

Dengue: A Wave May Be Coming; Is Yellow Fever Far Behind?

Healthcare Investment Banking Q2 2024 Update



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Previous Experience: Founder & MD, Long Trail Advisors, LLC; Co-Head — Healthcare Group, Ladenburg Thalmann & Co. Inc.; Head of IB, Punk Ziegal & Co.

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Ms. Fischbein has a long track record of successfully advising clients in the healthcare industry on M&A and licensing transactions and public and private equity and debt financings, as well as providing strategic advisory services.

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Board Involvement: Cytodel, Palisade Bio Inc (NASDAQ: PALI), and Harvard Business School Club of New York.

M.B.A, Harvard Business School; B.A. Harvard University.

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- Sales to strategic and private equity buyers
- Divestitures to strategic and private equity buyers
- Buy-side acquisition programs
- Leveraged & management buyouts
- Going private transactions

Capital Raising

- Financial advisory
- Equity and debt private placements
- Growth capital
- PIPEs
- Recapitalizations

Other Services

- Fairness opinions
- Solvency opinions
- Valuations
- Restructuring, refinancing, and distressed M&A transactions
 - Debtor and creditor representations
 - §363 sales & plans of reorganization



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Alejandro Sanchez Analyst



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DENGUE: A WAVE MAY BE COMING IS YELLOW FEVER FAR BEHIND? II M&A & PRIVATE PLACEMENTS REVIEW III PUBLIC MARKETS REVIEW

Wait, a wave of dengue fever in the United States? Isn't that a tropical disease? Well readers, it is, and it is here. The highest number of reported cases is in subtropical Florida.¹ But this viral disease has now been reported in 45 U.S. states and territories.² The U.S. Centers for Disease Control (CDC) issued a Health Alert Network (HAN) Health Advisory to the U.S. healthcare community to expect a sharp increase in dengue virus infections.³

So, what is dengue fever and how did it arrive in the United States? First, let's examine the disease and then we can delve into its transmission and how it has arrived here.

Dengue is a viral disease caused by a family of viruses or serotypes designated DENV-1, DENV-2, DENV-3, and DENV-4.⁴ These viruses cause a severe flu-like illness with symptoms including high fever, severe headaches, pain behind the eyes, severe joint and muscle pains, nausea, vomiting, swollen lymph nodes (swollen glands), and possibly a rash.⁵ There are cases that become so severe that patients require hospitalization. As with most viral diseases, there is not much in the way of treatment available beyond managing the symptoms, which includes ibuprofen or acetaminophen to reduce fever and aches and pains. Lots of fluids are needed so the patient does not dehydrate. Bed rest is recommended until these constitutional symptoms subside and the patient is feeling better. Though for most people who are infected, it is like a severe case of the flu, but this is not the case for pregnant people.

Dengue in pregnancy can be quite serious and can be passed from mother to fetus. This infection can cause spontaneous abortions (miscarriages), preterm birth, gestational diabetes, and preeclampsia. The fetus can suffer from intrauterine growth restriction (small size). The newborn can suffer from microcephaly (small head), hearing loss, neurodevelopmental disorders, ocular abnormalities, and motor disorders. Also, the mother can suffer from a host of issues postpartum. ⁶ All told, it is not a pretty picture.

¹ United States Centers for Disease Control

² Ibid.

³ https://emergency.cdc.gov/han/2024/han00511.asp

⁴ United States Center for Disease Control

⁵ World Health Organization; Dengue and sever dengue, 23 April 2024

⁶ Ahuja S and Gharde PM. Cureus 15 Nov., 2023 15(11)

Dengue is transmitted via a bite from the Aedes species of mosquito. You may remember this sucker; it is the same mosquito that spreads Zika, as well as other viral diseases. Trying to reduce the risk of mosquito bites is the first line of defense and insect repellents are the way to go. Repellents containing the old reliable DEET have been shown to be the most effective when directly applied to your skin and clothing. Botanicals and other nonchemical alternatives also offer some protection.⁷ Of course, long sleeves and pants, where practical, are always helpful.

In addition, mosquito control and eradication programs must be ramped up. DDT, the first modern synthetic insecticide, was developed in the 1940s and was highly effective. Its use in the United States was discontinued in 1972 due to health and environmental issues.⁸ Other synthetic and semi-synthetic insecticides are currently in use with success.⁹ In addition, male mosquitoes that have been genetically modified to be sterile are being released in certain areas, disrupting the insects' life cycle as they breed with females. Standing water, a breeding ground for mosquitoes, must also be addressed wherever present. You know all those millions of car and truck tires that are filling up dumps? They are a wonderful breeding ground for mosquitoes, but somehow their cleanup has eluded us.

At this point you may be wondering about a vaccine. Does one exist? In the United States, there is one approved vaccine: Dengvaxia, manufactured by Sanofi Pasteur. It is only approved for use in children aged 16 and younger. After three doses, spread over 18 months, it offers a high degree of protection with few side effects.¹⁰ Now, for the downside: it is only for children who have had a documented case of dengue and, because of the low utilization of the vaccine, Sanofi Pasteur is discontinuing manufacturing of this effective vaccine. Newer vaccines are rapidly being developed that cover all four serotypes of the virus. Results from clinical studies that have been reported and indicate that these newer vaccines may offer protection with only one dose. But it will still take some time until these new vaccines gain regulatory approval and find their way to market.^{11,12}

⁷ https://www.webmd.com/allergies/features/avoid-mosquito-bites

⁸ DDT- A Brief History and Status; United States Department of Environmental Protection Agency

⁹ Pesticides Used to Control Adult Mosquitoes; United States Department of Environmental Protection Agency

¹⁰ https://www.cdc.gov/dengue/vaccine/index.html

¹¹ Wilder-Smith A, The Lancet, 12:2, February 2024

¹² Halstead SB, NEJM 390; 464-65. 13 January, 2024

Unvaccinated people who have suffered from a dengue infection develop lifelong neutralizing antibodies to the serotype of the virus to which they were infected. However, they can get reinfected with one of the other three serotypes. Subsequent infections may be even more severe than the original infection due to an immunologic phenomenon called antibody dependent enhancement or ADE. In short, the antibodies to the original serotype bind to the virus particle of the new serotype, which enables the virus to enter cells that are normally part of the body's immune defense. Within the cells, the virus replicates causing an enhanced infection. This, in turn, signals the immune system to respond with the release of a large quantity of cytokines, which are proteins that stimulate an immune response. The large amount of these proteins triggers a "cytokine storm," which can cause an acute reaction and severe illness, as we had seen in the early days of the COVID-19 pandemic.¹³

Now for the bad news. Dengue viruses are endemic in over 100 countries.¹⁴ In our modern age, travel between countries is easy and relatively inexpensive. Infected people can arrive in a country, get bitten by a mosquito which then bites another person, and thus transmits the virus. Since the incubation period for the virus is 3-14 days, travelers may arrive home totally asymptomatic and inadvertently pass on the virus.¹⁵ This is probably how the virus arrived in the United States. But since the virus is endemic, meaning that there is a local reservoir of virus, mosquitoes keep it in circulation. So, this virus, like many others, is here to stay.

