Health Care Innovation Landscape Report

Utah 2020

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Welcome

This report highlights the imperative for optimizing three health care innovation ecosystem elements—infrastructure, incentives and culture—to advance impactful health care innovation in the state of Utah. In addition to alignment of essential ecosystem elements, key measures have been identified that can be tracked to create a clear path to impact on reducing costs, improving patient experience and improving population health. Cambia Grove, in partnership with Point B, Inc., has developed this report to both inform and assess Utah's health care innovation ecosystem as of 2020 and make recommendations for how to strengthen it. The framework and structure for the analysis in this report follow the methodology of Cambia Grove's Health Care Innovation Advancement Framework: Optimizing Ecosystems to Support Impactful Innovation white paper, a helpful companion piece to aid in understanding our goals and approach.

"We believe innovation is key to a path toward creating a health care system that serves everyone equitably. We ask all innovators to take up the mantle of the Health Care Innovation Advancement Framework and create solutions that will drive realization of the Triple Aim."

– Maura Little, Executive Director, Cambia Grove

STATE OF UTAH

GARY R. HERBERT
GOVERNOR

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

SPENCER J. COX
LIEUTENANT GOVERNOR

December 16, 2020

Dear Utah Health Innovation Ecosystem,

Utah has a rich history of innovation spanning back to our pioneering days. As we look to the future of health innovation in our great state, there is incredible promise in the potential for new solutions to improve the health care for our families and neighbors. I am pleased to be part of the community effort to build upon our strong health innovation ecosystem.

From the early days of genetic tracking to today's ability to use real time care collaboration network to unify a patient's entire care team and reengineering drug discovery, Utah is a leader in the delivery of care to our citizens, but like our pioneering ancestors, we won't stop exploring new opportunities to innovate.

Our culture of compassion spans across financial goals to create solutions that truly serve. In order to help us continue to lead the country, we must look to invest in critical elements such as broadband access to support communities that may be underserved by our current health care structure.

We must also ensure that individuals from all backgrounds are experiencing and receiving high quality health care regardless of race and ethnicity. Innovation will not solve all of our challenges, but we know we can address-many problems that we face as a state.

Thank you to Cambia Grove and the health innovation community for laying the foundation of measurable success for years to come. I look forward to partnering with you all as we build the next generation health care ecosystem together.

Sincerely,

Spencer J. Cox
Utah Lieutenant Governor

Summary

Health Care Innovation in Utah

Utah has a history of investment in education, research and creating life-saving innovations. The state is anchored by two of the top five US technology transfer ranking institutions, creating capacity for advancement in health sciences and talent for biotech, pharmaceutical, digital health and equipment companies, steeped in world class research and cross-sector collaboration. Inventions and innovations such as the Jarvik artificial heart, Ancestry.com and Health Evaluation through Logical Programming (HELP)—the first hospital information system to integrate patient data for clinical decision support that accelerated electronic medical record (EHR) adoption, all have roots in Utah. The University of Utah is home to the Utah Population Database, the world's largest repository for genetics, epidemiology, demography and public health data—the only such database in the US.

Concentrated public investment, including steady NIH grant funding and public/private partnerships that promote job creation across life sciences, health care, technology and a myriad of other adjacent sectors, position Utah to attract thought leaders, talent and investors. From 2012-2016, employment in the life sciences industry in Utah grew by an impressive 26.2%[1], compared to a US average national growth rate of 5.9%. Finally, Utah has been a leader in moving toward greater Medicare Advantage adoption, which serves as a proxy that indicates progress in value-based care, an area where large players like Intermountain Healthcare are making great strides, yet there is more progress to be made. These advancements, and the additional collaboration between public and private sector endeavors to support entrepreneurship, are just a few of the state's initiatives for promoting health care innovation in Utah.

The remainder of this report will use "health care innovation" as a term that encompasses advancement in the areas of life sciences, health information technology, digital health, and innovative services.

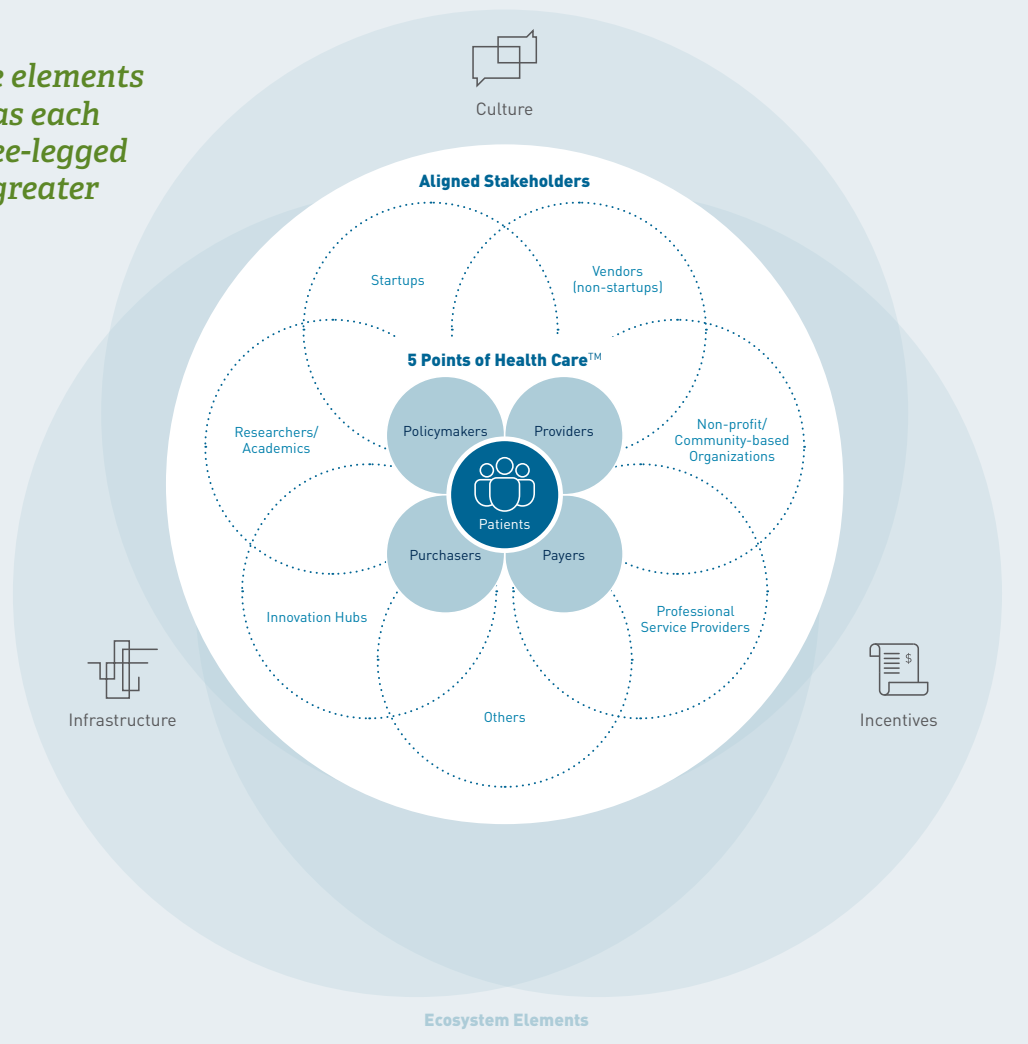> *"This report and the focus it has on infrastructure, incentives, and culture highlights why we're the fastest growing life science community in the nation."*

– Salt Lake City Mayor Erin J. Mendenhall

[1] Utah Life Sciences Industry Report. (2018, June). BioUtah. https://bioutah.org/wp-content/uploads/2018/06/BioUtah-Life-Sciences-Industry-Report-2018-FINAL-2.pdf

Status of Utah's Health Care Innovation Ecosystem

The health care innovation ecosystem is defined by the actors within the ecosystem and the elements that influence their actions. For the purposes of this innovation report, we will focus on three ecosystem elements: infrastructure, incentives and culture. The hypothesis is that if these elements are optimized and balanced, as each leg would need to be on a three-legged stool, innovation will have a greater chance to occur, succeed, be accelerated into adoption and ultimately impact the Triple Aim. Below is a summary of what it means for each of the ecosystem elements to be optimized.

The hypothesis is that if these elements are optimized and balanced, as each leg would need to be on a three-legged stool, innovation will have a greater chance to occur.

Culture

Aligned Stakeholders

Startups

Vendors (non-startups)

Researchers/ Academics

Non-profit/ Community-based Organizations

5 Points of Health Care™

Policymakers

Providers

Patients

Purchasers

Payers

Innovation Hubs

Professional Service Providers

Infrastructure

Others

Incentives

Ecosystem Elements

Capturing a snapshot assessment of the three ecosystem elements for Utah is challenging due to limited data, as is case for all states.[2] Additionally, each element is complex and multi-faceted, making comprehensive analysis difficult. However, we have chosen measures and information that together tell an important story that allows us to identify both bright spots and areas for improvement that are foundational to health care innovation across all states. Below we provide an overview of each ecosystem element for Utah. Detailed analyses of each are in the Utah State Health Care Innovation Ecosystem Analysis section, and all quantitative data referenced in this report is located in the Appendix. The ecosystem elements considered paramount to drive health care innovation in Utah state—infrastructure, incentives and culture—have trended supporting, supporting and neutral, respectively.
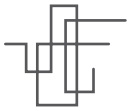
Infrastructure

These include the formal and informal arrangements, key resources needed to enable innovators to implement their work and execute their strategy, as well as the right technical and physical systems to connect solutions with end users. The infrastructure must be encouraging of systemic changes to support innovation.

Incentives

These include both carrots (e.g., financial and non-financial rewards, recognition, and positive impact), and sticks (e.g., fines and penalties) to drive behavior. The right incentives, and alignment of incentives across stakeholders, must be in place for sustained change.

Culture

These include the predominant beliefs and norms that define and drive behavior in the ecosystem. There must be an open, inclusive and equitable culture to ensure that the solutions being created match the problems that exist.

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[2]For example, NAICS codes currently do not capture the granularity of digital health or health IT, making it difficult to accurately track advancement in these industries. See the Limitations to Data section for more information.

Infrastructure Overview

Utah's infrastructure is strong and directly supports impactful innovation in health care. The state's focus on STEM education, top tier research institutions, urban broadband access, national public funding and the state's tenacious drive for economic development have clearly set Utah apart. A key to Utah's current overall strength in innovation has been understanding the critical infrastructure components and their interdependencies that drive value across systems and in turn, impact culture and incentives. Specifically, Utah has developed a focused and lasting talent pipeline through education opportunities matched to job creation and employment in the health care and supportive industries. Linking innovation and economic development helps to channel growth and create the opportunities that will benefit the state, residents and businesses alike. One concrete area for improvement is increasing early-stage (Series A and B) funding for entrepreneurs to help catalyze novel thinking to build a pipeline of new business models and innovations in health care. Having a strong infrastructure in place provides fuel to accelerate innovation.

Incentives Overview

Incentives in Utah are well positioned to support health care innovation. Changes to the regulatory environment[3] and tax requirements have paved the way for new economic development and an overall favorable environment for health care and related sectors to develop and thrive. Utah ranks in the top ten states for appeal to entrepreneurs and larger company diversification strategies. Areas for improvement include a continued focus to complete the transition to value-based care by building on the work from two State Innovation Models (SIM) grants and by considering national programs such as the Delivery System Reform Incentive Payment (DSRIP) program. This program incentivizes hospitals and other providers to improve access to care and how care is delivered, specifically targeting Medicaid enrollees, low-income residents and the uninsured. When incentives for health care innovation are created and evolve to align interests across parties in the health care ecosystem, innovation can adapt quickly and efficiently to address changing ecosystem demands.

Culture Overview

Utah has a unique and strong culture of self-sufficiency, collaboration and resilience. However, when we consider Utah's culture in terms of impactful health care innovation, the story is mixed. In the areas of research, technology development and commercialization, the state is on solid footing. There is a strong focus on a culture of experimentation and learning that underpins innovation. Investment in lab space, startup networks and a foothold in diagnostics invites experimentation than can lead to market disruption and innovation. Utah's current cultural challenges with regard to innovation lie in establishing health care-focused accelerators and incubators, which draw in early-stage funding and can improve diversity. A lack of gender diversity is revealed by the lowest percent of practicing female physicians as well as in local and state elected positions. The fact that diversity of health providers in Utah does not reflect the population they care for is a key consideration for the disparity of health outcomes across race and ethnicity. Another area for consideration in Utah is equitable pay. Based on a weighted average calculation, pay for employees in the health care innovation industry is increasing but still below the US as a whole, while the number of health care workers is growing, suggesting lower than average wages for non-professional positions in the sector.

Applying the Health Care Innovation Advancement Framework

Utah has most of the key ingredients to lead in health care innovation, drive cost reduction for all state residents and to improve both patient experience and population health outcomes: the Institute for Health Care Improvement (IHI) Triple Aim. The systemic discrimination faced by marginalized communities has historically driven health inequities and now drives a heightened sense of urgency to enable innovation. The greatest opportunity is for Utah to take a step further to align and optimize the ecosystem elements so that key investments in infrastructure, incentives and culture are those that create and take advantage of important synergies across the three. When these elements are optimized, they support all aspects of the impactful innovation process, which can in turn enable us to make progress toward the Triple Aim. For a more thorough explanation of the Health Care Innovation Advancement Framework, please refer to our white paper of the same name.

When the ecosystem elements are optimized, they support all aspects of impactful innovation.

