



ESSENTIAL:

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

April 2022



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For more information on this report please contact its authors with TEconomy Partners:

Marty Grueber, Ryan Helwig, Simon Tripp, and Dylan Yetter

1.800.TEC.1296 | info@teconomypartners.com | www.teconomypartners.com

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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



1210 Waterway Boulevard, Suite 5000
Indianapolis, IN 46202

By:

TEconomy Partners, LLC

BioCrossroads

Marty Grueber, Principal and Research Director
Ryan Helwig, Principal and Project Director
Simon Tripp, Principal and Senior Director
Dylan Yetter, Senior Research Analyst

Patricia Martin, President and CEO
Nora Doherty, Executive Vice President
Lori LeRoy, Executive Vice President
Brian Stemme, Senior Vice President

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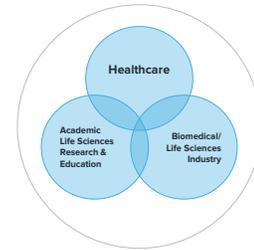
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Introduction

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 the Uplands Region of Indiana 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).

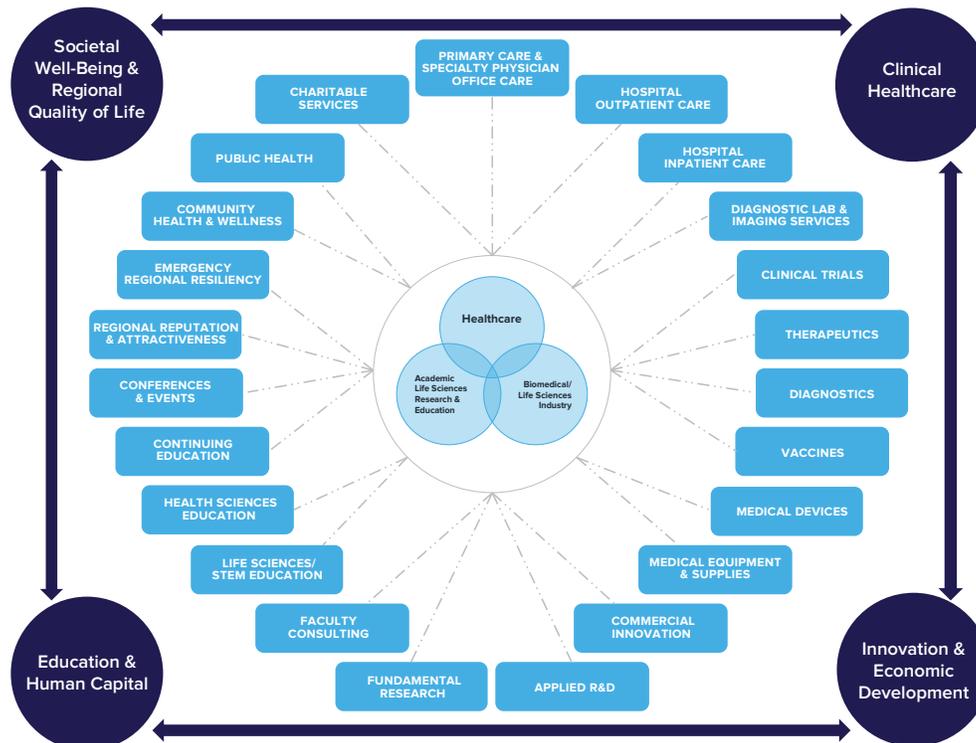
► **Figure 1: Three Core Elements of the Healthcare and Life Sciences Sector**



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 23,000 in the 11-County Uplands region. The industrial life sciences segment accounts for more than 8,000 of these jobs, with significant strengths and concentrations in medical device and pharmaceutical manufacturing where major employers like Cook Medical, Baxter, and Catalent are actively manufacturing a varied set of biomedical products and solutions (see sidebars). These large employment footprints make up an outsized and highly “specialized” concentration of healthcare and life sciences industry jobs in the region. In fact, the Uplands region’s industrial life sciences sector is more than four times as specialized as the national average with a location quotient of 4.43.

Healthcare and life sciences act as major drivers of the regional economy and high-quality jobs. The sector has seen rapid 18% job growth since 2015, well outpacing overall private sector growth of 2%. Average wages in the healthcare and life sciences industry reach nearly \$63,000, well above those for their private sector counterparts.

Medical Devices and the Uplands Region

Cook Medical, one of the state’s key medical device firms is located in the Uplands region (Bloomington). Cook is a leading developer and manufacturer of advanced medical devices for applications such as minimally-invasive surgery, providing products that are used across 41 medical specialties.

