



ESSENTIAL:

THE IMPACT OF THE HEALTHCARE AND LIFE SCIENCES SECTOR IN INDIANA'S WABASH HEARTLAND REGION

April 2022



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Prologue

In Indiana, we see the benefits of having a strong healthcare and life sciences sector every day. It accounts for one in every ten jobs in the state, provides an annual economic impact of \$150 billion, and is present in the substantial assets spanning the corporate, university and philanthropic sectors. This sector did not grow up overnight and is not limited to the central part of the state where you will find national and global leaders in pharmaceuticals (Eli Lilly and Co), diagnostics (Roche Diagnostics), and agbioscience (Elanco and Corteva). Travel to the northern part of the state and you will find Warsaw, the Orthopedics Capital of the World® - a cluster representing 45% of the global orthopedic market for total joint replacements that traces its beginnings back to Revra DePuy in 1895, J. O. Zimmer in 1927 and Dane Miller's Biomet in 1977. To the south, entrepreneurial companies have turned into worldwide leaders in life sciences including Hill-Rom in Batesville, IN growing in 1929 when Bill Hillenbrand had the idea to bring the home into the hospital; the Cook Group in Bloomington, IN founded by Bill Cook in 1963 initially focused on tools for minimally invasive medical devices; and Mead Johnson which has operated a manufacturing plant for Enfamil infant nutrition formula in Evansville, IN for more than 100 years. Throughout the state, our hospital systems ensure access to high-quality healthcare while also contributing to overall economic vitality.

Healthcare and life sciences start with research, but do not end there. Hoosiers working in healthcare and life sciences may be found providing care in hospitals and your doctor's office; working in manufacturing facilities making orthopedic implants, stents, or producing life-saving medicines, such as insulin and cancer treatments; providing general business support as office workers in accounting, administration, or marketing; at construction sites building or refurbishing facilities; or in academic or corporate laboratories. From investments in facilities, equipment, research, talent, and connections through BioCrossroads, Indiana's healthcare and life sciences industry has a substantial collective impact on not just the economic vitality of Indiana, but also the health of its citizens.

In this series of reports, TEconomy Partners, LLC. looks at different parts of our state and details how these investments drive our economy and how they help provide benefits to Indiana's other sectors including manufacturing, technology, and retail. We look at the State of Indiana as well as a more focused look at key economic regions, including Northeast Indiana, South Bend-Elkhart, the Wabash Heartland, Metro Indianapolis, the Indiana Uplands, and Southwest Indiana.

This is an important and timely report. And certainly, it is appropriate here to thank those whose efforts have made it possible: Lilly Endowment Inc. and the Richard M. Fairbanks Foundation, through generous grants to the CICIP Foundation on behalf of BioCrossroads, provided the essential funding; the many members of the healthcare and life sciences community, including manufacturing, transportation, and logistics; leaders at our major research universities and government agencies; our consultants at TEconomy Partners, who know both Indiana and the innovation sector well and drew on their substantial expertise to provide a helpful and comprehensive study; as well as our professional teams at BioCrossroads and CICIP.

It is said that "What Indiana Makes, Makes Indiana." Hoosiers working in healthcare and life sciences are discovering, making, and delivering treatments and cures to improve the quality of life for those of us in Indiana - and people all over the world - all while driving Indiana's economy. Please join us on this journey to learn more about how the life sciences and healthcare sector make our communities.

Sincerely,



Patricia A. Martin
President and CEO, BioCrossroads
April 2022



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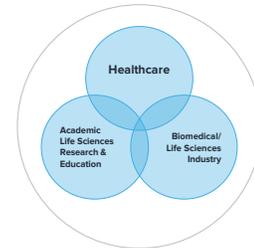
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Introduction

This regional profile presents quantitative analysis of the current position, recent performance, economic impacts, and overall importance of the healthcare and life sciences sector in Wabash Heartland region as an economic driver. The assessment spans the industry’s three core elements or pillars of healthcare, industrial life sciences, and academic life sciences R&D (Figure 1).

