Fitzroy Health

Where Are Health Systems Creating New Revenue Streams?

As Providers Strive to Diversify Income and Ensure Sustainability, a New Industry Study Analyzes Expected Risk-Adjusted Returns of 1,400 Non-Core Revenue Initiatives

Christopher Coburn, Partners HealthCare // James Stanford, Fitzroy Health

PARTNERS® HEALTHCARE
FOUNDED BY BRIGHAM AND WOMEN'S HOSPITAL AND MASSACHUSETTS GENERAL HOSPITAL

BRIGHAM HEALTH BRIGHAM AND WOMEN'S HOSPITAL
MASSACHUSETTS GENERAL HOSPITAL
MASSACHUSETTS EYE AND EAR
McLean HOSPITAL HARVARD MEDICAL SCHOOL AFFILIATE
NEWTON-WELLESLEY HOSPITAL
SPAULDING REHABILITATION NETWORK

Overview

Facing their worst economic headwinds in a decade, health systems are turning to novel **technologies and other non-traditional business lines to diversify their revenue.** Successful health systems have increased operating margin by as much as five points through these new income sources, becoming vital contributors to hospitals' patient care missions.

This shift has garnered the attention of the industry and prompted a first-of-its-kind study by New England-based Partners HealthCare, and Fitzroy Health, a health care private equity firm, to evaluate the financial impact of non-traditional revenue initiatives.

The study, which concluded in January 2019, indicates that health systems can and should quantify a target for novel revenue streams, and execute a commercialization strategy with a risk-adjusted portfolio of initiatives that builds on their unique ecosystems and competitive advantages.

The research considered more than **1,400 revenue initiatives that health systems have pursued to generate new revenue.** This study classified those initiatives into three primary areas for revenue generation:

Lever 1	**Bring Care Model Innovations to Market**
Lever 2	**Transform Cost Centers into Profit Centers**
Lever 3	**Increase Royalties from Drugs, Devices, and Diagnostics**

Why

To avoid a looming crisis in U.S. care delivery, hospital systems need to find a viable way to increase both revenues and operating margins. Health system operating margins hit 10-year lows in 2018 as costs continue to grow faster than revenues[i]. This contrasts sharply with the performance of the U.S. economy where the gross domestic product (GDP) has grown by almost 40% in that time[ii]. Today, health systems generate most of their margin through non-operating income – relying predominantly on investment returns and real estate investments. **And In 2017, the average health system made twice as much revenue from Wall Street as from patient care[iii]. Then in 2018, stock market volatility cut hospital margins by many billions of dollars[iv].**

More than a quarter of U.S. hospitals lost money on operations in at least one of the years from 2015 to 2017[v]. At the same time, other participants like health plans, pharmaceutical companies, medical device manufacturers, and other suppliers enjoyed healthy margins.

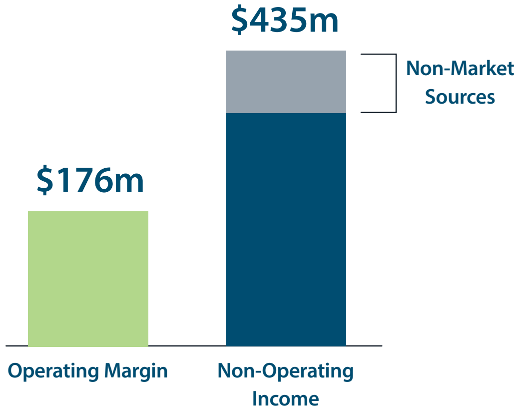

Figure 1: Hospital Income Comparison

In 2017, the average health system made more than twice as much income from Wall Street than from patient care[iii].

Why

Care continues to shift away from hospital-based fee-for-service models to outpatient and value-based programs, challenging the heavily fixed cost economics of health systems today. New entrants like CVS/Aetna, Apple Health, Amazon, and Google's Verily are emerging with the potential to disrupt traditional health care models.

