

# Municipal Brief

## Not for Profit Hospitals: Risk Assessment Framework

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We present a metrics based credit risk assessment of the top 86 US Not for Profit hospitals based upon the amount debt outstanding, on a 1-5 scale (1 = lowest risk), based on their market position, financial performance and indebtedness. The general framework methodology is shown in Appendix 1 at the end of the report.

### Not For Profit Hospitals - Overview

The US healthcare sector is a major component of the US economy and comprises a variety of participants. In addition to physicians and nurses, the industry includes hospitals, home health care services, insurers, pharmaceutical companies and equipment manufacturers, among others. Hospitals are a critical component of the healthcare system, primarily providing acute care services, traditionally utilizing a fee for service operating model. Not-for-profit hospitals (the focus of this report), comprise approximately 67% of all hospitals in the country, per the latest data from the American Hospital Association.

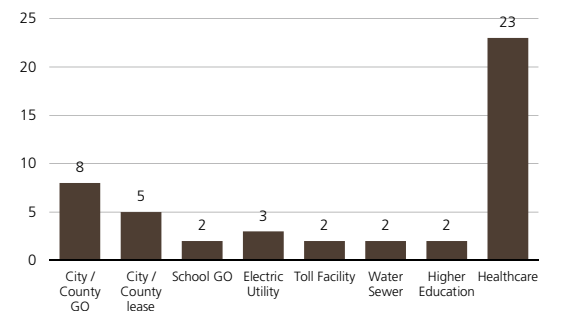
From an investor perspective, the healthcare sector is an important constituent of the overall US municipal bond market, comprising approximately 13% of the Bloomberg Barclays revenue bond index. The probability of default is higher than many other sectors of the municipal bond market. Fig.1 shows the number of defaults among Moody's rated issuers in key municipal sectors from 1970-2017. Not surprisingly, many private clients have approached the sector with a degree of caution.

The sector is undergoing substantial transformation and consolidation that is altering the healthcare delivery model with significant implications for credit quality. We discuss these changes in detail later in the report. We also have adjusted our 1-5 risk scoring scale for the health care sector to reflect the uncertainties posed by changes to the industry's operating model in the wake of enactment of the Affordable Care Act (discussed later in the report).

### Summary of Results

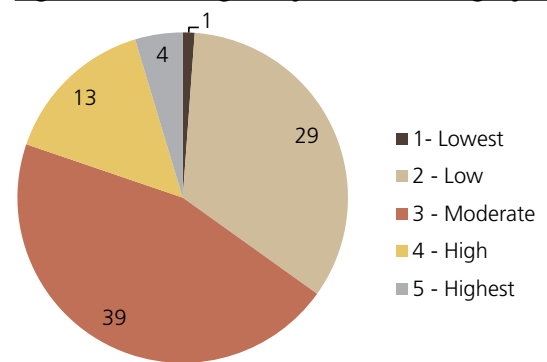
The broad results of our framework for the 86 obligors, in terms of the distribution of CIO Risk Categories is shown in Fig. 2. Compared to other municipal sectors we have published so far, a significantly higher proportion of obligors are placed in Categories 4 and 5. Meanwhile, only one obligor in Category 1 highlighting the higher risk profile of this sector.

**Fig. 1: Number of Defaults by Sector (1970-2017)**



Source: Moody's US Municipal Bond Defaults and Recoveries, 31 July 2018, UBS

**Fig. 2: No. of obligors by CIO Risk Category**



Source: UBS

The next section provides the CIO Risk Category for each of the 86 obligors.

*We would like to acknowledge Arsh Tandon, Graduate Talent Program Analyst for his contribution in the preparation of this report.*

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## Key Results of the Framework

The key results of our framework covering the top 86 not for profit hospitals with the most debt outstanding, are presented in Fig. 3. The definitions of the CIO Risk Categories are shown in Fig. 4.

**Fig. 3: List of not for profit hospitals by CIO Risk Category (in alphabetical order within each category)**

Category 1		Category 3		Category 4	
Northwestern Memorial HealthCare & Subs	IL	AHS Hospital Corporation & Subs	NJ	Adventist Health System-West	CA
<b>Category 2</b>		Allina Health System	MN	Bon Secours Health System Inc & Subs	MD
Adventist Health System	FL	Atrium Health	NC	Catholic Health Initiatives	CO
Advocate Health Care Network & Subs	IL	Aurora Health Care Inc & Affiliates	WI	Christus Health	TX
Ascension	MO	Banner Health & Subs	AZ	Dignity Health & Subordinate Corporations	CA
Baptist Health South Florida Inc & Affiliates	FL	Baptist Healthcare System Inc & Affiliates	KY	Memorial Hermann Health System	TX
Baptist Health System Inc & Subs	FL	Baylor Scott & White Holdings & Controlled Affiliates	TX	Northwell Health Inc	NY
BayCare Health System Inc & Affiliates	FL	Beaumont Health & Consolidated Subs	MI	Ochsner Health System & Subs	LA
BJC HealthCare	MO	Fairview Health Services	MN	OSF Healthcare System & Subs	IL
Boston Children's Hospital & Subs	MA	Franciscan Alliance Inc & Affiliates	IN	Tower Health & Subs	PA
Children's Hospital Colorado Health System	CO	Hartford HealthCare Corporation & Subs	CT	University of Maryland Medical System Corp. & Subs	MD
Cleveland Clinic Health System	OH	HealthPartners Inc	MN	WellStar Health System Inc & Affiliates	GA
Duke University Health System Inc & Affiliates	NC	Henry Ford Health System	MI	West Virginia Univ. Health System & Controlled Entities	WV
Geisinger	PA	Hospital Sisters Health System & Subs	IL	<b>Category 5</b>	
Houston Methodist	TX	Johns Hopkins Health System Corp. & Affiliates	MD	Baptist Memorial Health Care Corporation & Affiliates	TN
Indiana University Health Inc & Subs	IN	Louisiana Children's Medical Center	LA	MetroHealth System	OH
Inova Health System	VA	MedStar Health Inc	MD	Palomar Health	CA
Intermountain Health Care & Affiliated Companies	UT	Mercy Health	OH	Premier Health Partners & Affiliates	OH
Mayo Clinic	MN	Northeast Georgia Health System Inc & Affiliates	GA		
Memorial Sloan Kettering Cancer Center & Affiliates	NY	Norton Healthcare Inc & Affiliates	KY		
MultiCare Health System	WA	NYU Langone Hospitals	NY		
New York & Presbyterian Hospital	NY	Orlando Health Inc & Controlled Affiliates	FL		
Novant Health Inc & Affiliates	NC	Partners Healthcare System Inc & Affiliates	MA		
OhioHealth Corporation	OH	PeaceHealth Networks	WA		
Oregon Health & Science University	OR	Piedmont Healthcare Inc & Affiliates	GA		
Scripps Health & Affiliates	CA	Presbyterian Healthcare Services & Affiliates	NM		
Stanford Health Care	CA	Providence St Joseph Health	WA		
Texas Health Resources	TX	Sanford	SD		
University of Colorado Health	CO	SCL Health	CO		
University of Pennsylvania Health System	PA	Sentara Healthcare & Subs	VA		
Yale New Haven Health System & Subs	CT	SSM Health	MO		
		Sutter Health & Affiliates	CA		
		Thomas Jefferson University	PA		
		Trinity Health	MI		
		UnityPoint Health	IA		
		University Hospitals Health System Inc	OH		
		University of California Medical Centers	CA		
		University of Chicago Medical Center	IL		
		University of Pittsburgh Medical Center	PA		

Note 1: Some merged entities such as Catholic Health and Dignity Health are listed separately in our framework as the bonds are trading separately and we do not have a full year's worth of operating and financial data on the combined entity.

Note 2: Kaiser Permanente, a large obligor that is a combination of a health plan and hospitals, has been excluded from the framework due to data availability issues.

Source: UBS

**Fig. 4: CIO Risk Category Definitions**

CIO Risk Category	Relative Risk Level	Definition
1	Lowest	We believe borrowers in this top tier are well-insulated from adverse credit developments in the near term. These bond issuers are characterized by having access to sufficient financial resources to withstand recessionary pressure without degradation in credit quality, in our view.
2	Low	These borrowers are highly regarded and exhibit excellent credit profiles but are not quite as well-positioned as those in our first category. However, the credit risk posed by the obligors in this category remains very low.
3	Moderate	While we view the obligors classified in the prior two categories to pose the lowest credit risks, the borrowers in Category 3 should still exhibit resilience in the face of future financial stress. Credit risk remains relatively low, though not as low as those obligors in Category 1 and 2.
4	High	We believe that obligors placed in this category, while possessing some desirable credit attributes (e.g., a commanding market position or an exclusive right to provide service) also have identifiable credit challenges such as high leverage and/or low coverage that could lead to a weaker credit profile over time and will require closer surveillance.
5	Highest	We view the obligors placed in this category to exhibit material weakness in credit quality due to adverse financial and economic conditions or idiosyncratic risks. The debt of obligors placed in this category may not be appropriate instruments for investors with conservative investment risk profiles.

