



INDIANA UNIVERSITY
SCHOOL OF MEDICINE

The Economic Value of
Indiana University School of Medicine

EXECUTIVE SUMMARY

THIS study represents an additional key component of the 2020 university-wide economic impact analysis of Indiana University performed by Emsi Burning Glass. While the economic impact of IU School of Medicine was reflected in the aggregate of the overall results reported in the IU study, this study module focuses exclusively on IU School of Medicine to effectively attribute the school's specific economic impact.

Indiana University and the daily lives of Hoosiers are inextricably intertwined. Through economic engagement activities, IU connects the university's intellectual and creative resources with strategic opportunities that not only align educational programs with the health care workforce needs of the state, but also provide a foundation to foster continued economic growth.

Specifically, IU School of Medicine's impact on Indiana can be felt widely and tangibly across each of its 92 counties. Through the scope of its activities, IU School of Medicine vastly benefits Indiana by educating health care professionals, improving health by preventing and treating disease, enhancing policymaking, developing sustainable infrastructure, and promoting economic growth. IU School of Medicine researchers also develop scientific and technological advancements that drive improved health care. In terms of direct contributions to economic growth, IU School of Medicine purchases a considerable amount of goods and services from businesses across the state while also employing residents in nearly every county, each of whom contribute directly to the state tax base.

Fifty years ago, states across the nation, including Indiana, faced concerns about physician shortages as more Americans found access to health care services through federal programs such as Medicare and Medicaid and with the rapid development of new medical therapies and treatments. To meet the growing health needs of Hoosiers, Indiana cities pitched ideas for new, additional medical schools across the state. In response, IU School of Medicine devised an innovative solution—a regional campus system that distinguishes the school from other U.S. medical schools. The nine regional campuses across the state offer a standardized four-year curriculum, but each has its own special area of concentration, and each offers a special working and learning environment tailored to the different needs, styles, and interests of the communities they serve. They are known for close-knit communities that facilitate high-quality medical education, access to leading medical research and clinical resources, and early hands-on experience. And they are a key reason IU School of Medicine is the largest medical school, by enrollment, in the United States. This model to create a pipeline of physicians leverages the strengths of campuses across the state and provides medical students diverse experiences and access to unique learning opportunities. In the future, IU School of Medicine expects an increased flow of students between the different campuses, as well as greater



IU SCHOOL OF MEDICINE
CAMPUS LOCATIONS (INDIANA)

KEY TAKEAWAYS

- IU School of Medicine created **\$2.2 billion** in added income for Indiana in FY 2018-19.
- **One out of every 116 jobs** in Indiana is supported by the activities of IU School of Medicine, the school's faculty, and its students.
- For every dollar students invest in their education at IU School of Medicine, they will receive **\$8.90** in higher future earnings.
- For every tax dollar spent educating IU School of Medicine students, taxpayers will receive an average of **\$2.40** in return over the course of the students' working lives.

sharing of faculty expertise and research collaborations. New expanded facilities have opened recently in Bloomington and Evansville, with others likely to follow to accommodate the growing needs of the state's medical education and research missions.

A national leader in medical research and education, IU School of Medicine has more than 60 academic departments and specialty divisions across nine campuses statewide. With strong clinical partnerships with Indiana's most advanced hospitals and physician networks and robust research funding from the National Institutes of Health and other prominent external funding sources, IU School of Medicine is continuously advancing its mission to prepare the next generation of healers.

IU School of Medicine faculty physicians provide the highest quality care to patients throughout Indiana and to those who travel from afar to access the school's diverse expertise. The school is closely aligned with Indiana University Health, the state's largest and most comprehensive health care system with 16 hospitals across Indiana, including IU Health Methodist Hospital, University Hospital, and Riley Hospital for Children at IU Health. This unique partnership enables IU School of Medicine's faculty physicians to seamlessly integrate research findings into patient care and to offer promising clinical research studies to patients close to home. IU Health's statewide footprint also allows IU School of Medicine to influence the delivery of care outside the traditional academic health center and to provide the most advanced therapies to patients in community hospitals throughout Indiana. Through economic engagement activities, IU School of Medicine connects its research and educational mission with strategic opportunities that not only align with the health care and workforce needs of the state, but also provide a foundation to foster continued economic growth.

