

Marquette Intellectual Property Law Review

Volume 22 | Issue 1

Article 6

Celebrating Wisconsin Entrepreneurs: Lessons Learned From Wisconsin Entrepreneurs and Businesses, and Future Prospects for a Healthcare Sector that is Healthcare Reform

Daniel S. Sem

Si Gou

Taleb Aljabban

Follow this and additional works at: <https://scholarship.law.marquette.edu/iplr>

 Part of the [Business Organizations Law Commons](#), [Health Law and Policy Commons](#), [Intellectual Property Law Commons](#), [Law and Society Commons](#), and the [Science and Technology Law Commons](#)

Repository Citation

Daniel S. Sem, Si Gou, and Taleb Aljabban, *Celebrating Wisconsin Entrepreneurs: Lessons Learned From Wisconsin Entrepreneurs and Businesses, and Future Prospects for a Healthcare Sector that is Healthcare Reform*, 22 Marq. Intellectual Property L. Rev. 51 (2018). Available at: <https://scholarship.law.marquette.edu/iplr/vol22/iss1/6>

This Article is brought to you for free and open access by the Journals at Marquette Law Scholarly Commons. It has been accepted for inclusion in Marquette Intellectual Property Law Review by an authorized editor of Marquette Law Scholarly Commons. For more information, please contact megan.obrien@marquette.edu.

CELEBRATING WISCONSIN ENTREPRENEURS™

LESSONS LEARNED FROM WISCONSIN ENTREPRENEURS AND BUSINESSES, AND FUTURE PROSPECTS FOR A HEALTHTECH SECTOR THAT IS DRIVING HEALTHCARE REFORM

DANIEL S. SEM, SI GOU, AND TALEB ALJABBAN*

I. INTRODUCTION	52
II. WISCONSIN'S ENTREPRENEURIAL ECOSYSTEM	54
A. Beyond Beer and Cheese: Major Industries and Exports.....	54
B. Celebrating Wisconsin Entrepreneurs	57
C. Measuring Entrepreneurialism in Wisconsin: National Ranking.....	59
D. Challenges Facing the Wisconsin Entrepreneurial Ecosystem60	
1. Midwestern Culture:	60
2. Decreasing Immigrant Population:	61
3. Low Unemployment:	61
4. More of a Manufacturing and Less of a Technology- Innovation Culture:	62
5. Lack of Access to Capital.	63
E. Opportunities: Resources and Initiatives to Grow the Ecosystem	63
F. Wisconsin Law - Legislation to Encourage Investment in	

* Dean and Professor of Business, Professor of Pharmaceutical Sciences, Concordia University Wisconsin; J.D., Marquette University Law School, Ph.D., University of Wisconsin at Madison, MBA, Marquette University. Daniel Sem is also a co-founder of Bridge to Cures Inc., www.bridgetocures.com [<https://perma.cc/F27G-X74W>], a nonprofit devoted to mentoring healthcare and HealthTech entrepreneurs in Wisconsin. Si Gou is an undergraduate student and Taleb Aljeban is a graduate student at Concordia University Wisconsin, in the Batterman School of Business. The authors would like to thank members of the *Remedium eXchange (Rx) Think Tank*, <http://rxthinktank.org/our-staff/> [<https://perma.cc/33FD-4TQA>], for strategic input on this article, as well as Colin Murdy and Professor Tom Scholz.

Wisconsin Startups	66
G. Future Growth Opportunities – Spotlight on Healthcare and HealthTech.....	68
III. CHALLENGES AND OPPORTUNITIES FOR THE HEALTHTECH INDUSTRY IN WISCONSIN.....	69
A. Wisconsin’s Rich History of Healthcare and HealthTech Innovation	69
B. HealthTech Startups and the Entrepreneurial Ecosystem in Southeast Wisconsin	74
C. The Major Challenge Facing the Healthcare Industry in the United States is Cost and Access.....	76
D. Healthcare Access Challenges for the Poor—Universal Care via Emergency Rooms?	79
E. Healthcare Access Challenges for the Poor—A HealthTech Solution.....	80
F. Healthcare Solutions: Transparent Pricing, Medical Homes and Bundling	81
G. Enabling HealthTech Technology: Consumerizing Healthcare	83
H. Barriers to Healthcare Reform and Consumerization	85
IV. HEALTHTECH-ENABLED HEALTHCARE REFORM: A ROADMAP FOR THE UNITED STATES	86
A. Learning from Best Practices in the Rest of the World.....	86
B. Proposal for a HealthTech-enabled Hybrid and Tiered Healthcare System in the United States	89
C. The Remedium eXchange (Rx) Think Tank—Helping to Consumerize Healthcare.....	91
V. CONCLUSION	92

I. INTRODUCTION

Wisconsin has a rich history of entrepreneurial activity, which is often not appreciated beyond its well-recognized strength in the beer and cheese industries. However, Wisconsin’s entrepreneurial nature has been called into question. Recently, Wisconsin was ranked fiftieth in the United States for startup activity by the Kauffman Foundation.¹ In contrast, Wisconsin ranks at the top

1. Rick Romell, *For Third Straight Year, Wisconsin Ranks Last in Business Startup Activity*, MILWAUKEE J. SENTINEL (May 18, 2017, 7:00 AM), <http://www.jsonline.com/story/money/2017/05/18/third-straight-year-wisconsin-ranks-last-business-startup-activity/328803001> [<https://perma.cc/S6YZ-HPUJ>].

of the country for startups that are local and established business with more longevity.² The first half of this article will review some of the challenges and opportunities that have faced Wisconsin entrepreneurs, and will provide an overview of over 150 Wisconsin companies (**Table 1**), with lessons learned from the entrepreneurial journeys taken by their founders. Multiple industry sectors will be reviewed, including food and beverage, manufacturing, biotechnology and healthcare. Resources (legal, regulatory, mentoring, seed funds) that are being created to improve Wisconsin's entrepreneurial ecosystem will also be presented.

The second half of the article will provide a deeper and forward-looking analysis of one industry sector, HealthTech (**Table 2**), which has significant growth potential, and potential to positively impact healthcare reform. However, the HealthTech industry also faces political, legal, regulatory, and business challenges that could block its growth—a growth that has potential to positively impact the healthcare industry. The history of the healthcare and HealthTech industry in Wisconsin will be reviewed, followed by a summary of the current status and a look forward for the industry. The status of healthcare in the United States, with its high cost and poor access, will be discussed in the context of the current political debate. It will be argued that this political debate is focused more on who is covered than on how to constrain cost and increase quality, and it does not provide a useful discussion of the relative value (and current implementation) of single payer versus competitive markets as a way to control cost and increase quality. A case will be presented that Wisconsin's HealthTech entrepreneurs could provide lower cost and higher quality healthcare, via technology-enabled consumerization of care. Still, challenges exist that relate to privacy issues and barriers to market entry, which may extend beyond intellectual property-based monopoly-power (intended to foster innovation) into the realm of anti-competitive business practices that hinder market-driven improvements in healthcare delivery (e.g., consumer-driven value-based shopping; usage of medical centers of excellence; consumer-centric integrated care). The promise of HealthTech-based consumerization tools that empower and educate consumers at the front-line of healthcare to provide higher quality care at lower cost is presented, along with the legal and regulatory challenges that may need to be addressed for HealthTech entrepreneurs to succeed in this goal.

2. *Larger States Rankings: Main Street Entrepreneurship*, KAUFFMAN FOUNDATION, <http://www.kauffman.org/kauffman-index/rankings?report=startup-activity&indicator=se-rate&type=larger> [<https://perma.cc/RPY6-VQXL>] (last visited Sept. 26, 2017).

