



Department of
Job and Family Services

TO STRENGTHEN OHIO'S FAMILIES THROUGH THE DELIVERY OF INTEGRATED SOLUTIONS TO TEMPORARY CHALLENGES

Health Care Employment in Ohio: Components of a Growth Sector

2009 Report



Health Care Employment in Ohio Components of a Growth Sector

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Preface

In 2008, the Ohio Department of Job and Family Services (ODJFS), Bureau of Labor Market Information published a report entitled *Ohio Health Care Employment: Labor Market Trends and Challenges*. The report remarked on several unique economic features of health care industries, such as its resiliency to macroeconomic cycles, historic growth, high training needs of certain key occupations, potential to grow further in light of an aging population, and a slight tendency to draw business from outside the state. Overall, health care has been an important part of Ohio's economy. This report represents an update of statistics and analysis from that publication.

Section I contains a brief review of how total employment health care industries has changed in the last 30 years and how they are reacting to the current economic recession. Section II takes a closer look at the industries that comprise health care, including employment growth, number of establishments, average weekly wages, staffing patterns, and their relative importance in Ohio vis-à-vis the United States. Section III examines the occupations that feed into health care industries and projections for employment through 2016. Section IV addresses the education and training needs for key health care occupations, gauges the education system's ability to meet projected need for trained workers, and discusses a potential shortage of registered nurses. Finally, section V compares health care labor markets for eight Metropolitan Statistical Areas around Ohio. The technical notes and references sections at the end of this publication contain important information about the sources of information used and their relative strengths and limitations.

Health care industries account for nearly one out of every eight jobs in Ohio today. Workforce development professionals across the state will need to take a close look at health care industries and occupations in order to fully understand this crucial part of the state economy.

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Executive Summary

Health care, comprised of ambulatory health care, hospitals, and nursing and residential care, accounts for approximately one out of every eight payroll jobs in Ohio. It is expected to be one of the fastest-growing sectors of the economy over the next ten years.

- Health care industries employed 662,780 workers in 2007, about 12.5 percent of total payroll employment or one employee for every 17 people.
- Since 1976, health care employment has grown at a 2.8 percent annual compound rate, with almost no reaction to economic recessions.
- Health care employment has historically been resilient to economic downturns due to inelastic demand, reduced opportunity cost of time for treatment, consumption pattern changes, and increased labor availability.
- The current economic recession, however, has had an effect, due to lost health insurance and disrupted capital markets. Employment growth has been flat in the first four months of 2009.
- Ambulatory health care employs 230,321 workers in Ohio and has grown 20.6 percent since 2000. It is expected to grow 26.8 percent between 2006 and 2016. The most prevalent occupations in this subsector are medical secretaries, registered nurses, and home health aides.
- Hospitals in Ohio employ 259,563 workers. Average wages have climbed 32.8 percent since 2000 to \$855 per week. The industry has been consolidating into a smaller number of high-employment establishments. Hospital employment is expected to grow 13.4 percent from 2006 to 2016. The most prevalent occupations are registered nurses; nursing aides, orderlies, and attendants; and licensed practical and licensed vocational nurses.
- Nursing and residential care employs 172,896 workers and has added 623 new establishments since 2000 (22.5%). Employment is expected to grow 13.4 percent from 2006 to 2016. The most prevalent occupations are nursing aides, orderlies, and attendants; licensed practical and licensed vocational nurses; and home health aides.
- Employment in nursing and residential care is much more concentrated in Ohio than nationally.
- Health care occupations accounted for 575,640 workers in Ohio in 2006. Employment in these occupations is expected to grow 20.4 percent by 2016. We project a combined 21,217 health care job openings during this period.
- There will be health care job openings at every level of education and training. The greatest employment growth and the largest number of openings will be in occupations requiring associate degrees or short-term on-the-job training.
- We have identified twelve key health care occupations based on high employment; education and training requirements; and importance in health care industries. Average wages range from \$29.45 to \$11.20 per hour.

- Three-fourths of all the health care jobs in Ohio by 2016 will require some sort of postsecondary education. These requirements may be met through postsecondary education or apprenticeship.
- There are 177 postsecondary institutions offering 474 training programs linked to key health care programs.
- There is a possible shortage of trained registered nurses in the U.S.—one that could potentially become worse due to rising wages and a lack of teachers.

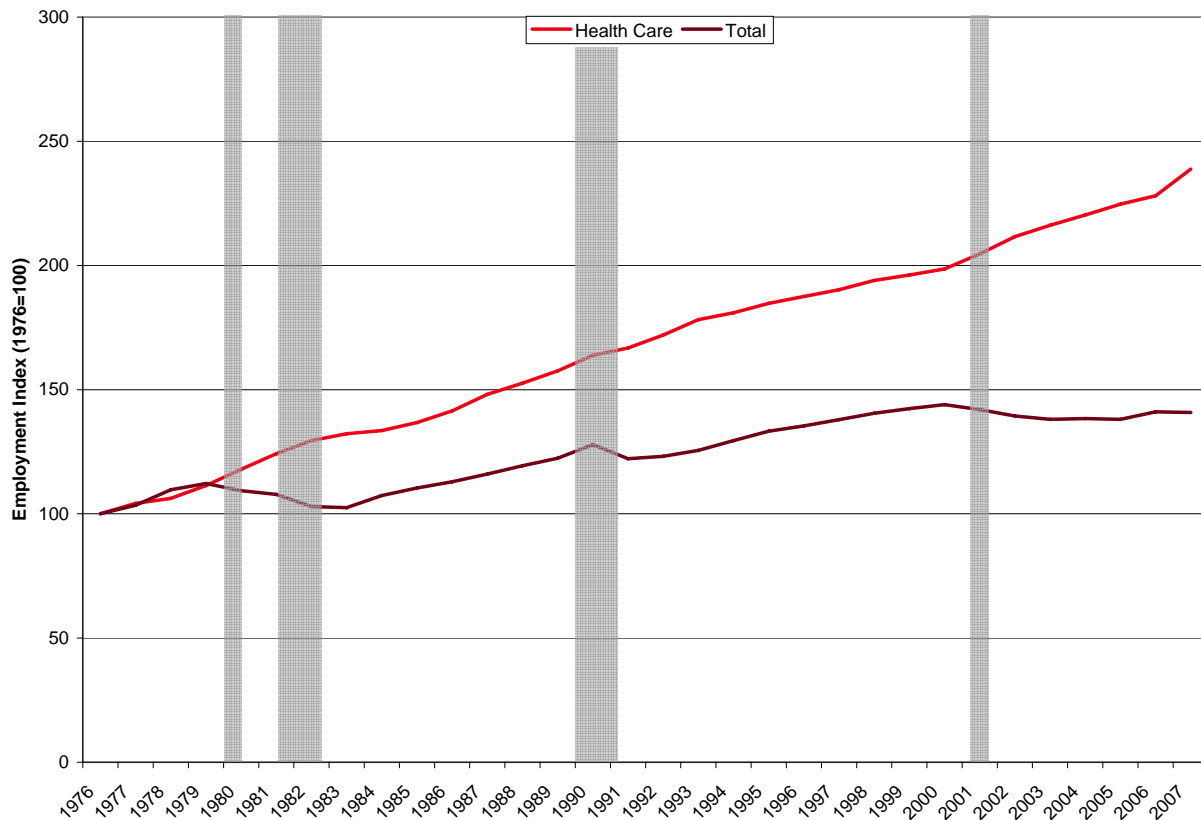
I. Health Care Employment

Health care employment may refer to a set of either industries or occupations. Industries include three NAICS subsectors: ambulatory health care (NAICS 621), hospitals (NAICS 622), and nursing and residential care (NAICS 623).¹ Although all three may be considered health care, each has different staffing profiles. Combined Ohio employment for these three subsectors was 662,780 in 2007, or about 12.5 percent of total payroll employment.

Historical Trends

Figure 1 below compares the growth in these three subsectors with growth across all industries. Employment levels were indexed to (scaled to employment in) 1976. The figure also shows economic recessions during this span. Between 1976 and 2007, total health care employment grew at a steady compound rate of 2.8 percent per year and showed almost no reaction to recessions in 1980, 1981-82, 1990, and 2001. By comparison, total employment only grew 1.1 percent per year on average and dropped significantly during these downturns.

Figure 1: Health Care and Total Employment Growth in Ohio, 1976-2007



Shaded areas represent economic recessions, peak to trough.

Source: QCEW; Bureau of Economic Research.

¹ For more information on how industries are classified and defined, see the Technical Notes at the end of this document.

One might also compare the growth in Ohio's health care employment with that of the population. In 1976, Ohio's population was about 10,753,000, with health care employment of 277,500—one employee in the health care industry for every 39 people. By 1986 there was one employee for every 27 people. In 1996, one for every 22 people. Most recently, in 2007, Ohio's population was 11,477,641 and the health care industries had one employee for every 17 people. Employment in health care industries has grown more than twice as fast as the population.

Reactions to the Economic Downturn

There are many reasons to expect this growth will continue. Advances in medical technology and the aging of the population, whose health care needs are usually greater than the general population,² should generate continued expansion. Expectations of public policy expanding health care coverage would further increase expenditures and utilization. In addition, since most of the health care industry cannot be outsourced, the growth would have to be local.

Can this growth withstand an economic recession? Hospital workload and employment has been shown to increase during recessions.³ One possible reason is that, for labor market participants, the opportunity cost of time for treatment drops, making people more likely to go to see a doctor.⁴ There may also be consumption pattern changes during a recession. With reduced access to medical insurance coverage, workers in a recession may opt instead to only go to the emergency room when necessary, instead of pursuing regular preventative care within ambulatory health care services.⁵

Another reason for increasing employment during recessions may be simple labor availability. Nationwide, there is a large number of job vacancies in health care, especially in hospitals and certain high-training occupations, such as nursing (see section IV). When workers in other industries lose their jobs, they become available for hire (with appropriate training) in health care establishments. Research has found a strong inverse relationship between employment changes in health care and in total nonfarm employment.⁶

This is not to suggest that the health care industry is completely immune to fluctuations in the broader economy. This particular recession especially has had strong negative effects on the health care industry not present in past downturns. First, and perhaps most obviously, laid off workers are likely to lose their health insurance, putting some medical services out of reach. Also, the current credit crunch has interrupted providers' access to capital markets. Large hospitals in particular have accessed the credit markets directly in the past by issuing variable-interest bonds to pay for capital improvements, such as expansions or new equipment.⁷ The interest on such bonds has risen significantly, putting financial stresses on their issuers and forcing them to cut back elsewhere.

² Goodman, 3.

³ *Ibid.*, 7-8.

⁴ Ruhm, 620.

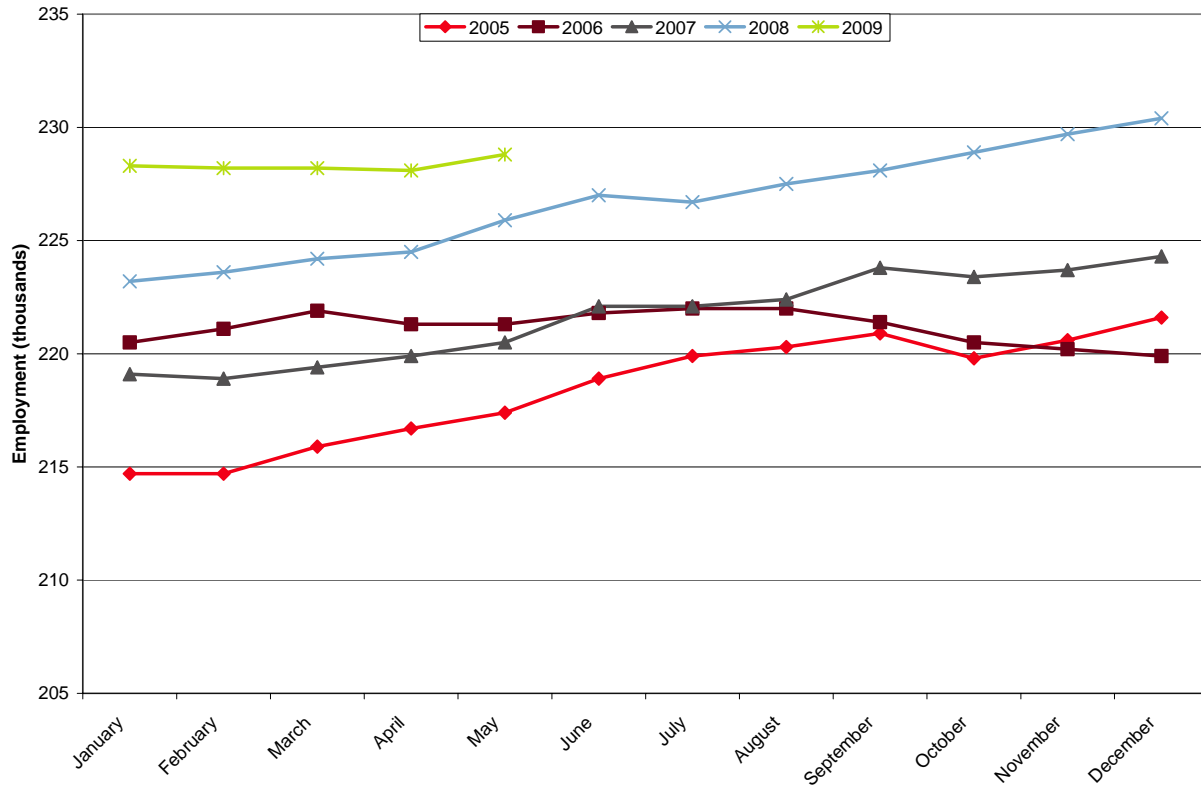
⁵ Goodman, 8.

