



**CAMBRIA
GROVE**

UTAH HEALTH CARE INNOVATION LANDSCAPE



2019

**UTAH
HEALTH CARE
INNOVATION
LANDSCAPE**

**REPORT PREPARED BY CAMBIA GROVE
IN PARTNERSHIP WITH EDCUTAH**



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Dear Health Care Innovation Community,

Cambia Health Solutions is a taxpaying non-profit family of more than 20 companies including Regence BlueCross BlueShield of Utah, working toward a Cause — To serve as a catalyst to transform health care, creating a more person focused and economically sustainable health care system. As a company over 100 years old, we believe the future is dependent on innovating better, more personalized health care experiences through research, and development of new ideas, products and services.

Utahans have paved the way toward health care transformation by focusing on consumers for decades. The innovation ecosystem is built on a pioneering history, abundance of technology entrepreneurs, strong research and a legacy of life-changing medical-device development. Utah has become a leader in driving our health care system into the next generation, through the convergence of talent and commitment.

A shared vision and approach has made us proud to be part of the Utah health care community since 1942. We are happy to partner with Governor Gary R. Herbert and the Economic Development Corporation of Utah to develop this report, showcasing a new way to envision the health care innovation landscape. We move forward together, not constrained by industry classifications, but instead focused on meeting the needs of people and their families — for whom our company and all health care companies were created.

Sincerely,

A handwritten signature in blue ink, appearing to read "Mark B. Ganz".

Mark Ganz
President and CEO
Cambia Health Solutions

WELCOME

Cambia Grove and the Economic Development Corporation of Utah collaborated to create this report in an effort to measure the current state of the health care innovation industry in the state of Utah. The health care innovation industry is a sub-category of the overall health care economy, driving progress and innovation in health care.

A thorough analysis of the health care innovation industry and the overall health care economy shows that health care is quickly evolving. New technologies and research are changing the way we think about health care, and the innovation happening in Utah and other states is driving this change. This report identifies and quantifies the health care innovation work in the state of Utah, including health IT, digital health, innovative services, and life sciences.

This report follows a similar Cambia report from 2015 that measured the health care innovation sector in Washington state.

ABOUT CAMBIA GROVE

Cambia Grove is a health care innovation hub based in Seattle, Washington, focused on bridging the gap between entrepreneurs and the traditional health care sectors in communities across the country. Cambia Health Solutions, which was founded a century ago in the logging camps of the Pacific Northwest and is driven by a mission to transform the way people experience health care, launched Cambia Grove in 2015 to connect with like-minded changemakers to create solutions that advance Cambia's Cause to create a person-focused and economically sustainable health care system.

ABOUT EDCUTAH

Since 1987, EDCUtah has worked with state and local government and private industry to attract and grow competitive, high-value companies and spur the expansion of local Utah businesses. EDCUtah is a private nonprofit organization.



STATE OF UTAH

GARY R. HERBERT
GOVERNOR

OFFICE OF THE GOVERNOR
SALT LAKE CITY, UTAH
84114-2220

SPENCER J. COX
LIEUTENANT GOVERNOR

Dear reader,

On behalf of the state of Utah, thank you for your interest in the state's innovative health care industry. Two key components of our innovative health care industry are life science and technology. These two clusters are among the state's largest industries and provide a strong foundation for Utah's economy.

In Utah we are especially proud of our business-friendly environment in our life science and technology industries. Jobs in these fields are well compensated, challenging and highly desirable for our talented workforce.

Utah is uniquely situated to have an impact on the health care innovation industry. Our roots date back to the 1800's, when pioneers settled our great state. The state of Utah is known for its happy and industrious, hardworking people. With our heritage and work ethic we build innovative health care companies, with the goal to improve access and quality health care to Utahns.

An example of this is Utah's own Ancestry.com, which is the largest for-profit genealogy company in the world. Ancestry.com, and AncestryDNA, provide access to more than 16 billion historical records, and use those records to identify ancestors and uncover health related records and information.

In 2017, the economic impacts of the life science industry in Utah included 130,439 jobs and \$13 Billion in GDP.

Utah has gained a reputation for being highly-educated, healthy, young, and multilingual. Our state's unparalleled access to outdoor recreation, family-friendliness, and affordability represents a great quality of life that keeps Utahns in the state and attracts professionals from all over the country.

You may have heard of our Silicon Slopes—a hotbed for innovative tech startups just south of Salt Lake City. Our health community is just as vibrant, made up of reputable companies such as Merit Medical Systems, Becton Dickinson, Edwards Lifesciences, Varex Imaging, Health Catalyst, and BioFire Diagnostics. Not to mention our renowned network of medical experts, practitioners and researchers. These two communities are becoming increasingly integrated, resulting in a sweet spot of opportunity for further health care innovation growth in Utah.

I hope you'll enjoy reading more about health care innovation in Utah. Please don't hesitate to reach out to my friends at Cambia and EDCUtah for more information.

Sincerely,

Gary R. Herbert
Governor

HEALTH CARE ECONOMY

STATE REVIEW OF 2019

The health care industry plays an important role in the United States economy, and it is no different in the state of Utah. The overall health care economy in Utah employs over 200,000 people and is a major contributor to GDP, job growth, and other important economic metrics. Utah enjoys a compelling history of health care innovation and quality health care. Utah's population consistently ranks as one of the healthiest in the nation, with some of the lowest per-capita health care costs. Utah ranks 5th in the nation on the United Health Foundation's 2017 "America's Health Rankings," with impressively low rates of smoking, cancer deaths, preventable hospitalizations, and a low percentage of children living in poverty. With health care evolving throughout the nation, innovation is needed, and Utah is at the forefront of that effort.

The traditional health care system is made up of the 5 Points of Health Care™: payer, provider, purchaser, patient, and policymaker.* The "health care economy" includes all aspects of health care, broken up into three sub-categories: traditional health care, expanded health care, and health care innovation. These three categories capture all direct and indirect functions of the health care economy. Analysis of these sub-categories of industry can shed light on the strengths and weaknesses of health care in Utah.

 <p>TRADITIONAL HEALTH CARE</p> <ul style="list-style-type: none"> • Ambulatory • Physician's Offices • Health Care Services • Hospitals • Nursing & Residential Care • Health Insurance 	 <p>EXPANDED HEALTH CARE</p> <ul style="list-style-type: none"> • Medical & Diagnostics Labs • General Medical Manufacturing • Pharmacies • Funeral Services • Public Health • Home Health • Health Care Retail & Wholesale 	 <p>HEALTH CARE INNOVATION</p> <ul style="list-style-type: none"> • Digital Health • Health IT • Life Sciences • Innovative Services <p><small>* For examples of each category, see the company list on pages 14-17</small></p>
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THE HEALTH CARE ECONOMY AND INNOVATION

The three categories that comprise the overall health care economy—traditional health care, expanded health care, and health care innovation—are increasingly important industries in Utah. While most only associate the health care industry with traditional categories, such as hospitals and ambulatory services, this report will focus on—and quantify—the rising tide of health care innovation. Companies that fit in the health care innovation sub-category drive innovation through research, product development, and technology. They keep the health care industry at the forefront of effectiveness.

In Utah, the health care innovation sub-sector is an important and meaningful part of the overall health care economy. With a 5-year job growth rate of 22.2% in **digital health, health IT, life sciences, and innovative services**, Utah continues to demonstrate strong recognition that innovation in health care is fundamental to the well-being of its citizens and economy.

Metrics	Traditional Health Care	Expanded Health Care	Health Care Innovation
Employment	164,839	31,885	34,130
Average Annual Wages	\$46,131	\$49,974	\$72,293
Employment Density	0.79	0.80	2.16
5-Year Job Growth	19.1%	15.4%	22.2%

The table above provides an overview of the health care economy as comprised by three sub-categories. Traditional health care includes the bulk of employment, with expanded health care and health care innovation making up just 14% and 15% of the total health care economy, respectively. While traditional health care and expanded health care both have average annual wages under \$50,000, health care innovation has a much higher average annual wage of over \$70,000. Health care innovation also has a higher 5-year job growth rate at 22.2%.