HealthCare leaders have devoted more than a decade to addressing cost pressure, and now need additional levers to pull. These include achieving scale through mergers, expanding scope through vertical integration, and innovating financial models through value-based contracting. A lever that has earned sharper focus in recent years is the growth of non-core revenue.

Today's challenge for health system executives is to plan for a future in which operating margins face continuing compression and non-operating margins rely on an aging bull market. **Getting it right will be important for patient care for decades to come.**

Study

38
AMC/Specialty

36
Large Health System

74
TOTAL

Within AMC/Specialty and Large Health System, interviewees by role:

20
C-Suite/Board Members

7
Strategy/Business Development

39
Innovation/Commercialization

3
Ventures Group

5
Other

Partners HealthCare has a proud history of turning breakthrough science into market-leading technologies and staying on the forefront of innovation. As the industry has responded to recent margin pressure with vigor and creativity, the New England-based health system collaborated with Fitzroy Health, a health care private equity firm that helps health systems execute upon growth strategies.

For this study, novel revenue streams are defined as...

any revenue that is not based on traditional reimbursable medical services, government support, or traditional non-operating investments like securities and real estate.

The team conducted comprehensive interviews with leaders ranging from board members to venture executives at 74 U.S. health systems and academic medical centers.

The study identified more than **1,400 health system-backed initiatives to analyze.** Through the examination process, ten option types emerged. Fitzroy Health then applied its proprietary evaluation method to document, categorize, and compare them based on economic value, invested capital, time to realization, risk profile, and success rate. The results produced three levers of value creation that can provide sustainable revenue for health systems.

Study

Non-Core Revenue Optimization Strategies: Market Assessment

Lever		Option	Income Potential[1]	Risk[2]
LEVER I **Bring care model innovations to market**	1	Invest in and spin out companies that institution uses to adapt to changing health care system	●	●
	2	Leverage data assets	◑	◕
	3	Take equity in early stage vendors to the institution	●	◑
	4	Expand capabilities to innovate care model	◕	○
LEVER II **Transform cost centers into profit centers**	5	Shared service platforms (Spin-outs/JVs/JOCs)	●	◑
	6	Pool funds and operational expertise with peer institutions	◑	◑
LEVER III **Generate royalties from drugs, devices, and diagnostics**	7	Expand external partnerships on early-stage drug development	◕	◕
	8	Increase pre-commercialization funds for life sciences assets	●	●
	9	Expand infrastructure for biopharma development	◑	◑
	10	Broaden supportive ecosystem to encourage entrepreneurship	◑	○

1. Income potential from representative initiative in category: High: >$200M, Moderate: $50M-200M, Low: <$50M
2. Risk score is a composite of capital requirements, time to realization, cultural friction, success rate. High=Very risky

For any single institution, the value of each option depends on that **institution's internal capabilities** and **market dynamics**.

Health systems can apply and prioritize their own investment opportunities and generate a portfolio of initiatives that **diversify their revenue opportunities.**

More Key Findings

- **100 percent** of study participants acknowledged the need to diversify revenue.
- **90 percent** indicated novel revenue streams were an urgent priority that leadership teams are counting on to show positive results in the next three years.
- **Less than 3 percent** of those indicating diversifying revenue as an urgent priority reported that they had budgeted for non-operating revenue.
- **Remaining 97** percent identified uncertainty as the main driver for excluding this revenue from the budget.

Successful health systems are staking out strategic territory where they can commit at an institutional level with R&D investments starting at **$15 million and going well above $1 billion**. Examples in recent years include:

$50m ➡ $454m

Children's Hospital of Philadelphia: Invested in gene therapy startup Spark, $454 million in return[vi]

$800m+

Ascension Ventures: $800 million-plus in Assets Under Management (AUM)[vii]

$200m

University of Pittsburgh Medical Center: Immune Transplant and Therapy Center[viii]

38 funds

38 health system-backed funds investing directly in digital health startups[ix]

$100m

UCHealth (Colorado): $100 million digital health co-development fund launched 2018[x]

$150m

$150m Providence St. Joseph's announces second venture fund January 2019[xi]

Lever 1: Bring Care Model Innovations to Market

Three Levers of Value Creation

Based on study results, the revenue initiatives were condensed into three main levers using a cluster analysis. The following section introduces each lever by describing its key value drivers and sharing a case study of a successful example.