⁶ *Ibid.*, 9-10.

⁷ Arnst, "Health Care: Not So Recession-Proof."

Figure 2 below uses the most recent data available to examine how private hospital employment has changed in the current recession. This chart compares individual years to highlight seasonal changes. Typically, employment in hospitals increases during the first quarter of the year. In the first four months of 2009, however, employment has been nearly stagnant, with only a modest climb in May. This came after a large employment drop of about 2,100 workers from December 2008 to January 2009. Clearly, the recession is having a chilling effect on hospital employment.

Figure 2: Hospital Employment, 2005 to April 2009



Source: Bureau of Labor Statistics [BLS], *Current Employment Statistics*.

II. Industrial Makeup and Projections

At both the national and state levels, health care industries are projected to create more new jobs than any other major industry group—nearly three million new health care wage and salary jobs nationally and about 121,500 in Ohio between 2000 and 2016.⁸

One common mistake when speaking of the health care industry is to treat it as one large homogenous entity, when in fact there are several different segments, each with their own labor needs, growth patterns, and employment and wage prospects. As mentioned earlier, health care industries are comprised, in terms of employment, of three subsectors: ambulatory health care, hospitals, and nursing and residential care facilities. (Unless otherwise noted, all employment and wage information includes both public and private establishments.) A closer examination of the three subsectors follows.

Ambulatory Health Care

Ambulatory health care includes most doctors' offices; outpatient care services, such as dialysis centers; offsite medical labs; home health care services; blood banks; and ambulance transportation. Figure 3 below shows how employment, average weekly wages, and number of establishments have changed over the last seven years.⁹

Figure 3: Summary Profile of Ambulatory Health Care

Year	Number of Estab.	Employees	Empl. per Estab.	Average Weekly Wages
2000	17,114	190,967	11.2	\$774
2001	17,248	194,287	11.3	\$807
2002	17,543	201,509	11.5	\$822
2003	17,821	207,544	11.6	\$831
2004	17,841	212,612	11.9	\$860
2005	18,022	220,324	12.2	\$873
2006	18,246	225,638	12.4	\$891
2007	18,276	230,321	12.6	\$901
Net Change, 2000-07	1,162	39,354	1.4	\$127
Percent Change, 2000-07	6.8%	20.6%	12.9%	16.5%

Source: ODJFS, "Employment and Wages Publications" [QCEW].

Ambulatory health care has had the strongest job growth of any of the three health care subsectors: 20.6 percent. The number of establishments over this period indicates relative stability in establishment size; the average workplace only has about 1.4 more employees today than it did in 2000. Average weekly wages were \$901, having grown 16.5 percent

⁸ Figueroa and Woods, 75-85; ODJFS, *2016 Ohio Job Outlook*, A1-A7.

⁹ See the Technical Notes at the end of this report for important information about industrial employment data.

during this period—strong growth, but still the slowest among the three subsectors. For comparison, the statewide average weekly wage was \$768 in 2007.

Between 2006 and 2016, there are expected to be 59,400 net new jobs created in ambulatory health care in Ohio, an increase of 26.8 percent.¹⁰

Figure 4 below shows the twenty most prevalent occupations in this subsector. (A more detailed discussion on health care occupations follows in section III.) In the top twenty, there are eleven occupations with average wages above the statewide median hourly wage of \$15.25. Note that this list also includes five office and administrative support occupations, including the most prevalent occupation, medical secretaries. This may reflect the industry’s reliance on clerical workers to coordinate billing with insurance companies. Ten of these occupations require some sort of postsecondary award for entry. Three require at least a master’s degree.

Figure 4: Twenty Most Prevalent Occupations in Ambulatory Health Care

Code	Occupational Title	2008 Avg. Hr. Wage	Edu. & Train. Requirements
43-6013	Medical Secretaries	\$13.61	Mod.-Term OJT
29-1111	Registered Nurses	\$28.25	Associate
31-1011	Home Health Aides	\$9.80	Short-Term OJT
31-9092	Medical Assistants	\$12.98	Mod.-Term OJT
31-9091	Dental Assistants	\$15.39	Mod.-Term OJT
43-4171	Receptionists and Information Clerks	\$11.31	Short-Term OJT
43-3021	Billing & Posting Clerks & Machine Operators	\$14.45	Mod.-Term OJT
29-2061	Licensed Practical & Licensed Vocat. Nurses	\$19.09	Postsec. Award
29-2021	Dental Hygienists	\$29.61	Associate
29-2041	Emergency Medical Technicians & Paramedics	\$13.40	Postsec. Award
29-1069	Physicians and Surgeons, All Other	\$83.51	Prof. Degree
29-1062	Family and General Practitioners	\$76.99	Prof. Degree
43-1011	First-Line Sup/Mgrs of Office & Admin. Support	\$22.49	Work Exp.
43-9061	Office Clerks, General	\$12.84	Short-Term OJT
31-9099	Healthcare Support Workers, All Other	\$13.40	Short-Term OJT
29-1123	Physical Therapists	\$35.92	Master's
31-2021	Physical Therapist Assistants	\$23.90	Associate
11-9111	Medical and Health Services Managers	\$39.22	Bach. & Exp.
31-1012	Nursing Aides, Orderlies, and Attendants	\$11.45	Postsec. Award
43-6011	Executive Secretaries & Administrative Assistants	\$19.41	Work Exp.

Highlighted occupations have average wages above the state median \$15.25.

Source: Occupational Staffing Patterns; ODJFS, "Occupational Wages and Employment;" ODJFS, *2016 Ohio Job Outlook*, C1-C13.

¹⁰ ODJFS, *op cit.*, A1-A7.

Hospitals

This subsector includes most general medical and surgical hospitals, both public and private, along with psychiatric, children's, and other specialty hospitals. Figure 5 below shows how employment, average weekly wages, and number of establishments have changed over the last seven years.

Figure 5: Summary Profile of Hospitals

Year	Number of Estab.	Employees	Empl. per Estab.	Average Weekly Wages
2000	287	231,337	806.1	\$643
2001	290	237,516	819.0	\$666
2002	297	243,506	819.9	\$691
2003	289	247,180	855.3	\$722
2004	303	251,788	831.0	\$763
2005	276	255,448	925.5	\$788
2006	271	258,821	955.1	\$831
2007	267	259,563	972.1	\$855
Net Change, 2000-07	-20	28,226	166.1	\$211
Percent Change, 2000-07	-7.0%	12.2%	20.6%	32.8%

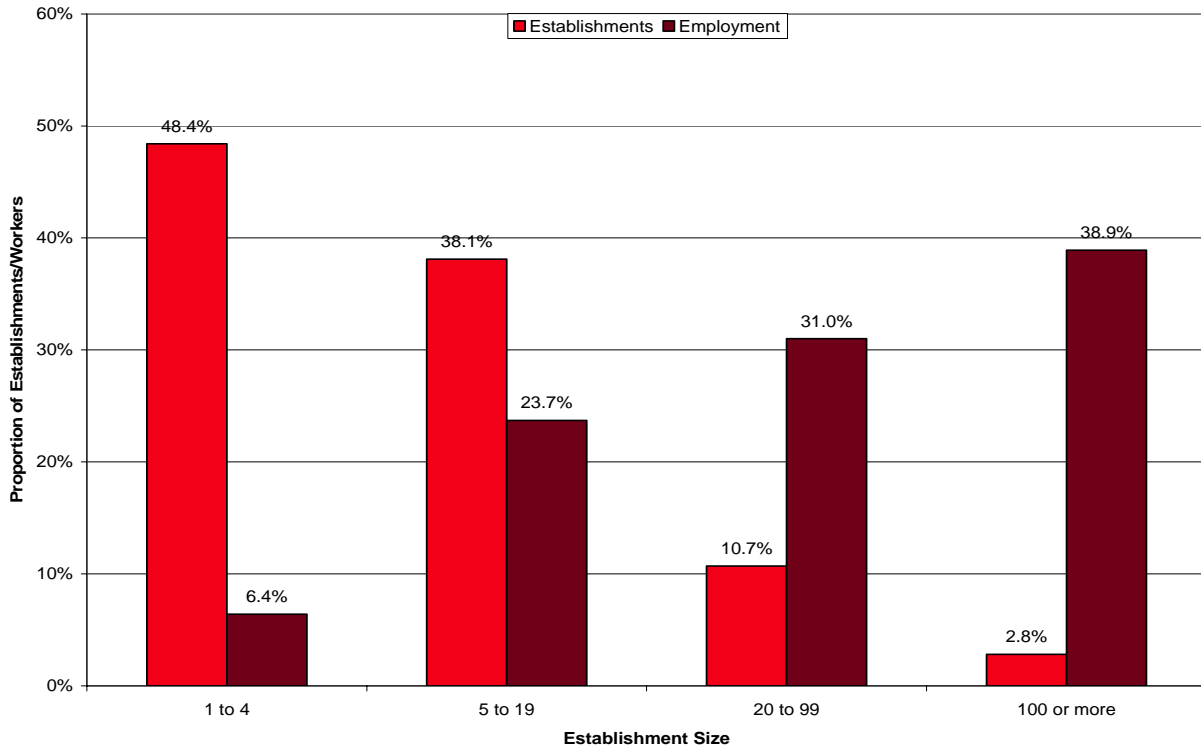
Source: ODJFS, "Employment and Wages Publications" [QCEW].

One notable trend in hospitals is the strong growth in average weekly wages. The average worker earned \$855 per week in 2007, \$211 more than in 2000 (32.8%). Employment growth has not been as strong as in the other health care industries—only 12.2 percent during the period of analysis.

Another interesting aspect of the hospital subsector is its patterns in establishment size. Nationally, most health services consist of smaller establishments employing less than 20 people. Nearly half of non-hospital establishments employ fewer than five workers. (See figure 6 on the next page.) Only about a third of workers are in establishments with more than one hundred people. Conversely, among hospitals, nearly 60 percent of establishments have more than one hundred workers, and 71.1 percent of hospital jobs are in establishments with more than one thousand workers. (See figure 7 on the next page.)

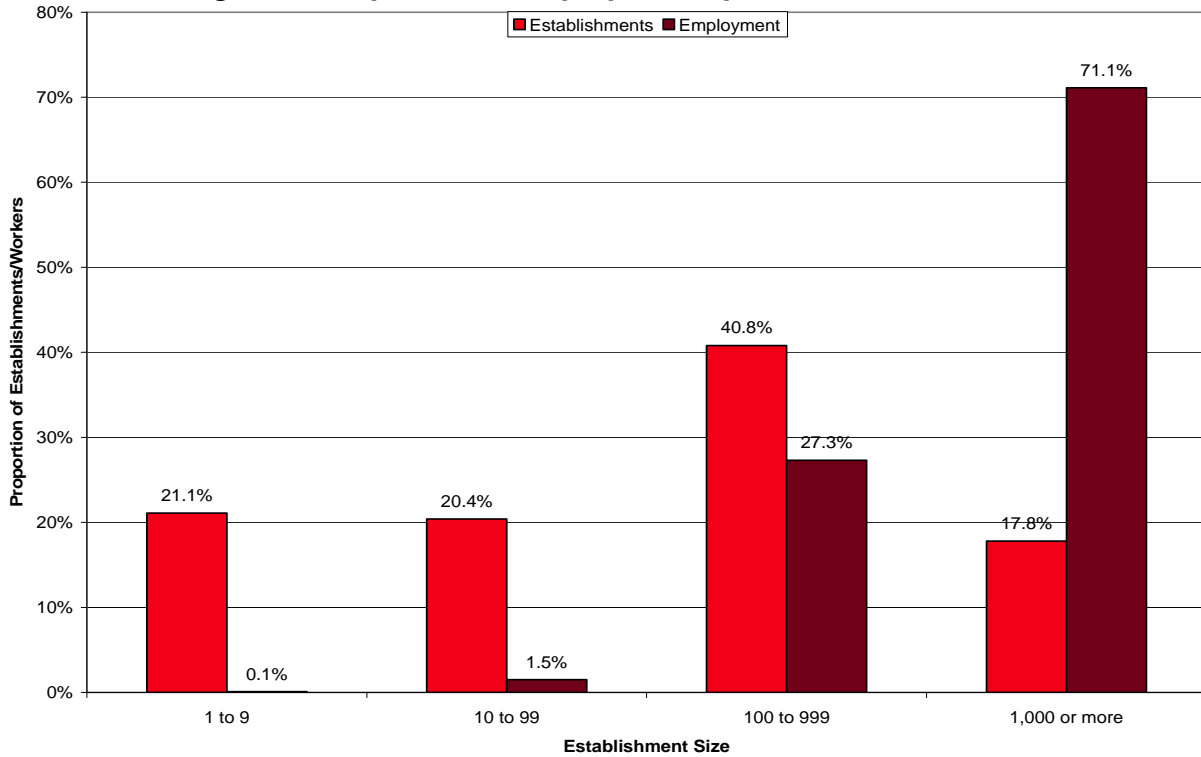
The general profile for hospitals is one with a small number of high-employment centers. The average hospital in Ohio has 972.1 employees, and this average has been growing. Employment has grown, even as the net number of establishments has declined. This indicates the industry is consolidating even further. (Ambulatory health care also shows some consolidation tendencies, though not nearly as strong.)