In addition, the Indiana University Precision Health Initiative, housed within IU School of Medicine and one of three initiatives of IU's ambitious Grand Challenges Program, provides opportunities to develop innovative research programs to support the implementation of transformative precision health for the state of Indiana in six clinical areas: Alzheimer's disease, childhood sarcoma, multiple myeloma, triple negative breast cancer, Type 2 diabetes, and undiagnosed rare diseases. IU's investment in the Precision Health Initiative has generated substantial impact within the research, clinical, and educational missions. The infrastructure that has been built to support the Precision Health Initiative will continue to drive further innovation that will positively impact Indiana's economy in the future.

Additionally, IU School of Medicine supports creation of new jobs and prepares a workforce ready to fill them. Research indicates that a well-educated workforce corresponds with improved health, lower rates of mortality, and lower overall



rates of crime and poverty. A degree from IU School of Medicine provides its graduates with the capacity to increase lifetime earning potential and to achieve upward social mobility. IU School of Medicine alumni contribute greatly to the state in serving their local communities as doctors, health professionals, medical researchers, policymakers, and more.

IU School of Medicine directly contributes to the state's economic growth by purchasing a considerable amount of goods and services from Indiana businesses, while also employing residents who contribute directly to the state's tax base. The physicians and doctorally prepared researchers who graduate from IU School of Medicine contribute significantly to the state, helping to ensure access to high-quality health care and advancing patient care and treatments through robust research programs.

This study measures the economic impact created by IU School of Medicine on the state business community and the benefits the medical school generates in return for the investments made by its key stakeholder groups—students, taxpayers, and society. As in the overall IU study, all results reflect employee, student, and financial data provided by IU School of Medicine for fiscal year (FY) 2018-19 (July 1, 2018 – June 30, 2019).

Specifically, the following two analyses are presented in this study:



Economic impact analysis: Impacts on the Indiana economy are reported under the economic impact analysis and are measured in terms of added income.



Investment analysis: The returns on investment to students, taxpayers, and society in Indiana are reported under the investment analysis.





Economic impact analysis

IMPACTS CREATED BY IU SCHOOL OF MEDICINE IN FY 2018-19



Through its tripartite mission to promote innovation and excellence in education, research, and patient care, IU School of Medicine has a major impact on Indiana's economy. With expenditures in the areas of operations, research, construction, entrepreneurship, and student spending, the school generates a flow of spending that contributes to the economy in significant ways. In addition, the school's alumni are major contributors to the economic health of the state. With nine campuses across Indiana, IU School of Medicine graduates the majority of the state's physicians and plays a leading role in supporting the state's health care talent strategy.

While attending IU School of Medicine, students gain knowledge, skills, and clinical training increases their productivity and allows them to command a higher wage once they enter the workforce. The employers of IU School of Medicine alumni enjoy the fruits of this increased productivity in the form of additional non-labor income (i.e., higher profits).

Through excellence in medical education and clinical training, IU School of Medicine graduates are highly prepared to serve the health care needs of Indiana and achieve personal and financial success. IU School of Medicine alumni, along with the school's spending impacts, added **\$2.2 billion in income to the state economy in FY 2018-19**.

Operations spending impact



IU School of Medicine adds economic value to Indiana as a major employer of state residents and a large-scale buyer of goods and services. In FY 2018-19, the medical school employed 4,516 full-time



\$582.1 million
Operations Spending Impact



\$359.1 million
Research Spending Impact



\$2.3 million
Construction Spending Impact



\$17.1 million
Start-up Company Impact



\$13.6 million
Student Spending Impact



\$1.2 billion
Alumni Impact



\$2.2 billion
TOTAL IMPACT

- OR -

34,370
JOBS SUPPORTED

and part-time faculty and staff (excluding research employees), 99% of whom lived in Indiana. Total IU School of Medicine payroll was \$318.5 million (excluding payroll from research employees), much of which was spent in the state for groceries, mortgage and rent payments, dining out, and other household expenses. In addition, the medical school spent \$358.5 million on day-to-day expenses related to facilities, supplies, and professional services (excluding research expenditures).

IU School of Medicine’s day-to-day operations spending added \$582.1 million in income to the state during the analysis year. This figure represents the medical school’s payroll, the multiplier effects generated by the in-state spending of the medical school and its employees, and a downward adjustment to account for funding that the medical school received from state sources. The **\$582.1 million** in added income is equivalent to supporting **8,354 jobs** in the state.



Research spending impact



IU School of Medicine provides educational leadership and health care innovation to Hoosier communities. Research activities impact the economy by employing people and requiring the purchase of equipment and other supplies and services. Over the last four years, IU School of Medicine received 300 invention disclosures, filed 412 new patent applications, and produced 125 licenses.

