagnostic imaging, generally to the medical profession or to the patient on referral from a health practitioner. Between 2001 and 2008, the industry gained 2,677 jobs (54.7 percent) and 314 establishments. From 2008 to 2017, the industry lost 1,241 jobs (16.4 percent) but gained 155 more establishments.

Figure 16. Medical and Diagnostic Laboratories

| Year | Establishments | Employment |
|-----------------------|----------------|--------------|
| 2001 | 313 | 4,896 |
| 2002 | 401 | 5,591 |
| 2003 | 423 | 5,821 |
| 2004 | 437 | 6,500 |
| 2005 | 476 | 6,745 |
| 2006 | 538 | 7,150 |
| 2007 | 576 | 7,570 |
| 2008 | 627 | 7,573 |
| 2009 | 653 | 7,507 |
| 2010 | 639 | 7,383 |
| 2011 | 637 | 7,485 |
| 2012 | 641 | 7,375 |
| 2013 | 697 | 7,460 |
| 2014 | 736 | 7,454 |
| 2015 | 784 | 7,286 |
| 2016 | 802 | 6,304 |
| 2017 | 782 | 6,332 |
| Net Change | 469 | 1,436 |
| Percent Change | 149.8% | 29.3% |

Source: Quarterly Census of Employment and Wages

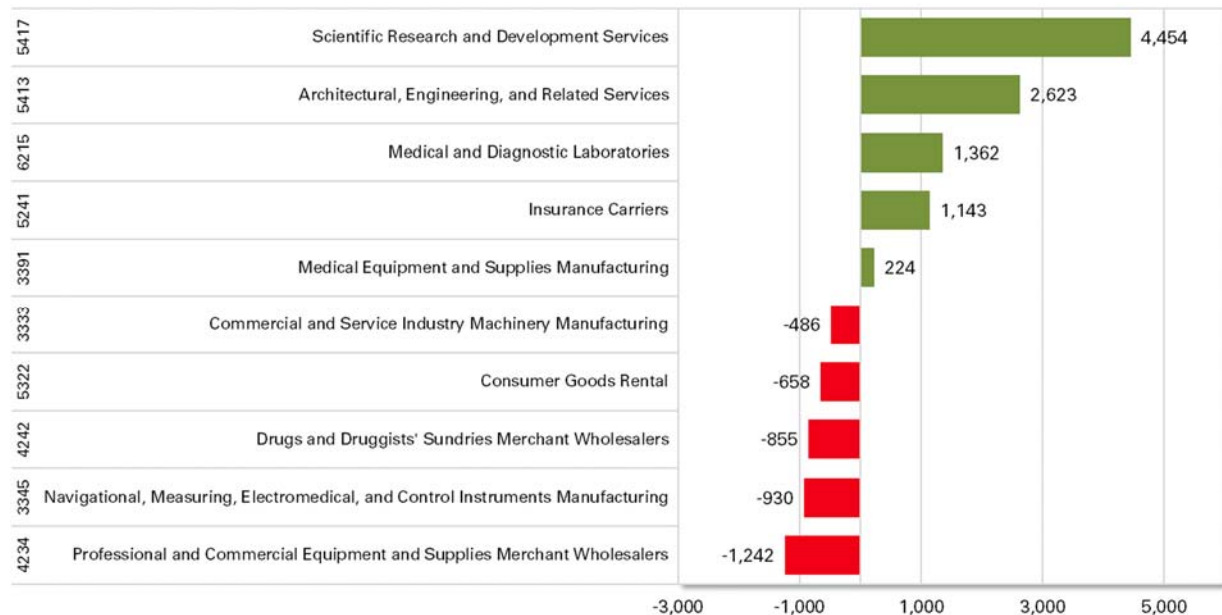
The BioHealth Workforce

Three factors affect an industry’s workforce needs. The first is industry growth or decline. Growing industries need more workers; shrinking industries need fewer. The second is the need to replace workers who leave to work in other industries, for retirement or for other reasons. Even shrinking industries can have significant replacement needs. The last factor is the availability of trained workers or workers who can be trained. The following section examines projected industry employment, worker age and education distributions, and the projected occupational needs for the biohealth cluster.

Projected Employment Change, Ohio 2016-2026

Figure 17 shows the long-term employment projections for 10 of the industries in the biohealth cluster, which is expected to grow by 5,635 jobs from 2016 to 2026. The highest job growth is expected to occur in scientific research and development services, with 4,454 jobs added. Other growth is expected in architectural, engineering, and related services (2,623 jobs), medical and diagnostic laboratories (1,362 jobs), insurance carriers (1,143 jobs), and medical equipment and supplies manufacturing (224 jobs). Professional and commercial equipment and supplies merchant wholesalers is expected to lose the most jobs through 2026.

