

Bioscience Economic Development Strategy for the Great Falls Development Authority in Great Falls, Montana, Region

October 2022





Great Falls Development Authority



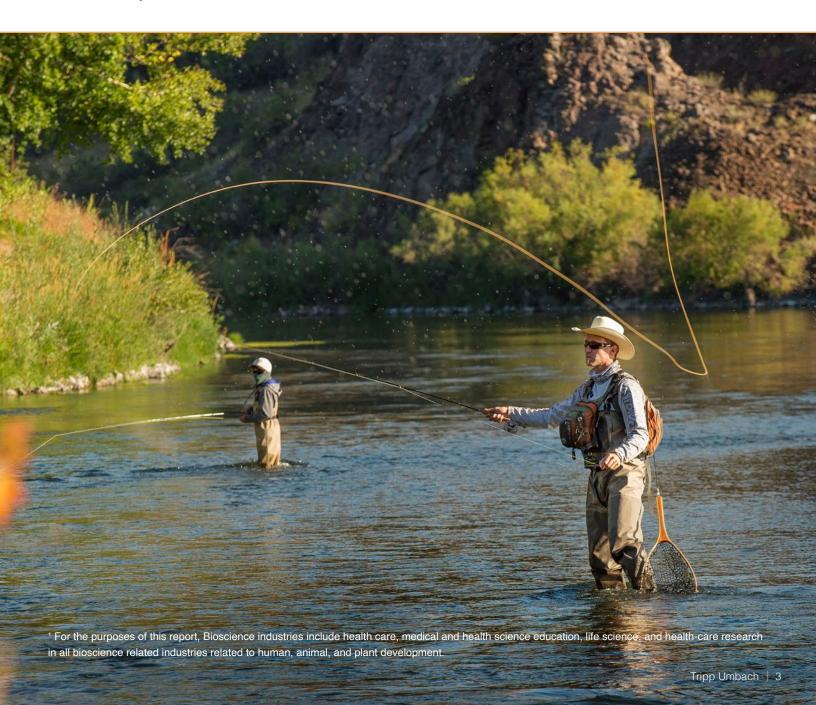
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Introduction

The Great Falls Development Authority (GFDA) commissioned Tripp Umbach to create an economic development strategy to grow and diversify bioscience-related industries¹ in Great Falls. This report continues GFDA's ongoing strategic planning process to expand and diversify the regional economy by focusing on transformational initiatives.

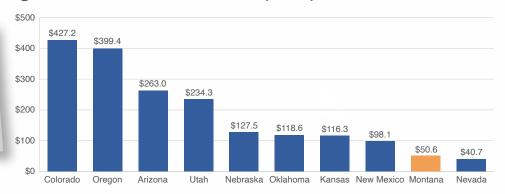
The Great Falls community has many excellent health and bioscience assets and the momentum to expand those resources. This study begins by evaluating other communities and regions that have successfully leveraged health and bioscience assets to drive significant investment in bioscience economic developments. The study evaluates strategies having the greatest opportunity for growing the economy in the Great Falls region. This study also provides recommendations for the GFDA to move forward with specific initiatives to measurably advance the health and bioscience economy over the next five years.



Executive Summary

NIH Funding in Peer States in millions (2019)





NIH Funding in Montana in millions



- NIH funding in recent years has been flat or declining.
- Montana received \$47.9 million in NIH research funding in 2021, about 10 times less than Colorado and just more than half of what Nebraska received.

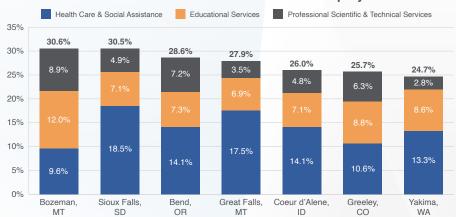
Peer Market Comparisons

Great Falls has a stronger health-care economy compared with peer markets, with 17.5% of total regional employment engaged in the health-care sector.

Higher education as a percentage of total employment in Great Falls is on par with peer markets, with nearly **7%** of all jobs in the region in the higher education sector.

Scientific and technical service employment in Great Falls lags behind peer markets, with less than 4% of jobs in scientific and technical service industries.

