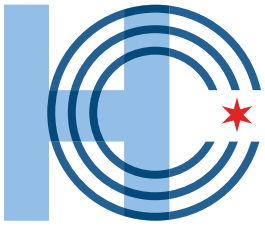
2017-2018

# STATE OF THE CHICAGO HEALTH CARE INDUSTRY



HEALTH CARE COUNCIL

*of Chicago*

# EXECUTIVE SUMMARY

The Health Care Council of Chicago (HC3) is comprised of Chicago's foremost health care institutions, and seeks to represent the city's eclectic and diverse health care community to support business growth and solve our city's most important health-related issues. The organization was founded in November of 2016 with the objective of identifying unique and unusual areas of common interest and creating a broad platform for collaboration. Since then, HC3 has added dozens of members, hosted important events, and engaged in various initiatives and partnerships throughout the city.

This document is the second annual report on the State of the Chicago Health Care Industry. Through its pages, we carefully document key events in our city's health care ecosystem that signal important trends. Our goal is to objectively capture and contextualize this information to shed light on the developments that are of greatest significance to our city – including health care sector stakeholders, investors, and our most vulnerable communities.

Lauded for its ethnic and cultural diversity, Chicago's economy is among America's most diverse, with no more than 12 percent of the region's four-million-person workforce employed by any single industry. Home to over 400 major corporate headquarters, Chicago's geographic centrality, lively cultural scene, and world-class educational and research institutions continue to attract students, professionals, entrepreneurs, and investors from around the globe.

For its part, Chicago boasts a highly diverse economic and industrial base that has nevertheless produced a formidable health care development engine, thanks to a nexus of intellectual property and commercial expertise unparalleled in most other major markets. Despite these concentrated resources, the city has significant economic and health-related shortcomings to address.

As we conclude 2018 and look to the new year, there are some key trends and considerations that deserve the attention of Chicago's policy makers and businesses.

1. **Elections Matter**

   The outcome of the November gubernatorial contest between Republican incumbent Bruce Rauner and his Democratic-challenger J.B. Pritzker will determine which of two markedly different approaches the state will take in defining its role in health care. A win by Governor Rauner will likely result in a doubling-down on the current simplification of managed care and the operationalization of new programs for the vulnerable. In contrast, J.B. Pritzker has proposed a public-option buy-in for those uninsured in Illinois who earn too much to qualify for Medicaid. There are decisions of consequence following the gubernatorial election, with the potential to shape the Illinois health care ecosystem for years to come.

   Meanwhile, Chicago's mayoral election, set for February 2019, has been thrown into a state of uncertainty by Mayor Rahm Emanuel's surprise announcement that he will not seek a third term. With no obvious frontrunner at this point, the future direction of policy meant to address the city's most vulnerable individuals and communities remains particularly unclear.

2. **Further Consolidation in Chicago's Hospital Community**

   Health care services is a major economic engine in Illinois, where hospitals alone contributed $95.3 billion to the state economy and produced 466,000 jobs in 2017, with the majority located in the Chicago area. Spurred by the search for ever greater administrative, operational, and technological efficiencies, Chicago continues to see a consolidation of providers that's likely to eliminate the remaining stand-alone hospitals in the coming years. This consolidation continues to sideline for-profit players, whose ranks within the city are shrinking due to stiff competition from their well-differentiated, non-profit rivals, as well as Illinois' strict regulatory regime. Chicago remains a competitive provider market, and the prevailing consolidation has the potential to improve service continuity and technology adoption, while hastening the move away from fee-for-service models.

### 3. The Continuing Search for Medicaid Solutions

Nearly a quarter of Illinois' 13 million residents are covered by Medicaid and CHIP, landing Illinois sixth on the list of total Medicaid recipients by state.33 The state's managed Medicaid program, HealthChoice Illinois, continues to grow both in geographic reach and enrollment, even as high medical loss ratios and questions about the quality of care create instability for patients and participating insurers. The state has seen various permutations of this program and its rules in recent years. Most recently, Illinois was granted an 1115 Medicaid waiver that allows greater continuity between state resources and managed care providers, as well as experimentation with the care delivery system.

Despite the improvements in the program's fiscal foundation, Illinois still owed close to $1 billion in outstanding Medicaid debt (as of August 31, 2018), and is widely considered to be near the top of the list nationwide for creating unreasonable barriers to access in the form of onerous prior authorization for treatment, late payments to payers and providers, and excessively restrictive reimbursement policies. The result of this year's gubernatorial election could catalyze more change as the state continues seeking the most prudent ways to allocate scarce Medicaid resources.

### 4. Declining Life Sciences Infrastructure

Proximity to over 30 teaching hospitals, six top universities, and three major government research facilities has kept Chicago high on the list of attractive regions for the life sciences industry. Chicago has long been the home to world-class research and development institutions that have commercialized some of the most promising clinical advancements. However, there are signs of a decline in Chicago's prominence as a biotech-friendly city due to competition from other life sciences hubs with more proactive business and political leadership. Strategic investments in the biotech infrastructure and workforce are required to maintain Chicago's standing and promote future success.

### 5. Growing Ecosystem for Digital Innovation

The Innovation Cities Index ranked Chicago 11th out of 500 benchmarked cities. The index is a measurement of startup activity and health of the economy. During our interviews, industry leaders called out four elements of Chicago's ecosystem that make it a hub for digital health: R&D, incubation, capital, and talent. Chicago's MATTER, AVIA, and Healthbox were cited time and again as "beacons" that have drawn the attention of strategic investors from across the country. Anchored by the University of Illinois, the University of Chicago, Northwestern University, as well as Argonne National Laboratory and Fermilab, the Chicago region is well-placed to continue leveraging the intellectual capital created by local top-flight research institutions. The presence of large digital health companies like Allscripts and Catamaran, as well as associations like the Chicago-based Healthcare Information and Management Systems Society (HIMSS) and American Medical Association (AMA), has resulted in a deep pool of local executive talent that has, in many cases, remained in the area to mentor startup talent, in turn creating a cycle of repeat entrepreneurship.

### 6. Incredible Investment Opportunities

2018 it is turning out to be a premier year to fundraise and invest. The health care industry has seen announced M&A transactions totaling $315 billion in the first half of 2018, double this period last year. Similarly, health care venture capital is up 76 percent from the same period, with startups raising $18.5 billion. The health care industry ranks third behind energy and media entertainment in terms of total deal volume, with a compelling investment thesis driven by an aging population, continuous discovery of innovative drugs and devices, and a still fragmented and largely inefficient care delivery system. This sustained growth is indicative of a stable sector with repeat investors and a healthy pipeline of companies backed by larger, later-stage funding rounds.

DuPage Medical group recorded Illinois' second-largest deal – a $1.45 billion private equity investment. Of the 126 deals we tracked since last year's report, 119 are companies that have received seed to follow on funding for a total of $613 million.

7. **Health Disparities Continue to Cast a Pall Over Chicago**

   There is a 16-year difference in life expectancy between residents of the Loop and those who live on the West Side of Chicago; the same difference that exists between the United States and Iraq. Pervasive negative social determinants, socioeconomic asymmetry, and public health challenges continue to exacerbate our "tale of two cities." Several bold initiatives are being formed to address these health inequities, but much remains to be done if we are to tap into the economic power of all of Chicago while working to improve the lives of the less fortunate.

These seven areas represent important considerations for policy makers and the business community. Our collective aim should be the ongoing improvement in economic conditions for health care businesses, increased efficiency and effectiveness of our health system, and driving down health disparities and inequities between neighborhoods and socioeconomic groups. Our city is awash in the talent and resources necessary to have a profound impact in each of these areas. Our collective ability to collaborate and operate with an abundance mentality will mark the difference between being a city with important health care resources, and becoming a city that marshals those resources to drive transformation and growth for all its residents.

# INTRODUCTION: CHICAGO'S HEALTH CARE BUSINESS CLIMATE

The Chicago metropolitan area is the nation's fourth largest gross regional product producer, generating $609 billion in output in 2017. Famous for its ethnic and cultural diversity, Chicago's economy is also among America's most diverse, with no more than 12 percent of the region's four-million-person workforce employed by any single industry.[1] Home to over 400 major corporate headquarters, Chicago's geographic centrality, lively cultural scene, and world-class educational and research institutions continue to attract students, professionals, entrepreneurs, and investors from around the globe.

For this report, we define Chicago proper and the outlying areas commonly referred to as "Chicagoland" (including the city of Chicago and the surrounding counties of Cook, DeKalb, DuPage, Grundy, Kane, Kankakee, Kendall, Lake, McHenry, and Will) as "Chicago." Although this expansive geographic footprint features varied and diverse communities and neighborhoods, they are bound together by their proximity to Chicago and its unique role in American industry.

## POLITICAL AND ECONOMIC CLIMATE

After a veto override was required to pass Illinois' fiscal 2018 budget, many in the state were pleasantly surprised when the 2019 spending bill sailed through the Democratic-controlled General Assembly and was immediately signed by Republican Governor Bruce Rauner. Although the compromise that led to the deal was a rare instance of comity in Illinois' fractious politics, many observers point to the inclusion of questionable revenue and spending projections required to achieve balance in the $38.5 billion budget.

Observers have noted the city's reputation as a "dangerous place" due to ubiquitous news coverage of the tragic gun violence that plagues several South- and West-Side neighborhoods. While this reputation may be undeserved from a statistical perspective, the perception of Chicago as unsafe detracts from its appeal to engineering professionals whose skills are in high demand in other large urban centers. Also working against the attraction and retention of human and financial capital in the region is the precarious state of public finances. According to Moody's Investor Services, adjusted net pension liabilities (ANPL) in Illinois grew by 25 percent in fiscal 2017, reaching $250 billion, or 601 percent of state revenues that year—a historic high for any state, and compared to a median state ANPL of 106.8 percent.[2] With $28 billion in unfunded pension liabilities, Chicago's bond ratings are below or near the junk threshold. Both the city and state are saddled with high-interest bond payments, as well as onerous, unfunded retiree health benefit obligations. The future large tax hikes that could be required to service these debts would undoubtedly discourage many potential residents and businesses from relocating to Chicago and accelerate the multi-year trend of depopulation in the city—a phenomenon that has been more prevalent among low- and middle-class earners.

As for state-level issues, the end of fiscal 2018 saw Illinois' backlog of unpaid bills totaling $6.8 billion—about $900 million below earlier forecasts by the Governor's Office of Management and Budget (GOMB). This is down from a peak of $16.7 billion in late 2017, much of which accrued during the two-and-a-half-year budget standoff, and more than half of which consisted of debts related to Medicaid.

As the November 2018 elections approach, Democrats nationwide have identified health care as a prime campaign issue. With the governor's office up for grabs in Illinois, businessman and Democratic challenger J.B. Pritzker has proposed a "public option" plan called IllinoisCares that would allow state residents to buy into Medicaid. Although Prtizker asserts the plan would not increase taxes, details remain murky, and an actuarial analysis has yet to be completed. Should Governor Rauner retain the role, his administration will double-down on Medicaid reforms made possible through a recently approved CMS waiver. There are decisions of consequence following the gubernatorial election, with the potential to shape the Illinois health care ecosystem for years to come.

## OVERVIEW OF SECTIONS

This report aims to capture the multi-faceted aspects of Chicago's health care industry. Although it is not exhaustive, we hope that this analysis will provide a useful

overview for health care professionals, industry leaders, policy makers, and others invested in Chicago's health care sector. We have outlined this report in five sections:

**Section I: Chicago Health Care Sectors**

This section evaluates the health care industry through its sectors (i.e., providers, commercial health insurance, Illinois Medicaid managed care, digital health, medical devices and technologies, and life sciences), as well as addressing the state of the area's health care workforce development. Understanding the background, trends, and recent milestones in each of these sectors provides context to Chicago's overall health care landscape.

**Section II: Capital Formation**

This section examines Chicago's health care industry through the lens of mergers and acquisitions (M&As), capital formation, and investment. It also reports intelligence gathered through HC3 interviews of more than a dozen Chicago-based venture and private equity firms.

**Section III: Health Care Innovation and Incubation**

Chicago's entrepreneurial spirit is most apparent in its innovation hubs, incubators, and accelerators. The driving motivation of these entities is to hasten innovation and develop solutions for tomorrow's challenges. Corporate investors are forging partnerships with Chicago's academic medical centers and research hubs, providing the opportunity for universities and industry to collaborate on scientific development. Incubators and accelerators located in Chicago help health care startups connect with the resources and capital needed to bring their solutions to market.

**Section IV: Health Equity and Public Health**

Any analysis of Chicago's health care industry would be incomplete without addressing the health of its citizens. A major challenge to industry and political leadership lies in connecting Chicago's most vulnerable inhabitants with key social and medical services. A 2016 public health initiative, Healthy Chicago 2.0, outlines a plan for improving environmental conditions and reducing health inequity.