Impactful Innovation

Problem → Idea → Solution → Adoption → Impact → *The Triple Aim*
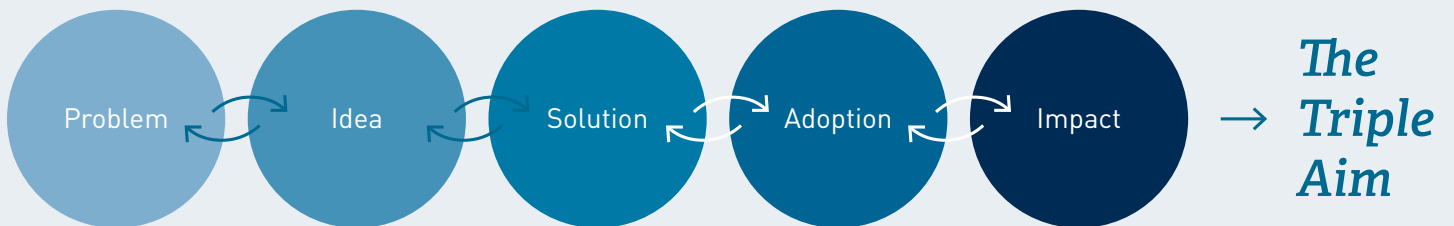
Optimized Ecosystem Elements
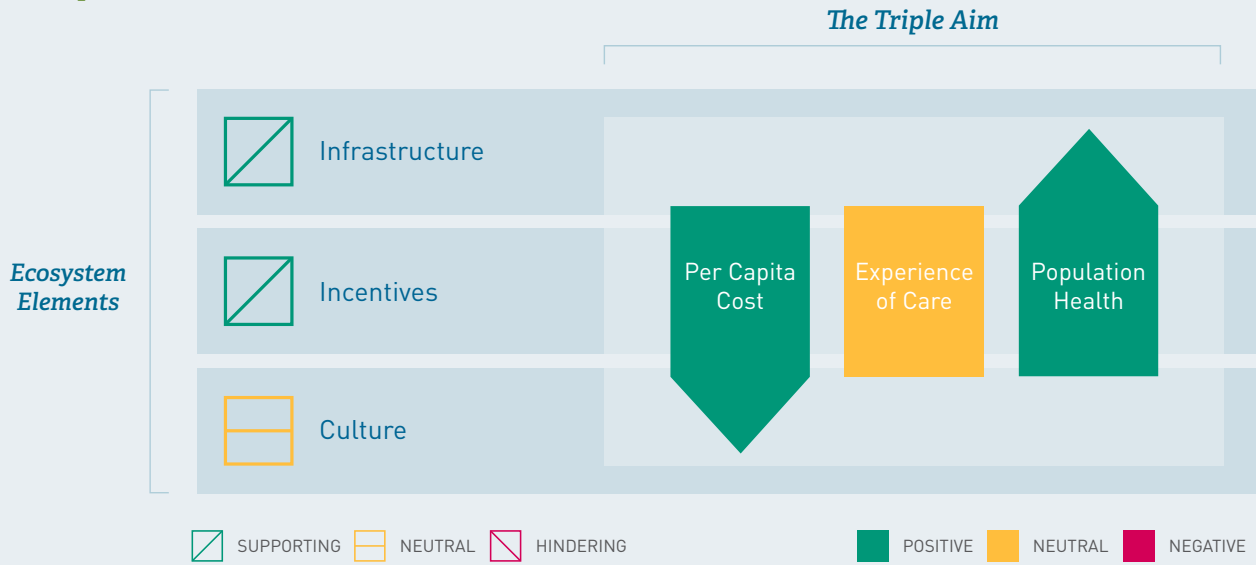
Infrastructure

Incentives

Culture

Calls to Action

The activities and events of the past several years, through 2020, have both accelerated health care innovation and created new challenges. Utah has a clear opportunity to be a leader in critical areas that underpin health care innovation. The state has laid the groundwork for value-based care models and investment in health care information technology, but there is room for further optimization. Health care cost management, health care experience and population health depend on aligning Utah's key ecosystem elements: infrastructure, incentives and culture. Specifically, based on our analysis, we recommend prioritizing the following actions to affect the elements:

1 REVIVE HEALTH CARE INNOVATION PROGRAMS TO INCREASE EARLY-STAGE (SERIES A & B) FUNDING FOR STARTUPS

2 ENSURE STATEWIDE BROADBAND CONNECTIVITY TO DEMOCRATIZE ACCESS TO HEALTH-ORIENTED DIGITAL PLATFORMS, APPLICATIONS, AND INFORMATION

3 CONTINUE PURSUIT OF SEAMLESS HEALTH DATA INTEGRATION AND INTEROPERABILITY TO BUILD ON THE FOUNDATION OF STRONG ELECTRONIC HEALTH RECORD (EHR) IMPLEMENTATION AND ADOPTION

4 RESTORE MOMENTUM TO BE A NATIONAL LEADER FOR THE IMPLEMENTATION OF VALUE-BASED CARE MODELS

5 BOOST DIVERSITY OF HEALTH CARE PROVIDERS AND LEGISLATIVE LEADERSHIP TO CREATE A CULTURE OF INCLUSIVITY AND EQUITY

6 CATALYZE ACCELERATORS AND INCUBATORS FOCUSED ON HEALTH CARE INNOVATION TO CREATE A CRITICAL MASS OF CROSS-FUNCTIONAL STAKEHOLDERS THAT CAN FREELY EXCHANGE IDEAS, MAKING SURE NEW SOLUTIONS ARE SOLVING KNOWN AND EXISTING PROBLEMS

The remainder of this report provides more detailed analyses for the ecosystem elements and Triple Aim for Utah that support the conclusions we have made in the summary infographic on page 12.
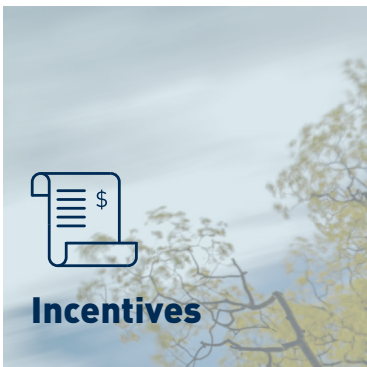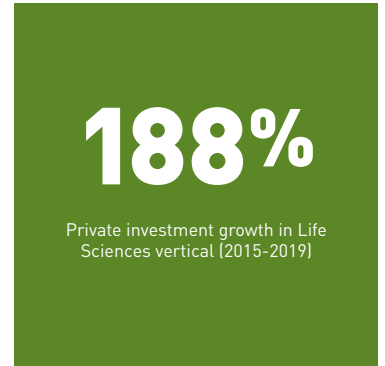
Utah has a clear opportunity to be a leader in critical areas that underpin health care innovation.

Summary of Utah's health care innovation ecosystem and resulting impactful innovation, as measured by the Triple Aim.

The Triple Aim

Ecosystem Elements		Per Capita Cost	Experience of Care	Population Health
☑	Infrastructure			
☑	Incentives			
☐	Culture			

☑ SUPPORTING   ☐ NEUTRAL   ◇ HINDERING

■ POSITIVE   ■ NEUTRAL   ■ NEGATIVE

Infrastructure

97%
Hospitals that have adopted a certified EHR (2017)

$1b
Total NIH awards directed towards Utah universities (2015-2019)

188%
Private investment growth in Life Sciences vertical (2015-2019)

Incentives

16
Utah's national Medicare Advantage adoption rank (2018)

3
Utah's national entrepreneurship rank, which evaluates business environment based on company formation (2018)

25
Number of CMS SIM initiatives focused on episode-based payments

Culture

50
Utah's national rank for female physician representation (2018)

1
University of Utah's national rank for technology transfer (2017)
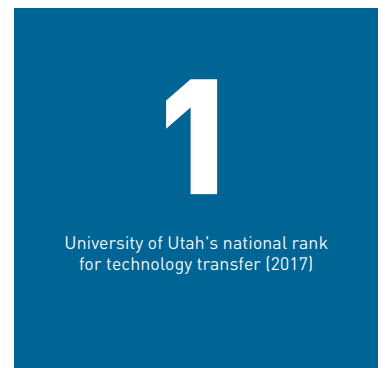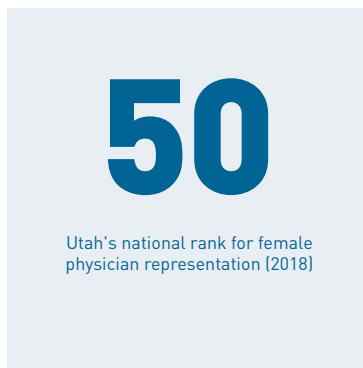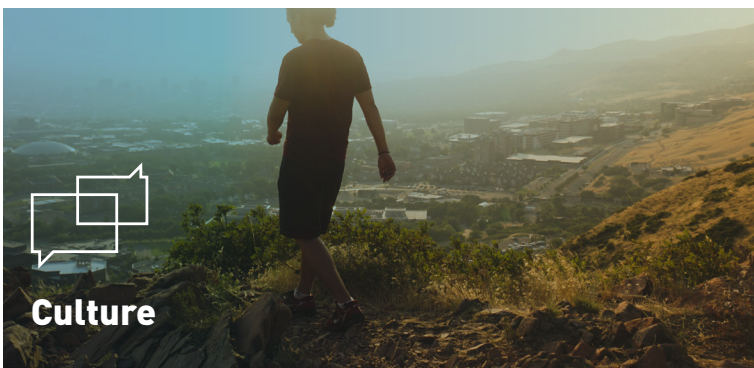
Utah State Health Care

Innovation Ecosystem Analysis

Infrastructure Analysis

Overall, Utah's infrastructure is currently optimized to support health care innovation. The right resources and inputs must be in place at a system level to enable individuals, families and communities to receive transformational care, products and services. Therefore, an ecosystem's infrastructure is fundamental since it encompasses the base tools and support structures that enable Utah's health care players to increase care provision, manage costs and improve health outcomes.

Health care systems in Utah are fed by a strong supply of talent. Since 2010, more graduate students are pursuing STEM education each year in Utah, with STEM graduate degrees earned at twice the rate of all graduate degrees. Within STEM, degrees related to computer and information sciences are most popular. Western Governor's University (WGU), headquartered in Salt Lake City, has one of the largest and most affordable undergraduate nursing programs, among others, in the country. All practice-based nursing training is done in partnership with health systems across the country, while coursework is completed online. WGU is a nonprofit, so tuition is reasonable, especially compared to online for-profit universities. On average, students graduate with less than half the debt of the national average for undergraduates.

One of our proxies for evaluating health care innovation infrastructure is connectedness, or the use of technology and data interoperability, in the sector. In the area of hospital health information technology adoption, Utah has consistently improved and as of 2017, leads relative to the US average for all measures. Another measure of connectedness is internet accessibility. Generally, broadband coverage in Utah is widespread, but fixed coverage in rural areas is lower, with only 68% of the rural population meeting the FCC service benchmark. Rural residents of Utah stand to benefit most from increased virtual services, including telehealth services, access to digital health apps and health education, but without better connectivity, they will fall victim to the digital divide.

From a financial infrastructure perspective, public health care investment has stayed fairly constant. Utah has received a relatively consistent amount of NIH funding over time from 2015-2019 at about 0.8% of the total available funds granted in the US, with University of Utah receiving the largest portion. In terms of private health care funding, there has been a substantial increase in private capital investment in HealthTech in Utah. Between 2018 and 2019 investment in this vertical nearly tripled from $8.4M to $25M. However, an area for concern lies in early-stage funding (Series A and B) for entrepreneurs, which dried up completely as of 2019 (Figure 1).

Infrastructure Analysis (Continued)

While total VC funding coming into Utah has increased overall, early-stage funding has plummeted.

■ Seed
■ Series A and Series B
■ Later-stage Funding

Funding data by deal class ($ million)[4]
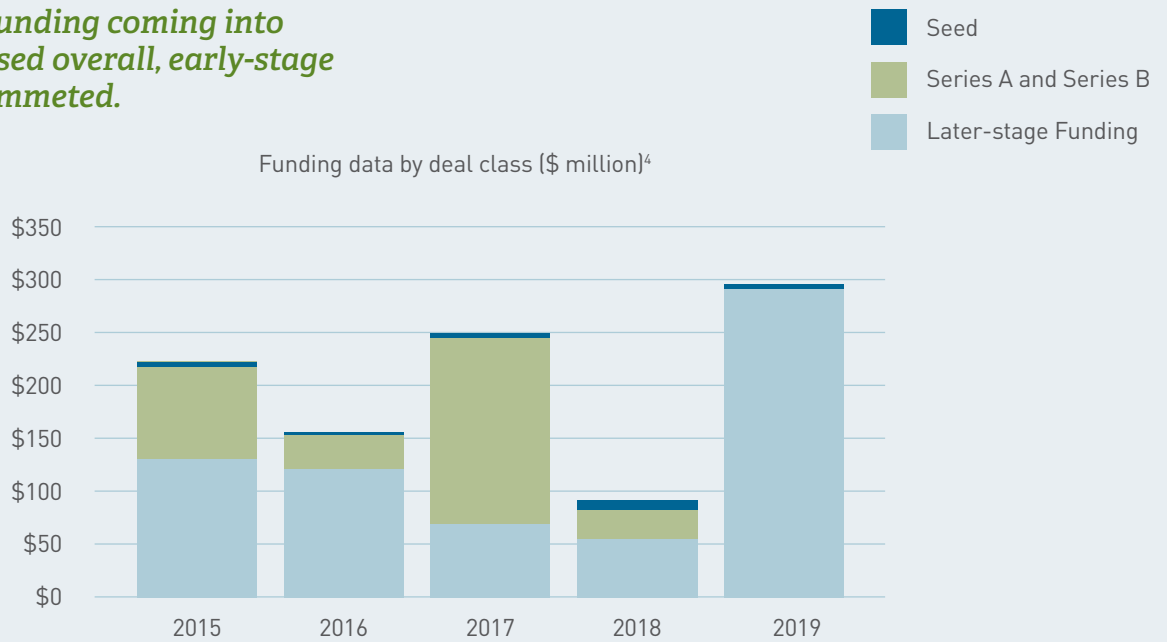
One program that helped promote health care innovation in Utah was the USTAR program (Utah Sciences Technology and Research Initiative). In 2006, the Utah State Legislature initially established USTAR to attract top research talent to the state's two public universities. Later in 2016, USTAR was refocused to promote economic development in Utah by increasing technology commercialization. Finally, in 2019, USTAR was formally disbanded as its own entity, and certain initiatives moved under the purview of the Utah Governor's Office of Economic Development (GOED). During the period from 2016-2019, USTAR supported companies with $123M in funding[5] and was integral in the creation of more than 400 net new technology jobs in Utah. Moreover, USTAR-managed spaces included tech entrepreneur services and incubator facilities that helped startups involved with USTAR frequently win federal small business administration grants. Independent evaluation[6] by TEConomy Partners, LLC regarded the USTAR program as largely successful. This analysis indicates that Utah could certainly benefit from another similar program, particularly to support critical funding for early-stage companies.

[4]Pitchbook

[5]USTAR 2018 Annual Report. (2018, June 6). Utah State Legislature. https://le.utah.gov/interim/2018/pdf/00003827.pdf

[6]Evaluation of Utah Science Technology and Research Initiative's Strategic Value and Operational Effectiveness. (2018, August 1). TEConomy Partners, LLC. https://le.utah.gov/interim/2018/pdf/00003196.pdf

Incentives Analysis

Currently, incentives in Utah are largely in support of health care innovation. The key to innovation is a willingness and vision to do things differently through behavior change and reinforcement. Systems and the humans who run them are vulnerable to inertia and habits. Incentives spur systemic changes that affect how health care in Utah is delivered and measured.