¹³ Pria J, GAVI; VaccinesWork, 30 January, 2024

¹⁴ European Centre for Disease Prevention and Control; 7 August 2023

¹⁵ Ibid.

Yellow fever, like dengue, is a viral disease, and is spread by the same Aedes mosquito. It is like dengue, but worse. The virus is thought to have found its way to the Western Hemisphere from Africa in the 1600s, with the first major outbreak recorded in Central America in 1693. A hundred years later, an outbreak in Philadelphia killed between 300 and 400 people. The disease moved around the U.S. South and an outbreak in the mid 1800s in the lower Mississippi valley killed approximately 20,000 people with an additional 11,000 fatalities in New Orleans. Moving forward a hundred years, the French were attempting to dig a canal across Panama. One of the reasons they failed in their effort was that almost 20,000 laborers, managers, and engineers died from yellow fever. The United States took over the project at about the time that a Cuban physician, Carlos Finlay, hypothesized that yellow fever was transmitted through mosquito bites. A group of U.S. Army physicians in Cuba confirmed Finlay's theory. In response to these findings, the U.S. government launched a massive mosquito control and eradication program in Panama, thus making work on the canal in the humid jungles feasible.

A major advance in controlling this feared disease were the first crude vaccines that were developed in the late 1920s. Mass production of a more refined vaccine commenced in 1937 and was further expanded after the start of World War II, when all troops heading to the North African theater and elsewhere were vaccinated. The disease was, for the time, under control. Currently, there is a modern vaccine used in South America with a modest stockpile in the United States.¹⁸

So, why are we concerned? Since 2016, yellow fever has been making a strong comeback in Brazil. The Brazilian government began mobilizing in 2018 by instituting a mass vaccination program in their urban centers, with over 22 million people vaccinated. This action controlled the outbreak by 2020.¹⁹ In an article published in the New England Journal of Medicine on October 14, 2023, Peter Hotez, MD, PhD, sounded a warning that yellow fever may reappear in the Southeastern part of the United States where other mosquito-borne diseases such as dengue are appearing in greater numbers. He fears that our country may not be prepared to respond to such an outbreak.²⁰

¹⁶ Prabhu M, Gavi; VaccineWork, 21 May 2021

¹⁷ Ibid.

¹⁸ Friedson JG, Yale J Biol Med; 83(2) 77-85, June 2010

¹⁹ Pan American Health Organization https://www.paho.org/en/stories/yellow-fever-returning-epidemic

²⁰ Hotez PJ, LeBeaud AD, NEJM; 389 (16) 1445-47, 14 October 2023

As we know, the federal government's response to the COVID-19 pandemic was chaotic. Now, with all these forewarnings, this somewhat organized chaos that we are witnessing with bird flu in cows and some humans cannot be allowed to repeat itself. The preparation and response must come from a coordinated effort among agencies in Washington, and not be delegated to understaffed and ill-prepared state health authorities. The national stockpile of yellow fever vaccine should be expanded and be readied for deployment. And equally important, an educational program must be prepared. People should be aware of the risks and threats of mosquito-borne diseases and the safety and efficacy of vaccination. This is a tall order, but education is key to overcoming ignorance and the misinformation that has permeated our society.

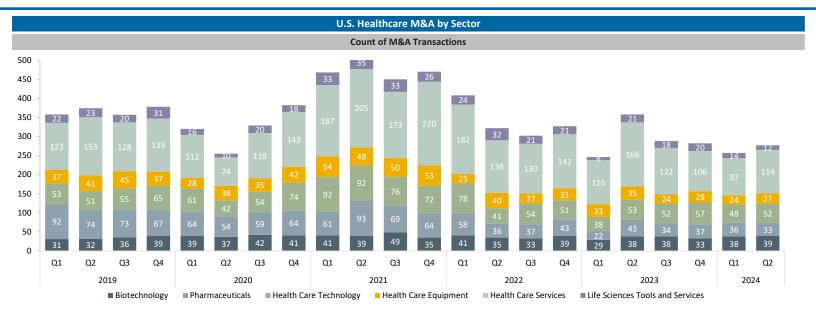
P.S.: IT'S BAAAAAACK ...

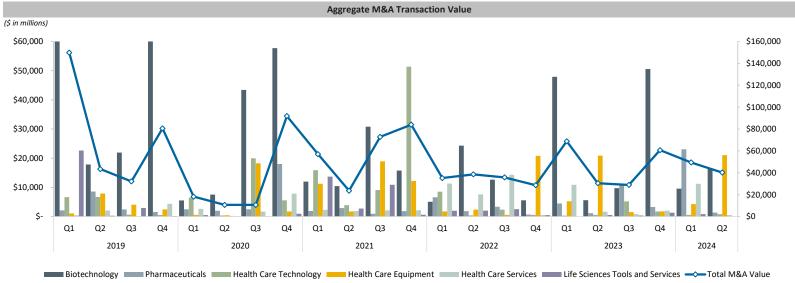
COVID-19 is back. Of course, it never left, but we are seeing a resurgence in cases. The actual number of cases is not clear and is being extrapolated by the number of hospital admissions due to COVID-19 and the monitoring of wastewater for the virus. But the summer "spike" is in full force. So, make sure you are up to date on your vaccines. The current boosters should offer sufficient coverage, but updated boosters are expected this fall. When the new booster is available make sure to roll up your sleeve and get "the jab." And, of course, keep washing your hands. If you are immunocompromised or are in fragile health, it is a good idea to mask up in enclosed crowded spaces.

I DENGUE: A WAVE MAY BE COMING IS YELLOW FEVER FAR BEHIND?