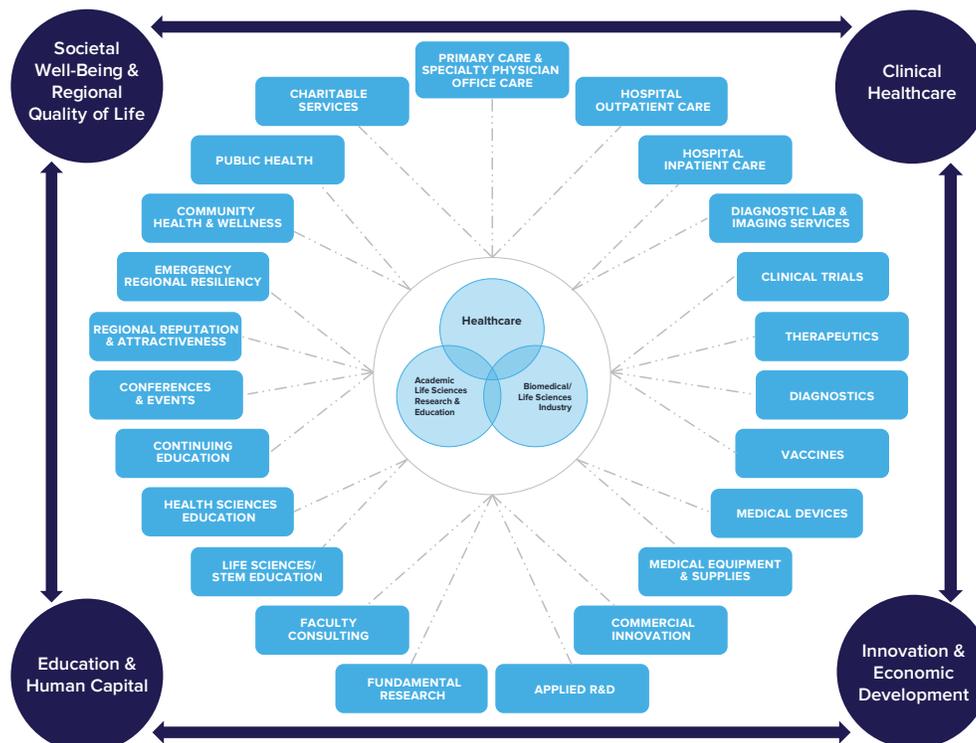
► **Figure 1: Three Core Elements of the Healthcare and Life Sciences Sector**



In addition to the economic impacts presented in this regional profile, it is critical to further consider the broader and truly extensive functional impacts—those that cannot easily or readily be measured in dollars and cents or jobs—generated by the healthcare and life sciences sector presented in Figure 2. In pursuing their missions to advance health and well-being, healthcare and life sciences organizations and the sector writ large, undertake a wide range of activities and thus generate a broad variety of functional impacts. Ultimately, they can be seen to converge around four primary functional benefit domains:

- **Provision of Clinical Healthcare** – Working to sustain the physical health of populations served.
- **Innovation and Economic Development** – Producing products and services needed and valued by society which in turn generate employment, economic output, exports, and public sector revenues.
- **Education and Human Capital Development** – Advancing basic and applied knowledge and building the know-how and skills necessary within the health and life sciences workforce.
- **Societal Well-being and Quality-of-life** – Securing public health and building equitable, diverse, and resilient communities with robust livability, quality-of-place, and quality-of-life.

► **Figure 2: The Functional Impacts of the Healthcare and Life Sciences Sector**



Source: TEconomy Partners, LLC

Regional Healthcare and Life Sciences Industry

SIZE AND STRUCTURE OF THE INDUSTRY

Healthcare and life sciences firms combine to employ more than 15,000 in the 10-County Wabash Heartland region. The industrial life sciences segment accounts for just over 1,900 of these jobs, with the majority of employment within the medical device manufacturing and biomedical research and development subsectors. The region is home to major employers like Evonik and Integra LifeSciences. These large employers and their smaller counterparts combine to make up a concentration of jobs in the region that just above (4%) the national average for life sciences (location quotient of 1.04). The larger healthcare segment employs more than 13,000 in health systems that include Franciscan Health and St. Clare Medical Center.

Healthcare and life sciences act as major drivers of the regional economy and high-quality jobs. The industry has seen rapid 8.8% job growth since 2015, well outpacing overall private sector growth of 1.2%. Average wages in the industry exceed \$59,000 annually, well above those for their private sector counterparts.