Source: UBS

## Winds of Change

The healthcare sector currently is in the midst of enormous change that is fundamentally altering the healthcare delivery model with significant implications for the financial health and credit quality of acute care hospitals. The main elements driving change are:

- **Increased competition** – The healthcare sector is experiencing an overall shift to outpatient services leading to stagnant / marginal growth in hospital inpatient admissions. The shift to outpatient services combined with technological advancements is leading to the emergence of non-traditional competition. The CVS-Aetna affiliation, for example, is designed to win a share of hospitals' outpatient dollars by providing similar services at a reduced cost and at many more physical locations. Per Moody's, competitive supply of outpatient services has led to an actual decrease in hospital outpatient visits in 2018, down for the first time in five years. Over the next decade, hospitals will be competing with a powerful combination of insurers and retailers. Moreover, patients are now equipped with more information regarding the cost of their medical services. Younger consumers have higher expectations and are more likely to treat their health care as they would any other consumer item, raising the specter of more competition around pricing and service levels.
- **Shifting payor mix and reimbursement pressures** – Hospitals receive reimbursements from three primary sources, Medicare, Medicaid and commercial insurers. Medicare and Medicaid typically provide lower reimbursement rates than commercial insurers. Hospitals are facing several challenges on this front, as described below:
  - The federal government continues to be under pressure to manage healthcare costs, leading to lower Medicare and Medicaid reimbursement rates;
  - An aging population is shifting the payor mix more towards Medicare. New Medicare reimbursement policies, effective on 1 January, limits the premium for services performed at off-campus outpatient facilities and thus could strain the finances of some hospitals;
  - High deductible plans increasingly offered by commercial insurers are shifting a greater proportion of payment obligations (and therefore financial burden) onto patients, thus exposing hospitals to increased consumer credit risk.
- **Federal healthcare policy uncertainty** – Medicaid expansion, as a result of the Affordable Care Act (ACA), has benefited hospitals by providing reimbursement for care that otherwise would have been uncompensated. (This has partially offset some of the adverse trends set for above). However, the recent US District Court decision invalidating the ACA and the persistent ambiguity over the constitutionality of the Affordable Care Act makes long-term planning far more challenging for hospital administrators.
- **Increasing prevalence of value based reimbursement models** – Hospitals have traditionally utilized a fee for service operating model wherein their revenues were dependent on patient volumes, occupancy and acuity and not on actual patient outcomes. The introduction of 'value-based reimbursement models' initiated by the ACA, that involves incentives and penalties based on outcomes (e.g. reimbursement based on readmission rates), poses more downside risk than upside benefit for hospitals and is likely to put pressure on acute care operating financial metrics.
- **Rising cost pressures** – The rising cost of prescription drugs poses a major challenge for hospitals. According to a recent study by the University of Chicago, prescription drug spending by hospitals across the US increased by 18.5 percent from 2015 to 2017. Moreover, a scarcity of physicians and nurses, focused on primary care and geriatrics pose challenges in a nation that is aging rapidly. Extended care, through telemedicine, and the use nurse practitioners and physician assistants will be more important over time. Recruiting the most talented physicians, specialists and nurses will be more difficult for smaller systems and rural hospitals and will most likely to exacerbate cost pressures.
- **Cybersecurity** – Electronic health records are a boon for patients who are obliged to seek medical care from physicians who may be unfamiliar with their personal history. Hospitals also benefit through data aggregation that should allow for more efficient case load management. However, the digitization of data also creates vulnerabilities that invite criminal behavior associated with identity theft and ransom ware. Information technology is becoming a larger line item in hospital budgets.

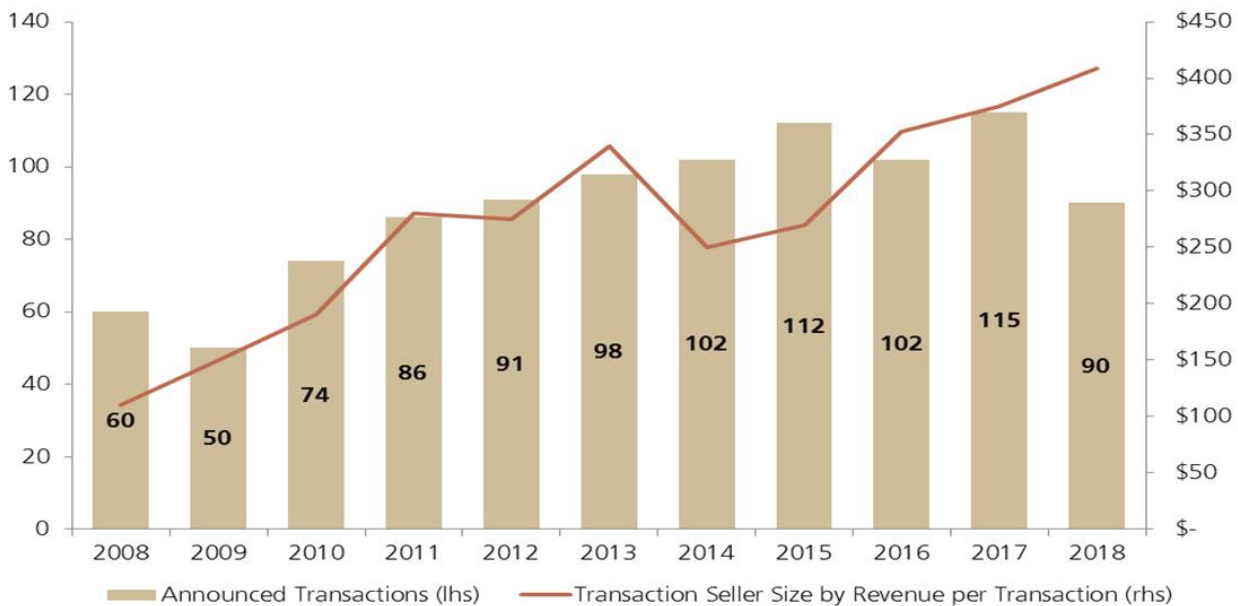
## The Dash for Size

All of the above factors are changing the demand-supply dynamics of the sector, resulting in greater levels of uncertainty and downward pressure on margins. In response, hospital managements are increasingly adopting new strategies that are essentially a dash for greater size and scale (and at times scope) of services. Consequently, the sector has seen significant consolidation through mergers and acquisitions (M&A). Even though historical investments in new buildings and more beds have all too often proven inefficient in an environment that increasingly focuses on ambulatory care, larger hospital systems have inherent advantages over their smaller rivals. Their size provides greater geographical diversity, more leverage in contract negotiations with suppliers and greater flexibility to invest in more sophisticated IT applications to manage patient populations and treatment outcomes.

In recent years, mergers and acquisition activity has significantly intensified – with an increase in both the number and the average size of transactions in the last 10 years. (See Fig.5 below)

**Fig. 5: Trends in Healthcare M&A Activity**

left axis: count of transactions; right axis: average revenue of seller in USD millions



Source: Kaufman Hall, UBS as of 31 December 2018

To name just two, 2017 saw the announcements of the Dignity / Catholic Health Initiatives and the Advocate / Aurora mergers. These mega-deals that create combined entities with revenues of USD 28 billion and USD 11 billion, respectively. 2018 also saw mega-merger announcements, such as the Baylor, Scott & White / Memorial Hermann and Bon Secours / Mercy Health deals. Looking ahead, we believe healthcare M&A activity is expected to remain strong.

While there are ostensible benefits of scale and scope, mergers come with their own set of additional risks, such as managerial and technological integration, ability to execute on the business plan and potential regulatory challenges. Mergers that involve significant increase in scope (e.g. acute care hospital expanding into home health services), face greater execution and integration risks than the ones where increase in scale and/or geographic diversity is the main driver. Fig. 6 and Fig. 7 below outline M&A rationale for some key recent transactions and provide subjective assessment of the scale vs. scope rationale.

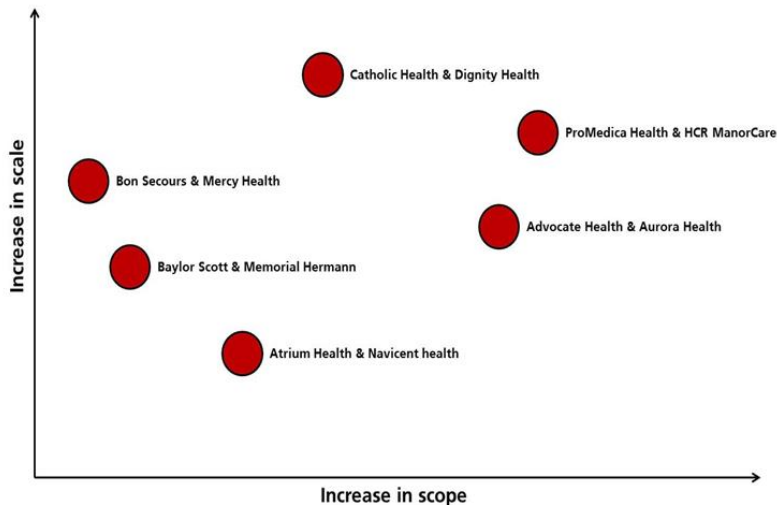
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**Fig. 6: Key Rationale behind some recent mergers**

Merger	Key Reason for Merger	Scale	Scope
Catholic Health Initiatives & Dignity Health	Increase in scale; moderate increase in scope	Geographically complementary with no overlap; Gives CHI exposure to CA market where Dignity is a big player. Additionally creates bargaining power for both systems	Focused on increasing scope with specialized care that will ultimately allow for price increases.
Baylor Scott & Memorial Hermann	Increase in scale	Baylor Scott and Memorial Hermann can expand to Houston and Dallas, respectively. Gives both systems bargaining power with insurers in increasingly competitive markets	New system aims to improve accessibility, affordability and number of services provided. Both provide similar services and have virtual touchpoints for patients
Bon Secours & Mercy Health	Increase in scale	The combined entity covers 7 states (overlapped in KY) with a focus on improving economies of scale and cutting costs	Both operate hospitals and post-acute care facilities. Bon Secours brings skilled nursing facilities to the combined system
Advocate & Aurora	Increase in scale and scope	Advocate (IL) and Aurora (WI) partnership expands geographic footprint and enhances scale to recognize greater efficiencies	Transaction gives Aurora access to some of the nation's best hospitals and a large home health and hospice company. Advocate now has access to over 150 clinics and more than 70 pharmacies.
Atrium Health & Navicent Health	Moderate increase in scale and scope	Navicent health gives NC based Atrium a hub for operations in central and south GA	Atrium will maintain and expand Navicent's core services: Level 1 trauma center, tertiary services and teaching hospital
ProMedica Health & HCR ManorCare	Increase in scale and scope	Partnership has enabled ProMedica to significantly scale its system to become the 15th largest in the nation. ProMedica previously operated in 2 states, acquisition gives access to 28 more	Gives ProMedica access to post-acute care market creating an organization providing an array of services and capabilities: hospital system, a physician group, telehealth, several health plans, an academic affiliation, skilled nursing, assisted living, rehab, home health and hospice.