Percent of Total Bioscience Related Employment



Roadmap for Bioscience Economic Development in Great Falls

Health and Bioscience District

Bioscience Incubator

Graduate Medical Education Consortium

Veterinary School of Medicine

Economic & Social Impact to Great Falls, MT

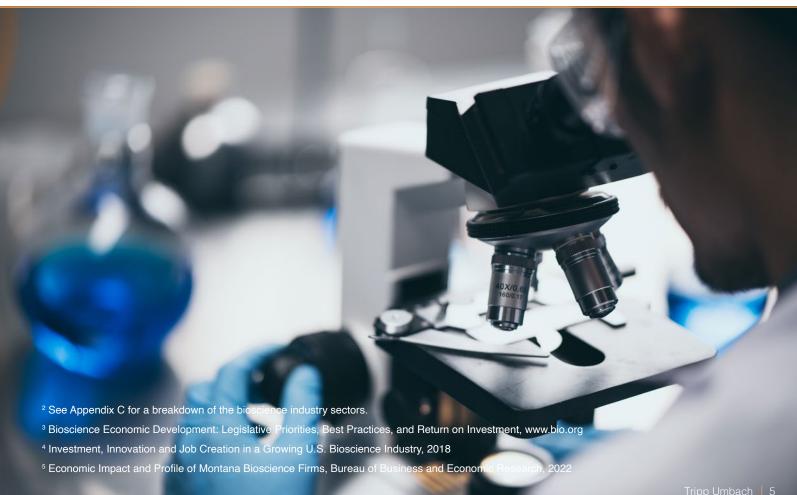
Key Findings

Key Finding 1: Bioscience is a growing industry nationally and regionally.

The bioscience industry² is an important and growing driver of the U.S. economy, accounting for more than 1.6 million jobs and an additional 5 million jobs because of the economic multiplier effect.3

The nation's bioscience industry generates high-paying, quality jobs, leading to significant economic impacts. The importance of the bioscience industry as an economic engine for the nation is emphasized by its wage levels. Wages in the bioscience industry are nearly two times the overall U.S. average. The average bioscience worker earns more than \$107,000, which is \$50,000 more than the nation's private sector average. 4 Bioscience workers earn wages almost double that of their counterparts in other major industries, which is reflective of the highly innovative, value-adding nature of the industry and the education and skills required.

The United States leads the world in growth of bioscience-related industries. Global competition within the industry, however, has been rapidly increasing. State-sponsored programs to encourage investment and assist bioscience companies in leveraging existing resources are vital to the growth of this innovative industry in the United States and the Great Falls region. Montana's bioscience industry is also growing. In the pandemic year 2020, although state employment fell, Montana bioscience employment registered significant gains. The overall job growth from 2015 to 2020 was 30%, which is more than 12 times larger than job growth in the private sector.5



Key Finding 2: Montana trails peer states in bioscience development but is poised for growth.

Federal funding for bioscience research is a vital element in attracting and advancing science- and technology-driven industries. The National Institutes of Health (NIH) is recognized as the nation's primary funder of biomedical research, leading to better health, economic growth, and advances in scientific knowledge. NIH funds research for colleges, universities, hospitals, and other biomedical research institutions. NIH research funding directly impacts trends in bioscience-related academic research. as health sciences represents 53% of NIH expenditure totals. Figure 1 represents the amount of NIH funding in different states. Montana in 2019 received \$50.6 million, which lagged behind peer western states.

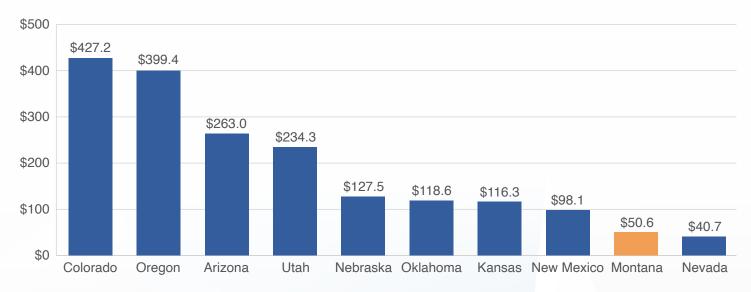


Figure 1: 2019 NIH Research Funding by State in Millions

Not only does Montana have lower levels of federal bioscience research and development funding than peer states, but the amount of NIH funding has also been flat or declining in recent years.