► **Table 1:** Wabash Heartland Region Healthcare and Life Sciences Industry Employment by Subsector, 2020

Healthcare and Life Sciences Subsectors	Wabash Heartland Regional Employment
Life Sciences	1,910
Biomedical Manufacturing	1,034
<i>Pharmaceutical Manufacturing</i>	23
<i>Medical Instruments, Devices, and Supplies Manufacturing</i>	1,011
Biomedical Distribution	70
Biomedical Research & Development (Industry, NEC)	806
Healthcare	13,373
Hospitals	7,654
Physician and Other Health Practitioner Offices	3,590
Medical Testing	145
Ambulatory Healthcare Services	981
Outpatient Care Centers	1,002
Total	15,282

Source: TEconomy analysis of 2020 U.S. Bureau of Labor Statistics QCEW Data enhanced by Emsi.

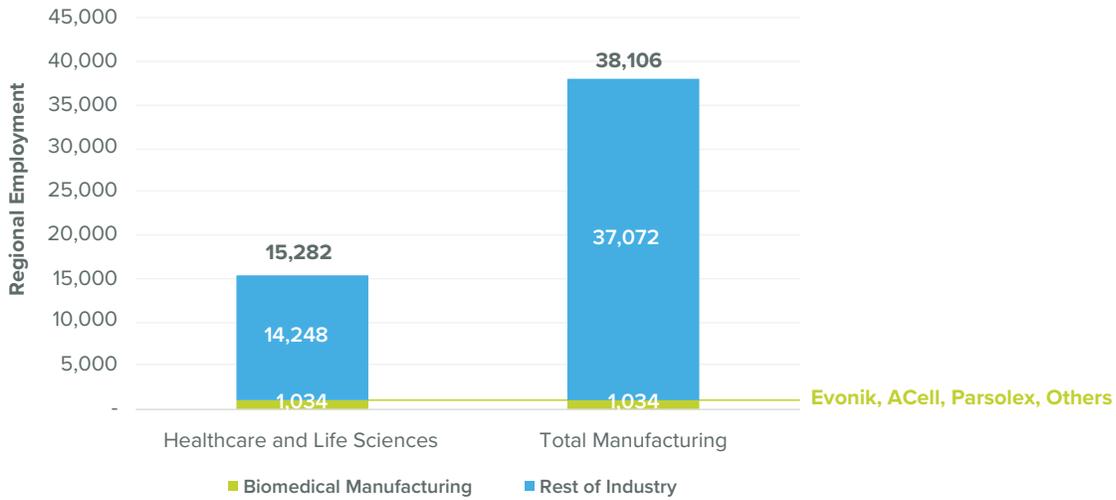
► **Table 2:** Wabash Heartland Region Healthcare and Life Sciences Industry, 2020

LS/HC Major Sector	Establishments, 2020	Employment, 2020	Location Quotient, 2020	Employment Change, 2015-2020	Average Wages, 2020
Healthcare	436	13,373	0.82	10.1%	\$57,407
Life Sciences	90	1,910	1.04	0.9%	\$76,452
HC/LS Total	526	15,282	0.85	8.8%	\$59,787
Total Regional Employment	8,084	203,422	1.00	1.2%	\$41,684

Source: TEconomy analysis of 2020 U.S. Bureau of Labor Statistics QCEW Data enhanced by Emsi.

In a production-intensive region and state, the 1,034 industrial life sciences manufacturing jobs in the Wabash Heartland region account for 3% of all regional manufacturing jobs (Figure 3).

► **Figure 3: Wabash Heartland Region Life Sciences Manufacturing Employment Compared to Total Manufacturing, 2020**



Source: TEconomy analysis of 2020 U.S. Bureau of Labor Statistics QCEW Data enhanced by Emsi.

In the 2020 national TEconomy/BIO state life sciences report, the Lafayette-West Lafayette metropolitan area was recognized as one of just seven U.S. metropolitan areas with a specialized concentration in four of the five major industry subsectors (including in the agricultural biosciences, not covered in this report), demonstrating its uniquely varied strengths.