► **Table 1:** Uplands region Healthcare and Life Sciences Industry Employment by Subsector, 2020

Healthcare and Life Sciences Subsectors	Uplands Regional Employment
Life Sciences	8,487
Biomedical Manufacturing	7,814
<i>Pharmaceutical Manufacturing</i>	2,136
<i>Medical Instruments, Devices, and Supplies Manufacturing</i>	5,679
Biomedical Distribution	394
Biomedical Research & Development (Industry, NEC)	278
Healthcare	14,618
Hospitals	7,334
Physician and Other Health Practitioner Offices	4,550
Medical Testing	121
Ambulatory Healthcare Services	1,787
Outpatient Care Centers	947
Total	23,105

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

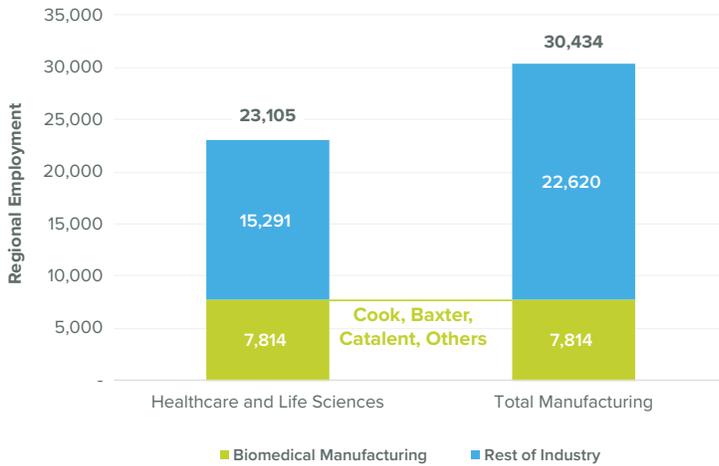
► **Table 2:** Uplands Region Healthcare and Life Sciences Industry, 2020

LS/HC Major Sector	Establishments, 2020	Employment, 2020	Location Quotient, 2020	Employment Change, 2015-2020	Average Wages, 2020
Healthcare	531	14,618	0.86	18.1%	\$56,769
Life Sciences	66	8,487	4.43	18.0%	\$73,432
HC/LS Total	597	23,105	1.22	18.0%	\$62,889
Total Regional Employment	8,638	213,056	1.00	2.1%	\$40,187

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

In a production-intensive region, the industrial life sciences account for a sizable, one in four regional manufacturing jobs (Figure 3).

► **Figure 3: Uplands 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.

Contract Biopharmaceutical Production in the Uplands Region

The Uplands region is developing into an important hub for the contract development and manufacturing of pharmaceuticals, biologics, and associated products. Some key examples of operations for this important life sciences business sector in the Uplands region include:

Baxter BioPharma Solutions and Catalent Biologics are currently playing a major role in the U.S. response to the COVID-19 pandemic. These contract manufacturers, both located in Bloomington, have collectively manufactured over 500 million vaccine doses on behalf of Moderna and Johnson & Johnson. Over the past 2 years these companies have hired thousands of new employees and invested hundreds of millions of dollars in expanded facilities.