Figure 2: NIH Research Funding in Montana

Of peer states, Montana, and South Dakota are most similar in terms of tax environment, urban population density, and number of biology degrees awarded (See Table 3). If Montana had the same number of biotech jobs as South Dakota in the agriculture biotech field, the state would have an additional 4,800 jobs at an annual salary of \$83,000, resulting in \$173 million annual increase in direct income.⁷ Tripp Umbach estimates that the additional 4,800 jobs would represent more than \$600 million in total economic impact to the state's economy.

Table 3: Peer State Analysis of Biotech Jobs

State	Biotech Jobs	Tax Environment Ranking	University Presence	% of Pop. Urban
Utah	34,000	10th	Brigham Young, Utah State University	90.6
Nebraska	17,000	28th	University of Nebraska	73.1
South Dakota	6,000	2nd	University of South Dakota	56.7
Montana	3,200	5th	Montana State University, University of Montana	55.9

When evaluating the peer states listed above, Tripp Umbach found a greater-than-average focus on agriculture and animal biotech and relatively lower wages in biotech sectors but still higher wages relative to the U.S. average. Universities are the locus of growth, aiding in the establishment of incubator centers and workspaces. University spin-offs and small companies drive growth as well as job creation. Relative to South Dakota, which is similar in terms of urbanization and non-farm jobs per capita, Montana has roughly half as many jobs in bioscience companies. Overall, investment in workforce development is critical, as bioscience wages tend to be 40-50% greater than state averages. The existing bioscience industry in the state supports 4,729 jobs, \$450.8 million in annual income received by Montana households, and \$918.4 million more in annual gross receipts of Montana business and non-business organizations.8

According to the Montana Department of Labor and Industry, Montana's economy grew an inflationadjusted 6.7% in 2021, the seventh largest rate of growth in the country. It also marks the sharpest rate growth in Montana in more than 40 years. Montana ranks sixth in employment growth rates among the much larger states of Washington and California, despite the challenges in recruitment and retention of the workforce to the area. Economic growth in Montana is expected to continue for the foreseeable future.

⁷ The biotech industry employment multiplier is estimated to be roughly 5.

⁸ The Economic Impact and Profile of Montana Bioscience Firms, Bureau of Business and Economic Research, 2022

Key Finding 3: Great Falls has an opportunity to be a regional health-care and bioscience hub

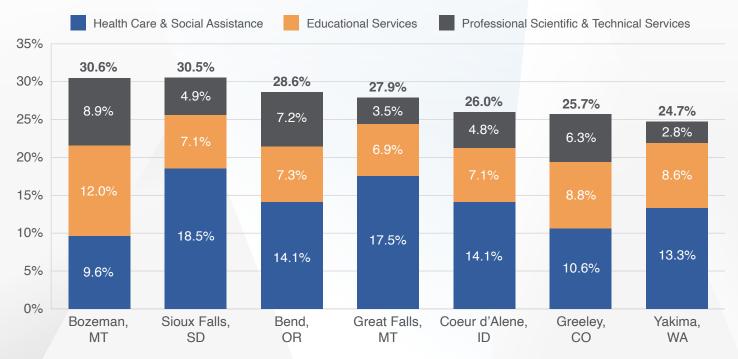
Most bioscience activity occurs mainly within the western half of Montana as smaller hubs have formed around the cities of Billings, Bozeman, Hamilton, Kalispell, and Missoula. The industry, while mostly concentrated in Western Montana, has an employment footprint across a majority of the state. From 2020 to 2021, bioscience employed workers in 23 of the state's 56 counties.

Employment in biosciences in Great Falls have grown in the past decade, exceeding the average rate of employment growth within the regional economy. Bioscience stands out as an industry that will continue to support growth in the state even while other parts of the economy fade.

Growing the bioscience industry in Great Falls, Montana, will continue to fuel growth throughout the state, supporting local and state economies through increased local spending and tax revenues. Proximity to upstream and downstream firms in the sector can attract entry by similar firms. In one recent study, having at least one incumbent firm in the sector attracts entry by others as a concentration of incumbents makes a difference in attracting start-ups.9

The centralized location of Great Falls and available sites for development offer a variety of industrial and technological opportunities for different enterprises to thrive. Great Falls also has exceptional quality-of-life assets and cost of living below that of peer markets. Benchmark data collected by Tripp Umbach indicates that the Great Falls area currently has an underdeveloped science and technical employment sector, with the bioscience being a subset of this broader cluster, when compared to peer markets. However, Great Falls has a larger health-care sector when compared with peer markets and an equally strong higher education sector in terms of percent of total employment. See Figure 4.