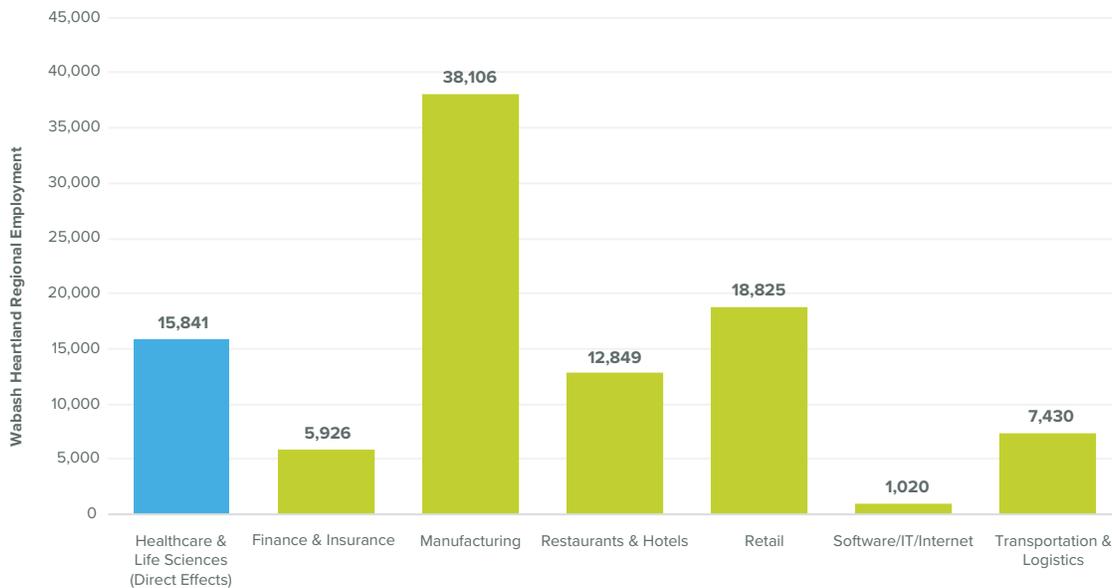


COMPARATIVE IMPORTANCE OF THE INDUSTRY

Healthcare and life sciences represent a leading sector in the Wabash Heartland region (Figure 4). When compared against other major industries, the sector is among the largest in terms of total regional jobs.

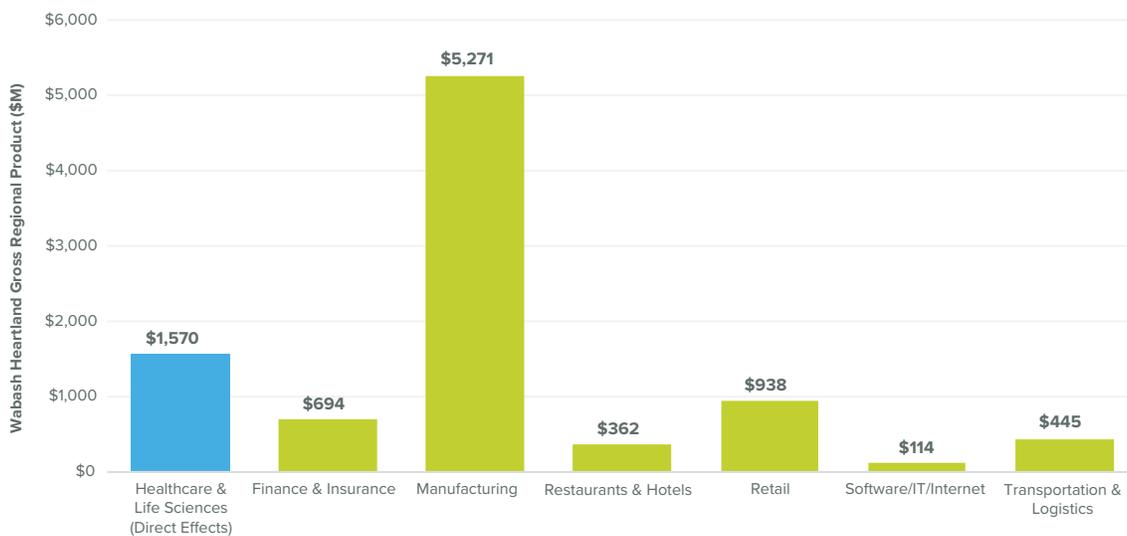
The strong value-adding nature of healthcare and life sciences, and its value to the region as an outsized economic driver is evident in the sector's contribution to regional GDP (Figure 5). In the Wabash Heartland region, the industry contributes to 8.1% of regional GDP.