Academic medical centers and large health systems are unlocking value in data, digital health, and tech-enabled services that promise to improve access, affordability, and experiences. Almost any health system with sufficient size and reputation can plausibly create value through innovations that have transformed their own operating and clinical models.

Health systems can monetize these innovations in four ways:

1. **Consulting**
2. **Licenses**
3. **Co-developments**
4. **Spin-outs**

1. **Consulting:** The researchers find that due to its straightforward business model and light risk, consulting is often the initial instinct for commercialization of these innovations. Before pursuing a consulting business, the institution should weigh carefully the true costs of personnel and leadership time against what are usually modest (<$1M per year) and non-renewable revenues.
2. **Licensing Intellectual Property (IP):** By contrast, licensing brings greater potential for renewable revenues and typically requires less ongoing time commitment from internal experts. For example, Geisinger Health System licensed its patient care management content in 2017 to Epic and Cerner for use in their clinical decision support modules [xii]. The challenge, of course, is to create defensible IP, and in many instances in care model innovation, protection is hard to secure. The potential revenue amount and longevity depends on the strength and value of the underlying IP.

Lever 1: Bring Care Model Innovations to Market

3. **Co-developments.** This study defines a co-development as an "outside-in" partnership between an early stage company and a health system where the health system improves the market value of the company's solution through product development or proof of impact. **Partners** (Health Catalyst), **Providence Health & Services** (Omada), and **Northwell** (Avizia), represent just a few of the many co-development examples that have reached a broader market. A successful co-development results in: (1) the health system distributing the solution across the health system, preferably through a commercial contract at market rates and (2) the health system participating in the company's upside as compensation for the risk taken to develop the product in a live clinical or operating environment.
4. **Spin-out:** A spin-out, by contrast, represents an "inside-out" effort to take a technology or operation from inside the health system to external customers, such as **Partners'** QPID Health. Massachussets General Physician Organization (MPGO) launched QPID to make disparate digital technologies interoperable. In 2012, MGPO spun out QPID as an independent company and then in 2016, eviCore acquired QPID, earning a 4x return.

Co-developments and spin-outs of care model innovations have attracted attention from investors and chief innovation officers in recent years.

Lever 1: Bring Care Model Innovations to Market

CASE STUDY

Co-developing transformative digital health solutions: Denver, Colorado-Based UCHealth Partnership with RxRevu.

University of Colorado Health's CARE Innovation Center led by Richard Zane, M.D., chief innovation officer, recognized the need to transform its care model and the imperative to identify – from a very large pool – early-stage companies who can advance the institution's patient care capabilities.

UCHealth established a comprehensive model for innovation co-development that manages the complex and consensus-oriented needs of health systems while solving for the urgency of early-stage ventures. They have launched co-developments with several partners, from large corporations like United Health Group to independent ventures like RxRevu, a clinical decision support tool to manage and measure medication prescribing across thousands of clinicians and multiple locations.

The RxRevu partnership is instructive because of its iterative approach to provider workflow integration with data and electronic health records (EHR). The solution saves time and reduces unwanted clinical variation while reducing administrative burden on the system.

To succeed, a co-development partnership requires extensive iteration that allows access to an active clinical environment to test point-of-care workflows in a controlled manner. UCHealth's innovation methodology helps RxRevu drive effective usability for the clinical decision maker while designing a comprehensive suite of business intelligence tools for health system administrators.

Success Factors

1. **A commitment to clinical workflow innovation.**
2. **A clinically enabled team sponsored by a strong champion and empowered by the C-Suite.**
3. **Access to an EHR test environment in an active clinical setting.**
4. **Sufficient dedicated budget and personnel to solve complex problems.**

Lever 2: Transform Cost Centers into Profit Centers

Even a moderately sized health system represents an ecosystem of interconnected services and businesses. Not-for-profit health systems have kept tight control and ownership over many of these cost centers, even if they are non-core and sub-scale. Maintaining these areas have become less tenable as increasing margin compression pushes executives to look for more efficient and scaled solutions.