Figure 6: Non-Hospital Health Services Establishments and Employment by Number of Workers



Source: BLS, "Health Care."

Figure 7: Hospitals and Employment by Number of Workers



Source: BLS, "Health Care."

Between 2006 and 2016, there are expected to be 33,500 net new jobs created in hospitals in Ohio, an increase of 13.4 percent.¹¹

Figure 8 below shows the twenty most prevalent occupations in this subsector. Again, there are eleven occupations with average wages above the state median, but recall that average weekly wages in hospitals across all occupations have been growing rapidly. Education and training is slightly more important in this subsector; 11 occupations require a postsecondary award or better. The types of occupations in hospitals are also more diverse, a reflection of the many types of operations needed in these larger establishments. Only 12 of these occupations are in healthcare practice or support. The rest are in such fields as office and administrative support; management; or housekeeping.

Figure 8: Twenty Most Prevalent Occupations in Hospitals

Code	Occupational Title	2008 Avg. Hr. Wage	Edu. & Train. Requirements
29-1111	Registered Nurses	\$28.25	Associate
31-1012	Nursing Aides, Orderlies, and Attendants	\$11.45	Postsec. Award
29-2061	Licensed Practical & Licensed Vocat. Nurses	\$19.09	Postsec. Award
43-6013	Medical Secretaries	\$13.61	Mod.-Term OJT
37-2012	Maids and Housekeeping Cleaners	\$9.35	Short-Term OJT
29-2034	Radiologic Technologists and Technicians	\$23.64	Associate
43-4111	Interviewers, except Eligibility and Loan	\$13.45	Short-Term OJT
29-1126	Respiratory Therapists	\$23.50	Associate
11-9111	Medical and Health Services Managers	\$39.22	Bach. & Exp.
29-1069	Physicians and Surgeons, All Other	\$83.51	Prof. Degree
43-9061	Office Clerks, General	\$12.84	Short-Term OJT
43-6014	Secretaries, except Legal, Medical & Executive	\$14.57	Mod.-Term OJT
43-3021	Billing & Posting Clerks & Machine Operators	\$14.45	Mod.-Term OJT
31-9099	Healthcare Support Workers, All Other	\$13.40	Short-Term OJT
29-2071	Medical Records & Health Info. Technicians	\$15.29	Associate
29-2012	Medical and Clinical Laboratory Technicians	\$17.88	Associate
29-2099	Health Technologists & Technicians, All Other	\$18.57	Postsec. Award
29-2055	Surgical Technologists	\$18.01	Postsec. Award
43-6011	Executive Secretaries & Administrative Assistants	\$19.41	Work Exp.
31-9092	Medical Assistants	\$12.98	Mod.-Term OJT

Highlighted occupations have average wages above the state median \$15.25.

Source: Occupational Staffing Patterns; ODJFS, "Occupational Wages and Employment;" ODJFS, *2016 Ohio Job Outlook*, C1-C13.

¹¹ *Ibid.*

Nursing and Residential Care

This subsector includes a wide number of long-term care facilities, such as substance abuse rehabilitation, nursing homes, residential mental health facilities, or even homes for delinquent children. (Again, these employment figures combine all private and public establishments.) Figure 9 shows how employment, average weekly wages, and number of establishments have changed over the last seven years.

Figure 9: Summary Profile of Nursing and Residential Care

Year	Number of Estab.	Employees	Empl. per Estab.	Average Weekly Wages
2000	2,775	156,328	56.3	\$398
2001	2,958	162,184	54.8	\$412
2002	2,983	165,468	55.5	\$427
2003	3,065	168,445	55.0	\$439
2004	3,107	170,345	54.8	\$450
2005	3,242	171,495	52.9	\$453
2006	3,297	167,745	50.9	\$458
2007	3,398	172,896	50.9	\$470
Net Change, 2000-07	623	16,568	-5.5	\$73
Percent Change, 2000-07	22.5%	10.6%	-9.7%	18.3%

Source: ODJFS, "Employment and Wages Publications" [QCEW].

In the last seven years, 623 net new nursing and residential care establishments were created in Ohio—net growth of about 22.5 percent in a relatively steady line. Employment, while still having grown about 10.6 percent during that time, has not kept pace with the growing number of facilities. Unlike hospitals and ambulatory care, nursing and residential care establishment sizes have been shrinking; the average establishment had 5.5 fewer employees in 2007 than in 2000 (-9.7%). Average weekly wages have grown 18.3 percent since 2000, but they are still the lowest of the three health care subsectors—only \$470 in 2007. For comparison, average weekly wages across all Ohio industries that year were \$768—more than 60 percent higher.

Between 2006 and 2016, there are expected to be 28,600 net new jobs created in nursing and residential care facilities in Ohio, an increase of 13.4 percent.¹²

Figure 10 on the next page shows the twenty most prevalent occupations in this subsector. The most striking feature on this table is the large number of occupations with average wages below \$10 per hour. Only six occupations shown here have average wages above the state median. Thirteen of these occupations require nothing more than on-the-job training for entry.

¹² *Ibid.*

Figure 10: Twenty Most Prevalent Occupations in Nursing and Residential Care

Code	Occupational Title	2008 Avg. Hr. Wage	Edu. & Train. Requirements
31-1012	Nursing Aides, Orderlies, and Attendants	\$11.45	Postsec. Award
29-2061	Licensed Practical & Licensed Vocat. Nurses	\$19.09	Postsec. Award
31-1011	Home Health Aides	\$9.80	Short-Term OJT
29-1111	Registered Nurses	\$28.25	Associate
37-2012	Maids and Housekeeping Cleaners	\$9.35	Short-Term OJT
35-2021	Food Preparation Workers	\$9.34	Short-Term OJT
39-9021	Personal and Home Care Aides	\$9.72	Short-Term OJT
35-2012	Cooks, Institution and Cafeteria	\$12.44	Mod.-Term OJT
39-9032	Recreation Workers	\$10.99	Short-Term OJT
35-3021	Comb. Food Prep. & Serv. Work, inc. Fast Food	\$8.00	Short-Term OJT
51-6011	Laundry and Dry-Cleaning Workers	\$9.63	Mod.-Term OJT
35-3041	Food Servers, Nonrestaurant	\$9.37	Short-Term OJT
49-9042	Maintenance and Repair Workers, General	\$17.19	Mod.-Term OJT
39-9011	Child Care Workers	\$10.26	Short-Term OJT
11-1021	General and Operations Managers	\$50.42	Bach. & Exp.
43-4171	Receptionists and Information Clerks	\$11.31	Short-Term OJT
11-9111	Medical and Health Services Managers	\$39.22	Bach. & Exp.
35-1012	FL Sup/Mgrs of Food Prep. & Serving Workers	\$14.43	Work Exp.
21-1022	Medical and Public Health Social Workers	\$21.44	Bachelors
35-3031	Waiters and Waitresses	\$8.61	Short-Term OJT

Highlighted occupations have average wages above the state median \$15.25.

Source: Occupational Staffing Patterns; ODJFS, "Occupational Wages and Employment;" ODJFS, 2016 Ohio Job Outlook, C1-C13.

Note also that this occupational profile is the most diverse of the three health care subsectors; there are administrative, maintenance, and food service occupations shown here.

Concentration of Health Care Employment

Many approaches to economic and workforce development attempt to classify industries or sectors as being "local" or "export" by using location quotients (LQs). A location quotient is the ratio of the concentration of an industry in a local area to the concentration in a larger area, usually the United States as a whole. Industries or sectors with high LQs, generally accepted as 1.2 or more, are considered highly concentrated in an area and may be expected to bring new capital into the community from outside.¹³ Ohio's LQs for ambulatory health care, hospitals, and nursing and residential care in 2007 were 1.0, 1.1, and 1.3, respectively. This indicates nursing and residential care has a higher employment concentration in Ohio than average.

Although most hospitals are meant to provide services only to their local areas, there are several reasons they can become large regional providers. Research and medical specialty facilities may attract both patients and financial support from outside their local

¹³ ODJFS, *Inroads*, 20.

areas. Ohio is home to several nationally recognized specialty hospitals and health care facilities.¹⁴

Other factors, such as population demographics or government policies, may explain the concentration of nursing and residential care facilities. The percentage of Ohioans 65 and older is above the national average, suggesting a higher-than-average need for health care. Ohio's health care policies may also be attractive to some providers; Ohio Medicaid payments are above the national average in many categories.¹⁵

¹⁴ U.S. News and World Report, "Cleveland Clinic."

¹⁵ Kaiser Family Foundation, 2.

III. Occupational Outlook to 2016

Health care may refer to occupations instead of industries. In 2006, health care industries employed 652,204 workers. Health care occupations, on the other hand, accounted for only about 575,640 workers.

This difference in numbers can be explained by the fact that not all workers in health care occupations work in health care industries, nor do health care industries exclusively employ health care occupations. Of course there is a large amount of overlap, but it is not a perfect match. Registered nurses might work in hospitals or elementary schools. Or a nursing care facility might employ both physical therapists and cafeteria cooks.

There are 76 occupations that may be considered part of health care.¹⁶ The complete list is given in appendix B at the end of this document, divided by education and training requirements. Across these occupations, there are expected to be 117,250 net new jobs between 2006 and 2016 in Ohio (20.4%). For comparison, total employment during that period is only expected to grow 5.0 percent.¹⁷ Of the 30 occupations in Ohio projected to grow the fastest during this period, 18 are health care occupations.¹⁸

New job growth is not the only source of occupational demand; net replacement needs will be another major source. On average there are expected to be 21,217 health care job openings per year from 2006 to 2016. Of these, 44.2 percent will be openings resulting from replacement needs. (Across all occupations, the projected replacement rate is much higher—about three-fourths.¹⁹) Even in low-growth or declining occupations there will always be a need to replace those who exit the occupation, either through retirement, career changes, or other causes. For example, even though psychiatric technician employment is projected to drop 6.0 percent in the next ten years, there will still be an average 46 openings per year to meet replacement needs.

Ohio's aging labor force plays a significant role in occupational replacement needs. In a recent report on aging workers, data from the 2000 Census were used to determine which occupations have a high proportion of individuals in the 44 to 54 age range. There are five health care occupations where more than one quarter of the occupational incumbents were in this age group in 2000. These are listed in figure 11 on the next page.

¹⁶ For more information on how occupations are classified and defined, see the Technical Notes at the end of this document.

¹⁷ ODJFS, *2016 Ohio Job Outlook*, C1.

¹⁸ *Ibid.*, 15-16.

¹⁹ *Ibid.*, 13.

Figure 11: Selected Occupations and Proportions Aged 45 to 54, 2000

Occupation	Percent 45 to 54
Total, All Occupations, All Industries	22.7%
Psychologists	42.8%
Medical & Health Service Managers	35.1%
Counselors	33.7%
Speech-Language Pathologists	33.7%
Licensed Practical & Licensed Vocational Nurses	30.9%
Registered Nurses	29.8%

Source: ODJFS, *Ohio's Graying Labor Force*, 25.

There are health care occupations and openings at every level of education and training. For example, home health aides and personal and home care aides each require less than one month of on-the-job training; dental hygienists and radiologic technicians require associate degrees; and physicians and surgeons require professional degrees. Figure 12 below summarizes these projections by education and training level. The greatest employment growth, and the largest number of openings, will be in occupations requiring associate degrees and short-term on-the-job training.

Figure 12: Health Care Occupational Projection Summary, by Education & Training Level

Education & Training Level	Employment		Change 2006-16		Average Annual Openings
	2006	2016 Projected	Net	Percent	
All Healthcare Occupations	575,640	692,890	117,250	20.4%	21,217
Short-Term On-the-Job Training	82,060	111,470	29,410	35.8%	4,093
Moderate-Term On-the-Job Training	71,270	86,030	14,760	20.7%	2,715
Long-Term On-the-Job Training	4,880	4,830	-50	-1.0%	134
Postsecondary Vocational Award	139,490	159,350	19,860	14.2%	4,120
Associate Degree*	161,990	196,940	34,950	21.6%	6,225
Bachelor's Degree	31,950	37,410	5,460	17.1%	1,169
Work Experience plus a Bachelor's Degree or Higher	10,910	12,550	1,640	15.0%	368
Master's Degree	29,520	35,750	6,230	21.1%	1,127
Doctoral Degree	4,600	5,020	420	9.1%	113
First Professional Degree	38,970	43,540	4,570	11.7%	1,153

*Registered nurses are included in this category, though training requirements may be met through a two-year associate degree, a three-year diploma, or a four-year bachelor's degree.

Source: ODJFS, *2016 Ohio Job Outlook*, C1-C13.

We identified a set of health care occupations for further analysis. First, we eliminated small occupations with total employment below 5,000. Second, we eliminated occupations that only required short-term on-the-job training, since these positions would be easy to replace. Third, we narrowed the list to occupations that were in the top ten most employed occupations within any of our three subsectors. Finally, we focused only on those occupations that were employed primarily in health care industries. The result was a list of twelve key health care occupations, shown in figure 13 on the next page.

Average hourly wages range from \$83.51 for physicians and surgeons²⁰ to \$11.45 for nursing aides, orderlies, and attendants.