Source: UBS

**Fig. 7: Relative scale and scope motivation**



Source: UBS

Some of the above credits (ProMedica, HCR Manor and Navicent) are excluded from our framework for reasons such as data availability, size etc.). We have not explicitly penalized an obligor for M&A integration risks in the framework. However, we do note relevant M&A activity in the table of detailed results at the end of this report.

## Sector Assumptions - Metric Weights and Thresholds

CIO has chosen 13 metrics (shown in Fig. 8 below) that, in our view, have the most significant impact on credit quality of not for profit hospitals. The metrics were chosen based on analysts' subjective judgment and consensus. Each metric is assigned a weight that represents its relative importance. The direction of influence arrow that indicates whether a higher or lower value is beneficial from a credit perspective. Metrics are categorized under three main categories, referred to as Risk Drivers.

- Demand and Market Profile** : Since this sector is exposed to significant market competition, this risk driver carries the highest weight of 37.5%. Key metrics include the size of the hospital as measured by net patient revenues (NPR); larger size provides more flexibility and negotiating leverage. With regard to the percent of NPR from Medicare and Medicaid, a smaller value is better since these payors typically have lower reimbursement rates than commercial insurers. Occupancy refers to the percent of beds that are occupied and is a traditional measure of the hospital's asset utilization. Net patient revenues / patient days attempts to capture the level of acuity in that more advanced care hospitals will typically derive more revenue from a given length of stay. Finally, the bad debt and charity care metric takes into account patients from whom the hospital cannot recover or does not charge fees; obviously a lower level is better.
- Financial Performance**: The two metrics with the highest weights here are operating cashflow margin, which is a measure of financial efficiency and days cash on hand that serves as a measure of liquidity. NPR growth measures topline revenue growth and EBIDA margin, though similar to operating cashflow margin, also indicates non operating sources of revenue such as tax support, BAB subsidies, investment income etc.
- Leverage and Coverage**: This measures the degree of indebtedness of a hospital. The two important metrics here are the debt service coverage ratio, which indicates the cushion the obligor has in meeting debt service payments from cash flows, and unrestricted cash to debt, which is an indicator of financial flexibility as it measures liquidity based leverage. Average age of assets is a accounting based proxy for maintenance capital expenditure requirements. Debt to capitalization is a traditional measure of asset based leverage. Lower values for both are preferable from a credit perspective.

Definitions associated with each metric are provided in Appendix 2 at the end of this report. Credit data used to calculate the metrics used in the framework was sourced from Merritt Research Inc.

**Fig. 8: Metric weights and thresholds**

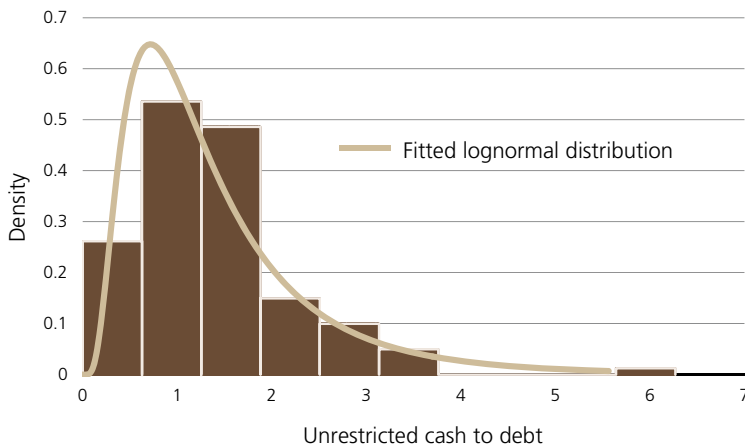
Risk Driver	Metric	Metric Weight	Direction of Influence	Threshold Score 1	Threshold Score 10
Demand and Market Profile Weight 37.5%	Net patient revenues (NPR in USD million)	7.5%	↑	10,000	500
	Medicare and Medicaid (% of NPR)	7.5%	↓	30%	65%
	Occupancy (%)	7.5%	↑	90%	50%
	Net patient revenues / Patient days	7.5%	↑	12,000	4,500
	Bad debt provision and charity care (% of NPR)	7.5%	↓	3%	20%
	Commercial (% of GPR)	0.0%	↔	60%	20%
Financial performance Weight 32.5%	Operating cashflow margin	10.0%	↑	25%	-10%
	Days cash on hand	10.0%	↑	400	100
	Net patient revenue growth (3 years)	7.5%	↑	15%	-3%
	EBIDA margin	5.0%	↑	16%	6%
	Empty	0.0%			
Leverage & Coverage Weight 30%	DSCR	10.0%	↑	5.0	1.0
	Average age of assets (yrs)	5.0%	↓	7	14
	Unrestricted cash to debt	10.0%	↑	2.5	0.5
	Debt to capitalization	5.0%	↓	20%	90%
	<b>Total</b>	<b>100%</b>			
	↑	Higher is better			
	↓	Lower is better			

Source: UBS

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Just as the weight of a metric represents its relative importance, the thresholds of 1 and 10 for each metric are used as boundaries to gauge a hospital's risk level on that metric. Lets take the example of the metric **Unrestricted cash to debt** within the risk driver leverage and coverage. A higher ratio is more desirable as it indicates greater degree of financial flexibility and lower leverage, both of which are positive credit attributes. In the framework, this metric has thresholds of 2.5 and 0.50 for a score of 1 and 10 respectively. That means hospitals with ratio of 2.5 or higher were assigned the lowest risk score of 1 on this metric and those that had 0.50 or less were assigned the highest risk score of 10. For hospitals that fall in between these values, a fitted lognormal distribution of the underlying data (as shown in Fig. 9) is used to set thresholds that determine the score on this metric. These thresholds are shown in Fig. 10. For example if a hospital has a unrestricted cash to debt ratio of 1.5 it will receive a score of 4 on this metric.

**Fig. 9: Distribution of unrestricted cash to debt**



Source: UBS

In cases where a statistical distribution is unsuitable, an equally spaced linear interpolation is used to establish the thresholds between 1 and 10.

In this manner, each hospital receives a score from 1-10 for each metric. A weighted average risk score is then calculated for each hospital using all the metric weights and scores.

**Fig. 10: Thresholds for unrestricted cash / debt**

Score	Metric Value
1	2.50
2	1.98
3	1.65
4	1.41
5	1.21
7	0.90
8	0.77
9	0.64
10	0.50

Source: UBS

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## Quantitative Adjustments

The framework for this sector makes 2 quantitative adjustments to the weighted average risk score to arrive at the final risk score. Relatively few credits are affected by these adjustments in terms of their overall Quantitative Risk Assessment. The rationale, criteria and amount of the adjustments are shown in Fig. 11 below:

**Fig. 11: Quantitative adjustments**

Metric	Rationale	Criteria	Penalty
Insurance premium / Total revenue	If a hospital also runs health insurance plans and derives significant premium revenues (as a % of total revenues), there is some additional mispricing risk that is not captured by the framework's metrics	1. Premium / Total revenue $\geq$ 25% 2. Premium / Total revenue $\geq$ 50%	1. Risk score increase by 0.25 2. Risk score increase by 0.50
Days cash on hand and Unrestricted cash to debt are very weak	Even though both metrics are part of the framework, our view is if both these metrics are extremely weak then other metrics even if very strong cannot fully compensate	A hospital receives the highest risk score of a 10 on both metrics	The highest Quantitative Risk Assessment the obligor may receive is capped at 3

Source: UBS

## Final Risk Score and Quantitative Risk Assessment

The final risk score, which is a number from 1-10, is then compared to a preset risk score scale to determine the Quantitative Risk Assessment of the obligor on a 1-5 scale. We use a 10 point scale for individual metrics as they may have wide variation, but on an aggregate level we feel that a 5 point scale is sufficient to differentiate overall credit risk between obligors.

As we discussed in the sector overview, the risk score scale is the same for all municipal sectors except healthcare, due to its greater default risk. The municipal and healthcare risk score scales are shown in Fig. 12 and Fig. 13 respectively. Since the healthcare scale has lower cutoffs compared to the muni scale, healthcare obligors are held to a higher standard to achieve the same quantitative risk assessment as obligors in other municipal sectors. For example, if an airport and a hospital had a final risk score of 4.75 in their respective sector frameworks, they would receive a Quantitative Risk Assessment of 2 and 3, respectively.

In addition to the overall Quantitative Risk Assessment, each of the three individual risk drivers i.e. (Demand and Market profile, Financial Performance and Leverage & Coverage) are also scored (using the metrics assigned to each risk driver) and placed on a scale of 1-5. This is intended to provide a more intuitive understanding of the overall Quantitative Risk Assessment of the obligor.

## CIO Risk Category

The CIO Risk Category for each of the 86 obligors is the same as their Quantitative Risk Assessment as we did not find any overarching qualitative factors that would warrant an adjustment for any obligor. The following tables provide detailed results for each of the 86 obligors, including a brief description, the relative risk profile of the obligor with respect to each risk driver, the resulting Quantitative Risk Assessment and finally the assigned CIO Risk Category. The obligors are presented in alphabetical order.