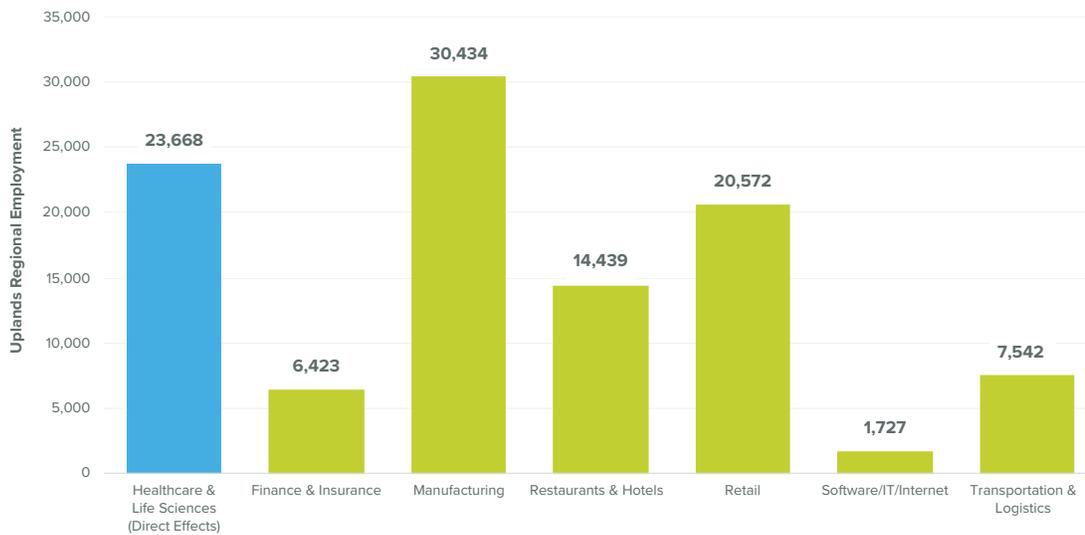


COMPARATIVE IMPORTANCE OF THE INDUSTRY

Healthcare and life sciences represents a major employer in the Uplands region (Figure 4). When compared against other major industry sectors, the industry is behind only manufacturing 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). As one of the world's most R&D- and innovation-intensive advanced industries, healthcare and life sciences punches well above its weight in its contributions to economic growth and state/regional wealth generation. In the Uplands region, the industry accounts for just under 11% of private sector jobs but accounts for 18% of regional GDP.

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



Source: TEconomy analysis of Uplands regional IMPLAN impact model and Emsi data.

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



Source: TEconomy analysis of Uplands regional IMPLAN impact model and Emsi data.



Regional Healthcare and Life Sciences Ecosystem

The Uplands region contributes significantly to the state's healthcare and life sciences innovation ecosystem, particularly with respect to its intensive life sciences R&D activities and top talent generation out of Indiana University in Bloomington. Highlights from the regional ecosystem assessment include:

- In 2020, IU-Bloomington had \$150 million in life sciences-related R&D expenditures, primarily focused in biological and biomedical sciences.
- Twenty-three percent of IU-Bloomington graduates are in a STEM-related field, 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 four companies receiving VC investments of nearly \$71 million in the latest 3-year period, and an additional four companies receiving federal SBIR/STTR awards to the tune of \$4.5 million.
- The region acts as a key site for clinical trials with more than 400 active trials utilizing Uplands regional site locations since 2019.

CASE STUDY:

Building the Talent Pipeline

Organizations across the health and life sciences spectrum well recognize the importance of education, especially STEM education, for society and for assuring a pipeline of talent exists to meet the needs of Indiana sector operations. Many collaborations and support programs exist between Indiana organizations to foster continuous education and life-long learning.

In Bloomington, Cook Medical has created My Cook Pathway, an educational assistance program enabling employees to advance their education all the way from high school equivalency certification, associates and certificate completion with Ivy Tech and multiple higher ed partners for completion of bachelors and master's degrees all at little to no cost to themselves via upfront tuition assistance resources.

Regional Healthcare and Life Sciences Impacts

To estimate the economic importance of the Uplands region’s healthcare and life sciences sector an IMPLAN economic impact model representing the 11-county Uplands region was developed and used for this analysis. The sector’s 23,105 healthcare and life science employees (direct effect) and the \$150 million in related research at IU-Bloomington 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 23,668 direct healthcare and life sciences jobs (including academic research jobs) within the Uplands region, and how the spending of the sector’s institutions and actors ripple through the broader regional economy. The more than \$3.3 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 \$7.3 billion in 2020. Importantly, considering the number of public and non-profit institutions captured within, the sector generates more than \$139 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 Uplands 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	23,668	\$1,762.30	\$3,317.16	\$7,324.89	\$139.10	\$360.09
Indirect Effect	7,982	\$365.17	\$554.60	\$1,182.62	\$47.63	\$70.33
Induced Effect	7,505	\$234.97	\$534.39	\$972.42	\$67.12	\$54.06
Total Impact	39,156	\$2,362.44	\$4,406.15	\$9,479.93	\$253.85	\$484.49
<i>Multiplier</i>	1.65	1.34	1.33	1.29		