# SECTION I: CHICAGO HEALTH CARE SECTORS

## PROVIDERS

Health care services is a major economic engine in Illinois, where hospitals alone contributed $95.3 billion to the state economy and produced 466,000 jobs in 2017, with the majority of that impact in the Chicago area.[3] Chicago is dominated by not-for-profit health systems, including Advocate Aurora Health (16.8 percent of the market), Northwestern Memorial HealthCare (11.6 percent) and Rush (8.4 percent). For-profit providers have struggled in the highly fragmented Chicago market due to stiff competition from their well-differentiated, non-profit rivals, as well as Illinois' strict regulatory regime. Over the past several years, Chicago's gradual population decrease has further contributed to its image as a less desirable market for for-profit expansion. Of the 95 medical centers in Chicagoland, only 16 are for-profit institutions. National hospital chain Tenet Healthcare, which entered the Chicago market in 2013, sold its four area hospitals in 2017 and 2018. Quorum, another national chain, is also reportedly seeking to exit the Chicago market completely.[4]

The trend towards consolidation observed in last year's report has accelerated. The growing list of hospital deals include Loyola Medicine's acquisition of MacNeal Hospital from Tenet; St. Louis-based Ascension Health's purchase of Chicago's Presence Health, which triggered the integration of Presence into Amita Health; and Northwestern Medicine's merger with Centegra Health System in the northwest suburbs. Advocate Health Care, which called off its proposed merger with NorthShore University HealthSystem after three years of litigation, opted instead to expand into Wisconsin. In April 2018, Advocate finalized its merger with Milwaukee-based Aurora Health Care to become the nation's tenth largest not-for-profit hospital system.

This wave of consolidation comes at a time when hospitals and health systems seek to boost market share, diversify reimbursement, and increase operating efficiencies in the face of a discouraging economic outlook for providers. Medicaid and Medicare reimbursement rates are low and risk further decline,

while the elderly are a rising share of the patient population; the two-and-a-half-year budget stalemate in Illinois cut off payments to many providers for an unprecedented period; deductibles and co-pays are growing in tandem with increasing prices for pharmaceuticals and medical products, including costly health information technology (HIT); finally, erosion of the Affordable Care Act (ACA) under the Trump administration is expected to further decrease the size of the insured population.

There remain important considerations regarding the economic implications (positive or otherwise) of provider consolidation for consumers. For example, the Federal Trade Commission ruled that NorthShore University HealthSystem's 2000 acquisition of Highland Park Hospital had led to higher prices for both patients and insurers. A 2012 review by the Robert Wood Johnson Foundation found that, in markets where competition is already weak, hospital mergers can increase prices to insurers by as much as 20 percent.[5]

Providers counter that stand-alone hospitals being absorbed by health systems—or health systems growing larger through mergers and acquisitions—can help stabilize the finances of smaller providers while maintaining access in their communities. They also contend that it will take time for the economic efficiencies of HIT—which is more likely to be adopted by large organizations with ample tech budgets—to work their way through the system. Consolidation can therefore improve patient service, metrics, and wait times, as well as expand a patient's in-network geographical options.[6]

Some observers view the stand-alone hospital as endangered, with the potential to disappear from the area within the next few years. However, with the number of independent hospitals in Chicago shrinking, consolidation could slow, and deal size diminish, due to a lack of attractive targets and increasing anti-trust scrutiny.

As an alternative to hospitals acquiring or merging with one another, health systems are increasingly acquiring independent physician groups to grow their market share. By 2016, about 42 percent of physicians nationwide worked for hospitals, up from about 26 percent four years earlier. Practice ownership continues to shift from small to large groups as Chicago's physician community grapples with the same increasing costs and technical, regulatory, and contracting complexity as their counterparts nationwide.

For the non-acute provider community, Chicago is home to two organizations that have developed innovative models to improve the quality and value of health care in high-cost populations:

**MHN:** Founded in 2009, the Medical Home Network Accountable Care Organization (MHN-ACO) is a non-profit collaborative serving 180,000 Chicago Medicaid customers by coordinating care, engaging patients, and facilitating information exchange among 23 hospitals and over 300 primary care entities. Using a risk assessment that factors in medical, behavioral, and social determinants of health, MHN identifies "risk cohorts" that help providers prioritize care. In a two-year pilot program that sought to quantify the effects of this integrated approach, the cost of care for 170,000 MHN-covered lives was found to be 3.5 percent lower in year one, and 5 percent lower in year two, compared to a control population. MHN also reports that its safety-net patients in Chicago are 18 percent less likely to visit an emergency room, and spend 15 percent fewer days in in-patient settings, than comparable non-MHN patients.[7]

**Oak Street Health:** Since 2013, Chicago-based Oak Street Health brings a population-health approach to Medicare Advantage customers in underserved neighborhoods with a high prevalence of chronic conditions. To maximize customer access, Oak Street's 26 centers in Illinois, Indiana, and Michigan are housed in retail locations. In addition, they offer transportation, around-the-clock phone coverage, and physician visits that last an average of 30 minutes. Oak Street reports a long-term patient retention rate of 97 percent, and a 40 percent reduction in hospital inpatient visits among its more than 30,000 patients.[8]

*Key Events:*

*2017*

**July – September** University of Chicago Medicine rebranded itself as UChicago Medicine, part of its transformation into a full-fledged health system with reach beyond Hyde Park. Its suburban expansion included acquisition of Ingalls Hospital in 2016, as well as partnerships with Silver Cross Hospital, New Lenox, Edward-Elmhurst Health, and Little Company of Mary Hospital & Health Care Centers (linked here).

**November** ACOs run by Advocate Health Care and Amita Health came in second and sixth in the nation, respectively, in the Medicare Shared Savings Program. The organizations saved $116 million combined in 2016 (linked here).

**December** South Shore Hospital, a 136-bed "safety-net" institution on Chicago's South Side, announced it would cut salaries by 10 percent, lay off employees, and seek to renegotiate existing vendor contracts (linked here).

*2018*

**January** Developers broke ground on a small portion of "The Gateway," a proposed 1.2 million square-foot, mixed-use project of the Illinois Medical District Commission that was first proposed in 2014 (linked here).

**February** Norwegian American Hospital on Chicago's west side requested state permission to close its pediatric unit, reflecting the trend of decreasing rates of hospitalization among children, as well as diversion of pediatric patients to specialty children's hospitals (linked here).

**March** Seven Illinois hospitals appeared on IBM Watson Health's list of 2018 "100 Top Hospitals," including Advocate Illinois Masonic Medical Center, NorthShore University HealthSystem, Northwestern Memorial Hospital, Riverside Medical Center, Advocate Condell Medical Center, Advocate Sherman Hospital, Edward Hospital, and Northwestern Medicine Central DuPage Hospital. The rankings were based on risk-adjusted outcomes, average cost per beneficiary, and profit margin (linked here).

**April** UChicago Medicine opened a Level 1 trauma center—the first of its kind on Chicago's South Side in almost three decades (linked here).

**June** Edward-Elmhurst Health sought permission from the Illinois Health Facilities and Services Review Board for a $50 million addition to its hospital facility. The new construction would free up capacity to accommodate more cardiovascular patients (linked here).

Northwestern Medicine received $25 million from the Bluhm Family Charitable Foundation, in part to advance the use of artificial intelligence and machine learning in treating cardiovascular disease (linked here).

A Circuit Court judge in McHenry County overturned state approval given to Mercyhealth to build a 13-bed "micro-hospital"—an approach to more profitably adding hospital bed capacity that has yet to gain traction in Illinois, where tight state regulations make it difficult to build small (linked here).

Newly formed Advocate Aurora Health announced its intention to build a $250 million, 60-bed hospital and medical office complex near Kenosha, Wisconsin, with construction scheduled to be completed by 2021 (linked here).

**July** Seeking to allay federal concerns about the distribution of Medicaid matching funds to hospitals, Illinois updated the formula by which those funds are allocated. The new system better reflects the switch from inpatient to outpatient care, but worries some safety-net institutions that stand to lose from the reform (linked here).

**August** Rush University Medical Center applied to the Illinois Health Facilities and Services Review Board for regulatory approval to build an 11-story outpatient cancer-care center next to its current headquarters on Chicago's near west side. Rush estimates the project will cost $473 million, and could be completed by 2022 (linked here).

**September** In a decision worth tens of millions of dollars to Chicago's largest hospitals, the Illinois Supreme Court unanimously upheld the constitutionality of a state law allowing not-for-profit hospitals to offset property tax liability with charitable expenditures (linked here).

## *What to Watch For:*

### *Telehealth*

Many providers are leveraging telehealth to reach and stay connected with their patients, lower the costs of providing care, and reduce the travel burden on the elderly, infirm, and geographically remote. Promising areas of therapeutic focus include behavioral health, "telestroke," and chronic condition management. While telehealth has been applauded by most health care stakeholders, myriad barriers to its expansion exist in the form of restrictive Medicare and Medicaid reimbursement policies, as well as legislative prohibitions at the state level.

In July 2018, the Centers for Medicare & Medicaid Services (CMS) proposed changes that would significantly lower barriers to telehealth interactions, which are currently Medicare-reimbursable only for patients in rural locations and require patients to be present at a health care facility at the time of the consultation. Under the proposed rules, new reimbursement codes would be created to cover remote services, including brief, 5-10-minute "virtual check-ins," and review of patient photos or pre-recorded video. Medicare would reimburse providers $14 for a virtual check-in between a health care professional (the "distant site") and a patient (the "originating site") with a pre-existing relationship, as compared to $92 for an in-person patient visit. In a move that could signal future reimbursement opportunities for direct-to-consumer telehealth vendors, CMS also asked for comments regarding the potential for limited interactions, such as virtual dermatological or ophthalmological visits, where no pre-existing relationship exists.[9]

In many states, telehealth parity laws require that in-person and telehealth visits be reimbursed at the same rate. In 2017, the American Telemedicine Association (ATA) gave Illinois failing grades for its lack of private insurance parity, as well as for Medicaid coverage and reimbursement in the areas of patient setting (for, among other things, excluding a patient's home as an originating site), its narrow list of eligible providers, and the failure to cover telehealth services for rehabilitation and remote patient monitoring. However, some recent developments have given telehealth advocates cause for optimism.

Illinois Senate Bill 3049, which Governor Rauner signed in August, broadened the list of providers and originating sites eligible for Medicaid-reimbursable mental health treatment.[10] Additionally, in the spring of this year Lieutenant Governor Evelyn Sanguinetti convened the Illinois Medicaid Telemedicine Task Force to focus on further expanding telehealth in the areas of behavioral health, chronic disease management, technological infrastructure, and outreach and education. Final recommendations from the task force could come as early as the fall.[11]

### *Alternative Payment Models and Value-based Care*

Implementation of the ACA created a flurry of interest in the promise of alternative payment models (APM) and value-based care (VBC) to both improve health outcomes and slow the growth in costs. Additionally, passage of the Medicare Access and CHIP Reauthorization Act (MACRA) in 2015 created financial incentives for providers to move away from traditional fee-for-service arrangements towards advanced APMs. In 2016, the proportion of health care payments nationwide made through some type of APM—including pay-for-performance, capitation, bundled payments, and shared savings—rose to 29 percent, an increase of 6 percentage points over 2015, for a total of $354.5 billion.[12] This left about 70 percent of practice revenue tied to traditional fee-for-service payments.[13]

Demographic and economic trends are certain to accelerate the move towards value. Between now and 2030, approximately 10,000 people per day nationwide will become eligible for Medicare. Because revenue from commercial insurance subsidizes the overall cost

of treating Medicare and Medicaid patients, providers will find the status quo increasingly unsustainable as their patient populations become older, more medically complex, and less profitable.

In August 2018, UChicago Medicine and Humana announced they were entering into a value-based agreement for Humana's Medicare Advantage members in the HMO, PPO, and Private Fee-for-Service (PFFS) categories. Among the stated goals of the agreement are personalizing and coordinating care, focusing on prevention, leveraging digital technologies, and reimbursing physicians based on outcomes rather than encounters.[14]

Industry experts interviewed by HC3 indicated that the switch to APM/VBC in Chicago has been surprisingly slow given the city's size and health care profile. Citing the importance of a competitive payer mix in promoting innovative payment and care approaches, they noted that Chicago is dominated by a single payer, BCBSIL, which controls more than 60 percent of the insurance market.

*Direct-to-Employer Contracting*

A 2018 survey of 170 large employers who provide health insurance to more than 19 million employees and dependents found that, while only 3 percent of them contracted directly with health systems and providers in 2018, 11 percent are planning to do so in 2019.[15] Direct-to-employer contracting allows large employers to bypass health insurers and work directly with providers to offer discounted primary care and specialty services to their employees—often with special perks like same-day appointments and wellness navigators. Chicago-based Boeing currently contracts directly with providers to cover employees in four markets (though not yet in Chicago).[16] The recent announcement of the direct-contracting relationship between Emory Healthcare and Walmart to cover the retail giant's Atlanta-area employees is likely a harbinger of things to come. With Illinois home to 36 Fortune 500 company headquarters, Chicago employers have the opportunity to be among the pioneers in direct contracting.[17]

## COMMERCIAL HEALTH INSURANCE

Interviews conducted by HC3 researchers with insurance executives and others knowledgeable about the industry characterized the Chicago commercial health insurance market as complex, with weak penetration of HMOs, and a highly fragmented physician community relative to other large urban locales. They observed that area employers often prefer to maintain options for broad-access networks that offer dual products to their populations, rather than moving their entire populations into single-product or narrow-network options. This may be a result of the fragmented provider community, and is not uncommon among large, national employers more generally.