II. WISCONSIN'S ENTREPRENEURIAL ECOSYSTEM

An entrepreneurial ecosystem can be defined as a core element of an economic development strategy that focuses on fostering entrepreneurship.³ This could include the people, the supporting institutions and resources, as well as the culture and values of a region. This article begins by providing a historical overview of Wisconsin's entrepreneurial ecosystem and of the Wisconsin entrepreneur.⁴

A. Beyond Beer and Cheese: Major Industries and Exports

As is well-known, Wisconsin's entrepreneurial successes include producing cheese and brewing beer. While these industries are an important aspect of its economy, Wisconsin's largest industries are finance, insurance, real estate, and rental and leasing according to the Bureau of Economic Analysis ("BEA").⁵ Wisconsin has a rich entrepreneurial history and is home to many well-recognized domestic and international companies that were started by Wisconsin entrepreneurs (**Table 1**); and, increasingly it is the source of new and emerging companies in growth in areas like healthcare (e.g., medical devices and diagnostics), biotechnology, and HealthTech (e.g., digital health).⁶

Immigrants from Europe and the Eastern United States settled in Wisconsin during the nineteenth century, with dramatic growth in the period of time leading up to becoming a state in 1848. Wisconsin's population increased thirty-fold, from 11,000 to over 305,000, during the period from 1836–1850.⁷ With this rapid population growth, there was an increased demand for merchandise. Immigrants brought crucial knowledge and experience "of successful *Old World* consumer co-operative techniques . . . supporting co-operative stores," and establishing the concept of a market.⁸ As markets started to flourish, many

3. Daniel Isenberg, *What an Entrepreneurship Ecosystem Actually Is*, HARV. BUS. REV. (May 12, 2014), <https://hbr.org/2014/05/what-an-entrepreneurial-ecosystem-actually-is> [<https://perma.cc/A827-LPKV>].

4. Dan Sem, *Sem: The Wisconsin Entrepreneur*, MILWAUKEE J. SENTINEL (Oct. 18, 2016), <http://www.jsonline.com/story/money/business/onramp/blog/2016/10/18/sem-wisconsin-entrepreneur/92382318> [<https://perma.cc/4NPN-62RW>].

5. *Wisconsin*, U.S. DEP'T OF COM. BUREAU OF ECON. ANALYSIS (Sept. 26, 2017), <https://www.bea.gov/regional/bearfacts/pdf.cfm?fips=55000&areatype=STATE&geotype=3> [<https://perma.cc/9P3V-R5XM>].

6. *Strength of Wisconsin Biohealth*, BIOFORWARD WISCONSIN, <https://www.bioforward.org/strength-wisconsin-biohealth/> [<https://perma.cc/SEP2-6DV3>] (last visited Sept. 26, 2017).

7. *19th-Century Immigration*, WIS. HISTORICAL SOC'Y, https://www.wisconsinhistory.org/tuningpoints/tp-018/?action=more_essay [<https://perma.cc/5ANT-QRLD>] (last visited July 31, 2017).

8. LARRY GARA, *A SHORT HISTORY OF WISCONSIN*, 186 (The State Historical Soc'y of Wis. 1962).

ambitious immigrant entrepreneurs founded their own companies in Wisconsin. As time progressed, Wisconsin established itself with strength as a dominant dairy supplier. According to the United States Department of Agriculture, Wisconsin was ranked second in the United States, with 1.3 million milk cows and \$5 billion in sales in 2012.⁹ Adding to this strength in the dairy industry, Wisconsin is also strong more generally in the food and beverage industry, with dairy-based companies like Sargento Cheese, Palermo's (pizza), and Culver's (frozen custard) being prominent brands (**Table 1**).

Along with the dairy industry, Wisconsin is a significant beer supplier. In one month, Wisconsin produces 868,424 barrels of beer, and sells 622,071 cases and 71,638 kegs of beer for export out of state.¹⁰ Examples of Wisconsin beer companies¹¹ include Miller (now MillerCoors), Leinenkugel, Minhas Craft Brewing, Stevens Point Brewery and more recently, Lakefront Brewery, Sprecher's and New Glarus Brewing. Older brands that have since left Wisconsin include Joseph Schlitz Brewing Company (founded in 1848 and once the largest producer of beer) and Pabst Brewing Company (founded in 1844).

Besides the dairy and beer industries, businesses from different industries thrived in the past two centuries, including construction, energy, finance, healthcare, insurance, law, and manufacturing. Some companies founded in Wisconsin have grown to have an international presence, such as Harley-Davidson, Northwestern Mutual, Alliant Energy, Acuity Insurance, and Brady Corporation (**Table 1**).

9. *Dairy Cattle and Milk Production*, 1 2012 CENSUS OF AGRIC. ACH 12-14 (2014), https://www.agcensus.usda.gov/Publications/2012/Online_Resources/Highlights/Dairy_Cattle_Milk_Prod/Dairy_Cattle_and_Milk_Production_Highlights.pdf [<https://perma.cc/C3N2-5NM9>].

10. *Wisconsin Beer Production Report Returns Posted between 11/1/2016 and 11/30/2016*, STATE OF WIS. DEP'T OF REVENUE, <https://www.revenue.wi.gov/DORReports/bt1001611.pdf> [<https://perma.cc/6UH2-MYLC>].

11. Barbara Zaferos, *Largest Wisconsin Breweries*, THE BUS. JOURNALS (May 27, 2016 5:00 AM), <https://www.bizjournals.com/milwaukee/subscriber-only/2016/05/27/largest-wisconsin-breweries.html> [<https://perma.cc/G8Z6-QKPM>].



Fig. 1. The Wisconsin Entrepreneur Exhibit™ profiles over 150 Wisconsin companies in thirteen major sectors. The profiles (<https://www.cuwbusiness.com/wi-entrepreneur>) tell the stories of the founders and their values.

Manufacturing is the largest employment sector in Wisconsin,¹² and the biggest manufacturing sub-sectors include electric equipment manufacturing (e.g., Rockwell Automation Inc. and Generac Power Systems) followed by paper and paper converting (e.g., Kimberly Clark) and then other sectors such as food and beverage (dairy, agriculture), chemicals (plastics, consumer products) and machinery (machines, metalworking, hardware, foundries, stamping).

Wisconsin also exports a considerable number of products. Wisconsin's

12. John Schmid, *Manufacturing Biggest Single Employment Sector in State*, MILWAUKEE J. SENTINEL (Sept. 26, 2014), <http://archive.jsonline.com/business/as-us-creates-low-wage-jobs-wisconsin-clings-to-manufacturing-b99348747z1-277269841.html> [<https://perma.cc/5QYF-NVN2>].

exports increased to \$19.8 billion in 2010, with the top five export destinations being Canada, Mexico, China, Germany, and Japan.¹³ Manufacturing and machinery represent one of Wisconsin's larger export industries, comprising 27% of total Wisconsin's total exports in 2010, followed by computers and electronics, and transportation equipment.¹⁴ Historically, Wisconsin companies also contributed significantly during World War II. For example, Oshkosh Corporation designed and built eighty vessels for the U.S. effort.