IU SCHOOL OF MEDICINE RESEARCH DEVELOPMENTS

Fiscal year	Inventions	Patents	Licenses
2015-16	74	120	33
2016-17	73	98	44
2017-18	75	97	23
2018-19	78	97	25
Total	300	412	125

Source: IU School of Medicine.

In FY 2018-19, IU School of Medicine spent \$142.6 million on payroll to support research activities. This, along with \$296 million in other research spending, created a net total of **\$359.1 million** in added income for the state economy. This added income is equivalent to supporting **5,236 jobs**.

Construction spending impact



Each year IU School of Medicine invests in its facilities to enhance its teaching and research capacities and meet the evolving emphases of health and medical education in the 21st century. While the

amount varies from year to year, this annual construction activity has a substantial impact on the state economy. In FY 2018-19, IU School of Medicine's construction spending generated **\$2.3 million** in added income, which is equivalent to supporting **33 jobs**.

Start-up company impact



IU Ventures, IU's early-stage venture and angel investment arm, previously known as the IU Research and Technology Corporation, has launched nearly 100 startups since its formation in 1997. In addition, it was named Tech Transfer Unit of the Year in the 2018 Global University Venturing Awards in recognition of IU's leadership in the commercialization of intellectual property. Research conducted at IU School of Medicine builds the foundation for health care innovations that affect lives. The IU Innovation and Commercialization Office brings IU School of Medicine discoveries out of the lab and into the marketplace by helping researchers protect, develop, and commercialize their inventions. IU School of Medicine creates an exceptional environment that fosters innovation and entrepreneurship, evidenced by its cutting edge start-up companies. In FY 2018-19, IU School of Medicine start-up companies added **\$17.1 million** in income to the Indiana economy, which is equivalent to supporting **80 jobs**.



Student spending impact



As the largest medical school in the nation with an acclaimed medical educational curriculum that reflects the modern U.S. health care environment and delivery models, IU School of Medicine attracts students from across the United States. In FY 2018-19, approximately more than a quarter of the students attending IU School of Medicine came from outside the state. It's likely these students would not have come to Indiana if the medical school did not exist. In addition, in-state students desiring a medical degree would have left Indiana, if the medical school was not located here. While attending the medical school, these relocated and retained students spent money on lodging, food, transportation, and household and personal expenses. This spending generated **\$13.6 million** in added income for the state economy in FY 2018-19, which supported **324 jobs** in Indiana.

Alumni impact



Thousands of physicians who received education and clinical training at IU School of Medicine are employed in Indiana. IU School of Medicine graduates receive higher earnings and contribute to the health care organizations that employ them. In FY 2018-19, IU School of Medicine alumni generated **\$1.2 billion** in added income for the state economy, which is equivalent to supporting **20,343 jobs**.



Total impact

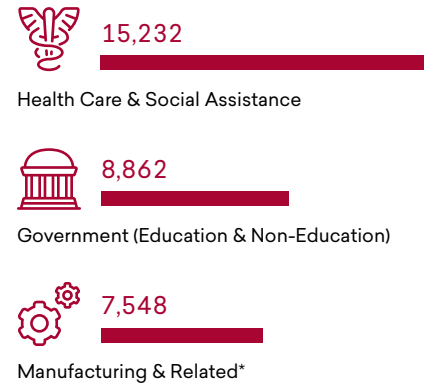
IU School of Medicine added **\$2.2 billion** in income to the Indiana economy during the analysis year, equal to the sum of the operations, research, and construction spending impacts, the start-up company impact, the student spending impact, and the alumni impact. If the medical school did not exist, these impacts would not have been generated in Indiana. For context, the \$2.2 billion impact was equal to approximately **0.6%** of the total gross state product (GSP) of Indiana.

*The additional income of **\$2.2 billion** created by IU School of Medicine is equal to approximately **0.6%** of the total gross state product of Indiana.*

IU School of Medicine's total impact can also be expressed in terms of jobs supported. The \$2.2 billion impact supported **34,370 state jobs**, using the jobs-to-sales ratios specific to each industry in the state. This means that **one out of every 116 jobs** in Indiana is supported by the activities of IU School of Medicine, the school's faculty, and its students. In addition, the \$2.2 billion, or 34,370 supported jobs, stemmed from different industry sectors. IU School of Medicine's spending and alumni in the Health Care & Social Assistance industry sector supported 15,232 jobs in FY 2018-19.