Figure 4: Percent of Total Employment in Bioscience-Related Sectors in Great Falls and Peer Markets (2019)



⁹ Artz, G. M., Kim, Y., Orazem, P. F., & Han, P. J. (2021). Which Small Towns Attract Start-Ups and Why? Twenty Years of Evidence from Iowa. American Journal of Agricultural Economics, 103(2), 702-720.

Key Finding 4: Great Falls has a growing bioscience cluster.

Growing the bioscience industry in Great Falls must be driven by connecting regional assets and focusing future investments in health care, higher education, research, and bioscience industry development and attraction. Regarding research and development, the McLaughlin Research Institute is an established center for neurogenetic research on Alzheimer's, Parkinson's, and other degenerative nerve diseases. The Institute is poised for growth as it develops stronger relationships with universities, health-care systems, and medical schools. Regarding medical education, Touro University and multiple health-care partners are moving forward with a new research-oriented osteopathic medical school in Great Falls in close proximity to McLaughlin, colleges and universities, and health-care systems. Besides the aim of the new medical school to help the state address the physician shortage and increase access to health care, it is also an important driver of expanding the bioscience economy.



Proximity to academic innovation is a driving influence of bioscience industry growth in Montana and nationally. Academic research anchors offer extensive collaborations with other research institutions and a multi-disciplinary approach that integrates complementary technologies to create a focus in a broad-based area of the biosciences. Existing and newly established partnerships that integrate entrepreneurship and industry involvement the research experience facilitate the path from research to commercialization and help innovative ideas reach the marketplace.

In a recent study by The Bureau of Business and Economic Research,¹⁰ the economic impact of the Touro University College of Osteopathic Medical School will support 278 jobs for each year of the two-year construction period and support 360 jobs when the school is fully operational. Construction alone will bring more than \$50 million in spending to Great Falls. Job gains are expected to grow substantially as the graduates impact the health-care workforce throughout the state. Within 10 years of the school's full operation, annual income received by Montana households is expected to equal more than \$110 million and employment in the region will grow to more than 1,800. These significant impacts highlight the strong linkages between the new medical school's operations and the state's economic strength.

Entities already in place in Great Falls provide strong momentum in moving forward with a growing health and bioscience district. The addition of a College of Veterinary Medicine associated with one or more of the higher education players can also add to regional strengths in agriculture and animal-related bioscience research and development. No doctor of veterinary medicine degree is available in Montana nor the four bordering states (see Figure 5).

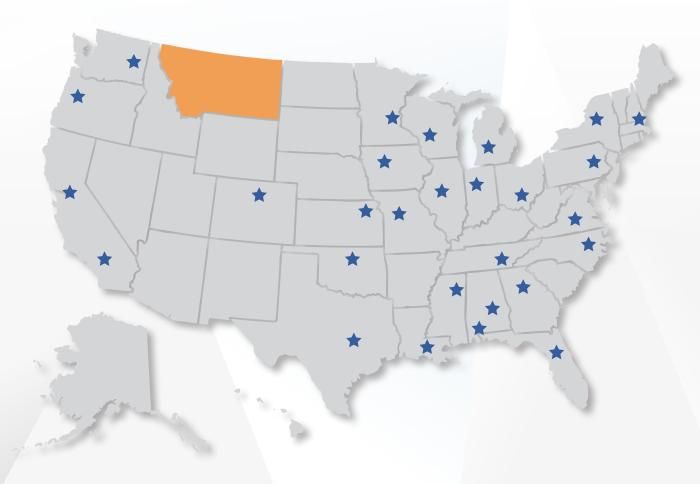


Figure 5: National Veterinary School Locations

¹⁰ The Economic Impact of the Montana Osteopathic Medical School, Bureau of Business and Economic Research, 2021

Recommended Priorities and Strategies

1. Establishing a Health and Bioscience District in Great Falls, Montana

Social capital is important for communities like Great Falls that are more remotely sited and more reliant on their own spirit of collaboration than larger cities or metropolitan areas. A recent study found that social capital makes up for deficiencies related to purely market forces. These results suggest that fostering a strong bioscience economic development coalition will enable Great Falls to compete with better positioned communities in Montana and neighboring states. Therefore, Tripp Umbach believes that local economic development groups such as GFDA are critical in opening businesses in more remote towns that might have greater constraints on resources and technical assistance for businesses.¹¹