► **Figure 4: Wabash Heartland Region Healthcare and Life Sciences Employment Compared to Other Industries, 2020**



Source: TEconomy analysis of Wabash Heartland Regional IMPLAN impact model and Emsi data.

► **Figure 5: Wabash Heartland Region Healthcare and Life Sciences Gross Regional Product Compared to Other Industries, 2020**



Source: TEconomy analysis of Wabash Heartland Regional IMPLAN impact model and Emsi data.



Regional Healthcare and Life Sciences Ecosystem

The Wabash Heartland region represents a leading driver of the state's healthcare and life sciences innovation ecosystem, particularly as home to Purdue University and its large base of life sciences-related R&D activities. Highlights from the regional ecosystem assessment include:

- In 2020, Purdue and other regional university researchers combined to spend nearly \$149 million in life sciences-related R&D expenditures.
- Regional funding from NIH, the gold standard in biomedical research, has totaled \$183 million over the latest 3-year period.
- The Wabash Heartland region is a major generator of talent. Among regional postsecondary graduates, 41% received a degree in a STEM-related field in 2020, contributing not only to healthcare and life sciences industry talent pipelines but also to broader advanced industry workforce and talent needs.
- High-growth potential healthcare and life sciences companies are being funded in the region with 17 companies receiving VC investments of \$338 million in the latest 3-year period, and an additional 8 companies receiving federal SBIR/STTR awards that totaled \$7 million.
- The region acts as a key site for clinical trials with 384 active trials utilizing Wabash Heartland regional site locations since 2019.

Enhancing the Regional Innovation Ecosystem: Purdue's Investments in Discovery Park

A major investment at Purdue that embodies the university's commitment to enhancing technology commercialization and collaborative economic development is the development of Discovery Park, a 40-acre interdisciplinary research environment open to university research teams, industry, and other stakeholders seeking to collaborate on complex challenges and opportunities. Life sciences feature heavily in the investments made at Discovery Park. Examples of infrastructure, facilities, and programs focused on life sciences at the Park include:

- **Bindley Bioscience Center** – a \$15 million, 30,000 assignable square foot, collaborative life sciences research center, opened in 2005. The center includes 20,000 square feet of lab space, and houses core equipment needed for modern life sciences, together with space for research collaborations.
- **Drug Discovery Facility** – opened in 2014, the Drug Discovery Facility at Discovery Park was a \$28 million investment, developing 32,000 assignable square feet, including 24,000 square feet for labs, offices, conferences, and meetings. Designed to advance drugs through discovery and on into development, the facility houses the Purdue Institute for Drug Discovery and accommodates more than 100 multidisciplinary researchers.

Regional Healthcare and Life Sciences Impacts

To estimate the economic importance of the Wabash Heartland regions healthcare and life sciences sector an IMPLAN economic impact model representing the 10-county region was developed and used for this analysis. The sector’s 15,282 healthcare and life science employees (direct effect) and the more than \$148 million in related research (primarily at Purdue University – West Lafayette with some at both Indiana State and Ball State) are used to drive the various sectors of the model to estimate additional direct, indirect, and induced effects and total impacts. The economic impact model (based upon input-output analysis) estimates the flow of goods and services between sectors and between inputs and final demand (indirect effects). Additionally, the spending of wages within the regional economy by the employees of these sectors are also captured (induced effects). This spending and re-spending of dollars within the economy is described as the “ripple effect” and when combined across all three types of effects provides an estimate of the total impacts. Impact effects are estimated for employment, labor income, value added, output, and tax revenues (federal and state/local estimated separately, see text box for the definitions of each of these).

The results of the full economic impact analysis, shown in Table 3, capture the 15,841 direct healthcare and life sciences jobs (including academic research jobs) within the Wabash Heartland region, and how the spending of the sector’s institutions and actors ripple through the broader regional economy. The nearly \$1.6 billion in value added to the regional economy, as discussed with Figure 5, appears as the direct effect in Table 3. Combined, the components and subsectors of the healthcare and life sciences sector are estimated to generate direct output of more than \$2.8 billion in 2020. Importantly, considering the number of public and non-profit institutions captured within, the sector generates nearly \$48 million in state and local tax revenues annually (including taxes of all types).