In the past, health care technology was often developed outside of Utah, but a long streak of regulatory adjustments is driving important changes. Since assuming office in 2009, Governor Herbert adjusted about 400 regulations to benefit businesses.[7] In the last four years, several health care mergers and acquisitions have taken place in Utah, including Laborie's purchase of Salt Lake City-based Clinical Innovations and Japanese company Sumitomo Dainippon's acquisition of Tolero Pharmaceuticals. In both cases, business operations will remain in Utah. Michigan-headquartered medical technology company Stryker tripled their presence in Utah, further validation of a favorable business environment. As of 2020, Utah ranks 5th according to US News and 9th according to the Tax Foundation for business-friendliness, with particular areas of emphasis in the categories of entrepreneurship, venture capital investment and property tax, respectively.

Utah has an Economic Development Tax Increment Financing (EDTIF) program which provides up to a 30% tax credit for several years for business projects that meet specific criteria such as the creation of high wage jobs and significant capital investment. The program has been modified several times, most recently in late 2019 for increased efficiency and transparency; however, since its establishment in 2005, it has created more than 24,000 net new high-paying jobs and more than $500M in new state revenues[8], three times the amount the program awarded through tax credits. Eligible businesses are those that are relocating to Utah or expanding in the state, and roughly two-thirds of awards have gone to expansion projects.

Another policy in place in Utah that incents health care innovation is the research and development (R&D) tax credit. However, there is no state innovation (section 1332) waiver, nor is there a Delivery System Reform Incentive Payment (DSRIP) waiver. CMS has awarded two State Innovation Models (SIM) grants in Utah, which aligned to a goal of having 80% of payments in the state made through a value-based purchasing plan by 2018, although it is unclear what progress the state has made toward this goal.

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[7]Utah: The Best State for Business. (2018.) Business in Utah | Business Elevated. https://siteselection.com/cc/utah/2018/business-climate-overview-utah-the-best-state-for-business.cfm

[8]EDTIF Elevated? Utah's Evolving State Incentive Program. (2020 January). Utah Foundation. http://www.utahfoundation.org/uploads/rr773.pdf
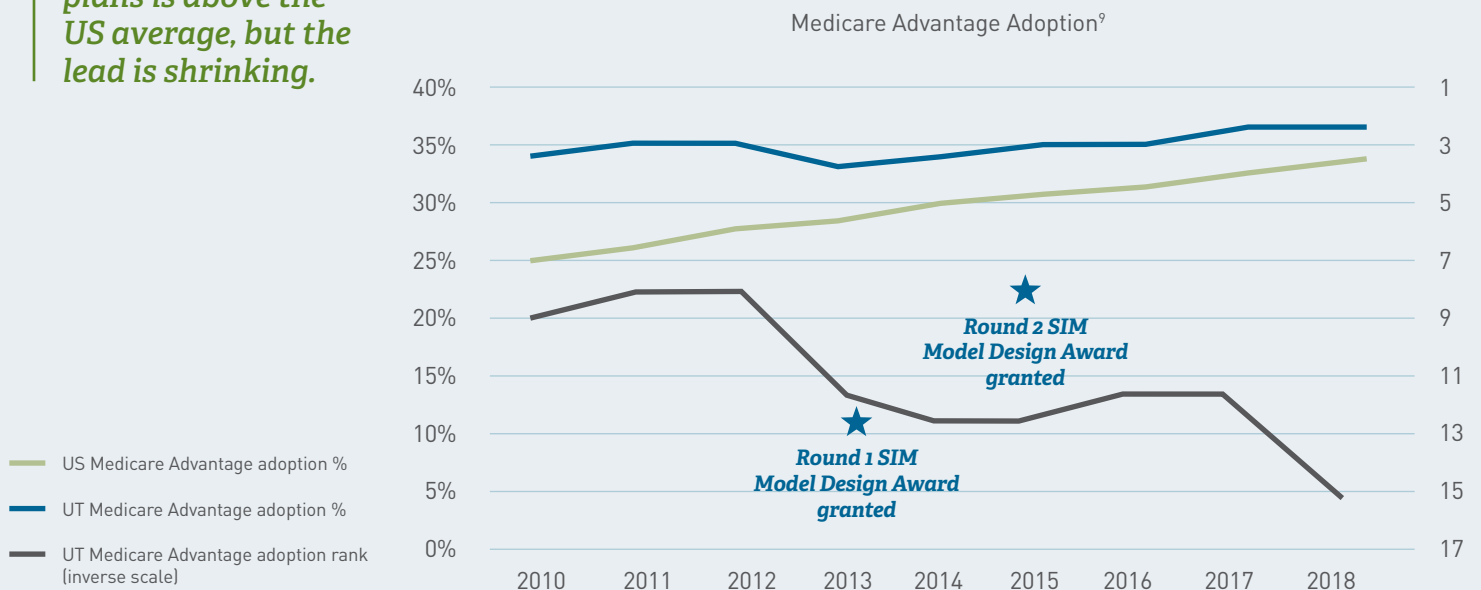
Incentives Analysis (Continued)

Pockets of the American health care system are at varied places in the journey to shift from fee-for-service to value-based care models, and the story is no different for Utah. One unique aspect of Utah's value-based care transition is the dominance of Intermountain Healthcare in the state. Intermountain Healthcare is the largest private employer in Utah, has roots in The Church of Jesus Christ of Latter-day Saints, and is both a provider system and a payer system with about one in five Utahns insured by its subsidiary SelectHealth. Where Intermountain Health leads, other payer and provider organizations in Utah may follow, and the organization is making significant strides toward value-based care. In 2019, Intermountain Healthcare spun out a new company, Castell, specifically devoted to accelerating value-based care within the Intermountain system. The prior year, in 2018, Intermountain was involved in the establishment of CivicaRx, a nonprofit pharmaceutical company with the mission to manufacture generic drugs at unprecedented affordability.

Shifting our lens to the public sector, in general, beneficiaries of Medicare Advantage (MA) programs spend substantially less than Medicare Fee-For-Service, providing a better value and covering additional services, to reduce costs and improve outcomes. For health care payers who are hesitant to make the complete switch to value-based care, MA offers an opportunity to explore alternative payment models that are still rooted in fee-for-service structures. As such, MA adoption at the state level is considered a proxy for commitment to value-based care. Utah leads relative to the US average in number of MA beneficiaries, ranking 16th out of all states as of 2018, but this lead has decreased from ranking 9th in 2010 to 13th in 2015 (Figure 2).

FIGURE 2

Utah's adoption of Medicare Advantage plans is above the US average, but the lead is shrinking.

Medicare Advantage Adoption[9]

— US Medicare Advantage adoption %

— UT Medicare Advantage adoption %

— UT Medicare Advantage adoption rank (inverse scale)

Round 2 SIM Model Design Award granted

Round 1 SIM Model Design Award granted

[9] A dozen facts about Medicare Advantage in 2019. (2019, August 6). The Henry J. Kaiser Family Foundation. https://www.kff.org/medicare/issue-brief/a-dozen-facts-about-medicare-advantage-in-2019/, and Monthly MA enrollment by state/County/Plan type. (2019, November 9). CMS Homepage | CMS. https://www.cms.gov/Research-Statistics-Data-and-Systems/Statistics-Trends-and-Reports/MCRAdvPartDEnrolData/Monthly-MA-Enrollment-by-State-County-Plan-Type

Culture Analysis

We now turn to our analysis of Utah's culture with respect to health care innovation. While there are some aspects of Utah's culture that promote health care innovation, there are as many that are hindering, particularly in the area of diversity. On balance, the conclusion is a neutral status for culture in Utah.

Overall, the population of Utah is the youngest on average across the US, and residents are comparatively healthy, and live healthy lifestyles. Residents are attracted to or stay in the state for the abundant natural resources and outdoor activities, reasonable costs of living, and a strong focus on community. Yet, gender diversity in health care leadership is poor in Utah with the lowest proportion of active female physicians of any state, ranking 50th for this metric. Additionally, although the representation of women in the state legislature has improved from 15% to 24% of total as of 2020, Utah still falls behind the US average (Figure 3). In terms of racial and ethnic diversity, the proportion of non-white allopathic medical school graduates was 28% in 2018, which is larger than the 22% of non-white residents in Utah as a whole. However, of these minority medical school graduates, only 3% were Hispanic, while Hispanics make up 14% of the state population. Utah would benefit greatly from more female representation in government and in medicine because every policy, legislation and care decision impacts rights, behaviors and life choices of all genders. Improving the racial diversity of doctors in Utah is critical because people of color have markedly worse health outcomes than white populations, and patients who are treated by care teams of their own racial or ethnic background and who speak their same language[10] report receiving higher quality care[11] as well as a better overall care experience.

FIGURE 3

Utah is far behind the rest of the US for women's representation as physicians and legislators.

■ Women ■ Men

Gender diversity in health care and legislative leadership[12]

Active Female Physicians in UT
(25% in 2018)

Women in UT State Legislature
(24% in 2020)
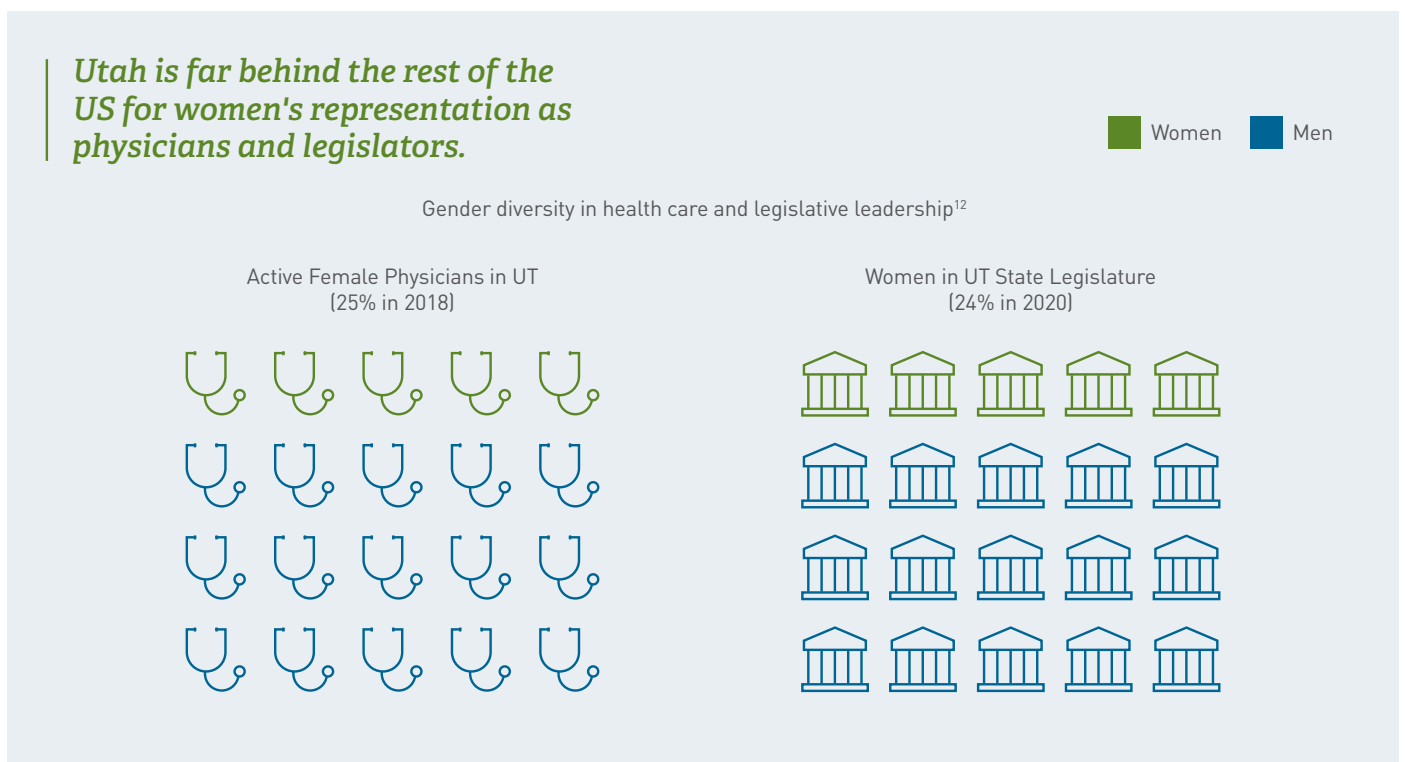
[10]Providing High-Quality Care for Limited English Proficient Patients: The Importance of Language Concordance and Interpreter Use. (2007, October 24). Journal of General Internal Medicine. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2078537/

[11]Patients are more satisfied with care from doctors of same race. (2002, November 9). British Medical Journal. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1124573/

[12]State physician workforce data report. (n.d.). AAMC. https://www.aamc.org/data-reports/workforce/report/state-physician-workforce-data-report and (n.d.). Legislative News, Studies and Analysis | National Conference of State Legislatures. https://www.ncsl.org/

Culture Analysis (Continued)

Beyond diversity, technology commercialization is a strong suit for Utah, which is in line with the state's pioneering and tenacious spirit. University of Utah ranks 1st and Brigham Young University ranks 4th in the nation out of all colleges and universities for the rate of technology transfer, which entails commercializing technology intellectual property from the university through patents, licensing and the formation of new businesses. Utah's higher education systems are intentionally designed to spur entrepreneurship. Another bright spot in Utah's culture of innovation is Silicon Slopes, a 501(c)(3) nonprofit organization on a mission to connect the state's entrepreneurship and tech community to broaden opportunities for all. With regional chapters in 15 Utah cities and 6,000 member companies, the Silicon Slopes organization has co-opted the moniker of Utah's technology and startup network to hold events and programs that serve more than 40,000 people each year. While there are 11 accelerators and incubators headquartered in Utah, none of them specifically focuses on health startups or companies. In terms of an area of expertise within health care, Utah is a hotbed for health care diagnostics: at least six companies currently provide serological or molecular testing for COVID-19.

Pay for health care innovation industry workers in Utah has matched the US over time based on a weighted average; however, in absolute dollar terms, these employees in Utah earn less than the US average. The number of workers in this industry has grown twice as fast in Utah as for the US, perhaps suggesting more hiring on the lower end of the experience pool.

Now that we have laid out our detailed analysis of the ecosystem elements in Utah, we will next delve into each of the three components that make up the Triple Aim.