Tripp Umbach recommends that the GFDA continue with a second phase of the current bioscience economic development strategy by coordinating a focused Healthcare and Bioscience District implementation plan for the purpose of coordinating, marketing, and communicating specific actions within the district over the next five years. Moving forward with such a plan will galvanize strong partnerships among industry, higher education, health care, and state government and lead to the development of a thriving Healthcare and Bioscience District. Ongoing engagement with representatives from healthcare and bioscience partners including Benefits, Great Falls Clinic, McLaughlin Research Institute, Touro Medical College, Great Falls College MSU, University of Providence, and others represents a vital first step in identifying and recommending strategies in sustaining and growing this important industry segment.





Bioscience Incubator at McLaughlin Research Institute

To achieve the goals of the Healthcare and Bioscience District, investment in Montana biosciences in the Great Falls region must be scaled up considerably, from both the public and private sector, to compete within an increasingly competitive environment with peer markets. Expanding the research base will lead to health-care breakthroughs and discoveries will lead to innovations and new products.

Therefore, Tripp Umbach recommends immediate action to advance research and innovation research infrastructure through developing an incubator at the McLaughlin Research Institute. The goal of the Healthcare and Bioscience District is to be transformational – to enable Montana to rise to a new stature in the biosciences and be competitive on the national level. It is recommended that a \$2 million grant be secured before the end of 2022 to develop 2,000 square feet of space within the institute, to develop a full-time staffed office of translational commercial development, and a research grant program to support start-up firms. These initial steps are vital to begin the process of growing bioscience companies in Great Falls and to serve as encouragement from established firms to invest and grow in the region.

Expanding Graduate Medical Education Training throughout Montana 3.

Expected population growth in Montana will drive the need for more physicians and for the state to fund residency training programs. According to a study conducted by the Weldon Cooper Center for Public Service at the University of Virginia, Montana's population is projected to expand by 15% from 2020 to 2040 – an increase of 161,669 people. Projections indicate that by the year 2030, Montana will need more than 500 additional primary-care physicians. Physician workforce development is an impediment in Montana's economic growth, as Montana ranks among the most underserved states in most areas of health-care delivery, in large part because of shortages of physicians. Access to care, particularly in primary care, if not addressed could negatively slow economic progress. Therefore, Montana must develop new residency programs over the next few years to close the gap in the number of physicians needed in the state.

Tripp Umbach recommends additional state investment in expanding the state's residency training capacity, as it will leverage recent federal increases CMS funding for hospitals to develop new or expanded residency training programs. State and federal funding, coupled with support from communities and local hospitals, will lessen the discrepancy between the number of new medical school graduates and the number of GME positions available in Montana, thereby increasing the number of physicians who will remain in Montana after graduation to provide health-care services. Proposed state funding would provide critical startup funding to hospitals as once reimbursement from CMS starts to flow to the hospital, the programs are self-sustaining.

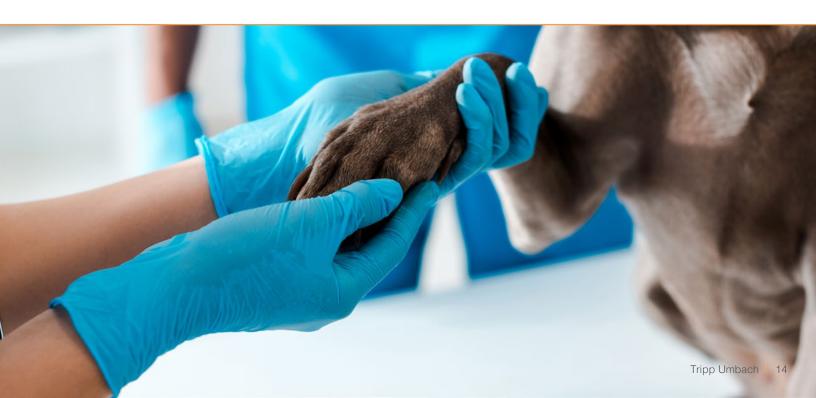
A consortium of Montana-based medical schools and health system is needed to advocate for GME expansion as the most effective strategy that Tripp Umbach recommends. In Utah, a new state start-up funding program for hospitals will erase the leading barrier in developing new residency training programs at hospitals that qualify to establish a federal funding stream. Once accredited by the Accreditation Council for Graduate Medical Education (ACGME), The Center for Medical Services (CMS) provides funding to eligible hospitals to support residency training physicians. Federal funds are distributed after expenses from training programs appear on the hospitals' annual financial reports. As a result, funding to the hospital is not initiated from CMS until 12-18 months after the residency program has started. A state-sponsored bridge program in Indiana has resulted in more than 200 new residency positions and is expected to have an economic impact of \$500 million by 2035. The return on investment to Indiana is expected to exceed \$30 in economic impact for every \$1 that is invested.