B. Celebrating Wisconsin Entrepreneurs

Wisconsin has a rich history of entrepreneurial successes, but the stories of the formation of those companies – and of the people who founded them – are not available in one location. To address this problem, information on over 150 Wisconsin companies, including their founders' stories and the core values of the companies, is being compiled in a partnership between Concordia University Wisconsin and the Milwaukee County Historical Society,¹⁵ in what is being called the *Wisconsin Entrepreneur Exhibit*TM. The compilation interface is shown in **Fig. 1**, with a synopsis of key information provided in **Table 1**. Wisconsin companies tend to cluster into the sectors shown in **Fig. 1**; but it is noteworthy that the largest sector in terms of numbers of companies is food and beverage, with recognizable brands like Sargento, Palermo's, Sendik's, Johnsonville Foods, Usinger's, MillerCoors, Pabst, Cousins Subs, Sentry Foods, Roundy's (Kroger's, Pick 'n Save in Wisconsin), Oscar Meyer, Penzeys Spices, Hillshire Farms, Organic Valley, Rocky Rococo, and Natural Ovens. The trade organization supporting the food and beverage industry sector in Wisconsin is FaB Wisconsin.¹⁶ The other largest sector is manufacturing and engineering, which includes Harley-Davidson, Hydrite Chemical, Johnson Controls, Kohler, Mercury Marine (Evinrude Outboard Engines), Rexnord, SC Johnson and Trek Bikes, amongst many others. It is noteworthy that Wisconsin can also boast a large number of law firms (Foley, Michael Best, DeWitt Ross and Stevens, Godfrey Kahn, Quarles and Brady) and insurance companies (Acuity, American Family, Northwestern Mutual, Sentry, Thrivent and West Bend Mutual). The trade organization supporting the manufacturing industry sector in Wisconsin is *Wisconsin Manufacturers*

13. WISCONSIN DEP'T OF REVENUE, *Wisconsin's Exports: A Special Report on Wisconsin's Economy*, 1 (2011) <https://www.revenue.wi.gov/DORReports/10exports.pdf> [<https://perma.cc/X3TT-CBZT>].

14. *Id.* at 4.

15. MILWAUKEE CO. HISTORICAL SOC'Y, <https://milwaukeehistory.net/> [<https://perma.cc/H9ZB-FYT7>] (last modified 2018).

16. FAB WISCONSIN, <http://www.fabwisconsin.com> [<https://perma.cc/P8G4-EJRC>] (last modified 2012).

and Commerce.¹⁷ Retail companies include Menards, Kohl's, QuikTrip, Allen Edmonds Shoes, and Florsheim Shoes. This sampling of the larger list of companies in the *Wisconsin Entrepreneur Exhibit*TM illustrates the large number of recognizable brands (companies) that have their origins in Wisconsin and were started by Wisconsin entrepreneurs. A representative profile of a company is shown in **Fig. 2** for Sargento. A survey of the company profiles reveals a common theme of values amongst Wisconsin companies, including trust, honesty, integrity, hard work, and quality. Mission statements reflect these same values, and on occasion also state the centrality of the founders' faith and religious values as drivers of corporate culture, which frequently blend faith, business, and economics.



Sargento is a family owned cheese company dedicated to enhancing long-term stakeholder value. Sustained by an insatiable winning spirit, we are guided by our faith in God. Our central purpose is to be the best at responding to customer and consumer needs for cheese, cheese-based, and other culinary solutions. We will achieve this goal by exceeding expectations for innovation, service, quality, value, taste and convenience. We share results of our success with those that contribute to that success.

LEONARD GENTINE, SR.

FOUNDER,
SARGENTO INC.
FOUNDED 1953

“ Hire good people
and treat them
like family. ”



HISTORY

Originally from Milwaukee, Leonard Gentine Sr. and his wife, Dolores, moved to Plymouth, Wisconsin with a dream to open a funeral home. Developing a consistent business base in a small town proved more problematic than anticipated. The few families employing his services paid cash, an IOU or, on rare occasion, a cow. After nearly two decades of anemic business growth, Leonard remained patient as his trickling cash flow barely supported his family.

With help from a friend - an owner of a cheese company - Leonard ventured into a cheese gift-box business: a side venture intended to subsidize his funeral home business. Surprisingly, the gift-box business eventually evolved into something far greater - a regional cheese company.

Leonard believed in a basic philosophy. "Hire good people and treat them like family." That simple idea, coupled with innovation - a hallmark of the company's growth - and Leonard's entrepreneurial bent, changed the face of the cheese category with scores of ground-breaking products common today, including vacuum packaging, sliced cheese, shredded cheese, easy-open/close packaging and peg bet merchandising in retail stores.

By 2014, eighteen years after Leonard passed away, a profitable Sargento Foods, Inc. posted sales that exceeded a billion dollars in revenues. As a formidable competitor in the cheese industry, offering natural cheese products, cheese sauces, and other culinary solutions, Sargento has dramatically reshaped the cheese industry.

What Leonard Gentine, Sr. achieved in the mid years of his life - how he engaged and energized those around him - is the story of a true entrepreneur. His willingness to place others ahead of himself - treating others as he would want to be treated - left a corporate culture and foundation upon which others could build even greater heights. And following his death, they did.

VALUES

TRUST, HONESTY AND FAIRNESS
Success: us built when working with good people and treating them the way you would like to be treated.

CUSTOMER RESPONSE
Central purpose is to listen to customer reviews and ideas.

QUALITY EXCELLENCE
Every job is a self-portrait of the person who did it.
Autograph your work with excellence

COMMUNITY SUPPORT
Whether its time, talent or treasury, Sargento is a firm believer in helping the community.








Fig. 2. Representative profile of a company in the Wisconsin Entrepreneur ExhibitTM.

C. Measuring Entrepreneurialism in Wisconsin: National Ranking

According to the Kauffman Foundation's annual Index of Startup Activity, Wisconsin ranked last for startup activity.¹⁸ This ranking has led many in Wisconsin to feel concerned about the level of entrepreneurialism in the state and prompted debate on how to improve it. It has also led to discussions about what defines the Wisconsin entrepreneur.

While Wisconsin may rank at the bottom in the Kauffman Index for Startup Activity, it actually ranks second in the country in the Kauffman Foundation's *Index of Main Street Entrepreneurship*, which focuses on local small and established businesses (more than five years old and less than fifty employees), and includes factors such as survival rate of these business.¹⁹ Thus, while Wisconsin may not have the startup churning activity that is observed in states like California, it does appear to excel at building and growing small sustainable businesses that stand the test of time. In this regard, there are many stories of Wisconsin entrepreneurs and companies that have started small but later grew to be widely recognized brands, like Harley-Davidson, Kohl's, Menards, Rockwell Automation, Cousins Subs, Sargento (cheese), Briggs and Stratton, SC Johnson, and Miller,²⁰ to name just a few (see **Table 1** and **Fig. 1**).²⁰

If Wisconsin ranks low in one Kauffman Index and high in another for entrepreneurial business activity, how does one define the Wisconsin entrepreneur and what he or she is good at? An entrepreneur can be defined as a person who is viewed as an innovator and who creates new industries and precipitates major structural changes in the economy.²¹ Entrepreneurial activity is enterprising human action in pursuit of the generation of value, through the creation or expansion of economic activity, by identifying and exploiting new products, processes, or markets.²² In the words of Todd Teske, CEO of Briggs and Stratton, the innovation (that drives entrepreneurialism) can be defined as "customer-driven problem solving."²³ In a recent conference focused on "*Celebrating the Wisconsin Entrepreneur*," an expert panel

18. See KAUFFMAN FOUNDATION, *supra* note 2.

19. 2016 *Main Street Reports*, KAUFFMAN FOUNDATION, <http://www.kauffman.org/kauffman-index/reporting/main-street> [<https://perma.cc/8JGW-BUGR>] (last visited Sept. 26, 2017).

20. *Wisconsin Entrepreneur Exhibit*, CONCORDIA BUS., <https://www.cuwbusiness.com/wien-entrepreneur> [<https://perma.cc/T4MC-3RRH>].

21. MARK CASSON, *THE OXFORD HANDBOOK OF ENTREPRENEURSHIP 3* (Mark Casson et al. eds., 2006).

22. Nadim Ahmad and Anders Hoffman, *A Framework for Addressing and Measuring Entrepreneurship*, ENTREPRENEURSHIP INDICATORS STEERING GROUP (Nov. 20, 2007), <http://search.oecd.org/std/business-stats/39629644.pdf> [<https://perma.cc/GMS2-B8LH>].

