

Biomedical & Life Sciences

Industry Cluster Profile | Metropolitan Chicago Region

Overview

This report¹ provides key data for the Biomedical and Life Sciences cluster which is significant to the metropolitan Chicago region's economy.² The Biomedical and Life Sciences cluster represents similar industries that are closely connected through supply chains and shared labor pools within the region and is primarily comprised of organizations whose services are in some way related to the medical field which include producing medical instruments and equipment, conducting research and development activities, and addressing the healthcare needs of the region's residents. A detailed listing of the industries included in the cluster, as defined at the 6-digit NAICS level, are provided as an addendum to this report.

This report was developed through a partnership between The Workforce Boards of Metropolitan Chicago (WBMC) and the Metro Economic Growth Alliance (MEGA) of Chicago. The WBMC is a regional consortium of six Workforce Boards that have collaborated for the past nine years on initiatives that address workforce and economic development issues. The Workforce Boards oversee development of a workforce system that provides individuals with education and training required for career opportunities in high demand occupations and provides employers with access to a skilled, competitive workforce. The MEGA is a partnership of lead economic organizations from throughout the metropolitan Chicago region that are committed to growing the regional economy through coordinated, effective business development. The metropolitan Chicago region includes the following counties: Cook, DeKalb, DuPage, Grundy, Kane, Kankakee, Kendall, Lake, McHenry, and Will.

Significance of Cluster to Region

The Biomedical and Life Sciences industry cluster encompasses 19,603 establishments and employs 512,805 (2012) people in the metropolitan Chicago region. During the period of 2011 to 2021 this industry cluster's jobs are expected to grow by 18.1% as compared to national growth for this cluster of 22.5%. The region's average annual wages/salaries for these jobs are \$56,400 for total regional wages/salaries in excess of \$28.9 billion. With a 1.03 location quotient, this cluster has a higher than average concentration of economic activity in the region when compared to the nation's economic activity in this cluster overall.

A location quotient (LQ) measures how concentrated an industry cluster is in a given region as compared to the nation. An LQ greater than 1.0 means the cluster is an export industry. Industries with a high LQ are typically, but not always, export-oriented industries bringing money into the region rather than simply circulating money that is already in the region. An LQ of <1.0 means it typically has to import from outside to satisfy local demand.



¹ Industry cluster reports produced by the Fond du Lac County Economic Development Corporation served as a model for the reports developed by The Workforce Boards of Metropolitan Chicago (<http://www.fcfdc.com/targetedindustries.html>), The Workforce Boards used these reports to guide both content and format for presenting information relative to the metropolitan Chicago region.

² The source of data utilized for this report was the Economic Modeling Specialists, Inc.'s (EMSI) 2012 2nd quarter complete employment data set. EMSI estimates are based on a methodology that combines employment information from the Illinois Department of Employment Security (IDES) with self-employment numbers and EMSI-derived estimates for unsuppressed data. More information related to EMSI data sources and methodologies for compiling projections can be found at http://www.workforceboardsmetrochicago.org/Portals/0/Uploads/Data_Sources_and_Calculations.pdf.



Cluster Definition

“An industry cluster is a group of interdependent firms and related institutions that draw a productive advantage from their geographic concentration and connections. Firms in a cluster share common resources and technologies, rely on a similar labor pool and institutions, and are linked through strong relationships and transactions in addition to co-location.”³

Based on employment and economic activity generated by each industry, the core strength of the Biomedical and Life Sciences industry cluster comes from general medical and surgical hospitals, office of physicians, nursing care facilities, pharmaceutical preparation manufacturing, and offices of dentists. These core industries not only have high employment numbers, representing 60.3% of the total cluster employment, but also drive employment and inputs from other industries supporting them.

Other significant industries in this cluster, based on both employment and in-region economic activity, include research and development in the physical, engineering, and life sciences; home healthcare services; office of physical, occupational, and speech therapists and audiologists; continuing care retirement communities; and medical, dental, and hospital equipment and supplies merchant wholesales.



Key Strengths

- Average annual wages/salaries of \$56,400 (2012) for this industry cluster are higher than the national average of \$52,618 and the state average of \$52,856.
- The projected growth rate for this industry cluster through 2021 is 18.1%.
- This cluster represents 9.9% of the region's total workforce.