In most cases, and especially for highly commoditized services, such as laundry and food services, the right answer is a traditional outsourcing arrangement to an existing scaled corporation. In some cases, however, health systems have built programs into platforms to deliver commercial-grade services to other customers, and become a source of new, non-traditional income for health system. These solutions go to market through a range of structures:

- **Internal departments** that serve external customers like Partners' own clinical trial management support services.
- **Wholly owned subsidiaries** like Bon Secours Mercy's revenue cycle service company Ensemble Health Partners.
- **Independent companies** like Prodigo Solutions, a supply chain management spin-out from University of Pittsburgh Medical Center.

In each of these cases, the companies expanded their reach to much broader customer bases, increasing their revenues while generating scale benefits.

Lever 2: Transform Cost Centers into Profit Centers

Success depends on the ability to deliver differentiated, value-added services efficiently and reliably. After identifying an opportunity to transform a cost center into a profit center, the first challenge for executives is to determine if the addressable market – and the proposed offering's market fit – is sufficient to justify the effort.

Even in straightforward commercialization, there are design decisions that executives must make before selling externally and which are usually unfamiliar territory for even sophisticated health systems.

Health system leaders – including boards – often have strong, conflicting opinions about the goals of the initiative. For example, if maximizing a business's opportunity means spinning it out as a company, selling solutions at market rates back to the health system, and bringing on new executives to manage the business, any one of those factors can lead to friction among existing stakeholders. Additionally, executives need to weigh whether the offering is more valuable as a product marketed externally or as a closely held source of proprietary differentiation, though health systems often overvalue the latter. These dynamics add to the time and cost of launching a commercialization effort, though when managed effectively, can lead to sizable and reliable income streams.

CASE STUDY

Salute Safety -- Spinning Out Weill-Cornell's Environmental Health & Safety business

Weill-Cornell Medicine's Vice Provost (CFO) Steven Cohen was aware that the leaders who ran the institution's Environmental Health & Safety department (EH&S) were considered industry thought leaders.

The department received frequent requests for help from other research institutions. Starting in 2006, Weill-Cornell provided other research institutions a limited number of support solutions including audits, education, and international chemical shipping.

Lever 2: Transform Cost Centers into Profit Centers

They managed these services internally, with the same resources and systems they used to manage their own needs. As the program grew, the department leaders looked for a software solution to manage the growing complexity, and not finding one, developed their own.

With this IP, they partnered with Fitzroy Health to launch a joint venture to commercialize the technology and service lines. Now an independent company named Salute Safety, it supports EH&S programs at major research institutions and AMCs.

One of the important structural decisions was how to treat Weill-Cornell's use of the technology and services from the new company. Executives often balk at paying for something that was internally developed, but Cohen recognized that becoming a customer to the new business would accelerate the JV's technology R&D as well as its market value. This move gave the business its first real customers, established a market price for the services, and also made it easier for peer organizations to get comfortable becoming customers. Even when there are trusted relationships between institutions, compliance and data hygiene practices often lead customers to prefer using software managed by an independent company over that managed by a large peer.

By becoming an independent company serving a market rather than one institution, Salute was able to attract capital and talent to accelerate technology and service development. By commercializing its EH&S cost center, Weill-Cornell improved its own operations while capturing enterprise value for itself.