23. *Wisconsin International Trade Conference*, METRO. MILWAUKEE ASS'N OF COMMERCE, <http://web.mmac.org/events/Wisconsin-International-Trade-Conference-1117/details> [<https://perma.cc/2YEL-VMQK>] (last visited Sept. 29, 2017).

attempted to define Wisconsin entrepreneurs, and how they differ from their coastal counterparts.²⁴ Wisconsin entrepreneurs were described as “innovative, capital efficient, hard-working, values-driven, humble and reliable,” and it was noted that these traits are valuable in creating sustainable businesses that last; but they may work against the creation of very high-risk and high-reward startups that need large amounts of venture capital to scale. It was noted also that a trait of the Wisconsin entrepreneur is humility, which is a virtue. But, a potential down-side was noted: “the panel and audience agreed humility is another great virtue—but it cuts both ways, because you need to do selling to attract investment and then customers.”²⁵ While the Wisconsin entrepreneur may be somewhat risk averse and may not excel at sales (and, in the extreme, hype and puffery), it was observed “the Wisconsin entrepreneur is more enduring and robust—often more the distance-runner than the sprinter.”²⁶ Perhaps this is why the Wisconsin entrepreneur is a national leader in Main Street Entrepreneurship.²⁷

D. Challenges Facing the Wisconsin Entrepreneurial Ecosystem

The Kauffman Foundation survey data make it clear that while Wisconsin is strong in Main Street Entrepreneurship, challenges remain for the creation of high-risk and high-reward scalable startups, the kind that are funded by venture capital. While the causes of this entrepreneurial culture dichotomy are not known, several are proposed below.

1. Midwestern Culture:

As discussed in the previous section, the expert panel at the *Celebrating Wisconsin Entrepreneur*TM event concluded that Wisconsin entrepreneurs typically embrace hard work, integrity, delivering on promises without excessive hype or hyperbole, being reliable, and acting with humility coupled to a commitment to values. This assessment is further supported by the research that went in to profiling the over 150 Wisconsin-based companies in the *Wisconsin Entrepreneur Exhibit*TM (**Fig. 1; Table 1**). These are certainly admirable traits in business and in life. However, the panel also felt that this humility exhibited in the Midwest, which is typically coupled to an aversion to “selling,” along with an aversion for pursuit of high-cost high-risk ventures (seemingly opposed to being “reliable”)—while admirable in some situations (e.g., *Index of Main Street Entrepreneurship*)—can be problematic in starting

24. Sem, *supra* note 4.

25. *Id.*

26. *Id.*

27. See KAUFFMAN FOUNDATION, *supra* note 18.

new companies with high growth potential. This mindset often hinders the risk taking and “selling” that is needed to start and finance a very high-risk and high-reward scalable venture, via a process that is sometimes coupled to a high level of uncertainty associated with outcomes for the venture. What might be viewed as bold and visionary in California is sometimes viewed as foolish and risky puffery in Wisconsin. The approach in Wisconsin, rather, is to bootstrap a business and grow it incrementally as revenue grows, thereby justifying the expansion.

2. Decreasing Immigrant Population:

Wisconsin has a rich history of immigrant entrepreneurs, as can be seen after perusal of the founders of some of its most iconic companies (**Table 1** and **Fig. 1**). Immigrants are important to Wisconsin’s entrepreneurial ecosystem because they are statistically twice as likely to start a small business relative to non-immigrants, perhaps because they have by necessity overcome the risk-aversion challenge that plagues all startup entrepreneurs; and immigrants provide a diversity which an entrepreneurial ecosystem needs. As evidence of this, consider Wisconsin’s business creation successes in the early twentieth century, which came at a time when roughly twenty-five percent of the state’s population was born overseas.²⁸ The extent of immigrant migration to (and retention in) Wisconsin is much lower now than a century ago and is less than in the coastal United States, where immigrant entrepreneurs were often first attracted by the quality education offered by the high density of top U.S. universities in those locations.

3. Low Unemployment:

While a good thing, low unemployment means people are often (overly) satisfied with their current job and the status quo. Sometimes people pursue entrepreneurial ventures because they have no other options (i.e., the risk of taking “the leap” is lower in terms of opportunity cost, in a “what do I have to lose” situation). Wisconsin’s unemployment rate recently dropped to a seventeen-year low of 3.2%, well below the 9.2% peak during the Great Recession.²⁹ The U.S. unemployment rate is 4.4%.³⁰ Historically, Wisconsin’s unemployment rate is lower than the national average.³¹ While unemployment

28. *Wisconsin’s a Bottom-Feeder in Startup Index. Here’s Why, and How it Can Improve*, WIS. STATE J. (May 19, 2017), http://host.madison.com/wsj/business/wisconsin-s-a-bottom-feeder-in-startup-index-here-s/article_ec612faf-03fd-5b93-968c-730b427e8eed.html [https://perma.cc/2CYF-2ASU].

29. *Id.*

30. *Id.*

31. *Id.*

is certainly not a solution to Wisconsin's dearth of startups, it is worth noting that as a result of the churning that occurs when large companies with highly skilled workforces have layoffs, skilled yet unemployed workers often start new companies—as has been the case with the downsizing of Michigan's pharmaceutical industry.³²

4. More of a Manufacturing and Less of a Technology-Innovation Culture:

The major Wisconsin industries that are driving economic growth are in manufacturing, and some related “old growth” industries.³³ The state can attribute only 15% of its economic output to technology-innovation-driven industries, while the nation on average gains 18.8% of its economic output from technology-innovation-driven industries; states like California and Massachusetts rank even higher.³⁴ While Wisconsin's industries have historically been focused on manufacturing, it is now making the transition to advanced manufacturing—which relies more on technology and innovation.³⁵ Part of what attracts and retains technology-innovation startups are first class educational institutions and an educated workforce. While Wisconsin does have excellent universities and technical colleges, they are not in as high a density as in states with larger technology-innovation hubs (e.g., Massachusetts and California). Additionally, there is a slightly lower level of post-secondary education in the workforce in Wisconsin compared to the national average. Wisconsin adults age twenty-five and older with only a high school degree number 33.6%, compared to the national average of 28.4%.³⁶ However, Wisconsin does have a growing technology-innovation industry base. Furthermore, a Wisconsin Economic Development Corporation (“WEDC”) report notes that “Madison's life-sciences and biotechnology industries are seen as being among the state's showcase industries.”³⁷ Furthermore, the recent announcement of Foxconn locating in Wisconsin is expected to grow the state's advanced manufacturing capability—as long as there is enough of a skilled

32. Jay Greene, *Life After Pfizer: A Decade Later, Michigan Pharmaceutical Companies have Found Paths to Growth*, MODERN HEALTHCARE (May 15, 2017), <http://www.modernhealthcare.com/article/20170515/NEWS/170519908> [<https://perma.cc/4MS3-YDJZ>].

33. John Schmid, *Wisconsin Economy Stuck in Old Growth Industries*, MILWAUKEE J. SENTINEL (June 17, 2013), <http://archive.jsonline.com/business/wisconsin-economy-stuck-in-old-growth-industries-b9934100z1-211923141.html> [<https://perma.cc/R3BJ-MVPD>].

34. *Id.*

35. *The Rise of Skilled Manufacturing*, WIS. HISTORICAL SOC'Y, https://www.wisconsinhistory.org/turningpoints/tp-044/?action=more_essay [<https://perma.cc/9A82-RYEK>] (last visited Sept. 29, 2017).