Value Chain

An essential component for an industry cluster is the local supply chain. Although not all inputs (goods or services) that an industry cluster needs can be produced in the local economy, it is desirable to meet as many of the cluster's needs locally as possible. Total requirements, meaning how much this cluster purchases from in- and out-of-region industries, are \$28.2 billion. Of these purchases, \$19.5 billion are in-region.

The economic activity associated with the Biomedical and Life Sciences industry cluster supports 3,179,661 jobs. 512,805 of those jobs are in cluster industries and in-region. With a job multiplier of 5.37, the cluster generates 2,753,762 jobs in the larger economy.

The job multiplier provides some indication of the total number of jobs (direct and indirect) supported by economic activity of the cluster. To determine the cluster's impact on jobs, total jobs in the cluster are multiplied by the job multiplier. Direct jobs are in industries comprising the cluster within a specified area; indirect jobs are in industries outside of the cluster and in the larger economy.

³ Metropolitan Chicago's Freight Cluster: A Drill-Down Report on Infrastructure, Innovation, and Workforce, Chicago Metropolitan Agency for Planning, Summary Report, June 2012, page 8.



Core and Support Industries

Within each cluster, there are certain industries that contribute more to the economy of the region than others. These industries not only have high employment numbers, but also impact employment and inputs from other industries supporting them. The chart below provides relevant information for the core and support industries in the Biomedical and Life Sciences industry cluster.



BIOMEDICAL AND LIFE SCIENCES CLUSTER

NAICS Code	Description	2011 Jobs	2021 Jobs	Change	% Change	2012 Wages/ Salaries	2011 Establishments
622110	General Medical and Surgical Hospitals (Private)	151,678	167,158	15,480	10%	\$55,798	133
621111	Offices of Physicians (except Mental Health Specialists)	63,467	77,161	13,694	22%	\$84,582	5,749
623110	Nursing Care Facilities	46,616	58,635	12,019	26%	\$29,085	356
621610	Home Health Care Services	45,072	60,449	15,377	34%	\$26,932	865
621210	Offices of Dentists	28,061	33,395	5,334	19%	\$51,564	4,485
325412	Pharmaceutical Preparation Manufacturing	16,073	16,653	580	4%	\$122,611	43
541712	Research and Development in the Physical, Engineering, and Life Sciences except Biotechnology	15,877	13,169	(2,708)	(17%)	\$115,119	180
621340	Offices of Physical, Occupational and Speech Therapists, and Audiologists	14,974	23,153	8,179	55%	\$46,690	920
623311	Continuing Care Retirement Communities	12,034	17,251	5,217	43%	\$26,019	103
423450	Medical, Dental, and Hospital Equipment and Suppliers Merchant Wholesalers	8,633	9,653	1,020	12%	\$78,333	543



Occupational Opportunities

The Biomedical and Life Sciences industry cluster employs 512,805 people in the metropolitan Chicago region. During the period of 2011 to 2021, this industry cluster is expected to grow 91,749 new jobs. Additionally, there will be job openings that represent employment opportunities. Job openings occur when individuals change jobs, retire, or leave the workforce.

The table provided below identifies the ten occupations projected to experience the largest job growth through 2021. In assessing the employment opportunities these occupations offer, it is anticipated that there will be 51,704 new jobs and an additional 30,609 positions available through job openings.

With the exception of only one of the top ten high growth occupations in the Biomedical and Life Sciences cluster, this cluster provides career opportunities in “middle skill” jobs requiring shorter term training/education. Median hourly earnings for high growth occupations range from a low of \$9.40 to a high of \$38.27.