The table also shows employment density for each industry. Employment density is a measure of occupation density, with 1.0 representing the national average. Employment density less than 1.0 means there is a lower density of employment in that industry than the national average, while a score over 1.0 indicates a higher density. In Utah, health care innovation has employment density of 2.16, demonstrating density of over two times the national average.

SOURCES: JobsEQ, Bureau of Labor Statistics, Utah Department of Workforce Services

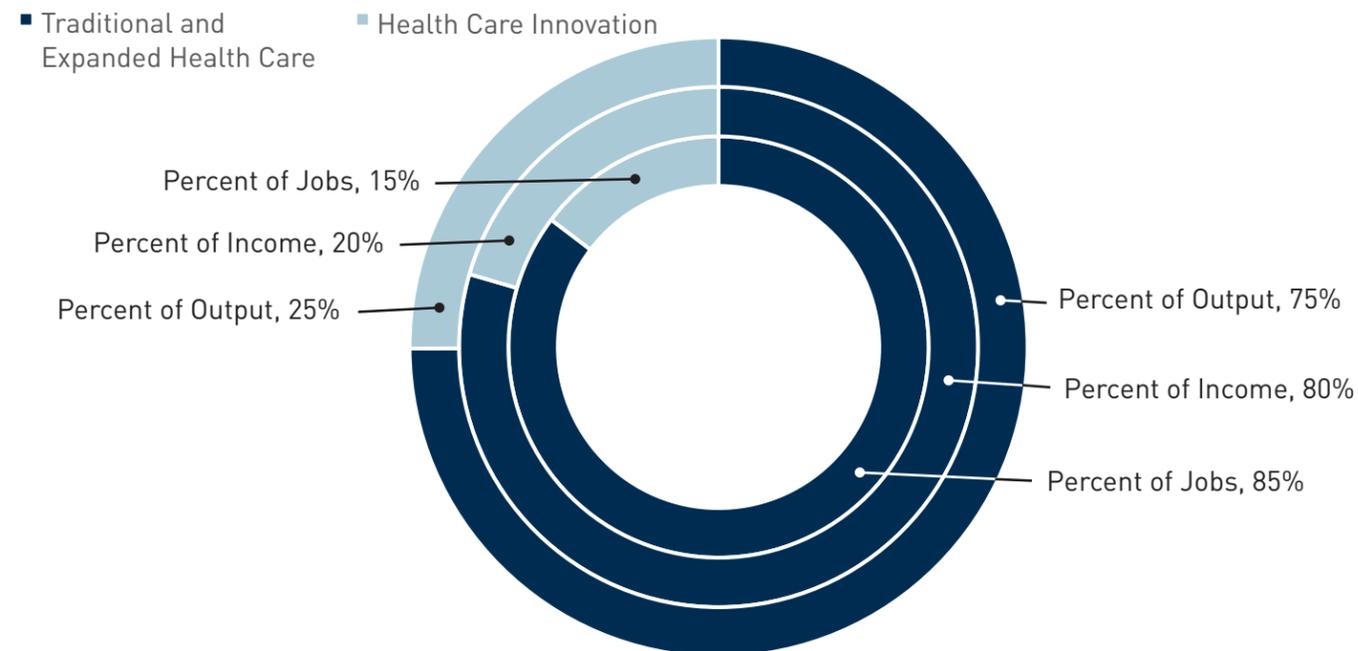
* 5 Points of Health Care™ is a trademark of Cambia Health Solutions. © 2018 Cambia Health Solutions. All Rights Reserved.

HEALTH CARE INNOVATION SECTOR

The health care innovation sub-category of the overall health care economy is defined as digital health, health IT, life sciences, and innovative services. This group of industries drive innovation in health care through research, development of products, technology and software, and other innovations. The industry cluster is also a key contributor to the Utah economy, demonstrating an output per worker far greater than the average in Utah. Workers in health care innovation are well compensated, highly skilled, and productive.

Metric	Total Utah Economy	Health Care Economy	Health Care Innovation
Compensation Per Worker	\$55,442	\$65,144	\$90,250
GDP Per Worker	\$102,155	\$88,065	\$149,411

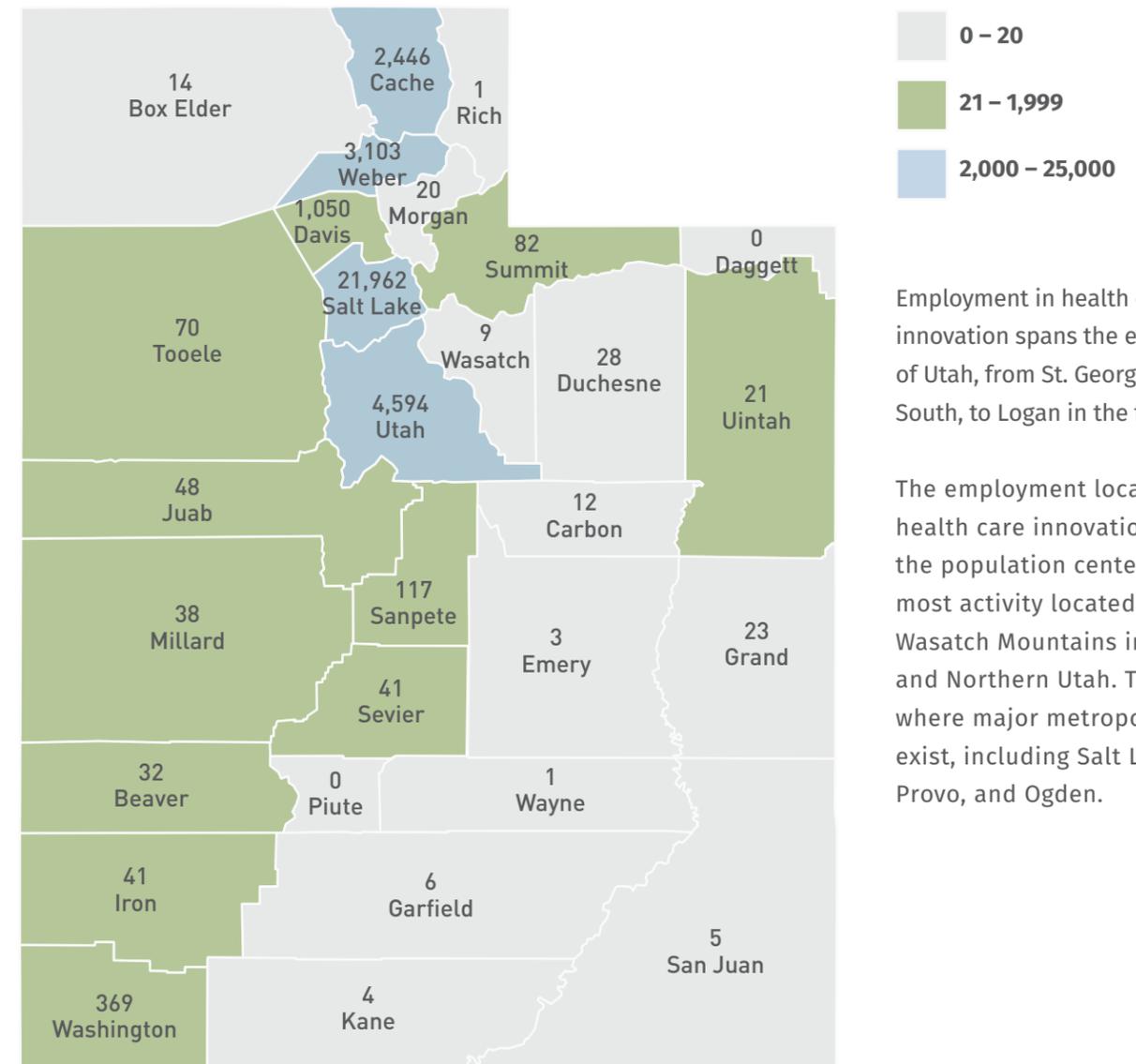
BREAKDOWN OF JOBS, INCOME, AND OUTPUT IN THE OVERALL HEALTH CARE ECONOMY



SOURCES: JobsEQ, Bureau of Labor Statistics, Utah Department of Workforce Services

Even though the health care innovation sector only accounts for 15% of total jobs in the overall health care economy in Utah, it accounts for 20% of total income and 25% of total output. Workers in the health care innovation sector are highly compensated and have an average output much higher than the average Utah worker. This bodes well for Utah, because health care innovation jobs have grown by more than 22% over the last 5 years and the density of employment in this industry in Utah is more than twice the national average.