Utah Health Care
Triple Aim Analysis

### Per Capita Cost

Out of all 50 states and Washington, D.C., Utah has the lowest per capita health care costs for CMS and one of the lowest for private care (Figure 4). Utah's demographics may help account for the low cost of care. Utah is the youngest state population in the country, and fewer people are over age 65 in the state than in the US as a whole. Additionally, as result of the individual mandate in the Affordable Care Act, legal residents of the US are required to have health insurance. In Utah, the Healthy Utah program was created in 2016[13] to provide coverage to Utahns who earn too much to qualify for Medicaid but too little to qualify for health insurance rebates. The Healthy Utah program has reduced uncompensated care, putting less of a burden on the state's overall health care system and minimizing cost shifting to employers and employees.

Many health systems have difficultly capturing a complete detailed view of their costs due to the incredible complexity of the US health care system. However, for the University of Utah system specifically, a major factor for keeping costs down has been a comprehensive effort to holistically capture, document and track every cost-impacting piece of data from supply costs to labor. This data measurement and analysis has allowed U of Utah Health Care to pinpoint extraneous care to save hundreds of thousands of dollars each year.[14]

FIGURE 4

Utah's cost of care is consistently among the lowest in the country (including DC).

UT rank of median households and CMS[15]

Rank (inverse scale)
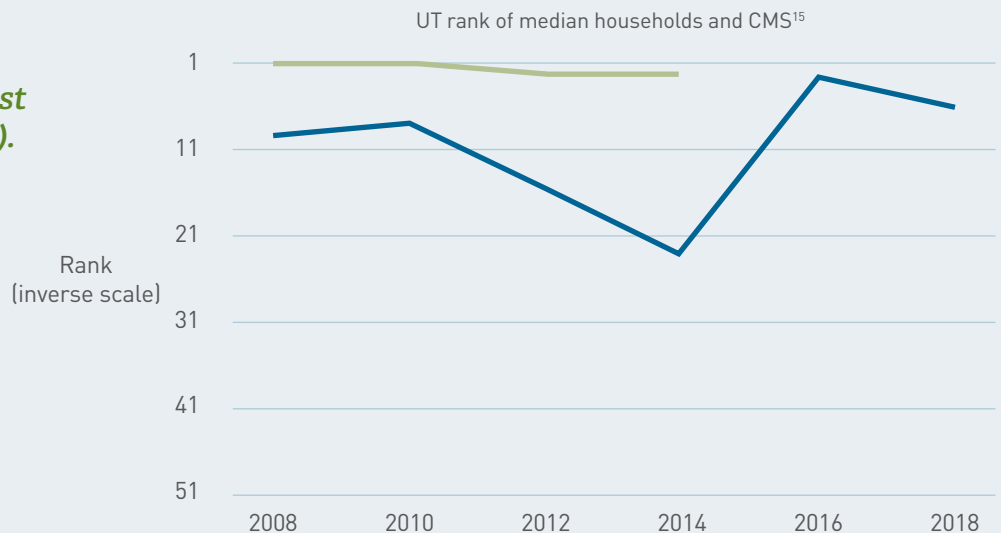
— UT rank for % of median household income spent on private employee insurance

— UT rank for CMS all payers, physician and clinical services expenditure

[13]Healthy Utah: Provide Coverage, Protect the Taxpayer, Promote Individual Responsibility. (2014 December). State of Utah Governor's Office. https://ccf.georgetown.edu/wp-content/uploads/2014/12/healthyutahplan.pdf

[14]What Are Hospital's Costs? Utah System is Trying to Learn. (2015, September 7). The New York Times. https://www.nytimes.com/2015/09/08/health/what-are-a-hospitals-costs-utah-system-is-trying-to-learn.html

[15]NHE fact sheet. (2020, March 24). CMS Homepage | CMS. https://www.cms.gov/Research-Statistics-Data-and-Systems/Statistics-Trends-and-Reports/NationalHealthExpendData/NHE-Fact-Sheet

(n.d.). Commonwealth Fund. https://www.commonwealthfund.org/sites/default/files/2019-11/Collins_state_premium_trends_2008_2018_db_1.pdf

https://www.census.gov/data/tables/time-series/demo/income-poverty/historical-income-households.html

Experience of Care Analysis

The experience of care aim focuses on evaluating the perceived value of care. Although health care costs in Utah have remained low over time, overall, experience of care in the state has not improved or worsened meaningfully. Over the last five years, hospital ratings in Utah have stayed relatively consistent based on a composite of more than 100 Hospital Compare measures or have declined slightly based on survey responses from recently discharged patients (Figure 5). In terms of patient complications, Utah hospitals are performing at the same level as the national average. Although there has been no change in the overall ratings of Utah Medicaid plans since 2015, private and Medicare insurance plans have improved over this time period, and as of 2019-2020, one of the four Medicaid plans in the state received a 4+ star rating. Looking at the rates that Medicare enrollees are receiving common medical evaluations such as blood lipid tests, Utah's ranking matches or falls below the US average, and over time, Black patients have had their access to tests drop, with the exception of mammograms.

FIGURE 5

Utah's HCAHPS hospital survey results show slight advantage over US average, but no meaningful change over time.

UT   US

Hospital Compare (Medicare): HCAHPS Survey Summary Results[16]
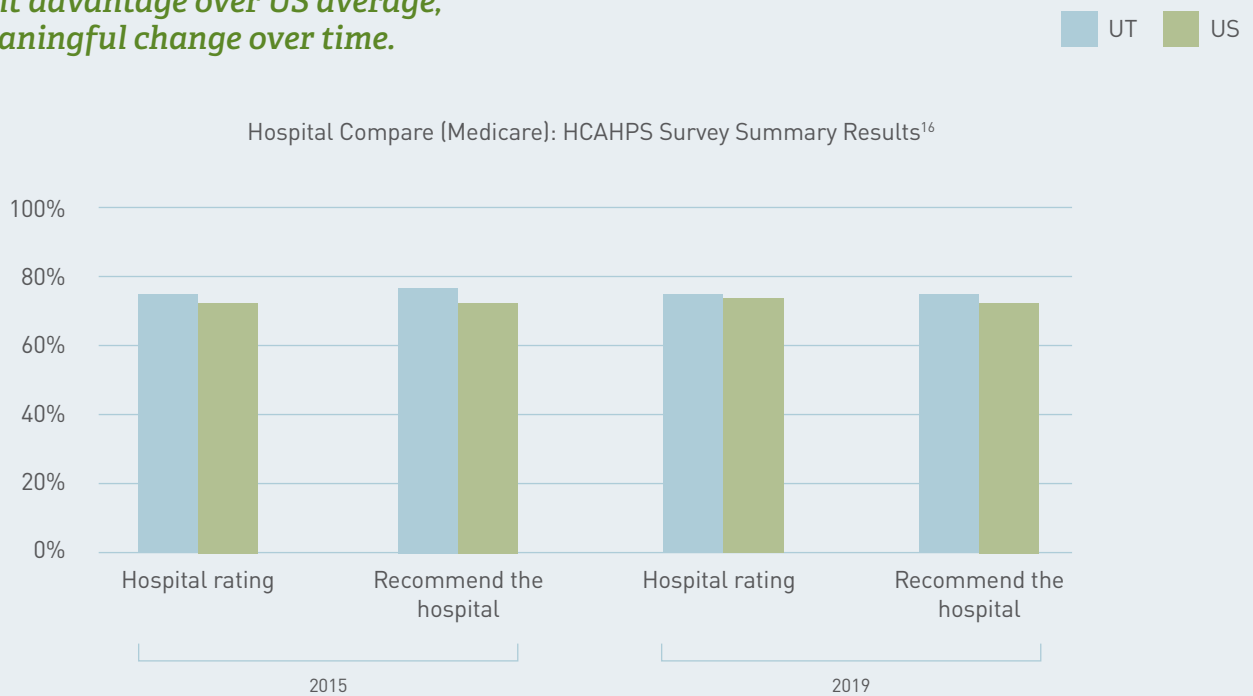
Utah's history of pioneering in the area of experience of care is a bright spot. In 2012 the University of Utah system was the first in the country to make unredacted patient reviews and ratings of physicians publicly available.[17] This precedent of transparency around patient perceptions of the quality of care has since been adopted by major health systems nationwide. Based on 2019 data, Utahn Medicaid patients rate their experience with physicians in line with or just below the national average for nearly all measures.

[16]https://www.hcahpsonline.org Centers for Medicare & Medicaid Services, Baltimore, MD. Accessed May 5, 2020

[17]She's calling for a health care revolution. The radical first step: listen to patients. (2016, October 17). STAT. https://www.statnews.com/2016/10/17/vivan-lee-hospitals-utah/

Population Health Analysis

Population health in Utah is positive with some caveats. Due in part to discouragement from The Church of Jesus Christ of Latter-day Saints (LDS), a faith that a majority of Utahans adhere to, the state is a national leader in rates of smoking cessation and binge drinking avoidance. The general health of Utah residents is above the US average, but this lead is dropping somewhat as the rest of the US improves (Figure 6). A similar pattern has emerged for obesity: Utah has had more residents with healthy BMIs than the country as a whole going back to at least 2016, however, more recently, the portion of residents classified as normal weight has decreased while obesity is increasing. Although the mortality of Utah's Medicare enrollees has decreased, a positive historical trend, the state's ranking relative to the rest of the country has fluctuated, not improving consistently. Part of what may be contributing to mortality is Utah's rank as the worst in the nation for air quality,[18] which has been shown to contribute to both higher rates of respiratory illness, and all-cause mortality.

FIGURE 6

Utah remains one of the healthiest states in the country.

Health rankings and burden of disease[19]

Rank (inverse scale)

— UT's overall rank
— UT's smoking rank
— UT's binge drinking rank
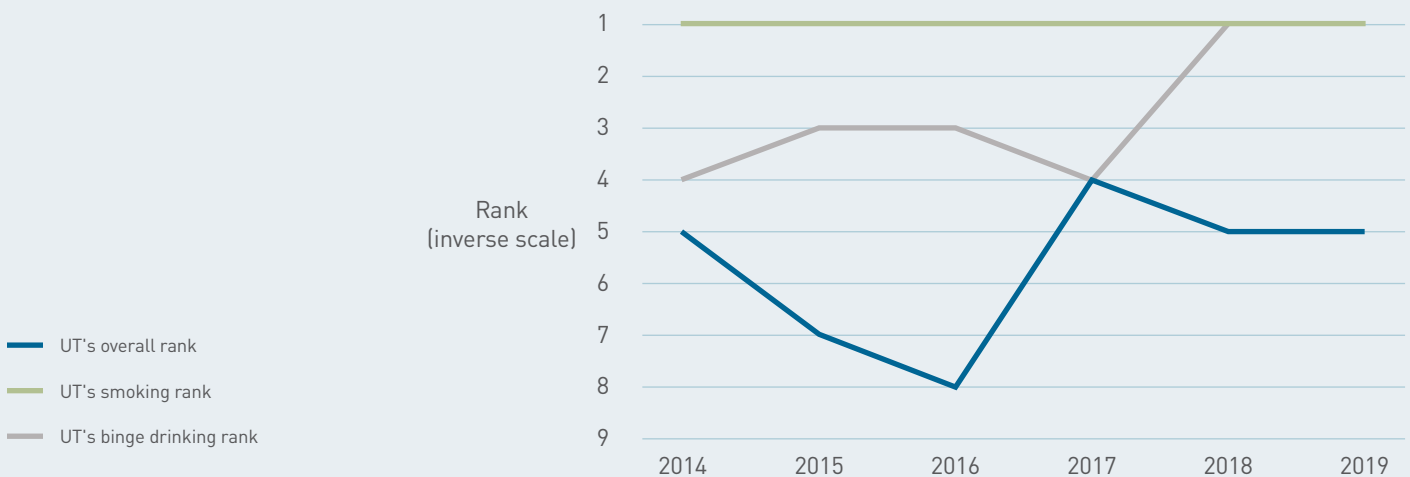
Year over year from 2012-2017, the population of Utah grew at a rate of about 1.7%, but, over the same period, the burden of disease for Utahns has increased at an average annual rate of 3%, or almost twice as quickly. Mental health issues are more of a problem in Utah than in other states. Utah ranks 6th highest nationwide[20] for suicide deaths per 100,000 population, and suicides are the leading cause of death for pre-teens and young adults from 10 to 24 years old. Additionally, as of 2017, about four out of every one hundred people in Utah experience major depression, the highest in the country. Utah's population health is strong, but increased attention is needed in the key areas of nutrition and mental health care to improve it further.

[18]Air Quality by State 2020. (2020). World Population Review. https://worldpopulationreview.com/state-rankings/air-quality-by-state

[19](n.d.). America's Health Rankings. https://www.americashealthrankings.org/

[20]Suicide Facts & Figures: Utah 2020. (2020). American Foundation for Suicide Prevention. https://aws-fetch.s3.amazonaws.com/state-fact-sheets/2020/2020-state-fact-sheets-utah.pdf

Closing

Next Steps

Cambia Grove will continue to employ a convene, identify, and catalyze approach for optimizing the ecosystem elements in Utah to further support impactful innovation. This report provides a baseline to build upon and compare against for future landscape analyses to track the progress on supporting health care innovation in the state. Our long-term goal is to validate the key levers that drive impactful health care innovation, finding causal relationships between these key levers and improvements to the health care system. And finally, we will use this analysis in conjunction with our other programs, such as the Solutions Lab, to identify further opportunities for the community to leverage the Health Care Innovation Advancement Framework to support significant changes in health care.

"We must advance impactful innovation to achieve the Triple Aim. Together, we can optimize three key elements of health care innovation–infrastructure, incentives and culture–to support widespread transformation. Join us."

– Julie Panek Anderson, Director of Strategic Initiatives, Cambia Grove

About Cambia Grove

Cambia Grove is a health care innovation hub focused on advancing innovation in health care across the country. Cambia Health Solutions was founded a century ago in the logging camps of the Pacific Northwest driven by its mission to transform the way people experience health care. The company 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. To further its mission, Cambia Grove has compiled a list of commonly used innovation assets. These can be found at https://www.cambiagrove.com/innovation-assets and https://www.cambiagrove.com/impactful-innovation-exchange.

About Point B, Inc.

Point B, Inc. is a consulting company dedicated to helping organizations with critical strategic initiatives in the areas of customer engagement, growth investments, workforce experience, and operations excellence. It achieves sustainable success for its customers by focusing on the humans at the center of change. Point B is a national company, with 13 U.S. locations and global reach via its partnership with Nextcontinent. The company is 100% employee-owned and is regularly recognized as an exceptional place to work.