SOC Code	Occupation	Jobs in Cluster 2011	Projected Jobs in Cluster 2021	New Jobs in Cluster 2011-2021	% Change	Estimated Openings in Cluster ⁴ (New & Replacement) 2011-2021	% of the Total Jobs in Cluster (2012)	Median Hourly Earnings	Education Level
29-1111	Registered Nurses	68,792	82,555	13,763	20%	13,763	13.6%	\$32.32	Associate's degree
31-1011	Home Health Aides	26,008	36,690	10,682	41%	10,682	5.2%	\$9.40	Short-term on-the-job training
31-1012	Nursing Aides, Orderlies, & Attendants	32,604	40,076	7,472	23%	7,472	6.4%	\$11.53	Postsecondary vocational award
39-9021	Personal & Home Care Aides	11,477	15,771	4,294	37%	4,294	2.3%	\$9.64	Short-term on-the-job training
31-9092	Medical Assistants	10,810	14,160	3,350	31%	3,350	2.2%	\$14.62	Moderate-term on-the-job training
29-2061	Licensed Practical & Licensed Vocational Nurses	11,873	14,892	3,019	25%	3,019	2.3%	\$21.16	Postsecondary vocational award
31-9091	Dental Assistants	8,940	11,480	2,540	28%	2,540	1.8%	\$15.68	Moderate-term on-the-job training
43-6013	Medical Secretaries	8,872	11,300	2,428	27%	2,428	1.8%	\$16.12	Moderate-term on-the-job training
29-1123	Physical Therapists	6,301	8,693	2,392	38%	2,392	1.3%	\$38.27	Master's degree
43-9061	Office Clerks, General	8,708	10,472	1,764	20%	1,764	1.7%	\$13.71	Short-term on-the-job training

⁴ Estimated openings for occupations in cluster were calculated by determining the proportion of regional jobs within the cluster and applying that rate to the projected regional openings for occupation.

Market Opportunities

Uncovering Gaps

A gap analysis shows how much an entire industry cluster purchases from various other industries (its “requirements”), along with how much is satisfied by those industries inside and outside the region. A gap occurs when industries that produce inputs (goods or services) needed by the cluster’s core industries are not available locally or are underdeveloped. Although not all inputs that an industry cluster needs can be produced in the local economy, identifying and closing gaps benefits the region and the competitiveness of the cluster overall. Development or expansion of businesses that can fulfill the cluster’s needs for goods and services will create jobs and keep more money in the region.

Gap=Market Opportunity

Total in-region requirements, meaning how much the Biomedical and Life Sciences cluster purchases in-region are \$19.5 billion. This cluster satisfies 69% of its requirements in-region.

Further analysis indicates that the cluster purchases \$8.7 billion outside of the region. Based on a review of these out-of-region purchases, potential market opportunities associated with the Biomedical and Life Sciences cluster have been identified and are reflected on the chart below. Gaps identified, not all inclusive, provide opportunities in the specific cluster but also across all industries in the region. This gap provides an opportunity to assist current employers in expanding or attracting new employers to fill the unmet need.