IU SCHOOL OF MEDICINE IMPACTS BY INDUSTRY (JOBS SUPPORTED)



* Administrative & Waste Services; Utilities; Construction; Transportation & Warehousing; Professional & Technical Services; Educational Services; Accommodation & Food Services; Other Services (except Public Administration).

One out of every 116 jobs in Indiana is supported by the activities of IU School of Medicine, the school's faculty, and its students.



Investment analysis



An investment analysis evaluates the costs associated with a proposed venture against its expected benefits. If the benefits outweigh the costs, then the investment is financially worthwhile. The analysis presented here considers IU School of Medicine as an investment from the perspectives of students, taxpayers, and society in Indiana.

Student perspective

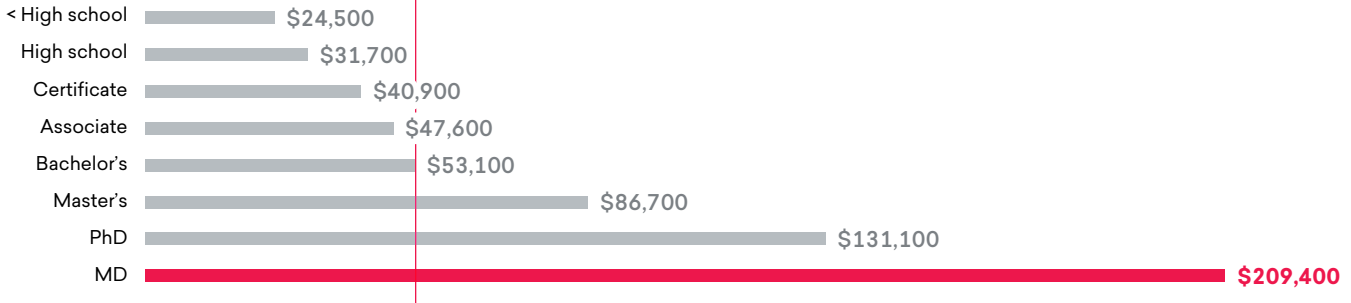


In FY 2018-19, IU School of Medicine served 2,104 students. In order to attend the medical school, the students paid for tuition, fees, books, and supplies. In choosing a graduate medical education, students decided to forego income they would have earned had they not pursued an advanced degree. The total investment made by IU School of Medicine's students in FY 2018-19 amounted to a present value of \$160 million.

In return for their investment, IU School of Medicine students will receive a stream of higher future earnings that will continue to grow throughout their working lives. For example, the average IU School of Medicine Doctor of Medicine (MD) graduate from FY 2018-19 will see annual earnings that are \$156,300 higher than a person with a bachelor's degree working in Indiana. Over a working lifetime, the benefits of the IU School of Medicine MD over a bachelor's degree will amount to an undiscounted value of \$6.6 million in higher earnings per graduate. The present value of the cumulative higher future earnings that IU School of Medicine's FY 2018-19 students will receive over their working careers is \$1.4 billion.

*In FY 2018-19, IU
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The average IU School of Medicine MD degree graduate will see an increase in earnings of **\$156,300** each year compared to a person with a bachelor's degree working in Indiana.

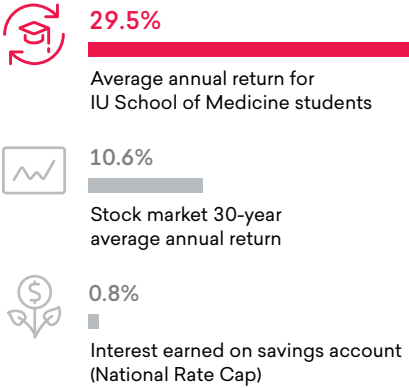


Source: Emsi Burning Glass employment data.

The students' benefit-cost ratio is **8.9**. In other words, for every dollar students invest in IU School of Medicine in the form of out-of-pocket expenses and forgone time and money, they will receive a cumulative value of \$8.90 in higher future earnings. **For every \$10,000 students invest in their education at IU School of Medicine, they will receive \$89,000 in return** in the form of higher future earnings. Annually, the students' investment in IU School of Medicine has an average annual internal rate of return of **29.5%**, which far surpasses the U.S. stock market's 30-year average rate of return of 10.6%.

This analysis is conservative because it does not take into account the improved well-being of IU School of Medicine students. Many years of research have demonstrated that a college education leads to happier and healthier lives. Educated members of society typically use the knowledge and skills they acquire over their years of learning to pursue their life goals and dreams, while also improving their lifestyles and overall well-being. They are generally more financially stable than those who do not engage in higher education, and they are inspired to work to improve their mental, physical and emotional health.