Figure 17. Projected Employment Change, 2016-2026

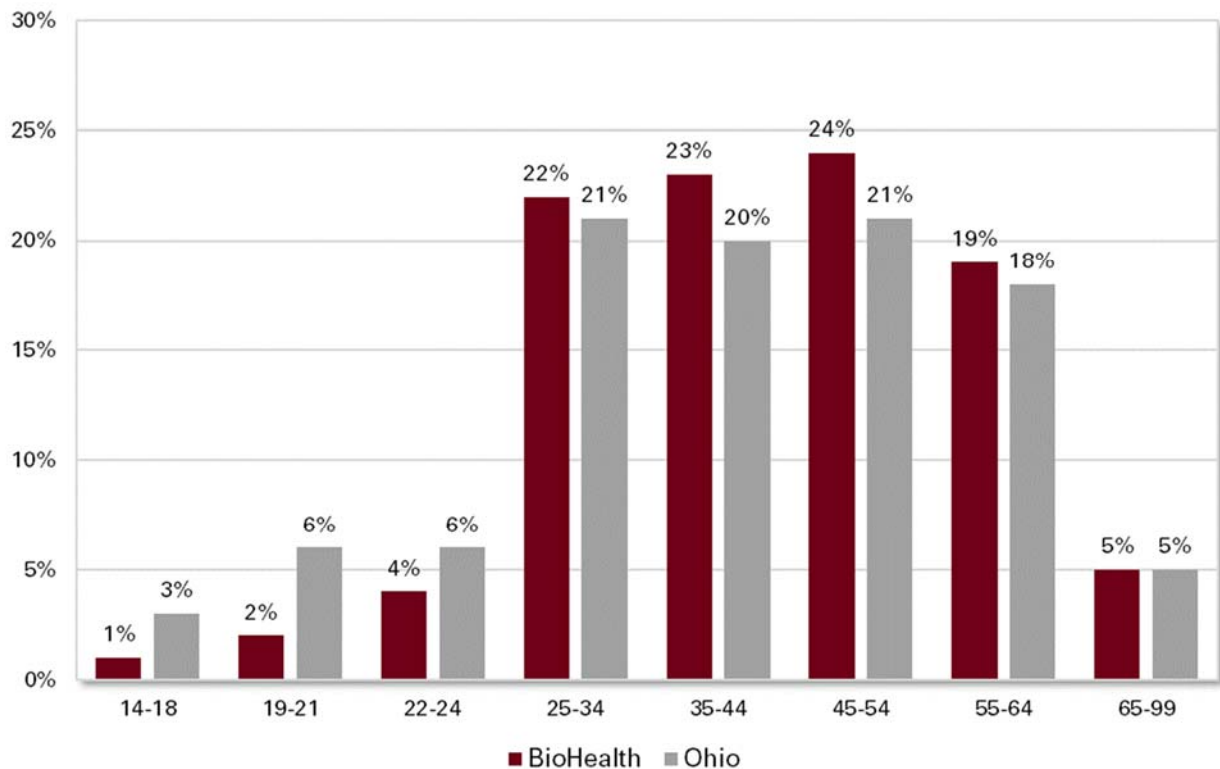


Source: Ohio Bureau of Labor Market Information

Age Distribution of Ohio Workers

Figure 18 shows the age distribution of workers in the biohealth industry cluster compared to all Ohio workers for the third quarter of 2017. The biohealth services cluster has a somewhat higher proportion of workers aged 25-64 and lower proportions of workers under 25. Businesses in the biohealth cluster will need to replace retiring workers at a somewhat faster pace than other Ohio industries.

Figure 18. Age Distribution of Ohio Workers



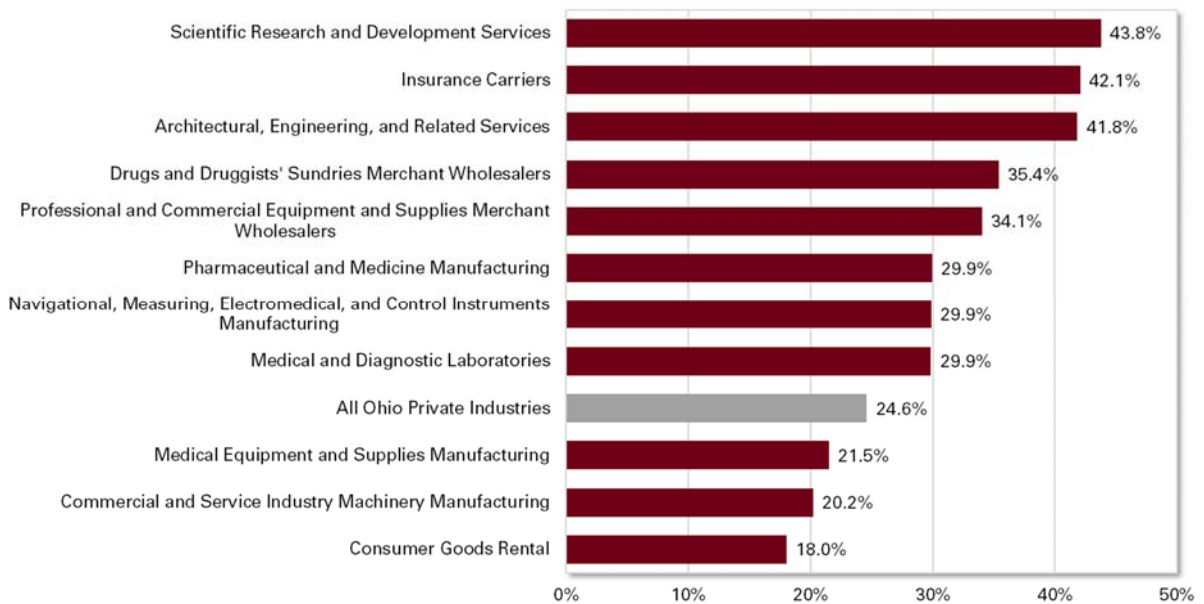
Source: U.S. Census of Quarterly Workforce Indicators, 2017 Q3

BioHealth Cluster Education and Training Needs

The biohealth industry cluster is growing in Ohio, and as Figure 19 shows, occupations in this cluster have high education and training requirements.

Across all Ohio private industries, an average of 24.6 percent of workers 25 and older had a bachelor's degree or higher in 2017. Among the biohealth cluster industries, eight had a higher percentage of employees with a bachelor's degree or higher, ranging from 29.9 to 43.8 percent. Eight industries - led by scientific research and development services (43.8 percent), insurance carriers (42.1 percent), and architectural, engineering, and related services (41.8 percent) - had a higher percentage of employees with at least a bachelor's degree compared to all Ohio private industry employees at 24.6 percent. These three industries are also among the four fastest growing biohealth industries. Only three industries had a lower percentage of college-educated employees than the statewide private industry average: consumer goods rental (18.0 percent), commercial and service industry machinery manufacturing (20.2 percent), and medical equipment and supplies manufacturing (21.5 percent).

Figure 19. Percent of BioHealth Workers 25+ with a Bachelor's Degree or Higher



Source: U.S. Census of Quarterly Workforce Indicators, 2017 Q3

Although every business has a unique set of jobs, businesses in the same industry and related industries tend to employ similar occupations. Figure 20 shows the typical education levels, on-the-job training (OJT) and related work experience associated with the 25 occupations that make up the largest share of employment in the biohealth cluster. Entrants in 14 of the top 25 occupations typically require a bachelor’s degree. Twelve of the occupations require short-, moderate-, or long-term OJT.² Four require related work experience.