Although employer-sponsored health insurance has taken a back seat in terms of news coverage, nearly 60 percent of Illinoisans get their coverage through employer plans. Across the country, premiums for employer-sponsored health insurance rose by 6.6 percent in 2017, a slight up-tick from the previous five-year average of 5.6 percent. With health care costs steadily rising, employers continue to shift costs to employees when possible, either through higher premiums, lower-cost plans with higher deductibles and out-of-pocket maximums, or reduced prescription drug coverage.[18]

Meanwhile, the City of Chicago has publicized its efforts to contain health care costs for its employees by promoting generic drugs over brand-name medications, working with providers to standardize diagnostic lab tests, and adopting an employee wellness plan that targets prevention and early detection of chronic illnesses. The city also reduced its health care obligations through changes in collective bargaining agreements with the police and firefighters unions, as well as moving the majority of its retirees into ACA exchange and other private plans. A further spending reduction came in 2017 when the Illinois Supreme Court allowed the city to proceed with a three-year phase-out of health care benefits for employees who retired after 1989, saving $130 million a year.[19,20]

After a tumultuous few years of losses rooted in the underpricing of ACA plans, health insurers' profitability rebounded in 2017 and 2018. A report by the White House Council of Economic Advisors observed that, while health insurance stocks generally tracked the S&P

500 prior to ACA implementation, insurers' stock prices outperformed the index by 106 percent from January 2014 to 2018.[21] Fitch Ratings reported that, for the first half of 2017, the aggregate underwriting gain (profit minus claims) for 34 Blue Cross companies was $5.1 billion greater than during the same period in 2016. The improved financial performance was largely a result of premium increases, lower-than-anticipated utilization, and stricter enrollment and underwriting practices for ACA plans.[22] While not a full referendum on the stability of ACA-related markets, there are clear signals of increasing comfortability on the side of investors and operators.

Chicago-based Health Care Service Corporation, parent of Blue Cross and Blue Shield of Illinois (BCBSIL), saw its 2017 net income jump to $1.26 billion after losses of $281.9 million in 2014, $65.9 million in 2015, and a historically modest gain of $106.3 million in 2016. Anthem, Centene, Cigna, and Molina Healthcare are among the publicly traded, for-profit insurers who are also reporting better results since the exit from the individual market of other large insurers, including Aetna, Humana and UnitedHealth Group.[23] This return to profitability casts some doubt on the predicted "death spiral" of exchange plans, even as the Trump administration continues to chip away at the ACA.

The state operates its ACA exchange, Get Covered Illinois (GCI), in partnership with the federal government. In 2017, five insurers offered plans through GCI: Ambetter/Celtic, BCBSIL, Cigna, Health Alliance, and Humana. Although Humana exited the individual market nationwide for the 2018 plan year, the majority of Illinoisans continue to have a choice between two insurers, with most consumers in the Chicago area having three to choose from.[24]

Between 2013 and 2017, the uninsured rate in Illinois dropped from approximately 18 to 7 percent, thanks largely to the subsidization of individual plans and expanded Medicaid access brought by the ACA.[25] Mirroring that trend, the U.S. Census' American Community Survey found that nearly 91 percent of Chicago residents were insured in 2016—the highest percentage on record.[26]

Nearly 335,000 Illinoisans acquired health insurance through GCI for the 2018 plan year—a drop of about 6 percent from the previous year, and similar to declines seen in the rest of the country.[27] This decrease in enrollment was significantly lower than forecasted given recent actions by the Trump administration, including halving the open enrollment period; reducing the advertising and outreach budget by 90 percent; eliminating the individual mandate; and announcing an end to cost-sharing reduction (CSR) payments, by which insurers are reimbursed for discounts provided to low-income customers.[28]

Despite an average premium increase of 25 percent in 2018, over 80 percent of Illinoisans buying insurance on the exchange received subsidies and tax credits that actually lowered the cost of their premiums.[29] This is due to so-called "silver loading," in which the entire premium increase resulting from the end of CSR payments to insurers is added to the cost of a silver plan—the benchmark cost for determining the level of premium support for which an enrollee is eligible. While this is good news for consumers who earn between 100 and 250 percent of the federal poverty line and thus qualify for subsidies, unsubsidized consumers have borne the brunt of the entire increase, particularly those with silver plans.

*Key Events:*

*2017*

**October** President Trump issued an executive order expanding access to association and short-term health plans that fall short of ACA coverage requirements. He later tweeted that he wanted to end federal subsidies to consumers insured under the ACA's health care exchanges (linked here).

*2018*

**March** Chicago-based Health Care Service Corporation, which runs Blue Cross and Blue Shield plans in five states, launched Affordability Cure, a $1.5 billion, three-year program focused on building partnerships with providers and employers to marshal digital resources in an effort to contain costs (linked here).

**July** The CMS announced it was halting the ACA's "risk adjustment" program, by which

insurers with less expensive customers partly cover losses of insurers whose enrollees turn out to be sicker and costlier than expected. The payments in 2018 would have amounted to $10.4 billion for expenses incurred in 2017 (linked here).

### *What to Watch For:*

*Lower-Than-Expected ACA Rates*

Illinois insurers who will offer ACA coverage in 2019 were required to file their rates with the state at the beginning of June, though the numbers were not made public until August. In a sign that prices in the ACA market may be stabilizing around a competitive equilibrium, BCBSIL said that it would lower the cost of many plans by between 0.84 and 1.5 percent—the first average rate reduction by the insurer since the exchange began. Other Illinois ACA insurers have proposed rate increases of between 1 and 11 percent, compared with last year's proposed increases of between five and 43 percent. Finalized plan and cost information is scheduled to be released by the Illinois Department of Insurance in October.[30]

*Association and Short-Term Health Plans*

The U.S. Department of Labor finalized a rule in June 2018 that could expand the use of association health plans AHPs, in which groups of businesses within similar industries jointly purchase non-ACA-compliant health insurance for their employees. This move—which would make cheaper coverage available to some employers—could further alter the risk pool for ACA plans by shifting younger, healthier enrollees into AHPs, potentially leading to higher premiums and fewer people covered by ACA plans. Although the new rule has so far not led to a mass exodus from exchange plans, some analysts have predicted that anywhere from 2.4 million to 4.3 million people could switch from the existing individual and small group market plans to AHPs over the next five years.[31]

In addition to facilitating AHP enrollment, the U.S. Department of Health and Human Services finalized a rule that reverses Obama-era restrictions on the use and renewal of non-ACA-compliant "short-term" plans, extending them from 90 to 364 days, and allowing renewal in some cases for up to a total of three years. Because short-term plans are not considered health insurance under ACA criteria, insurers offering them are permitted to deny coverage to people on the basis of pre-existing conditions. The Illinois General Assembly sent legislation to the governor limiting short-term plans to less than 181 days and prohibiting renewals with the same insurer within 60 days of a plan's termination, in an attempt to mitigate potential market destabilization.[32]

## ILLINOIS MEDICAID MANAGED CARE

Nearly a quarter of Illinois' 13 million residents are covered by Medicaid and CHIP, landing Illinois sixth on the list of total Medicaid recipients by state.[33] A majority of the state's Medicaid enrollees reside in the Chicago area, and nearly all of these are covered by managed care organizations (MCOs) that administer benefits through contracts with the Illinois Department of Healthcare and Family Services (HFS).

Medicaid accounts for roughly one quarter of Illinois' general fund outlays. The program covers one in seven adults below the age of 65, more than half of low-income individuals, three in eight children, four in nine people with disabilities, and four in seven nursing home residents in the state. While 20 percent of Illinois Medicaid enrollees in 2016 were elderly and disabled, they accounted for nearly 60 percent of expenditures. Further, 30 percent of Illinois' Medicaid dollars are spent on so-called "dual eligibles"—people who meet the criteria for both Medicaid and Medicare—to cover long-term care and other costs not paid for by Medicare.[34]

In the fall of 2017, Governor Rauner finalized his rollout of HealthChoice Illinois, a $60 billion, four-year program aimed at expanding the state's Medicaid managed care system. Seeking to lower costs, decrease the administrative burden on providers, and improve population health outcomes, HealthChoice reduced the number of MCOs contracting with the state from 12 to seven, while expanding their geographic reach from 30 to all 102 counties. An additional 800,000 clients are expected to join MCO rolls by the end of 2018, increasing their share of covered Medicaid recipients from 63 to 80 percent. In arguing for the revamp, Rauner predicted an estimated $300 million in savings over the life of the program due to competitive rates, overhead reduction, and administrative efficiencies.

Critics in the legislature and in the association and advocacy communities objected to the overhaul. They argued that plans for the coverage of medically-fragile children were inadequate, that narrowed provider networks would increase the travel burden on beneficiaries, and that cuts to reimbursement rates for medical supplies and equipment would impede patient access and economically harm suppliers. They further asserted that HFS was deficient in its ability to guarantee that clients would be reliably connected with primary-care physicians and specialists in rural areas, as well as in its ability to oversee contract compliance. The latter charge was bolstered when a 2018 audit of HFS revealed that the department was unable to fully account for over $7 billion in fiscal year 2016 spending by MCOs on Medicaid clients.[35]

In July 2017, the state legislature overrode a veto by Rauner to pass a $36 billion budget and revenue package, raising individual and corporate income tax rates in a bid to increase revenue by an estimated $5 billion. The veto override ended a two-and-a-half-year political impasse, but the huge backlog of unpaid bills—which peaked at $16.7 billion—exacted a heavy toll on Medicaid beneficiaries, payers, and providers. Most of the largest insurers saw 18-month reimbursement lags, resulting in providers turning away Medicaid patients and sometimes being forced to close their doors.[36] Other safety-net providers and hospitals saw limitations in available cash, introducing operational strain.

Days prior to the budget vote, a federal judge had ordered Illinois to prioritize Medicaid payments over other liabilities. In October, the State used the proceeds of a $6 billion bond sale, along with restarted federal matching funds, to pay down $8.7 billion of its Medicaid debts and slow the mounting burden of late payment penalties.[37] In July 2018, the legislature passed, and Governor Rauner signed, a $38.5 billion appropriations bill that excluded the 4 percent Medicaid provider rate cut the governor had proposed.

In April 2018, the Rauner administration barred BCBSIL from enrolling any more HealthChoice customers and fined the company $150,000, citing poor patient access and inattention to client appeals and grievances. BCBSIL had been the single largest private insurer in the program, with one quarter of enrollees. BCBSIL responded by announcing plans to cut reimbursement rates for medical suppliers for its existing Medicaid customers by 35 percent. Another large, private insurer, IlliniCare, had already cut reimbursement to suppliers by 50 percent beginning in 2018.

Despite improvements in the program's fiscal foundation, the Illinois comptroller's Debt Transparency Report Summary for the period ending August 31, 2018, showed the state still owing close to $1 billion in outstanding medical bills, most of which were Medicaid related. In addition, Illinois is widely considered to be near the top of the list nationwide for creating unreasonable barriers to access in the form of onerous prior authorization for treatment, late payments to payers and providers, and excessively restrictive reimbursement policies.

*Key Events:*

*2017*

**July** Aetna Better Health threatened to drop its participation in Illinois' Medicaid managed care program over nearly $700 million in unpaid bills (linked here).

**August** The Cook County Health and Hospitals System announced it expected revenue to climb from $800 million in fiscal year 2017 to about $1.2 billion in fiscal 2018, thanks largely to increased enrollment in its CountyCare health plan as a result of the overhaul of Illinois' Medicaid managed care system (linked here).

*2018*

**January** The state auditor general found that the Department of Healthcare and Family Services could not fully account for over $7 billion in payments to and from private insurers participating in Illinois' Medicaid managed care program. The audit also found the department had failed to adequately track denial of claims and the portion of payments spent on administration and care coordination (linked here).

**April** The Rauner administration barred BCBSIL from enrolling any new clients under HealthChoice Illinois and fined the company $150,000, citing poor patient access and inattention to client appeals and grievances (linked here).

**May** Blue Cross and Blue Shield of Illinois said it would cut reimbursement rates for medical suppliers by 35 percent beginning in 2019 (linked here).

**June** Governor Rauner signed a $38.5 billion budget with no cuts to Medicaid (linked here).

*What to Watch For:*

*Rising Costs*

Total general revenue and related funds spending on Medicaid is projected to climb to $14.5 billion in fiscal year 2019, which represents an increase of almost 18 percent over 2015. Of this total, $7.9 billion will come from the state, which equates to 20 percent of Illinois' general fund outlays.[38] Factors contributing to this growth include measures to combat the opioid epidemic, as well as the federal government's decreasing matching rates for ACA Medicaid expansion. From 2014 through 2016, federal funds covered the full cost of Medicaid expansion under the ACA; that share decreased to 95 percent in 2017 and will phase down to 90 percent by 2020.[39]

The fiscal 2019 Illinois budget passed without the 4 percent provider rate cut proposed by the governor, which would have represented approximately $300 million in payment cuts over a full year. However, many providers are asking whether the state will review or adjust reimbursement rates going forward. This is a crucial question for the future of Medicaid access: Industry observers interviewed by HC3 suggested that medical loss ratios in excess of 95 percent have driven, and will continue to drive, the exit of plans from HealthChoice Illinois. With 2.8 million people eligible for Medicaid managed care and only six MCOs throughout the state, Illinois can ill afford further plan attrition.