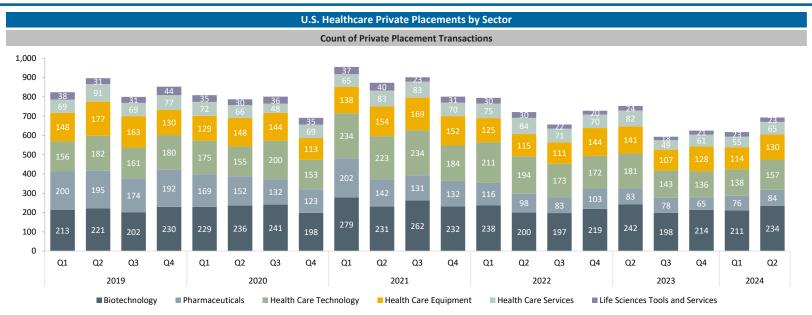
II M&A & PRIVATE PLACEMENTS REVIEW

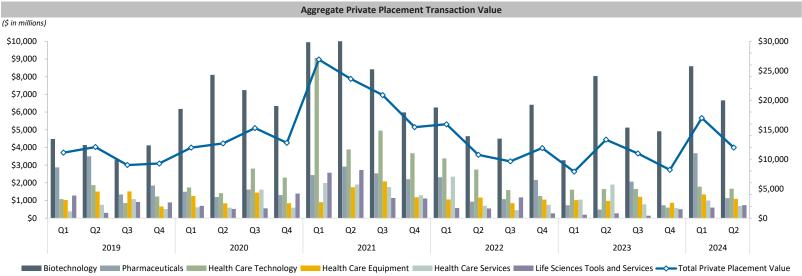
III PUBLIC MARKETS REVIEW



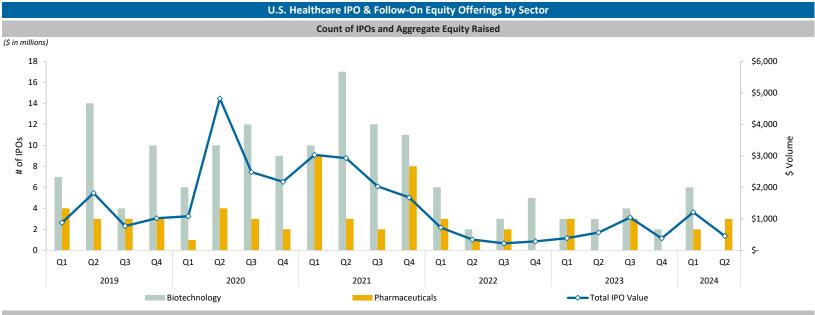


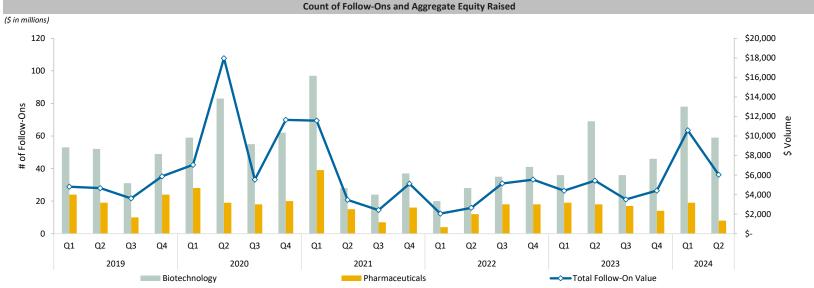
Note: Q1 2019 total transaction value for Biotechnology was \$116,936. Sources of information: S&P Capital IQ.

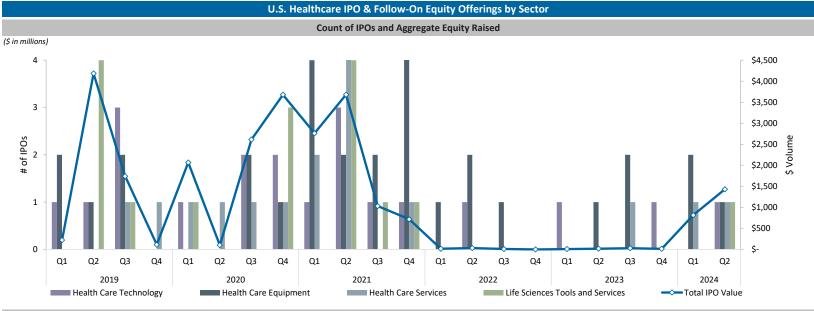


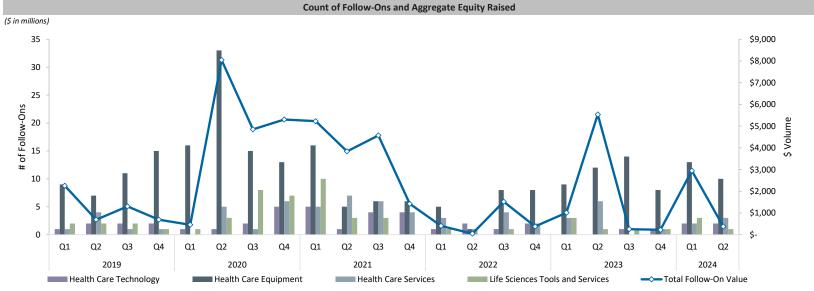


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П	M&A & PRIVATE PLACEMENTS REVIEW
Ш	PUBLIC MARKETS REVIEW









Note: Q2 2021 total count of IPOs for Health Care Services was 5 and Q4 2021 total count of IPOs for Health Care Equipment was 8



Selected Companies Review

(\$ in thousands, except per security)