Success Factors

1. **Existing commercial-grade service, validated by third parties, with strong evidence of market demand and competitive differentiation.**
2. **Organizational support for spin-out, including significant time commitment from senior leaders to execute the agreement and facilitate change management.**
3. **Clear and well-documented alignment between the health system and external investors about mutual expectations for governance, growth, service commitments, and exit options.**

Lever 3: Increase Royalties from Drugs, Devices, and Diagnostics

Medical research powerhouses are pursuing a range of innovative approaches to increasing the volume, velocity, and value capture of early-stage life sciences assets. Historically, this lever has generated the largest wins for top academic medical centers exemplified by:

- **New York University** with Remicade ($650 million+)[xiii]
- **UCLA** with Xtandi ($1.1 billion)[xiv]
- **Northwestern** with Lyrica ($1.4 billion)[xv]

Due to its reliance on abundant world-class research talent and infrastructure, this lever is unavailable to most of the market, but leading institutions are proving they can unlock substantial new gains through the following focused efforts:

- Developing and resourcing the earliest-stage technologies
- Budgeting and building an infrastructure that advances scientific gains early
- Prioritizing a culture of entrepreneurship within the organization's strategic plan

Examples of commercial initiatives:

- Tri-I TDI collaboration between **Weill-Cornell, Rockefeller University, and Memorial Sloan-Kettering** ($15 million startup grant provided by donors, matched with in-kind servies from Takeda)[xvi]
- Deerfield Academic Partnerships with **Northwestern, Vanderbilt, Harvard,** and **others** each starting with $50 million - $80 million in Deerfield capital commitments[xvii]
- Internal investments at **Mayo Clinic, Children's Hospital of Philadelphia, Memorial Sloan Kettering** the **University of California** Drug Discovery Consortium, and **Partners HealthCare**

Lever 3: Increase Royalties from Drugs, Devices, and Diagnostics

One of the common features uniting Lever 3 initiatives is the potential to participate in the sharp inflection in value of a given therapy as it moves from Method of Use IP to Composition of Matter IP. This effort can double or triple the royalties earned by an institution.

In tech licensing alone, self-funding early stage drug development has the potential to increase health system licensing income by a third or more. This equates to more than an estimated $30 million per year for top research institutions.

Success rests on the institution's ability to select the best investments within a scientific subsector. **Children's Hospital of Philadelphia (CHOP)** invested $50 million in pediatric gene therapy that resulted in Spark, a publicly traded company that returned a reported $456 million to the hospital[vi], or through a series of small venture investments, as Mayo Clinic, Memorial Sloan Kettering, NYU, and others have done successfully.

CASE STUDY

Elevating impact from licensable assets through the Partners Innovation Fund

Partners HealthCare launched the Partners Innovation Fund (PIF) in 2008 to help commercialize innovations in medical informatics, diagnostics, drugs, and devices that emerge from the Partners HealthCare Harvard faculty investigator community. Since then, they have grown to $171 million in assets under management, brought vital resources to early-stage medical technologies, and earned top-quartile venture returns for Partners HealthCare.

Life sciences startups emerge from the early, grant-supported research stage to get to the clinical trial/commercialization stage where industry capital becomes available. PIF partners with venture capital firms to provide necessary resources to promising companies based on the breakthroughs of its Harvard faculty.

Lever 3: Increase Royalties from Drugs, Devices, and Diagnostics

The investments also ensure that Partners HealthCare can participate in the value creation of the companies that successfully make an impact on medicine.

In the space of two years, five PIF portfolio companies executed IPOs. One of them, Editas Medicine, is a leading genome editing company based on the revolutionary CRISPR-CAS9 technology and dedicated to treating patients with genetically defined diseases by correcting their disease-causing genes. The company was founded by world leaders in genome editing, and its mission is to translate the promise of genome editing science into a broad class of transformative genomic medicines to benefit the greatest number of patients.

Editas made an ideal candidate for a PIF investment based on its groundbreaking science with roots in some of America's premiere research institutions, including Harvard Medical School and Massachusetts General Hospital. PIF joined Editas first institutional capital round alongside Flagship Ventures, Polaris Partners, and Third Rock Ventures. Editas went public on the NASDAQ in 2016 and by 2018 was well more than $1 billion, generating a 6.5X return on invested capital for PIF.

Success Factors

1. **Strong dealflow associated with world's top research institutions.**
2. **Venture capital investing talent with deep experience in life sciences product development and commercialization.**
3. **Clear and institutional commitment to the discipline of investing, including saying "no" more times than saying "yes" even to important inventors and physicians in the organization.**

For Further Study: Talent Recruitment and Compensation

One area emerged universally as a challenge across all three levers – finding capable and committed talent to manage these initiatives. Leaders acknowledged that the skill sets were often difficult to source from existing personnel.