Figure 13: Key Health Care Occupation Employment Projections and Wages

Occupational Title	Employment		Growth, 2006-16		Avg. Ann. Openings	2008 Avg. Hr. Wage
	2006	2016 Proj.	Net	Percent		
Registered Nurses	113,050	138,640	25,590	22.6%	4,425	\$28.25
Nursing Aides, Orderlies, and Attendants	77,140	88,250	11,110	14.4%	1,801	\$11.45
Licensed Practical & Licensed Vocat. Nurses	38,690	44,070	5,380	13.9%	1,593	\$19.09
Medical Secretaries	30,640	34,710	4,070	13.3%	895	\$13.61
Medical Assistants	19,000	25,090	6,090	32.1%	845	\$12.98
Physicians and Surgeons, All Other	11,120	12,600	1,480	13.3%	349	\$83.51
Medical and Health Services Managers	10,910	12,550	1,640	15.0%	368	\$39.22
Emergency Medical Technicians & Paramedics	10,150	11,520	1,370	13.5%	253	\$13.40
Dental Assistants	10,040	12,130	2,090	20.8%	383	\$15.39
Radiologic Technologists and Technicians	9,740	11,040	1,300	13.3%	262	\$23.64
Dental Hygienists	6,320	7,640	1,320	20.9%	253	\$29.61
Respiratory Therapists	5,350	6,540	1,190	22.2%	198	\$23.50

Source: ODJFS, *2016 Ohio Job Outlook*, C1-C13; BLS, "May 2008 State Occupational Employment and Wage Estimates."

²⁰ Please see the technical notes at the end of this document for important information on how physicians and surgeons are classified in this report.

IV. Education and Training Needs and Infrastructure

Of the 692,890 total health care jobs projected for 2016 in Ohio, almost three-fourths will require some sort of postsecondary education. Training requirements in the twelve key health care occupations may be met in one of two ways: degree or certificate attainment at postsecondary institutions, or apprenticeship programs. Only five of these twelve occupations have active apprenticeship programs in Ohio. (One additional occupation is apprenticeable, but there is no active program in the state at this time.) There are 35 apprenticeship programs in Ohio in key health care occupations: 13 programs for nursing aides, orderlies, and attendants; 12 for dental assistants; 6 for medical secretaries; and two each for medical assistants and emergency medical technicians and paramedics.²¹

Educational Needs

One purpose for designating the key health care occupations earlier is to identify which educational and training programs will have the greatest impact on the health care industry. Cross-referencing key occupations with the training programs needed to prepare for them (see appendix C) and counting how many students completed these programs in the 2006-07 school year, gives an idea of whether the current educational infrastructure is sufficient to meet market demand.²²

A comparison of training program completers with projected average annual openings, along with the number of available apprenticeship programs (an alternative source of job training) is shown in figure 14 on the next page. Please bear a few caveats in mind when reading this table: First, training output includes all degree types, from postsecondary certificates to doctoral diplomas. However, people who earn degrees above the bachelor's level tend to be more geographically mobile and cannot be cleanly assigned to a regional labor market. Second, this table recognizes that, of those who complete training programs, about 15 percent never enter the labor market.²³ (That is, they do not look for work; this does not include those who look but cannot find employment.) This can happen for any number of reasons, such as failure to pass licensing exams, health problems, or family obligations. And third, training output for registered nurses only includes the basic training program and not the other programs listed in appendix C. Most of the other programs are intended primarily for continuing education and career enhancement for current nurses, and are not meant for entry-level nursing students.

²¹ DOL, *Program Sponsors Database*.

²² For more information on how educational programs are classified and defined, see the Technical Notes at the end of this document.

²³ Ohio Board of Regents, 36.

Figure 14: Training Output for Key Health Care Occupations

Occupational Title	Avg. An. Openings 2006-16	Training Output 2006-07	Entering Labor Market [†]	Difference	App. Programs
Registered Nurses*	4,425	5,802	4,932	507	**
Nursing Aides, Orderlies, and Attendants	1,801	914	777	-1,024	13
Licensed Practical & Licensed Vocat. Nurses	1,593	3,361	2,857	1,264	**
Medical Secretaries	895	889	756	-139	6
Medical Assistants	845	3,678	3,126	2,281	2
Physicians and Surgeons, All Other	349	928	789	440	**
Medical and Health Services Managers	368	935	795	427	**
Emergency Medical Technicians & Paramedics	253	671	570	317	2
Dental Assistants	383	543	462	79	12
Radiologic Technologists and Technicians	262	585	497	235	0
Dental Hygienists	253	238	202	-51	**
Respiratory Therapists	198	281	239	41	**

*Training output only includes Registered Nurse Training (CIP 51.1601).

**Not an apprenticeable occupation

[†]Of those completing degree programs, about 15% do not enter the occupational market.

Source: ODJFS, *2016 Ohio Job Outlook*, C1-C13; OSDS; DOL, *Program Sponsors Database*.

Only three of the twelve key occupations show any shortfall in training output. Two, nursing aides, orderlies, and attendants and medical secretaries, have relatively modest training requirements (on-the-job training is usually sufficient) so any shortage would be short-lived.²⁴ The third however, dental hygienists, has more stringent requirements. Prospective hygienists must complete a two-year postsecondary program and meet state licensing requirements.²⁵ In the most recent year for which data were available, there was an estimated 20.2 percent difference between the number of annual openings and the number of newly available trained workers. Figure 15 suggests that current training program utilization may not be enough to fill projected openings. This does not necessarily mean there will be a shortage of trained dental hygienists. Qualified workers can come from any number of sources, including displaced workers or other geographic areas.

Educational Infrastructure

There are 192 postsecondary institutions offering programs linked to the key health care occupations, around the state. A complete listing of these institutions, including contact information, is available in appendix D. Figure 15 on the next page shows health care education programs in Ohio, by occupation and degree type. In total, there 542 programs in the key health care occupations. The majority are associate degrees and award programs lasting one to two years.

²⁴ BLS, "Nursing, Psychiatric, and Home Health Aides," *Occupational Outlook Handbook*; *Ibid.*, "Secretaries and Administrative Assistants."

²⁵ *Ibid.*, "Dental Hygienists;" Ohio State Dental Board, *Licensing Information*.

Figure 15: Postsecondary Health Care Programs in Ohio, by Award Type and Key Occupation

	Postsec., < 1 yr.	Postsec., 1-2 yrs.	Assoc.	Postsec. 2-4 yrs.	Bach.	Postbacc. Cert.	Master's	Post-Master's	Doctor's	1st Prof. Degree	TOTAL
Registered Nurses*			38	8	32		10	1	3		92
Nurs. Aides, Ord., & Attlds.	10	4		1							15
LPNs & LVNs	4	49	4	1	1						59
Medical Secretaries	19	21	30								70
Medical Assistants	17	46	46		1						110
Physicians and Surgeons										7	7
Med. & Health Svc. Mgrs.	9	11	8		25	2	13				68
EMTs & Paramedics	20	11	13								44
Dental Assistants	9	9	2								20
Radiology Techs.	2	2	21	2	3						30
Dental Hygienists	1		11		1						13
Respiratory Therapists	1		16	2	2						21
Total Programs Available	92	153	189	14	65	2	23	1	3	7	542

*Program count only includes Registered Nurse Training (CIP 51.1601).

Nationwide Nursing Shortage

Ensuring an adequate supply of skilled registered nurses could be one of the biggest employment challenges over the next ten years. Registered nursing is the largest health care occupation, accounting for nearly one out of every six health care jobs in 2016 and a roughly equal proportion of annual openings.²⁶ In addition, as noted seen in figure 11 earlier, nearly 30 percent of incumbent nurses are nearing or have reached retirement age. Nationwide, the market will need 41,000 new registered nurses per year between 2006 and 2016 just to meet replacement needs.²⁷

Industry leaders and analysts have been complaining for years about an apparent shortage of qualified nursing staff and persistent difficulty in recruiting new nurses. This is partially in response to increased overall demand for health care services as the baby boom generation ages and new medical technologies emerge. These new technologies are not expected to have any significant effect on staffing patterns in the near future, however.²⁸ This would require major organizational and managerial changes by employers.

In classical economics, whenever the supply of any good becomes scarce, consumers will bid up the price in order to secure their needs, and skilled labor, such as nursing, is no exception. As mentioned earlier, the average hourly wage for registered nurses in Ohio in 2007 was \$27.56. In 2002, the average wage was only \$22.50 per hour, an increase of 22.5 percent. This wage growth was much faster than the 18.4 percent growth in the employment cost index over the same period,²⁹ indicating either growth in demand, reduction of supply, or both.³⁰

²⁶ ODJFS, *2016 Ohio Job Outlook*, C1-C6.

²⁷ BLS, *Occupational Projections and Training Data*, 136.

²⁸ The BLS only projects a small net increase in RN utilization across industries. See U.S. Bureau of Labor Statistics, *Occupational Projections and Training Data*, 115.

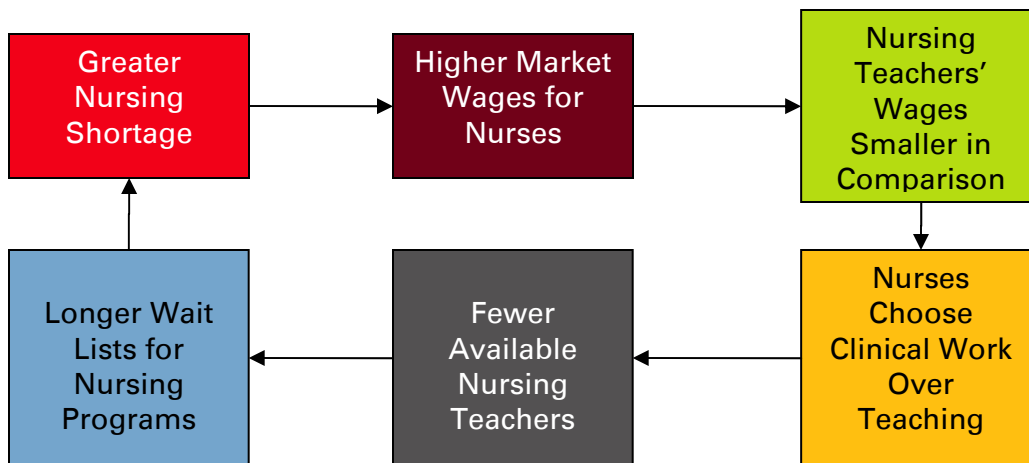
²⁹ U.S. Bureau of Labor Statistics, *Employment Cost Index*, 3.

³⁰ There are serious drawbacks to using this hourly wage data as an indicator of labor shortages. See the technical notes for details.

Aside from wages, some employers are even offering innovative perks in order to attract nurses, such as concierge services, gas cards, and 'door prizes' for employees.³¹ Increases in perks and benefits may be treated as growth in overall compensation and the 'price' of qualified nurses.

One challenge is getting an adequate number of nursing faculty to teach a new crop of workers.³² In addition to entry barriers, such as the need for a doctoral degree, taking a teaching position often represents a significant pay cut. A recent study found that entry-level nursing professors can expect to make \$50,000 per year.³³ For comparison, average wages for RNs in Ohio are about \$58,750 per year, not taking higher-paying specialties into account.³⁴ One specialist nurse noted, "If I [became] a professor at a college, I would take a pay cut of about \$20,000 to \$25,000."³⁵ Further, this wage differential could become worse over time, as businesses react to further shortages by raising wages and perks even more. Figure 16 below illustrates how this shortage could spin out of control.

Figure 16: Worsening Nursing and Teacher Shortages



More experienced nursing instructors may make more than the average nurse's salary. Half of all nursing instructors in Ohio earned between \$48,576 and \$76,884 per year. Still, there are other barriers to entry, most notably additional educational requirements.

In 2006, there were approximately 2,160 postsecondary nursing instructors and teachers in Ohio. By 2016, this is projected to grow by 17.1 percent to 2,530. During this period, an average of 73 openings per year are expected. However, this may not be enough to meet demand. One group estimated 100 additional nursing faculty would be needed to increase annual production of registered nurses by 800.³⁶

³¹ Ericksen, "Recruiting nurses."

³² Hoholik, "Nursing schools needing teachers."

³³ *Ibid.*

³⁴ BLS, "State Occupational Employment & Wage Estimates."

³⁵ Hoholik, *op cit.*

³⁶ Ohio Nursing Acceleration Program, 2.

It is also worth noting that that average wages for registered nurses in Ohio fall well below the national average. While RNs in Ohio earn \$58,750 per year, nationally the average wage is \$65,130.³⁷ Since people with more education tend to be more geographically-mobile, there could be potential brain drain in the state as trained nurses seek higher-paying positions elsewhere.

³⁷ BLS, "National Occupational Employment & Wage Estimates."

V. Regional Analysis

The U.S. Office of Management and Budget has developed a list of Metropolitan Statistical Areas (MSAs) across the country, based on commuting patterns. A map of the MSAs in Ohio and their names can be found in appendix A. A brief comparison of the health care industry, its key occupations, and vital training programs in each of the MSAs follows.

Location Quotients

Figure 17 below compares location quotients (LQs) in each of the MSAs. As discussed earlier in section II, an LQ of 1.2 or greater is generally accepted to indicate an especially concentrated industry. These are highlighted in gray below.

Figure 17: Health Care Location Quotients, 2007

Metropolitan Statistical Area	Ambl. Health Care	Hospitals	Nursing & Res. Care
Ohio Statewide	1.0	1.1	1.3
Akron	1.1	1.2	1.2
Canton-Massillon	1.3	1.1	1.8
Cincinnati-Middletown*	1.1	1.1	1.3
Cleveland-Elyria-Mentor	1.0	1.5	1.4
Columbus	1.0	0.9	1.0
Dayton	1.2	1.3	1.3
Toledo	1.2	1.4	1.6
Youngstown-Warren-Boardman*	1.4	1.0	1.9
Balance of State	1.0	1.0	1.8

*Data includes ONLY Ohio counties in the metropolitan area.