				Market Statistics					Me	trics			Valuation I	Benchmark:	s
		Clos	ing Price	% of 52-week	Enterprise	Rev	venue	ı	EBITDA	EBITDA	EBITDA	EV / Re	venue	EV / EI	BITDA
Company	Ticker	30	-Jun-24	High-Low	Value	L	.TM		LTM	LTM Margin	2025 E Growth	LTM	2024 E	LTM	2024 E
Vaccines															
AstraZeneca PLC	LSE:AZN	\$	156.15	97.3% - 130.6%	\$ 268,825.0	\$ 4	7,611.0	\$	15,803.0	33.2%	13.0%	5.65x	5.21x	17.0x	15.1
Bavarian Nordic A/S	CPSE:BAVA	\$	24.80	88.4% - 137.5%	1,619.7		960.6		321.9	33.5%	15.5%	1.69x	2.15x	5.0x	8.3
BioNTech SE	NasdaqGS:BNTX	\$	80.36	63.9% - 100.4%	2,767.2		2,944.9		(180.1)	-6.1%	15.1%	0.94x	0.94x	na	na
CSL Limited	ASX:CSL	\$	196.96	96.3% - 129.1%	107,981.1	1	4,179.0		4,403.0	31.1%	12.3%	7.62x	7.09x	24.5x	20.8
CureVac N.V.	NasdaqGM:CVAC	\$	3.40	31.3% - 153.5%	482.6		63.7		(292.2)	-459.0%	-6.8%	7.58x	7.96x	na	na
Dynavax Technologies Corporation	NasdaqGS:DVAX	\$	11.23	74.1% - 107.2%	1,024.0		236.1		(16.7)	-7.1%	647.9%	4.34x	3.59x	na	nm
GSK plc	LSE:GSK	\$	19.33	83.9% - 117.4%	95,340.4	3	8,823.9		13,308.0	34.3%	10.2%	2.46x	2.38x	7.2x	7.1
Inovio Pharmaceuticals, Inc.	NasdaqCM:INO	\$	8.08	54.8% - 207.8%	117.2		0.7		(119.7)	-16687.1%	na	nm	nm	na	na
Johnson & Johnson	NYSE:JNJ	\$	146.16	83.1% - 102.1%	360,702.7	8	5,648.0		30,613.0	35.7%	4.7%	4.21x	4.06x	11.8x	11.3
Merck & Co., Inc.	NYSE:MRK	\$	123.80	92.0% - 124.9%	342,739.6	6	1,403.0		21,211.0	34.5%	13.1%	5.58x	5.34x	16.2x	11.7
Moderna, Inc.	NasdaqGS:MRNA	\$	118.75	69.7% - 189.8%	36,206.8		5,153.0		(4,560.0)	-88.5%	-24.8%	7.03x	8.71x	na	na
Novavax, Inc.	NasdaqGS:NVAX	\$	12.66	53.1% - 358.4%	1,880.5		996.6		(333.8)	-33.5%	-186.0%	1.89x	1.91x	na	8.3
Pfizer Inc.	NYSE:PFE	\$	27.98	74.0% - 111.0%	216,800.3	5	4,889.0		9,621.0	17.5%	11.4%	3.95x	3.59x	22.5x	10.2
Sanofi	ENXTPA:SAN	\$	96.37	86.2% - 111.6%	131,226.9	4	9,938.5		13,161.6	26.4%	14.3%	2.63x	2.64x	10.0x	9.0
		Мес	an	74.8% - 148.7%	\$ 111,979.6	\$ 2	5,917.7	\$	7,352.9	-1216.8%	41.5%	4.27x	4.27x	14.3x	11.3
		Мес	dian	78.6% - 127.0%	\$ 65,773.6	\$	9,666.0	\$	2,362.4	21.9%	12.3%	4.21x	3.59x	14.0x	10.2

Market value equals price per share times number of diluted shares outstanding. Enterprise value equals market value plus debt, preferred stock, and non controlling interests, less cash.

SELECTED PUBLIC COMPANIES - PHARMA (CONT.)

				Se	lected Comp	oanies Revie	w						
(\$ in thousands, except per security)													,
Closing Price Company Ticker 30-Jun-24		Market Statistics			М	etrics			Valuation I	Benchmarks	5		
		Clos	ing Price	% of 52-week	Enterprise	Revenue	EBITDA	EBITDA	EBITDA	EV / Re	venue	EV / EE	BITDA
Company	Ticker	30	-Jun-24	High-Low	Value	LTM	LTM	LTM Margin	2025 E Growth	LTM	2024 E	LTM	2024 E
Neurology													
AbbVie Inc.	NYSE:ABBV	\$	169.96	92.9% - 128.1%	\$ 359,674.1	\$ 54,403.0	\$ 26,116.0	48.0%	7.7%	6.61x	6.52x	13.8x	13.6x
Biogen Inc.	NASDAQ:BIIB	\$	231.82	80.6% - 122.4%	39,624.5	9,663.1	2,519.8	26.1%	5.1%	4.10x	4.16x	15.7x	11.9x
Eli Lilly and Company	NYSE:LLY	\$	905.38	98.9% - 208.4%	838,287.8	35,932.1	13,373.7	37.2%	36.1%	23.33x	19.51x	nm	nm
Johnson & Johnson	NYSE:JNJ	\$	146.16	83.1% - 102.1%	360,702.7	85,648.0	30,613.0	35.7%	4.7%	4.21x	4.06x	11.8x	11.3x
Pfizer Inc.	NYSE:PFE	\$	27.98	74.0% - 111.0%	216,800.3	54,889.0	9,621.0	17.5%	11.4%	3.95x	3.59x	22.5x	10.2x
Regeneron Pharmaceuticals, Inc.	NasdaqGS:REGN	\$	1,051.03	97.2% - 152.7%	104,365.7	13,100.1	4,424.5	33.8%	7.9%	7.97x	7.55x	23.6x	18.9x
Roche Holding AG	SWX:ROG	\$	277.65	89.8% - 117.2%	251,385.3	71,777.5	24,841.5	34.6%	7.9%	3.50x	3.73x	10.1x	9.9x
Sanofi	ENXTPA:SAN	\$	96.37	86.2% - 111.6%	131,226.9	49,938.5	13,161.6	26.4%	14.3%	2.63x	2.64x	10.0x	9.0x
Takeda Pharmaceutical Company Limited	TSE:4502	\$	25.93	85.6% - 107.0%	71,813.6	28,189.2	7,521.7	26.7%	0.3%	2.55x	2.66x	9.5x	10.1x
Tonix Pharmaceuticals Holding Corp.	NASDAQ:TNXP	\$	0.70	1.2% - 117.2%	9.6	10.3	(101.2	-987.5%	na	0.94x	0.69x	na	na
		Мес	n	78.9% - 127.8%	\$ 237,389.0	\$ 40,355.1	\$ 13,209.2	-70.2%	10.6%	5.98x	5.51x	14.6x	11.9x
		Мес	dian	85.9% - 117.2%	\$ 174,013.6	\$ 42,935.3	\$ 11,391.3	30.2%	7.9%	4.03x	3.90x	12.8x	10.8x
Anti-Infectives													
Abbott Laboratories	NYSE:ABT	\$	103.36	85.0% - 115.3%	\$ 189,802.1	\$ 40,326.0	\$ 10,368.0	25.7%	9.2%	4.71x	4.55x	18.3x	17.8x
Cipla Limited	NSEI:CIPLA	\$	17.76	93.6% - 148.6%	13,745.9	3,054.1	755.1	24.7%	11.8%	4.50x	4.18x	18.2x	17.0x
Hikma Pharmaceuticals PLC	LSE:HIK	\$	23.90	85.1% - 110.5%	6,268.1	2,875.0	791.0	27.5%	6.4%	2.18x	2.10x	7.9x	7.9x
Johnson & Johnson	NYSE:JNJ	\$	146.16	83.1% - 102.1%	360,702.7	85,648.0	30,613.0	35.7%	4.7%	4.21x	4.06x	11.8x	11.3x
Merck & Co., Inc.	NYSE:MRK	\$	123.80	92.0% - 124.9%	342,739.6	61,403.0	21,211.0	34.5%	13.1%	5.58x	5.34x	16.2x	11.7x
Viatris Inc.	NasdaqGS:VTRS	\$	10.63	78.1% - 121.6%	29,761.7	15,361.2	4,733.4	30.8%	-3.5%	1.94x	1.99x	6.3x	6.2x
Novartis AG	SWX:NOVN	\$	107.02	99.1% - 115.9%	236,098.3	47,733.0	18,944.0	39.7%	8.0%	4.95x	4.81x	12.5x	12.3x
Pfizer Inc.	NYSE:PFE	\$	27.98	74.0% - 111.0%	216,800.3	54,889.0	9,621.0	17.5%	11.4%	3.95x	3.59x	22.5x	10.2x
Sun Pharmaceutical Industries Limited	NSEI:SUNPHARMA	\$	18.19	92.5% - 147.4%	42,287.8	5,820.7	1,558.7	26.8%	15.5%	7.27x	6.81x	27.1x	25.5x
Teva Pharmaceutical Industries Limited	NYSE:TEVA	\$	16.25	91.9% - 219.0%	35,619.5	16,004.0	4,462.0	27.9%	7.0%	2.23x	2.23x	8.0x	7.5x
		Мес	n	87.4% - 131.6%	\$ 147,382.6	\$ 33,311.4	\$ 10,305.7	29.1%	8.4%	4.15x	3.96x	14.9x	12.7x