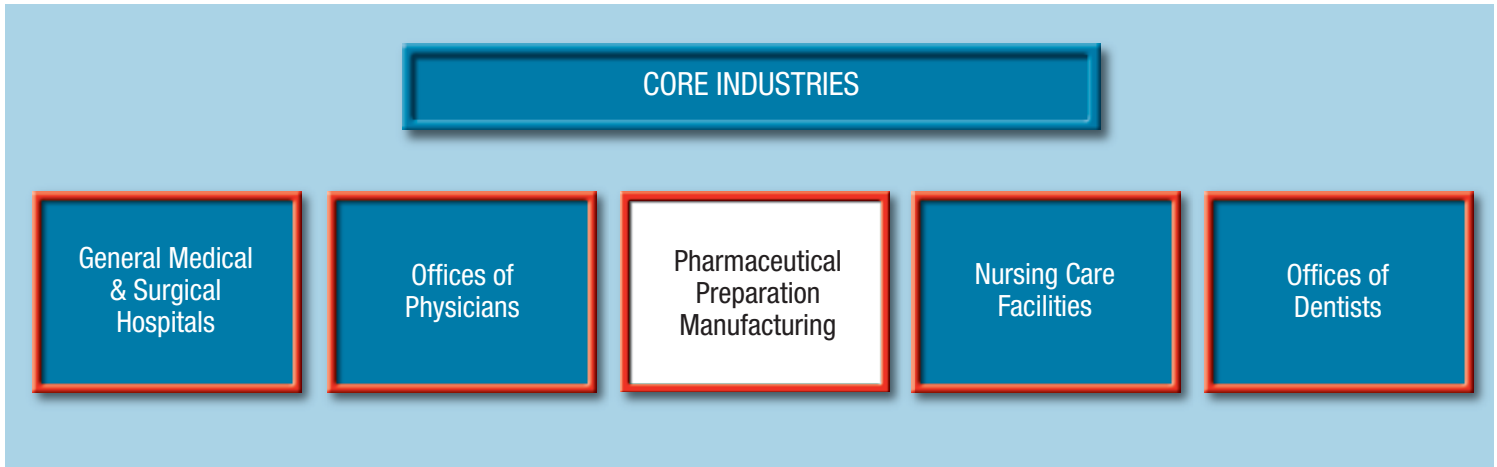
MARKET OPPORTUNITIES

Industry/Gap	Unmet Need in Cluster	2012 Annual Average Wage/Salary	# of Establishments (2011) # of Employees in Cluster (2011) ⁵
Medicinal and Botanical Manufacturing	\$1,120,898,690	\$77,893	11 establishments 205 employees
Biological Product (except Diagnostic) Manufacturing	\$320,690,812	\$74,422	7 establishments 826 employees
In-Vitro Diagnostic Substance Manufacturing	\$271,194,241	\$65,084	5 establishments 166 employees
Pharmaceutical Preparation Manufacturing	\$241,706,606	\$122,611	43 establishments 16,073 employees
Surgical Appliance and Supplies Manufacturing	\$155,741,837	\$69,839	80 establishments 2,317 employees
Surgical and Medical Instrument Manufacturing	\$78,525,388	\$111,086	65 establishments 5,272 employees
Dental Laboratories	\$78,700,019	\$34,179	250 establishments 1,304 employees
Electromedical and Electrotherapeutic Apparatus Manufacturing	\$45,725,493	\$88,336	31 establishments 1,115 employees

⁵ Number of establishments and employees are specific to cluster unless industry/gap is not in the cluster, in which case number of industry establishments and employees in region.

INDUSTRY CLUSTER MAP

The following cluster map illustrates the primary or core industries as well as the ancillary industries of this cluster. Industries represented in rectangles with no shading/fill reveal substantial unmet needs or gaps in the region. Boxes in red signify jobs within direct/defined cluster.



Conclusion

This report provides key data about the Biomedical and Life Sciences industry cluster, one of the primary clusters in the metropolitan Chicago region's economy. The workforce development community can use this report to support decisions related to the investment of resources in addressing future workforce needs in the region. Entities responsible for economic development in the region can utilize the industry level data and market opportunity analysis to inform their efforts in working with employers interested in locating to or expanding in the region.

For additional data related to the Biomedical and Life Sciences cluster or assistance with other labor market information needs, visit www.workforceboardsmetrochicago.com for information on contacting the Workforce Investment Board in your area.

BIOMEDICAL AND LIFE SCIENCES CLUSTER⁶

NAICS Codes	Description
325411	Medicinal and Botanical Manufacturing
325412	Pharmaceutical Preparation Manufacturing
325413	In-Vitro Diagnostic Substance Manufacturing
325414	Biological Product (except Diagnostic) Manufacturing
333314	Optical Instrument and Lens Manufacturing
334510	Electromedical and Electrotherapeutic Apparatus Manufacturing
334516	Analytical Laboratory Instrument Manufacturing
334517	Irradiation Apparatus Manufacturing
339112	Surgical and Medical Instrument Manufacturing
339113	Surgical Appliance and Supplies Manufacturing
339114	Dental Equipment and Supplies Manufacturing
339115	Ophthalmic Goods Manufacturing
339116	Dental Laboratories
423450	Medical, Dental, and Hospital Equipment and Supplies Merchant Wholesalers
423460	Ophthalmic Goods Merchant Wholesalers
541711	Research and Development in Biotechnology
541712	Research and Development in the Physical, Engineering, and Life Sciences (except Biotechnology)
541720	Research and Development in the Social Sciences and Humanities
562211	Hazardous Waste Treatment and Disposal
621111	Offices of Physicians (except Mental Health Specialists)
621112	Offices of Physicians, Mental Health Specialists
621210	Offices of Dentists
621310	Offices of Chiropractors
621320	Offices of Optometrists
621330	Offices of Mental Health Practitioners (except Physicians)
621340	Offices of Physical, Occupational and Speech Therapists, and Audiologists

⁶The Biomedical/Biotechnical (Life Sciences) cluster, as defined by the Purdue Center for Regional Development, the Indiana Business Research Center at Indiana University's Kelly School of Business and the Strategic Development Group has been customized for the metropolitan Chicago region. Specifically, NAICS codes 446110, 446120, 446130, 446191, and 446199 were eliminated and NAICS codes 621111, 621112, 621210, 621310, 621320, 621330, 621340, 621391, and 621399 were added.