4. Evaluating Feasibility of a Veterinary School of Medicine in Great Falls, Montana

The strength and success of the future regional economy increasingly depends on the ability to innovate and provide solutions for farmers, manufacturers, energy producers, retailers, and consumers. Bioscience plays a leading role in strengthening food and energy security, reducing waste, and improving animal health for sustainability of our world. The Great Falls region is already an important agriculture and animal production region, although a great deal of the economic spinoff from these industries leaves the state. Further, since the region does not have a research-intensive college of agriculture or veterinary medicine professional degree program, most of the research and innovation impacts leave Montana and flow to Washington, Minnesota, and Colorado.

Adding a School of Veterinary Medicine in Great Falls will advance research to improve health outcomes for animals and people – as well as their impact on the environment. Global ecosystems, with connections among plants, animals, and humans, are becoming a focus of economic development programs. There is an immediate need to understand these systems as the world's population continues to grow. Researchers are studying methods to effectively scale and allocate resources efficiently and safely. Research advances in public health and the environment are integral to address current and future issues related to food safety, food security, safeguarding animal populations, and sustainable agriculture.

A new School of Veterinary Medicine in Great Falls that serves Montana and four adjoining states will accelerate current and future initiatives in bioscience economic development. This program would help grow future Veterinary Technician programs at Great Falls College and strengthen research ties with Montana State University and the University of Montana. Tripp Umbach recommends that Touro University in partnership with the GFDA lead a feasibility study to evaluate a Veterinary Medicine program in close partnership with the multiple partners in Montana and neighboring states. To gather the resources needed to develop a sustainable veterinary medicine program, Tripp Umbach recommends that a steering committee be formed to develop an implementation strategy for a private vet school in Great Falls, supported by a multi-state consortium of public and private organizations.



Conclusion

The economic vitality of the Great Falls region would benefit from a successful and essential healthcare and bioscience district. After an in-depth nine-month study, Tripp Umbach recommends that the Great Falls Development Authority move forward with promoting Great Falls as a growing health-care and bioscience hub by moving forward with the below initiatives.

- 1. Healthcare and Bioscience District Development Plan
- 2. Bioscience Incubator at the McLaughlin Research Institute
- 3. Graduate medical education consortium and state funding program
- 4. Feasibility study for a School of Veterinary Medicine

These actions over the next five years will provide foundational pieces for Great Falls to become a bioscience hub and magnet for inward investment over the following 20 years.



Appendix A: Summary of Stakeholder Interviews

Strengths

Community Collaboration Strong Momentum McLaughlin Research Institute Healthcare Organizations **Higher Education Touro Medical College** Quality of Life Location

Challenges

Workforce, Recruitment, Retention Housing State and Federal Funding Lack of Coordinated and Branded Health and Education District Underdeveloped Bioscience Industry Community

Opportunities

Overall Attraction to the Great Falls Area/Population Growth Higher Paying Jobs, Higher Levels of Education Improved Quality of Healthcare and Attraction of Patients to Great Falls Area More Innovation-Based Economic Development

Appendix B: Existing Conditions

The State of Montana

Montana is a vast area of open space, situated in the northwest portion of the United States. The state is fourth-largest in sheer size, but its population statistics are a testament to a geography that is not suitable for large development.¹² As of 2022, Montana's population is 1.1 million. Montana's estimated population grew 1.8% from 2020 to 2021.