36. Schmid, *supra* note 30.

37. *Organizational Reports*, WISCONSIN ECON. DEV. CORP., <http://inwisconsin.com/inside-wedc/transparency/reports/> [<https://perma.cc/9SZW-Q64T>] (last visited Aug. 27, 2017).

workforce in Wisconsin to support this kind of technology-innovation.³⁸

5. Lack of Access to Capital.

A serious concern for Wisconsin-based startups is a lack of venture capital that is needed for the more high-risk, high-reward scalable startups.³⁹ Wisconsin companies raised slightly over \$223 million in 2016, which is less than 1% of the \$69 billion raised nationally,⁴⁰ predominantly in California, Massachusetts, and New York; but here again there have been improvements in the last few years. Wisconsin Technology Council's policy papers⁴¹ indicate there have recently been increasing investments, which will work to dramatically support and improve entrepreneurial activity in Wisconsin.

E. Opportunities: Resources and Initiatives to Grow the Ecosystem

While Wisconsin has recognized strengths in Main Street Entrepreneurship, it has weaknesses in overall Startup Activity, according to the Kauffmann Foundation indices. However, progress is being made in building an entrepreneurial ecosystem to better support Wisconsin startups. Wisconsin's best example of an entrepreneurial hub is Madison, a city that has built a national reputation as a center for technological innovation and entrepreneurship.⁴² While Madison may be the most well-known hub of entrepreneurial startup activity in Wisconsin, there are initiatives that are having an impact outside of Madison, in southeast Wisconsin, and across the state. Some of these initiatives and organizations that are working to build and

38. Rick Barrett, *Rockwell Automation partners with Foxconn on Wisconsin Plant Technologies*, MILWAUKEE J. SENTINEL (July 28, 2017), <http://www.jsonline.com/story/money/2017/07/28/rockwell-automation-partners-foxconn-wisconsin-plant-technologies/519756001> [<https://perma.cc/5GL5-FTZH>]; Issie Lapowsky, *The Tech Skills Gap Will Test Foxconn's New Wisconsin Factory*, WIRED (July 26, 2017 6:41 PM), <https://www.wired.com/story/foxconn-wisconsin-us-tech-skills-gap> [<http://perma.cc/QX99-NWTL>].

39. Kathleen Gallagher, *Alarm Sounded Over Wisconsin's Lack of Start-ups, Venture Capital*, MILWAUKEE J. SENTINEL (June 01, 2014), <http://archive.jsonline.com/business/alarm-sounded-over-wisconsins-lack-of-start-ups-venture-capital-b99279993z1-261467221.html> [<https://perma.cc/8AFP-K5ES>].

40. Jeff Buchanan, *Investors Reboot Wisconsin Venture Capital Association*, XCONOMY (Mar. 22, 2017), <http://www.xconomy.com/wisconsin/2017/03/22/investors-reboot-wisconsin-venture-capital-association> [<https://perma.cc/X3BX-FLM6>].

41. *WTC 2017 Whitepapers*, WISCONSIN TECH. COUNCIL, <http://wisconsintechcouncil.com/publications/wtc-white-papers> [<https://perma.cc/M3CC-3LMM>].

42. Alex Paul & Peter Engelke, *Madison, Wisconsin: How a City Becomes an Innovation Hub*, ATLANTIC COUNCIL (June 16, 2016), <http://www.atlanticcouncil.org/blogs/futuresource/madison-wisconsin-how-a-city-becomes-an-innovation-hub> [<https://perma.cc/PMP7-2H8G>].

improve the entrepreneurial ecosystem include: Gener8tor,⁴³ gBETA,⁴⁴ WEDC,⁴⁵ MEDC,⁴⁶ Startup MKE,⁴⁷ The Commons,⁴⁸ and BioForward.⁴⁹ Gener8tor is a startup accelerator that has offices in Madison, Milwaukee, and Minneapolis, and was recently ranked among the top 16 accelerator programs in the United States by the Seed Accelerator Rankings project.⁵⁰ It is one of only four such programs in that ranking that do not have a presence in California.

As nucleating hubs of innovation, Wisconsin has excellent universities, one of which is University of Wisconsin–Madison (UW–Madison). U.S. News & World Report ranked UW–Madison the tenth Best Public College,⁵¹ and it is also ranked third highest for research and development spending.⁵² Medical College of Wisconsin, Marquette University and UW–Milwaukee also have very large and growing research and development programs integrated into the educational experience. As Nelson Mandela said, “[e]ducation is the most powerful weapon which you can use to change the world.”⁵³ Universities, of which there are many in Wisconsin, equip students with the necessary knowledge and skills to succeed in industry, and to be startup innovators. To successfully start and grow a company, there needs to be a visionary leader and

43. *Funding*, GENER8TOR, <https://www.gener8tor.com/statistics> [<https://perma.cc/89NG-ESFN>] (last visited Sept. 29, 2017).

44. GBETA, <https://www.gbетаaccelerator.com> [<https://perma.cc/YYL2-CLSW>] (last visited Sept. 29, 2017).

45. *Start, Relocate or Grow Your Business*, IN WISCONSIN, <http://inwisconsin.com> [<https://perma.cc/XF8L-MQ4N>] (last visited Sept. 29, 2017).

46. *M7 Venture Capital Fund*, MEDCONLINE, http://www.medconline.com/M7_Venture_Capital_Fund.html [<https://perma.cc/63B5-XKVH>] (last visited Sept. 29, 2017).

47. STARTUP MILWAUKEE, <https://www.startupmke.org/> [<https://perma.cc/94GQ-N2F8>] (last visited Sept. 29, 2017).

48. THE COMMONS, <http://www.thecommonswi.com/> [<https://perma.cc/Z7YC-CC64>] (last visited Sept. 29, 2017).

49. BIOFORWARD WISCONSIN, <https://www.bioforward.org/> [<https://perma.cc/MDS8-5579>] (last visited Sept. 29, 2017).

50. Melanie Lawder, *Gener8tor Again Named as One of Nation's Best Startup Accelerators*, MILWAUKEE BUS. J. (June 6, 2017, 11:42 AM), <https://www.bizjournals.com/milwaukee/news/2017/06/06/gener8tor-again-named-as-one-of-nations-best.html> [<https://perma.cc/Z8N9-TJGC>].

51. Kari Knutson, *UW-Madison Ranked 10th Best Public College by U.S. News & World Report*, UNIV. OF WIS. MADISON NEWS (Sept. 12, 2016), <http://news.wisc.edu/uw-madison-ranked-10th-best-public-college-by-u-s-news-world-report> [<https://perma.cc/M5HU-VPWH>].

52. *Highest Research & Development in 2017*, BEST COLLEGES.COM, <http://www.bestcolleges.com/features/colleges-with-highest-research-and-development-expenditures/> [<https://perma.cc/85YN-U62R>] (last visited Sept. 29, 2017).

53. Nelson R. Mandela, Speech at the Launch of Mindset Network: *Lighting Your Way to a Better Future* (July 16, 2003), NELSON MANDELA FOUNDATION, http://db.nelsonmandela.org/speeches/pub_view.asp?pg=item&ItemID=NMS909&txtstr=education%20is%20the%20most%20powerful [<https://perma.cc/U858-ELJ4>].

a team of people skilled in the relevant fields. Wisconsin has the universities to produce this talent, as long as some of them stay in Wisconsin.

In addition to having the right people, capital is needed to start a company. For a larger company with a bolder (and more expensive) vision, venture capital often plays an essential role. Bob Zider summarized the issue as follows: “the idea [of venture capital] is to invest in a company’s balance sheet and infrastructure until it reaches a sufficient size and credibility,”⁵⁴ and that venture capital allows new companies to grow and scale. Recently, the *Wisconsin Venture Capital Association*, which had been dormant since the recession of 2008, has been reformed, and could provide much-needed support to grow venture capital in Wisconsin.⁵⁵ According to the *Madison Region Economic Partnership*, at least 128 Wisconsin early stage companies raised investment capital, and several new venture funds were launched recently, including American Family Ventures and HealthX Ventures.⁵⁶

The *Wisconsin Venture Capital Association*, mentioned above, is a consortium of venture capital, angel and corporate investors, and was recently formed to begin addressing⁵⁷ the capital access problem in Wisconsin.⁵⁸ In addition to Angel investors and Angel networks (e.g., Silicon Pastures;⁵⁹ Golden Angels;⁶⁰ BrightStar;⁶¹ Wisconsin Super Angel Fund)⁶² there are a growing number of Wisconsin-based venture capital sources:⁶³

Venture Investors⁶⁴

HealthX Ventures⁶⁵

54. Bob Zider, *How Venture Capital Works*, HARV. BUS. REVIEW (November-December 1998), <https://hbr.org/1998/11/how-venture-capital-works> [<https://perma.cc/WH55-T8CM>].