\$ 116,045.0 \$ 28,165.0 \$ 7,177.2

27.7%

8.6%

4.36x

4.12x

88.5% - 118.7% Market value equals price per share times number of diluted shares outstanding. Enterprise value equals market value plus debt, preferred stock, and non controlling interests, less cash.

Median

Sources of information: S&P Capital IQ.

14.3x

11.5x

SELECTED PUBLIC COMPANIES - PHARMA (CONT.)

Selected Companies Review (\$ in thousands, except per security) **Market Statistics** Metrics Valuation Benchmarks **Closing Price** % of 52-week **EBITDA EBITDA EBITDA** EV / Revenue Enterprise Revenue EV / EBITDA Company Ticker 30-Jun-24 High-Low Value LTM LTM LTM Margin 2025 E Growth LTM 2024 E LTM 2024 E Cancer Immunotherapy NasdagGS:AMGN \$ 312.45 94.8% - 143.0% \$ 222,262.2 \$ 29,532.0 \$ 11,658.0 39.5% 2.8% 7.53x 6.74x Amgen Inc. 19.1x 11.9x BioNTech SE NasdagGS:BNTX \$ 2.767.2 2,944.9 -6.1% 15.1% 0.94x 0.94x 80.36 63.9% - 100.4% (180.1)na na NYSE:BMY \$ 40.91 131,667.1 18,172.0 39.9% 248.0% 2.89x Bristol-Myers Squibb Company 62.6% - 103.2% 45,534.0 2.86x 7.2x 25.6x bluebird bio, Inc. NasdagGS:BLUE \$ 0.98 17.8% - 116.5% 319.1 21.7 (131.8)-606.5% -39.4% 14.69x 2.61x na na NasdaqCM:CLDX \$ Celldex Therapeutics, Inc. 37.01 69.6% - 167.4% 1,642.5 6.1 (147.1)-2423.0% 29.0% nm nm na na Cellectis S.A. ENXTPA:ALCLS \$ 1.77 48.1% - 186.3% 109.0 12.1 (84.6)-697.2% 8.98x 3.65x 1.4% na na Gilead Sciences. Inc. NasdagGS:GILD Ś 68.61 78.1% - 110.5% 105,064.0 27,450.0 12,665.0 46.1% 43.5% 3.83x 3.81x 8.3x 10.9x **Incyte Corporation** NasdagGS:INCY \$ 60.62 90.0% - 120.6% 9,817.4 3,767.9 801.8 21.3% 39.0% 2.61x 2.40x 12.2x 10.4x \$ Merck & Co., Inc. NYSE:MRK 123.80 92.0% - 124.9% 342,739.6 61,403.0 21,211.0 34.5% 13.1% 5.58x 5.34x 16.2x 11.7x Novartis AG SWX:NOVN \$ 107.02 236,098.3 47,733.0 18,944.0 39.7% 8.0% 4.95x 4.81x 12.5x 99.1% - 115.9% 12.3x Regeneron Pharmaceuticals, Inc. NasdagGS:REGN \$ 1,051.03 97.2% - 152.7% 104,365.7 13,100.1 4,424.5 33.8% 7.9% 7.97x 7.55x 23.6x 18.9x Mean 73.9% - 131.0% \$ 105,168.4 21,045.9 \$ 7,939.3 -316.2% 33.5% 6.00x 4.07x 14.2x 14.5x \$ Median 78.1% - 120.6% \$ 104,365.7 \$ 13,100.1 4,424.5 33.8% 13.1% 5.26x 3.73x 12.5x 11.9x Cardiovascular \$ \$ 15,803.0 AstraZeneca PLC LSE:AZN 156.15 97.3% - 130.6% \$ 268,825.0 \$ 47,611.0 33.2% 13.0% 5.65x 5.21x 17.0x 15.1x Bayer Aktiengesellschaft \$ 28.27 72,448.7 50,720.7 12,382.1 XTRA:BAYN 49.0% - 105.7% 24.4% 4.1% 1.43x 1.44x 5.9x 6.6x Bristol-Myers Squibb Company NYSE:BMY Ś 40.91 62.6% - 103.2% 131.667.1 45,534.0 18,172.0 39.9% 248.0% 2.89x 2.86x 7.2x 25.6x \$ 68.61 Gilead Sciences, Inc. NasdagGS:GILD 78.1% - 110.5% 105,064.0 27,450.0 12,665.0 46.1% 43.5% 3.83x 3.81x 8.3x 10.9x Johnson & Johnson NYSE:JNJ Ś 146.16 83.1% - 102.1% 360,702.7 85,648.0 30,613.0 35.7% 4.7% 4.21x 4.06x 11.8x 11.3x Novartis AG SWX:NOVN 107.02 99.1% - 115.9% 236,098.3 47,733.0 18,944.0 39.7% 8.0% 4.95x 4.81x 12.5x 12.3x Pfizer Inc. NYSE:PFE \$ 27.98 74.0% - 111.0% 216,800.3 54,889.0 9,621.0 17.5% 11.4% 3.95x 3.59x 22.5x 10.2x **ENXTPA:SAN** \$ 96.37 131,226.9 49,938.5 Sanofi 86.2% - 111.6% 13,161.6 26.4% 14.3% 2.63x 2.64x 10.0x 9.0x **United Therapeutics Corporation** NasdaqGS:UTHR \$ 318.55 99.0% - 152.7% 11,555.6 2,498.3 1.312.8 52.5% 4.3% 4.63x 4.22x 8.8x 8.1x Mean 80.9% - 115.9% \$ 170,487.6 45,780.3 \$ 14,741.6 35.1% 39.0% 3.79x 3.63x 11.6x 12.1x Median 83.1% - 111.0% \$ 131,667.1 \$ 47,733.0 \$ 13,161.6 35.7% 11.4% 3.95x 3.81x 10.0x 10.9x