**Fig. 12: Municipal risk score scale**

Final Risk Score (Municipal)	Quantitative Risk Assessment	Relative Risk Level
Between 1.00 and 3.50	1	Lowest
Between 3.50 and 5.00	2	Low
Between 5.00 and 6.25	3	Moderate
Between 6.25 and 7.25	4	High
Between 7.25 and 10.00	5	Highest

**Fig. 13: Healthcare risk score scale**

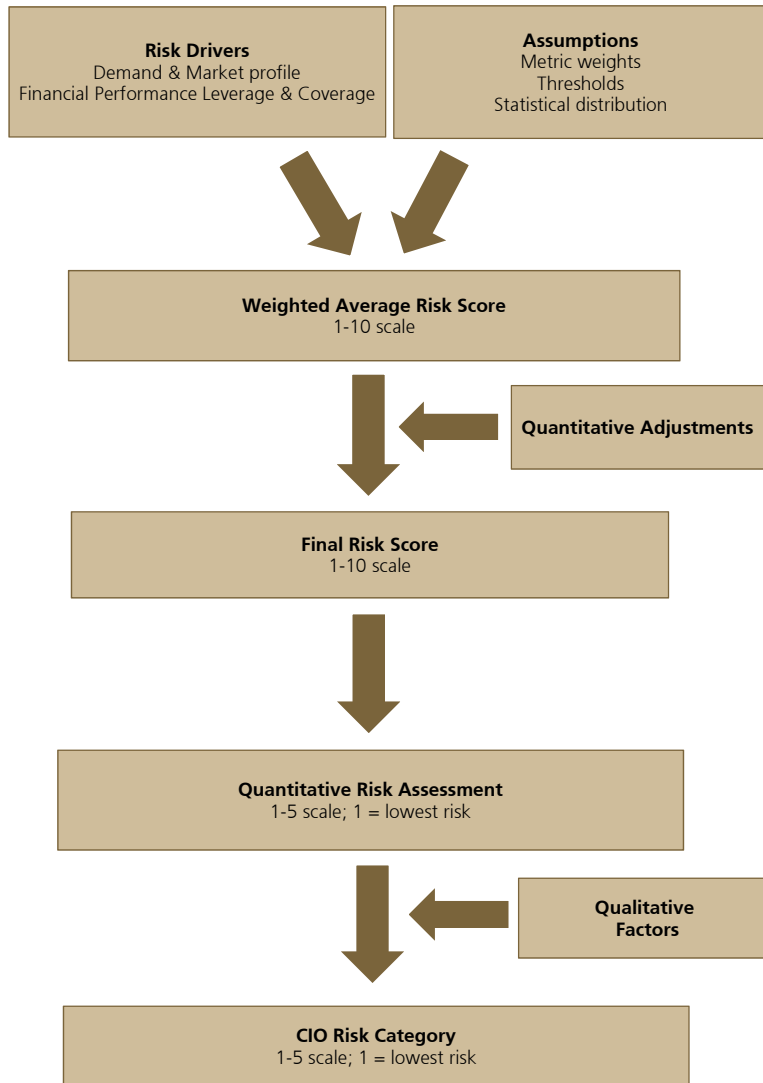
Final Risk Score (Healthcare)	Quantitative Risk Assessment	Relative Risk Level
Between 1.00 and 2.75	1	Lowest
Between 2.75 and 4.50	2	Low
Between 4.50 and 6.00	3	Moderate
Between 6.00 and 7.15	4	High
Between 7.15 and 10.00	5	Highest

Source: UBS



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## Appendix 1: Schematic of the general framework methodology



Source: UBS

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## Appendix 2 – Metric Definitions

Metric	Description
Net patient revenues (NPR)	NPR is the revenue the hospital actually receives from payors (Medicare, Medicaid and Insurance companies and patients) as per relevant contractual provisions.
Medicare and Medicaid (% of NPR)	Proportion of NPR that is paid by Medicare and Medicaid. Since these payors typically have lower reimbursement rates compared to commercial insurers, a high proportion is indicative of an adverse payor mix.  A traditional measure of hospital bed utilization.
Occupancy (%)	$Occupancy = Patient\ Days / (Available\ beds * 365)$  Patient Days = number of patients admitted * average length of stay.
Net patient revenues / Patient days	This metric measures the amount of revenues the hospital receives per patient day. This is intended to be a proxy for the level of acuity the hospital provides. Higher acuity is source of market strength. Hospitals typically receive greater revenue for a patient day for providing more advanced care services.
Bad debt provision and charity care (% of NPR)	This metric captures the proportion of NPR that the hospital does not receive due to either patients' inability to pay and/or charity care that the hospital provides and does not charge for.
Operating cashflow margin	This metric indicates the operating financial health of the hospital.  $Operating\ cashflow\ margin = Cashflow\ from\ operations / NPR\ where$  $Cashflow\ from\ operations = Revenues - expenses + depreciation - working\ capital\ changes$
Days cash on hand	This metric indicates the length of time the hospital can meet its operating expenses with no revenues  $Days\ cash\ on\ hand = (Cash + Investments) * 365 / Operating\ expenses$
Net patient revenue growth (3 years)	This is simply the annual growth rate of NPR over the last 3 years. A high growth rate generally indicates growing market presence of the hospital.
EBIDA margin	EBIDA stands for Earnings Before Interest, Depreciation and Amortization. $EBIDA\ margin = EBIDA / NPR$  This metric differs from operating cash flow margin in that it includes non-operating revenue sources such as tax support, investment income, BAB subsidy etc.
DSCR	DSCR stands for Debt Service Coverage Ratio  $DSCR = Cashflow\ available\ for\ meeting\ principal\ and\ interest\ payments / Principal\ and\ interest\ due$  A higher ratio is more desirable as it indicates greater financial cushion in meeting debt obligations
Average age of assets	This is an accounting measure of the age of assets of the hospital  $Average\ age\ of\ assets = Accumulated\ depreciation / Depreciation$  A high value may indicate the hospital will need to make maintenance capital investments soon and therefore less desirable from a credit perspective
Unrestricted cash to Debt	This ratio is the amount of money that the hospital can use without any restrictions compared to the total debt it has. It is an important metric as it incorporates liquidity based measure of leverage. A high ratio is very desirable as it indicates increased financial flexibility.
Debt to capitalization	This is a traditional measure of leverage. $Debt\ to\ capitalization = Debt / value\ of\ net\ capital\ assets$

Source: UBS

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**Note:** Demand and Market Profile, Financial Performance and Leverage & Coverage scores are individual Risk Drivers which are used to compute the Quantitative Risk Assessment.

Hospital/System	State	Obligor Description	Total Debt Outstanding (in USD mn)	Demand and Market Profile	Financial Performance	Leverage and Coverage	Quantitative Risk Assessment	CIO Risk Category
Adventist Health System	FL	Headquartered in Florida, Adventist Health System operates 42 acute care facilities in Florida, Georgia, Kentucky, North Carolina, Illinois, Wisconsin, Kansas, Colorado and Texas. The system receives about two-thirds of its revenues from hospitals within Florida which will continue given recent acquisitions of both the Bayfront Health facilities and Munroe Regional Medical Centers from Community Health Systems.	3,004	3	2	2	2	2
Adventist Health System-West	CA	Adventist Health System West is an integrated system serving California, Hawaii, Oregon and Washington with a majority of its facilities in California. Outside of California, the system includes one hospital in Hawaii and two in Oregon. With over 23,000 employees and 5,000 physicians, the system provides care in 20 hospitals, approximately 290 clinics, 14 home care agencies among other wellness care facilities.	1,787	4	3	3	4	4
Advocate Health Care Network & Subs	IL	Advocate is an integrated health care system serving the Chicago metro area and central Illinois. The system includes 12 acute care hospitals, an integrated children's hospital, a large physician group, and various other services. <b>M&amp;A:</b> Effective 4/1/18, the system merged with Aurora Health Care to create Advocate Aurora Health, Inc., the 10th largest integrated healthcare system in the US. The new entity includes 27 hospitals, over 500 sites of care and 3,300 physicians.	1,647	3	2	1	2	2
AHS Hospital Corporation & Subs	NJ	Atlantic Health System (AHS) is a large system comprised of five hospitals that provides regional health care services in New Jersey, Pennsylvania and New York. AHS provides outpatient services, ambulatory services, rehabilitation and skilled and emergency care.	944	3	3	3	3	3
Allina Health System	MN	Allina Health System delivers health care services to patients in Minnesota and western Wisconsin. Due to its large size, the System is one of the states largest employers with over 20,000 employees. The integrated health system is positioned as a healthcare leader in the Minneapolis-St. Paul area providing emergency, ambulatory, homecare and hospice services via its 13 hospitals and estimated 6,000 physicians and associated specialists.	975	2	4	3	3	3
Ascension	MO	Ascension is the largest non-profit healthcare system in the US operating in 22 states and the District of Columbia. It operates 154 hospitals (including 109 acute care) and provides senior care as well as home health services. The system's size has enabled it to achieve synergies and savings through consolidation of support functions, clinical services, and quality initiatives.	7,963	3	3	1	2	2
Atrium Health	NC	Carolinas Health Care System announced its new name of Atrium Health on 2/11/18 as part of its strategy to diversify from the Carolinas. Atrium is based out of Charlotte, North Carolina, and owns or manages several dozen hospitals throughout the Carolinas and Georgia. These facilities include small community hospitals, large tertiary facilities, a children's hospital, and a cancer hospital. <b>M&amp;A:</b> On 2/12/18, Atrium and Georgia-based Navicent Health announced a letter of intent to merge which was recently effective on 1/1/19.	1,868	4	3	2	3	3
Aurora Health Care Inc & Affiliates	WI	Created in 1984, Aurora Health Care is the largest provider of care in Wisconsin and the largest private employer in the state. It's an integrated system serving communities throughout eastern Wisconsin and northern Illinois comprised of 14 wholly owned hospital facilities, more than 150 physician clinic facilities, 70 pharmacies and an estimated 1,700 employed physicians. <b>M&amp;A:</b> Effective 4/1/18, the system merged with Advocate Health Care (AHC) to create Advocate Aurora Health, Inc. (AAH), the 10th largest integrated healthcare system in the US. The new entity includes 27 hospitals, over 500 sites of care and 3,300 physicians.	1,482	2	4	2	3	3
Banner Health & Subs	AZ	Banner operates 27 acute-care hospitals across six states, with Arizona representing the largest market by far. Banner is a leader in the greater Phoenix market, and also has a strong market position in the highly competitive northern Colorado market. It acquired the University of Arizona's health network several years ago and is currently researching ways to improve synergies related to the delivery of services and better financial operations.	3,638	3	3	3	3	3