Figure 20. Typical Education, OJT and Related Work Experience Needs for the 25 Largest BioHealth Occupations

| SOC Code | Occupational Title | Typical Education level at Entry | OJT/Related Experience |
|----------|--|-----------------------------------|------------------------|
| 11-1021 | General and Operations Managers | Bachelor's degree | 5 years or more |
| 11-3021 | Computer and Information Systems Managers | Bachelor's degree | 5 years or more |
| 11-3031 | Financial Managers | Bachelor's degree | 5 years or more |
| 13-1031 | Claims Adjusters, Examiners, and Investigators | High School diploma or equivalent | Long-term OJT |
| 13-1161 | Market Research Analysts and Marketing Specialists | Bachelor's degree | None |
| 13-1199 | Business Operations Specialists, All Other | Bachelor's degree | None |
| 13-2011 | Accountants and Auditors | Bachelor's degree | None |
| 13-2053 | Insurance Underwriters | Bachelor's degree | Moderate-term OJT |
| 15-1121 | Computer Systems Analysts | Bachelor's degree | None |
| 15-1132 | Software Developers, Applications | Bachelor's degree | None |
| 15-1142 | Network and Computer Systems Administrators | Bachelor's degree | None |
| 17-2071 | Electrical Engineers | Bachelor's degree | None |
| 17-2141 | Mechanical Engineers | Bachelor's degree | None |
| 29-1141 | Registered Nurses | Bachelor's degree | None |
| 41-2021 | Counter and Rental Clerks | No formal educational credential | Short-term OJT |
| 41-3021 | Insurance Sales Agents | High School diploma or equivalent | Moderate-term OJT |
| 41-4011 | Sales Representatives, Wholesale and Manufacturing, Technical and Scientific Products | Bachelor's degree | Moderate-term OJT |
| 41-4012 | Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific Products | High School diploma or equivalent | Moderate-term OJT |
| 43-1011 | First-Line Supervisors of Office and Administrative Support Workers | High School diploma or equivalent | Less than 5 years |
| 43-3031 | Bookkeeping, Accounting, and Auditing Clerks | Some college, no degree | Moderate-term OJT |
| 43-4051 | Customer Service Representatives | High School diploma or equivalent | Short-term OJT |
| 43-6014 | Secretaries and Administrative Assistants, Except Legal, Medical, and Executive | High School diploma or equivalent | Short-term OJT |
| 43-9041 | Insurance Claims and Policy Processing Clerks | High School diploma or equivalent | Moderate-term OJT |
| 43-9061 | Office Clerks, General | High School diploma or equivalent | Short-term OJT |
| 51-9061 | Inspectors, Testers, Sorters, Samplers, and Weighers | High School diploma or equivalent | Moderate-term OJT |

Source: Ohio Bureau of Labor Market Information

² Short-term OJT lasts less than one month. Moderate-term OJT lasts one to 12 months and may include informal training. Long-term OJT lasts more than 12 months and combines work experience with formal classroom instruction.

BioHealth Cluster Industry Staffing Patterns

A staffing pattern refers to the number and types of occupations typically needed by an industry. The following tables show the most common occupations in each industry's staffing pattern and each occupation's projected employment. The occupations below are described by their Standard Occupational Classification (SOC) code.

Pharmaceutical and Medicine Manufacturing: NAICS 3254

Chemical plant and system operators (SOC 51-8091) is the largest occupation in this industry. Most occupations in this industry are projected to decline. However, three occupations are projected to grow: industrial engineers (SOC 17-2112), chemists (SOC 19-2031), and industrial machinery mechanics (SOC 49-9041).

Figure 21. Ohio Staffing Pattern for Pharmaceutical and Medicine Manufacturing

| SOC Code | Occupational Title | 2016 | 2026 | Numeric Change | Percent Change |
|----------|--|------|------|----------------|----------------|
| 51-8091 | Chemical Plant and System Operators | 738 | 694 | -44 | -6.0% |
| 51-9011 | Chemical Equipment Operators and Tenders | 490 | 460 | -30 | -6.1% |
| 51-9061 | Inspectors, Testers, Sorters, Samplers, and Weighers | 355 | 334 | -21 | -5.9% |
| 17-2112 | Industrial Engineers | 261 | 307 | 46 | 17.6% |
| 19-2031 | Chemists | 258 | 268 | 10 | 3.9% |
| 51-1011 | First-Line Supervisors of Production and Operating Workers | 239 | 225 | -14 | -5.9% |
| 11-3051 | Industrial Production Managers | 158 | 149 | -9 | -5.7% |
| 51-9199 | Production Workers, All Other | 140 | 132 | -8 | -5.7% |
| 17-2199 | Engineers, All Other | 136 | 128 | -8 | -5.9% |
| 53-7062 | Laborers and Freight, Stock, and Material Movers, Hand | 131 | 123 | -8 | -6.1% |
| 17-3026 | Industrial Engineering Technicians | 129 | 122 | -7 | -5.4% |
| 13-1199 | Business Operations Specialists, All Other | 101 | 95 | -6 | -5.9% |
| 19-4021 | Biological Technicians | 96 | 91 | -5 | -5.2% |
| 17-3029 | Engineering Technicians, Except Drafters, All Other | 88 | 83 | -5 | -5.7% |
| 51-9111 | Packaging and Filling Machine Operators and Tenders | 85 | 80 | -5 | -5.9% |
| 53-7064 | Packers and Packagers, Hand | 82 | 77 | -5 | -6.1% |
| 49-9041 | Industrial Machinery Mechanics | 73 | 76 | 3 | 4.1% |
| 17-2041 | Chemical Engineers | 67 | 63 | -4 | -6.0% |
| 19-1022 | Microbiologists | 66 | 63 | -3 | -4.6% |
| 13-1081 | Logisticians | 64 | 61 | -3 | -4.7% |
| 11-1021 | General and Operations Managers | 60 | 57 | -3 | -5.0% |
| 13-2011 | Accountants and Auditors | 54 | 51 | -3 | -5.6% |
| 43-5071 | Shipping, Receiving, and Traffic Clerks | 51 | 46 | -5 | -9.8% |

Source: Ohio Bureau of Labor Market Information

Commercial and Service Industry Machinery Manufacturing: NAICS 3333

The largest occupation in this industry is welders, cutters, solderers, and brazers (SOC 51-4121). All occupations in this industry cluster are projected to shrink through 2026. The largest numeric drop is projected for team assemblers (SOC 51-2092). The largest percentage drop is projected for engine and other machine assemblers (SOC 51-2031). The smallest drop is projected for electrical and electronics engineering technicians (SOC 17-3023).