Economic Impact Measures

- **Employment** or the total number of jobs analyzed and estimated; includes the direct jobs captured as part of the healthcare and life sciences sector and indirect/induced jobs generated and supported through purchases and expenditures.
- **Labor Income**, also known as total compensation, is the total amount of income—including salaries, wages, and benefits (individual and company payments)—received by employees, proprietors, and other supplier and supported workers in the economy.
- **Value Added** captures the difference between an industry’s total output and the cost of its intermediate inputs; sometimes referred to as the industry or sector’s “contribution to GDP.”
- **Output**, also known as production, sales, or business volume, is the total value of goods and services produced by the healthcare and life sciences sector in the economy along with the value of goods and services produced throughout the regional economy due to the ripple effects of sector spending. For public/non-profit entities, such as universities and hospitals, expenditures, rather than revenue, are often the truest measure of this economic activity. The total output impacts are often referred to as the total economic impact.
- **State/Local and Federal Government Tax Revenues** includes the estimated revenues to federal and state/local governments from all sources as a result of the direct, indirect, and induced impacts estimated.

► **Table 3:** Economic Impact of the Wabash Heartland Region Healthcare and Life Sciences Industry, 2020

Impact Type	Employment	Labor Income (\$M)	Value Added (\$M)	Output (\$M)	State & Local Tax Revenues (\$M)	Federal Tax Revenues (\$M)
Direct Effect	15,841	\$1,218.04	\$1,569.60	\$2,832.03	\$47.98	\$213.66
Indirect Effect	5,121	\$194.16	\$319.14	\$665.23	\$24.02	\$38.10
Induced Effect	4,695	\$148.09	\$354.30	\$628.78	\$45.08	\$35.08
Total Impact	25,657	\$1,560.29	\$2,243.04	\$4,126.04	\$117.08	\$286.85
<i>Multiplier</i>	1.62	1.28	1.43	1.46		

Source: TEconomy analysis of Wabash Heartland regional IMPLAN impact model.



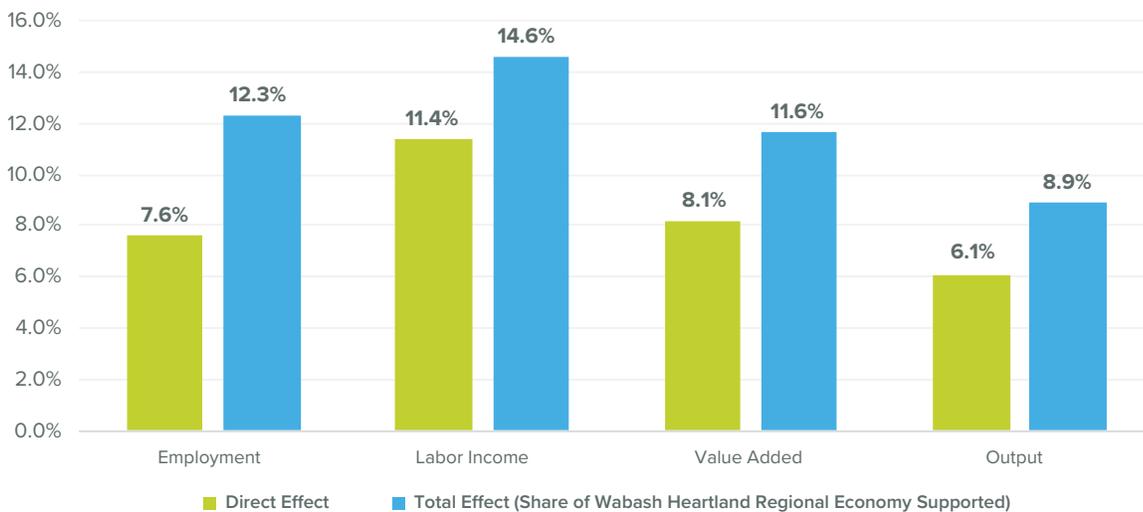
Evonik Industries: Manufacturing Active Pharmaceutical Ingredients in Lafayette

Evonik Industries, a German diversified specialty chemicals firm, has had a life sciences-focused manufacturing presence in Lafayette since it acquired Eli Lilly and Company's Tippecanoe Laboratories in 2010. Evonik has utilized the large campus—with several manufacturing buildings, a sizable fermentation facility, and a water treatment plan—to produce active pharmaceutical ingredients (APIs), primarily for Lilly but also for other biopharmaceutical customers in a contracting role. The site employs more than 600 and has particular strengths and competencies in producing high-potency drugs, fermentation, and enzyme reactions.