*1115 Waiver*

In May, the Trump administration granted Illinois' request for an 1115 waiver, which gives the state five years of flexibility to shift up to $2 billion in Medicaid funding into a series of pilot projects targeting behavioral health, substance abuse, and postnatal home visits, among others.[40] An important related initiative is the Integrated Health Home (IHH) program, which aims to connect Medicaid clients with a coordinated suite of providers of mental and physical health care, as well as community-based and in-home care, thus reducing their reliance on emergency services and the high-cost interventions associated with untreated chronic conditions. As the criteria for what constitutes an IHH were still quite loose at the time of writing, payers and providers will be paying close attention to further guidance from the Department of Healthcare and Family Services (HFS), and the ultimate ability of IHHs to bend the cost curve in a significant way.

## DIGITAL HEALTH

Digital health is a broad category that encompasses electronic health records (EHR), data analytics, wearable devices for consumers and patients, and telehealth, with the goal of reducing inefficiencies and cost, improving access to and quality of care, and increasing the personalization of treatment. The general shift from analog to digital technologies across the economy is old news, but some of the details remain striking. For example, a 2018 study that tracked five years of revenue growth and stock price at more than 1,000 top U.S. public companies found a near perfect relationship between those indicators of business performance and the companies' "digital strength," with health care companies demonstrating the greatest sensitivity at both the high and low ends of the index.[41] Despite this tight correlation, health care has been relatively slow to the party—lagging, for example, the federal government in terms of digital adoption.[42]

In interviews conducted by HC3 researchers, industry leaders called out four elements of Chicago's ecosystem that make it a hub for digital health: R&D, incubation, capital, and talent.

Chicago's MATTER, AVIA, and Healthbox were cited time and again as "beacons" that have drawn the

attention of strategic investors from across the country. Anchored by the University of Illinois, the University of Chicago, Northwestern University, as well as Argonne National Laboratory and Fermilab, the Chicago region is well-placed to continue leveraging the intellectual capital created by local top-flight research institutions. The presence of large digital health companies like Allscripts and Catamaran, as well as associations like the Chicago-based Healthcare Information and Management Systems Society (HIMSS) and American Medical Association (AMA), has resulted in a deep pool of local executive talent that has, in many cases, remained in the area to mentor startup talent, in turn creating a cycle of repeat entrepreneurship.

Among the high-profile players in Chicago's digital health industry are Livongo, with its diabetes and hypertension management systems; Tempus, which performs genetic sequencing and analysis that aids in targeted therapies for oncology patients; higi's health stations, which now number over 11,000 across the country, allowing users to monitor their weight, BMI, and blood pressure, and track the readings on their devices and mobile apps; and VillageMD, which partners with primary care providers at all levels to customize data analytics and care coordination to improve clinical outcomes across its six-state network of 2,500 physicians.

Peoria-based OSF HealthCare, a non-profit health system with 13 acute care facilities and 125 clinical sites in Illinois and Michigan, is a well-regarded digital innovator. Hoping to improve clinical interactions, OSF recently launched a research platform to gather data on individual patients—covering everything from health status, to nicknames and hobbies, to life challenges like lack of childcare or transportation, as well as inability to afford medications.[43]

Some observers have pointed to the lack of a statewide health information exchange (HIE) as a barrier to fully harnessing the power of electronic records to impact the health of Illinoisans. In 2010, former Governor Pat Quinn allocated $19 million to create such an exchange, but the program was ended in 2015 by Governor Rauner after the initiative foundered due to lack of interest from providers and competition from regional exchanges. There is widespread recognition that Chicago can do more to retain the top engineering talent that comes out of its universities and research centers, which is often siphoned away to the coasts.

Rush University Medical Center has strategically focused on providing digital solutions to engage patients and improve medical records. Rush was one of the first providers in the country, and the first in Illinois, to begin using an ingestible sensor developed by Proteus Digital Health to alert patients with chronic illnesses when they've failed to take their medicine on schedule—a huge driver of both illness and cost. Rush has also integrated the Apple Health app and mobile health data with electronic medical records, enabled higi health station users to send their screening data directly to their EHRs, and incorporated social determinants of health into patient EHRs.

*Key Events:*

*2017*

**August** — In a $185 million cash deal, Chicago's Allscripts bought McKesson's Enterprise Information Solutions business, with plans to place the entire suite of McKesson's digital solutions under the Allscripts brand (linked here).

**October** — The Wall Street Journal published an article alleging that Chicago's Outcome Health had misled customers and investors regarding the number of patient-targeted ads it had displayed on its network of monitors installed in doctors' offices, as well as the overall number of monitors installed (linked here).

*2018*

**January** — Extending its reach into the independent physician practice market, Allscripts acquired EHR vendor Practice Fusion for $100 million (linked here).

**April** — Chicago-headquartered Livongo Health, which makes devices to monitor diabetes and hypertension, raised $105 million from investors. Its more than 350 customers are

mainly large, self-insured employers seeking to control costs associated with chronic conditions (linked here).

**June**

In a continuing effort to rehabilitate its image and relationship with investors, Outcome Health replaced its founding CEO, Rishi Shah, with Matt McNally, former chief media officer of Publicis Health (linked here).

Chicago-based Regroup Therapy raised $5.5 million from investors. Addressing the shortage and poor geographic distribution of mental health professionals, Regroup provides mental health services across 19 states through videoconferencing (linked here).

## *What to Watch For:*

### *Alternative Payments*

The trend towards alternative payment models (APMs), along with the development of digital applications that facilitate the coordination of care and collection and use of reliable data, form a virtuous circle. According to one industry observer, "If you forced everyone into value-based care models, they would have to develop innovative tools." Accelerating the adoption of value-based care approaches in Illinois could therefore advance the development and adoption of digital health in the state more broadly.

### *Non-traditional Market Entrants*

In 2008, only 17 percent of physicians used an EHR and only 11 percent of Americans had a smartphone. A decade later, those numbers have risen to 87 percent and 79 percent, respectively. The ubiquity of technology among providers and consumers has created enormous incentives for tech companies to enter the health care market. Apple unveiled its Health app in 2014 and has been augmenting its health and wellness offerings ever since, including its foray into EHR with its Health Records API, and the FDA-cleared electrocardiogram function of the Apple Watch 4, both of which were unveiled in 2018. Microsoft is pushing into health care from its AI and Research Division, and Google's sister company, Verily is reportedly seeking partnerships with insurers to jointly bid for Medicaid managed care contracts. It seems likely that some of the biggest developments in digital health in the coming years will come from outside the health care industry altogether.

### *HIMSS Global Conference to Return to Chicago*

In 2009, the Chicago-based Healthcare Information and Management Systems Society (HIMSS) announced that Chicago would no longer be on the rotation of sites for its annual global conference—one of the ten largest conferences in the country. According to HIMSS, Chicago had lost out to Orlando and Las Vegas to host the nearly 50,000 attendees due to the prohibitive cost of hosting the event at McCormick Place. However, earlier this year, after working closely with the city's official tourism arm, Choose Chicago, to negotiate a more attractive package of incentives, HIMSS reversed course and announced plans to return to Chicago and McCormick Place in 2023.

Following shortly on the heels of Amazon's purchase of online pharmacy PillPack, Deerfield-based Walgreens announced a robust new digital platform, Find Care Now. The app and online portal will connect Walgreens customers to health care services offered by 17 providers. In the Chicago area, this includes Walgreens' in-store Advocate clinics, medical and behavioral telehealth encounters, and online dermatology appointments.[46] Walgreens has also announced a partnership with Humana to pilot senior-focused clinics in two of its locations in Kansas City, Missouri, offering primary-care and pharmacy services, along with advisers to answer Medicare-related questions.

### *Outcome Health*

The biggest digital health story of the past year in Chicago was Outcome Health, which runs patient-targeted ads on video screens it installs in doctors' offices. With a valuation exceeding $5 billion, the company raised over $500 million in its first round of funding in the spring of 2017—the largest single raise in Chicago since Groupon secured $950 million on its fifth round in 2011.[47] Six months later, an article in the Wall Street Journal alleged that Outcome

had charged customers for non-existent ad placements and falsified installation and performance data.[48] In the wake of the revelations, medical groups and associations that had partnered with the company to provide content severed ties; a third of Outcome's employees took buyouts; and investors including Goldman Sachs, CapitalG, and Pritzker Group Venture Capital, sued the company. As part of the settlement announced in January 2018, founders Rishi Shah and Shradha Agarwal stepped down from their roles as CEO and president, respectively. In the spring of 2018, a number of new directors were brought on to the board and Matt McNally, former chief media officer of Publicis Health, was installed as CEO, in an apparent bid to rebuild trust within the advertising industry.[49]

## MEDICAL DEVICE AND TECHNOLOGY

The Advanced Medical Technology Association (AdvaMed) estimates that the medtech industry employs nearly 12,000 people directly in Illinois, with an annual economic contribution to the state of $5.5 billion.[50] Some of the most recognizable names in the industry, including Abbott, Baxter, GE Healthcare Hill-Rom, and Hospira, are global companies with headquarters in the Chicago area. With a highly diversified portfolio of products that includes biopharma, hospital supplies, nutrition, and health care services, these companies generally have a less well-defined identity as pure medical device makers than their counterparts in Indiana, Massachusetts, New Jersey, Minnesota, or California.

Central to Chicago's medtech ecosystem are accelerator Insight Labs, innovation center mHUB, and health tech incubator MATTER. Since MATTER opened its doors in 2015, its medical device venture members have raised over $167 million in funding since their founding, and currently account for 20 percent of its membership portfolio. Southwest of the city, research conducted by Argonne National Laboratory and Fermilab has contributed to innovation in medical technology, particularly in the area of medical imaging.

### *Key Events:*

*2017*

**September** The FDA recalled nearly 500,000 implantable pacemakers made by Abbott over concerns that the devices could be hacked. The necessary firmware update required upload by trained staff in a medical office (linked here).

**October** A year after announcing its intention to buy point-of-care diagnostics company Alere, Abbott completed the acquisition for $5.3 billion (linked here).

*2018*

**January** President Trump signed a stopgap spending bill that included a two-year delay on implementation of a 2.3 percent excise tax on medical devices. Part of the ACA's funding mechanism, the tax was expected bring in $29 billion over ten years, though industry trade groups predicted it would result in a net loss of 40,000 jobs (linked here).

**June** General Electric spun off Chicago-based subsidiary GE Healthcare, the $19 billion-a-year unit best known for manufacturing large medical imaging equipment (linked here).

**July** The FDA approved Abbott's third-generation MitraClip device to treat mitral regurgitation (MR)—the most common heart valve disease—without open-heart surgery (linked here)..

### *What to Watch For:*

*A Streamlined FDA Approval Process*

In December 2017, Food and Drug Administration (FDA) Commissioner Scott Gottlieb, MD, announced that his agency would be creating a new path to approval for Class II and certain Class I medical devices to provide faster access for patients and consumers. In the traditional, "510(k) pathway," a manufacturer must demonstrate that a new device is substantially equivalent in terms of safety and effectiveness to an existing device approved for the same purpose, known as a predicate device. Because this standard dates back to 1976, some of the predicate devices are four decades old, which makes comparison to new and more advanced devices difficult. In 2017, the FDA approved 46 original premarket device applications, up from 38 in 2016.[51]

In April 2018, FDA released its Medical Device Safety Action Plan, which aims to "protect patients and spur innovation of new products that are safer, more effective, and address unmet medical needs." The document outlines steps the agency hopes to take in the areas of cybersecurity, speeding new devices to market, and streamlining the process for mitigating problems with devices that arise post-market.[52]

## LIFE SCIENCES

Proximity to over 30 teaching hospitals, six top universities, and three major government research facilities has kept Chicago high on the list of attractive regions for the life sciences industry. In fiscal 2017, the National Institutes of Health (NIH) granted nearly 1,800 awards totaling more than $729 million to public and private research and medical institutions in Chicago. Topping that list were Northwestern University, with 746 awards totaling $301 million; the University of Chicago, with 406 awards totaling $168 million; and the University of Illinois at Chicago, with 322 awards totaling $119 million.[53]

A 2018 CBRE analysis found that jobs in Chicago's pharmaceutical and medical manufacturing companies numbered nearly 18,000, making it the fifth largest employment market in the country in those sectors.[54] From quantity to quality, Lake County's robust cluster of life science companies pay a 50-percent premium relative to the county's average wage.[55] With life sciences employment having grown at more than double the rate of overall employment nationwide for nearly two decades, the demand for a well-remunerated workforce to power these organizations bodes well for the area's economic future.