55. Buchanan, *supra* note 39.

56. *Venture Capital*, MADISON REGION ECON. P'SHIP, <http://madisonregion.org/start-locate-expand/find-capital/venture-capital/> [<https://perma.cc/HFU8-5PFL>] (last visited Sept. 7, 2017).

57. Buchanan, *supra* note 39.

58. *Id.*

59. *Who We Are*, SILICON PASTURES, <http://siliconpastures.com/> [<https://perma.cc/9L7M-AVFR>] (last visited Sept. 29, 2017).

60. GOLDEN ANGELS INV'RS, <http://www.goldenangelsinvestors.com/> [<https://perma.cc/XD G2-W7B7>] (last visited Sept. 29, 2017).

61. *BrightStar Wisconsin: Job Creation through Capital Donation*, BRIGHTSTAR WISCONSIN, <http://www.brightstarwi.org> (last modified 2018).

62. WISCONSIN SUPER ANGEL FUND, L.P., <http://wsafund.com/> [<https://perma.cc/RXG5-4EQV>] (last visited Sept. 29, 2017).

63. *Startup Funding Guide*, STARTUP MILWAUKEE, <https://www.startupmke.org/funding/> [<https://perma.cc/2YB9-EBBA>] (last visited Sept. 29, 2017).

64. VENTURE INV'RS, <https://ventureinvestors.com/> [<https://perma.cc/397J-FUEY>] (last visited Sept. 29, 2017).

65. *About HealthX Ventures*, HEALTHX VENTURES, <https://www.healthxventures.com/#about> [<https://perma.cc/J77B-Q7VX>] (last visited Sept. 29, 2017).

4490 Ventures⁶⁶

Baird Venture Partners⁶⁷

CMFG Ventures⁶⁸

Capital Midwest Funds⁶⁹

Northwestern Mutual Future Investors⁷⁰

American Family Ventures⁷¹

Gary Comer Inc. (GCI)⁷²

CSA Partners⁷³

37Celsius,⁷⁴ for later stage companies.

Finally, Wisconsin's nationally recognized accelerator program, Gener8tor, has already invested in fifty-four companies that have gone on to secure over \$120 million in follow-on capital.⁷⁵ While Wisconsin still ranks last for startup activity, this will hopefully change as an increasing number of venture capital sources emerge for Wisconsin startups, and as the state itself enacts legislation to further encourage startup investments.

F. Wisconsin Law - Legislation to Encourage Investment in Wisconsin Startups

Legislation to help foster startup formation in Wisconsin includes the 2013 Wisconsin Act 41,⁷⁶ which provides a source of startup capital via creation of the Badger Fund-of-Funds.⁷⁷ Act 41 created Wisconsin Statute section 16.295,

66. *4490 Ventures Forward Funding*, 4490VENTURES, <http://4490ventures.com/> [https://perma.cc/Q645-Y2SH] (last visited Sept. 29, 2017).

67. *Sector Focus*, BAIRD CAPITAL, <http://www.bairdcapital.com/sector-expertise/baird-capital-sectors.aspx> [https://perma.cc/2M57-CKTV] (last visited Sept. 29, 2017).

68. CMFG VENTURES, <http://www.cmfgventures.com/> [https://perma.cc/YB4Y-6YUX] (last visited Sept. 29, 2017).

69. *Overview*, CAPITAL MIDWEST, <http://www.capitalmidwest.com/> [https://perma.cc/VHM5-HZET] (last visited Sept. 29, 2017).

70. *Future Ventures*, NW. MUT. FUTURE VENTURES, <http://nmfutureventures.com/> [https://perma.cc/GSM2-X49T] (last visited Sept. 29, 2017).

71. *Fueling Entrepreneurs' Dreams*, AM. FAMILY VENTURES, <http://amfamventures.com/> [https://perma.cc/R7S8-4AH3] (last visited Sept. 29, 2017).

72. *About Us*, GCI, <http://www.gcionline.com/about/> [https://perma.cc/2ZCL-FTHD] (last visited Sept. 29, 2017).

73. *Funding Innovation*, CSA PARTNERS, <http://csapartners.com/> [https://perma.cc/T7AR-FLLQ] (last visited Sept. 29, 2017).

74. 37CELSIUS CAPITAL PARTNERS, <http://www.37celsiuscapital.com> [https://perma.cc/8JUU-V225] (last modified 2017).

75. *Funding*, *supra* note 40.

76. Wisconsin Act 41, WIS. STAT. §§ 16.295, 20.505(1)(fm), 25.17(72) (2013–2014).

77. *Our Partners*, IDEAFUND OF LA CROSSE, <https://www.ideafundvc.com/people> [https://perma.cc/LV82-B6SE] (last visited Oct. 2, 2017); Badger Fund of Funds (Venture Capital)

to “establish and administer a program for the investment of moneys in venture capital funds that invest in businesses located in this state.”⁷⁸ According to the statute, the state provides \$25 million to the Fund-of-Funds, which is to be managed by an investment manager that provides \$300,000 of their own funds.⁷⁹ The state funds are leveraged since they are to be matched 2:1 by private funds.⁸⁰ This is therefore a public-private partnership, where the state of Wisconsin invests along-side private investors, including (to date) the Winnebago Seed Fund (\$4 million), the Idea Fund of La Crosse (\$8.1 million) and Rock River Capital Partners (\$6 million).⁸¹ It is the experienced private investors who are co-investing and making the investment decisions, rather than the government.

Other Wisconsin legislation that was created to foster Wisconsin’s startup investment includes the investor tax credits that were created by Act 255 in 2004 and revised in 2013.⁸² The statute that was enacted by Act 255, Wisconsin Statute Section 238.15, is called the “Early Stage Business Investment Program” and contains within it the “angel investor tax credit.”⁸³ This tax credit encourages investment in Wisconsin startups and applies only to investments in Wisconsin-based companies with less than 100 employees and that have raised less than \$10 million in private equity capital.⁸⁴ Businesses that meet these and other criteria specified in the statute are said to have Qualified New Business Venture (“QNBV”) certification, and are then eligible for the angel investor tax credit, which is 25% of the equity investment.⁸⁵

One final piece of legislation that Wisconsin has passed to nurture startup activity is Act 52, which was passed to create the state counterpart to the federal

Annual and Quarterly Reports, <https://doa.wi.gov/Pages/StateFinances/VentureCapitalQuarterlyandAnnualReports.aspx> [<https://perma.cc/7E2F-VSRK>] (last visited Oct 2, 2017).

78. WIS. STAT. § 16.295.

79. Jeff Engel, *WI’s Badger Fund of Funds Unlocks State Money, Eyes First Recipients*, XCONOMY (Mar. 3, 2015), <http://www.xconomy.com/wisconsin/2015/03/03/wis-badger-fund-of-funds-unlocks-state-money-eyes-first-recipients> [<https://perma.cc/77FM-MJ8L>].

80. *Investing in Next-Generation Jobs*, WISCONSIN TECHNOLOGY COUNCIL 4 (2015), <http://wisconsintechcouncil.com/wp-content/uploads/2015/09/2015WhitePapers-Web.pdf> [<https://perma.cc/U9FW-5HAF>]; WIS. STAT. § 16.295 (2015–2016).