The table clearly indicates that, across Ohio, employment in nursing and residential care is highly concentrated relative to the rest of the region. In the rural portions of the state (i.e., areas not part of the eight largest metropolitan areas), this industry's share of employment is 1.8 times as high as that of the rest of the country. The Youngstown-Warren-Boardman, Canton-Massillon, and Toledo areas also have relatively high concentrations. The only region that has a normal share of employment in this subsector is the Columbus MSA.

While location quotients are generally used to determine whether a region is host to an export industry, this measure does have some drawbacks, especially in regards to health care. For some areas, health care may comprise a large portion of payroll employment if there is comparatively high local unemployment or if most of the economy relies on employment not covered in the Quarterly Census of Employment and Wages. And because demand for health care services may be regarded as relatively inelastic as the economy expands and contracts (as suggested in figure 1), it might be more prominent in an economically ailing region. Thus, the Cleveland area's LQ of 1.5 for hospitals could reflect either high employment at nationally recognized establishments or a relative lack of employment in other industries.

Since we might expect demand for health care to stay constant relative to general economic conditions, we could use total population as a proxy for demand. An employment-population ratio greater than the national ratio might indicate greater demand for services than would normally be supported by the local area—an export industry. (In any of these local/national comparison statistics, we are assuming constant labor productivity and constant patterns of consumption or general health.)

Figure 18: Formula for Modified “Population Location Quotient”

$$PLQ = \frac{E_r \times P_n}{E_n \times P_r}$$

A formula for this new measure—call it the population location quotient or PLQ—is shown above, where E_r is the industry’s regional employment, E_n is the industry’s national employment, P_r is regional population, and P_n is national population. Results are shown in figure 19 below.

Figure 19: Modified Health Care Population Location Quotients, 2007

Metropolitan Statistical Area	Ambl. Health Care	Hospitals	Nursing & Res. Care
Ohio Statewide	1.1	1.2	1.4
Akron	1.1	1.3	1.2
Canton-Massillon	1.2	1.1	1.6
Cincinnati-Middletown*	1.2	1.2	1.4
Cleveland-Elyria-Mentor	1.1	1.6	1.5
Columbus	1.2	1.1	1.1
Dayton	1.2	1.4	1.3
Toledo	1.3	1.5	1.7
Youngstown-Warren-Boardman*	1.3	0.9	1.7
Balance of State	0.9	0.9	1.6

*Data includes ONLY Ohio counties in the metropolitan area.

Within the hospital subsector, the Cleveland area has the highest modified LQ—indicative of the industry’s importance in the region. Note that the LQs for Ohio’s non-metropolitan areas actually dropped slightly. In many of these areas, local hospitals are often the largest private employers. As with the regular LQs earlier, nursing and residential care is still very concentrated across Ohio, with the Columbus area again having the lowest concentration.

Occupational Employment and Projections

Figure 13 earlier in this report had identified twelve occupations key to the health care industry: RNs; nursing aides, orderlies, and attendants; LPNs; medical secretaries; medical assistants; physicians and surgeons; medical and health services managers; dental assistants; radiologic technologists and technicians; EMTs and paramedics; dental hygienists; and respiratory therapists. Figures 20 and 21 compare the relative average hourly wages and projected annual openings for each of these occupations across major metropolitan areas in Ohio. (Balance of State figures are not available.)

Figure 20: May 2008 Average Hourly Wages by Metropolitan Area, Selected Occupations

	Ohio Statewide	Akron	Canton-Massillon	Cincinnati-Middletown	Cleveland-Elyria-Mentor	Columbus	Dayton	Toledo	Youngstown-Warren-Boardman
Registered Nurses	\$28.25	\$28.33	\$28.11	\$29.20	\$29.99	\$28.82	\$27.84	\$26.70	\$24.76
Nurs. Aides, Ord., & Attnds.	\$11.45	\$11.30	\$10.69	\$11.81	\$11.63	\$11.98	\$11.71	\$11.80	\$11.00
LPNs & LVNs	\$19.09	\$18.86	\$17.70	\$20.10	\$20.73	\$20.22	\$19.82	\$18.97	\$16.88
Medical Secretaries	\$13.61	\$13.76	\$12.79	\$14.41	\$14.32	\$14.16	\$13.49	\$14.11	\$11.69
Medical Assistants	\$12.98	\$13.18	\$12.60	\$13.63	\$12.86	\$13.74	\$13.16	\$13.67	\$11.76
Physicians and Surgeons	\$83.51	\$91.67	\$100.74	\$71.78	\$67.20	\$86.93	\$103.67	\$89.81	\$100.04
Med. & Health Svc. Mgrs.	\$39.22	\$42.09	\$41.27	\$39.89	\$47.44	\$39.63	\$39.73	\$37.71	\$36.56
EMTs & Paramedics	\$13.40	\$13.93	\$14.17	\$15.34	\$14.82	\$13.85	\$12.88	\$12.35	\$12.49
Dental Assistants	\$15.39	\$15.54	\$14.01	\$16.51	\$14.81	\$16.94	\$16.47	\$15.26	\$14.29
Radiology Techs.	\$23.64	\$21.99	\$22.28	\$23.65	\$24.00	\$25.02	\$23.89	\$23.83	\$26.54
Dental Hygienists	\$29.61	\$29.59	\$28.54	\$31.13	\$29.52	\$33.29	\$28.23	\$27.11	\$25.53
Respiratory Therapists	\$23.50	\$22.42	\$22.51	\$23.43	\$24.61	\$24.27	\$23.62	\$24.28	\$24.24

Source: BLS, "May 2008 State Occupational Employment & Wage Estimates"; BLS, "May 2008 Metropolitan and Nonmet. Employment & Wage Estimates."

Generally speaking, the larger a metropolitan area is, the higher its average wages are in these occupations. The Cleveland, Cincinnati, and Columbus MSAs—the three largest in Ohio—have the three highest average wages for RNs, LPNs, and medical secretaries. The Youngstown and Canton areas, conversely, has many of the state’s lower wages for these occupations. However, working in a larger area is no guarantee of high wages; the Cleveland area has the third-lowest wages for medical assistants and dental assistants, while the Youngstown area has the highest wages for radiological technologists and technicians.

Figure 21: 2006-16 Projected Average Annual Openings by Metropolitan Area, Selected Occupations

	Ohio Statewide	Akron	Canton-Massillon	Cincinnati-Middletown	Cleveland-Elyria-Mentor	Columbus	Dayton	Toledo	Youngstown-Warren-Boardman
Registered Nurses	4,425	258	127	829	931	579	357	309	192
Nurs. Aides, Ord., & Attnds.	1,801	65	49	218	360	NA	116	104	89
LPNs & LVNs	1,593	75	50	222	302	187	94	86	92
Medical Secretaries	895	46	32	149	180	128	67	56	58
Medical Assistants	845	63	33	170	121	207	55	53	48
Physicians and Surgeons	349	62	17	84	43	70	28	NA	17
Med. & Health Svc. Mgrs.	368	22	9	68	71	57	23	25	19
EMTs & Paramedics	253	29	8	54	41	46	7	30	14
Dental Assistants	383	26	14	80	86	79	46	35	21
Radiology Techs.	262	9	10	49	45	47	22	15	16
Dental Hygienists	253	25	7	68	32	67	20	32	19
Respiratory Therapists	198	10	9	33	34	22	17	24	NA

Note: These are estimates only; some rows may not total due to openings outside the metropolitan areas

NA-Estimate not available due to data suppression; see Technical Notes.

Source: ODJFS, *2016 Ohio Job Outlook*, C1-C13; ODJFS, *2016 Job Outlook* [Various], 6 et seq.

Again, larger metropolitan areas can support larger workforces and will have more openings in general. In all but a few of these occupations, we project that the Cleveland area will have the largest number of openings.

VI. Conclusions

Clearly, health care presents plenty of employment opportunities for the Ohio workforce. The health care industries have experienced decades of steady employment growth and have largely resisted downturns in the business cycle. Employment forecasts predict continued growth, in part because an aging population will require more health care.

The current recession has shown that health care employment is not impervious to downturns in the business cycle. So far in 2009, health care employment growth has been flat. This may be for reasons ranging from a tight credit market limiting the ability of health care facilities to expand to an increase in the number of individuals without health insurance and unable to pay for health care. It is uncertain how the recession or President Obama's health care vision will affect health care employment in the long term.

A major concern regarding health care is increasing costs. One aspect of controlling costs may be ensuring an adequate supply of skilled workers. In addition to employment growth from expanding health care industries, demand for many health care occupations may increase as baby boomers retire and begin to leave the workforce. Shortages of workers may further increase health care costs. This is most evident with registered nurses. Addressing the need for skilled workers will require matching education and training output to employment demand without over-producing qualified workers. This will require understanding national, state, and local labor markets and how they compete for workers.

Technical Notes

The Ohio Department of Job and Family Services (ODJFS), Office of Workforce Development, Bureau of Labor Market Information prepared this report.

Industrial employment and wage data in this report are from the Quarterly Census of Employment and Wages (QCEW), with the exception of figure 2. These data are compiled using unemployment compensation tax returns and administrative data. As a result, business establishments not covered by Ohio unemployment compensation law are not counted. Most health care business establishments are covered and are thus included. ODJFS staff have also added in employment and wage figures from publicly-owned establishments (e.g., government hospitals). QCEW preliminary data are generally published about six to seven months after the reference period. Some QCEW data, including some of the data used to develop location quotients, is suppressed for confidentiality.

The employment data from figure 2 are from the Current Employment Statistics program (CES). These data are compiled using survey reports, statistical interpolations, and historical time series. As such, CES figures are estimates and not firm tallies like in QCEW. CES estimates are only published two to three months after the reference period, making them more current than QCEW. CES also differs from QCEW in some other respects, such as frequency, definitions of employment, and geographic detail. Like QCEW, some data may be suppressed for confidentiality. Data for May 2009 are preliminary only and may be subject to revision.

All industries in this report were classified using the North American Industrial Classification System (NAICS) 2002 edition, developed in part by the U.S. Office of Management and Budget. NAICS assigns each industry a 2- to 6-digit code, with longer codes assigned to more detailed industries. For more details on NAICS and a complete listing of industries and definitions, please visit <http://www.census.gov/epcd/www/naics.html>.

Occupational employment and average wage data in this report are from the Occupational Employment Statistics (OES) program. These survey estimates are compiled through voluntary questionnaires sent to business establishments around the state on a three-year cycle. Because not all data are updated every year, some wage information may be “aged” to reflect general wage growth and may not represent true average market wages. OES preliminary data are generally published about one year after the reference period.

Occupations in this report were classified using Standard Occupational Classifications (SOC), developed by the U.S. Bureau of Labor Statistics. Like NAICS, SOC uses a set of 2- to 6-digit codes to classify standardized occupations, with longer codes going to more detailed occupations. For details on SOC and a complete listing of occupations and definitions, please visit <http://www.bls.gov/soc/home.htm>.

One of the twelve key health care occupations, “physicians and surgeons, all other,” is actually a *residual* category to include doctors not classified elsewhere in SOC. Physicians and surgeons in general are divided up into eight specialty classifications:

anesthesiology; family and general practice; general internal medicine; obstetrics and gynecology; pediatrics; psychiatry; surgery; and finally the “all other” category for other specialties (e.g. oncology, cardiology, or countless others). Employment statistics, including employment, openings, and wages, are for the “all other” category only. Educational statistics, including available programs and number of completers, are for *all* physicians and surgeons listed above.

ODJFS publishes long-term employment projections for Ohio every two years, looking over a ten-year time frame. The most recent projections were for the 2006-16 period and cover statewide employment and employment in Ohio’s eight largest metropolitan areas. Additional projections for Ohio’s Economic Development Regions will be published later this year. Some projection figures, especially those for substate areas, were suppressed due to confidentiality concerns or small size. Projections for postsecondary nursing instructors and teachers were developed through special research and are available upon request from ODJFS staff. Complete details on Ohio’s long term employment projections, including notes on methodology, are available at <http://ohiolmi.com/proj/projections.htm>.

Please note, **all employment projections are subject to change as the economic situation evolves and establishments enter and exit the market.** Employers, workers, and workforce professionals are advised to carefully review the literature before setting future career plans.

Data on educational program completions are from the Integrated Postsecondary Education Data System (IPEDS) from the U.S. Department of Education. IPEDS uses data collected from some all schools participating in federal financial aid programs. Raw IPEDS data is prepared and tabulated by ODJFS staff. To log on to the IPEDS system and download data, visit <http://nces.ed.gov/ipeds/pas/>. IPEDS preliminary data are generally published one year after the reference period.

Instructional programs were classified using Classifications of Instructional Programs (CIP). Again, CIP uses a set of 2- to 6-digit codes to classify standardized educational programs, with longer codes representing more detailed programs. For program titles and definitions, visit <http://nces.ed.gov/pubs2002/cip2000/>.