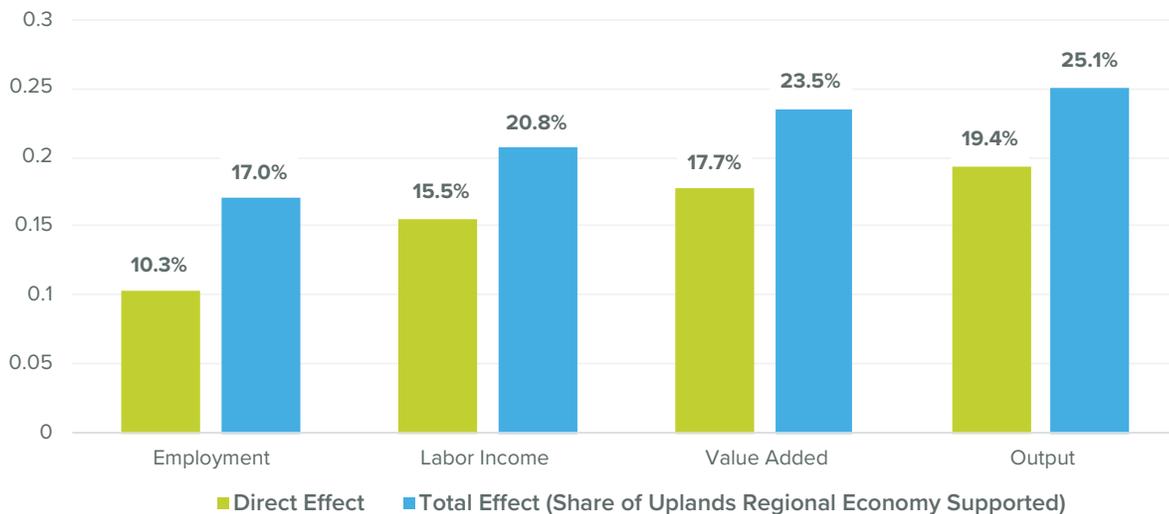
Source: TEconomy analysis of Uplands regional IMPLAN impact model.



From a total impact perspective, **the Indiana Uplands Region healthcare and life sciences sector generates and supports nearly \$9.5 billion—every \$1 of direct output generates an additional \$0.29 within the regional economy.** This economic impact also generates and supports additional employment in the region. A total of more than 39,000 Upland region jobs are supported by the sector with the non-direct additional employment almost equally split between indirect (supplier) and induced jobs. Every job within the Uplands healthcare and life sciences industry supports 0.65 additional jobs in the regional economy.

While these numbers seem impressive at face value, the importance of the Uplands region’s 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 17% of the regional economy across the four major impact metrics.

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



Source: TEconomy analysis of Uplands 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 Uplands 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 800,000 square feet of construction with a total investment of just under \$600 million. These investments add to the health and life sciences capacities and capabilities in the Uplands Region, while also generating significant regional economic impacts through the development and construction activities. These investments supported more than 4,700 job in 2020.

Major Uplands Region Healthcare and Life Science-Related Capital Projects

Organization/Project	\$ Investment	Completion Year
IU Health, Bloomington Regional Academic Health Center	\$389 million	2021
Catalent Biologics—new developments at two sites	\$150 million	2021
Baxter BioPharma Solutions – expansion of sterile fill/finish facilities	\$50 million	2022
TOTALS FOR ABOVE PROJECT EXAMPLES	\$589 million	

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 a significant economic engine for Indiana's Uplands 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 Uplands region benefits greatly from the long-term investments that have been made by key private sector corporations such as Cook Medical, Baxter, Catalent, Boston Scientific, and others and public sector organizations such as Indiana University and IU Health 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 Uplands 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, 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 an important advanced industry for Uplands regional economy.
- The sector directly employs 23,105 the region, hundreds more in biological and biomedical education and research at IU-Bloomington and supports a further 15,566 regional jobs through its indirect and induced expenditure impacts.
- The direct jobs supported demonstrate high average wages of more than \$62,000 (over \$20,000 higher than the Uplands region's average job), and total compensation levels (wages and benefits) per job of more than \$74,400.
- These impacts are generated by a sector that is particularly well-rounded and diverse in the Uplands region including industry presence in medical devices and equipment, biopharmaceuticals, and clinical healthcare, and life sciences research and education.
- The sector is providing wide ranging functional impacts that collectively provide access to high quality clinical healthcare, an innovation 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 Uplands region's life sciences and healthcare capacity represent a fundamental good—enhancing the quality of life for Hoosiers, boosting the Uplands 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 UPLANDS REGION

\$9.5 B

total economic impact generated by the Uplands region's healthcare and life sciences sector

THE HEALTHCARE AND LIFE SCIENCES SECTOR IN INDIANA'S UPLANDS 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 18% 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 Uplands Indiana 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 REGION

11 Counties

Brown, Crawford, Daviess, Dubois, Greene, Lawrence, Martin, Monroe, Orange, Owen, Washington



Employment



Output



Gross Regional Product

EFFECT	Employment	Output	Gross Regional Product
DIRECT	23,668	\$7.3B	\$3.3B
INDIRECT & INDUCED	15,487	\$2.6B	\$1.1B
TOTAL SUPPORTED IMPACT SHARE OF REGIONAL ECONOMY	17.0%	25.1%	23.5%

Compared to the next largest direct GRP sectors:
\$3.3B Manufacturing
\$1.0B Retail



\$1 = +29¢

Every \$1 of all goods and services produced by the healthcare and life sciences sector, generates an additional \$0.29 within the Uplands Indiana regional economy.



\$253.8M

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