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Baptist Health South Florida Inc & Affiliates	FL	Baptist Health South Florida is a large health and clinical care network in southern Florida. In 2017, Bethesda Health merged with BHSF growing the system to 10 hospitals, more than 40 physician practices and approximately 50 outpatient facilities. The system is now the second largest employer in the State of Florida with an estimated 18,000 employees.	1,434	3	2	1	2	2
Baptist Health System Inc & Subs	FL	Baptist Health System is a healthcare organization and clinical care network which provides services in Northeast Florida and Southeast Georgia. The network consists of five hospitals in Jacksonville and a sizeable network of primary care practices. The system leads market share of its region and is anchored by Baptist Medical Center, Wolfson Children's Hospital and Baptist Medical Center South.	692	3	2	2	2	2
Baptist Healthcare System Inc & Affiliates	KY	Baptist Healthcare System (Baptist Health), operates a network of hospitals, minor medical centers, and specialty facilities in Kentucky and southern Indiana. The system is one of the largest systems in Kentucky and specializes in providing cancer care, heart and vascular, women's health, and pediatrics services within its eight acute care hospitals. <b>M&amp;A:</b> On 5/30/18, the system entered into an agreement to acquire Hardin Memorial Hospital as a managed acute care hospital. As of publication, litigation has delayed the acquisition which may result in increased financial pressure.	970	4	4	2	3	3
Baptist Memorial Health Care Corporation & Affiliates	TN	Established in 1912, Baptist Memorial Health Care Corporation, is the market leader in West Tennessee, North Mississippi and Eastern Arkansas. The system includes 19 acute care hospitals, home health and hospice care, six cancer centers and several outpatient centers.	1,017	5	5	4	5	5
BayCare Health System Inc & Affiliates	FL	Founded in 1997, BayCare Health System is a leading health care system that provides a wide range of services within its 14 hospitals and hundreds of other locations throughout the Tampa Bay and central Florida regions. Inpatient and outpatient services include acute care, primary care, imaging, laboratory, behavioral health, home care, and wellness. In 2018, the system announced a new health insurance product slated for fiscal 2019. The details have yet to be released.	1,146	3	1	1	2	2
Baylor Scott & White Holdings & its Controlled Affiliates	TX	Baylor Scott & White is the largest non-profit health system in Texas with 48 hospitals, a large network of affiliated physicians, the large Scott & White Health Plan with ~250,000 members, and the Baylor Scott & White Quality Alliance with ~300,000 covered lives. The system has continued to achieve significant operating synergies following the October 2013 merger of Baylor Health Care System and Scott & White Healthcare, and the growth trend has continued in all major measures of patient volume and covered lives. <b>M&amp;A:</b> On 9/28/18, the system announced its intent to merge with Memorial Hermann with an expected closure in mid 2019. The merger would create a new non-profit with combined revenues of USD 15bn, making it the largest system in Texas and one of the largest in the US.	3,501	3	3	3	3	3
Beaumont Health & Consolidated Subs	MI	Beaumont Health is the sole corporate member of William Beaumont Hospital, Oakwood Healthcare, and Botsford General Hospital. The three legacy organizations merged on 9/1/2014 making Beaumont the largest healthcare provider in southeast Michigan, with eight acute care facilities located in the Detroit suburbs. In addition to the hospitals, it includes a sizable physician group with almost 900 physicians, a medical school, a research institute, and 183 ambulatory patient care sites. <b>Comment:</b> Beaumont Health's CIO Risk Category was adjusted upward from its previously published CIO Risk Category 4. The creation of CIO's quantitative framework model resulted in a recalibration of some credits, including this one.	1,624	3	4	4	3	3
BJC HealthCare	MO	BJC HealthCare provides medical care, education and research programs in the St. Louis, Missouri metropolitan area. BJC HealthCare owns or operates 15 hospitals in St. Louis, Eastern and Central Missouri and Southern Illinois. The system also owns or operates long-term care facilities, home care and hospice services, primary and specialty care physician practice sites among other wellness programs. Notable hospitals within the system include Barnes-Jewish and St. Louis Children's which are consistently ranked among the country's best hospitals which also serve as teaching facilities for its affiliate, the Washington University School of Medicine.	2,071	3	2	2	2	2

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Bon Secours Health System Inc & Subs	MD	<p>Bon Secours Health System owns or manages 19 acute-care hospitals, one psychiatric hospital, four nursing care facilities, four assisted living facilities and 14 home care services in six states. It's business position varies from market to market; with Richmond, Virginia being the most profitable historically.</p> <p><b>M&amp;A:</b> Effective 9/1/18, Bon Secours Health System and Mercy Health merged to the newly formed Bon Secours Mercy Health. The system will have hospitals in Maryland, Virginia, South Carolina, Florida, New York, Ohio and Kentucky.</p>	821	3	5	4	4	4
Boston Children's Hospital & Subs	MA	<p>As one of the largest pediatric medical centers in the United States, Boston Children's offers a complete range of health care services for children from birth through 21 years of age. It also serves as the primary pediatric teaching hospital for Harvard University's medical school. Children's is consistently highly ranked by US News &amp; World Report, as demonstrated by its 2018-19 ranking of number one nationally.</p>	1,280	1	2	2	2	2
Catholic Health Initiatives	CO	<p>Catholic Health Initiatives (CHI) is one of the largest health systems in the nation with hospitals in 18 states and a service area that covers approximately 17% of the US population. CHI serves over 4 million patients a year through operations and facilities spanning acute care, physician practices, long-term care facilities and more via its 101 hospitals and various other long term care and assisted living facilities.</p> <p><b>M&amp;A:</b> Effective 2/1/19, Catholic Health Initiatives and Dignity Health have merged into CommonSpirit Health with almost USD 28bn of annual revenues. The indebtedness and obligations of the respective legacy organizations remain separate until the organizations agree upon certain terms and conditions.</p>	8,526	3	5	5	4	4
Children's Hospital Colorado Health System	CO	<p>Headquartered in Aurora, Colorado, Children's Hospital Colorado Health System is the market leader for pediatric services in the state, with a majority of admissions derived from the Denver region. Children's Hospital Colorado is the primary pediatric teaching facility for the University of Colorado School of Medicine. With more than 1,000 health care professionals representing the full spectrum of pediatric specialties, the network for Children's Colorado includes several regional locations including its main campus on the Anschutz Medical Campus, and more than 400 outreach clinics.</p>	685	3	2	2	2	2
Christus Health	TX	<p>Christus Health is an international health system comprising numerous services and facilities, including more than 60 hospitals and long-term care facilities, multiple clinics and outpatient centers and dozens of other health ministries and ventures. Christus Health services can be found in over 60 cities in Texas, Arkansas, Louisiana, and New Mexico as well as in Columbia, Chile and Mexico, with two-thirds of revenues recently derived from Texas facilities.</p>	1,298	3	4	4	4	4
Cleveland Clinic Health System	OH	<p>Cleveland Clinic Health System (CCHS) is the leading provider of healthcare services in northeast Ohio and has an international patient draw. It operates 14 hospitals, with approximately 3,900 staffed beds, 21 outpatient family health centers, 10 ambulatory surgery centers, and numerous physician offices in Ohio. It also operates a hospital and clinic in Weston, Florida, a region which it is currently trying to expand in. As part of its diversification of international efforts, CCHS is currently constructing a hospital facility in London which it expects to be patient pay and completed by 2021.</p> <p><b>M&amp;A:</b> CCHS has recently merged with Indian River Medical center and Martin Health as part of the expansion efforts into Florida.</p>	4,027	2	2	2	2	2
Dignity Health & Subordinate Corporations	CA	<p>Based out of San Francisco, Dignity Health was formerly known as Catholic Health Care West. It operates almost 40 hospitals across California, Arizona, and Nevada. While most of its acute care business is centralized in the Golden State, Dignity has non-acute operations, including occupational health and urgent care centers, across a total of 23 states.</p> <p><b>M&amp;A:</b> Effective 2/1/19, Catholic Health Initiatives and Dignity Health have merged into CommonSpirit Health with almost USD 28bn of annual revenues. The indebtedness and obligations of the respective legacy organizations remain separate until the organizations agree upon certain terms and conditions.</p> <p><b>Comment:</b> Dignity Health's CIO Risk Category was adjusted upward from its previously published CIO Risk Category 5 due to the recalibration of the rating scale from 1-6 to its current 1-5 as well as its suggested Risk Category per the analytical framework.</p>	5,195	3	5	4	4	4
Duke University Health System Inc & Affiliates	NC	<p>Duke University Health System (DUHS) is a leading provider of tertiary and quaternary services. DUHS is a three hospital system with over 1,400 staffed beds, anchored by Duke University Hospital- its nationally and internationally prominent academic medical center.</p>	1,759	2	2	2	2	2