Figure 22. Ohio Staffing Pattern for Commercial and Service Industry Machinery Manufacturing

| SOC Code | Occupational Title | 2016 | 2026 | Numeric Change | Percent Change |
|----------|--|------|------|----------------|----------------|
| 51-4121 | Welders, Cutters, Solderers, and Brazers | 290 | 268 | -22 | -7.6% |
| 51-2092 | Team Assemblers | 247 | 182 | -65 | -26.3% |
| 51-2099 | Assemblers and Fabricators, All Other | 156 | 115 | -41 | -26.3% |
| 51-2022 | Electrical and Electronic Equipment Assemblers | 153 | 113 | -40 | -26.1% |
| 41-4012 | Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific Products | 139 | 129 | -10 | -7.2% |
| 51-2031 | Engine and Other Machine Assemblers | 124 | 91 | -33 | -26.6% |
| 51-1011 | First-Line Supervisors of Production and Operating Workers | 115 | 107 | -8 | -7.0% |
| 51-4041 | Machinists | 114 | 105 | -9 | -7.9% |
| 17-2141 | Mechanical Engineers | 99 | 91 | -8 | -8.1% |
| 43-4051 | Customer Service Representatives | 94 | 87 | -7 | -7.5% |
| 43-5071 | Shipping, Receiving, and Traffic Clerks | 88 | 78 | -10 | -11.4% |
| 11-1021 | General and Operations Managers | 76 | 70 | -6 | -7.9% |
| 51-2041 | Structural Metal Fabricators and Fitters | 72 | 53 | -19 | -26.4% |
| 43-6014 | Secretaries and Administrative Assistants, Except Legal, Medical, and Executive | 71 | 56 | -15 | -21.1% |
| 49-9071 | Maintenance and Repair Workers, General | 67 | 62 | -5 | -7.5% |
| 17-2071 | Electrical Engineers | 64 | 59 | -5 | -7.8% |
| 11-3051 | Industrial Production Managers | 63 | 58 | -5 | -7.9% |
| 17-3023 | Electrical and Electronics Engineering Technicians | 61 | 57 | -4 | -6.6% |
| 51-4072 | Molding, Coremaking, and Casting Machine Setters, Operators, and Tenders, Metal and Plastic | 60 | 48 | -12 | -20.0% |
| 51-8031 | Water and Wastewater Treatment Plant and System Operators | 57 | 47 | -10 | -17.5% |
| 43-9061 | Office Clerks, General | 55 | 46 | -9 | -16.4% |
| 51-9061 | Inspectors, Testers, Sorters, Samplers, and Weighers | 55 | 41 | -14 | -25.5% |
| 51-9083 | Ophthalmic Laboratory Technicians | 53 | 47 | -6 | -11.3% |
| 43-3031 | Bookkeeping, Accounting, and Auditing Clerks | 52 | 44 | -8 | -15.4% |

Source: Ohio Bureau of Labor Market Information

Navigational, Measuring, Electromedical, and Control Instruments Manufacturing: NAICS 3345

Electrical and electronic equipment assemblers (SOC 51-2022) is the largest occupation in this industry. Four occupations - industrial engineers (SOC 17-2112), software developers, applications (SOC 15-1132), aerospace engineers (SOC 17-2011), and market research analysts and marketing specialists (SOC 13-1161) - are expected to grow; all other occupations in this industry are projected to shrink through 2026. The occupation projected to have the largest numeric loss is electrical and electronic equipment assemblers (SOC 51-2022).

Figure 23. Ohio Staffing Pattern for Navigational, Measuring, Electromedical, and Control Instruments Manufacturing

| SOC Code | Occupational Title | 2016 | 2026 | Numeric Change | Percent Change |
|----------|--|------|------|----------------|----------------|
| 51-2022 | Electrical and Electronic Equipment Assemblers | 978 | 755 | -223 | -22.8% |
| 41-4012 | Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific Products | 477 | 458 | -19 | -4.0% |
| 51-2099 | Assemblers and Fabricators, All Other | 398 | 307 | -91 | -22.9% |
| 51-9061 | Inspectors, Testers, Sorters, Samplers, and Weighers | 386 | 298 | -88 | -22.8% |
| 17-2071 | Electrical Engineers | 374 | 360 | -14 | -3.7% |
| 51-2023 | Electromechanical Equipment Assemblers | 366 | 282 | -84 | -23.0% |
| 17-2112 | Industrial Engineers | 347 | 355 | 8 | 2.3% |
| 43-4051 | Customer Service Representatives | 318 | 306 | -12 | -3.8% |
| 17-2072 | Electronics Engineers, Except Computer | 285 | 275 | -10 | -3.5% |
| 51-1011 | First-Line Supervisors of Production and Operating Workers | 261 | 251 | -10 | -3.8% |
| 17-2141 | Mechanical Engineers | 223 | 215 | -8 | -3.6% |
| 51-2092 | Team Assemblers | 220 | 170 | -50 | -22.7% |
| 11-3051 | Industrial Production Managers | 213 | 206 | -7 | -3.3% |
| 43-5071 | Shipping, Receiving, and Traffic Clerks | 204 | 186 | -18 | -8.8% |
| 15-1132 | Software Developers, Applications | 198 | 210 | 12 | 6.1% |
| 17-2011 | Aerospace Engineers | 195 | 199 | 4 | 2.1% |
| 13-1023 | Purchasing Agents, Except Wholesale, Retail, and Farm Products | 192 | 167 | -25 | -13.0% |
| 11-9041 | Architectural and Engineering Managers | 187 | 180 | -7 | -3.7% |
| 43-6014 | Secretaries and Administrative Assistants, Except Legal, Medical, and Executive | 167 | 137 | -30 | -18.0% |
| 51-4041 | Machinists | 160 | 154 | -6 | -3.8% |
| 49-2094 | Electrical and Electronics Repairers, Commercial and Industrial Equipment | 149 | 144 | -5 | -3.4% |
| 51-4121 | Welders, Cutters, Solderers, and Brazers | 146 | 141 | -5 | -3.4% |
| 13-2011 | Accountants and Auditors | 144 | 139 | -5 | -3.5% |
| 51-2011 | Aircraft Structure, Surfaces, Rigging, and Systems Assemblers | 144 | 111 | -33 | -22.9% |
| 43-3031 | Bookkeeping, Accounting, and Auditing Clerks | 137 | 119 | -18 | -13.1% |
| 13-1161 | Market Research Analysts and Marketing Specialists | 126 | 134 | 8 | 6.4% |

Source: Ohio Bureau of Labor Market Information

Medical Equipment and Supplies Manufacturing: NAICS 3391

The largest occupation in this industry is dental laboratory technicians (SOC 51-9081), which is projected to grow by 11.9 percent by 2026. Seven occupations in this industry are projected to decline through 2026. Those expected to decline the most are team assemblers (SOC 51-2092); inspectors, testers, sorters, samplers, and weighers (SOC 51-9061); and assemblers and fabricators, all other (SOC 51-2099). The occupation projected to have the highest percentage growth is orthotists and prosthetists (SOC 29-2091).