Chicago has seen a number of successful IPOs in the past year from biopharma companies engaged in the development of novel treatments, including Evanston-based Aptinyx (brain and nervous system disorders), which raised $102 million; Chicago-based Xeris (emergency glucagon delivery device for diabetes), which raised $86 million; Chicago-based Iterum (anti-infectives), which raised $80 million; and Skokie-based Exicure (gene therapy), which closed a $20 million private placement in a reverse merger.

The case of AveXis highlights Chicago's allure for the life sciences industry. Although the company's core technology, which targets neurological disorders, was developed in Ohio, the founders recruited Chicago-based Sean Nolan as CEO and established AveXis's headquarters in north suburban Bannockburn. The move from Ohio placed AveXis in close proximity to a host of large biopharma operations, giving them ready access to the top executive and scientific talent they would need to navigate FDA approval and secure funding. (Nolan had previously held commercial roles at both Abbott and Ovation Pharmaceuticals). In April 2018, Novartis purchased AveXis for $8.7 billion—the most ever paid for a Chicago-area biotech firm.

The concentration of pharmaceutical research and development activity in Illinois is nearly twice the national average for states, and the Chicago area's biopharma cluster is an active promoter of collaborative research with area universities. Examples include AbbVie's ongoing cancer research partnership with Northwestern University and the University of Chicago, Takeda's three-year commitment to the University of Chicago to advance personalized therapies for inflammatory bowel disease, and Abbott's satellite R&D facility at the University of Illinois' (Urbana-Champaign) Research Park.[56]

As a cautionary note, Illinois faces severe challenges in important areas of life sciences infrastructure. Vacancy rates for lab space hover around 1 percent in Chicago—the lowest vacancy rate of any large, urban market—which represents a serious constraint on future biopharma innovation and development. Lack of state promotion in the form of Small Business Innovation Research (SBIR) matching grants (which exist, but are not currently funded), minimal state presence at trade events, and a relative dearth of job training and incentives, has resulted in corporate flight to states with more robust incentive programs.

Positive steps are being taken. In 2017, Illinois resurrected the EDGE tax credit that had been suspended in 2015 due to mismanagement and budgetary constraints, and renewed and expanded the Angel Investment Tax Credit that had expired in 2016. The Illinois Growth and Innovation Fund, which

was established in 2016 by Illinois Treasurer Michael Frerichs, will invest more than $220 million over three years in venture funds focused on emerging technology and biosciences companies operating predominantly in Illinois.[57] Despite some notable relocations of prominent biopharma R&D organizations outside of the Chicago area, industry leaders interviewed by HC3 said that Chicago remains widely recognized as being home to exceptional life sciences commercial talent.

*Key events:*

*2018*

**April** AveXis, a Bannockburn-based gene therapy startup, was bought by Novartis for $8.7 billion. The deal was the biggest in history for a Chicagoland biotech company (linked here).

**May** Irish pharma maker Allergan announced it would exercise its $1 million option to buy an oral anti-depression medicine based on research by Northwestern University's Joe Moskal. Allergan acquired an IV version of the treatment in 2015 when it purchased Evanston-based Naurex for $560 million (linked here).

**June** Northwestern University received a $65-million pledge from New York-based Deerfield Management to support research and speed development and commercialization of drugs to treat conditions as varied as Parkinson's, Alzheimer's, depression, and cancer (linked here).

The fiscal 2019 state budget included a $500 million appropriation to help jumpstart the Discovery Partners Institute, a research collaboration between the University of Illinois at Urbana-Champaign, the University of Chicago, Northwestern University, and others, focusing on, among other areas, health and wellness. The initiative is slated to include a one-million square-foot facility in Chicago's South Loop (linked here).

**July** Takeda Pharmaceuticals, with U.S. headquarters in Deerfield, completed a two-year restructuring that included relocation of around 750 Deerfield-based R&D and vaccines employees to Cambridge, Massachusetts (linked here).

**September** Following closely on its relocation of R&D and vaccines staff to Cambridge, Takeda announced it would close its U.S. headquarters in Deerfield upon completion of its acquisition of Shire Pharmaceuticals, which is expected in early 2019. Takeda employs approximately 1,000 people in Deerfield (linked here).

## *What to Watch For*

### *A Reprieve for Research Funding*

From 2003 to 2015, the NIH lost 22 percent of its research funding capacity due to discretionary budget cuts, automatic cuts resulting from the 2013 federal budget sequestration, and inflation. Although appropriations began to increase in fiscal 2016, the consequences of more than a decade of diminished NIH funding and increased competition for a limited pool of awards continue to be felt.[58] In 2017, when the White House proposed slashing NIH funding by more than 20 percent, biomedical researchers around the country braced for a hard landing. But to the surprise of many, the omnibus spending deal reached in March 2018 actually increased the agency's budget by 8.3 percent, to $37 billion—a new high for the NIH in real dollars.[59] That's good news for biomedical research—and for Illinois, which ranks ninth on the list of NIH awards by state.

### *Lab Space Shortage*

The shortage of wet lab space is one of the top challenges facing biopharma in the Chicago area. At 12.5 million square feet, Chicago ranks fourth behind Boston/Cambridge (26 million), the San Francisco Bay Area (20.9 million), and San Diego (14.2 million) for total commercial lab space. With a vacancy rate of only 1.2 percent, it's difficult to see the existing lab infrastructure accommodating the desired level of industry growth in the future.

There are some modest efforts on the horizon to address this issue. The University of Chicago's Polsky Center is expanding its business incubator in Hyde Park, with 280,000 square feet of new office and laboratory space slated to open in early 2020. In Lake County, Rosalind Franklin University of Medicine and Science broke ground on its $50 million public-private Innovation and Research Park, a 100,000-square-foot expansion that will house lab and other facilities open to industry and is set to open in 2019.[60]

*Structural Concerns*

Among the industry executives HC3 interviewed for this paper, most expressed serious concern that Chicago is losing ground as a life sciences hub. They identified a few key drivers of this deterioration in our area's viability as a nurturing environment for life sciences innovation:

**Geography:** While Chicago's biopharma cluster is located primarily in northern Cook County and Lake County, the universities that are producing breakthrough science and scientists are in or near the heart of the city—a commute that can last over an hour.

**Research & Commercial Integration:** Biopharma companies in Boston/Cambridge and the San Francisco Bay Area have planted dozens of offices and labs directly on the campuses of their local universities to appeal to the next generation of cutting-edge researchers. This degree of integration between companies and academic research centers has yet to emerge in Chicago.

**Funding & Brain Drain:** From 2007 through 2015, less than 5 percent of the aggregate value in all venture capital deals occurred in Illinois, compared to over 50 percent in California, and over 10 percent each in New York and Massachusetts. In 2015, Illinois received about half of the Midwest total of venture funding, though less than 2 percent of the total nationwide. Biotechnology was the third highest-funded sector in the state in that year, at $132 million. A 2016 study tallied the number of funded biotech VC firms in Chicago at nine, compared with 18 in Boston and 63 in San Francisco. The same study counted six biotech incubators in Chicago, compared to more than 20 each in Boston, San Francisco, and New York.[61,62] In many ways these are unfair comparisons, particularly given Silicon Valley's dominance of venture funding across the board. However, they do illustrate the challenges Chicago faces in retaining the top research and entrepreneurial talent its commercial and academic institutions produce when their skills are in such high demand on the coasts.

In December 2016, New York City Mayor Bill De Blasio announced the 10-year, $500 million LifeSci NYC initiative to promote New York as a life sciences research and innovation hub. Among other priorities, the program includes $100 million for an applied life sciences campus, $50 million in targeted investments in existing academic and research institutions, $10 million for new incubators and innovation centers, $20 million a year in seed and growth funding for startups, and $300 million in tax incentives to promote the construction of commercial lab space. The city estimates that LifeSci NYC will create 9,000 direct life sciences jobs and 7,000 jobs in related fields, as well as $2.5 billion in annual economic output, $1 billion in tax revenue, and attract $6.5 billion in private investment.[63] This is in addition to a $650 million initiative by New York State to promote the same kind of cutting-edge investment and job creation throughout the state.

State and local officials clearly felt compelled to make a large, strategic public investment in guaranteeing the competitiveness of New York as a center for life sciences. Such a move should prompt serious discussion in Chicago and Illinois regarding how best to conserve and augment the assets that have heretofore attracted biotech investment and talent to the region.

## WORKFORCE DEVELOPMENT

With an aging population and rising prevalence of chronic health conditions like obesity and diabetes, the U.S. is facing a shortage of skilled health care workers, including home health aides, lab techs, nurses, and physicians. Health care consulting firm Mercer estimates that by 2025 there will be a nationwide shortage of 11,000 physicians and surgeons, over 29,000 nurse practitioners, 98,000 clinical lab technicians and technologists, and nearly 450,000 home health aides.[64]

The health care industry is the largest private employer in the Chicago area, and benefits from a robust educational infrastructure feeding its talent pipeline. In 2014, area colleges granted 5,600 degrees in nursing, 5,100 degrees in allied health services, 3,600 degrees in biology, and 2,800 degrees in health administration.

The proportion of health–related STEM (science, technology, engineering, and math) degrees awarded in Illinois is 7 percentage points greater than the national average. More than 95 percent of jobs in STEM fields in the state are in health care, and employment in health care services in Illinois is 19 percent greater than the national average.[65] The state of Illinois estimates that, for the period between 2012 and 2022, total health care employment in the region will have grown 16.5 percent.

*Physicians*

The number of active physicians in Chicago has increased by 12 percent since 2010, with the bulk of the increase seen in Cook, DuPage, Lake, Will, and McHenry Counties—home to 60 percent of the state's population. Although this increase has come during a time when Chicago's population has been steadily decreasing, we note the large number of physicians—30 percent—who are at or near retirement age:

## EXHIBIT 1: ACTIVE CHICAGOLAND PHYSICIANS BY AGE, 2010 - 2018[66]

| Age Group | 2010 | 2018 | Change | Percent of 2018 total |
|---|---|---|---|---|
| 30 and under | 1,228 | 1,579 | 29% | 5% |
| 31-35 years | 3,003 | 3,678 | 22% | 12% |
| 36-40 years | 3,464 | 3,604 | 4% | 11% |
| 41-45 years | 3,356 | 3,329 | -1% | 11% |
| 46-50 years | 3,382 | 3,423 | 1% | 11% |
| 51-55 years | 3,326 | 3,164 | -5% | 10% |
| 56-60 years | 2,953 | 3,139 | 6% | 10% |
| 61-65 years | 2,469 | 3,052 | 24% | 10% |
| 66-70 years | 1,779 | 2,353 | 32% | 7% |
| 70 and up | 3,185 | 4,254 | 34% | 13% |
| **Total** | **28,145** | **31,575** | **12%** | **100%** |

In 2016, 31 percent of active physicians in Illinois were international medical graduates (IMGs), placing Illinois fourth in terms of number of practicing IMGs nationwide, and reinforcing the importance of inward migration to the city's cultural and economic life.

In the same year, 5,649 students were enrolled in MD- or DO-granting institutions in the state. In terms of retention, 31.5 percent of physicians who had completed their undergraduate medical education in Illinois were active in the state (compared to a national median of 38.5 percent), while 48.2 percent of physicians who had finished their graduate medical education in the state remained active here (compared to a national median of 44.9 percent).[67]

*Nurses*

In 2013, the National Council of State Boards of Nursing and The Forum of State Nursing Workforce Centers found that, nationwide, 55 percent of registered nurses (RNs) were over 50 years old, putting them at or near retirement age within the next decade. While there are currently approximately three million nurses in the United States, the American Nurses Association has estimated that an additional one million new RNs will be required to meet demand by 2022.[68] Although an aging population will require greater numbers of nurses, faculty shortages are forcing many nursing programs to turn away qualified applicants.[69]

RNs account for the vast majority of nursing licensees in Illinois. Since 2010, the state has seen large increases in the number of advanced practice nurses (APNs), including nurse practitioners and certified nurse anesthetists. A concerning trend is the decline in the number of licensed practical nurses (LPNs) at a time when bedside care-givers are becoming an ever-more important part of the health care workforce:

## EXHIBIT 2: ACTIVE ILLINOIS NURSING LICENSEES, 2010 - 2018[70]

| Nurse Categories | 2010 | 2018 | Change | Percent of 2018 total |
|---|---|---|---|---|
| Licensed Practical Nurses | 30,579 | 27,492 | -10% | 11% |
| Registered Nurses | 167,681 | 198,121 | 18% | 79% |
| Advanced Practice Nurses | 6,921 | 14,353 | 107% | 6% |
| Advanced Practice Nurses Controlled Substance | 3,820 | 9,805 | 157% | 4% |
| **Total** | **209,001** | **249,771** | **20%** | **100%** |

*Middle-Skill Jobs*

Jobs that require a high school diploma in addition to some amount of post-secondary education (short of a bachelor's degree) are referred to as "middle-skill." Middle-skill employment is foundational to the economic vibrancy of a community, and is particularly important in the health care sector, where it overlaps significantly with the large number of occupations traditionally categorized as "allied health."[71]

A JP Morgan report found that 44 percent of employment in the Chicago region is middle-skill, and that health care accounts for about one quarter of the region's online job postings for "target middle-skill jobs"—defined as "high-demand occupations that also pay a living wage." With approximately 15,000 openings per year, these target jobs span the patient care, administrative, and technical subsectors within health care. They provide a career pathway, with "stackable credentials" that allow people with few skills to work towards better-paying careers while earning above-average wages—for example, medical assistant (post-secondary training) to surgical technologist (associate's degree), or medical biller (high school diploma) to health information manager (certificate program or associate's degree). The demand for qualified workers in these areas exceeds the supply in many cases, and there are too few opportunities for Chicagoans to get the information and training they need to fill the gaps.[72]

In a proactive effort to fill those gaps, Malcolm X College's Health Sciences department offers an array of programs in the allied health fields, culminating in basic certificates (e.g., Community Health Worker, Medical Billing, Phlebotomy Technician), advanced certificates (e.g., Paramedic, Medical Coding, Pharmacy Technology), and associate degrees (e.g., Health Information Technology, Radiography, Surgical Technology). More than 650 students graduated from Malcolm X with health care credentials in the 2016-2017 academic year.