EMPLOYMENT BY COUNTY



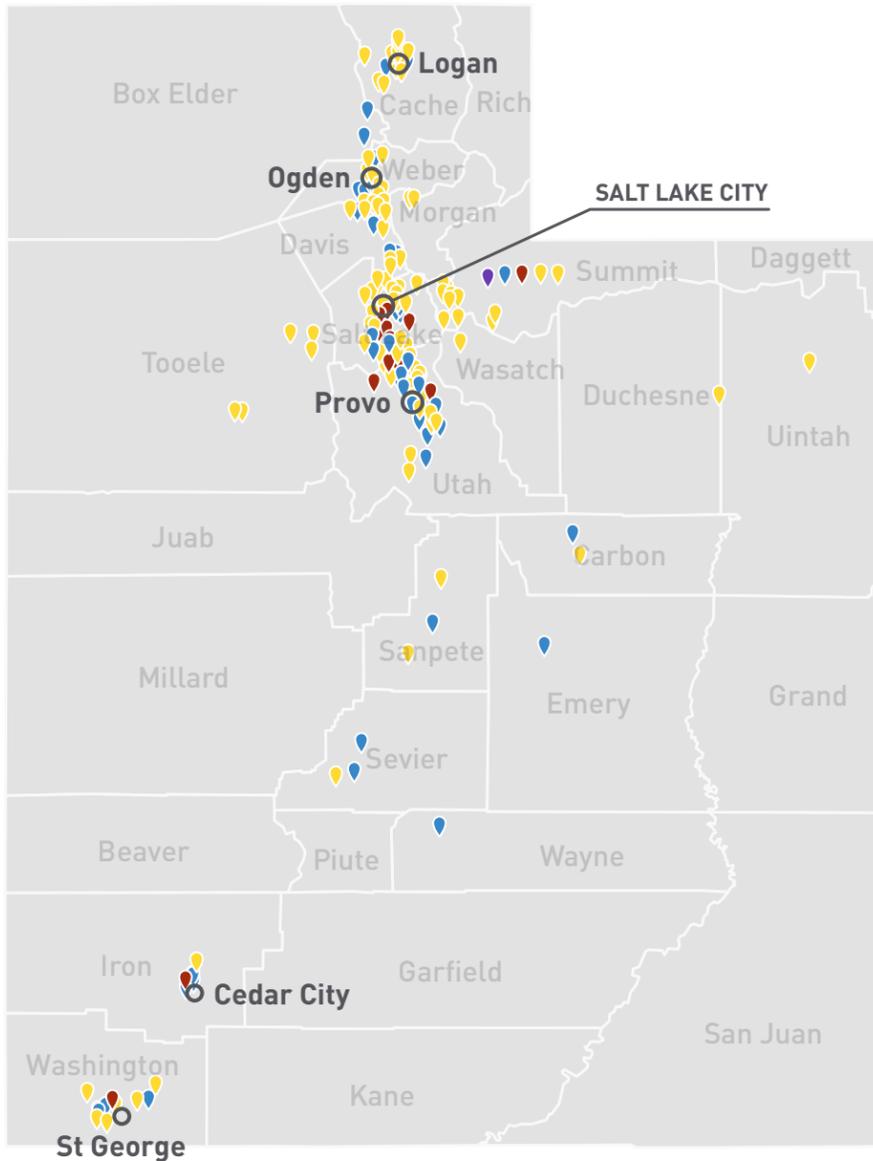
Employment in health care innovation spans the entire state of Utah, from St. George in the far South, to Logan in the far North.

The employment locations for health care innovation mirrors the population centers, with most activity located along the Wasatch Mountains in Central and Northern Utah. This is where major metropolitan areas exist, including Salt Lake City, Provo, and Ogden.

SOURCES: JobsEQ, Bureau of Labor Statistics, Utah Department of Workforce Services

FIRMS AND EMPLOYMENT BY INNOVATION CATEGORY

Category	Firms	Employment
Digital Health / Health IT	37	2,954
Life Sciences	364	28,941
Innovative Services	131	2,235
Total	532	34,130



Health care innovation companies can be found throughout the entire state of Utah. These companies fit within the four sub-categories of health care innovation: digital health, health IT, life sciences, and innovative services.

As with health care innovation employment, the number of firms in this industry continues to grow. New companies are added to the industry at an impressive rate each year, especially in health IT and the development of health-related software.



SOURCES: JobsEQ, Bureau of Labor Statistics, Utah Department of Workforce Services

MAJOR STARTUPS

“Utah is a hotbed for health care innovation. Utah offers a highly-educated, multi-lingual talent pool; a business-friendly environment; and a nationally-renowned network of medical experts, practitioners, and researchers. BioFire has benefited from each of these elements and is honored to play a small role in Utah’s leadership in expanding health care innovation.”

Wade Stevenson
SVP, Global Marketing
BioFire Diagnostics



Company	City	Category	Description
Aviacode	Salt Lake City	Innovative Services	Aviacode creates medical coding-related software and services that provide a proprietary SaaS-based workflow platform that helps to translate clinical documentation into billing codes.
AZOVA	Alpine	Health IT	AZOVA's Healthcare Commerce Cloud platform enables health care providers to increase revenue-per-patient, minimize A/R collections, maximize productivity, and reduce administrative costs.
Banyan	Orem	Health IT	Banyan is a provider of a health care communication platform created to humanize health care by connecting doctors with patients online and offline.
BioFire Diagnostics	Salt Lake City	Life Sciences	BioFire Diagnostics is a provider of DNA amplification. The company offers real-time thermocycling, mutation scanning, and genotyping services.
Biomerics	Salt Lake City	Life Sciences	Biomerics is a contract manufacturer that specializes in the design, development, and production of innovative polymer solutions for medical device and biotech industries.
Clene Nanomedicine	Salt Lake City	Life Sciences	Clene Nanomedicine created a drug development platform focused on growing therapeutic nanoparticles and developing highly reactive clean-surface nanoparticles at commercially viable rates.
Clinical Innovations	Murray	Life Sciences	Clinical Innovations is a manufacturer and distributor of medical devices used during child delivery, enabling them to ensure safety for the infant and mother.
Collective Medical Technologies	Sandy	Health IT	Collective Medical Technologies operates a real-time collaboration network enabling health care providers to collaborate with one another on vulnerable patients who require care across the community.
CoNextions	Salt Lake City	Life Sciences	CoNextions is a developer of a simple and rapid tendon repair technology dedicated to achieving safer, stronger, and more durable tendon repairs in patients.
Connexion Point	Sandy	Health IT	Connexion Point's health care plan intelligence platform helps health care providers communicate with members and prospects about health care plans, benefits, and options.
Control Medical Technology	Park City	Life Sciences	Control Medical Technology is a developer of medical devices used to remove fluids, tissue, thrombus (blood clots), and other pathologies during medical procedures.
Cure Medical LLC	Lehi	Life Science	Cure Medical is focused on providing cutting edge medical equipment and solutions for the prevention and treatment of cervical cancer.
DiscGenics	Salt Lake City	Life Sciences	DiscGenics is a biotechnology company developing and commercializing advanced spinal therapeutics intended to treat patients with diseases of the intervertebral disc.
Health Catalyst	Salt Lake City	Health IT	Health Catalyst is a provider of health care data warehousing, analytics, and an outcomes improvement platform that helps improve clinical, financial, and operational outcomes.
KLAS Enterprises	Orem	Health IT	KLAS Enterprises is a provider of an online platform that helps health care providers make informed technology decisions by offering vendor performance information.