Figure 24. Ohio Staffing Pattern for Medical Equipment and Supplies Manufacturing

| SOC Code | Occupational Title | 2016 | 2026 | Numeric Change | Percent Change |
|----------|---|------|------|----------------|----------------|
| 51-9081 | Dental Laboratory Technicians | 707 | 791 | 84 | 11.9% |
| 51-9082 | Medical Appliance Technicians | 523 | 601 | 78 | 14.9% |
| 51-9083 | Ophthalmic Laboratory Technicians | 413 | 454 | 41 | 9.9% |
| 51-2092 | Team Assemblers | 360 | 301 | -59 | -16.4% |
| 51-9198 | Helpers--Production Workers | 325 | 340 | 15 | 4.6% |
| 51-9061 | Inspectors, Testers, Sorters, Samplers, and Weighers | 308 | 257 | -51 | -16.6% |
| 43-4051 | Customer Service Representatives | 296 | 309 | 13 | 4.4% |
| 51-2099 | Assemblers and Fabricators, All Other | 281 | 235 | -46 | -16.4% |
| 17-2112 | Industrial Engineers | 257 | 292 | 35 | 13.6% |
| 51-1011 | First-Line Supervisors of Production and Operating Workers | 247 | 258 | 11 | 4.5% |
| 29-2091 | Orthotists and Prosthetists | 223 | 268 | 45 | 20.2% |
| 41-4012 | Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific Products | 203 | 211 | 8 | 3.9% |
| 51-4081 | Multiple Machine Tool Setters, Operators, and Tenders, Metal and Plastic | 185 | 187 | 2 | 1.1% |
| 51-4121 | Welders, Cutters, Solderers, and Brazers | 172 | 179 | 7 | 4.1% |
| 43-5071 | Shipping, Receiving, and Traffic Clerks | 162 | 160 | -2 | -1.2% |
| 43-6014 | Secretaries and Administrative Assistants, Except Legal, Medical, and Executive | 154 | 137 | -17 | -11.0% |
| 43-5081 | Stock Clerks and Order Fillers | 152 | 158 | 6 | 4.0% |
| 51-4041 | Machinists | 136 | 142 | 6 | 4.4% |
| 43-9061 | Office Clerks, General | 133 | 125 | -8 | -6.0% |
| 53-7062 | Laborers and Freight, Stock, and Material Movers, Hand | 130 | 135 | 5 | 3.9% |
| 43-5061 | Production, Planning, and Expediting Clerks | 127 | 133 | 6 | 4.7% |
| 51-9199 | Production Workers, All Other | 124 | 129 | 5 | 4.0% |
| 53-3033 | Light Truck or Delivery Services Drivers | 121 | 126 | 5 | 4.1% |
| 53-7064 | Packers and Packagers, Hand | 117 | 122 | 5 | 4.3% |
| 51-4033 | Grinding, Lapping, Polishing, and Buffing Machine Tool Setters, Operators, and Tenders, Metal and Plastic | 114 | 107 | -7 | -6.1% |
| 17-2031 | Biomedical Engineers | 113 | 118 | 5 | 4.4% |

Source: Ohio Bureau of Labor Market Information

Professional and Commercial Equipment and Supplies Merchant Wholesalers: NAICS 4234

The largest occupation in this industry is sales representatives, wholesale and manufacturing, technical and scientific products (SOC 41-4011). Only two of the occupations in this industry - software developers, applications (SOC 15-1132) and market research analysts and marketing specialists (SOC 13-1161) - are projected to increase through 2026. The largest numeric decline is expected in customer service representatives (SOC 43-4051). The largest percentage decline is expected in secretaries and administrative assistants, except legal, medical, and executive (SOC 43-6014).

Figure 25. Ohio Staffing Pattern for Professional and Commercial Equipment and Supplies Merchant Wholesalers

| SOC Code | Occupational Title | 2016 | 2026 | Numeric Change | Percent Change |
|----------|--|-------|-------|----------------|----------------|
| 41-4011 | Sales Reps., Wholesale and Manufacturing, Technical and Scientific Products | 3,293 | 3,216 | -77 | -2.3% |
| 43-4051 | Customer Service Representatives | 2,235 | 1,965 | -270 | -12.1% |
| 41-4012 | Sales Reps., Wholesale and Manufacturing, Except Technical and Scientific Products | 1,712 | 1,672 | -40 | -2.3% |
| 43-5071 | Shipping, Receiving, and Traffic Clerks | 1,049 | 973 | -76 | -7.2% |
| 49-2011 | Computer, Automated Teller, and Office Machine Repairers | 844 | 824 | -20 | -2.4% |
| 43-6014 | Secretaries and Administrative Assistants, Except Legal, Medical, and Executive | 692 | 574 | -118 | -17.1% |
| 49-9062 | Medical Equipment Repairers | 614 | 599 | -15 | -2.4% |
| 15-1151 | Computer User Support Specialists | 610 | 596 | -14 | -2.3% |
| 15-1132 | Software Developers, Applications | 559 | 601 | 42 | 7.5% |
| 43-3031 | Bookkeeping, Acctg., and Auditing Clrks. | 550 | 483 | -67 | -12.2% |
| 15-1152 | Computer Network Support Specialists | 542 | 529 | -13 | -2.4% |
| 43-5081 | Stock Clerks and Order Fillers | 479 | 467 | -12 | -2.5% |
| 15-1142 | Network and Computer Systems Admins. | 455 | 422 | -33 | -7.3% |
| 11-1021 | General and Operations Managers | 448 | 437 | -11 | -2.5% |
| 13-1161 | Mrkt. Research Analysts and Mktg. Spclsts. | 444 | 477 | 33 | 7.4% |
| 41-1012 | First-Line Supervisors of Non-Retail Sales Workers | 434 | 424 | -10 | -2.3% |
| 43-4151 | Order Clerks | 403 | 354 | -49 | -12.2% |
| 43-1011 | First-Line Supervisors of Office and Administrative Support Workers | 380 | 340 | -40 | -10.5% |
| 11-2022 | Sales Managers | 375 | 366 | -9 | -2.4% |
| 13-2011 | Accountants and Auditors | 370 | 361 | -9 | -2.4% |
| 13-1199 | Business Operations Specialists, All Other | 362 | 354 | -8 | -2.2% |
| 41-9031 | Sales Engineers | 304 | 297 | -7 | -2.3% |
| 43-5032 | Dispatchers, Except Police, Fire, and Amb. | 303 | 281 | -22 | -7.3% |
| 53-3033 | Light Truck or Delivery Services Drivers | 293 | 286 | -7 | -2.4% |
| 11-3021 | Computer and Information Systems Mgrs | 273 | 267 | -6 | -2.2% |
| 53-7051 | Industrial Truck and Tractor Operators | 267 | 260 | -7 | -2.6% |
| 13-1022 | Wholesale and Retail Buyers, Except Farm Products | 255 | 224 | -31 | -12.2% |