Funded by a $5 million, five-year donation from BMO Harris Bank to Rush University Medical Center, Rush and Malcom X have embarked upon a partnership to develop a new curriculum to train students in emerging health care roles, with the goal of strengthening and expanding the quality and availability of care in Chicago's West and South Side neighborhoods. The grant enabled the creation of scholarships to allow five Malcolm X graduates to pursue BS degrees in Health Sciences at Rush; funds four Health Disparities Fellowships at Rush; furthers the collaboration between Rush and the Medical Home Network, which connects health care providers to promote patient-centered, coordinated care; and contributes to the implementation of student-led initiatives on the West and South Sides to improve health care access and quality.

Launched in October 2015, the Advocate Workforce Initiative and NAVIGATE program is a skills-based training program intended to "connect Chicagoland's underemployed and unemployed residents with high-quality, in-demand jobs" in the health care industry. Made possible by a $3 million grant from JP Morgan Chase and led by Advocate Health Care, the initiative consists of training, a licensing exam, a guaranteed interview with Advocate, as well as job placement assistance. Partnering extensively with community organizations and City Colleges of Chicago (including Malcolm X College), the program has had more than 500 enrollees since inception, an 83 percent completion rate, and a 90-day job retention rate of almost 87 percent.

## *What to Watch For*

*Future RN Surplus*

A report by Mercer found that Illinois is among the few states likely to see a surplus of RNs by 2025, which they credit to a robust health care education pipeline, as well as Chicago's continued population decline.[73]

*Free Medical School Tuition*

The New York University School of Medicine announced in August 2018 that all current and future medical students would receive free tuition, regardless of merit or need. In explaining the change, the school cited concerns about affordability, as well as the financial disincentives created by mounting student loan debt that steer physicians away from careers in family medicine, pediatrics, and research, and into more highly paid specialties.

Other schools have taken similar steps, though none as comprehensive as NYU: Columbia University received a

$250 million gift to defray medical school tuition through full scholarships for students in need; UCLA covers tuition and all expenses for about 20 percent of its students, though only on the basis of merit; and Case Western Reserve University's medical school at the Cleveland Clinic pays tuition and fees for its research program.[74]

Other top medical schools are likely to follow NYU's lead in the coming years, and if they do, the geographic competition for talented medical students could become intense. Given its top-tier institutions and the importance of high-quality health care to the local economy, look for Chicago medical schools to follow suit.

# SECTION II: MERGERS, ACQUISITIONS, AND CAPITAL FORMATION

Health care industry consolidation through mergers and acquisitions continues to break records, with announced transactions totaling $315 billion in the first half of 2018, double this period last year. Similarly, health care venture capital is up 76 percent from the same period, with startups raising $18.5 billion.[75] The health care industry ranks third behind energy and media entertainment in terms of total deal volume, with a compelling investment thesis driven by an aging population, continuous discovery of innovative drugs and devices, and a still fragmented and largely inefficient care delivery system.[76] This sustained growth is indicative of a stable sector with repeat investors and a healthy pipeline of companies backed by larger, later-stage funding rounds.[77]

While 2017 saw a significant volume of horizontal mergers rejected by regulators, 2018 has been the year of vertical integration. This trend has been bolstered by the approval of AT&T's merger with Time Warner—the largest vertical integration to date. Health care incumbents are increasingly seeing the value of owning a greater share of the care continuum as a means for growth and improved outcomes.

Non-traditional entrants are also creating a sense of urgency in the space. The health care industry comprises 20 percent of U.S. GDP, has a profit pool of over $400 billion, and is the second-to-last industry in terms of speed of technology adoption—making it ripe for consolidation, innovation, and disruption. It is therefore unsurprising that tech giants such as Apple, Facebook, Amazon, Google, and Microsoft have made major health care investments. It remains to be seen whether these players will have a real impact, as some have previously tried and failed. Investors will be keeping a close eye on these companies, as well as scrutinizing the progress of the Amazon-Berkshire-JPMorgan joint venture towards "reinventing" health care in the coming years.

## MERGER AND ACQUISITION (M&A) ACTIVITY

*2017*

**November** Skokie-based Exicure, a gene therapy company founded in 2011 by Northwestern University researchers, raised $11.2 million, largely from Chinese drug maker Luye Pharma Group (linked here).

*2018*

**January** Chicago's Maestro Health, provider of technology and services to help organizations choose and administer health benefits, was sold for $155 million to Paris-based AXA (linked here).

**March** Gateway Foundation, Illinois' largest addiction services provider and one of the top non-profits in the sector nationwide, announced plans to begin acquiring smaller drug- and alcohol-rehab facilities in California (linked here).

Loyola Medicine paid $270 million for MacNeal Hospital, an osteopathic teaching hospital in Berwyn, broadening the near-west suburban footprint of the Maywood-based Catholic health system. Included in the deal is Tenet-owned Chicago Health System (a 1,000-physician practice) and CHS' accountable care organization (ACO) (linked here).

CVS and Aetna shareholders approved a merger between the pharmacy and payer. The combined company would have annual revenues of approximately $245 billion (linked here).

**April**

Novartis paid $8.7 billion to purchase Bannockburn-based AveXis, a gene-therapy company that went public in 2016. The acquisition was the largest in history for a Chicago-area biotech firm, raising hopes that gene-therapy expertise at University of Chicago and Northwestern University will provide fertile ground for future start-ups in the region (linked here).

Rush and Little Company of Mary Hospital & Health Care Centers mutually agreed to call off merger negotiations begun in 2017. One of Chicagoland's largest health systems, Rush had hoped to expand its presence into the south-suburban market with the acquisition. Although no reason was specified, analysts suggest that complicated mergers that add more market power without bringing down average costs hold little benefit for the acquiring organization (linked here).

German drug and medical equipment maker Fresenius SE called off its $4.3 billion purchase of Lake Forest-based Akorn Inc., alleging the generic cancer drug manufacturer had lied to the FDA about product-development practices. As part of the deal, Fresenius had agreed to pay Akorn $34 per share, the market price of which had fallen to around $14 at the time of Fresenius's announcement (linked here).

Advocate Health Care, the largest health system in Illinois, finalized its merger with Milwaukee-based Aurora Health Care. With 27 hospitals, more than 500 sites of care, 3,300 physicians and 70,000 associates and caregivers, and combined annual revenues of approximately $11 billion, Advocate Aurora is` the nation's tenth largest not-for-profit hospital system (linked here).

**May**

Harrison Street Real Estate Capital bought eight medical office buildings, totaling 439,000-square-feet, from DuPage Medical Group. The $240 million transaction was the largest medical office deal in the Chicago area in years (linked here).

**June**

Chicago-area biopharma companies Aptinyx and Xeris completed IPOs, raising $102 million and $86 million, respectively (linked here).

Illinois regulators granted approval for the merger of Northwestern Memorial HealthCare and Crystal Lake-based Centegra Health System, increasing the number of hospitals in Northwestern's system from seven to 10 (linked here).

**August**

Cigna shareholders approved a merger with pharmacy benefit manager Express Scripts in a $52 billion deal (linked here).

## PROVIDERS

Provider consolidation continues to be the leader in deal activity across the industry. Given the strong network of hospitals in Chicago, as well as heightened FTC regulation in recent years, we anticipated provider consolidation to slow in 2018. However, we have seen sizable mergers between Midwestern providers, particularly across state lines. St. Louis-based Ascension completed its acquisition of Chicago's Presence Health, which now operates as a joint venture with Adventist Midwest called Amita Health. Headquartered in Arlington Heights, Amita Health is Illinois' largest hospital network by number of hospitals.[78] Advocate Health Care, the largest health system in Illinois, finalized its merger with Milwaukee-based Aurora Health Care. With 27 hospitals, more than 500 sites of care, 3,300 physicians and 70,000 associates and caregivers, and combined annual revenues of approximately $11 billion, Advocate Aurora is the nation's tenth largest not-for-profit hospital system.[79]

California-based Dignity Health announced plans to merge with Colorado's Catholic Health Initiatives. As part of the merger, the new, yet-to-be-named organization's headquarters will be a co-location of administrations based in Chicago, where neither had a presence before. This merger will form the nation's second largest not-for-profit Catholic health system, with more than 700 care

sites and 139 hospitals in 28 states. The new organization seeks to become a national platform for innovation and research, with a focus on advancing precision medicine through entrepreneurial partnerships.[80]

## PAYERS

Retail pharmacy giant CVS and Aetna, the nation's third largest health insurer, were the first incumbents to kick-off vertical integrations in 2018 with their proposed merger. This purchase could challenge the status quo by advancing the concept of the patient-centered medical home (PCMH). The goal of the PCMH is to deliver coordinated, comprehensive, and preventive services at the primary-care level, using both technology and the improved geographic accessibility that comes with CVS's brick-and-mortar locations. "By acquiring Aetna, we will now play a role in the patient's whole journey," said Thomas Moriarty, ' chief policy and external affairs officer for CVS.[81] This is a significant pivot from Aetna's attempt to horizontally merge with Humana, which was rejected last year by the Department of Justice (DOJ) due to anti-trust issues. The CVS-Aetna merger is expected to be approved by the end of 2018.

In a similar vein, Cigna shareholders approved the merger with pharmacy benefit manager (PBM) Express Scripts. The approval came despite concerns that the insurer was overpaying for Express Scripts, and over the opposition of activist investor Carl Icahn.[82] Although the Trump administration has expressed a desire to limit the role of PBMs, the deal received swift DOJ approval.

Talks of a Walmart-Humana merger continue to percolate in 2018. This relationship dates back 13 years, when Humana placed sales agents for Medicare Part D drug plans in Walmart stores. Walmart's reported interest in acquiring Humana could mean significant innovations in wellness and disease management given the chain's foot traffic, sales tracking, and, for example, ability to categorize and shelve its food and retail offerings to appeal to customers with certain chronic conditions. Additionally, Humana has partnered with Walgreens to develop in-store "senior-focused primary care clinics." According to Humana's CEO, the insurer's partnership with Walgreen's won't prevent future deals with Walmart, as he perceives the retail giants as "different" stores with different customers.[83] Market watchers will be closely following the ability of vertical integration to redefine, and perhaps blur the lines of, the health care landscape in the future.

## MEDICAL DEVICE

The level of medtech M&A activity in 2017 was more than double that of the previous year, both in terms of value and deal count. Much of this increase was due to an increased presence of corporate buyers.[84] Corporate buyers such as Abbott are creating a more competitive environment for investors given their willingness to pay a premium for assets to integrate into their existing portfolios. For medical suppliers, their customers continue to grow through consolidation and are simplifying their vendor list, preferring suppliers with a broad portfolio of products as a one-stop-shop. In response, medical supply vendors like Abbott are expanding their portfolio through acquisition to preserve their position as a preferred vendor. Last year Abbott made two significant acquisitions in St. Jude Medical and Alere, for a combined $30 billion, thus dramatically expanding its cardiovascular and diagnostic portfolios, respectively.[85]

The medtech industry is faced with the same challenges as other suppliers, including greater focus on value over volume, stricter reimbursement regimes in both public and private settings, heightened competition, and an uncertain regulatory environment. A study by AdvaMed and Deloitte noted a decades-long decline in medtech venture funding, the proportion of which dropped from 13 percent of all venture deals in the mid-1990s to 4 percent in 2016. Crucial series A medtech funding has been particularly hard hit, declining as a percentage of total venture investment in the sector from 19 percent in 2006 to 10 percent in 2016.[86] As a result, innovation at the start-up stage is becoming more difficult to finance, and established companies face a slimmer pipeline of new products available for acquisition.[87]

Interviews conducted by HC3 identified Chicago as fertile ground for medtech innovation thanks to a solid base of angel investors, many of whom are current or former health care executives, clinicians, and surgeons looking to better people's lives beyond the scope of their own companies and practices. With regard to venture capital available to Chicago innovators, one interviewee noted that "the Midwest is more connected to health

care, so the money is more patient here." Of note, Endotronix has raised over $100 million as of its last round in September 2018,[88] single-handedly skewing the total medtech dollars raised in the region.