Methodology

Our methodology is based on the principle of "progress, not perfection". The elements within the Health Care Innovation Advancement Framework are all multifaceted and complex. By applying design thinking techniques to elevate the most critical questions, engaging with the community to develop a set of potential answers, and using iterative methods to measure and track progress, we believe we have advanced the conversation meaningfully. We believe there is value in highlighting the directionality of data to identify historical trends and patterns, even if pinpointing the exact degree of change remains elusive. Additional reports will employ the same analyses as Utah, using national quantitative data sources and a standardized supplemental qualitative data process.

This report is intended to be descriptive and serve as a snapshot in time. Where possible, we have included context (e.g., past years) to highlight trends and directional insights. The report is not intended to be predictive (i.e., forecasting the future), though with additional data points we aim to get there. Through our work, we aim to look for leading indicators of progress and find signals in the data. For additional methodology information, please refer to our [Health Care Innovation Advancement Framework](#) white paper.

Limitations to Data

The report relies heavily on publicly available data (e.g., via Centers for Medicare & Medicaid Services), as that is often the most readily available data. We chose these data sources to allow for efficient data gathering, and to support learning in a way that can be quickly replicated. The quantitative data analyses we have included are based on nationally representative data sets to allow for cross-state comparison, and in some cases, we have chosen to forego state-specific data sources that are not scalable to other states, which could undermine this comparison. Where possible we have supplemented with other qualitative data sources to paint a holistic picture.

This report also sometimes uses narrow metrics as representative of a larger point. Given the limited availability of quantitative data sources (cost-prohibitive or in many cases non-existent), we chose to make the most of the data available and triangulate on the key signals by combining multiple data sources. At other times, the data are several years old but still the latest available. It is our hope that by shining a light on gaps in data and measurement, we will spark and encourage the development of new and improved measures over time. We plan to update this report with additional measures as they become available.

Appendix

Index of Key Terms

ACO: Accountable Care Organization

AP tests: Advanced Placement tests

APM: Alternative Payment Model

ASR: Age Standardized Rate

BMI: Body Mass Index

CAHPS: Consumer Assessment of Healthcare Providers and Systems

CDC: Centers for Disease Control and Prevention

CMMI: Center for Medicare and Medicaid Innovation

CMS: Centers for Medicare & Medicaid Services

CPC+: Comprehensive Primary Care Plus

DSRIP: Delivery System Reform Incentive Payment

EDTIF: Economic Development Tax Increment Financing

EOC: Episode of Care

HCAHPS: Hospital Consumer Assessment of Healthcare Providers and Systems

HIPAA: Health Insurance Portability and Accountability Act

NAICS: North American Industry Classification System

NCQA: National Committee for Quality Assurance

R&D: Research and Development

SIM: State Innovation Models
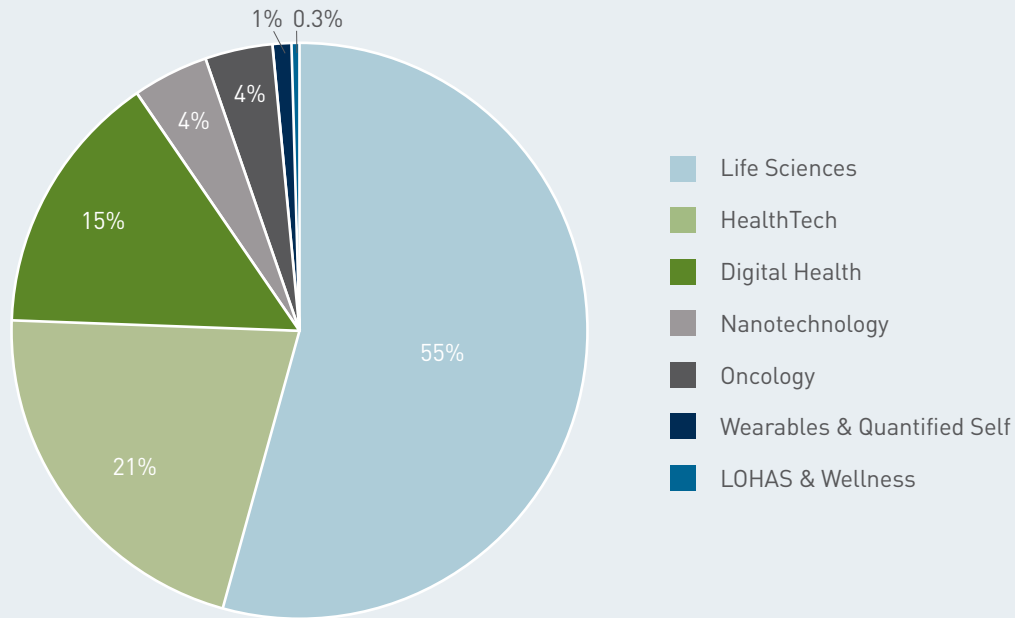
STEM: Science, Technology, Engineering and Mathematics

USTAR: Utah Science Technology and Research Initiative

Ecosystem Enabler Measures

Ecosystem element	Key enabler	Available metrics
Infrastructure	• Collaboration spaces (physical or digital) to support testing and iteration • Reward commensurate with risks along the process, not just big payoff at end • Key needed resources: money, education system to produce necessary talent, data, leadership, and tools • Technical infrastructure (e.g., broadband internet, information technology), such as to support interoperability • Marketplace for discovery of solutions • Mechanisms to roll out and scale solutions and capture/provide feedback	• Private capital investments • Availability of funds to sustain innovators along the process (e.g., Series A and B funding) • NIH awards directed towards university and primary research • Interoperability/EHR adoption metrics (e.g., hospital health IT adoption) • Broadband internet services deployment • Legal support and regulatory requirements • STEM education data (while STEM degrees are not the only ones that lead to innovation, it is a measurement to track the technical capabilities needed to catalyze innovation)
Incentives	• Alignment of incentives to spark and support impactful health care innovation (e.g., value-based care) • Public or private recognition (money, fame, impact) • Innovation-friendly legal/regulatory/tax requirements • Lack of or limits on non-competes • Personal inspiration for patients to be healthy, depending on their own goals	• Policy and tax friendliness level (e.g., state innovation waiver, total tax burden, R&D tax credits) • Split of value-based care vs. fee-for-service models (e.g., Medicare Advantage adoption), and programs to support the transition (e.g., SIM, DSRIP)
Culture	• Collaboration & information-sharing on key challenges and ideas • Leadership and talent in the health care system that promotes inclusivity and equity • Focus on person-focused challenges, and frequent validation that solutions are solving their needs • Risk tolerance and acceptance of failure • Evangelizers and champions to "pull" ideas and create willingness to change • Trust between the health care sector as represented by the 5 Points of Health Care™ and industries such as information and communications technology, life sciences, and advanced manufacturing • Motivation from experienced innovators to mentor others	• Performance of the health care innovation industry (e.g., jobs creation, payroll, number of establishments) • Diversity of leadership in medical field and state legislature • Rate of technology transfer from academia • Number of health and health tech accelerators and incubators

Infrastructure Data

Makeup of private investments in health care verticals 2015–2019

Legend:
- Life Sciences
- HealthTech
- Digital Health
- Nanotechnology
- Oncology
- Wearables & Quantified Self
- LOHAS & Wellness

Private capital investments in health care verticals ($million)[21]

Vertical	2015	2016	2017	2018	2019	Total	2015–19 change
Wearables & Quantified Self	1.1	0.0	0.0	4.6	0.1	5.8	-91%
Life Sciences	43.4	12.1	153.8	1.5	124.9	335.7	188%
Oncology	5.0	0.0	16.0	1.5	0.0	22.5	-100%
Digital Health	11.0	5.9	47.5	28.6	0.0	93.0	-100%
HealthTech	2.5	5.9	87.5	8.4	25.0	129.3	908%
LOHAS & Wellness	0.0	0.0	0.0	0.0	1.6	1.6	NA
Nanotechnology	27.0	0.0	0.0	0.0	0.0	27.0	-100%
Total	89.9	23.9	304.8	44.6	151.6	614.8	69%

NB: Data measures global private capital investments made in WA state. LOHAS stands for Lifestyles of Health and Sustainability.

Comments: Between 2015 and 2019, overall private capital investments into Utah increased by 69%. In particular the HealthTech and Life Sciences verticals saw large increases in funding over this time span, with most other verticals seeing large decreases or total stop in funding. Life Sciences, HealthTech and Digital Health made up 91% of all private capital investments into Utah.

[21]Pitchbook

NIH awards directed towards organizations ($million)[22]


Legend:
- University of Utah
- All Others
- Utah State University
- Brigham Young University
- Navigen, Inc.
- Biofire (see note below)

Pie chart values: 86%, 4%, 3%, 3%, 2%, 2%
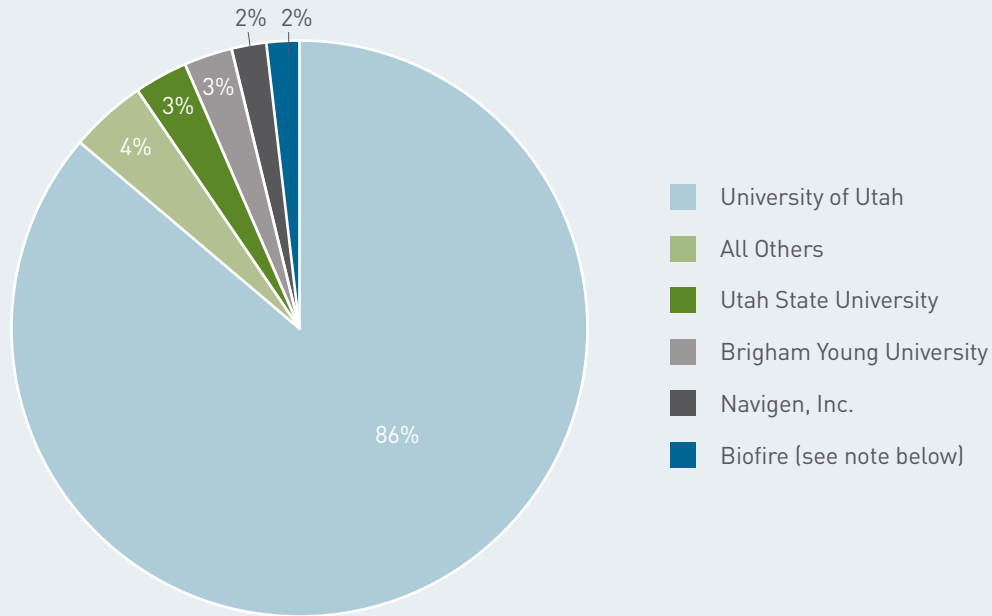
Organization name	2015	2016	2017	2018	2019	% of Total
UT awards as % of total awards	0.7%	0.7%	0.8%	0.8%	0.8%	
University of Utah	$136	$153	$171	$200	$203	86%
Utah State University	$6	$5	$5	$6	$8	3%
Brigham Young University	$4	$8	$3	$4	$6	3%
Navigen, Inc.	$4	$3	$5	$4	$2	2%
Biofire (see note below)	$2	$4	$3	$5	$1	2%
IHC Health Services, Inc.	$1	$0	$0	$1	$2	0%
Epitel, Inc.	$1	$1	$1	$1	$1	0%
Recursion Pharmaceuticals, LLC	$1	$1	$0	$1	$0	0%
Remaining Institutions	$3	$9	$10	$8	$11	4%
Total	**$159**	**$185**	**$198**	**$228**	**$234**	**100%**

NB: Biofire line includes: Biofire Diagnostics, LLC, Biofire Defense, LLC and Biofire Diagnostics, Inc. combined

Comments: University of Utah received the largest share directed towards Utah, with a total of $862 million, or 86% of all NIH funds directed towards UT organizations. NIH funding to Utah increased 48% between 2015 and 2019 in absolute terms. As a percent of total funding across US, Utah's share increased slightly, from 0.7% to 0.8%.

[22]NIH awards by location and organization. (n.d.). NIH Research Portfolio Online Reporting Tools (Report). https://www.report.nih.gov/award/index.cfm

Hospital Health IT Adoption and Use[23]

Between 2015 and 2017, UT made great strides in hospital health IT, exceeding the US average for all metrics.
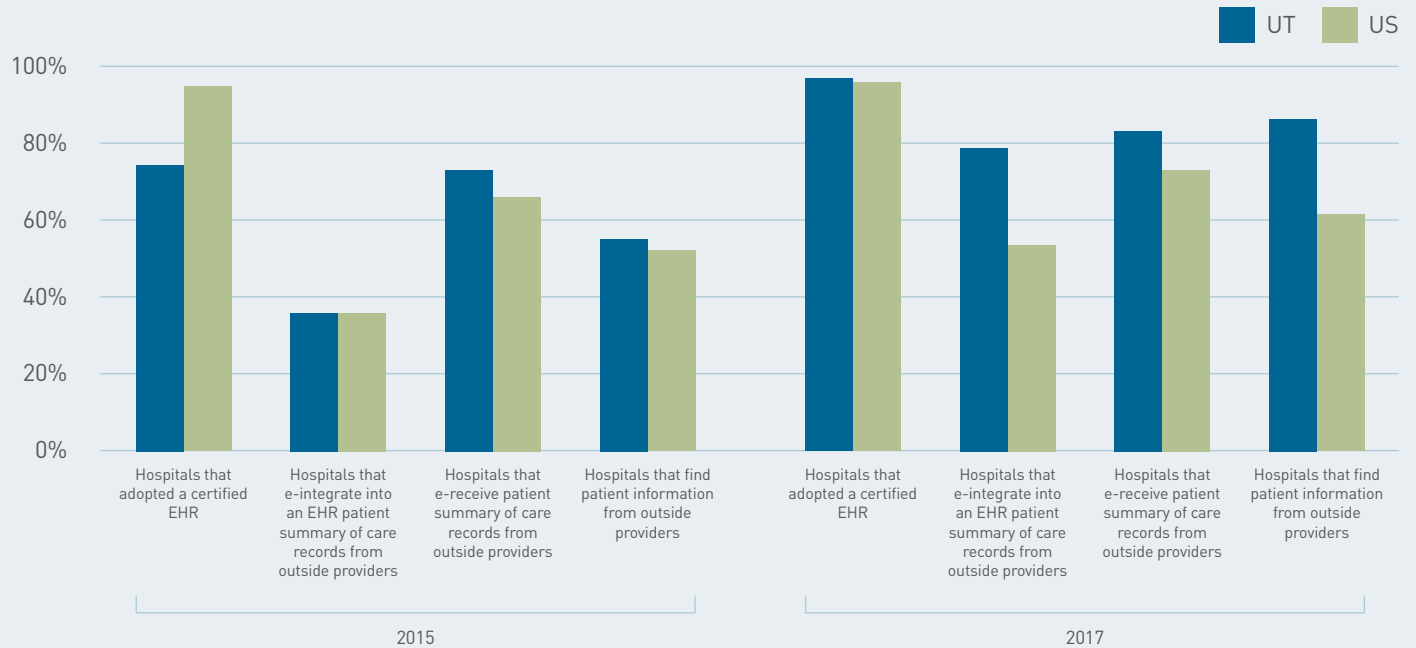
Metric	2015 (UT)	2015 (US)	2017 (UT)	2017 (US)
Hospitals that adopted a certified EHR	75%	96%	97%	96%
Hospitals that e-integrate into an EHR patient summary of care records from outside providers	38%	38%	79%	53%
Hospitals that e-receive patient summary of care records from outside providers	74%	65%	82%	74%
Hospitals that e-send, receive and find clinical information and integration into an EHR from outside providers	N/A	N/A	75%	41%
Hospitals that exchange care summaries with any outside provider	65%	76%	N/A	N/A
Hospitals that find patient information from outside providers	56%	52%	84%	61%

NB: EHR certification standards were revised during this period, hence trends in EHR-related statistics may be less meaningful. Caveat: Latest data year available is 2017.