Market value equals price per share times number of diluted shares outstanding. Enterprise value equals market value plus debt, preferred stock, and non controlling interests, less cash.

at Statistics	Matrics	Valuation Renchmarks
et Statistics	Metrics	Valuation Benchmark

				Market Statistics						Me	trics			Valuation	Benchmark	s
		Clos	ing Price	% of 52-week	E	nterprise	ī	Revenue		EBITDA	EBITDA	EBITDA	EV / Re	evenue	EV / EI	BITDA
Company	Ticker	30	-Jun-24	High-Low	Value			LTM		LTM	LTM Margin 2025 E Growth		LTM	2024 E	LTM	2024 E
Imaging							Т									
FUJIFILM Holdings Corporation	TSE:4901	\$	23.39	99.1% - 143.0%	\$	30,843.6	\$	19,575.7	\$	2,821.3	14.4%	11.3%	1.58x	1.61x	10.9x	10.4
General Electric Company	NYSE:GE	\$	158.70	88.0% - 150.4%		178,136.8		69,521.0		8,483.0	12.2%	14.8%	2.56x	4.92x	21.0x	22.4
Hitachi, Ltd.	TSE:6501	\$	22.39	98.0% - 210.3%		105,516.7		64,320.0		8,322.8	12.9%	21.6%	1.64x	1.88x	12.7x	14.4
Hologic, Inc.	NasdaqGS:HOLX	\$	74.25	90.1% - 116.0%		17,798.1		3,960.6		1,222.1	30.9%	6.0%	4.49x	4.37x	14.6x	13.1
Intelligent Ultrasound Group plc	AIM:IUG	\$	0.09	55.6% - 115.2%		28.0		14.2		(3.2)	-22.4%	na	1.97x	1.42x	na	14.7
Koninklijke Philips N.V.	ENXTAM:PHIA	\$	25.28	83.8% - 148.0%		29,844.6		19,570.6		945.1	4.8%	13.4%	1.52x	1.49x	31.6x	9.3
Shenzhen Mindray Bio-Medical Electronics	SZSE:300760	\$	40.03	92.0% - 114.8%		45,572.3		4,977.6		1,880.6	37.8%	19.4%	9.16x	7.93x	24.2x	20.7
Siemens Healthineers AG	XTRA:SHL	\$	57.64	92.5% - 121.2%		79,392.9		23,592.6		3,922.8	16.6%	15.5%	3.37x	3.21x	20.2x	15.7
		Med	ın	87.4% - 139.9%	\$	60,891.6	\$	25,691.5	\$	3,449.3	13.4%	14.6%	3.29x	3.35x	19.3x	15.1
		Ме	dian	91.0% - 132.1%	\$	38,208.0	\$	19,573.1	\$	2,350.9	13.7%	14.8%	2.27x	2.54x	20.2x	14.6
Robotic Surgery																
Accuray Incorporated	NasdaqGS:ARAY	\$	1.82	42.3% - 124.3%	\$	327.2	\$	430.6	\$	1.3	0.3%	80.6%	0.76x	0.76x	nm	15.2
Globus Medical, Inc.	NYSE:GMED	\$	68.49	99.1% - 157.9%		9,426.6		1,898.5		480.8	25.3%	15.4%	4.97x	3.81x	19.6x	13.1
Intuitive Surgical, Inc.	NasdaqGS:ISRG	\$	444.85	99.5% - 174.6%		155,052.1		7,318.5		2,267.4	31.0%	19.2%	21.19x	19.31x	nm	nm
Smith & Nephew plc	LSE:SN.	\$	12.39	77.5% - 110.6%		13,566.1		5,549.0		1,117.0	20.1%	10.9%	2.44x	2.33x	12.1x	9.3
Stereotaxis, Inc.	NYSEAM:STXS	\$	1.82	55.3% - 136.8%		143.0		27.1		(20.4)	-75.2%	-48.6%	5.28x	4.71x	na	na
Stryker Corporation	NYSE:SYK	\$	340.25	94.1% - 136.1%		141,884.4		20,963.0		5,438.0	25.9%	11.1%	6.77x	6.36x	26.1x	23.4
Zimmer Biomet Holdings, Inc.	NYSE:ZBH	\$	108.53	75.0% - 106.4%		27,946.6		7,452.4		2,473.4	33.2%	5.5%	3.75x	3.60x	11.3x	10.5
		Ме	n	77.6% - 135.2%	\$	49,763.7	\$	6,234.1	\$	1,679.7	8.7%	13.4%	6.45x	5.84x	17.3x	14.3
		Ме	lian	77.5% - 136.1%	\$	13,566.1	\$	5,549.0	\$	1,117.0	25.3%	11.1%	4.97x	3.81x	15.9x	13.1

Selected Companies Review

Market value equals price per share times number of diluted shares outstanding. Enterprise value equals market value plus debt, preferred stock, and non controlling interests, less cash.