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Fairview Health Services	MN	Fairview Health Services is an integrated health system based in Minneapolis, Minnesota. It provides a full spectrum of health care services operating 11 hospitals, including University of Minnesota Medical Center, and numerous primary care and specialty clinics. After a merger with HealthEast in 2017, the system extended its geographic reach covering the Minneapolis-St. Paul metropolitan area and greater Minnesota. The system recently executed a Letter of Intent with the University of Minnesota to extend its affiliation agreement.	1,411	2	4	2	3	3
Franciscan Alliance Inc & Affiliates	IN	Franciscan Alliance operates healthcare facilities in Indiana and Illinois, with almost half its revenue derived from the central Indiana region. Founded in 1875, the integrated health system has 14 hospitals which provide medical services within the cardiac, emergency/urgent care, oncology, orthopedics, and neurology. Franciscan Alliance also maintains a significant ambulatory and information system network for the larger Indiana and southern Illinois region.	1,239	3	3	2	3	3
Geisinger	PA	Geisinger is a vertically integrated, physician-led health system that includes seven acute care hospitals with multiple campuses, a multi-specialty physician group practice of about 1,650 physicians practicing at over 200 primary and specialty clinics, a medical school and Geisinger Health Plans. The system covers central, south central and northeastern Pennsylvania as well as southern New Jersey after its 2016 integration with AtlantiCare Health System.  <i>Comment: Geisinger's CIO Risk Category was adjusted upward from its previously published CIO Risk Category 3. The creation of CIO's quantitative framework model resulted in a recalibration of some credits, including this one.</i>	1,759	2	3	1	2	2
Hartford HealthCare Corporation & Subs	CT	Hartford HealthCare (HHC) is Connecticut's only truly integrated healthcare system. With more than 19,000 employees, the system is the largest in the state with six acute-care hospitals, a new standalone orthopedic hospital, ambulatory services, behavioral health and rehabilitation services, a large physician group, skilled-nursing and home health services, and a comprehensive range of services for seniors, including senior-living facilities.  <b>M&amp;A:</b> HHC will continue to integrate the Charlotte Hungerford Hospital, which it acquired in January 2018. On 10/1/18 HHC signed a definitive agreement with St. Vincent's Medical Center in Bridgeport (part of Ascension), to acquire substantially all of the assets and its related operations, making it HHC's 2nd largest hospital following Hartford Hospital. As of publication, the merger is awaiting government approvals.	912	3	5	4	3	3
HealthPartners Inc	MN	HealthPartners (HP) is a large integrated health care organization providing health care services and health plan financing and administration to the Twin Cities metropolitan area. It serves more than 1.5 million medical and dental health plan members nationwide. The care system includes a multi-specialty group practice of more than 1,700 physicians that serves more than 1.2 million patients.	679	3	5	2	3	3
Henry Ford Health System	MI	The Henry Ford Health System is a comprehensive, integrated health system which provides managed care within the Detroit metropolitan area. Henry Ford established the health system in 1915, which also owns the health insurance company Health Alliance Plan. The system is comprised of six hospitals, medical centers and one of the nation's largest group practices, the Henry Ford Medical Group, which includes more than 1,200 physicians practicing in over 40 specialties.	1,034	2	5	2	3	3
Hospital Sisters Health System & Subs	IL	Hospital Sisters Health System (HSHS) is a multi-institutional health care system that cares for patients in four separate markets in Illinois (Central & Southern) and Wisconsin (Eastern & Western). HSHS has 15 hospitals, a sizeable ambulatory services and two large medical groups with more than 900 physicians across 60 specialty areas.	739	4	3	2	3	3
Houston Methodist	TX	Houston Methodist includes eight hospitals with its flagship, Houston Methodist Hospital, located within the nationally renowned Texas Medical Center in downtown Houston.	1,674	2	2	2	2	2
Indiana University Health Inc & Subs	IN	Indiana University Health (IU Health), formerly known as Clarian Health Partners, is a nonprofit healthcare system located in Indiana. It is the largest and most comprehensive healthcare system in the state, with multiple hospitals under its IU Health brand. It also has a partnership with Indiana University School of Medicine.	1,451	2	2	1	2	2
Inova Health System	VA	Inova Health System is an integrated, health care delivery system which includes five hospitals and over 100 outpatient clinical locations across the Northern Virginia and Washington DC metropolitan area.	1,763	2	2	1	2	2

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Intermountain Health Care Inc & Affiliated Companies	UT	Intermountain Health Care (IHC) is an integrated health system that includes 23 hospitals, 170 clinics, and a health insurance company which covers 875,000 lives. The System has a leading market position in Utah, employing over 1,500 physicians serving communities in Utah and southeastern Idaho. IHC also provides extensive telehealth services in five states with 35 telehealth programs.	2,019	2	2	1	2	2
Johns Hopkins Health System Corporation & Affiliates	MD	The Johns Hopkins Health System (JHHS) is headquartered in Baltimore and operates six academic and community hospitals, four suburban healthcare and surgery centers, and 39 primary and specialty care outpatient sites. The system is anchored by Johns Hopkins Hospital, and serves as the premier academic medical center for Johns Hopkins University School of Medicine. JHHS and its affiliates offer the full spectrum of integrated health care services.	2,050	1	4	3	3	3
Louisiana Children's Medical Center	LA	Louisiana Children's Medical Center (LCMC) is the only freestanding children's hospital in Louisiana serving both the state of Louisiana and the Gulf Region. The system has a large presence in New Orleans and a close relationship with the State via Louisiana State University. LCMC has 5 hospital locations and over 1,800 physicians.	708	5	2	3	3	3
Mayo Clinic	MN	The Mayo Clinic is one of the largest non-profit academic medical centers in the US, with locations in Minnesota, Arizona, and Florida. It enjoys an excellent clinical reputation and sees a strong draw of national and international patients. Research and teaching are an important part of Mayo's mission. It employs more than 4,500 physicians and scientists and almost 60,000 administrative and allied staff focused on treating difficult to diagnose medical conditions.	3,085	1	4	2	2	2
MedStar Health Inc	MD	MedStar is a large, integrated healthcare system that operates more than 120 entities, including ten hospitals in the Baltimore-Washington metro area. It is a leading provider of health care services to the Baltimore-Washington DC region. In 2000, Georgetown University Hospital became part of MedStar Health and was renamed MedStar Georgetown University Hospital (MGUH). A renewed agreement (in June 2017) with Georgetown University solidifies the long-term partnership between the two institutions to provide enhanced clinical and academic alignment for the next 50 years, including the construction of a new surgical pavilion at MGUH on university property that will be leased to MedStar.	1,671	2	5	4	3	3
Memorial Hermann Health System	TX	Memorial Hermann operates 17 acute care hospitals, including the primary teaching hospital for the University of Texas Medical School at Houston, and a large ambulatory care network. It has the leading market position in the Houston area. The system is aligned with approximately 3,500 physicians in a clinically integrated network, including faculty and private practice physicians.  <b>M&amp;A:</b> On 9/28/18, the system announced its intent to merge with Baylor Scott & White with an expected closure in mid 2019. The merger would create a new nonprofit with combined revenues of USD 15bn and 68 hospitals, making it the largest system in Texas and one of the largest in the US.  <b>Comment:</b> Memorial Hermann's CIO Risk Category was adjusted downward from its previously published CIO Risk Category 3. The creation of CIO's quantitative framework model resulted in a recalibration of some credits, including this one.	2,307	4	4	5	4	4
Memorial Sloan Kettering Cancer Center & Affiliated Corporations	NY	Memorial Sloan Kettering Cancer Center ("Sloan" or "MSKCC") is a leading provider of cancer research and clinical care in the United States. MSKCC is the largest and oldest private cancer center in the world with its main campus in New York City.	2,789	1	3	3	2	2
Mercy Health	OH	Mercy Health operates a nonprofit health system that provides healthcare services to people in Ohio and Kentucky. It operates acute care hospitals, nursing homes / long-term care residences, senior living communities, housing sites for the elderly, home health agencies, hospice programs, wellness centers, outreach services, a health insurance plan, and other healthcare organizations.  <b>M&amp;A:</b> Effective 9/1/18, Bon Secours Health System and Mercy Health merged to the newly formed Bon Secours Mercy Health (BSMH). The system will have 43 hospitals in Maryland, Virginia, South Carolina, Florida, New York, Ohio and Kentucky.  <b>Comment:</b> Mercy Health's CIO Risk Category was adjusted upward from its previously published CIO Risk Category 5. The creation of CIO's quantitative framework model resulted in a recalibration of some credits, including this one.	2,142	4	3	3	3	3

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MetroHealth System	OH	Founded in 1837, MetroHealth System is a public health care system which represents a component unit of Cuyahoga County. Located in Cleveland, the system serves as one of three major health systems for the region. It provides inpatient care as well as rehabilitation services and is affiliated with Case Western Reserve University School of Medicine.	1,061	5	5	5	5	5
MultiCare Health System	WA	MultiCare is a large healthcare system which provides services in both the Puget Sound and Spokane regions. The system acquired several facilities on 7/1/17 in the Spokane region as well as a behavioral health unit on 5/1/17. These acquisitions expanded the systems variety of services and facilities which now include seven hospital employing just over 1,000 physicians statewide.	1,342	3	2	2	2	2
New York & Presbyterian Hospital	NY	The New York and Presbyterian Hospital (NYPH) includes 10 acute care hospitals and long term care facilities located at seven campuses in New York City and Westchester County, New York. NYPH is affiliated with both Cornell University and Columbia Medical School providing strong reputation and recruiting efforts.	2,830	2	3	2	2	2
Northeast Georgia Health System Inc & Affiliates	GA	Northeast Georgia Health System serves more than 800,000 people across the northeastern Georgia region as a community health system. The system is anchored by its three hospital campuses, providing services with its 700 medical staff members covering more than 50 specialties.	1,023	4	2	4	3	3
Northwell Health Inc	NY	Formerly known as North Shore Long Island Jewish Health System, Northwell Health is a large integrated healthcare system with operations across much of Long Island, New York City, and Westchester County. Five out of the system's 21 hospitals are tertiary facilities, including North Shore University in Manhasset, Long Island Jewish Medical Center on the Queens-Nassau County border, Staten Island University Hospital, Southside Hospital in Bay Shore, and Lenox Hill Hospital in Manhattan. The remainder of the system is composed of smaller, community-based and specialty hospitals, 550 ambulatory and physician practice centers, three long-term care facilities, a hospice program, and a research institute.	3,555	3	5	4	4	4
Northwestern Memorial HealthCare & Subs	IL	Northwestern Memorial Healthcare (NMHC) is a major academic medical center located in Chicago that provides the full spectrum of inpatient and outpatient services. Northwestern Memorial Hospital is the primary teaching hospital for Northwestern University's Feinberg School of Medicine. The system also operates large hospitals in the northern and western suburbs of Chicago.  <b>M&amp;A:</b> NMHC has been actively expanding its footprint over the past several years shown by its completed merger with Centegra Health on 9/1/18.  <b>Comment:</b> Northwestern Memorial's CIO Risk Category was adjusted upward from its previously published CIO Risk Category 2. The creation of CIO's quantitative framework model resulted in a recalibration of some credits, including this one.	1,446	2	2	1	1	1
Norton Healthcare Inc & Affiliates	KY	Founded in 1886, Norton Healthcare is one of Kentucky's health care systems with five acute care hospitals and more than 40 clinics in and around Louisville, Kentucky. The hospital and health care system is the area's third largest private employer, providing care at more than 140 locations throughout Greater Louisville and Southern Indiana.	1,136	3	3	4	3	3
Novant Health Inc & Affiliates	NC	Novant Health (Novant) and its affiliates operate an integrated health care system which serves North Carolina, South Carolina, Virginia and Georgia. The System consists of 14 hospitals, 350 physician sites and 75 outpatient diagnostic imaging centers.	1,499	2	2	2	2	2