STUDENTS SEE A HIGH RATE OF RETURN FOR THEIR INVESTMENT IN IU SCHOOL OF MEDICINE



Source: Forbes' S&P 500, 1989-2018. FDIC.gov, 6-2019.

Taxpayer perspective



IU School of Medicine generates more in tax revenue than it receives. Medical school graduates, based on their projected earnings, will make higher tax payments throughout their working lives. Employers of Indiana-based alumni will also make higher tax payments as they increase their output and purchases of goods and services. Based on historical data about the number of students expected to remain in Indiana over the course of their careers, by the end of the FY 2018-19 students' working lives, the state of Indiana will have collected a present value of \$271.6 million in added taxes.

Taxpayers will also experience savings generated by the improved lifestyles of IU School of Medicine students, who will be less likely to rely on government services as they enter the Indiana communities in which they will live and work. As such, by way of the education that IU School of Medicine students receive, taxpayers will experience savings in three main categories: 1) health care, 2) justice system, and 3) income assistance. Improved health will lower students' demand for national health care services. In addition, according to the U.S. Census Bureau, as students gain higher levels of education, they are less likely to interact with the criminal justice system, resulting in a reduced demand for law enforcement and reduced victim costs. IU School of Medicine students will be more employable, resulting in reduced demand for income assistance such as welfare and unemployment benefits. Altogether, the present value of the benefits associated with an IU School of Medicine education will generate \$18 million in savings to state and local taxpayers.

Total taxpayer benefits amount to \$289.6 million, the present value sum of the added taxes and public sector savings. Taxpayer costs are \$119.1 million, equal to the amount of state and local government funding IU School of Medicine received in FY 2018-19. These benefits and costs yield a benefit-cost ratio of **2.4**. This means that for every dollar of public money invested in IU School of Medicine in FY 2018-19, taxpayers will receive a cumulative present value of \$2.40 over the course of the students' working lives. To state this another way, **for every \$10,000 invested by taxpayers, they will receive \$24,000 in return.** The average annual internal rate of return for taxpayers is **10.3%**, which compares favorably to other long-term investments in the public and private sectors.

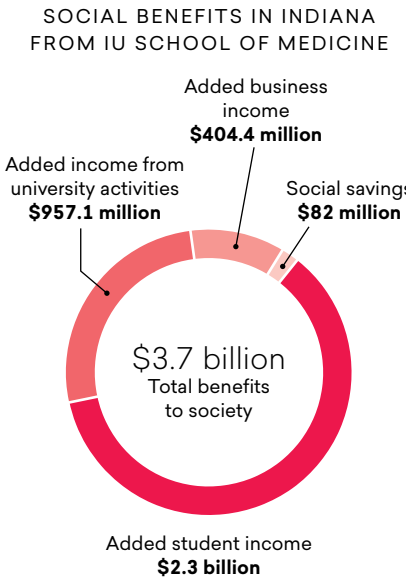
Social perspective



Through their volunteer work, leadership and philanthropic contributions, IU School of Medicine students enrich the civic and economic life of their communities. They contribute more in taxes, and they are also less reliant on government programs and services than those without college degrees. They are also more actively involved in vital societal activities, such as voting. Many of these benefits are difficult to quantify; however, this study is able to capture the increased economic base to the state from the growth in gross state product stemming from IU School of Medicine's impact on the state and the higher future earnings. In addition, the study identifies the personal and governmental benefits from the improved lifestyles of IU School of Medicine students.

As discussed in the previous section, education is statistically correlated with a variety of lifestyle changes that generate social savings. These costs are avoided by consumers but are also distinct from the costs circumvented by the taxpayers outlined above. Health care savings include reduced expenditures associated

*For every dollar of public money invested in IU School of Medicine, taxpayers will receive a cumulative value of **\$2.40** over the course of the students' working lives.*



with smoking, alcohol dependence, obesity, drug abuse, and depression. Savings related to crime include lower security costs and insurance administration, victim costs, and criminal justice expenditures. Income assistance savings include reduced welfare and unemployment claims.

Altogether, the social benefits of IU School of Medicine equal a present value of \$3.7 billion. These benefits include \$2.3 billion in added student income, \$404.4 million in added business income, \$957.1 million in added income from medical school activities, as well as \$82 million in social savings related to health, crime, and income assistance in Indiana. People in Indiana invested a present value total of \$1.3 billion in IU School of Medicine in FY 2018-19. The cost includes all the medical school and student costs.