Sources of information: S&P Capital IQ.

(\$ in thousands, except per security)

SELECTED PUBLIC COMPANIES - DEVICES (CONT.)

Median

					S	elected Com	pai	nies Revi	ew							
(\$ in thousands, except per security)																
				Market S	Statistics					Me	trics	Valuation Benchmarks				
		Clos	ing Price	% of 52	2-week	Enterprise	F	Revenue		EBITDA	EBITDA	EBITDA	EV / Re	venue	EV / EI	BITDA
Company	Ticker	30	-Jun-24	High-	-Low	Value		LTM		LTM	LTM Margin 2	025 E Growth	LTM	2024 E	LTM	2024 E
Orthopedics																
CONMED Corporation	NYSE:CNMD	\$	69.32	50.3% -	113.5%	\$ 3,092.1	\$	1,261.5	\$	206.5	16.4%	15.9%	2.45x	2.31x	15.0x	11.4x
Enovis Corporation N	NYSE:ENOV	\$	45.20	68.3% -	105.0%	3,828.3		1,817.3		236.0	13.0%	11.7%	2.11x	1.80x	16.2x	10.2x
Medtronic plc N	NYSE:MDT	\$	78.71	86.5% -	114.3%	119,147.5		32,364.0		9,056.0	28.0%	7.6%	3.68x	3.60x	13.2x	12.6x
Orthofix Medical Inc.	NasdaqGS:OFIX	\$	13.26	61.4% -	138.5%	626.5		760.0		22.0	2.9%	39.7%	0.82x	0.79x	28.5x	9.8x
Smith & Nephew plc L	SE:SN.	\$	12.39	77.5% -	110.6%	13,566.1		5,549.0		1,117.0	20.1%	10.9%	2.44x	2.33x	12.1x	9.3x
Stryker Corporation N	NYSE:SYK	\$	340.25	94.1% -	136.1%	141,884.4		20,963.0		5,438.0	25.9%	11.1%	6.77x	6.36x	26.1x	23.4x
Zimmer Biomet Holdings, Inc.	NYSE:ZBH	\$	108.53	75.0% -	106.4%	27,946.6		7,452.4		2,473.4	33.2%	5.5%	3.75x	3.60x	11.3x	10.5x
		Мес	an	73.3% -	117.8%	\$ 44,298.8	\$	10,023.9	\$	2,649.9	19.9%	14.6%	3.15x	2.97x	17.5x	12.4x
		Мес	dian	75.0% -	113.5%	\$ 13,566.1	\$	5,549.0	\$	1,117.0	20.1%	11.1%	2.45x	2.33x	15.0x	10.5x
Cardiovascular																
Abbott Laboratories N	NYSE:ABT	\$	103.36	85.0% -	115.3%	\$ 189,802.1	\$	40,326.0	\$	10,368.0	25.7%	9.2%	4.71x	4.55x	18.3x	17.8x
Baxter International Inc.	NYSE:BAX	\$	33.45	66.6% -	107.9%	28,251.5		14,892.0		2,872.0	19.3%	5.5%	1.90x	1.87x	9.8x	9.5x
Becton, Dickinson and Company	NYSE:BDX	\$	233.71	81.3% -	104.3%	82,493.9		19,716.0		5,070.0	25.7%	6.0%	4.18x	4.02x	16.3x	13.9x
Boston Scientific Corporation	NYSE:BSX	\$	77.01	98.7% -	159.3%	122,755.2		14,707.0		3,742.0	25.4%	14.3%	8.35x	7.67x	32.8x	26.4x
Edwards Lifesciences Corporation	NYSE:EW	\$	92.37	96.1% -	152.5%	54,956.3		6,143.4		1,920.1	31.3%	13.1%	8.95x	8.38x	28.6x	26.7x
Medtronic plc	NYSE:MDT	\$	78.71	86.5% -	114.3%	119,147.5		32,364.0		9,056.0	28.0%	7.6%	3.68x	3.60x	13.2x	12.6x
		Мес	an	85.7% -	125.6%	\$ 99,567.7	\$	21,358.1	\$	5,504.7	25.9%	9.3%	5.29x	5.01x	19.8x	17.8x

\$ 100,820.7 \$ 17,304.0

25.7%

8.4%

4.45x

4.28x

17.3x

Market value equals price per share times number of diluted shares outstanding. Enterprise value equals market value plus debt, preferred stock, and non controlling interests, less cash.

85.7% - 114.8%

Sources of information: S&P Capital IQ.

15.8x

					Sel	ecte	ed Com	an	ies Revie	w							
(\$ in thousands, except per security)																	
				Market Stati	stics						Me	trics			Valuation	Benchmark	s
		Clos	ing Price	% of 52-we	ek	En	terprise	F	Revenue		EBITDA	EBITDA	EBITDA	EV / Re	venue	EV / E	BITDA
Company	Ticker	30	-Jun-24	High-Low			Value		LTM		LTM	LTM Margin 2	2025 E Growth	LTM	2024 E	LTM	2024 E
Diagnostics/Lab Testing								Т									
Enzo Biochem, Inc.	NYSE:ENZ	\$	1.09	57.7% - 110	.1%	\$	6.2	\$	33.3	\$	(15.4)	-46.3%	na	0.19x	na	na	na
Exact Sciences Corporation	NASDAQ:EXAS	\$	42.25	41.9% - 104	.0%		9,719.0		2,534.8		(108.4)	-4.3%	51.8%	3.83x	3.43x	na	29.3x
Labcorp Holdings Inc.	NYSE:LH	\$	203.51	86.9% - 106	.0%		23,139.8		12,300.4		1,622.3	13.2%	6.5%	1.88x	1.81x	14.3x	10.4x
Myriad Genetics, Inc.	NASDAQ:MYGN	\$	24.46	94.3% - 177	.0%		2,261.9		774.2		(67.8)	-8.8%	78.2%	2.92x	2.72x	na	nm
NeoGenomics, Inc.	NASDAQ:NEO	\$	13.87	65.4% - 125	.7%		1,994.7		610.7		(20.5)	-3.4%	102.8%	3.27x	3.04x	na	nm
Quest Diagnostics Incorporated	NYSE:DGX	\$	136.15	93.5% - 113	.8%		20,317.3		9,287.0		1,775.0	19.1%	6.0%	2.19x	2.15x	11.4x	10.8x
		Мес	n	73.3% - 122	.8%	\$	9,573.2	\$	4,256.7	\$	530.9	-5.1%	49.1%	2.38x	2.63x	12.9x	16.8x
		Med	dian	76.1% - 112	.0%	\$	5,990.4	\$	1,654.5	\$	(18.0)	-3.8%	51.8%	2.55x	2.72x	12.9x	10.8x
Telehealth																	
CareCloud, Inc.	NasdaqGM:CCLD	\$	1.92	50.5% - 282	.4%	\$	40.2	\$	113.0	\$	4.7	4.1%	18.5%	0.36x	0.34x	8.6x	1.9x
SHL Telemedicine Ltd.	SWX:SHLTN	\$	5.12	44.2% - 131	.4%		80.7		57.1		(5.4)	-9.5%	na	1.41x	1.30x	na	na
Teladoc Health, Inc.	NYSE:TDOC	\$	9.78	32.2% - 102	.0%		2,150.9		2,619.3		46.0	1.8%	13.9%	0.82x	0.81x	46.7x	5.9x
Veradigm Inc.	OTCPK:MDRX	\$	9.50	67.4% - 189	.6%		-		1,529.0		115.4	7.5%	-2.0%	0.00x	0.00x	0.0x	0.0x
Welltower Inc.	NYSE:WELL	\$	104.25	98.6% - 133	.8%		75,556.6		6,937.0		2,718.7	39.2%	14.6%	10.89x	9.75x	27.8x	25.8x
		Мес	an	58.6% - 167	.8%	\$	15,565.7	\$	2,251.1	\$	575.9	8.6%	11.3%	2.70x	2.44x	20.8x	8.4x
		Мес	dian	50.5% - 133	.8%	\$	80.7	\$	1,529.0	\$	46.0	4.1%	14.3%	0.82x	0.81x	18.2x	3.9x