From a total impact perspective, **the Wabash Heartland region healthcare and life sciences sector generates and supports more than \$4.1 billion—every \$1 of direct output generates an additional \$0.46 within the regional economy.** This economic impact also generates and supports additional employment in the region. A total of **more than 25,500 Wabash Heartland region jobs are supported by the sector** with the non-direct additional employment slightly more concentrated in indirect (supplier) than induced jobs. Every job within the Wabash Heartland region healthcare and life sciences sector supports 0.62 additional jobs in the regional economy.

While these numbers seem impressive at face value, the importance of the Wabash Heartland regions healthcare and life sciences sector to the broader regional economy is more fully appreciated through the metrics in Figure 6. As shown in the figure, **the sector supports at least 8% of the regional economy across the four major impact metrics.**

► **Figure 6: Wabash Heartland Region Healthcare and Life Sciences Impacts Share of Regional Economy, 2020**



Source: TEconomy analysis of Wabash Heartland regional IMPLAN impact model.



Major Capital Projects: Investments and Impacts

Maintaining and operating a world class health and life sciences ecosystem requires building, maintaining, expanding, and upgrading a large base of physical infrastructure and capital equipment. In reviewing major investments made in recent years within the Wabash Heartland Region it is readily evident that industry, healthcare systems, and universities have been making a significant commitment to enhancing and expanding operations. Recent major projects announced and underway by the end of 2020 are shown below.

These projects comprise more than 175,000 square feet of construction with a total investment of nearly \$110 million. These investments add to the health and life sciences capacities and capabilities in the Wabash Heartland Region, while also generating significant regional economic impacts through the development and construction activities. These investments supported more than 390 jobs in 2020.

Major Wabash Heartland Region Healthcare and Life Science-Related Capital Projects

Organization/Project	\$ Investment	Completion Year
Purdue University, Brunner Purdue Veterinary Medical Hospital Complex	\$108 million	2022
Pulaski Memorial Hospital, expansion and enhancements		2021
TOTALS FOR ABOVE PROJECT EXAMPLES		

Source: TEconomy Partners analysis of data developed and provided by BioCrossroads and additional web research.

Conclusion

This regional profile readily demonstrates that healthcare and life sciences represent an important and diverse economic engine for the Wabash Heartland region; moreover, they also play a central role in providing economic and social resilience for the region on an ongoing basis and during public health emergencies. The Wabash Heartland region benefits greatly from the long-term investments that have been made by key private sector corporations such as ACell, Cook Biotech, Curia (AMRI), Evonik, Inotiv and others and public sector organizations such as Purdue University and its Discovery Park, IU Health-Arnett, Pulaski Memorial Hospital and others and creating a complete healthcare and life sciences ecosystem – an ecosystem that spans a complete range of activity from basic and translational research, through each step in the value added development and production of products, technologies, and services onwards into distribution and their use in the marketplace.

The operations of this value-chain in the Wabash Heartland region are well supported by talent development programs and higher education programs that supply the well-educated and skilled talent needed to fill demands across the sector. Similarly, the region is attracting the capital resources needed to develop, scale, and grow healthcare and life sciences enterprises—though like most regions of the country continued growth in resources are necessary.

The sector is expected to continue to grow, however, this growth could be dependent on how the ecosystem responds to forces of change and the opportunities presented for growth in healthcare products and services rooted in new technologies in genomics, gene editing, regenerative medicine, radiopharmaceuticals, synthetic biology, advanced health data analytics, personalized medicine, and other emerging fields of opportunity. Ongoing investment will be needed, and attention paid to sustaining and optimizing the regional ecosystem conditions to continue to allow the sector to thrive.