Some of the capabilities needed include early stage business development, venture capital management, consumer marketing, and machine learning just to name a few. These disciplines are in high demand from other industries with very different compensation structures. External recruits will also need an understanding of the complexities of health care, skill at working with consensus-oriented decision-making processes, and sensitivity to the multiple missions within health care organizations.

Recruiting and retaining such personnel in health systems is a perennial challenge for our respondents. The private sector may have a broader range of incentives it can offer to candidates, and while retention mechanisms represent an interesting area of innovation in our field, getting alignment within the institution is a prennial challenge.

While it is generally not difficult structurally to mimic private sector practices, multiple respondents described it as an ongoing challenge. Balancing the requirements of both talent and institutional culture should be one of the key focus areas of those pursuing novel revenue streams and we will share ongoing research in one of our next publications.

Conclusion

The traditional business of providing fee-for-service health care is getting more difficult – at least 21 hospitals closed in 2018 because patient care cost growth continues to outpace reimbursement[xviii]. This study analyzed more than 70 health systems that are investing in innovation to ensure their continued sustainability for patient care.

We found an industry undertaking a vast number of bold experiments to diversify revenue, representing billions of dollars of Research & Development investment. We uncovered more than 1,400 specific initiatives categorized into 10 different options for value creation. The value that resides inside health ecosystems represents billions of dollars of latent value -- be it through new licenses for therapeutics and devices, care model innovations that can be distributed beyond the health system, and new profit centers built on top of commercial-grade services.

In an attempt to synthesize all of these experiments into a set of takeaways for health system leaders, we find two common themes emerged:

- **Strategic clarity** on where the health system truly differentiates –backed up by substantial financial and cultural commitments, as when **CHOP** committed strongly to pediatric gene therapy and created Spark, a company that sold to Roche for $4.3 billion. Or when **UC Health** in Colorado made the strategic commitment, backed up by $100 million in funding to co-develop the next generation of digital health applications that promise a step-change in patient access, quality improvement, and affordability.
- A **portfolio management** approach that balances risk, return, and timing, as we see in **Ascension's** and **Providence's** investment funds that together represent over a billion in investment capital.

While all agree on the imperative for innovation and diversifying revenue streams, there is no one-size-fits-all approach to non-traditional growth.

The research demonstrates the vast and vibrant range of experiments underway at health systems across the U.S. to ensure the long-term sustainability of their patient care missions.

Each institution needs to define where it can **create unique value** based on its **core mission, its existing assets, its market characteristics,** and **its internal culture**.

About the Authors

Chris Coburn is Chief Innovation Officer, Partners HealthCare System and President, Partners HealthCare International. Partners consists of Harvard University affiliates Brigham Health, Massachusetts General Hospital, Massachusetts Eye and Ear, and McLean Hospital. Partners is the nation's largest academic research enterprise with over $13 billion in annual revenue, 1.5 million patient visits and $1.8 billion in research expenditures. It also has a managed care organization, out-patient facilities and community hospitals. Partners 6200 faculty are appointed at Harvard Medical School.

Chris leads a team of more than 125 professionals tasked with the worldwide commercial application of the unique capabilities and discoveries of all Partners' 74,000 employees. His unit's business development responsibilities include investing, company creation, international consulting, innovation management, industry collaborations, and licensing. Commercialization revenue exceeds $150 million annually and more than 250 companies have been spun-off from Partners in the last decade. Large-scale industry collaborations have been established in areas such as AI and drug development. Provider strategy and operational consulting has been delivered to clients in nearly 40 countries. His group also manages a nearly $200 million venture fund.

Prior to joining Partners, Chris was founding director of Cleveland Clinic Innovations and served for 13 years as its executive leader. Chris has been a member of numerous corporate and community boards including Explorys (acquired by IBM), Autonomic Technologies, and the U.S. Enrichment Corporation (NYSE:USU). He is a member of the Board of Overseers for the public media company WGBH in Boston.