Comments: Across all applicable metrics, UT has improved relative to the rest of the US, and now exceeds US averages. Nearly all hospitals in the state have adopted a certified EHR.

[23]Office of the National Coordinator for Health Information Technology. 'Non-federal Acute Care Hospital Health IT Adoption and Use,' Health IT Dashboard. http://dashboard.healthit.gov/apps/hospital-health-it-adoption.php. May 2019.

Broadband Internet Services Deployment[24]

Metric	2018	2019	2020
% of population with fixed 25 Mbps/3 Mbps (rural)	73%	64%	68%
% of population with fixed 25 Mbps/3 Mbps (urban)	100%	99%	99%
% of population with mobile 5 Mbps/1 Mbps (rural)	95%	98%	99%
% of population with mobile 5 Mbps/1 Mbps (urban)	100%	100%	100%

NB: The FCC retains the existing speed benchmark of 25 Mbps download/3 Mbps upload (25 Mbps/3 Mbps) for fixed services and examines the deployment of mobile services with minimum advertised speeds of 5 Mbps/1 Mbps.

Comments: There is widespread broadband coverage across the state, with the exception of fixed broadband coverage in rural areas, which has oscillated since 2018.

UT State Telehealth Laws[25]

Medicaid Program: Utah Medicaid

Program Administrator: Utah Department of Health

Medicaid live video reimbursement: Yes

Private payer law: Yes

NB: Private payer law refers to laws that govern private payer telehealth reimbursement policies.

[24]2018 broadband deployment report. (2018, February 5). Federal Communications Commission. https://www.fcc.gov/reports-research/reports/broadband-progress-reports/2018-broadband-deployment-report and 2019 broadband deployment report. (2019, June 11). Federal Communications Commission. https://www.fcc.gov/reports-research/reports/broadband-progress-reports/2019-broadband-deployment-report and 2020 broadband deployment report. (2020, June 8). Federal Communications Commission. https://www.fcc.gov/reports-research/reports/broadband-progress-reports/2020-broadband-deployment-report

[25]Center for Connected Health Policy, Fall 2019 https://www.cchpca.org/telehealth-policy/state-telehealth-laws-and-reimbursement-policies-report

STEM education data[26]

	2010–11	2012–13	2014–15	2016–17	2018–19
Graduate degrees/ certificates, as % of total graduate degrees/ certificates	18%	20%	23%	25%	25%

NB: Calculation for graduate degrees/certificates is as follows: Awards conferred to students completing programs at all USHE institutions in Utah by academic year.

Comments: Positive signs for percentage of graduate students pursuing STEM degrees, with STEM graduate degrees growing at twice the pace of all graduate degrees. In particular, the data shows strong increase in masters programs in the Computer & Info Sciences field, and in all Doctorate programs.

Funding data by deal class ($million)[27]

Deal Class/series	2015	2016	2017	2018	2019	Total
Corporate	$45	$4,483	$840	$1,460	$212	$7,039
Debt	$0	$1	$5	$0	$0	$6
Individual	$2	$1	$0	$1	$2	$6
Other	$7	$32	$11	$15	$1	$65
Private Equity	$6	$865	$405	$10	$6	$1,292
Public Investment	$0	$0	$0	$0	$0	$0
Venture Capital	$221	$156	$253	$89	$295	$1,014
Seed	$6	$2	$6	$9	$3	$26
Series A	$43	$33	$79	$0	$0	$155
Series B	$40	$0	$101	$24	$0	$165
Series C	$62	$37	$46	$0	$147	$293
Series D and later	$70	$80	$0	$55	$100	$305
Unknown	$0	$4	$20	$1	$45	$70
Total	**$281**	**$5,537**	**$1,513**	**$1,575**	**$516**	**$9,422**

NB: Data retrieved in July 2020.

Comments: Early-stage funding (seed, series A and B) has dropped by a large amount in recent years, while later stage funding (series C and D) has increased, potentially hindering funding for startups. Overall funding dropped by a large amount in the latest year (2019).

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[26]https://ushe.edu/data/. Includes all masters and doctorate degrees awarded in the following fields: Biological Sciences/Life Sciences, Computer & Info Sciences, Engineering & Related Technologies, Mathematics, Physical Sciences & Science Tech.

[27]Pitchbook

Incentives Data

State Innovation Waiver[28]

NB: Section 1332 of the Affordable Care Act (ACA) permits a state to apply for a State Innovation Waiver (Section 1332 waiver) to pursue innovative strategies for providing their residents with access to high quality, affordable health coverage. To receive approval for a Section 1332 waiver, the state must demonstrate that the waiver will provide access to quality health care that is at least as comprehensive and affordable as would be provided without the waiver, will provide coverage to at least a comparable number of residents of the state as would be provided coverage without a waiver, and will not increase the federal deficit.

Comments: Utah does not have a state innovation waiver in place.

Total tax burden[29]

NB: This metric measures total state and local taxes – including corporate income, personal income, sales and more – as a percent of total state income, according to the U.S. Census Bureau's Survey of State and Local Government.

Comments: Utah ranks 9th overall according to the Tax Foundation (with a particularly strong showing in the category of property tax) and 5th in the country according to US News's Business Environment Ranking (with particularly strong showings in the categories of entrepreneurship (#3) and venture capital (#4)).

R&D Tax Credits[30]

NB: The R&D tax credit is used to reduce income tax liabilities of small to medium sized businesses. The research tax credit was originally introduced by Congress in 1981 to encourage U.S.-based companies to develop new and improved products, processes or software. In addition to the federal tax credit, many states provide their own R&D tax credit.

Comments: Utah has an R&D tax credit in place. The tax credit is the sum of: 5% of qualified research expenses in Utah for the current tax year that exceed a base amount, 5% of payments made to a qualified organization for basic research in Utah for the current taxable year that exceed a base amount, and 7.5% of qualified research expenses for the taxable year.

[28]Tracking section 1332 state innovation waivers. (2020, January 7). The Henry J. Kaiser Family Foundation. https://www.kff.org/health-reform/fact-sheet/tracking-section-1332-state-innovation-waivers/, States see opportunities for flexibility in the ACA's innovation waiver program. (n.d.). Commonwealth Fund. https://www.commonwealthfund.org/blog/2017/states-see-opportunities-flexibility-acas-innovation-waiver-program, and State roles using 1332 health waivers. (2018, December 14). Legislative News, Studies and Analysis | National Conference of State Legislatures. https://www.ncsl.org/research/health/state-roles-using-1332-health-waivers.aspx

[29]These Are the Most Innovative States in America. (n.d.). Retrieved from https://www.usnews.com/news/best-states/rankings/economy/business-environment and 2020 State Business Tax Climate Index Ranks and Component Tax Ranks. (2019, October 22). Tax Foundation. https://taxfoundation.org/publications/state-business-tax-climate-index/

[30]Utah - State R&D tax credit information. (2019, September 7). Intrepid Advisors. https://intrepid-advisors.com/state-rd-tax-credit-eligibility-map/utah-rd-tax-credit/

Value-Based Care and Payment Innovation Models[31]

Approved for Comprehensive Primary Care Plus (CPC+): No

Awarded SIM grant: Yes, Round 1 and 2 design

ACO programs: No

EOC programs: No

NB: Comprehensive Primary Care Plus (CPC+) is a national advanced primary care medical home model that aims to strengthen primary care through regionally based multi-payer payment reform and care delivery transformation. CPC+ includes two primary care practice tracks with incrementally advanced care delivery requirements and payment options to meet the diverse needs of primary care practices in the United States (U.S.). CPC+ includes three payment elements: Care Management Fee (CMF); Performance-Based Incentive Payment; and Payment under the Medicare Physician Fee Schedule.

Medicaid DSRIP programs (2017)[32]

NB: Many states that have implemented Medicaid Alternative Payment Model (APM) initiatives have received federal funding to support their transformation efforts. Two mechanisms that many states have leveraged are the Center for Medicare and Medicaid Innovation State Innovation Models initiative and Medicaid Delivery System Reform Incentive Payment (DSRIP) programs. DSRIP programs can help states access federal matching funds, which can be used to support providers as they transition to providing value-based care.

Comments: Utah does not have a DSRIP waiver, one of US 37 states not to have one.

CMS SIM Initiative (2020 data)[33]

Initiative Category	# of initiatives
Episode-based Payment Initiatives	25
Initiatives to Speed the Adoption of Best Practices	4
Initiatives to Accelerate the Development and Testing of New Payment and Service Delivery Models	4
Accountable Care	1
Primary Care Transformation	1
Initiatives Focused on the Medicare-Medicaid Enrollees	0
Initiatives Focused on the Medicaid and CHIP Enrollees	0
Initiatives Focused on the Medicaid and CHIP Population	0
Total	**35**

[31](n.d.). Primary Care Collaborative. https://www.pcpcc.org/sites/default/files/resources/%7Ba7b8bcb8-0b4c-4c46-b453-2fc58cefb9ba%7D_Change_Healthcare_Value-Based_Care_in_America_State-by-State_Report.pdf

[32]Alternative payment models in Medicaid. (n.d.). https://www2.deloitte.com/content/dam/Deloitte/us/Documents/life-sciences-health-care/us-lshc-alternative-payment-models-in-Medicaid-MACRA.pdf

[33]CMS innovation center model participants. (n.d.). Data.CMS.gov | Data.CMS.gov. https://data.cms.gov/Special-Programs-Initiatives-Speed-Adoption-of-Bes/CMS-Innovation-Center-Model-Participants/x8pc-u7ta

CMS SIM Initiative (2020 data) (Continued)

NB: First year of data available. Data retrieved in March 2020. The Innovation Center develops new payment and service delivery models in accordance with the requirements of section 1115A of the Social Security Act. By means of that section, Congress created the Innovation Center for the purpose of testing "innovative payment and service delivery models to reduce program expenditures …while preserving or enhancing the quality of care" for those individuals who receive Medicare, Medicaid, or Children's Health Insurance Program (CHIP) benefits. Additionally, Congress has defined – both through the Affordable Care Act and previous legislation – a number of specific demonstrations to be conducted by CMS.

Through the State Innovation Models initiative (SIM), CMS is providing financial and technical support for developing and testing state-led, multi-payer health care payment and service delivery models.

Comments: The majority of initiatives focus on episode-based payments, with relatively little focus on the remaining initiative categories. There are no initiatives focused specifically on Medicare, Medicaid, or CHIP enrollees.

Medicare Advantage adoption[34]

Metric	2010	2015	2018
UT: Share of Medicare beneficiaries in Medicare Advantage (percent)	34%	35%	36%
UT: Share of Medicare beneficiaries in Medicare Advantage (rank)	9	13	16
US: Share of Medicare beneficiaries in Medicare Advantage (percent)	25%	31%	34%

NB: For each year, higher rank (e.g., 1) indicates higher adoption relative to the rest of the states.

Comment: Utah ranks above the US average for Medicare Advantage adoption.

[34]A dozen facts about Medicare Advantage in 2019. (2019, August 6). The Henry J. Kaiser Family Foundation. https://www.kff.org/medicare/issue-brief/a-dozen-facts-about-medicare-advantage-in-2019/, and Monthly MA enrollment by state/County/Plan type. (2019, November 9). CMS Homepage | CMS. https://www.cms.gov/Research-Statistics-Data-and-Systems/Statistics-Trends-and-Reports/MCRAdvPartDEnrolData/Monthly-MA-Enrollment-by-State-County-Plan-Type

Culture Data

Health care innovation industry growth[35]

UT's health care innovation industry weighted average payroll/employee has matched the rest of the US.
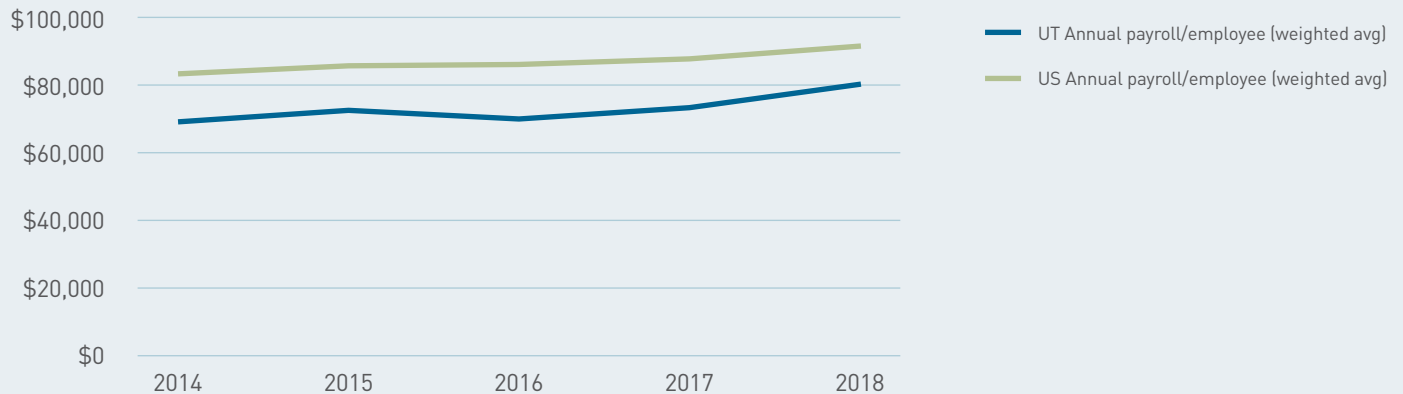
Metric	2014	2015	2016	2017	2018
Annual payroll/employee (weighted average)	$69,452	$73,002	$71,523	$73,649	$80,618
Number of employees (sum)	39,884	42,166	46,345	52,119	57,767
Number of establishments (sum)	1,728	1,886	2,045	2,252	2,506

Average annual growth rate	2014–2018 (UT)	2014–2018 (US)
Annual payroll/employee (weighted average)	4%	4%
Number of employees (sum)	10%	5%
Number of establishments (sum)	10%	9%

NB: Data retrieved in July 2020. See additional appendix section for NAICS codes included in the health care innovation industry.