Source: Ohio Bureau of Labor Market Information

Drugs and Druggists' Sundries Merchant Wholesalers: NAICS 4242

The largest occupation in this industry is pharmacy technicians (SOC 29-2052). All occupations are expected to shrink over the next 10 years. The largest numeric decline is expected in pharmacy technicians (SOC 29-2052). The largest percentage decline is expected in data entry keyers (SOC 43-9021).

Figure 26. Ohio Staffing Pattern for Drugs and Druggists' Sundries Merchant Wholesalers

| SOC Code | Occupational Title | 2016 | 2026 | Numeric Change | Percent Change |
|----------|--|------|------|----------------|----------------|
| 29-2052 | Pharmacy Technicians | 846 | 754 | -92 | -10.9% |
| 29-1051 | Pharmacists | 486 | 434 | -52 | -10.7% |
| 43-4051 | Customer Service Representatives | 462 | 412 | -50 | -10.8% |
| 43-5081 | Stock Clerks and Order Fillers | 365 | 326 | -39 | -10.7% |
| 51-9111 | Packaging and Filling Machine Operators and Tenders | 346 | 309 | -37 | -10.7% |
| 41-4012 | Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific Products | 325 | 290 | -35 | -10.8% |
| 43-3021 | Billing and Posting Clerks | 267 | 238 | -29 | -10.9% |
| 53-7062 | Laborers and Freight, Stock, and Material Movers, Hand | 265 | 237 | -28 | -10.6% |
| 53-3033 | Light Truck or Delivery Services Drivers | 234 | 209 | -25 | -10.7% |
| 41-4011 | Sales Representatives, Wholesale and Manufacturing, Technical and Scientific Products | 228 | 204 | -24 | -10.5% |
| 31-9095 | Pharmacy Aides | 196 | 175 | -21 | -10.7% |
| 43-4151 | Order Clerks | 164 | 131 | -33 | -20.1% |
| 43-3031 | Bookkeeping, Accounting, and Auditing Clerks | 150 | 120 | -30 | -20.0% |
| 41-9041 | Telemarketers | 143 | 102 | -41 | -28.7% |
| 43-5071 | Shipping, Receiving, and Traffic Clerks | 129 | 109 | -20 | -15.5% |
| 43-1011 | First-Line Supervisors of Office and Administrative Support Workers | 109 | 97 | -12 | -11.0% |
| 11-1021 | General and Operations Managers | 107 | 95 | -12 | -11.2% |
| 43-5111 | Weighers, Measurers, Checkers, and Samplers, Recordkeeping | 95 | 85 | -10 | -10.5% |
| 43-9021 | Data Entry Keyers | 78 | 49 | -29 | -37.2% |
| 43-6014 | Secretaries and Administrative Assistants, Except Legal, Medical, and Executive | 77 | 58 | -19 | -24.7% |

Source: Ohio Bureau of Labor Market Information

Insurance Carriers: NAICS 5241

The largest occupation in this industry is insurance claims and policy processing clerks (SOC 43-9041). More than half the occupations will experience growth. The occupations projected to have the most new positions are software developers, applications (SOC 15-1132), insurance claims and policy processing clerks (SOC 43-9041), and registered nurses (SOC 29-1141). The occupations projected to have the largest numeric decline are insurance underwriters (SOC 13-2053) and claims adjusters, examiners, and investigators (SOC 13-1031). The occupation projected to have the largest percentage decline is executive secretaries and executive administrative assistants (SOC 43-6011).

Figure 27. > Ohio Staffing Pattern for Insurance Carriers

| SOC Code | Occupational Title | 2016 | 2026 | Numeric Change | Percent Change |
|----------|---|--------|--------|----------------|----------------|
| 43-9041 | Insurance Claims and Policy Processing Clerks | 10,387 | 10,764 | 377 | 3.6% |
| 13-1031 | Claims Adjusters, Examiners, and Investigators | 6,411 | 5,853 | -558 | -8.7% |
| 43-4051 | Customer Service Representatives | 5,592 | 5,455 | -137 | -2.5% |
| 13-2053 | Insurance Underwriters | 5,148 | 4,542 | -606 | -11.8% |
| 15-1132 | Software Developers, Applications | 4,695 | 5,403 | 708 | 15.1% |
| 15-1121 | Computer Systems Analysts | 4,449 | 4,491 | 42 | 0.9% |
| 41-3021 | Insurance Sales Agents | 3,771 | 3,729 | -42 | -1.1% |
| 11-3031 | Financial Managers | 2,521 | 2,744 | 223 | 8.9% |
| 29-1141 | Registered Nurses | 2,038 | 2,408 | 370 | 18.2% |
| 13-1199 | Business Operations Specialists, All Other | 1,787 | 1,980 | 193 | 10.8% |
| 13-1111 | Management Analysts | 1,543 | 1,598 | 55 | 3.6% |
| 43-1011 | First-Line Supervisors of Office and Administrative Support Workers | 1,518 | 1,475 | -43 | -2.8% |
| 11-3021 | Computer and Information Systems Mgrs. | 1,356 | 1,430 | 74 | 5.5% |
| 13-2011 | Accountants and Auditors | 1,266 | 1,312 | 46 | 3.6% |
| 15-1142 | Network and Computer Systems Administrators | 1,191 | 1,195 | 4 | 0.3% |
| 43-3031 | Bookkeeping, Accounting, and Auditing Clerks | 990 | 909 | -81 | -8.2% |
| 23-2093 | Title Examiners, Abstractors, and Searchers | 857 | 842 | -15 | -1.8% |
| 43-9061 | Office Clerks, General | 848 | 777 | -71 | -8.4% |
| 43-6011 | Executive Secretaries and Executive Administrative Assistants | 722 | 567 | -155 | -21.5% |
| 43-6014 | Secretaries and Administrative Assistants, Except Legal, Medical, and Executive | 711 | 630 | -81 | -11.4% |
| 13-1161 | Market Research Analysts and Marketing Specialists | 702 | 793 | 91 | 13.0% |
| 15-1151 | Computer User Support Specialists | 669 | 685 | 16 | 2.4% |
| 23-1011 | Lawyers | 666 | 738 | 72 | 10.8% |
| 11-9199 | Managers, All Other | 658 | 689 | 31 | 4.7% |
| 11-3011 | Administrative Services Managers | 641 | 677 | 36 | 5.6% |
| 13-1151 | Training and Development Specialists | 609 | 637 | 28 | 4.6% |