## LIFE SCIENCES

2018 has been an exciting year for biotech investment activity in Chicago. We saw three key IPOs with Aptinyx, Iterum Therapeutics, and Xeris Pharmaceuticals. Additionally, Northwestern's biotech spinout, Exicure, which is developing gene-regulating therapies for inflammation, cancer and other diseases, has raised a total of $94 million since it was founded in 2009.[89] These transactions begin to illuminate Chicago's transformation from home to a few one-off successes into a hub for a critical mass of biotech innovation.

Similar to medtech, funding for early-stage therapeutic discovery has experienced a decades-long decline, namely in the form of fewer and smaller NIH awards. In response, universities have established their own venture funds, as well as unique partnerships like Northwestern University's launch of Lakeside Discovery, LLC, a $65 million venture backed by New York-based investment fund Deerfield Management. Lakeside Discovery's stated mission is to accelerate the translation of promising biomedical research at Northwestern that is disease and stage agnostic. This unique collaboration will strengthen the university's position as one of the leading academic medical research centers in the world. It will also offer more opportunities for researchers to apply for financial support, as well as increase access to technical and commercial expertise, including development plans and identification of experiments needed to reach Investigational New Drug (IND) readiness. With more projects able to be evaluated under an expedited timeline to IND readiness,[90] successful researchers will gain access to additional Deerfield capital—a compelling incentive to carry out research at Northwestern.

## NONTRADITIONAL ENTRANTS

An important question going forward hinges on the potential for newly-announced collaborative entities to use digital technology to disrupt the overall health care paradigm. Although the contours remain murky at the time of writing, the joint venture between Amazon, Berkshire Hathaway, and JPMorgan Chase is expected to address the use of data to improve outcomes throughout the cycle of care, and possibly create innovative models that harmonize the conflicting incentives between payers and providers. It may be non-traditional entrants that finally create a sense of urgency for incumbents to adopt new solutions faster. Through the increase in vertical integrations, as well as an uptick in corporate venture participation, incumbents are recognizing that the success of their organizations is increasingly dependent on working with innovative, early-stage companies.[91]

## PRIVATE EQUITY

Chicago is home to seven of the 12 best-known private equity firms with exclusive health care holdings, including Beecken Petty O'Keefe & Company, Chicago Pacific Founders, Cressey & Co., Linden, Shore Capital, RoundTable, and Water Street Capital. Collectively these funds have over $7 billion in active assets under management. 2018 is turning out to be a premier year for fundraising as well, with Cressey and Linden raising over $1 billion each.

In general, Chicago PE funds have been active investors in lower care settings, alternative care models, PPMs, behavioral health and substance services, retail health, pharma, and health care IT. DuPage Medical group, the largest independent physicians' group, recorded Illinois' second-largest deal–a $1.45 billion cash infusion from Los Angeles-based private equity firm Ares Management.[92] VillageMD and Evive Health also received sizable investments from outside PE funds.

## VENTURE CAPITAL

Liquidity seems almost limitless in venture capital, with an increasing number of startups raising $100 million or more—known as the "mega-round."[93] Few investors foresee a slowdown, as the number of startups valued at $1 billion has increased from 80 to 258 since 2015. In the first half of 2018, eight health care companies raised a "mega-round,"including Chicago-based Tempus. Investors are deploying capital at its fastest pace since 2006. According to Rock Health, "It's not just the big deals getting bigger; across almost every stage,

the average deal size has increased since last year."[94] Additionally, corporate venture capital is participating in 20 percent of all venture capital deals–a 66% increase from the year prior.

Chicago has seen an unprecedented amount of venture funding, which is consistent with national trends. Of the 126 deals we tracked since last year's report, 119 are companies that have received seed to follow on funding for a total of $613 million. Although average deal size for this cohort is under the national average, this represents an x percent increase in deal volume. Although average deal size for this cohort is under the national average, this represents a two-fold increase in deal volume from last year's cohort Additionally, investors from outside of Chicago are taking increasing advantage of the strong ROI on invested capital on companies based here.

## SECTION III: HEALTH CARE INNOVATION AND INCUBATION

Innovation hubs, accelerators, and incubators continue to thrive both locally and nationally. The number of accelerator programs in the U.S. rose 34% in the past two years, from 170[95] to 227[96], not including university-specific programs, which account for an additional 243 active programs. Mayors across the nation are taking note and increasing funding to support innovation and medical districts – the small geographic areas within cities where research, universities, medical institutions, and companies cluster and connect with startups, accelerators, and incubators.[97] Chicago is no exception, with the Illinois Science and Technology Park; Illinois Medical District; and the recently announced Illinois Innovation Network, a public-private partnership with the University of Illinois System. In fact, as of the publication of this report, the Innovation Cities Index ranked Chicago 11th out of 500 benchmarked cities. The index is a measurement of startup activity and health of the economy.[98]

### CORPORATE INNOVATION

A seismic shift to digital is occurring in the health care industry, including significant behavioral change at the C-suite of health care organizations. Most health care companies have hired either a chief strategy or innovation officer, commonly from outside the industry. Health care organizations are categorizing digital as a new asset class that is bringing efficiencies to labor, expanding services, and improving patient access. Incumbents that have neglected digital innovation are noticing their competition forming patient-friendly brands, which is impacting their market share.

Corporate innovators are like tech scouts, primarily responsible for finding novel technology that aligns with the strategic imperatives of the organization, as well as insights into the plays of innovation. There are over 4,500 health care aligned startups across the nation, most of which are in digital health.[99] Critical to the success of a corporate innovator is forming alliances with incubators, accelerators, universities, and investors alike to keep up with the pace of activity and the latest research. Many leading institutions based in Chicago and across the country look to incubators like MATTER for deal flow, market insights, and opportunities to collaborate.

### COLLABORATIONS

One of the more noble and ambitious collaborations announced this year is being spearheaded by Chicago-based AVIA in partnership with Andy Slavitt, former CMS Acting Administrator. The Medicaid Transformation Project consists of 19 health systems with 310 hospitals across the nation that currently serve 43 million Medicaid patients. The initial two-year commitment will identify, develop, and scale financially sustainable solutions around four key challenge areas: behavioral health, substance use disorder, women and infant care, and avoidable emergency department visits. One of the primary goals will be sharing of best practices across the collective to accelerate the work and adoption of digital solutions and alternative care models. "It's also a call for innovators, for digital companies, for tech companies, for venture capitalists and private equity companies, to say, if we create real solutions, we now know there are at least 19 major health systems that are very interested in evaluating them and rolling them out," said Andy Slavitt.[100] If the project meets its objectives of reducing the gap for the underserved and improving the health of the most vulnerable this could have a material impact on Medicaid's cost curve, creating positive externalities throughout the health care ecosystem.

### INNOVATION HUBS

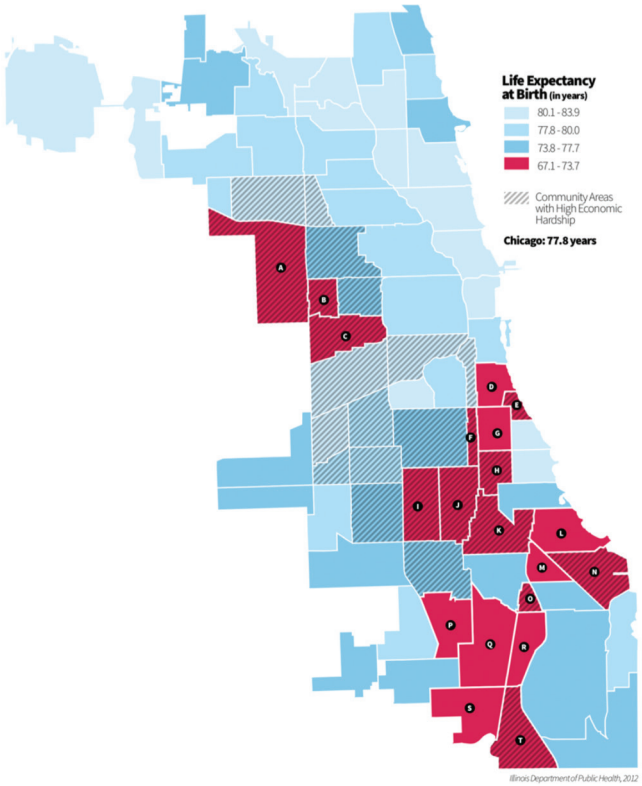
In November 2017, Governor Rauner introduced plans to add another innovation hub in Chicago called the Discovery Partners Institute (DPI) in partnership with the University of Illinois System. With discovery and innovation as the focal points, the DPI will bring universities, businesses, and public sector partners together to develop solutions in computing and big data, advanced materials, food and agriculture, and biosciences and health. It is estimated the project could stimulate $4 billion in annual venture capital investment, which is four times higher than the current rate in Illinois.[101] Although the state has identified $500 million in new annual research and development spending for the project in the 2019 budget, many details remain to be determined, including whether the University has submitted a grant proposal, received commitments from private companies or donors, or reached an agreement with Related Midwest, the Chicago developer that has offered to donate 20 acres for the site in the South Loop.[102]

### INCUBATORS AND ACCELERATORS

MATTER, the health tech incubator located in the Merchandise Mart, continues to thrive. As of this report, MATTER supports over 220 startup ventures across digital health, medical device, therapeutics, and diagnostics, with 25% of these companies based outside of Chicago. Since its inception in 2015, MATTER members have raised over $600 million in funding.

## SECTION IV: HEALTH EQUITY AND PUBLIC HEALTH

Like many urban markets, Chicago continues to be a tale of two cities. An assortment of neighborhoods, particularly on the South and West Sides, remains vulnerable to adverse socio-economic conditions, crime, disparities in education and childhood development, and other factors. Taken together, these social determinants have had and continue to reflect a negative impact on the community's health and well-being. The most notable manifestation of these social determinants of health (SDOH) is the life expectancy variation between communities. If you were to begin a commute from the center of the Loop downtown to various spots on the




South and West Sides, the life expectancy would drop by 16 years. This three-mile variation is equal to the life-expectancy gap between the United States and Iraq.

As the previous pages have laid out, Chicago is a resource-rich environment with significant health care resources, a vibrant economy, and a talented and compassionate workforce—as well as significant public health challenges in need of resolution.

### BACKGROUND

Recently, the Agency for Healthcare Research and Quality ranked the state of Illinois 45th in overall health care quality compared to other states.[103] Because of Chicago's significant population proportionality, these findings reflect poorly on the city. Many of the measures that weighted down the overall composite score focused on chronic disease management, post-facility discharge support and continuity, and non-acute health care settings.

Further, Illinois ranks 18th in maternal mortality, with 16.6 deaths per 100,000 live births—with black women and babies faring far worse than white women and

babies. In Illinois, black women have 3.5 times higher mortality rates than white women, and black infants have nearly three times higher mortality rates than white infants. These racially-correlated health disparities do not stop at perinatal issues, but permeate the whole of health care throughout the city and are reflected along racial and social lines in underserved communities.

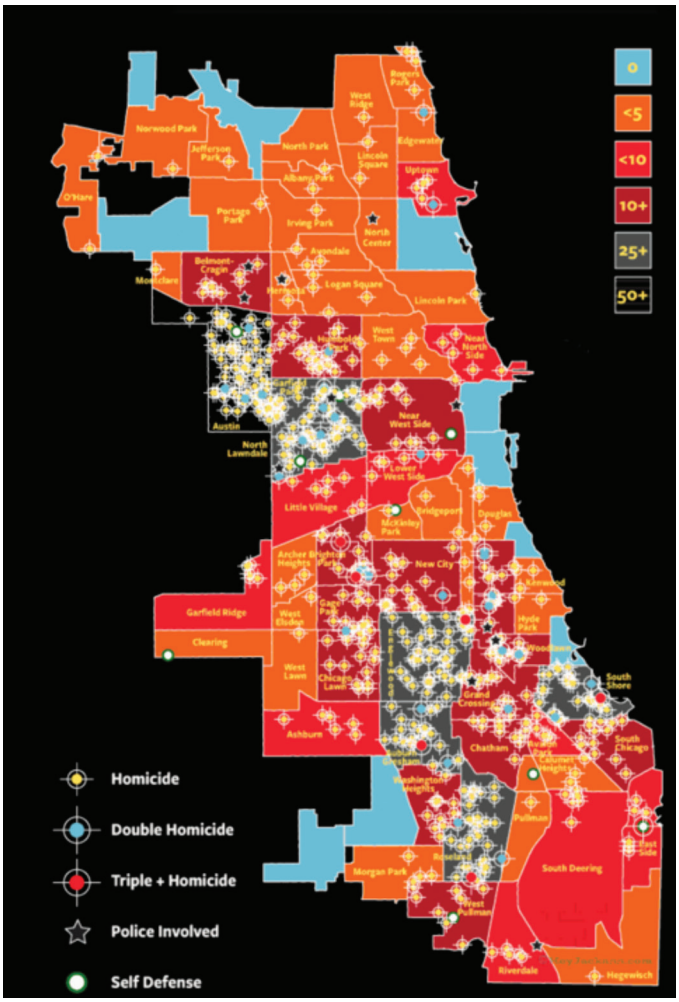
Disparities in socioeconomic conditions are particularly pronounced in Chicago and directly correlate with the variation in life expectancy. Median household income in the Near North Side, the Loop, and Lincoln Park are $77,218, $82,118, and $85,834, respectively. For Chicago's neighborhoods with the lowest life expectancy: Fuller Park (68.4 years), Washington Park (68.3 years), and West Garfield Park (68.2 years), these income numbers drop to $16,107, $23,090, and $23,933, respectively. The racial disparity found between these neighborhoods is notable. African Americans are 2.6 times more likely to be unemployed than whites.[104]

Chicago's incidences of crime and gun violence continue to have a strong bearing on the underdevelopment of our neighborhoods. In 2017,[105] a person was shot every two-and-a-half hours, and murdered every 13 hours. There were a total of 3,561 documented shootings, with 625 killed by gun violence (17 percent of total gun-shot victims were killed, with 83 percent wounded). The deadliest neighborhoods were Austin (83 homicides, 384 wounded), Garfield Park (36 homicides, 224 wounded), North Lawndale (41 homicides, 212 wounded), Englewood (49 homicides, 201 wounded), and Humboldt Park (26 homicides, 150 wounded).