Comments: Utah's weighted average payroll/employee has matched that of the US as a whole. The number of employees has grown twice as fast in Utah as for the US as a whole, perhaps suggesting more hiring on the lower end of the experience pool. Jobs in the areas of Instrument Manufacturing for Measuring and Testing Electricity and Electrical Signals (NAICS code 334515) and Software Publishers (NAICS code 511210) earn relatively higher salaries than others in the HCIS. Jobs in the areas of Electronic Shopping and Mail-Order Houses (NAICS code 454110) and Software Publishers (NAICS code 511210) make up 40% of all jobs in the HCIS.

[35]QCEW data views. (n.d.). Databases, Tables & Calculators by Subject. https://data.bls.gov/cew/apps/data_views/data_views.htm#tab=Tables. See list of codes in scope in this section of the appendix.

Active female physicians as percentage of total[36]

Metric	2010	2014	2018
Active female physicians (% of total)	21%	23%	25%
Active female physicians (national rank)	49	50	50

NB: Data by race and ethnicity were not available. Higher rank (e.g., 1) indicates higher female representation, as compared to the nation.

Comments: Utah remains the state with the lowest proportion of active female physicians.

Women in State Legislature[37]

Metric	2010	2015	2020
Women as percentage of the Legislature	21%	15%	24%
US average	24%	24%	29%

NB: Data retrieved in March 2020.

Comments: Women as a percent of the legislature has increased somewhat, but remains below the national average.

Diversity in health care leadership[38]

Utah's non-white medical school graduate proportion has roughly matched state demographics, though 2018 was an exception.
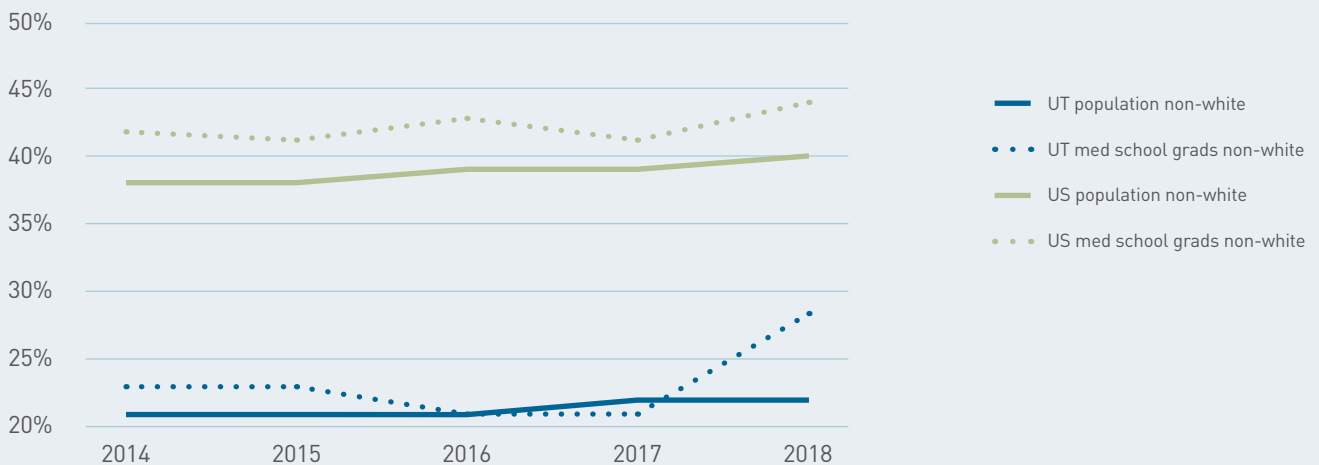
[36]State physician workforce data report. (n.d.). AAMC. https://www.aamc.org/data-reports/workforce/report/state-physician-workforce-data-report

[37](n.d.). Legislative News, Studies and Analysis | National Conference of State Legislatures. https://www.ncsl.org/

[38]Distribution of allopathic medical school graduates by race/Ethnicity. (2019, August 5). The Henry J. Kaiser Family Foundation. https://www.kff.org/other/state-indicator/allopathic-distribution-by-race-ethnicity/ and Population distribution by race/Ethnicity. (2019, December 4). The Henry J. Kaiser Family Foundation. https://www.kff.org/other/state-indicator/distribution-by-raceethnicity

Distribution of allopathic Medical School Graduates by Race/Ethnicity

Metric	2014	2016	2018
UT: non-white graduates	23%	21%	28%
US: non-white graduates	42%	43%	44%

NB: This metric matters because medical school graduates generally tend to stay in state post-graduation.

Comments: Utah's racial/ethnic diversity among allopathic medical school graduates is below the US average but increasing. However, relative to the state's non-white population (approximately 22%), there are more non-white medical school graduates. The state's Hispanic population remains underrepresented in medical school, as it makes up 14% of the state's population, but only 3% of graduates. As a state, Utah makes up 1% of the US population; however, it makes up only 0.5% of the nation's medical school graduate population.

University Technology Transfer[39]

Institution	Rank	Patents Issued Score	Licensing Issued Score	Licensing Income Score	Start-up Score
University of Utah	1	88.27	89.38	94.04	93.9
Brigham Young University	4	85.59	85.83	86.76	94.95
Utah State University	90	70.33	69.53	80.68	64.17

NB: Data as of Apr 2017.

Comments: Utah has a strong showing in the national technology transfer ranking, capturing the #1 and #4 spots nationwide.

Technology accelerators and incubators[40]

Investor type	2020 # of organizations
Accelerator	5
Incubator	6
Total	**11**

NB: First year of compiled data. Data retrieved in March 2020.

Comments: There are 11 total accelerators and incubators headquartered in Utah. None appear to be focused on health care, and two seem to no longer be active.

[39]Concept to Commercialization: The Best Universities for Technology Transfer. (n.d.). Milken Institute. https://milkeninstitute.org/sites/default/files/reports-pdf/Concept2Commercialization-MR19-WEB.pdf

[40](n.d.). Crunchbase. https://www.crunchbase.com/

me

Per Capital Cost Data

CMS National Health Expenditure[41] and Average Private-Sector Employee Cost: Premium Contribution and Deductible[42] as compared to household income[43]

Metric	2008	2010	2012	2014	2016	2018
Private sector average combined employee premium contribution and deductible	$3,749	$4,690	$5,509	$6,354	$5,841	$6,777
As % of Median Household Income, and rank	6.2% Rank: 10	7.3% Rank: 8	8.6% Rank: 16	9.9% Rank: 23	8.4% Rank: 2	8.8% Rank: 5
Private sector median household income	$60,300	$63,900	$64,000	$64,000	$69,601	$77,000
CMS All Payers Hospital Services Expenditure (Per Capita Dollars and rank)	$1,796 Rank: 1	$1,949 Rank: 1	$2,133 Rank: 2	$2,351 Rank: 2	N/A	N/A
CMS All Payers Physician and Clinical Services Expenditure (Per Capita Dollars and rank)	$1,160 Rank: 1	$1,198 Rank: 1	$1,246 Rank: 1	$1,319 Rank: 1	N/A	N/A

NB: Single and family premium contributions, deductibles and combined estimates are weighted for the distribution of single-person and family households in the state. For each year, higher rank (e.g., 1) indicates lower expenditure, relative to 50 states + DC. Caveat: Latest CMS data year available is 2014.

Comments: Utah consistently has one of the lowest costs of care nationwide. For CMS plans, Utah consistently has the lowest per-capita hospital and physician expenditures. On the private sector side, employee contributions continue to increase at a faster rate than household income increases. Despite that Utah continues to be one of the lowest cost of health care states in the private sector nationwide. In particular, the state brought rising private sector costs under control in 2016.

Experience of Care Data

Hospital Compare (Medicare): HCAHPS Star Rating[44]

Metric	2015	2020
# of 1-star rated hospitals (% of total)	0 (0%)	0 (0%)
# of 2-star rated hospitals (% of total)	1 (3%)	4 (12%)
# of 3-star rated hospitals (% of total)	14 (41%)	13 (39%)
# of 4-star rated hospitals (% of total)	18 (53%)	15 (45%)
# of 5-star rated hospitals (% of total)	1 (3%)	1 (3%)
Weighted average star rating - UT	3.6	3.4
Weighted average star rating - US average	3.2	3.2

[41]NHE fact sheet. (2020, March 24). CMS Homepage | CMS. https://www.cms.gov/Research-Statistics-Data-and-Systems/Statistics-Trends-and-Reports/NationalHealthExpendData/NHE-Fact-Sheet

[42](n.d.). Commonwealth Fund. https://www.commonwealthfund.org/sites/default/files/2019-11/Collins_state_premium_trends_2008_2018_db_1.pdf

[43]Historical Income Tables: Households. (n.d.). US Census Bureau. https://www.census.gov/data/tables/time-series/demo/income-poverty/historical-income-households.html

[44]https://www.hcahpsonline.org Centers for Medicare & Medicaid Services, Baltimore, MD. Accessed May 5, 2020

Hospital Compare (Medicare): HCAHPS Star Rating (Continued)

NB: The overall hospital rating includes a variety of the more than 100 measures reported on Hospital Compare, divided into 7 measure groups or categories: Mortality, Safety of Care, Readmission, Patient Experience, Effectiveness of Care, Timeliness of Care and Efficient Use of Medical Imaging. Rating ranges from 1 star (lowest) to 5 stars (highest).

Comments: Slight decline in hospital ratings between 2015 and 2020.

Hospital Compare (Medicare): HCAHPS Survey Summary Results[45]

Metric	2015	2019
Hospital rating - UT	76%	76%
Hospital rating - US average	72%	73%
Recommend the hospital - UT	77%	76%
Recommend the hospital - US average	72%	72%

NB: Each rating is the average "top-box" score (highest score possible) for that measure. For example, the "Hospital rating" is the percent of patients who give a 9 or 10 (high) for the Overall Hospital Rating; the rating for "Recommend the hospital" is the percent of patients who reported they would "definitely" recommend the hospital to friends and family.

Comments: No meaningful changes in hospital ratings between 2015 and 2019. UT results are slightly above US averages.

Hospital Compare (Medicare): 2018 Complications and Deaths[46]

Metric	Better	Same	Worse	Lack of data
Death rate for COPD patients	0	19	1	23
Death rate for heart failure patients	1	26	1	16
Death rate for pneumonia patients	0	40	0	4
Deaths among Patients with Serious Treatable Complications after Surgery	0	12	0	15
Serious blood clots after surgery	1	29	0	1
Serious complications	2	30	0	0

[45]https://www.hcahpsonline.org Centers for Medicare & Medicaid Services, Baltimore, MD. Accessed May 5, 2020

[46]Complications and deaths - National | Data.Medicare.gov. (n.d.). Data.Medicare.gov | Data.Medicare.gov. https://data.medicare.gov/Hospital-Compare/Complications-and-Deaths-National/qqw3-t4ie

Hospital Compare (Medicare): 2018 Complications and Deaths (Continued)

NB: Data is the number of hospitals in the state that performed better, same, or worse than the national average for that metric. Lack of data column indicates the hospital had too few of the given procedure to make a determination.

Comments: UT does not perform meaningfully better or worse than the national average in any of these metrics.

Dartmouth Atlas Primary Care Access and Quality (2008-2015 data)[47]

Metric	2010	2015
Female Medicare enrollees age 67-69 having at least one mammogram over a two-year period (Average % and rank)	Overall: 61%, 45 Black: 56%, 37 White: 61%, 40	Overall: 59%, 41 Black: 57%, 34 White: 59%, 38
Diabetic Medicare enrollees age 65-75 having hemoglobin A1c test (Average % and rank)	Overall: 84%, 25 Black: 89%, 2 White: 84%, 28	Overall: 87%, 20 Black: 86%, 10 White: 87%, 26
Diabetic Medicare enrollees age 65-75 having blood lipids (LDL-C) test (Average % and rank)	Overall: 75%, 42 Black: 74%, 25 White: 75%, 44	Overall: 73%, 42 Black: 71%, 31 White: 73%, 43

NB: For each year, higher rank (e.g., 1) indicates higher testing percentage relative to 50 states + DC. Caveat: Latest data year available is 2015. There have been recent changes in breast cancer screening guidelines, in particular requiring only biennial screenings after age 55. The above measure captures at least one screening over a two-year period.

Comments: No meaningful improvements for UT over the time period measured. With the exception of Black diabetic Medicare enrollees age 65-75 having hemoglobin A1c tests, Utah's ranking is at or below the US average across these metrics. However, that ranking has also dropped over the time period measured. With the small exception of mammograms, Black Medicare enrollees have seen worse or unchanged access to tests.

[47]Dartmouth atlas data. (n.d.). Dartmouth Atlas Data. https://atlasdata.dartmouth.edu/static/general_atlas_rates

Physician Compare (Medicare)[48]

Metric	2017 UT	2017 US avg.
Courteous and Helpful Office Staff	93	93
How Well Providers Communicate	92	93
Patient's Rating of Provider	92	92
Care Coordination	88	87
Getting Timely Care, Appointments and Information	79	81
Health Promotion and Education	64	62
Between Visit Communication	60	57
Stewardship of Patient Resources	30	27

NB: Scores for reported measures were calculated on a 0-100 scale. Physician Compare data was last updated on Mar 19, 2020.

Comments: UT's results are largely in line with the US average.

NCQA health insurance plan ratings[49]

	2015–2016	2019–2020
Private plans weighted average rating	2.9	3.3
% of private plans rated 4+	9%	13%
# of plans	11	15
Medicare plans weighted average rating	3.3	3.6
% of Medicare plans rated 4+	17%	40%
# of plans	12	10
Medicaid plans weighted average rating	3.5	3.5
% of Medicaid plans rated 4+	0%	25%
# of plans	3	4

NB: Data retrieved in March 2020. The rating is based on a weighted average of all measures (consumer satisfaction, prevention and treatment).

Comments: Improvements in private and Medicare plan overall ratings, no change in Medicaid plan overall ratings. One 4-star rated Medicaid plan in 2019-2020, as compared to zero in 2015-2016.