Source: Ohio Bureau of Labor Market Information

Consumer Goods Rental: NAICS 5322

The largest occupation in this industry is counter and rental clerks (SOC 41-2021). All occupations are expected to shrink over the next 10 years. The largest numeric decline is expected to occur for counter and rental clerks (SOC 41-2021). The largest percentage decline is expected to occur for secretaries and administrative assistants, except legal, medical, and executive (SOC 43-6014). The smallest percentage decline is expected for medical equipment repairers (SOC 49-9062).

Figure 28. Ohio Staffing Pattern for Consumer Goods Rental

| SOC Code | Occupational Title | 2016 | 2026 | Numeric Change | Percent Change |
|----------|---|-------|-------|----------------|----------------|
| 41-2021 | Counter and Rental Clerks | 1,890 | 1,716 | -174 | -9.2% |
| 53-3033 | Light Truck or Delivery Services Drivers | 830 | 754 | -76 | -9.2% |
| 11-1021 | General and Operations Managers | 522 | 474 | -48 | -9.2% |
| 43-4051 | Customer Service Representatives | 519 | 471 | -48 | -9.3% |
| 41-1011 | First-Line Supervisors of Retail Sales Workers | 351 | 319 | -32 | -9.1% |
| 53-7062 | Laborers and Freight, Stock, and Material Movers, Hand | 305 | 277 | -28 | -9.2% |
| 49-9031 | Home Appliance Repairers | 252 | 229 | -23 | -9.1% |
| 43-3011 | Bill and Account Collectors | 199 | 163 | -36 | -18.1% |
| 43-9061 | Office Clerks, General | 149 | 122 | -27 | -18.1% |
| 29-1126 | Respiratory Therapists | 147 | 133 | -14 | -9.5% |
| 41-3099 | Sales Representatives, Services, All Other | 134 | 122 | -12 | -9.0% |
| 43-6014 | Secretaries and Administrative Assistants, Except Legal, Medical, and Executive | 119 | 92 | -27 | -22.7% |
| 41-2031 | Retail Salespersons | 89 | 80 | -9 | -10.1% |
| 49-9062 | Medical Equipment Repairers | 79 | 72 | -7 | -8.9% |
| 41-2011 | Cashiers | 67 | 56 | -11 | -16.4% |
| 53-3032 | Heavy and Tractor-Trailer Truck Drivers | 65 | 59 | -6 | -9.2% |
| 49-9099 | Installation, Maintenance, and Repair Workers, All Other | 64 | 58 | -6 | -9.4% |

Source: Ohio Bureau of Labor Market Information

Architectural, Engineering, and Related Services: NAICS 5413

The largest occupation within this biohealth industry is mechanical engineers (SOC 17-2141), which is expected to grow by 388 jobs by 2026. The fastest growing occupation is projected to be industrial engineers (SOC 17-2112). Only five occupations are expected to shrink over the next 10 years. Secretaries and administrative assistants, except legal, medical, and executive (SOC 43-6014) are projected to lose the most jobs.

Figure 29. Ohio Staffing Pattern for Architectural, Engineering, and Related Services

| SOC Code | Occupational Title | 2016 | 2026 | Numeric Change | Percent Change |
|----------|---|-------|-------|----------------|----------------|
| 17-2141 | Mechanical Engineers | 2,241 | 2,629 | 388 | 17.3% |
| 17-2071 | Electrical Engineers | 1,548 | 1,859 | 311 | 20.1% |
| 51-9061 | Inspectors, Testers, Sorters, Samplers, and Weighers | 1,403 | 1,333 | -70 | -5.0% |
| 43-9061 | Office Clerks, General | 1,250 | 1,201 | -49 | -3.9% |
| 43-6014 | Secretaries and Administrative Assistants, Except Legal, Medical, and Executive | 1,158 | 1,052 | -106 | -9.2% |
| 19-4031 | Chemical Technicians | 770 | 827 | 57 | 7.4% |
| 13-1199 | Business Operations Specialists, All Other | 638 | 686 | 48 | 7.5% |
| 17-2072 | Electronics Engineers, Except Computer | 602 | 660 | 58 | 9.6% |
| 17-2081 | Environmental Engineers | 602 | 628 | 26 | 4.3% |
| 15-1121 | Computer Systems Analysts | 555 | 574 | 19 | 3.4% |
| 17-2112 | Industrial Engineers | 506 | 643 | 137 | 27.1% |
| 11-1021 | General and Operations Managers | 503 | 538 | 35 | 7.0% |
| 19-4091 | Environmental Science and Protection Technicians, Including Health | 498 | 511 | 13 | 2.6% |
| 43-3031 | Bookkeeping, Accounting, and Auditing Clerks | 487 | 468 | -19 | -3.9% |
| 41-3099 | Sales Representatives, Services, All Other | 470 | 498 | 28 | 6.0% |
| 19-2041 | Environmental Scientists and Specialists, Including Health | 452 | 486 | 34 | 7.5% |
| 17-3029 | Engineering Technicians, Except Drafters, All Other | 397 | 420 | 23 | 5.8% |
| 13-1161 | Market Research Analysts and Marketing Specialists | 374 | 435 | 61 | 16.3% |
| 19-2031 | Chemists | 360 | 353 | -7 | -1.9% |
| 17-2199 | Engineers, All Other | 356 | 384 | 28 | 7.9% |
| 43-5061 | Production, Planning, and Expediting Clerks | 347 | 372 | 25 | 7.2% |
| 17-3023 | Electrical and Electronics Engineering Technicians | 340 | 369 | 29 | 8.5% |

Source: Ohio Bureau of Labor Market Information

Scientific Research and Development Services: NAICS 5417

The largest occupation within this biohealth industry is mechanical engineers (SOC 17-2141), which is expected to gain the most jobs by 2026. Every occupation in this industry is expected to grow in the next 10 years, and most of them are expected to grow by more than 20 percent. The slowest growing occupations are projected to be secretaries and administrative assistants, except legal, medical, and executive (SOC 43-6014) and inspectors, testers, sorters, samplers, and weighers (SOC 51-9061).