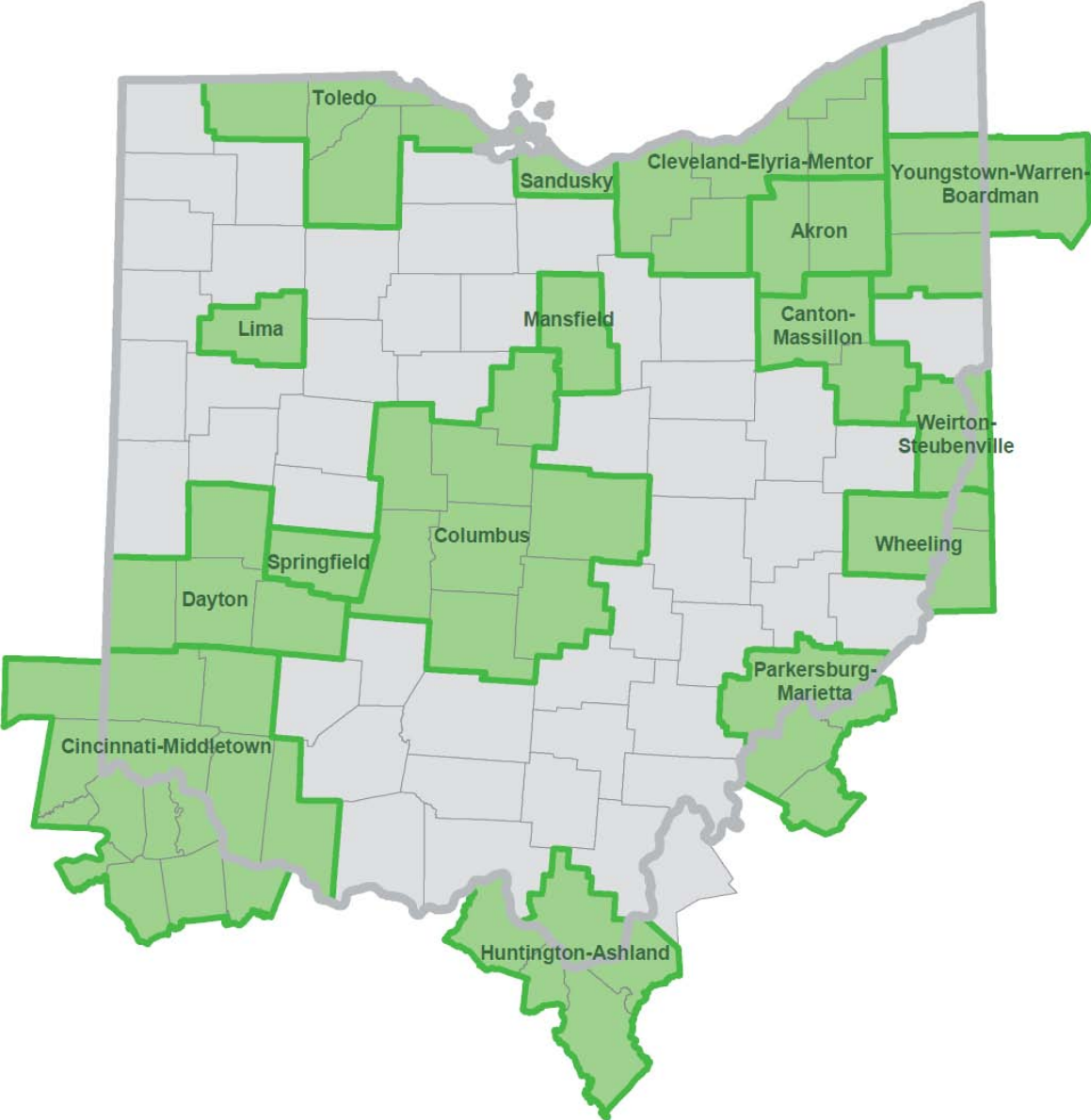
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Appendix A: Map of Ohio's Metropolitan Statistical Areas



Appendix B: Health Care Occupational Projections and Average Wages, by Education & Training Level

Code	Occupational Title	Employment		Change 2006-16		Average Annual Openings	Avg. Hr. Wages, May 2008
		2006	2016 Projected	Net	Percent		
Occupations Requiring Short-Term On-the-Job Training (up to one month)							
		82,060	111,470	29,410	35.8%	4,093	
31-1011	Home Health Aides	42,200	62,500	20,300	48.1%	2,408	\$9.80
31-1013	Psychiatric Aides	800	810	10	1.3%	8	\$14.09
31-2012	Occupational Therapist Aides	120	140	20	16.7%	4	\$11.73
31-2022	Physical Therapist Aides	1,450	1,760	310	21.4%	50	\$11.75
31-9093	Medical Equipment Preparers	2,140	2,410	270	12.6%	54	\$13.74
31-9095	Pharmacy Aides	2,100	1,740	-360	-17.1%	26	\$10.11
31-9096	Vet. Assistants & Laboratory Animal Caretakers	2,950	3,260	310	10.5%	68	\$11.04
39-9021	Personal and Home Care Aides	19,170	26,990	7,820	40.8%	1,107	\$9.72
39-9041	Residential Advisors	1,390	1,600	210	15.1%	60	\$14.70
43-4111	Interviewers, except Eligibility and Loan	9,740	10,260	520	5.3%	308	\$13.45
Occupations Requiring Moderate-Term On-the-Job Training (one to twelve months combined experience/training)							
		71,270	86,030	14,760	20.7%	2,715	
29-2052	Pharmacy Technicians	10,840	13,220	2,380	22.0%	569	\$12.53
31-9091	Dental Assistants	10,040	12,130	2,090	20.8%	383	\$15.39
31-9092	Medical Assistants	19,000	25,090	6,090	32.1%	845	\$12.98
43-6013	Medical Secretaries	30,640	34,710	4,070	13.3%	895	\$13.61
53-3011	Ambulance Drivers & Attendants, except EMT	750	880	130	17.3%	23	\$9.51
Occupations Requiring Long-Term On-the-Job Training (twelve months or more combined experience/training)							
		4,880	4,830	-50	-1.0%	134	
29-2081	Opticians, Dispensing	3,200	3,170	-30	-0.9%	102	\$16.58
51-9081	Dental Laboratory Technicians	1,680	1,660	-20	-1.2%	32	\$17.49
Occupations Requiring Postsecondary Vocational Awards							
		139,490	159,350	19,860	14.2%	4,120	
29-2041	Emergency Medical Technicians & Paramedics	10,150	11,520	1,370	13.5%	253	\$13.40
29-2051	Dietetic Technicians	600	660	60	10.0%	24	\$17.18
29-2053	Psychiatric Technicians	1,500	1,410	-90	-6.0%	46	\$15.77
29-2055	Surgical Technologists	3,440	4,210	770	22.4%	182	\$18.01
29-2061	Licensed Practical & Licensed Vocat. Nurses	38,690	44,070	5,380	13.9%	1,593	\$19.09
31-1012	Nursing Aides, Orderlies, and Attendants	77,140	88,250	11,110	14.4%	1,801	\$11.45
31-9011	Massage Therapists	3,970	4,740	770	19.4%	122	\$15.34
31-9094	Medical Transcriptionists	4,000	4,490	490	12.3%	99	\$14.82
Occupations Requiring an Associate Degree							
		161,990	196,940	34,950	21.6%	6,225	
29-1111	Registered Nurses	113,050	138,640	25,590	22.6%	4,425	\$28.25
29-1124	Radiation Therapists	500	610	110	22.0%	18	\$32.14
29-1126	Respiratory Therapists	5,350	6,540	1,190	22.2%	198	\$23.50
29-2012	Medical and Clinical Laboratory Technicians	5,280	6,030	750	14.2%	155	\$17.88
29-2021	Dental Hygienists	6,320	7,640	1,320	20.9%	253	\$29.61
29-2031	Cardiovascular Technologists and Technicians	1,720	2,110	390	22.7%	62	\$23.15
29-2032	Diagnostic Medical Sonographers	1,890	2,210	320	16.9%	58	\$27.07
29-2033	Nuclear Medicine Technologists	920	1,050	130	14.1%	26	\$30.53
29-2034	Radiologic Technologists and Technicians	9,740	11,040	1,300	13.3%	262	\$23.64
29-2054	Respiratory Therapy Technicians	470	460	-10	-2.1%	14	\$19.43
29-2056	Veterinary Technologists and Technicians	1,900	2,530	630	33.2%	121	\$13.86

Code	Occupational Title	Employment		Change 2006-16		Average Annual Openings	Avg. Hr. Wages, May 2008
		2006	2016 Projected	Net	Percent		
Occupations Requiring an Associate Degree [con't]		161,990	196,940	34,950	21.6%	6,225	
29-2071	Medical Records & Health Info. Technicians	6,600	7,550	950	14.4%	274	\$15.29
31-2011	Occupational Therapist Assistants	2,370	2,970	600	25.3%	96	\$23.79
31-2021	Physical Therapist Assistants	4,590	6,050	1,460	31.8%	205	\$23.90
49-9062	Medical Equipment Repairers	1,290	1,510	220	17.1%	58	\$22.86
Occupations Requiring a Bachelor's Degree		31,950	37,410	5,460	17.1%	1,169	
17-2031	Biomedical Engineers	270	320	50	18.5%	11	\$34.69
21-1011	Substance Abuse & Behavioral Dis. Counselors	2,470	3,310	840	34.0%	134	\$18.77
21-1021	Child, Family and School Social Workers	8,200	9,760	1,560	19.0%	330	\$17.40
21-1022	Medical and Public Health Social Workers	5,970	7,430	1,460	24.5%	272	\$21.44
21-1091	Health Educators	1,610	2,030	420	26.1%	61	\$20.56
29-1031	Dietitians and Nutritionists	2,630	2,780	150	5.7%	82	\$24.47
29-1125	Recreational Therapists	940	880	-60	-6.4%	14	\$19.85
29-2011	Medical and Clinical Laboratory Technologists	6,580	7,290	710	10.8%	170	\$24.45
29-2091	Orthotists and Prosthetists	150	160	10	6.7%	2	\$33.99
29-9011	Occupational Health and Safety Specialists	1,920	2,060	140	7.3%	51	\$32.91
29-9012	Occupational Health and Safety Technicians	500	520	20	4.0%	12	\$21.56
29-9091	Athletic Trainers	710	870	160	22.5%	30	\$42,200*
Occupations Requiring Work Experience plus a Bachelor's Degree or Higher							
11-9111	Medical and Health Services Managers	10,910	12,550	1,640	15.0%	368	\$39.22
Occupations Requiring a Master's Degree		29,520	35,750	6,230	21.1%	1,127	
19-3032	Industrial-Organizational Psychologists	150	170	20	13.3%	4	\$35.65
21-1014	Mental Health Counselors	2,780	3,610	830	29.9%	138	\$20.74
21-1015	Rehabilitation Counselors	3,740	4,170	430	11.5%	117	\$19.58
21-1023	Mental Health & Substance Abuse Social Work.	5,200	6,750	1,550	29.8%	265	\$16.97
29-1071	Physician Assistants	1,580	1,950	370	23.4%	59	\$39.03
29-1122	Occupational Therapists	4,210	5,180	970	23.0%	159	\$34.88
29-1123	Physical Therapists	6,820	8,510	1,690	24.8%	251	\$35.92
29-1127	Speech-Language Pathologists	5,040	5,410	370	7.3%	134	\$36.65
Occupations Requiring a Doctoral Degree							
19-3031	Clinical, Counseling and School Psychologists	4,600	5,020	420	9.1%	113	\$38.67
Occupations Requiring a First Professional Degree		38,970	43,540	4,570	11.7%	1,153	
29-1011	Chiropractors	2,070	2,380	310	15.0%	54	\$51.51
29-1021	Dentists, General	4,820	4,940	120	2.5%	106	\$79.52
29-1041	Optometrists	1,390	1,540	150	10.8%	39	\$58.29
29-1051	Pharmacists	10,010	11,540	1,530	15.3%	326	\$47.82
29-1061	Anesthesiologists	1,120	1,310	190	17.0%	39	\$101.47
29-1062	Family and General Practitioners	6,240	6,850	610	9.8%	174	\$76.99
29-1063	Internists, General	3,240	3,520	280	8.6%	86	\$73.68
29-1064	Obstetricians and Gynecologists	1,410	1,650	240	17.0%	49	\$89.78
29-1065	Pediatricians, General	2,230	2,440	210	9.4%	61	\$72.02
29-1066	Psychiatrists	810	900	90	11.1%	24	\$79.30
29-1067	Surgeons	2,430	2,620	190	7.8%	63	\$99.31
29-1081	Podiatrists	660	720	60	9.1%	28	\$57.72
29-1121	Audiologists	620	630	10	1.6%	8	\$28.18
29-1131	Veterinarians	1,920	2,500	580	30.2%	96	\$45.01

*Annual earnings, typically for a 9½ month school year

Source: ODJFS, *2016 Ohio Job Outlook*, C1-C13; ODJFS, "Occupational Wages and Employment."

Appendix C: Educational Programs for Key Health Care Occupations

Registered Nurses (29-1111)

- 51.1105 Pre-Nursing Studies
- 51.1601 Nursing/Registered Nurse (RN, ASN, BSN, MSN)
- 51.1603 Adult Health Nurse/Nursing
- 51.1604 Nurse Anesthetist
- 51.1605 Family Practice Nurse/Nurse Practitioner
- 51.1606 Maternal/Child Health and Neonatal Nurse/Nursing
- 51.1607 Nurse Midwife/Nursing Midwifery
- 51.1608 Nursing Science (MS, PhD)
- 51.1609 Pediatric Nurse/Nursing
- 51.1610 Psychiatric/Mental Health Nurse/Nursing
- 51.1611 Public Health/Community Nurse/Nursing
- 51.1616 Clinical Nurse Specialist
- 51.1699 Nursing, Other

Nursing Aides, Orderlies, & Attendants (31-1012)

- 51.1614 Nurse/Nursing Assistant/Aide and Patient Care Assistant

Licensed Practical and Licensed Vocational Nurses (29-2061)

- 51.1613 Licensed Practical/Vocational Nurse Training (LPN, LVN, Cert.)