BIOMEDICAL AND LIFE SCIENCES CLUSTER

NAICS Codes	Description
621391	Offices of Podiatrists
621399	Offices of All Other Miscellaneous Health Practitioners
621410	Family Planning Centers
621420	Outpatient Mental Health and Substance Abuse Centers
621491	HMO Medical Centers
621492	Kidney Dialysis Centers
621493	Freestanding Ambulatory Surgical and Emergency Centers
621498	All Other Outpatient Care Centers
621511	Medical Laboratories
621512	Diagnostic Imaging Centers
621610	Home Health Care Services
621910	Ambulance Services
621991	Blood and Organ Banks
621999	All Other Miscellaneous Ambulatory Health Care Services
622110	General Medical and Surgical Hospitals (Private)
622210	Psychiatric and Substance Abuse Hospitals (Private)
622310	Specialty (except Psychiatric and Substance Abuse) Hospitals (Private)
623110	Nursing Care Facilities
623210	Residential Mental Retardation Facilities
623220	Residential Mental Health and Substance Abuse Facilities
623311	Continuing Care Retirement Communities
623312	Homes for the Elderly
623990	Other Residential Care Facilities

NORTH AMERICAN INDUSTRY CLASSIFICATION SYSTEM (NAICS) DEFINITIONS⁷**CORE INDUSTRIES****325412 Pharmaceutical Preparation Manufacturing**

This U.S. industry comprises establishments primarily engaged in manufacturing in-vivo diagnostic substances and pharmaceutical preparations (except biological) intended for internal and external consumption in dose forms, such as ampoules, tablets, capsules, vials, ointments, powders, solutions, and suspensions.

621111 Offices of Physicians (except Mental Health Specialists)

This U.S. industry comprises establishments of health practitioners having the degree of M.D. (Doctor of Medicine) or D.O. (Doctor of Osteopathy) primarily engaged in the independent practice of general or specialized medicine (except psychiatry or psychoanalysis) or surgery. These practitioners operate private or group practices in their own offices (e.g., centers, clinics) or in the facilities of others, such as hospitals or HMO medical centers.

621210 Offices of Dentists

This industry comprises establishments of health practitioners having the degree of D.M.D. (Doctor of Dental Medicine), D.D.S. (Doctor of Dental Surgery), or D.D.Sc. (Doctor of Dental Science) primarily engaged in the independent practice of general or specialized dentistry or dental surgery. These practitioners operate private or group practices in their own offices (e.g., centers, clinics) or in the facilities of others, such as hospitals or HMO medical centers. They can provide either comprehensive preventive, cosmetic, or emergency care, or specialize in a single field of dentistry.

622110 General Medical and Surgical Hospitals

This industry comprises establishments known and licensed as general medical and surgical hospitals primarily engaged in providing diagnostic and medical treatment (both surgical and nonsurgical) to inpatients with any of a wide variety of medical conditions. These establishments maintain inpatient beds and provide patients with food services that meet their nutritional requirements. These hospitals have an organized staff of physicians and other medical staff to provide patient care services. These establishments usually provide other services, such as outpatient services, anatomical pathology services, diagnostic X-ray services, clinical laboratory services, operating room services for a variety of procedures, and pharmacy services.

623110 Nursing Care Facilities

This industry comprises establishments primarily engaged in providing inpatient nursing and rehabilitative services. The care is generally provided for an extended period of time to individuals requiring nursing care. These establishments have a permanent core staff of registered or licensed practical nurses who, along with other staff, provide nursing and continuous personal care services.

ANCILLARY AND SPECIALTY INDUSTRIES**325411 Medicinal and Botanical Manufacturing**

This U.S. industry comprises establishments primarily engaged in (1) manufacturing uncompounded medicinal chemicals and their derivatives (i.e., generally for use by pharmaceutical preparation manufacturers) and/or (2) grading, grinding, and milling uncompounded botanicals.