MAJOR STARTUPS, CON'T

“Collective is proud to be headquartered in Utah. We love its business-friendly government with support through GOED and EDCUtah, the vibrant health care community and top-tier talent it attracts and produces, and the stunning natural beauty and quality of life it offers. We’re fortunate to be building an innovative and mission-driven team here—both with individuals local to Utah and those relocating, in part, due to these several advantages offered by our region—and we feel grateful to get to be a part of it.”

Chris Klomp
CEO
Collective Medical Technologies



Company	City	Category	Description
Lineagen	Salt Lake City	Life Sciences	Lineagen is a developer of a genetic testing technology designed for physicians to personalize medical management for individuals with developmental delay and autism spectrum disorder.
Onsite Care	Salt Lake City	Innovative Services	Onsite Care offers customized medical care and wellness programming to corporate workplaces which allow companies to understand health risks faced by employees.
Orca Health	Sandy	Digital Health	Orca Health offers educational applications which focus on different body organs to educate and engage patients on their condition and the general functioning of the organs.
Owlet Baby Care	Provo	Digital Health	Owlet Baby Care's baby monitor uses pulse oximetry to track a baby's heart rate, oxygen levels, and skin temperature while sleeping, enabling parents to provide better care for babies in the home.
Peel Therapeutics	Salt Lake City	Life Sciences	Peel Therapeutics developed a cancer care platform that delivers anti-cancer nano-particles to regulate cellular response to environmental stresses.
ProLung	Salt Lake City	Health IT	ProLung's medical diagnostic devices assess the risk of malignancy in lung nodules found in the chest by a computed tomography scan, enabling doctors to detect early stage lung cancer.
Recursion Pharmaceuticals	Salt Lake City	Life Sciences	Recursion Pharmaceuticals is a provider of a drug discovery platform designed to interrogate complex biological interactions for drug re-purposing.
Scientia Vascular	West Valley City	Life Science	Scientia Vascular is a developer of endovascular medical devices designed for neuro, peripheral, and coronary vascular access applications.
Sera Prognostics	Salt Lake City	Life Sciences	Sera Prognostics develops innovative diagnostic tests designed for the early prediction of preterm birth risk and other pregnancy complications.
Somae Health	Springville	Innovative Services	Somae Health is a provider of health and wellness programs. The company provides an online platform that offers health and nutrition counseling, health tips, and weight loss programs.
Tolero Pharmaceuticals	Salt Lake City	Life Sciences	Tolero Pharmaceuticals develops therapeutics treatments that focus on oncology and hematological disorders.
Tute Genomics	Provo	Life Sciences	Tute Genomics is a provider of a cloud-based genetics platform designed to analyze and annotate the entire human genome, helping physicians develop personalized medicines.
UpWell	Salt Lake City	Innovative Services	UpWell is a developer of an online wellness management platform. The company's platform is a community of support, information, and encouragement for people with chronic conditions.
VendRx	Salt Lake City	Health IT	VendRx is a provider of a configurable in-office prescription medicine dispensing machine that fully automates dispensing pre-packaged pharmaceuticals.
Weave Communications	Lehi	Digital Health	Weave Communications is a developer of a customer experience management (CXM) platform designed to meet the needs of patients and to build better business and clinical outcomes.

ECONOMIC IMPACT OF HEALTH CARE INNOVATION

STATE REVIEW

Measuring the economic impact of an industry requires more than considering just the direct jobs and capital investment. Since industries are interconnected, they impact one another as dollars are spent in a region, sending a positive ripple throughout the economy. This economic impact analysis captures the direct, indirect, and induced employment, sales / output, and employee compensation created from the health care innovation industry in Utah.

Direct employment, sales / output, and employee compensation are those added by the industry directly. Indirect employment, sales / output, and employee compensation are created by regional companies supplying goods and services to companies in the health care innovation industry. Induced impact measures the employment, sales / output, and compensation created when employees from the industry spend their wages at local establishments.

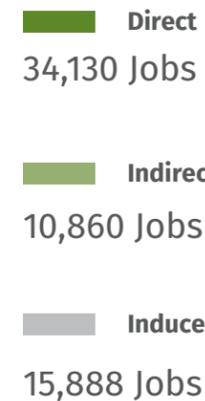
The health care innovation industry in Utah employs over 34,000 people and generates over \$7 billion in direct annual sales. However, when considering the indirect and induced ripple effect throughout the state from these employees and sales, it creates over 60,000 total jobs and over \$11 billion in annual output. The industry also creates a total of over \$3.6 billion in annual employee compensation.

UTAH ANNUAL IMPACT OF HEALTH CARE INNOVATION

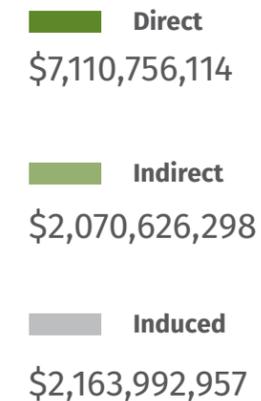
	Direct	Indirect	Induced	Total
Employment	34,130	10,860	15,888	60,878
Sales / Output	\$7,110,756,114	\$2,070,626,298	\$2,163,992,957	\$11,345,375,369
Compensation	\$2,283,155,806	\$681,903,397	\$701,913,061	\$3,666,972,264



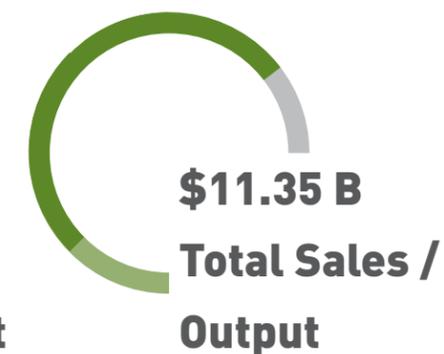
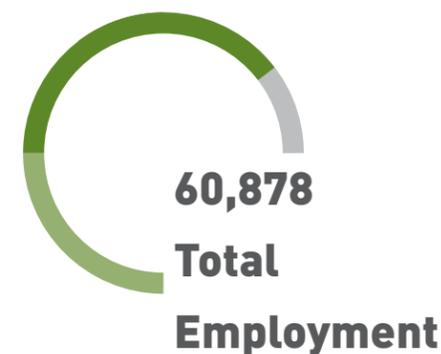
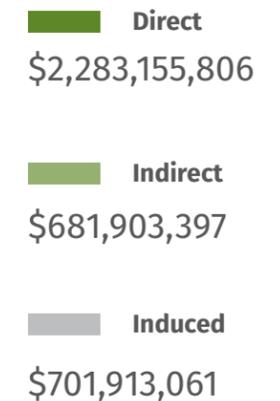
EMPLOYMENT