Medical Secretaries (43-6013)

- 51.0710 Medical Office Assistant/Specialist
- 51.0712 Medical Reception/Receptionist
- 51.0714 Medical Insurance Specialist/Medical Biller
- 51.0715 Health/Medical Claims Examiner
- 51.0716 Medical Administrative/Executive Assistant and Medical Secretary

Medical Assistants (31-9092)

- 51.0711 Medical/Health Management and Clinical Assistant/Specialist
- 51.0801 Medical/Clinical Assistant
- 51.0809 Anesthesiologist Assistant
- 51.0811 Pathology/Pathologist Assistant
- 51.0813 Chiropractic Assistant/Technician
- 51.0899 Allied Health and Medical Assisting Services, Other
- 51.1803 Ophthalmic Technician/Technologist
- 51.1804 Orthoptics/Orthoptist
- 51.1899 Ophthalmic and Optometric Support Services and Allied Professions, Other

Physicians and Surgeons (29-1060)

- 51.1201 Medicine (MD)
- 51.1507 Psychoanalysis and Psychotherapy
- 51.1901 Osteopathic Medicine/Osteopathy (DO)

Note: Completion of a residency program is required to practice medicine in Ohio.

Medical and Health Services Managers (11-9111)

- 51.0701 Health/Health Care Administration/Management
- 51.0702 Hospital and Health Care Facilities Administration/Management
- 51.0704 Health Unit Manager/Ward Supervisor
- 51.0706 Health Information/Medical Records Administration/Administrator
- 51.0717 Medical Staff Services Technology/Technician
- 51.0799 Health and Medical Administrative Services, Other
- 51.1602 Nursing Administration (MSN, MS, PhD)
- 51.2211 Health Services Administration.

Emergency Medical Technicians & Paramedics (29-2041)

- 51.0810 Emergency Care Attendant (EMT Ambulance)
- 51.0904 Emergency Medical Technology/Technician (EMT Paramedic)

Dental Assistants (31-9091)

- 51.0601 Dental Assisting/Assistant

Radiologic Technologists & Technicians (29-2034)

- 51.0907 Medical Radiologic Technology/Science - Radiation Therapist
- 51.0911 Radiologic Technology/Science - Radiographer

Dental Hygienists (29-2021)

- 51.0602 Dental Hygiene/Hygienist

Respiratory Therapists (29-1126)

- 51.0812 Respiratory Therapy Technician/Assistant
- 51.0908 Respiratory Care Therapy/Therapist

Not all programs may be available at all institutions.
Source: Occupational Supply-Demand System.

Appendix D: Health Care Education & Training Providers in Ohio, Key Occupations

Name	City	Phone	URL	Type
Ohio Northern University	Ada	(419) 772-2000	www.onu.edu/	4-yr. Coll. & Univ.
Akron Adult Vocational Services	Akron	(330) 761-1385	akronschools.com	Pub. Adult Sch.
Akron Institute	Akron	(330) 724-1600	www.akroninstitute.com	Priv. Bus. & Tech.
Akron School of Practical Nursing	Akron	(330) 761-3255		Pub. Adult Sch.
Brown Mackie College-Akron	Akron	(330) 869-3600	www.edmc.edu	Priv. Bus. & Tech.
University of Akron Main Campus	Akron	(330) 972-7111	www.uakron.edu	4-yr. Coll. & Univ.
Community Services Division-Alliance City	Alliance	(330) 821-2102	www.accrtw.org	Pub. Adult Sch.
Northwest State Community College	Archbold	(419) 267-5511	www.northweststate.edu	2-yr., Tech., & Comm.
Ashland County-West Holmes Career Center	Ashland	(419) 289-3313	acwhcc-jvs.k12.oh.us	Pub. Adult Sch.
Ashland University	Ashland	(419) 289-4142	www.ashland.edu	4-yr. Coll. & Univ.
Kent State University-Ashtabula Campus	Ashtabula	(440) 964-3322	www.ashtabula.kent.edu	2-yr., Tech., & Comm.
Ohio University-Main Campus	Athens	(740) 593-1000	www.ohio.edu	4-yr. Coll. & Univ.
University of Cincinnati-Clermont College	Batavia	(513) 732-5200	www.clc.uc.edu	2-yr., Tech., & Comm.
Ohio Hi Point Joint Vocational School District	Bellefontaine	(937) 599-3010	www.ohp.k12.oh.us	Pub. Adult Sch.
US Grant Joint Vocational School	Bethel	(513) 734-6222	www.grantcareer.com	Pub. Adult Sch.
University of Cincinnati-Raymond Walters College	Blue Ash	(513) 745-5600	www.rwc.uc.edu	2-yr., Tech., & Comm.
Bowling Green State University-Main Campus	Bowling Green	(419) 372-2531	www.bgsu.edu	4-yr. Coll. & Univ.
School of Nursing at Cuyahoga Valley Career Center	Brecksville	(440) 746-8200	www.cvcc.k12.oh.us	Pub. Adult Sch.
Kaplan Career Institute	Brooklyn	(216) 485-0900	www.tinst.com	Priv. Bus. & Tech.
Mahoning County Career and Technical Center	Canfield	(330) 729-4100	www.mahoningctc.com	Pub. Adult Sch.
Aultman Hospital School of Nursing	Canton	(330) 363-6347	www.aultmancollege.org	2-yr., Tech., & Comm.
Malone College	Canton	(330) 471-8100	www.malone.edu	4-yr. Coll. & Univ.
Practical Nurse Program Canton City Schools	Canton	(330) 453-3271	www.ccsdistrict.org	Pub. Adult Sch.
Cedarville University	Cedarville	(937) 766-2211	www.cedarville.edu	4-yr. Coll. & Univ.
RETS Tech Center	Centerville	(937) 433-3410	www.retstechcenter.com	2-yr., Tech., & Comm.
O C Collins Career Center	Chesapeake	(740) 867-6641	www.collins-cc.k12.oh.us	2-yr., Tech., & Comm.
Ohio University-Chillicothe Campus	Chillicothe	(740) 774-7200	www.chillicothe.ohiou.edu	4-yr. Coll. & Univ.
Pickaway Ross Joint Vocational School District	Chillicothe	(740) 642-1200	www.pickawayross.com	Pub. Adult Sch.
Samuel Stephen College	Chillicothe	(740) 774-6300	samuelstephencollege.edu	2-yr., Tech., & Comm.
Antonelli College	Cincinnati	(513) 241-4338	www.antonellicollege.edu	2-yr., Tech., & Comm.
Boecker College - Cincinnati	Cincinnati	(513) 771-2795	www.boeckercollege.edu	2-yr., Tech., & Comm.
Brown Mackie College-Cincinnati	Cincinnati	(513) 771-2424	www.brownmackie.edu	Priv. Bus. & Tech.
Christ Hospital School of Nursing	Cincinnati	(513) 585-2498	www.thechristcollege.org	2-yr., Tech., & Comm.
Cincinnati State Technical and Community College	Cincinnati	(513) 569-1500	www.cincinnatiastate.edu	2-yr., Tech., & Comm.
College of Mount St. Joseph	Cincinnati	(513) 244-4200	www.msjs.edu	4-yr. Coll. & Univ.
Good Samaritan College of Nursing & Health Science	Cincinnati	(513) 872-2631	www.gscollege.edu	2-yr., Tech., & Comm.
Great Oaks Inst. of Technology & Career Development	Cincinnati	(513) 771-8925	www.greatoaks.com	2-yr., Tech., & Comm.
Institute of Medical-Dental Technology	Cincinnati	(513) 851-8500	imdtcareers.com	Priv. Bus. & Tech.
Southwestern College	Cincinnati	(513) 874-0432	www.swcollege.net	2-yr., Tech., & Comm.
Southwestern College of Business	Cincinnati	(513) 421-3212	www.swcollege.net/c_cincinnati_oh.php	2-yr., Tech., & Comm.
University of Cincinnati-Main Campus	Cincinnati	(513) 556-6000	www.uc.edu	4-yr. Coll. & Univ.
Xavier University	Cincinnati	(513) 745-3000	www.xavier.edu	4-yr. Coll. & Univ.
Miami Valley Career Technology Center	Clayton	(800) 716-7161	www.mvctc.com	2-yr., Tech., & Comm.
Bryant and Stratton College-Cleveland	Cleveland	(216) 771-1700	www.bryantstratton.edu	4-yr. Coll. & Univ.
Case Western Reserve University	Cleveland	(216) 368-2000	www.case.edu	4-yr. Coll. & Univ.
Central School of Practical Nursing	Cleveland	(216) 391-8434	www.cspnohio.org	Priv. Bus. & Tech.
Cleveland Institute of Dental-Medical Assistants	Cleveland	(216) 241-2930	www.cidma.com	Priv. Bus. & Tech.
Cleveland State University	Cleveland	(216) 687-2000	www.csuohio.edu/	4-yr. Coll. & Univ.
Cuyahoga Community College District	Cleveland	(800) 954-8742	www.tri-c.edu	2-yr., Tech., & Comm.
David N Myers University	Cleveland	(216) 391-6937	www.myers.edu	4-yr. Coll. & Univ.
Huron School of Nursing	Cleveland	(216) 761-7996	www.cchseast.org/schools	2-yr., Tech., & Comm.
Notre Dame College	Cleveland	(216) 381-1680	www.notredamecollege.edu	4-yr. Coll. & Univ.
Remington College-Cleveland Campus	Cleveland	(216) 475-7520	www.remingtoncollege.edu	2-yr., Tech., & Comm.
Adult and Community Education-Hudson	Columbus	(614) 365-6000		Pub. Adult Sch.
American School of Technology	Columbus	(614) 436-4820	www.ast.edu	Priv. Bus. & Tech.
Bradford School	Columbus	(614) 416-6200	www.bradfordschoolcolumbus.edu	2-yr., Tech., & Comm.
Capital University	Columbus	(614) 236-6011	www.capital.edu	4-yr. Coll. & Univ.
Columbus State Community College	Columbus	(614) 287-5353	www.csc.edu	2-yr., Tech., & Comm.
Franklin University	Columbus	(614) 797-4700	www.franklin.edu	4-yr. Coll. & Univ.