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Healthcare Investment Banking

Selected Companies Review

(\$ in thousands, except per security)

				Market Statistics						Me	trics		Valuation Benchmarks				
		Closi	ng Price	% of 52-week	Ent	terprise	F	Revenue	E	BITDA	EBITDA	EBITDA	EV / Re	venue	EV / EI	3ITDA	
Company	Ticker	30-	Jun-24	High-Low	,	Value		LTM		LTM	LTM Margin 2	025 E Growth	LTM	2024 E	LTM	2024 E	
Facilities-Based & Practices																	
Acadia Healthcare Company, Inc.	NasdaqGS:ACHC	\$	67.54	77.0% - 108.9%	\$	8,318.6	\$	2,992.5	\$	660.5	22.1%	10.4%	2.78x	2.60x	12.6x	11.1x	
Amedisys, Inc.	NasdaqGS:AMED	\$	91.80	94.3% - 102.5%		3,427.8		2,251.4		226.5	10.1%	8.3%	1.52x	1.46x	15.1x	13.6x	
Brookdale Senior Living Inc.	NYSE:BKD	\$	6.83	89.6% - 198.8%		5,742.5		2,898.3		382.7	13.2%	8.9%	1.98x	1.83x	15.0x	14.8x	
Community Health Systems, Inc.	NYSE:CYH	\$	3.36	64.6% - 167.2%		13,174.6		12,522.0		1,338.0	10.7%	5.5%	1.05x	1.05x	9.8x	8.5x	
DaVita Inc.	NYSE:DVA	\$	138.57	93.7% - 193.8%		25,579.8		12,338.0		2,492.6	20.2%	3.7%	2.07x	2.02x	10.3x	9.7x	
Encompass Health Corporation	NYSE:EHC	\$	85.64	97.4% - 148.8%		12,110.7		4,956.8		1,041.0	21.0%	8.8%	2.44x	2.28x	11.6x	11.4x	
Fresenius Medical Care AG	XTRA:FME	\$	38.32	72.1% - 118.6%		24,243.5		21,009.7		2,706.3	12.9%	10.8%	1.15x	1.16x	9.0x	6.7x	
HCA Healthcare, Inc.	NYSE:HCA	\$	321.28	93.3% - 148.8%	1	27,756.8		66,716.0		12,869.0	19.3%	5.6%	1.91x	1.83x	9.9x	9.6x	
Pediatrix Medical Group, Inc.	NYSE:MD	\$	7.55	50.3% - 112.7%		1,288.3		1,998.7		189.7	9.5%	3.7%	0.64x	0.64x	6.8x	6.4x	
National HealthCare Corporation	NYSEAM:NHC	\$	108.40	99.0% - 190.6%		1,546.3		1,162.9		99.4	8.5%	na	1.33x	na	15.6x	na	
RadNet, Inc.	NasdaqGM:RDNT	\$	58.92	92.0% - 234.6%		5,591.9		1,657.8		230.8	13.9%	10.6%	3.37x	3.18x	24.2x	20.4x	
Select Medical Holdings Corporation	NYSE:SEM	\$	35.06	98.0% - 164.8%		9,830.4		6,787.9		807.8	11.9%	7.0%	1.45x	1.41x	12.2x	11.3x	
Sonida Senior Living, Inc.	NYSE:SNDA	\$	27.50	80.3% - 399.1%		962.8		239.6		26.4	11.0%	na	4.02x	na	36.5x	na	
Surgery Partners, Inc.	NasdaqGS:SGRY	\$	23.79	52.9% - 107.9%		7,411.6		2,794.5		554.3	19.8%	12.1%	2.65x	2.42x	13.4x	14.6x	
Tenet Healthcare Corporation	NYSE:THC	\$	133.03	93.4% - 260.6%		27,642.4		20,892.0		3,821.0	18.3%	4.0%	1.32x	1.35x	7.2x	7.6x	
The Ensign Group, Inc.	NasdaqGS:ENSG	\$	123.69	97.0% - 139.3%		8,544.5		3,852.7		336.4	8.7%	10.9%	2.22x	2.05x	25.4x	18.1x	
Universal Health Services, Inc.	NYSE:UHS	\$	184.93	95.3% - 154.2%		17,797.9		14,658.0		1,852.9	12.6%	5.2%	1.21x	1.14x	9.6x	8.8x	
		Mear	n	84.7% - 173.6%	\$	17,704.1	\$	10,572.3	\$	1,743.3	14.3%	7.7%	1.95x	1.76x	14.4x	11.5x	
		Medi	ian	93.3% - 154.2%	\$	8,544.5	\$	3,852.7	\$	660.5	12.9%	8.3%	1.91x	1.83x	12.2x	11.1x	

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