James Stanford is the Co-Founder and Managing Director of Fitzroy Health, a company that partners with academic medical centers and health systems to create new income streams. From launching joint ventures to expanding licensing pipelines to co-developing digital health solutions, James brings to market science and innovation that improves patient care while ensuring health care provider sustainability.

Prior to joining Fitzroy Health, James was a management consultant in the health care practice at McKinsey & Company serving the world's largest health care institutions. Previous to McKinsey James held a faculty position at the Advisory Board Academies. He earned an MBA in Health Care Management from The Wharton School at the University of Pennsylvania and holds an A.B. from Princeton University. James is a board director and advisor to high-growth companies and investors in the health care field.

Partners HealthCare Innovation

Partners HealthCare Innovation coordinates industrial relationships and IP management across Partners HealthCare, Brigham Health, Massachusetts General Hospital, and McLean Hospital, working with inventors, thought-leaders, entrepreneurs and industry. Its goal is to take medical inventions and innovations discovered by Partners HealthCare researchers and provide the appropriate support and infrastructure to allow technology development, commercialization and, ultimately, the development of products to benefit patients.

Fitzroy Health

Fitzroy Health partners with distinctive health care organizations to create commercial ventures that generate new sources of revenue and enterprise value. Through its unique model of risk sharing, Fitzroy Health supports all areas of commercial innovation, from sourcing and capacity building to commercialization and operation.

References

References:

[i] *https://www.healthcarefinancenews.com/news/nonprofit-public-hospital-margins-hit-10-year-record-low-moodys-report-says*

[ii] *https://data.worldbank.org/indicator/NY.GDP.MKTP.KD.ZG?end=2017&locations=US&start=2007*

[iii] *https://www.axios.com/hospitals-are-making-a-fortune-on-wall-street-1513388345-1b7e1923-e778-4627-8fcc-bfab39e2d5c4.html*

[iv] *https://www.modernhealthcare.com/providers/biggest-health-systems-see-steep-investment-losses-2018*

[v] *https://www.navigant.com/insights/healthcare/2018/health-systems-scale-not-linked-to-higher-revenue*

[vi] *https://www.bloomberg.com/news/articles/2019-02-25/children-s-hospital-to-reap-456-million-from-roche-spark-deal*

[vii] *http://www.ascensionventures.org/aboutus.asp*

[viii] *https://www.upmc.com/media/news/ittc*

[ix] Fitzroy Health database

[x] Fitzroy Health interview as part of UCHealth RxRevu case study

[xi] *https://www.geekwire.com/2019/providence-ventures-led-ex-amazon-exec-raises-second-150m-fundearly-stage-investments/*

[xii] *https://www.healthcareitnews.com/news/epic-add-geisinger-care-management-content-ehrpopulation-health-platform*

[xiii] *https://www.royaltypharma.com/royalty-pharma-acquires-a-portion-of-new-york-universitys-royaltyinterest-in-remicade-for-650-million*

[ivx] *http://newsroom.ucla.edu/releases/ucla-sells-royalty-rights-connected-with-cancer-drug-to-royaltypharma*

[xv] *https://dailynorthwestern.com/2016/04/10/in-focus/in-focus-as-lyrica-profits-dry-up-northwesternseeks-another-blockbuster-drug/*

[xvi] *https://www.takeda.com/newsroom/newsreleases/2016/tri-institutional-therapeutics-discoveryinstitute-inc.-expands-partnership-with-takeda-pharmaceutical-company-ltd/*

[xvii] *http://www.deerfield.com/NewsAndEvents.aspx?Type=All*

[xviii] *https://www.beckershospitalreview.com/finance/21-hospital-closures-in-2018.html*

PARTNERS HEALTHCARE | INNOVATION

Partners HealthCare Innovation
215 First Street, Suite 500, Cambridge, MA 02142
innovation.partners.org
857.307.2400

Fitzroy Health

Fitzroy Health
info@FitzroyHealth.com
1.646.779.9589