[48]Centers for Medicare & Medicaid Services (CMS) via https://data.medicare.gov/data/physician-compare
[49]NCQA health insurance plan ratings: http://healthinsuranceratings.ncqa.org/2019/Default.aspx and http://healthinsuranceratings.ncqa.org/2015/Default.aspx

Population Health Data

Dartmouth Atlas Medicare Mortality[50]

| Metric	2010	2011	2012	2013	2014	2015	2016	2017
Total Mortality: ASR-adjusted deaths among Medicare enrollees (Average % and rank)	4.38% Rank: 15	4.38% Rank: 15	4.33% Rank: 19	4.34% Rank: 21	4.19% Rank: 17	4.19% Rank: 17	4.13% Rank: 22	4.01% Rank: 13

NB: The metric measures the percentage of Medicare enrollees who died that year. For each year, higher rank (e.g., 1) indicates lower percentage relative to 50 states + DC. Age Standardized Rate (ASR) data assumes a standard age structure, allowing for comparisons across states. Caveat: Latest data year available is 2015.

Comments: UT is lagging behind rest of country until 2015. Slight drop in percentage over the years.

Behavioral Risk Factor Surveillance System Prevalence Summary[51]

UT continues to outperform the US in all metrics, though the advantage is shrinking.
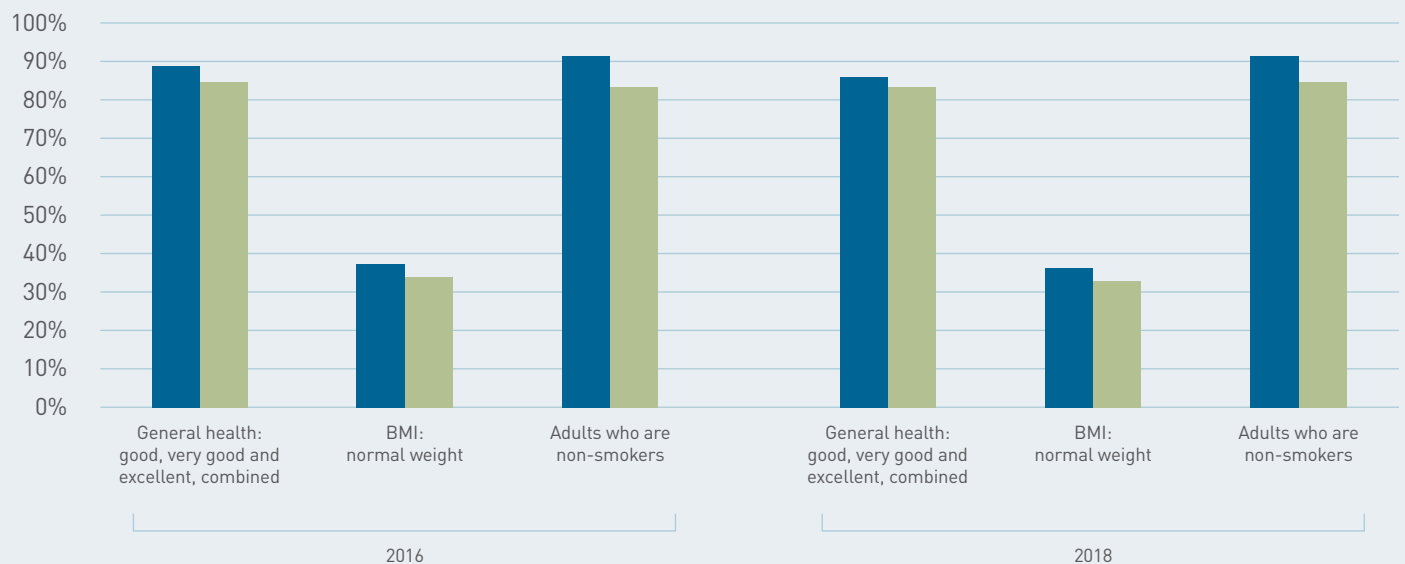
[50]Dartmouth atlas data. (n.d.). Dartmouth Atlas Data. https://atlasdata.dartmouth.edu/static/general_atlas_rates

[51]BRFSS: Table of demographics | Chronic disease and health promotion data & indicators. (n.d.). Socrata. https://chronicdata.cdc.gov/Behavioral-Risk-Factors/BRFSS-Table-of-Demographics/6rsf-i7tq

Behavioral Risk Factor Surveillance System Prevalence Data Details

How is your general health?	2016 (UT)	2016 (US)	2018 (UT)	2018 (US)
Excellent	22%	18%	21%	18%
Very good	37%	34%	34%	33%
Good	30%	32%	31%	32%
Fair	9%	13%	11%	13%
Poor	3%	4%	3%	4%

NB: Totals may not add up to 100% due to rounding.

Comments: General health of UT residents is above US average but dropping somewhat.

Weight classification by BMI	2016 (UT)	2016 (US)	2018 (UT)	2018 (US)
Underweight (BMI 12.0-18.4)	2%	2%	2%	2%
Normal weight (BMI 18.5-24.9)	38%	33%	36%	32%
Overweight (BMI 25.0-29.9)	35%	35%	34%	35%
Obese (BMI 30.0+)	25%	30%	28%	31%

NB: Totals may not add up to 100% due to rounding.

Comments: As compared to the US, UT has more residents with normal weights, and fewer obese residents. However, this favorable gap is shrinking..

Adults who are smokers	2016 (UT)	2016 (US)	2018 (UT)	2018 (US)
Yes	9%	17%	9%	16%
No	91%	83%	91%	84%

NB: Totals may not add up to 100% due to rounding.

Comments: No changes observed. Utah continues to perform better than the US as a whole for this metric.
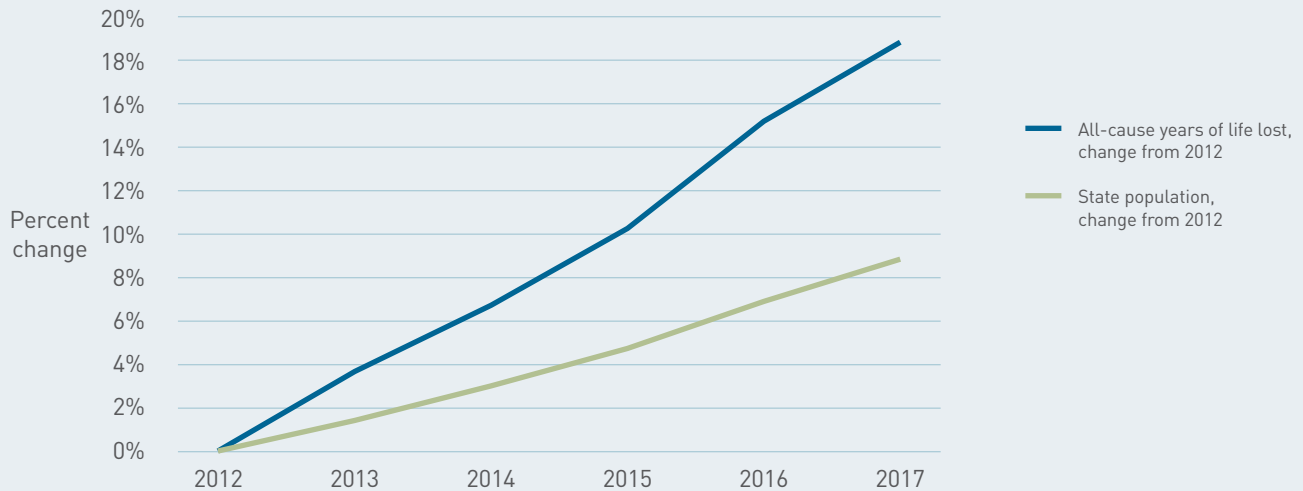
America's Health Rankings[52]

Metric	2014	2015	2016	2017	2018	2019
Overall rank (UT)	5	7	8	4	5	5
Income inequality - Gini Index	3	3	1	2	1	N/A
Neighborhood violence	N/A	N/A	N/A	N/A	N/A	16
High school graduation	55	25	26	26	27	26
Binge drinking	4	3	3	4	1	N/A
Smoking	1	1	1	1	1	1

NB: Higher rank (e.g., 1) indicates better performance versus other states.

Comments: UT remains among the highest ranked states in the US. In particular, the state is the national leader in smoking cessation, binge drinking avoidance and income equality. The state ranks around the middle of the country for high school graduation.

Global Burden of Disease[53]

Utah's all-cause years of life lost has outpaced its population growth.

[52](n.d.). America's Health Rankings. https://www.americashealthrankings.org/

[53]Global Burden of Disease Collaborative Network. Global Burden of Disease Study 2017 (GBD 2017) All-cause Mortality and Life Expectancy 1950-2017. Seattle, United States: Institute for Health Metrics and Evaluation (IHME), 2018. and https://www.census.gov/newsroom/press-kits/2018/pop-estimates-national-state.html

Global Burden of Disease (Continued)

Metric	2012	2013	2014	2015	2016	2017
All-cause DALYs (disability-adjusted life years), in K	662	679	698	720	745	766
All-cause deaths, in K	16	16	17	17	18	19
All-cause YLDs (years lived with disability), in K	345	354	363	372	382	392
All-cause YLLs (years of life lost), in K	316	325	336	348	364	375
Total state population, in K	2,853	2,898	2,937	2,982	3,043	3,103

NB: Disability-adjusted life years measure the number of years lost to ill health, disability, or early death. For all burden of disease metrics, higher numbers are worse.

Comments: Worsening trends across all metrics. Between 2012 and 2017, the state population has grown at an average annual rate of 1.7%. Over the same period, the respective metrics have grown at an average annual rate of 3.0% (DALYs), 3.4% (all-cause deaths), 2.5% (YLDs) and 3.5% (YLLs). Caveat: Latest data year available is 2017.

NAICS codes included in Health Care Innovation Industry

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

Industries and Verticals filters used for PitchBook searches

Data was included wherever any value from Industries list intersected with any value from Verticals list.

Industries

Business Products and Services (B2B)

- Electrical Equipment
- Industrial Supplies and Parts
- Machinery (B2B)
- Other Commercial Products

Commercial Services

- Accounting, Audit and Tax Services (B2B)
- BPO/Outsource Services
- Construction and Engineering
- Consulting Services (B2B)
- Education and Training Services (B2B)
- Environmental Services (B2B)
- Human Capital Services
- Legal Services (B2B)
- Logistics
- Media and Information Services (B2B)
- Office Services (B2B)
- Printing Services (B2B)
- Security Services (B2B)
- Other Commercial Services

Consumer Products and Services (B2C)

- Transportation
  - Air
  - Automotive
  - Marine
  - Rail
  - Other Transportation
- Other Consumer Products and Services
  - Other Consumer Products and Services

Energy

- Energy Equipment
  - Alternative Energy Equipment
  - Coal and Consumable Fuels Equipment
  - Oil and Gas Equipment
  - Other Equipment
- Energy Services
  - Energy Marketing
  - Energy Storage
  - Energy Traders and Brokers
  - Energy Transportation
  - Energy Infrastructure
  - Other Energy Services
- Utilities
  - Electric Utilities
  - Gas Utilities
  - Multi-Utilities
  - Water Utilities
  - Other Utilities
- Other Energy
  - Other Energy

Financial Services

- Capital Markets/Institutions
  - Asset Management
  - Brokerage
  - Investment Banks
  - Private Equity
  - Other Capital Markets/Institutions
- Commercial Banks
  - International Banks
  - National Banks
  - Regional Banks
  - Thrifts and Mortgage Finance
  - Other Commercial Banks
- Insurance

- Automotive Insurance
- Commercial/Professional Insurance
- Insurance Brokers
- Life and Health Insurance
- Multi-line Insurance
- Property and Casualty Insurance
- Re-Insurance
- Other Insurance
• Other Financial Services
- Consumer Finance
- Holding Companies
- Real Estate Investment Trusts (REITs)
- Specialized Finance
- Other Financial Services

Health Care
• Healthcare Devices and Supplies
- Diagnostic Equipment
- Medical Supplies
- Monitoring Equipment
- Surgical Devices
- Therapeutic Devices
- Other Devices and Supplies
• Healthcare Services
- Clinics/Outpatient Services
- Distributors (Healthcare)
- Elder and Disabled Care
- Hospitals/Inpatient Services
- Laboratory Services (Healthcare)
- Managed Care
- Practice Management (Healthcare)
- Other Healthcare Services
• Healthcare Technology Systems
- Decision/Risk Analysis
- Enterprise Systems (Healthcare)
- Medical Records Systems
- Outcome Management (Healthcare)

- Other Healthcare Technology Systems
• Pharmaceuticals and Biotechnology
- Biotechnology
- Discovery Tools (Healthcare)
- Drug Delivery
- Drug Discovery
- Pharmaceuticals
- Other Pharmaceuticals and Biotechnology
• Other Healthcare
- Other Healthcare

Information Technology
• Communications and Networking
- Cable Service Providers
- Connectivity Products
- Fiberoptic Equipment
- Internet Service Providers
- Telecommunications Service Providers
- Wireless Communications Equipment
- Wireless Service Providers
- Other Communications and Networking
• Computer Hardware
- Computers, Parts and Peripherals
- Electronic Components
- Electronic Equipment and Instruments
- Office Electronics
- Storage (IT)
- Other Hardware
• Semiconductors
- Application Specific Semiconductors
- General Purpose Semiconductors
- Production (Semiconductors)
- Other Semiconductors
• IT Services
- IT Consulting and Outsourcing
- Systems and Information Management
- Other IT Services

- Software
  - Other Information Technology
  - Other Information Technology
  - Application Software
  - Automation/Workflow Software
  - Business/Productivity Software
  - Communication Software
  - Database Software
  - Educational Software
  - Entertainment Software
  - Financial Software
  - Internet Software
  - Multimedia and Design Software
  - Network Management Software
  - Operating Systems Software
  - Social/Platform Software
  - Software Development Applications
  - Vertical Market Software
  - Other Software

Materials and Resources

- Chemicals and Gases
  - Commodity Chemicals
  - Industrial Chemicals
  - Multi-line Chemicals
  - Specialty Chemicals
  - Other Chemicals and Gases
- Textiles
  - Animal Textiles
  - Plant Textiles
  - Mineral Textiles
  - Synthetic Textiles
  - Other Textiles
- Other Materials
  - Other Materials

Verticals

Digital Health

HealthTech

HR Tech

Life Sciences

LOHAS & Wellness

Nanotechnology

Oncology

Wearables & Quantified Self

CAMBIA GROVE

Thank you to the many organizations and individuals who have helped develop this report.

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