As of September 30, 2018, there have been 437 homicides in Chicago with 2,322 documented shootings. In 2018, a person is murdered every 15 hours.

*Other social determinants abound:*

- Only 37 percent of Chicagoans use active transportation to get to work, a referendum on the city's infrastructure.
- Approximately 18 percent of Chicago adults do not have a high school diploma.[106] This number jumps to 41 percent for Hispanics.[107]
- Almost 40 percent of households in Chicago spend more than one-third of their monthly income on housing expenditures. About 54 percent of Chicago homes were built before 1950, showing an aged housing infrastructure that can lead to negative public health outcomes—including the 3.5 percent of Chicago children under the age of three with elevated lead levels in their blood.
- Food deserts are abundant in neighborhoods with asymmetric socioeconomic conditions.




Chicago's health system has not met many of these challenges. There remains a 7.6 percent uninsured rate in the city. While this number is markedly improved from the pre-ACA uninsured rate of 15 percent, it has recently begun to climb again.

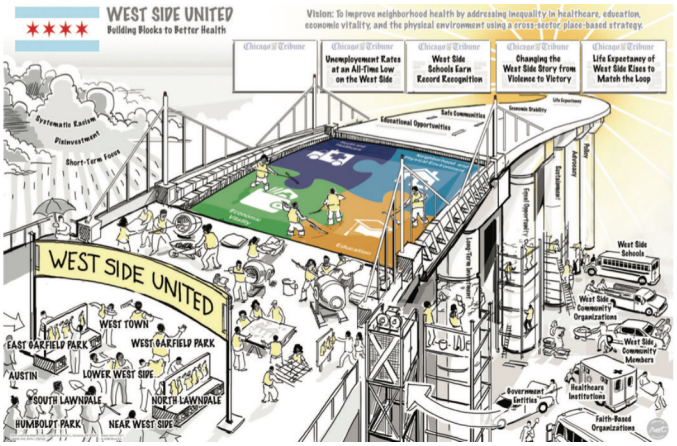
Virtually every public health indicator tells the same story. Chicago is categorically a tale of two cities: one that is resource rich, affluent, and healthy; the other, steeped in despair.

## KEY INITIATIVES

There are several important initiatives underway throughout the city in search of solutions to address some of these complex challenges. The sense of community and collaboration underlying each of these initiatives is of profound importance as men and women throughout Chicago increasingly recognize the disparities in our communities and are allocating an increasing number of resources to address them.

*West Side United*

In January 2017, nearly 120 individuals and 50 organizations convened to chart a path forward for Chicago's West Side, a part of the city particularly afflicted by the social and health disparities previously referenced. West Side United's (WSU) mission is to "build community health and economic wellness on Chicago's West Side and build healthy, vibrant neighborhoods." Its vision is to "improve neighborhood health by addressing inequality in healthcare, education, economic vitality, and the physical environment using a cross-sector, place-based strategy. Partners include healthcare providers, education providers, the faith community, business, government and others working together to coordinate investments and share outcomes."


*Healthy Chicago 2.0*

The city of Chicago has a critical role to play in addressing health and social disparities. Healthy Chicago is an initiative focused on taking actions in 10 key areas:

1. Expanding partnerships and community engagement
2. Improving social, economic, and community conditions
3. Improving education
4. Increasing access to health care and human services
5. Promoting behavioral health
6. Strengthening child and adolescent health
7. Preventing and controlling chronic disease
8. Preventing infectious diseases
9. Reducing violence
10. Utilizing and maximizing data and research

This initiative has identified 65 measures across these categories with target objectives for movement by 2020. While public-facing information regarding progress with these indicators has been limited, the city has allocated resources to underserved communities and continues to evangelize the underlying framework of social and community needs as critical determinants to the city's health.

## COLLABORATING SAFETY NET

Chicago boasts some of the most impressive and innovative safety-net organizations anywhere in the country. From the Sinai Health System to the Cook County Health and Hospitals System, key hospital institutions play a critical role as foundational safety nets in underserved communities. These institutions are

buttressed by a community of Federally-Qualified Health Centers (FQHCs), which comprise the backbone of the city's primary care resources for Medicaid beneficiaries and the uninsured. Further still are no-cost community health clinics, such as Community Health, that raise money and other in-kind contributions and provide health care to the underserved and uninsured. Taken together, these institutions represent an important infrastructure for Chicago communities.

However, these organizations lack the financial resources to proactively invest in the underlying social and health determinants that drive many of the disparities in Chicago. There are shifting dynamics, however, that could change the way in which these organizations engage.

The first is aligned payment incentives for health care and social supports. Gradually, Medicaid MCOs (and the state) are working to better align payment for services to focus on risk assessments, care plan development, patient activation and engagement, and other related functions. The objective is to re-allocate systemic resources to better engage patients in the community, focusing on primary care and other related needs, before the onset of an acute event.

The second is through unique collaborations and partnerships within the safety-net community. An important group of leaders with an elevated collaborative IQ are identifying areas of common interest and forging partnerships focused on information sharing, improved discharge planning and care transitions, and community programs.

The confluence of shifting payment dynamics and collaboration represent an opportunity to promote greater efficiency and alignment within Chicago's safety net. The benefits of such an outcome could bolster the role our community institutions play in addressing some of Chicago's longest-held disparity-based challenges.

# ABOUT HC3

**The Health Care Council of Chicago (HC3) is an action- oriented collaborative that brings leaders from across the health care ecosystem together to help support business growth and solve our city's most important health-related issues.**

We exist in response to our members' desire to impact health related issues and are a vehicle for our city's health care leaders to create true change and impact the conditions that determine health in our city

Founded by Leavitt Partners and MATTER, HC3 is growing into an independent, dynamic and member-led organization that's being shaped by the leaders of some of Chicago's most impressive and well-known healthcare organizations.

**THANK YOU TO OUR MEMBERS AND THEIR CONTINUED SUPPORT OF HC3'S MISSION AND VISION.**

HEALTH CARE COUNCIL
*of Chicago*

# REFERENCES


1 World Business Chicago
2 Moody's Investors Services, August 2018
3 Illinois Health and Hospital Association Economic Impact Report, 2018
4 Crain's Chicago Business, September 2017
5 Chicago Tribune, October 2017
6 American Hospital Association: Hospital Merger Benefits: Views from Hospital Leaders and Econometric Analysis, January 2017
7 Medical Home Network
8 Health Leaders Media, October 2017
9 FierceHealthcare, July 2018
10 Illinois Health and Hospital Association, State Advocacy Update, June 2018
11 Health News Illinois, July 2018
12 RevCycle Intelligence, October 2017
13 Becker's Hospital CFO Report, January 2018
14 Business Wire, August 2018
15 National Business Group on Health Press Release, August 2018
16 Managed Care Magazine Online, October 2017
17 Illinois Policy, June 2017
18 Health Leaders Media, October 2017
19 Crain's Chicago Business, August 2016
20 Chicago Sun-Times, November 2017
21 White House Council of Economic Advisers, March 2018
22 Forbes, February 2018
23 Forbes, February 2018
24 healthinsurance.org, June 2018
25 Illinois Office of Consumer Health Insurance 2017 Annual Report
26 Crain's Chicago Business, September 2017
27 healthinsurance.org, June 2018
28 Washington Post, July 2018
29 Chicago Tribune, April 2018
30 Chicago Tribune, August 2018
31 Crain's Chicago Business, March 2018
32 healthinsurance.org, August 2018
33 Henry J. Kaiser Family Foundation, June 2018
34 Henry J. Kaiser Family Foundation, Medicaid in Illinois, September 2018
35 Crain's Chicago Business, January 2018
36 Springfield State Journal-Register, July 2018
37 Illinois Channel, April 2018
38 Commission on Government Forecasting and Accountability, FY 2019 Budget Summary
39 The Civic Federation, State of Illinois FY 2019 Recommended Operating and Capital Budgets: Analysis and Recommendations, May 2018
40 Modern Healthcare, May 2018
41 Salesforce Blog, February 2018
42 Interview with Eric Langshur, July 2018
43 Health Data Management, October 2017
44 Healthcare IT News, May 2018
45 Insurance Times, March 2018
46 Chicago Tribune, July 2018
47 Chicago Sun-Times, June 2017
48 Wall Street Journal, October 2017
49 MedCity News, June 2018
50 AdvaMed, accessed August 2018
51 U.S. Food & Drug Administration, Devices Approved in 2017
52 C&M Health Law, May 2018

53 National Institutes of Health, Awards by Location & Organization, accessed September 2018
54 CBRE, February 2018
55 JLL, Life Sciences Outlook, United States, 2017
56 Illinois Science & Technology Coalition, 2017 R&D Index
57 Chicago Tribune, January 2016
58 Federation of American Societies for Experimental Biology, NIH Research Funding Trends, April 2018
59 Science, March 2018
60 Crain's Chicago Business, July 2018
61 Chicago Tribune, January 2016
62 Microeconomics of Competitiveness: Chicago Biotech, A Cluster Analysis, Spring 2016
63 Website of the City of New York, accessed September 2018
64 Mercer HPA: Demand for Healthcare Workers Will Outpace Supply by 2025: An Analysis of the US Healthcare Labor Market
65 Illinois Science & Technology Coalition, 2016 Talent Index
66 Data provided to HC3 by the American Medical Association, September 2018
67 Association of American Medical Colleges, 2017 State Physician Workforce Data Report
68 American Association of Colleges of Nursing, Nursing Shortage Fact Sheet, May 2017
69 CNN Money, April 2018
70 Illinois Department of Financial and Professional Regulation, Active Nurse Licensees, June 2018
71 Issues in Science and Technology, Pathways to Middle-Skill Allied Health Care Occupations, Fall 2016
72 JP Morgan Chase, Growing Skills for a Growing Chicago, June 2015
73 Mercer HPA: Demand for Healthcare Workers Will Outpace Supply by 2025: An Analysis of the US Healthcare Labor Market
74 New York Times, August 2018
75 Forbes, August 2018
76 Bain & Company, Global Healthcare Private Equity and Corporate M&A Report 2018
77 Rock Health, 2018 Midyear Funding Review
78 Crain's Chicago Business, March 2018
79 Joint Press Release, Advocate Health Care and Aurora Health Care, December 2017
80 Crain's Chicago Business, December 2017
81 Health Care Dive, March 2018
82 Reuters, August 2018
83 Forbes, August 2018
84 Bain & Company, Global Healthcare Private Equity and Corporate M&A Report 2018
85 Crain's Chicago Business, June 2018
86 Deloitte and AdvaMed: Out of the valley of death: How can entrepreneurs, corporations, and investors reinvigorate early-stage medtech innovation? 2017
87 McKinsey & Company, Capturing the new 'value' segment in medical devices, January 2015
88 Crunchbase
89 Crunchbase
90 Cision PR Newswire, May 2018
91 Forbes, August 2018
92 Crain's Chicago Business, August 2017
93 New York Times, August 2018
94 Rock Health, 2018 Midyear Funding Review
95 Entrepreneur, February 2016
96 Accelerator Info Search
97 Brookings, Advancing a new wave of urban competitiveness: The role of mayors in the rise of innovation districts, June 2017
98 Innovation Cities™ Index 2018
99 Crunchbase, Health Care Startups
100 Healthcare Informatics, August 2018
101 Illinois Manufacturers' Association, November 2017
102 News Gazette, August 2018
103 U.S. Department of Health and Human Services, 2017 National Healthcare Quality and Disparities Report
104 Healthy Chicago 2.0
105 https://heyjackass.com/category/2017-stats/
106 The Community Guide. Center-based early childhood education, August 2015
107 U.S. Census Bureau. American community survey: 2013 five-year estimates