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NYU Langone Hospitals	NY	<p>New York University Hospitals Center, also known as NYU Langone, is a large academic medical institution with over 1,500 licensed beds across its four inpatient campuses and various ambulatory centers centered in New York City. It is nationally recognized and works with the NYU School of Medicine for clinical and research purposes.</p> <p><b>M&amp;A:</b> NYU Langone entered its first phase of affiliation with Winthrop-University Hospital Association in Nassau County, now "NYU Winthrop" effective 1/1/17. The system is currently working with NYU Winthrop to improve operations prior to ultimately completing the merger by 1/1/22.</p> <p><b>Comment:</b> NYU Langone's CIO Risk Category was adjusted upward from its previously published CIO Risk Category 4 due to the recalibration of the rating scale from 1-6 to its current 1-5 as well as its suggested Risk Category per the analytical framework.</p>	1,974	1	4	4	3	3
Ochsner Health System & Subs	LA	<p>Ochsner Health System is the largest health system in both New Orleans and the state and also services a small portion of Mississippi. It has been trying to expand its geographic reach as shown by its acquisition of Millennium Healthcare Management (MHM) in early 2017 (which included 16 clinics across the service area) as well as two partnerships in 2016 with Glenwood regional Medical Center and Southwest Mississippi Regional Medical Center. The system's reputation is based on its specialty areas in cardiology, transplants, cancer and neurology.</p>	1,230	3	4	5	4	4
OhioHealth Corporation	OH	<p>OhioHealth is a market leader providing healthcare services within the Columbus region of Ohio. Consisting of ten hospitals, a rehabilitation center and several ambulatory locations, the system's network employs approximately 2,500 physicians.</p>	1,029	3	2	1	2	2
Oregon Health & Science University	OR	<p>Oregon Health &amp; Science University (OHSU) is a health sciences public university in Oregon. Serving as the states only public academic medical center, OHSU is the largest employer in the city of Portland and fourth largest in the state. The University's main campus includes two hospitals in Portland with over two-thirds of revenues derived from clinical services, which helps benefit the University's educational purposes.</p>	1,002	1	3	3	2	2
Orlando Health Inc & Controlled Affiliates	FL	<p>Orlando Health (OH) is the owner and operator of a regional healthcare system headquartered in Orlando, Florida. OH operates over 1,800 licensed beds in six hospitals serving the central Florida market. The System is one of Florida's more comprehensive medical systems, offering a wide-range of primary and specialist physician care and secondary acute healthcare services to approximately 2 million residents within Orange, Seminole and Osceola Counties in Central Florida.</p>	986	3	2	2	3	3
OSF Healthcare System & Subs	IL	<p>OSF HealthCare is an integrated health system which consists of 13 acute care facilities and two colleges of nursing, mainly within Illinois with one smaller size hospital in Michigan. OSF HealthCare owns an extensive network of home health services. In an effort to diversify geographically from its Chicago facilities, OSF acquired two hospitals in central Illinois from Ascension Health in February 2018.</p>	1,177	4	4	5	4	4
Palomar Health	CA	<p>Palomar Health (PH), formerly known as Palomar Pomerado Health, makes up the largest healthcare district in California. The system is located in Northern San Diego County with no other hospital facilities within its boundaries. It is anchored by two hospitals, one which provides an array of acute care services and one specialty hospital focused on Obstetrics, Rehabilitation, Behavioral Health, Pediatrics and Neonatal Intensive Care.</p>	1,300	3	5	5	5	5
Partners Healthcare System Inc & Affiliates	MA	<p>Boston-based Partners Healthcare operates 10 hospitals in the region, anchored by Brigham and Women's Hospital and Massachusetts General Hospital. Partners is the largest recipient of National Institute of Health funding in the country and is a principal teaching affiliate of Harvard Medical School. It also operates the Neighborhood Health Plan.</p> <p><b>M&amp;A:</b> Partners announced that it had entered into a definitive agreement in May 2018 to acquire Care New England, a multi-hospital system in Rhode Island. The acquisition is part of Partners' strategy to facilitate patient access to the academic medical centers at the core of the Partners system. As of December 2018, the System filed applications for state approval of the merger.</p> <p><b>Comment:</b> Partners Healthcare System's CIO Risk Category was adjusted upward from its previously published CIO Risk Category 4. The creation of CIO's quantitative framework model resulted in a recalibration of some credits, including this one.</p>	5,405	2	4	2	3	3

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PeaceHealth Networks	WA	PeaceHealth, headquartered in Vancouver Washington, owns or leases ten hospital facilities and several medical clinics in three regional care networks in Washington, Alaska, and Oregon. The system has a leading market share in each of its markets throughout the Pacific Northwest region with its estimated 16,000 caregivers.  <b>M&amp;A</b> The system announced in December 2018 that it entered into a definitive agreement to acquire Zoom+Care, an on-demand healthcare provider to allow patients app-driven services in addition to access to Zoom+Care's 37 neighborhood clinics.	954	3	3	2	3	3
Piedmont Healthcare Inc & Affiliates	GA	Piedmont Healthcare (PHC), is a statewide leader providing medical services via 11 hospitals within Georgia. It also includes Piedmont Clinic which has access to over 2,000 physicians in 500 locations across the state. The system has completed several recent acquisitions. Columbus Regional was acquired in March 2018 in an effort of expanding the systems geographic scope outside of the city of Atlanta. Other hospital facilities within the hospital include locations in Atlanta, Fayetteville, Stockbridge, Jasper, Newnan, and Covington.	1,267	3	2	3	3	3
Premier Health Partners & Affiliates	OH	Premier Health Partners (PHP) provides medical services via its network of two hospitals and two major health centers. Founded in 1995 and based in Dayton, Ohio, the system decided to close one of its hospitals in 2018 and terminate its own health plan business. Employing 2,300 physicians, the system is among the largest employers in the state and largest health system in Southwest Ohio.	937	4	5	4	5	5
Presbyterian Healthcare Services & Affiliates	NM	Presbyterian Healthcare Services (PHS) is the largest health care system in New Mexico. It was founded in 1908 as a small tuberculosis sanatorium and now owns and operates eight hospitals in seven communities. PHS's regional hospitals provide both acute and preventative care: from surgical, ambulatory and emergency services to health fairs, fun runs, and prevention and screening programs. In addition it manages a health plan with almost 500,000 and a physicians group over 900 providers.	863	3	3	2	3	3
Providence St Joseph Health	WA	Providence Health & Services merged with St. Joseph Health System and changed its name to Providence St. Joseph Health (PSJH) on 7/1/16. The combination created a single, integrated delivery system with over \$20bn in annual revenue. PSJH is one of the largest non-profit hospital systems in the country, serving much of the western US, with leading market share in most markets.  <b>Comment:</b> Providence St. Joseph Health's CIO Risk Category was adjusted upward from its previously published CIO Risk Category 4. The creation of CIO's quantitative framework model resulted in a recalibration of some credits, including this one.	6,620	2	4	3	3	3
Sanford	SD	Sanford is a large integrated multi-state healthcare system headquartered in Sioux Falls, South Dakota. It provides healthcare to patients in South Dakota, North Dakota, Minnesota, northwest Iowa and northeast Nebraska. The System includes over 40 hospitals, 250 clinics, 1,400 physicians and a fully insured health plan with nearly 175,000 members.	953	2	5	3	3	3
SCL Health	CO	SCL Health was founded by the Sisters of Charity of Leavenworth in 1864, operating in Colorado, Montana and Kansas. The health network provides comprehensive care through its multiple hospitals, physician clinics, and home health, hospice, and mental health services primarily located in Colorado and Montana. Over the last five years, management has actively assessed its operations with a series of divestitures at facilities where it was experiencing operation losses. As a result of the divestitures, SCL Health has focused its attention on expanding in the Denver, Colorado region which accounts for over half of the systems revenues as shown by a recent 9/11/18 acquisition of Rocky Mountain Orthopedic Associates.	1,351	3	3	2	3	3
Scripps Health & Affiliates	CA	Founded in 1924, Scripps Health is a large regional integrated health system in San Diego County, California. The system operates its four hospitals on five campuses in La Jolla, Chula Vista, and Oceanside. Scripps commenced offering health plan services to its employees in 2016 and plans to slowly offer services to members outside the organization. In 2017, the system also entered into an exclusive agreement with MD Anderson to expand services and clinical offerings in the southern California.	997	2	3	1	2	2
Sentara Healthcare & Subs	VA	Sentara Healthcare provides services to over two million residents each year in Virginia and northeastern North Carolina. Based in Norfolk, Virginia, the system has expanded its offerings in health care, growing as an integrated system throughout the region and operating a total of 12 hospitals, assisted living facilities, and offering rehabilitation, home health and diagnostic services.	1,418	4	3	2	3	3

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**Note:** Demand and Market Profile, Financial Performance and Leverage & Coverage scores are individual Risk Drivers which are used to compute the Quantitative Risk Assessment.