SALES / OUTPUT



COMPENSATION

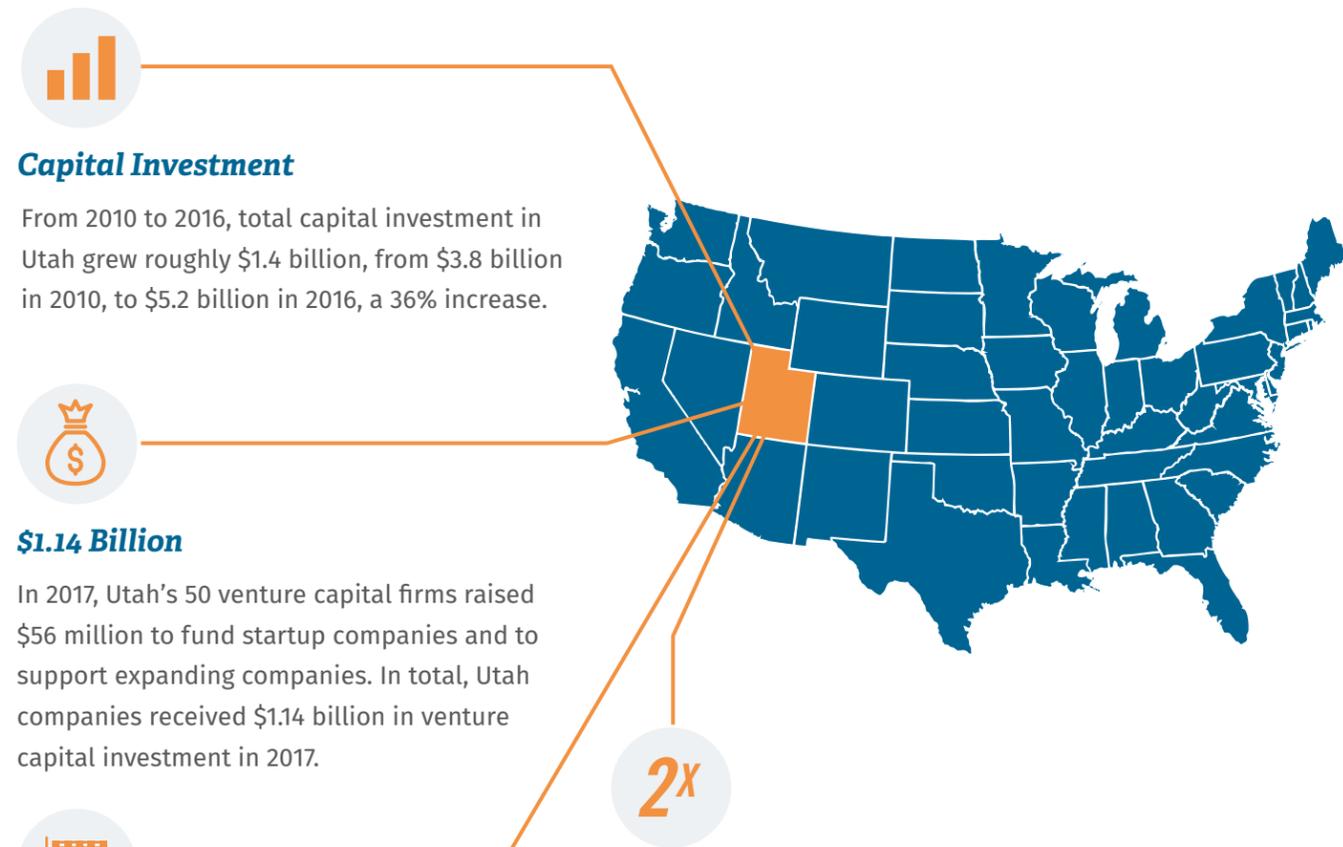


Utah Annual Impact of Health Care Innovation

FINANCE AND VENTURE CAPITAL

Utah has become a hotbed for tech companies and startups, and this has caused investors at all funding stages to take notice. With such a technology-focused economy, innovation in digital health and health IT has followed. Venture capitalists and angel investors are investing in these companies in Utah, further building the health care innovation sector.

From 2013 to 2017, funding in health care innovation in Utah amounts to more than \$4 billion and over 161 total deals, from angel and seed rounds to public offerings.



Capital Investment

From 2010 to 2016, total capital investment in Utah grew roughly \$1.4 billion, from \$3.8 billion in 2010, to \$5.2 billion in 2016, a 36% increase.

\$1.14 Billion

In 2017, Utah's 50 venture capital firms raised \$56 million to fund startup companies and to support expanding companies. In total, Utah companies received \$1.14 billion in venture capital investment in 2017.

Outpacing Nation

The number of venture capital deals and the funding per deal in Utah have both outpaced the national average since 2009. Utah also has the highest rate of funding in the nation for federal SBIR / STTR programs (Small Business Innovation Research and Small Business Technology Transfer programs).

2x
450% Growth

Over five years, Utah venture capitalists raised \$1.4 billion. From the end of the great recession in 2009, venture capital investment in Utah companies has grown by 450%, nearly double the national growth rate. The number of deals per year has also more than doubled in the same time period.

TOP VC COMPANIES HEADQUARTERED IN UTAH INVESTING IN HEALTH CARE INNOVATION

VC Firm	Number of Deals	Total Amount	Assets Under Management	HQ City
EPIC Ventures	46	\$ 772,330,000	\$ 208,300,000	Salt Lake City
Signal Peak Ventures	44	\$ 321,830,000	\$ 114,000,000	Salt Lake City
Cross Creek Advisors	33	\$ 1,017,690,000	\$ 525,000,000	Salt Lake City
Kickstart Seed Fund	29	\$ 106,340,000	\$ 148,000,000	Cottonwood Heights
Pelion Venture Partners	28	\$ 350,030,000	\$ 931,000,000	Salt Lake City

FUNDING IN HEALTH CARE BY FINANCING ROUND (2013 to 2017)

Funding Type	Number of Deals	Total Amount
Angel + Seed	76	\$ 87,220,000
Series A	31	\$ 255,760,000
Series B	14	\$ 286,650,000
Series C+	14	\$ 309,410,000
Mergers and Acquisitions	14	\$ 2,560,000,000
Public Offering	12	\$ 568,080,000
TOTAL	161	\$ 4,067,120,000