Information presented within the report leads to the following key conclusions:

- Healthcare and life sciences represent a significant advanced industry for the Wabash Heartland economy.
- The sector, including academic life sciences research, directly employs more than 15,800 in the region and supports a further 9,800 regional jobs through its indirect and induced expenditure impacts.
- The direct jobs supported demonstrate higher average wages of nearly \$60,000 (\$18,000 higher than the Wabash Heartland region's average job), and total compensation levels (wages and benefits) per job of \$76,900.
- These impacts are generated by a sector in the Wabash Heartland region with significant industry presence in pharmaceuticals, medical instruments, biotech, and through clinical healthcare and academic research operations.
- The sector is providing wide ranging functional impacts that collectively provide access to high quality clinical healthcare, an innovation and entrepreneurial pipeline leading to economic development, opportunities for individual advancement through STEM education and high-quality jobs and sustaining a high regional quality of life.

It is clear that past and future investments in the infrastructure and talent that advance Indiana's and the Wabash Heartland region's life sciences and healthcare capacity represent a fundamental good—enhancing the quality of life for Hoosiers, boosting the Indianapolis regional economy, and providing a proactive means of response in the face of public health emergencies.

THE IMPACT OF THE HEALTHCARE AND LIFE SCIENCES SECTOR IN INDIANA'S WABASH HEARTLAND

\$4.1 B total economic impact generated by the Wabash Heartland region's healthcare and life sciences sector

THE HEALTHCARE AND LIFE SCIENCES SECTOR IN INDIANA'S WABASH HEARTLAND REGION IS:



A powerful economic engine for the region

Diverse in its employment opportunities, creating demand for work across R&D, manufacturing, warehousing, distribution, and all business functions that support the value chain.



Growing

The combined healthcare and life sciences sector grew by 8.8% from 2015 to 2020.



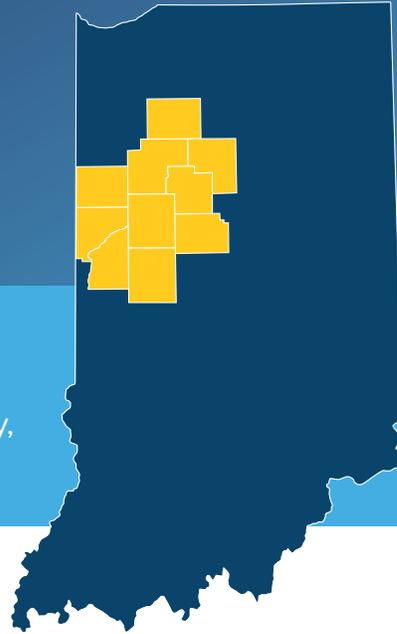
Well-rounded and connected

Because of its highly collaborative nature, it assured resiliency during the pandemic.

The functional impacts of the healthcare and life sciences sector on the Wabash Heartland region are those that are a positive impact generated for an economy, society or for individuals through the mission-focused activities of an organization, institution, industry, or specific project including:

- Working to sustain the physical health of populations served.
- Producing products and services needed and valued by society which, in turn, generate employment, economic output, exports, and public sector revenues.
- Advancing basic and applied knowledge and building the know-how and skills necessary within the healthcare and life sciences workforce.
- Securing public health and building equitable, diverse, and resilient communities with robust livability, quality-of-place and quality-of-life.

HEALTHCARE AND LIFE SCIENCES WABASH HEARTLAND REGION



10 Counties

Benton, Carroll, Cass, Clinton, Fountain, Montgomery,
Pulaski, Tippecanoe, Warren, White

	 EFFECT	 Employment	 Output	 Gross Regional Product
DIRECT		15,841	\$2.8B	\$1.6B
INDIRECT & INDUCED		9,816	\$1.3B	\$0.7B
TOTAL SUPPORTED IMPACT SHARE OF REGIONAL ECONOMY		12.3%	8.9%	11.6%

Compared to the next largest direct GRP sectors:
\$5.3B Manufacturing
\$0.9B Retail



\$1 = +46¢

Every \$1 of all goods and services produced by the healthcare and life sciences sector, generates an additional \$0.46 within the Wabash Heartland regional economy.



\$117.1M

Amount of state and local tax revenue generated and supported by the healthcare and life sciences sector in the Wabash Heartland region.