Hospital/System	State	Obligor Description	Total Debt Outstanding (in USD mn)	Demand and Market Profile	Financial Performance	Leverage and Coverage	Quantitative Risk Assessment	CIO Risk Category
SSM Health	MO	SSM Health is a fully integrated health care delivery system headquartered in St. Louis, Missouri. It owns and operates 24 adult hospitals, one pediatric hospital, St. Louis University Hospital, 10 post-acute facilities, a health plan, extensive network of physician practice operations, and other health care businesses located primarily in Missouri, Illinois, Oklahoma, and Wisconsin. The System provides a wide range of services employing 1,800 physicians and over 9,900 medical staff members.	2,366	3	4	4	3	3
Stanford Health Care	CA	Stanford Health Care (SHC) is wholly owned subsidiary of Stanford University, and is the principal teaching affiliate of the University's School of Medicine. It provides health services to its patients in the Silicon Valley and broader Bay area. The principal clinical facilities of SHC is Stanford Hospital which is located on the University's campus along with many of the systems clinics. SHC also operates several outpatient centers throughout the Bay Area as well as several physician offices.	1,566	1	3	2	2	2
Sutter Health & Affiliates	CA	Sutter Health is a large, integrated healthcare system with 29 acute care hospitals across Northern California. Its primary service area includes the cities of San Francisco, Oakland, Sacramento, and other surrounding communities. Additionally, it manages five medical foundations which collectively employ over 2,500 physicians, numerous out-patient facilities, and a small insurance plan. Sutter has recently been in the news for claims that it has been falsely providing health information of Medicare patients to increase payments from the government. It has additionally been under scrutiny by the state Attorney General for antitrust claims.	4,122	2	4	2	3	3
Texas Health Resources	TX	Headquartered in Arlington, Texas, Texas Health Resources (THR) is composed of 15 wholly-owned and six consolidated joint venture hospitals as well as numerous inpatient and outpatient facilities. THR benefits from the leading market position in the high growth Dallas Fort Worth Metroplex and surrounding area.	1,952	3	1	1	2	2
Thomas Jefferson University	PA	Thomas Jefferson University (TJU) includes nine colleges, two schools and one institute enrolling over 9,000 students as well as hospital facilities under multiple obligated group members within TJU. Thomas Jefferson Health is the largest provider of health care services in the greater Philadelphia metropolitan area serving patients in Pennsylvania and New Jersey. <b>M&amp;A:</b> In early 2018, TJU announced a letter of intent with Albert Einstein Healthcare Network to potentially merge assets and operations; official details have not been released as of publication.	1,694	3	3	2	3	3
Tower Health & Subs	PA	Tower Health, formerly Reading Health System, is a regional, integrated healthcare system that offers healthcare and wellness services to a population of 2.5 million people. Tower Health includes six acute care hospitals, a rehabilitation center and a comprehensive physician network. Tower Health has spent recent years expanding its reach into home health care management, behavioral health and urgent care facilities. It is anchored by Reading Hospital, accounting for almost two thirds of its patient discharges.	1,154	4	2	4	4	4
Trinity Health	MI	Trinity Health is one of the largest healthcare systems in the US following the 2013 merger of Trinity Health and Catholic Health East. It operates over 90 hospitals in 22 states across the US and is headquartered in Michigan.	7,069	3	4	3	3	3
UnityPoint Health	IA	UnityPoint Health, originally known as Iowa Health System, is a fully integrated system which was created in 1994. The system operates 22 hospitals in Iowa, Illinois, and Wisconsin. It employs approximately 28,000 as the largest nonprofit in Iowa.	1,201	3	4	2	3	3
University Hospitals Health System Inc	OH	University Hospitals is the second largest regional health care system in northeast Ohio. It offers the region's largest network of primary care physicians, outpatient centers and 11 hospitals. The System also includes a network of specialty care physicians, skilled nursing, elder health, rehabilitation and home care services, managed care and insurance programs, and occupational health and wellness.	1,379	3	4	3	3	3
University of California Medical Centers	CA	The University of California is the premier public university system in California, with 10 campuses, 6 medical schools, and five academic medical centers. The University's five medical centers provide essential healthcare services throughout the state. The medical centers represent one of the largest healthcare systems in the US by revenue.	3,500	1	4	3	3	3

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Hospital/System	State	Obligor Description	Total Debt Outstanding (in USD mn)	Demand and Market Profile	Financial Performance	Leverage and Coverage	Quantitative Risk Assessment	CIO Risk Category
University of Chicago Medical Center	IL	The University of Chicago Medical Center (UCMC), is a highly reputable academic system which is associated with the University of Chicago in Hyde Park. UCMC merged in 2016 with Ingalls Health System in an effort of expanding its outpatient services from a larger pool of physicians. It operates three hospitals and several outpatient physician clinics throughout Chicago and its suburbs.	1,028	3	2	3	3	3
University of Colorado Health	CO	University of Colorado Health (UCHealth), was founded on 7/1/12 and consists primarily of the University of Colorado Hospital Authority (UCHA), Poudre Valley Health Care (PVHC), and the former operations of Memorial Hospital Colorado Springs. In connection with the formation of UCHealth, UCHA and PVHC joined each other's obligated groups and both benefit from a revenue pledge from Memorial Hospital. UCHealth is the only academic medical center in the state, operating 10 hospitals and employing over 450 physicians including the systems 80 outpatient care sites.  <i>Comment: University of Colorado Health System's CIO Risk Category was adjusted upward from its previously published CIO Risk Category 3. The creation of CIO's quantitative framework model resulted in a recalibration of some credits, including this one.</i>	1,812	3	1	1	2	2
University of Maryland Medical System Corporation & Subs	MD	University of Maryland Medical System (UMMS) owns and operates a multi-hospital regional healthcare delivery system that provides a wide range of services. The major component of the system is the University of Maryland Medical Center, an academic medical center located in downtown Baltimore. The system includes 13 community and specialty hospitals with almost 2,500 licensed beds located throughout the state. UMMS is also the clinical training venue for the University of Maryland's School of Medicine.  <i>Comment: University of Maryland Medical System's CIO Risk Category was adjusted upward from its previously published CIO Risk Category 5. The creation of CIO's quantitative framework model resulted in a recalibration of some credits, including this one.</i>	1,921	3	4	5	4	4
University of Pennsylvania Health System	PA	The University of Pennsylvania Health System (UPHS) is composed of six hospitals located in Philadelphia and the surrounding areas. It also includes community based physicians, and a hospice care facility. UPHS's affiliation with the University's School of Medicine financial resources drives its clinical reputation; however, the University and School of Medicine are neither obligated for the System's debt.  <i>Comment: University of Pennsylvania Health System's CIO Risk Category was adjusted upward from its previously published CIO Risk Category 3. The creation of CIO's quantitative framework model resulted in a recalibration of some credits, including this one.</i>	2,373	2	2	2	2	2
University of Pittsburgh Medical Center	PA	The University of Pittsburgh Medical Center (UPMC) is the largest integrated health system in the state providing medical services to residents of Pittsburgh and western Pennsylvania. UPMC is the largest non-governmental employer in the state with 85,000 employees, including 4,800 physicians servicing 40 academic, community and specialty hospitals and 600 doctors offices. The system also offers a sizeable insurance product covering 3.4 million members and is closely affiliated with the University.  <b>M&amp;A:</b> Pinnacle Health System joined UPMC on 9/1/17. The affiliation added seven hospitals to UPMC as well as geographic expansion in central Pennsylvania.	3,466	2	5	3	3	3
WellStar Health System Inc & Affiliates	GA	WellStar Health System is the largest health system in Georgia, providing most of its services within the Atlanta metropolitan area. In 2016, the system acquired five hospitals located in Atlanta bringing its facilities to 11 hospitals and over 1,000 physicians and specialists.	1,427	4	3	3	4	4
West Virginia University Health System & Controlled Entities	WV	West Virginia United Health System (WVUHS) is the largest healthcare system in the state. West Virginia United Medicine (WVU Medicine) unites the clinical and research faculty of the West Virginia University Health Sciences Center with the hospitals, clinics, and health professionals of the West Virginia University Health System. WVU Medicine includes the physicians, specialists, and sub-specialists of the West Virginia University School of Medicine, the affiliated schools of the WVU Health Sciences Center, four community hospitals, three critical access hospitals and a children's hospital, all anchored by an academic medical center that offers tertiary and quaternary care.	1,118	4	3	4	4	4

# Municipal Brief

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Hospital/System	State	Obligor Description	Total Debt Outstanding (in USD mn)	Demand and Market Profile	Financial Performance	Leverage and Coverage	Quantitative Risk Assessment	CIO Risk Category
Yale New Haven Health System & Subs	CT	<p>Yale New Haven Health System (YNHSS) operates four hospitals in Connecticut and one in Rhode Island. The flagship academic medical center is located in New Haven and serves as the primary teaching hospital for the Yale School of Medicine. YNHSS has the leading market position in Connecticut and a wide patient draw. Its affiliation with Yale University is another positive.</p> <p><b>M&amp;A:</b> YNHSS announced plans to merge Milford Hospital with Bridgeport Hospital (which is currently part of YNHSS facilities) by mid 2019.</p> <p><b>Comment:</b> Yale New Haven Health System's CIO Risk Category was adjusted upward from its previously published CIO Risk Category 3. The creation of CIO's quantitative framework model resulted in a recalibration of some credits, including this one.</p>	1,109	2	3	2	2	2

# Municipal Brief

## Appendix

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Term / Abbreviation	Description / Definition	Term / Abbreviation	Description / Definition
GO	General Obligation Bond	TEY	Taxable Equivalent Yield (tax free yield divided by 100 minus the marginal tax rate)

MMD Municipal Market Data

	Rating Agencies		Credit Ratings	
	S&P	Moody's	Fitch/BCA Definition	
Investment Grade	AAA	Aaa	AAA	Issuers have exceptionally strong credit quality. AAA is the best credit quality.
	AA+	Aa1	AA+	Issuers have very strong credit quality.
	AA	Aa2	AA	
Investment Grade	AA-	Aa3	AA-	
	A+	A1	A+	Issuers have high credit quality.
	A	A2	A	
Investment Grade	A-	A3	A-	
	BBB+	Baa1	BBB+	Issuers have adequate credit quality. This is the lowest Investment Grade category.
	BBB	Baa2	BBB	
Investment Grade	BBB-	Baa3	BBB-	
	BB+	Ba1	BB+	Issuers have weak credit quality. This is the highest Speculative Grade category.
	BB	Ba2	BB	
Investment Grade	BB-	Ba3	BB-	
	B+	B1	B+	Issuers have very weak credit quality.
	B	B2	B	
Investment Grade	B-	B3	B-	
	CCC+	Caa1	CCC+	Issuers have extremely weak credit quality.
	CCC	Caa2	CCC	
Investment Grade	CCC-	Caa3	CCC-	
	CC	Ca	CC+	Issuers have very high risk of default.
	C		CC	
Investment Grade			CC-	
	D	C	DDD	Obligor failed to make payment on one or more of its financial commitments. this is the lowest quality of the Speculative Grade category.

## Appendix

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