325413 In-Vitro Diagnostic Substance Manufacturing

This U.S. industry comprises establishments primarily engaged in manufacturing in-vitro (i.e., not taken internally) diagnostic substances, such as chemical, biological, or radioactive substances. The substances are used for diagnostic tests that are performed in test tubes, petri dishes, machines, and other diagnostic test-type devices.

325414 Biological Product (except Diagnostic) Manufacturing

This U.S. industry comprises establishments primarily engaged in manufacturing vaccines, toxoids, blood fractions, and culture media of plant or animal origin (except diagnostic).

⁷2007 NAICS definitions found at <http://www.census.gov/eos/www/naics/>.

NORTH AMERICAN INDUSTRY CLASSIFICATION SYSTEM (NAICS) DEFINITIONS**334510 Electromedical and Electrotherapeutic Apparatus Manufacturing**

This U.S. industry comprises establishments primarily engaged in manufacturing electromedical and electrotherapeutic apparatus, such as magnetic resonance imaging equipment, medical ultrasound equipment, pacemakers, hearing aids, electrocardiographs, and electromedical endoscopic equipment.

339112 Surgical and Medical Instrument Manufacturing

This U.S. industry comprises establishments primarily engaged in manufacturing medical, surgical, ophthalmic, and veterinary instruments and apparatus (except electrotherapeutic, electromedical and irradiation apparatus). Examples of products made by these establishments are syringes, hypodermic needles, anesthesia apparatus, blood transfusion equipment, catheters, surgical clamps, and medical thermometers.

339113 Surgical Appliance and Supplies Manufacturing

This U.S. industry comprises establishments primarily engaged in manufacturing surgical appliances and supplies. Examples of products made by these establishments are orthopedic devices, prosthetic appliances, surgical dressings, crutches, surgical sutures, personal industrial safety devices (except protective eyewear), hospital beds, and operating room tables.

339116 Dental Laboratories

This U.S. industry comprises establishments primarily engaged in manufacturing dentures, crowns, bridges, and orthodontic appliances customized for individual application.

423450 Medical, Dental, and Hospital Equipment and Supplies Merchant Wholesalers

This industry comprises establishments primarily engaged in the merchant wholesale distribution of professional medical equipment, instruments, and supplies (except ophthalmic equipment and instruments and goods used by ophthalmologists, optometrists, and opticians).

541712 Research and Development in the Physical, Engineering, and Life Sciences

This U.S. industry comprises establishments primarily engaged in conducting research and experimental development (except biotechnology research and experimental development) in the physical, engineering, and life sciences, such as agriculture, electronics, environmental, biology, botany, computers, chemistry, food, fisheries, forests, geology, health, mathematics, medicine, oceanography, pharmacy, physics, veterinary and other allied subjects.

621340 Offices of Physical, Occupational and Speech Therapists, and Audiologists

This industry comprises establishments of independent health practitioners primarily engaged in one of the following: (1) providing physical therapy services to patients who have impairments, functional limitations, disabilities, or changes in physical functions and health status resulting from injury, disease or other causes, or who require prevention, wellness or fitness services; (2) planning and administering educational, recreational, and social activities designed to help patients or individuals with disabilities, regain physical or mental functioning or to adapt to their disabilities; and (3) diagnosing and treating speech, language, or hearing problems. These practitioners operate private or group practices in their own offices (e.g., centers, clinics) or in the facilities of others, such as hospitals or HMO medical centers.

621610 Home Health Care Services

This industry comprises establishments primarily engaged in providing skilled nursing services in the home, along with a range of the following: personal care services; homemaker and companion services; physical therapy; medical social services; medications; medical equipment and supplies; counseling; 24-hour home care; occupation and vocational therapy; dietary and nutritional services; speech therapy; audiology; and high-tech care, such as intravenous therapy.

623311 Continuing Care Retirement Communities

This U.S. industry comprises establishments primarily engaged in providing a range of residential and personal care services with on-site nursing care facilities for (1) the elderly and other persons who are unable to fully care for themselves and/or (2) the elderly and other persons who do not desire to live independently. Individuals live in a variety of residential settings with meals, housekeeping, social, leisure, and other services available to assist residents in daily living. Assisted-living facilities with on-site nursing care facilities are included in this industry.