Figure 30. Ohio Staffing Pattern for Scientific Research and Development Services

| SOC Code | Occupational Title | 2016 | 2026 | Numeric Change | Percent Change |
|----------|---|-------|-------|----------------|----------------|
| 17-2141 | Mechanical Engineers | 3,059 | 3,887 | 828 | 27.1% |
| 19-1042 | Medical Scientists, Except Epidemiologists | 846 | 1,072 | 226 | 26.7% |
| 19-4021 | Biological Technicians | 567 | 718 | 151 | 26.6% |
| 11-9041 | Architectural and Engineering Managers | 561 | 712 | 151 | 26.9% |
| 19-1029 | Biological Scientists, All Other | 547 | 695 | 148 | 27.1% |
| 19-2031 | Chemists | 515 | 655 | 140 | 27.2% |
| 43-5061 | Production, Planning, and Expediting Clerks | 484 | 609 | 125 | 25.8% |
| 17-3027 | Mechanical Engineering Technicians | 445 | 565 | 120 | 27.0% |
| 17-2199 | Engineers, All Other | 442 | 557 | 115 | 26.0% |
| 43-6014 | Secretaries and Administrative Assistants, Except Legal, Medical, and Executive | 435 | 440 | 5 | 1.2% |
| 11-9121 | Natural Sciences Managers | 425 | 536 | 111 | 26.1% |
| 17-2011 | Aerospace Engineers | 416 | 527 | 111 | 26.7% |
| 19-4031 | Chemical Technicians | 393 | 500 | 107 | 27.2% |
| 19-4099 | Life, Physical, and Social Science Technicians, All Other | 380 | 453 | 73 | 19.2% |
| 13-1199 | Business Operations Specialists, All Other | 350 | 433 | 83 | 23.7% |
| 19-1012 | Food Scientists and Technologists | 321 | 407 | 86 | 26.8% |
| 51-9061 | Inspectors, Testers, Sorters, Samplers, and Weighers | 319 | 324 | 5 | 1.6% |
| 43-9061 | Office Clerks, General | 304 | 326 | 22 | 7.2% |
| 11-1021 | General and Operations Managers | 279 | 339 | 60 | 21.5% |
| 13-2011 | Accountants and Auditors | 236 | 290 | 54 | 22.9% |
| 17-2112 | Industrial Engineers | 196 | 249 | 53 | 27.0% |
| 15-1121 | Computer Systems Analysts | 187 | 217 | 30 | 16.0% |
| 19-2032 | Materials Scientists | 169 | 215 | 46 | 27.2% |

Source: Ohio Bureau of Labor Market Information

Medical and Diagnostic Laboratories: NAICS 6215

The largest occupation in this industry is phlebotomists (SOC 31-9097). All but one of the occupations in this industry are expected to grow over the next 10 years, and most of them are expected to grow by more than 20 percent. The occupation projected to shrink by 2026 is medical transcriptionists (SOC 31-9094). The largest numeric increase is expected for phlebotomists (SOC 31-9097). The largest percentage increase is expected for diagnostic medical sonographers (SOC 29-2032).

Figure 31. Ohio Staffing Pattern for Medical and Diagnostic Laboratories

| SOC Code | Occupational Title | 2016 | 2026 | Numeric Change | Percent Change |
|----------|---|-------|-------|----------------|----------------|
| 31-9097 | Phlebotomists | 1,374 | 1,796 | 422 | 30.7% |
| 29-2011 | Medical and Clinical Laboratory Technologists | 666 | 805 | 139 | 20.9% |
| 29-2012 | Medical and Clinical Laboratory Technicians | 653 | 788 | 135 | 20.7% |
| 43-4051 | Customer Service Representatives | 341 | 370 | 29 | 8.5% |
| 43-6013 | Medical Secretaries | 271 | 339 | 68 | 25.1% |
| 43-5021 | Couriers and Messengers | 229 | 277 | 48 | 21.0% |
| 29-2034 | Radiologic Technologists | 216 | 260 | 44 | 20.4% |
| 29-1069 | Physicians and Surgeons, All Other | 203 | 245 | 42 | 20.7% |
| 43-9061 | Office Clerks, General | 169 | 184 | 15 | 8.9% |
| 31-9099 | Healthcare Support Workers, All Other | 165 | 200 | 35 | 21.2% |
| 29-2035 | Magnetic Resonance Imaging Technologists | 144 | 174 | 30 | 20.8% |
| 43-3021 | Billing and Posting Clerks | 137 | 165 | 28 | 20.4% |
| 41-3099 | Sales Representatives, Services, All Other | 123 | 148 | 25 | 20.3% |
| 29-2031 | Cardiovascular Technologists and Technicians | 85 | 103 | 18 | 21.2% |
| 29-2032 | Diagnostic Medical Sonographers | 85 | 113 | 28 | 32.9% |
| 29-2033 | Nuclear Medicine Technologists | 73 | 89 | 16 | 21.9% |
| 19-1042 | Medical Scientists, Except Epidemiologists | 72 | 87 | 15 | 20.8% |
| 43-5032 | Dispatchers, Except Police, Fire, and Ambulance | 64 | 73 | 9 | 14.1% |
| 31-9094 | Medical Transcriptionists | 62 | 53 | -9 | -14.5% |
| 43-1011 | First-Line Supervisors of Office and Administrative Support Workers | 56 | 68 | 12 | 21.4% |

Source: Ohio Bureau of Labor Market Information

Summary

Almost 200,000 Ohioans work in the biohealth industry cluster, accounting for about 4.3 percent of total private employment in 2017. One industry, insurance carriers (NAICS 5241), has a location quotient above 1.2, indicating an above-average concentration of employment in Ohio. Overall employment in the biohealth industry cluster is expected to increase over the next 10 years, primarily led by growth in four industries: scientific research and development services; architectural, engineering, and related services; medical and diagnostic laboratories; and insurance carriers. Employment in the cluster has been slower to recover from the 2007–2009 recession than Ohio or U.S. total employment. Although cluster employment has grown since 2010, it has not fully recovered. Educational requirements in the industry cluster are more advanced, as most occupations require a bachelor's degree or on-the-job training.

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