Name	City	Phone	URL	Type
Mount Carmel College of Nursing	Columbus	(614) 234-5800	www.mccn.edu	4-yr. Coll. & Univ.
Ohio Institute of Health Careers	Columbus	(614) 891-5030	ohioinstituteofhealthcareers.com	Priv. Bus. & Tech.
Ohio State University-Main Campus	Columbus	(614) 292-6446	www.osu.edu	4-yr. Coll. & Univ.
Technology Education College	Columbus	(614) 456-4600	teceducation.com	2-yr., Tech., & Comm.
University of Phoenix-Columbus Ohio Campus	Columbus	(614) 443-0095	www.phoenix.edu	4-yr. Coll. & Univ.
Auburn Career Center	Concord Twp	(800) 544-9750	www.auburncc.org	Pub. Adult Sch.
National Institute of Technology	Cuyahoga Falls	(330) 923-9959	nationalinstituteoftechnology.edu	2-yr., Tech., & Comm.
ITT Technical Institute-Dayton	Dayton	(937) 264-7700	www.itt-tech.edu	2-yr., Tech., & Comm.
Ohio Institute of Photography and Technology	Dayton	(937) 294-6155	www.oipt.com	2-yr., Tech., & Comm.
Sinclair Community College	Dayton	(937) 512-3000	www.sinclair.edu	2-yr., Tech., & Comm.
Southwestern College	Dayton	(937) 224-0061	swcollege.net	2-yr., Tech., & Comm.
Wright State University-Main Campus	Dayton	(937) 775-3333	www.wright.edu	4-yr. Coll. & Univ.
Delaware Area Career Center	Delaware	(740) 548-0708	www.delawareareacc.org	Pub. Adult Sch.
Kent State University-East Liverpool Campus	East Liverpool	(330) 382-7400	www.eliv.kent.edu	2-yr., Tech., & Comm.
Ohio Valley College of Technology	East Liverpool	(330) 385-1070		2-yr., Tech., & Comm.
Lorain County Community College	Elyria	(440) 366-5222	www.lorainccc.edu	2-yr., Tech., & Comm.
Ohio Institute of Health Careers-Elyria	Elyria	(440) 934-3101	ohioinstituteofhealthcareers.com	2-yr., Tech., & Comm.
Cleveland Clinic Health System-Sch. of Diag. Imaging	Euclid	(216) 692-8665	www.cchseast.org/schools	2-yr., Tech., & Comm.
Brown Mackie College-Findlay	Findlay	(419) 423-2211	brownmackie.edu	Priv. Bus. & Tech.
Southwestern College	Franklin	(937) 746-6633	www.swcollege.net	2-yr., Tech., & Comm.
Terra State Community College	Fremont	(419) 334-8400	www.terra.edu	2-yr., Tech., & Comm.
Vanguard Career Center	Fremont	(419) 334-6901	www.vssc.k12.oh.us	Pub. Adult Sch.
Everest Institute-Gahanna	Gahanna	(614) 322-3414		2-yr., Tech., & Comm.
Gallipolis Career College	Gallipolis	(740) 446-4367	www.gallipoliscareercollege.com	2-yr., Tech., & Comm.
Portage Lakes Career Center	Green	(330) 896-8200	www.portagelakescareercenter.org	Pub. Adult Sch.
W Howard Nicol School of Practical Nursing	Green	(330) 896-8105	plcc.k12.oh.us	Pub. Adult Sch.
Eastland-Fairfield Career and Technical Schools	Groveport	(614) 836-4541		Pub. Adult Sch.
Butler Tech-D Russel Lee Career Center	Hamilton	(513) 645-8200	www.butlertech.org	Pub. Adult Sch.
ATS Institute of Technology	Highland Hts	(440) 449-1700	www.atsinstitute.com	2-yr., Tech., & Comm.
Southern State Community College	Hillsboro	(937) 393-3431	www.sccc.edu	2-yr., Tech., & Comm.
Hiram College	Hiram	(330) 569-3211	www.hiram.edu	4-yr. Coll. & Univ.
Bowling Green State University-Firelands	Huron	(419) 433-5560	www.firelands.bgsu.edu	2-yr., Tech., & Comm.
University of Phoenix-Cleveland Campus	Independence	(216) 447-8807	www.phoenix.edu	4-yr. Coll. & Univ.
Ohio University-Southern Campus	Ironton	(740) 533-4600	www.southern.ohiou.edu/	4-yr. Coll. & Univ.
Southeastern Business College	Jackson	(740) 286-1554	www.southeasternbusinesscollege.com	2-yr., Tech., & Comm.
Ashtabula County Joint Vocational School	Jefferson	(440) 576-6015	www.acjvs.org	Pub. Adult Sch.
Kent State University-Kent Campus	Kent	(330) 672-3000	www.kent.edu	4-yr. Coll. & Univ.
Northcoast Medical Training Academy	Kent	(330) 678-6600	northcoastmedicalacademy.com	Priv. Bus. & Tech.
Kettering College of Medical Arts	Kettering	(937) 395-8601	kcma.edu	4-yr. Coll. & Univ.
Lakeland Community College	Kirtland	(440) 525-7000	www.lakelandcc.edu	2-yr., Tech., & Comm.
Ohio University-Lancaster Campus	Lancaster	(740) 654-6711	www.lancaster.ohiou.edu	4-yr. Coll. & Univ.
Southeastern Business College	Lancaster	(740) 687-6126	www.southeasternbusinesscollege.com	2-yr., Tech., & Comm.
Warren County Career Center	Lebanon	(513) 932-8145	www.wccareercenter.com	Pub. Adult Sch.
Apollo Career Center	Lima	(419) 998-3000	www.apollocareercenter.com	Pub. Adult Sch.
James A Rhodes State College	Lima	(419) 221-1112	www.rhodesstate.edu	2-yr., Tech., & Comm.
University of Northwestern Ohio	Lima	(419) 227-3141	www.unoh.edu	4-yr. Coll. & Univ.
Columbiana County Vocational School	Lisbon	(330) 424-9561	www.ccctc.k12.oh.us/	Pub. Adult Sch.
Ohio Business College-Lorain	Lorain	(440) 277-0021	ohiobusinesscollege.edu	2-yr., Tech., & Comm.
Scioto County Joint Vocational School District	Lucasville	(740) 259-5522	www.scjvs.com	Pub. Adult Sch.
Cleveland Institute of Dental-Medical Assistants	Lyndhurst	(216) 241-2930	www.cidma.com	Priv. Bus. & Tech.
Madison Local Schools-Madison Adult Education	Mansfield	(419) 589-6363	www.mlisd.net/adulted	Pub. Adult Sch.
MedCentral College of Nursing	Mansfield	(419) 520-2600	www.medcentral.edu	4-yr. Coll. & Univ.
North Central State College	Mansfield	(419) 755-4800	www.ncstatecollege.edu	2-yr., Tech., & Comm.
Washington County Career Center	Marietta	(740) 373-6283	www.mycareerschool.com	Pub. Adult Sch.
Washington State Community College	Marietta	(740) 374-8716	www.wsccl.edu	2-yr., Tech., & Comm.
Marion Technical College	Marion	(740) 389-4636	www.mtc.edu	2-yr., Tech., & Comm.
Tri-Rivers Career Center	Marion	(740) 389-4681	tririvers.com	Pub. Adult Sch.
Medina County Career Center	Medina	(330) 725-8461	mccc-jvsd.org	Pub. Adult Sch.
Cleveland Institute of Dental-Medical Assistants	Mentor	(216) 241-2930	www.cidma.com	Priv. Bus. & Tech.
Polaris Career Center	Middleburg Hts	(440) 891-7600	www.polaris.edu	Pub. Adult Sch.
Sanford-Brown Institute	Middleburg Hts	(440) 202-3232	www.sbcleveland.com	2-yr., Tech., & Comm.
Ehove Career Center	Milan	(419) 499-4663	www.ehove.net	Pub. Adult Sch.
Knox County Career Center	Mount Vernon	(740) 393-2933	www.kccc.k12.oh.us	Pub. Adult Sch.
Hocking College	Nelsonville	(740) 753-3591	www.hocking.edu	2-yr., Tech., & Comm.

Name	City	Phone	URL	Type
Tri-County Adult Career Center	Nelsonville	(740) 753-5464	www.tricountyadultcareercenter.org	Pub. Adult Sch.
Southeastern Business College	New Boston	(740) 456-4124	www.southeasternbusinesscollege.com	2-yr., Tech., & Comm.
Buckeye Joint Vocational School	New Philadelphia	(330) 308-5720	www.buckeyecareercenter.org	Pub. Adult Sch.
Kent State University-Tuscarawas Campus	New Philadelphia	(330) 339-3391	www.tusc.kent.edu	2-yr., Tech., & Comm.
Career & Technology Education Centers of Licking Co.	Newark	(614) 364-2333	www.c-tec.edu	Pub. Adult Sch.
Central Ohio Technical College	Newark	(740) 366-1351	www.cotc.edu	2-yr., Tech., & Comm.
ETI Technical College	Niles	(330) 652-9919	eticollege.edu	2-yr., Tech., & Comm.
Brown Mackie College-North Canton	North Canton	(330) 494-1214	www.brownmackie.edu	Priv. Bus. & Tech.
Stark State College of Technology	North Canton	(330) 494-6170	www.starkstate.edu	2-yr., Tech., & Comm.
Walsh University	North Canton	(330) 499-7090	www.walsh.edu	4-yr. Coll. & Univ.
Remington College-Cleveland West Campus	North Olmsted	(440) 777-2560	www.remingtoncollege.edu	2-yr., Tech., & Comm.
ITT Technical Institute-Norwood	Norwood	(513) 531-8300	www.itt-tech.edu	2-yr., Tech., & Comm.
Lorain County Joint Vocational School District	Oberlin	(440) 774-1051	www.loraincounty.com/jvsadult	Pub. Adult Sch.
Oregon Career Center	Oregon	(419) 697-3450	www.oregonctc.org	Pub. Adult Sch.
Miami University-Oxford	Oxford	(513) 529-1809	www.muohio.edu	4-yr. Coll. & Univ.
Bryant and Stratton College-Parma	Parma	(216) 265-3151	www.bryantstratton.edu	4-yr. Coll. & Univ.
Ursuline College	Pepper Pike	(440) 449-4200	www.ursuline.edu	4-yr. Coll. & Univ.
Owens Community College	Perrysburg	(567) 661-7000	www.owens.edu	2-yr., Tech., & Comm.
Pike County Joint Vocational School District	Piketon	(740) 289-2282	adulted.pikectc.org	Pub. Adult Sch.
Edison State Community College	Piqua	(937) 778-8600	www.edisonohio.edu	2-yr., Tech., & Comm.
Upper Valley Joint Vocational School	Piqua	(937) 778-1980	www.uvjs.org	Pub. Adult Sch.
Shawnee State University	Portsmouth	(740) 354-3205	www.shawnee.edu	4-yr. Coll. & Univ.
Boecker College	Ravenna	(330) 297-7319	www.boeckercollege.edu	2-yr., Tech., & Comm.
Gallia Jackson Vinton Joint Vocational School District	Rio Grande	(740) 245-5334	bhcc.k12.oh.us/	Pub. Adult Sch.
University of Rio Grande	Rio Grande	(740) 245-7206	www.rio.edu	4-yr. Coll. & Univ.
Northeastern Ohio Univ. Col. of Medicine & Pharmacy	Rootstown	(330) 325-2511	www.neoucom.edu	4-yr. Coll. & Univ.
Belmont Technical College	Saint Clairsville	(740) 695-9500	www.btc.edu	2-yr., Tech., & Comm.
Hannah E Mullins School of Practical Nursing	Salem	(330) 332-8940	www.salem.k12.oh.us/mullins/mullins.html	Pub. Adult Sch.
Kent State University-Salem Campus	Salem	(330) 332-0361	www.salem.kent.edu	4-yr. Coll. & Univ.
Firelands Regional Medical Center School of Nursing	Sandusky	(419) 557-7111	www.firelands.com	2-yr., Tech., & Comm.
Ohio Business College	Sandusky	(419) 627-8345	www.ohiobusinesscollege.edu	2-yr., Tech., & Comm.
Sandusky Career Center	Sandusky	(419) 625-9294	www.sanduskycareercenter.org	Pub. Adult Sch.
Wayne County Schools Career Center	Smithville	(330) 669-7070	www.wccsc.org	Pub. Adult Sch.
Miami-Jacobs Career College-Springboro Branch	Springboro	(937) 746-1830		2-yr., Tech., & Comm.
Clark State Community College	Springfield	(937) 325-0691	www.clarkstate.edu	2-yr., Tech., & Comm.
Community Hospital School of Nursing	Springfield	(937) 328-8900	www.chsn.com	2-yr., Tech., & Comm.
Franciscan University of Steubenville	Steubenville	(740) 283-3771	www.franciscan.edu	4-yr. Coll. & Univ.
Jefferson Community College	Steubenville	(740) 264-5591	www.jcc.edu	2-yr., Tech., & Comm.
Trinity Health System School of Nursing	Steubenville	(740) 283-7467	www.trinityson.com	2-yr., Tech., & Comm.
Carnegie Inst. of Integrative Medicine & Massotherapy	Suffield	(330) 630-1132	carnegieinstitute.net	Priv. Bus. & Tech.
Lourdes College	Sylvania	(419) 885-3211	www.lourdes.edu	4-yr. Coll. & Univ.
Davis College	Toledo	(419) 473-2700	www.daviscollege.edu	2-yr., Tech., & Comm.
Mercy College of Northwest Ohio	Toledo	(419) 251-1313	www.mercycollege.edu	4-yr. Coll. & Univ.
Professional Skills Institute	Toledo	(419) 531-9610	www.proskills.com	2-yr., Tech., & Comm.
Stautzenberger College	Toledo	(419) 866-0261	www.sctoday.edu	2-yr., Tech., & Comm.
Toledo School of Practical Nursing	Toledo	(419) 671-8700	www.tps.org	Pub. Adult Sch.
University of Toledo-Health Science Campus	Toledo	(419) 383-4457	hsc.utoledo.edu	4-yr. Coll. & Univ.
University of Toledo-Main Campus	Toledo	(419) 530-4636	www.utoledo.edu/	4-yr. Coll. & Univ.
Miami-Jacobs Career College - Troy	Troy	(937) 332-8580	www.miamijacobs.edu	2-yr., Tech., & Comm.
Urbana University	Urbana	(937) 484-1301	www.urbana.edu	4-yr. Coll. & Univ.
Vantage Career Center	Van Wert	(419) 238-5411		Pub. Adult Sch.
TCTC Adult Training Center	Warren	(330) 847-0503	www.tctcadulttraining.org	Pub. Adult Sch.
Trumbull Business College	Warren	(330) 369-3200	www.tbc-trumbullbusiness.com	2-yr., Tech., & Comm.
Boecker College - Columbus	Westerville	(614) 882-2551	www.boeckercollege.edu	2-yr., Tech., & Comm.
Hondros College	Westerville	(888) 466-3767	www.hondros.edu	2-yr., Tech., & Comm.
Otterbein College	Westerville	(614) 890-3000	www.otterbein.edu	4-yr. Coll. & Univ.
Wilberforce University	Wilberforce	(937) 376-2911	www.wilberforce.edu	4-yr. Coll. & Univ.
Bryant and Stratton College-Willoughby Hills	Willoughby Hills	(440) 944-6800	www.bryantstratton.edu	2-yr., Tech., & Comm.
Hoffin Career and Technical Center	Youngstown	(330) 744-8710	www.hoffincareer.com	Pub. Adult Sch.
Youngstown State University	Youngstown	(877) 468-6978	www.ysu.edu	4-yr. Coll. & Univ.

Name	City	Phone	URL	Type
Adult Center for Education	Zanesville	(740) 455-3111	www.mid-east.k12.oh.us	Pub. Adult Sch.
Ohio University-Zanesville Campus	Zanesville	(740) 453-0762	www.zanesville.ohiou.edu/	4-yr. Coll. & Univ.
Zane State College	Zanesville	(740) 454-2501	www.zanestate.edu	2-yr., Tech., & Comm.

This table includes institutions with active programs in Ohio.

Also visit <http://nces.ed.gov/collegenavigator/> to find institutions near you.

**Office of Workforce Development
P.O. Box 1618
Columbus, OH 43216-1618**

**Bureau of Labor Market Information
Business Principles for Workforce Development**

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Ted Strickland, Governor
State of Ohio

Douglas E. Lumpkin, Director
Ohio Department of Job and Family Services

Office of Workforce Development
Bureau of Labor Market Information
(7/2009)

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