81. Jeff Buchanan, *Winnebago Seed Fund, Part of Badger Fund of Funds, Raises \$11M*, XCONOMY (June 2, 2017), <http://www.xconomy.com/wisconsin/2017/06/02/winnebago-seed-fund-part-of-badger-fund-of-funds-raises-11m/> [<https://perma.cc/9RWX-NPLB>].

82. WISCONSIN TECH. COUNCIL, *supra* note 78.

83. WIS. STAT. § 238.15 (2013–2014).

84. WIS. STAT. § 238.15 (2015–2016).

85. *Qualified New Business Venture Program*, WISCONSIN ECON. DEV. CORP., <http://inwisconsin.com/entrepreneurs/assistance/qualified-new-business-venture/> [<https://perma.cc/Y9GC-VYSR>] (last visited Oct. 2, 2017).

JOBS Act,⁸⁶ which enabled crowdfunding. Crowdfunding is the selling of unregistered private securities on the internet, subject to regulatory restrictions. The Securities and Exchange Commission (“SEC”), a federal agency, provides guidance on and oversight of the process of crowdfunding.⁸⁷ Any such transactions are typically subject to both federal and state laws. The relevant Wisconsin statute resulting from Act 52, allows a startup to issue up to \$1 million in securities in a twelve-month period via the crowdfunding exemption, and \$2 million if the startup does a generally accepted accounting principles (“GAAP”) compliant audit.⁸⁸ However, any single investor cannot invest more than \$10,000, unless they are an *accredited investor*, as defined by federal law,⁸⁹ or a *qualified investor*, as defined by state law.⁹⁰ While crowdfunding is an interesting source of startup capital for Wisconsin companies, the bigger impact on our startup ecosystem is likely to come from legislation that fosters larger and more traditional equity investments, like Act 41 and Act 255. Meanwhile, it is clear that state government is doing what it can to encourage investment in Wisconsin startups, whether it be from individuals (Act 52), or from angel and venture capital investors (Acts 41 and 255).

G. Future Growth Opportunities – Spotlight on Healthcare and HealthTech

Wisconsin’s entrepreneurial ecosystem is showing signs of growth on other fronts, beyond the traditional manufacturing and advanced manufacturing sectors. One high-growth area of technology-based startup growth that is particularly promising, in part due to the tremendous success of Epic Systems (Madison, WI),⁹¹ are the healthcare and HealthTech sectors.⁹² This sector is

86. Jumpstart Our Business Startups Act, Pub. L. No. 112-106, 126 Stat. 306 (2012) (codified as amended in scattered sections of 15 U.S.C.).

87. Crowdfunding, 80 Fed. Reg. 71, 387 (Nov. 16, 2015) (to be codified in scattered sections of 17 C.F.R.).

88. WIS. STAT. § 551.202(26)(c)(1)(b) (2015–16); AICPA.ORG, *Generally Accepted Auditing Standards*, <https://www.aicpa.org/Research/Standards/AuditAttest/DownloadableDocuments/AU-00150.pdf> [<https://perma.cc/WPQ5-43GD>] (last visited, Apr. 14, 2018).

89. 17 C.F.R. § 230.501(a) (2017).

90. WIS. STAT. § 551.202(26)(d).

91. EPIC, <http://www.epic.com/> [<https://perma.cc/MH8C-45JC>] (last visited Sept. 29, 2017); Milt Freudenheim, *Digitizing Health Records, Before It Was Cool*, THE N.Y. TIMES (Jan. 14, 2012), <http://www.nytimes.com/2012/01/15/business/epic-systems-digitizing-health-records-before-it-was-cool.html?mcubz=0> [<https://perma.cc/F62G-SR9T>].

92. Jeff Engel, *Madison’s HealthTech Cluster: The Rise of Epic and Everybody Else*, XCONOMY (Aug. 17, 2015), <http://www.xconomy.com/wisconsin/2015/08/17/madisons-healthtech-cluster-epic-everybody-else/#> [<https://perma.cc/4BG3-7M5Y>]; *Health Care in Wisconsin, Part 1: Business Ecosystem Helps Foster Health Technology Success*, WISCONSIN ECON. DEV. CORP. (June 8, 2016), <http://inwisconsin.com/entrepreneurs/launch-blog/health-care-in-wisconsin-part-1-business-ecosystem-helps-foster-health-technology-success> [<https://perma.cc/2QBL-3382>]; Brian Lee, *Panel:*

supported by the industry trade organization BioForward,⁹³ which broadly supports the biohealth industry, including digital health, medical devices and diagnostics, biotech, and biopharmaceuticals. A recently developed resource in southeast Wisconsin to further assist healthcare and HealthTech entrepreneurs is Bridge to Cures,⁹⁴ which sponsors the healthcare innovation pitch event, that provides business, regulatory, and intellectual property mentoring to healthcare and HealthTech innovators, while also connecting them to sources of seed and venture capital funds.⁹⁵

Why is HealthTech the sector to watch? Many believe it is well-positioned to transform a \$3 trillion healthcare industry, and it may reshape how healthcare is delivered in the United States.⁹⁶ With the success of Wisconsin-based Epic Systems (which captured 26% of the U.S. hospital market for EMRs, Electronic Medical Records) behind us as a state, the next generation of HealthTech innovators in Wisconsin are working on the next generation of HealthTech startups.⁹⁷

III. CHALLENGES AND OPPORTUNITIES FOR THE HEALTHTECH INDUSTRY IN WISCONSIN

A. Wisconsin's Rich History of Healthcare and HealthTech Innovation

Wisconsin's history of innovation in the food and beverage industry sector as well as in manufacturing (and now advanced manufacturing) is impressive, but it is also strong in the areas of healthcare and HealthTech (e.g., digital health). Prominent companies in this sector, now, include Epic, Aurora, Ascension, Froedtert/MCW, Covance, Promega, GE Healthcare (once headquartered in, but not started in, Wisconsin), TomoTherapy, Roche NimbleGen, Dohmen Life Sciences, Cambridge Major Labs (now Alchemy),

WI Ahead in Health Tech, Startup and Tech News, MADISON STARTUPS (May 19, 2015), <http://www.madisonstartups.com/panel-wi-ahead-in-health-tech/> [https://perma.cc/B8W5-8NUX].

93. BIOFORWARD WISCONSIN, www.bioforward.org [https://perma.cc/8AHX-5HNZ] (last visited Oct. 01, 2017).

94. BRIDGES TO CURES, www.bridgetocures.com [https://perma.cc/VV6D-VPM3] (last visited Oct. 01, 2017).

95. Jeff Engel, *Bridge to Cures Eyes More Funds, Bigger Programs to Nurture Startups*, XCONOMY (Dec. 24, 2015), <http://www.xconomy.com/wisconsin/2015/12/24/bridge-to-cures-eyes-more-funds-bigger-programs-to-nurture-startups/> [https://perma.cc/6ZJJ-HMT4].

96. Gemma Acton, *Tech Set to Transform \$3 Trillion Health Care Industry*, CNBC (Jan. 17, 2017 11:41 AM), <https://www.cnbc.com/2017/01/17/tech-set-to-transform-3-trillion-health-care-industry.html> [https://perma.cc/U8XF-SEAD] (last visited Sep 29, 2017).

97. Engel, *supra* note 89; Lee, *supra* note 89; Heather Landi, *Report: Epic, Cerner and Athenahealth Lead Small Hospital EHR Adoption*, HEALTHCARE INFORMATICS (May 13, 2017), <https://www.healthcare-informatics.com/newsem/ehr/report-epic-cerner-and-athenahealth-lead-small-hospital-ehr-adoption> [https://perma.cc/F79T-PFAM].

Access HealthNet, and SmartChoice MRI.