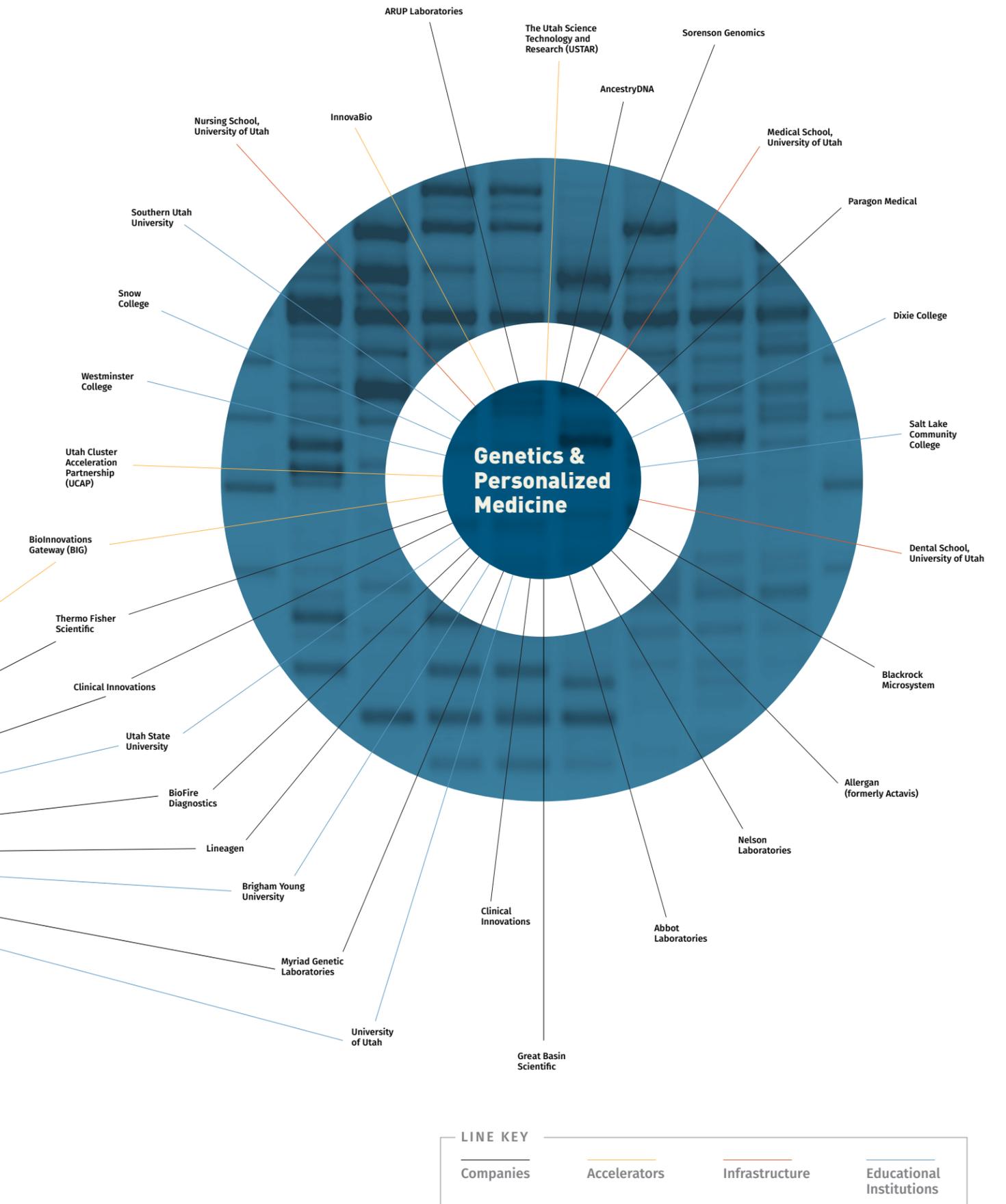
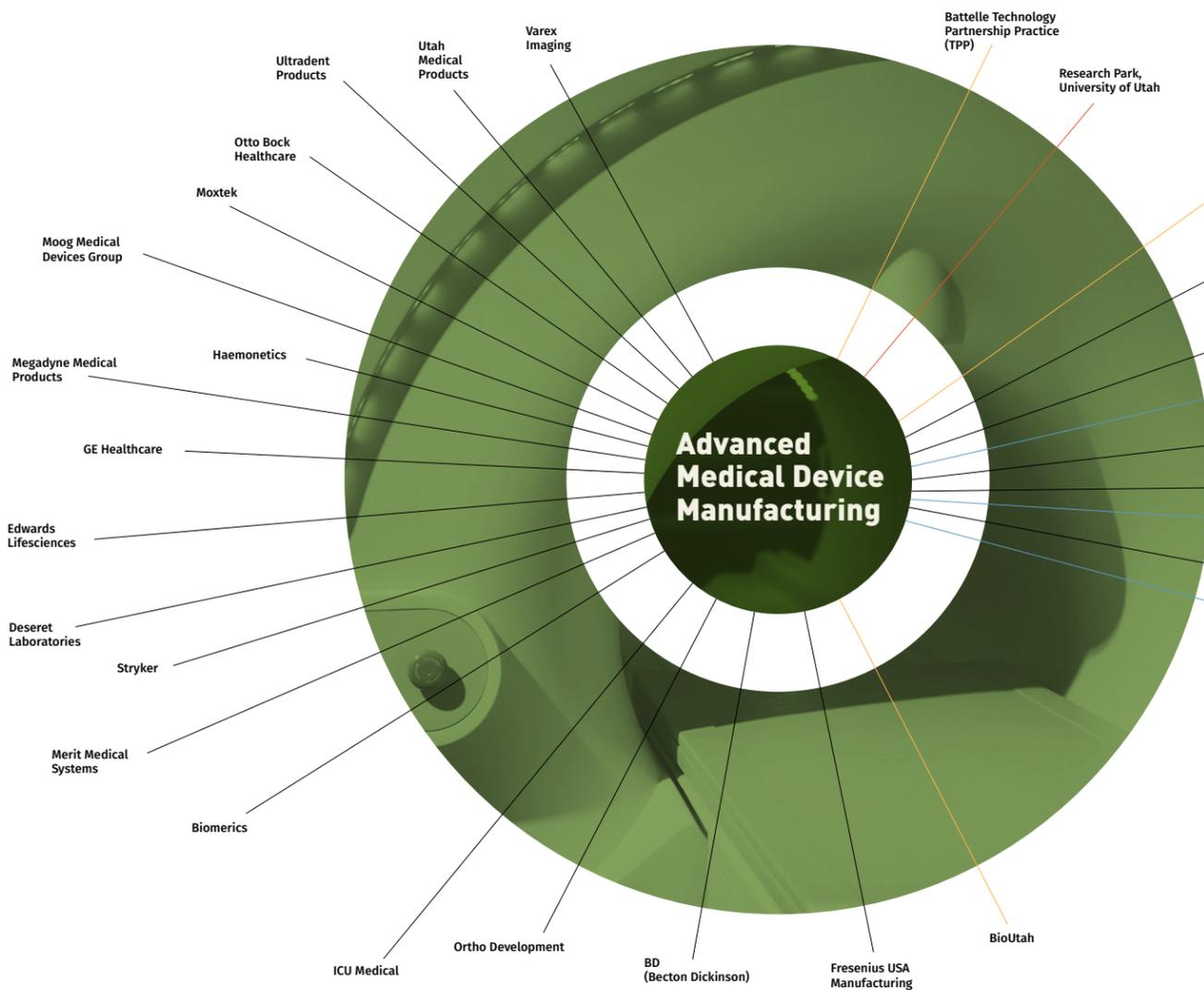
TOP RECENT UTAH HEALTH CARE INNOVATION DEALS

Company	Year	Industry	Deal Amount	Type of Deal
Health Catalyst	2018	HealthTech	\$ 55,000,000	Later Stage VC
Recursion Pharmaceuticals	2018	Biotechnology	\$ 20,500,000	Debt Funding
Owlet Baby Care	2018	Digital Health Technology	\$ 24,000,000	Early Stage VC
Artemis Health	2017	HealthTech	\$ 22,700,000	Early Stage VC
UpWell	2017	HealthTech	\$ 20,150,000	Early Stage VC
Collective Medical	2017	Digital Health Technology	\$ 47,500,000	Later Stage VC
Amedica	2017	Surgical Devices	\$ 26,000,000	Debt Refinancing
Tolero Pharmaceuticals	2017	Drug Development	\$ 780,000,000	Merger / Acquisition
Sera Prognostics	2017	Diagnostic Technology	\$ 40,000,000	Later Stage VC
Veridicus Health	2016	HealthTech	\$ 74,500,000	Merger / Acquisition
HealthEquity	2016	HealthTech	\$ 89,630,000	2nd Public Offering
Aviaco	2015	Healthcare Systems	\$ 21,330,000	PE Growth / Expansion

SOURCES: Pitchbook

AREAS OF EXCELLENCE IN HEALTH CARE INNOVATION

“Areas of Excellence” are industry sub-sectors in which Utah has a competitive advantage due to infrastructure, trained workforce, historical expertise, and community support. Utah has an established expertise in Medical Device Manufacturing and Genetics and Personalized Medicine, with companies, workforce, and education tailored to meet the needs of these industries. These two industries drive innovation in health care throughout the state and are critical to health care innovation. The diagram below shows the interconnectedness of these industries.