The state is home to few large urban areas. The largest city is Billings (Yellowstone County), home to 117,445 people in 2021. Other sizable cities are Missoula (Missoula County, population 119,533) and Great Falls (Cascade County, 84,511). Great Falls lies near the center of Montana on the northern Great Plains, next to the Rocky Mountain Front and about 100 miles south of the Canada-U.S. border. With a population at the 2021 census of 60,403, Great Falls is the largest city in Cascade County, which had a population of 84,511.

County Health Rankings¹³

The Robert Wood Johnson Foundation and the University of Wisconsin Population Health Institute collaborate to conduct the County Health Rankings & Roadmaps program. The goals of the program are to:

- Build awareness of the multiple factors that influence health.
- Provide a reliable, sustainable source of local data to communities to help them identify opportunities to improve their health.
- Engage and activate local leaders from many sectors in creating sustainable community change.
- Connect and empower community leaders working to improve health.

The rankings measure vital health factors in every county in America. They provide a snapshot of how where we live, learn, and work impact our health. They provide a starting point for change in communities. Montana has 56 counties, ranked on a scale from 1 (healthiest) to 48 (least healthy) with eight counties not reporting.

¹² Montana Population. (2020-05-04). Retrieved 2020-05-15, from http://worldpopulationreview.com/states/montana/

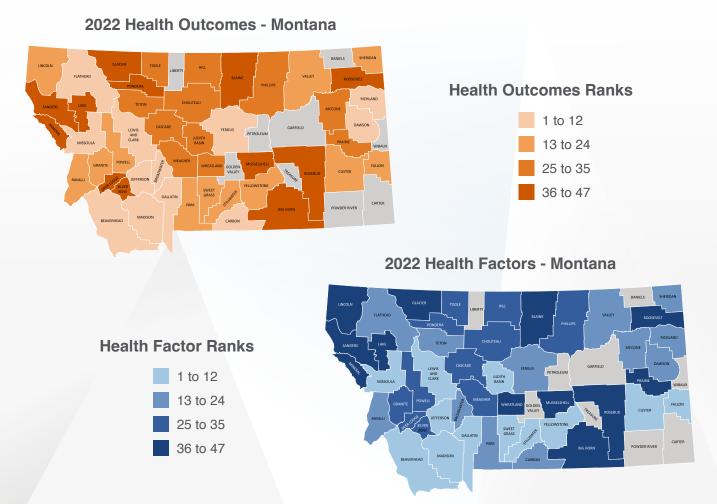
¹³ County Health Rankings & Roadmaps: www.countyhealthrankings.org

Reviewing the 2022 County Health Rankings, the rankings for Health Outcomes (27) and Health Factors (25) show Cascade County ranks poorly when compared to the remaining counties in Montana. Counties are ranked relative to the health of other counties in the same state on the following summary measures:

- Health Outcomes: Two types of health outcomes to represent the health of each county: length of life (premature death) and quality of life (physical health, mental health, and low birthweight). These outcomes are the result of a collection of health factors and are influenced by existing programs and policies at the local, state, and federal levels.
- Health Factors: A number of different health factors shape a community's health outcomes. The County Health Rankings are based on weighted scores of four types of factors:
 - Health behaviors (nine measures)
 - Clinical care (seven measures)
 - Social and economic (nine measures)
 - Physical environment (five measures)

Figure 7 shows the overall health outcomes and the health factors in Montana. Darker shades (higher rankings) indicate areas with poor rankings. As both maps reveal, Montana represents different clusters of counties with poor health ratings.¹⁴

Figure 7: 2022 Montana Health Outcomes and Health Factors



¹⁴ County Health Rankings & Roadmaps, 2020, www.countyhealthrankings.org

Appendix C: Bioscience Industry

Defining the biosciences can be challenging because of the complex mix of technologies, products, markets, research and development focus, and companies themselves. The industry includes companies engaged in advanced manufacturing, research activities, and technology services, but has a common thread or link in their application of knowledge in the life sciences and how living organisms function.