The benefit-cost ratio for society is **3.0**, equal to the \$3.7 billion in benefits divided by the \$1.3 billion in costs. In other words, for every dollar invested in IU School of Medicine, people in Indiana will receive a cumulative value of \$3.00 in benefits. Put differently, **for every \$10,000 society invests in IU School of Medicine, Indiana will see \$30,000 in benefits** over the students' working lives. The benefits of this investment will occur for as long as IU School of Medicine's FY 2018-19 students remain employed in Indiana's workforce.

Summary of investment analysis results

The results of the analysis demonstrate that IU School of Medicine is a strong investment for all three major stakeholder groups—students, taxpayers, and society. As shown, students receive a great return for their investments in an IU School of Medicine education. At the same time, taxpayers' investment in IU School of Medicine outperforms government expenditure and creates a wide range of social benefits throughout Indiana.



STUDENT PERSPECTIVE

\$1.4 billion
Present value benefits

\$160.0 million
Present value costs

\$1.3 billion
Net present value

Benefit-cost ratio Rate of return

8.9

29.5%



TAXPAYER PERSPECTIVE

\$289.6 million
Present value benefits

119.1 million
Present value costs

\$170.5 million
Net present value

Benefit-cost ratio Rate of return

2.4

10.3%



SOCIAL PERSPECTIVE

\$3.7 billion
Present value benefits

\$1.3 billion
Present value costs

\$2.5 billion
Net present value

Benefit-cost ratio Rate of return

3.0

n/a*

* The rate of return is not reported for the social perspective because the beneficiaries of the investment are not necessarily the same as the original investors.

Conclusion



IU School of Medicine drives the success of Indiana businesses, health care providers, and health systems. The medical school enriches the lives of students, supports state and local taxpayers, and advances the society in the state of Indiana by creating a more prosperous economy. This study demonstrates that IU School of Medicine increases the economic activity in the state, the earnings of its students, and the tax revenues received by the state. The medical school fills the state's talent pipeline with physicians who in turn provide high-quality health care to the people of Indiana and beyond. The school also fosters an environment for medical research and health care innovation to flourish. The alumni of IU School of Medicine strengthen the state through impactful economic and societal contributions.

In FY 2018-19, IU School of Medicine added **\$2.2 billion** in income to the state. This income would not have existed in the state without IU School of Medicine. This is an annual impact and will continue year after year as IU School of Medicine continues to serve students. The \$2.2 billion impact was equal to approximately **0.6%** of the total gross state product (GSP) of Indiana. The impact is equivalent to supporting **34,370 jobs**. In other words, **one out of every 116 jobs** in the state is supported by IU School of Medicine, the school's faculty, students, staff, and researchers. For every dollar students and taxpayers invested in the IU School of Medicine, students will receive **\$8.90** in the form of higher future earnings and taxpayers will receive **\$2.40** in the form of added tax revenues and government savings. By almost any measure and across every economic sector, IU School of Medicine delivers a substantial positive impact on the state and a strong return on investment for students, taxpayers, and Indiana as a whole.

*IU School of Medicine created **\$2.2 billion** for the state in FY 2018-19, which is equivalent to saying that **one out of every 116 jobs** in the state is supported by the activities of IU School of Medicine, the school's faculty, and its students.*

*For every dollar students and taxpayers invested in IU School of Medicine, they will receive an average of **\$8.90** and **\$2.40** in benefits, respectively.*

About the study

Data and assumptions used in the study are based on several sources, including the FY 2018-19 academic and financial reports from IU School of Medicine, industry and employment data from the U.S. Bureau of Labor Statistics and U.S. Census Bureau, outputs of Emsi Burning Glass's Multi-Regional Social Accounting Matrix model, and a variety of studies and surveys relating education to social behavior. The study applies a conservative methodology and follows standard practice using only the most recognized indicators of economic impact and investment effectiveness. For a full description of the data and approach used in the study, please contact IU School of Medicine for a copy of the main report.



Emsi Burning Glass provides colleges and universities with labor market data that help create better outcomes for students, businesses, and communities. Our data, which cover more than 99% of the U.S. workforce, are compiled from a wide variety of government sources, job postings, and online profiles and résumés. Hundreds of institutions use Emsi Burning Glass to align programs with regional needs, drive enrollment, connect students with in-demand careers, track their alumni's employment outcomes, and demonstrate their institution's economic impact on their region. Visit economicmodeling.com/higher-education to learn more or connect with us.