LINE KEY			
—	—	—	—
Companies	Accelerators	Infrastructure	Educational Institutions

HEALTH CARE INNOVATION PROGRAMS AND INITIATIVES

Utah has many organizations dedicated to furthering innovation in health care throughout the state of Utah. These organizations work together to promote higher education, technology, innovation, and health care integration.



BioUtah is an independent, non-profit trade association serving Utah's life sciences industry, enabling success and advancing innovation for life sciences companies in Utah.



The University of Utah Lassonde Entrepreneur Institute is a nationally ranked hub for student entrepreneurs and innovators at the University of Utah. The institute provides opportunities for thousands of students to learn about entrepreneurship and innovation, with many health care and life sciences companies launched at Lassonde, including Etched DNA, SitUP, Bruxit, and more.



Battelle Technology Partnership Practice (TPP) has been involved in analyzing Utah's life sciences industry and research and development base to identify gaps in the state's life science infrastructure and facilitate the development of strategies and actions.



BioInnovations Gateway (BiG) is an educational institution and workforce training facility that provides access to laboratories, machines, office space, and resources for high school students and entrepreneurs. BiG is a USTAR and Granite School district partnership.



The Utah Science Technology and Research's (USTAR) objective is to bolster Utah's research strengths and significantly increase technology commercialization to create many more high-caliber jobs throughout the state.



The University of Utah Center for Medical Innovation (CMI) provides resources to allow students and faculty from across all disciplines to work side-by-side with clinicians and industry leaders to solve the most challenging unmet health care needs. The Center creates an academic-industry-government partnership designed to accelerate life science technology innovation.



Silicon Slopes was created to promote Utah's growing technology community by providing resources for technology and life sciences companies, investors, and job seekers. They also track investors and their activity, including deal flow in Utah.

UTAH TALENT

Utah is home to 12 major colleges and universities and has an excellent talent pipeline of over 307,000 students to power the health care innovation economy. Bachelor's and graduate awards grew by 30.8% over the last five years. Utah has an educated workforce, with over 91% of the population 25 or older with a high school diploma and over 32% with a bachelor's degree.

Utah's labor force is well educated, growing, and affordable. Utah created nearly 40,000 jobs in 2017 and maintained one of the highest job growth rates in the nation throughout the year. The state is also the youngest in the nation, with a median age of 30.7.

MAJOR HEALTH CARE INNOVATION RELATED PROGRAMS AND DATA



CENTER FOR MEDICAL INNOVATION
UNIVERSITY OF UTAH
 The University of Utah Center for Medical Innovation provides resources to allow students and faculty from across all disciplines to work side-by-side with clinicians and industry leaders to solve the most challenging unmet health care needs. The Center creates an academic-industry-government partnership designed to accelerate life science technology innovation.



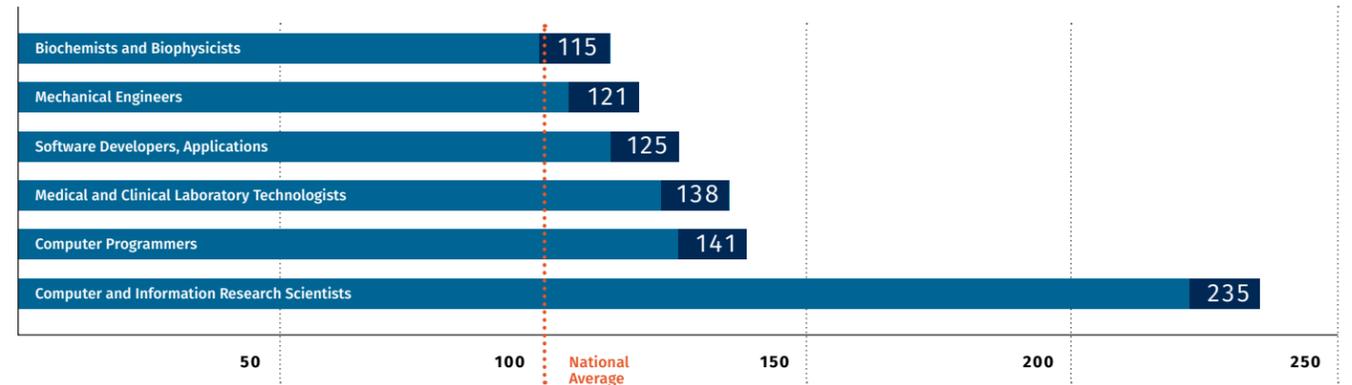
GENETICS, GENOMICS & BIOTECHNOLOGY
BRIGHAM YOUNG UNIVERSITY
 Students who major in Genetics, Genomics, and Biotechnology follow one of four tracks. Each track includes a comprehensive core of genetics, biology, and chemistry courses. The tracks include Biomedical Genetics, Bio-Business, Plant Genetics & Biotechnology, and Microbial Genetics & Biotechnology.



MEDICAL INNOVATION PATHWAY
STATE OF UTAH
 The Medical Innovation Pathway program provides high school students with the skills required to create career opportunities within Utah's life sciences industry. Students receive certifications in programs related to medical devices and equipment as well as research, testing, and medical labs.

This graph represents an index based on location quotients showing the large concentration of health care innovation-related occupations in Utah. Any occupation above the national average of 100 demonstrates a competitive advantage in Utah.

HEALTHCARE INNOVATIONS EMPLOYMENT INDEX

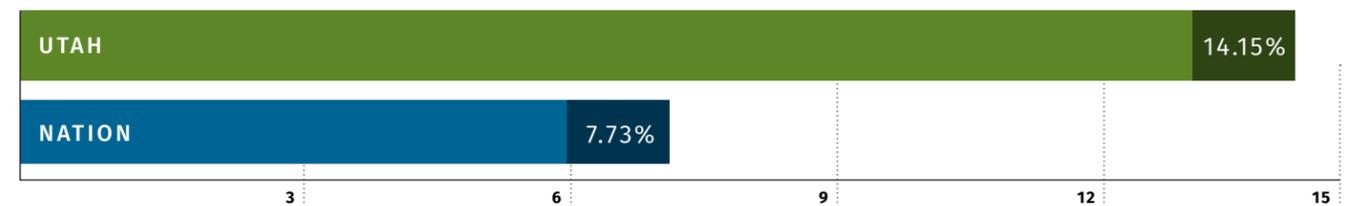


STATEWIDE EDUCATION AND EMPLOYMENT

2016-17 TOTAL STATEWIDE ENROLLMENT & DEGREES



FIVE-YEAR EMPLOYMENT CHANGE



SOURCE: Bureau of Labor Statistics

SOURCES: JobsEQ, Bureau of Labor Statistics, National Center for Education Statistics

UTAH INNOVATION IN HEALTH CARE

RECENT INNOVATIONS

SOFTWARE COLLABORATION

COLLECTIVE MEDICAL

Based in Cottonwood Heights, Collective Medical operates a real-time collaboration network which enables healthcare providers to more effectively collaborate with one another on vulnerable patients who require care across the community. Collective's platform enables real-time awareness and collaboration which leads to improved clinical outcomes and lower cost for the patient.

CERVICAL CANCER DEVICE

CURE MEDICAL

A group of University of Utah students developed a low-cost and portable device that kills cancer lesions in just 45 seconds. A team of Graduate and Medical Students working with an industry mentor, created this technology as part of the Center for Medical Innovation's Bench-to-Bedside Competition with just a \$500 seed grant. The device, called the Cinluma Thermocoagulator, applies heat to the cervix and eliminates lesions before they can become cancer. The device, which was made on a 3-D printer right at the University of Utah's Crocker Innovation and Design Lab, has now achieved CE-Mark and FDA clearance. Their company, Cure Medical LLC, is a Utah Startup based in Lehi reporting sales of the Cinluma device on four continents and in 38 countries.