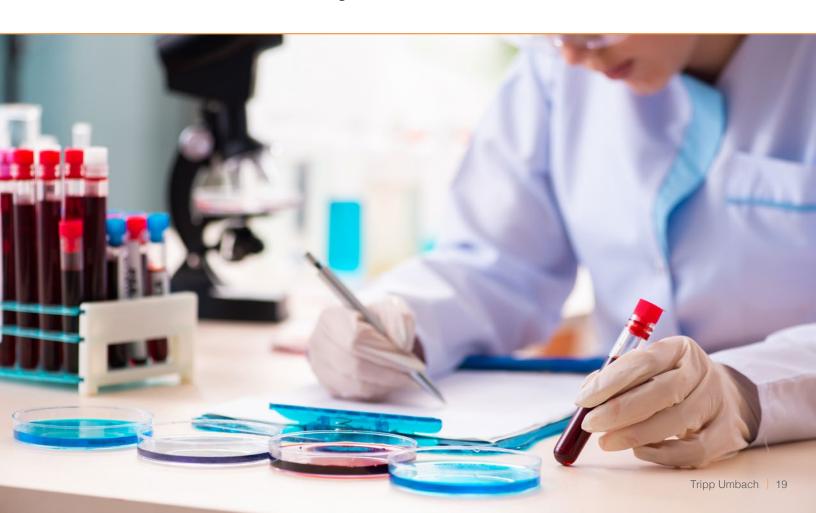
Agricultural Feedstock and Industrial Biosciences – Engagement in agricultural processing, organic chemical manufacturing, and fertilizer manufacturing. The subsector includes industry activity in the production of biofuels.

Bioscience-Related Distribution – Coordination of delivery of bioscience-related products or services spanning pharmaceuticals, medical devices, and agriculture biotechnology. Distribution in the biosciences is unique in its implementation of specialized technologies including cold storage, highly regulated monitoring and tracking, and automated drug distribution systems.

Pharmaceuticals and Drugs – Development and production of biological and medicinal products and manufacture of pharmaceuticals and diagnostic substances.

Medical Equipment and Devices – Development and manufacture of medical instruments and supplies, laboratory equipment, imaging equipment, and more.

Research, Testing, and Medical Labs – Engagement in research and development in biotechnology and other life sciences, life science testing laboratories, and medical laboratories.



Appendix D: Peer State Analysis of Biotech Sector Presence

Table 8 represents peer states compared to Montana. Utah, South Dakota, and Nebraska have greaterthan-average biotech sector presences as well as job growth. The states are ranked in Table 8 below from highest to lowest biotech sector growth and specialization. The first state, Utah, is highest-paying in the biopharma sectors and devices and has diverse specialization. South Dakota has a strong presence in agriculture and distribution and a less research intense biopharma sectors. Nebraska is also strong in agriculture and some research specialization.

Table 8: Peer State Analysis of Biotech Sector Presence

State	Utah	South Dakota	Nebraska	Montana
Population	3,271,616	886,667	1,961,504	1,084,225
Nonfarm Jobs (1000s)	1646.9	438.3	1029.8	486.2
Population Density	39.7	11.7	25.5	7.4
Nonfarm Jobs/ Population	0.50	0.49	0.53	0.45
Population with bachelor's or Higher (2014-2018)	33%	29%	31%	31%
Agricultural	0,0	+,+	+,0	0,0
Devices & Equipment	+,+	+,+	+,+	0,+
Distribution	0,+	+,+	+,+	0,+
Drugs & Pharm.	+,+	0,+	0,+	0,+
Research	+,+	0,0	0,0	0,0
Sectors with Growth & Specialization	3	3	2	0

Appendix E: About Tripp Umbach

Founded in 1990 Tripp Umbach is among the most established and respected private consulting firms in the United States. Tripp Umbach is a force in economic, community development, and planning. With more than 1,000 clients throughout the United States and internationally, Tripp Umbach is a leading provider of consulting services with the philosophy of turning ideas into action and impact to make the world a better place. Tripp Umbach has a rich history rooted in planning, community assessment, economic impact assessment, and economic development. Tripp Umbach continues to expand its consulting services at the intersection of community and economic development, population health research, higher education, economic development, and real estate development. Tripp Umbach applies advanced Economic Design Thinking tools to solve the most complex problems facing organizations, communities, and society at large. Tripp Umbach's projects over the past 30 years have resulted in more than \$30 billion in economic impact to communities throughout the world.

Tripp Umbach has completed strategic roadmaps for transforming economic development in communities throughout the United States. Our work in Phoenix, Arizona; Miami, Florida; Pittsburgh, Pennsylvania; and Spokane, Washington, has resulted in billions of dollars in bioscience -related economic development. Recently, Tripp Umbach evaluated the feasibility for the Touro University College of Osteopathic Medicine in Great Falls and has a consulting relationship with Montana State University.