BIOMARKER TESTING

CIBUSDX / APOLLODX

The ApolloDX diagnostic system is as easy to use as a glucometer and as small as a smartphone, providing medical professionals with the ability to rapidly detect diseases, or to test patient drug and biomarker levels. In the future, patients may test themselves, and have test results automatically transmitted to their healthcare provider within minutes. CibusDX is a related company that has licensed the ApolloDX technology to rapidly detect for pathogens harmful to humans in our food supply. CibusDX fundamentally improves the most important functions of food safety testing by making the testing faster, portable, simple to use, and immediately communicating results. The results can also be recorded in a blockchain.

DRUG DISCOVERY

RECURSION PHARMACEUTICALS

Recursion Pharmaceuticals is the provider of a drug discovery platform designed to interrogate complex biological interactions for drug re-purposing. The company's drug discovery platform uses biological tools to build cellular disease models, enabling biologists to query and understand the results of phenotypic screens, drug screens, and target discovery screens with immediate access to raw images and underlying data. With their innovative use of technology, including artificial intelligence, Recursion is at the forefront of innovation in drug discovery.

INFECTION PREVENTION

LIGHT LINE MEDICAL

Light Line Medical's patented visible light platform technology, developed in Research Park near the University of Utah, is destined to create a massive global shift in how the world prevents and treats health care associated infections. Without relying on drugs, chemicals, or UV light, visible light protects and disinfects catheters thereby eliminating these infections. It is the first antimicrobial for all infections (urology, respiratory, vascular, and dialysis) and has no antibiotic resistance. CDC has identified antibiotic resistant bacteria as "one of the world's most pressing public health threats." The significance of Light Line's technology has been recognized by the State of Utah, AMA, USPTO, NASA and NSF. Most recently, Light Line was featured on Fox/Bloomberg with Cathy Ireland.

TISSUE REGENERATION

POLARITYTE

Based in Salt Lake City, PolarityTE aims to be the first company to truly deliver regenerative medicine into clinical practice, fulfilling the long unmet promise that tissue engineering has failed to meet. Their technology utilizes a patient's own cells and tissues to regenerate functionally-polarized human tissue, creating uniquely functional tissue to mirror natural development in the human body. PolarityTE develops full-thickness hair-bearing skin for treatment of burns, wounds and scars with their launch product SkinTE.

METHODOLOGY

The data in this report was compiled and analyzed using the North American Industry Classification System (NAICS) to identify specific industry codes related to traditional health care, expanded health care, and health care innovation, as well as the sub-category industries within the overall health care innovation industry. The companies in each of the NAICS codes were researched and aggregate data from these NAICS codes were used to perform analyses such as economic impact, industry growth, employment density, input and output, etc. Some of these codes are used partially based on the makeup of companies in Utah represented by each individual code. All data derived from these codes are estimates. Each NAICS code used is outlined on the next page, broken down by major health care economy categories. Further subcategories were created from the health care innovation NAICS codes.

Add data was collected from sources cited throughout the document, including the US Bureau of Economic Alaysis, the US Bureau of Labor Statistics, the US Census Bureau, the Utah Department of Workforce Services, IMPLAN, the National Center for Education Statistics, and others.

The measured indirect and induced impacts were modeled using IMPLAN data on NAICS codes by inputting applicable sales, output, or employment figures. The analysis region used was for the entire State of Utah using the appropriate state level multipliers for each NAICS code. While not all dollars spent remain within a local economy, care was taken to only include those dollars that remained in the state.

Data was used from the most recent year available for each data set, generally from 2017, but older for datasets that have a longer lag. If you have additional questions about the methodology or data from this document, please contact Cambia Grove or EDCUtah.

TRADITIONAL HEALTH CARE

524113 Direct Life Insurance Carriers, **524114** Direct Health and Medical Insurance Carriers, **524292** Third Party Administration of Insurance and Pension Funds, **621111** Offices of Physicians (except Mental Health Specialists), **621112** Offices of Physicians, Mental Health Specialists, **621210** Offices of Dentists, **621310** Offices of Chiropractors, **621320** Offices of Optometrists, **621330** Offices of Mental Health Practitioners (except Physicians), **621340** Offices of Physical, Occupational and Speech Therapists, and Audiologists, **621391** Offices of Podiatrists, **621399** Offices of All Other Miscellaneous Health Practitioners, **621410** Family Planning Centers, **621420** Outpatient Mental Health and Substance Abuse Centers, **621491** HMO Medical Centers, **621492** Kidney Dialysis Centers, **621493** Freestanding Ambulatory Surgical and Emergency Centers, **621498** All Other Outpatient Care Centers, **621910** Ambulance Services, **621991** Blood and Organ Banks, **621999** All Other Miscellaneous Ambulatory Health Care Services, **622110** General Medical and Surgical Hospitals, **622210** Psychiatric and Substance Abuse Hospitals, **622310** Specialty (except Psychiatric and Substance Abuse) Hospitals, **623110** Nursing Care Facilities (Skilled Nursing Facilities), **623210** Residential Intellectual and Developmental Disability Facilities, **623220** Residential Mental Health and Substance Abuse Facilities, **623311** Continuing Care Retirement Communities, **623312** Assisted Living Facilities for the Elderly, **623990** Other Residential Care Facilities, **624110** Child and Youth Services, **624120** Services for the Elderly and Persons with Disabilities, **624190** Other Individual and Family Services, **624210** Community Food Services, **624221** Temporary Shelters, **624229** Other Community Housing Services, **624230** Emergency and Other Relief Services, **624310** Vocational Rehabilitation Services, **624410** Child Day Care Services

EXPANDED HEALTH CARE

326111 Plastics Bag and Pouch Manufacturing, **326112** Plastics Packaging Film and Sheet (including Laminated) Manufacturing, **326140** Polystyrene Foam Product Manufacturing, **326150** Urethane and Other Foam Product (except Polystyrene) Manufacturing, **326291** Rubber Product Manufacturing for Mechanical Use, **423450** Medical, Dental, and Hospital Equipment and Supplies Merchant Wholesalers, **423460** Ophthalmic Goods Merchant Wholesalers, **423610** Electrical Apparatus and Equipment, Wiring Supplies, and Related Equipment Merchant Wholesalers, **424210** Drugs and Druggists' Sundries Merchant Wholesalers, **446110** Pharmacies and Drug Stores, **446130** Optical Goods Stores, **446191** Food (Health) Supplement Stores, **541380** Testing Laboratories, **621511** Medical Laboratories, **621512** Diagnostic Imaging Centers, **621610** Home Health Care Services, **812210** Funeral Homes and Funeral Services, **812220** Cemeteries and Crematories, **923120** Administration of Public Health Programs

HEALTH CARE INNOVATION

325411 Medicinal and Botanical Manufacturing, **325412** Pharmaceutical Preparation Manufacturing, **325413** In-Vitro Diagnostic Substance Manufacturing, **325414** Biological Product Manufacturing, **333314** Optical Instrument and Lens Manufacturing, **334510** Electromedical and Electrotherapeutic Apparatus Manufacturing, **334515** Instrument Manufacturing for Measuring and Testing Electricity and Electrical Signals, **334516** Analytical Laboratory Instrument Manufacturing, **334517** Irradiation Apparatus Manufacturing, **339112** Surgical and Medical Instrument Manufacturing, **339113** Surgical Appliance and Supplies Manufacturing, **339114** Dental Equipment and Supplies Manufacturing, **339115** Ophthalmic Goods Manufacturing, **339116** Dental Laboratories, **454110** Electronic Shopping and Mail-Order Houses, **511210** Software Publishers, **518210** Data Processing, Hosting, and Related Services, **541713** Research and Development in Nanotechnology, **541714** Research and Development in Biotechnology, **541715** Research and Development in the Physical, Engineering, and Life Sciences

UTAH HEALTH CARE INNOVATION LANDSCAPE 2019

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