Wisconsin companies are leaders in healthcare innovation, but they face challenges. Herzlinger analyzed the difficulties that face healthcare innovation, including funding limitations, policy restrictions, accountability and more,⁹⁸ but in spite of these challenges, Wisconsin innovators and companies have many great achievements which contributed significantly to healthcare and technological advancement. These are reviewed below.

Examples of healthcare innovators include many biomedical researchers at the University of Wisconsin–Madison, such as Frederic E. Mohs. Mohs, while a medical student at UW–Madison, developed the micrographic surgical technique that was later widely used to remove skin cancer lesions.⁹⁹ Ralph M. Waters, recruited to UW–Madison in 1927, established an anesthesia training program, which improved anesthesia practice throughout the world.¹⁰⁰ Additionally, researchers Hart and Humphrey, along with E.V. McCollum and Harry Steenbock, did animal feeding experiments to discover essential nutrients present in corn but deficient in the other grains, and after years of research, characterized these unknown nutrients as *vitamins*.¹⁰¹ In addition to participating in the pioneering work that led to the discovery of vitamins, Harry Steenbock also discovered the connection between sunlight and calcium levels in blood, based on studies of goats that lacked proper calcium levels when kept indoors in the winter.¹⁰² After further experiments on rats, this led to Steenbock’s discovery and patenting of the process for using UV light to activate vitamin D—a process subsequently used to treat most of the milk sold in the United States, and a discovery that contributed to the elimination of rickets as a major medical problem.¹⁰³ As a result, the Wisconsin Alumni Research Foundation (“WARF”) was created in 1925 to commercialize

98. Regina E. Herzlinger, *Why Innovation in Health Care Is So Hard*, HARV. BUS. REV. (May 2006), <https://hbr.org/2006/05/why-innovation-in-health-care-is-so-hard> [<https://perma.cc/3ZTF-8Q4C>].

99. Nicholas A. Ross, et al., *Frederic E. Mohs, M.D. (1910-2002): Physician and Innovator*, DEP’T OF SURGERY, GIBBON SOCIETY HISTORICAL PROFILES (2015), <http://jdc.jefferson.edu/gibbonsocietyprofiles/43> [<https://perma.cc/S6UE-8Q9G>].

100. Donald Caton, *Ralph M. Waters, M.D., and Professionalism in Anesthesiology: A Celebration of 75 Years*, 98 ANESTHESIOLOGY 286, abstract (2003), <http://anesthesiology.pubs.asahq.org/article.aspx?articleid=1943820> [<https://perma.cc/P4CM-PWTM>].

101. *Vitamin-Finding Feces Bucket*, WIS. HISTORICAL SOC’Y (May 29, 2008), <https://www.wisconsinhistory.org/Records/Article/CS2635> [<https://perma.cc/M3X5-7UUP>].

102. Hector F DeLuca, *History of the Discovery of Vitamin D and its Active Metabolites*, 3 BONEKEY REPORTS 1, 2 (Jan. 2014), <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3899558> [<https://perma.cc/KT52-6RWU>].

103. *Id.*

Steenbock's invention of this method for activating vitamin D in milk.¹⁰⁴ At the time, WARF was a pioneering concept, being created to patent and commercialize faculty research to generate money to support more faculty research.¹⁰⁵ This vision grew far beyond initial expectations, with WARF now being one of the country's premier university technology transfer and commercialization foundations supporting university research and innovation. In 2014, WARF gave UW–Madison a \$58 million grant, 17% of its \$342 million annual revenue, to support research and related activities.¹⁰⁶ The drug Warfarin (derived from dicoumarol), discovered at UW–Madison by Dr. Karl Link and opening the door to a new class of blood anticoagulants, was named after WARF.¹⁰⁷

104. ARTHUR HOVE, *THE UNIVERSITY OF WISCONSIN: A PICTORIAL HISTORY*, 122 (Anne Biebel 1991).

105. *Id.*

106. Nick Novak, *UW–Madison Foundations Grow Assets to More than \$6 Billion*, MACIVER INSTITUTE (Mar. 20, 2015), <http://www.maciverinstitute.com/2015/03/uw-madison-foundations-grow-assets-to-more-than-6-billion> [<https://perma.cc/4BEM-P89N>].

107. Thomas Meek, *How dead cattle led to the discovery of Warfarin*, WISCONSIN ALUMNI RESEARCH FOUNDATION (June 27, 2013), <https://www.warf.org/news-media/news/in-the-news/how-dead-cattle-led-to-the-discovery-of-warfarin.cmsx> [<https://perma.cc/8TFF-CYBL>].

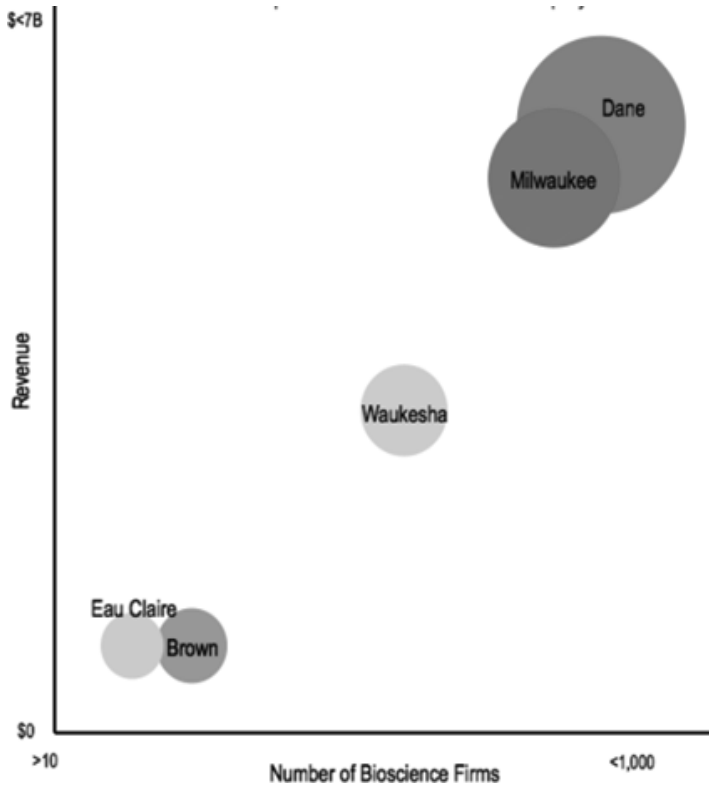


Fig. 3. Bioscience and Healthcare IT (HealthTech) activity in top 5 Wisconsin counties, based on revenue. Size of bubble corresponds to relative number of employees. Madison is in Dane county, and Waukesha is a suburb of Milwaukee. Source: Bioscience: Energizing Wisconsin's Economy; completed by *Ernst and Young, LLC - August 2015*. Data Year: 2013. Reproduced with permission. While a majority of bioscience is in Madison, a majority of HealthTech is in the Milwaukee and Waukesha areas.

Medical innovation in Wisconsin was certainly not limited to Madison. Milwaukee physician Dr. Dudley Johnson pioneered the first coronary artery bypass surgery in the 1960s, by removing a vein from the leg and implanting to the coronary artery, and thereby helping to make Milwaukee a leader in cardiovascular medicine and surgery. Dr. Johnson was also the first to do the multiple bypass surgery.¹⁰⁸ More recently, Dr. Howard Jacobs, when he was

108. Sam Roberts, *W. Dudley Johnson, Heart Bypass Surgery Pioneer, Dies at 86*, THE N.Y.

director of the Medical College of Wisconsin's Human and Molecular Genetics Center, was the first to use whole genome sequencing to guide a targeted treatment strategy,¹⁰⁹ for a young boy with an undiagnosed and life-threatening inflammatory disease. This successful gene-based diagnosis and treatment represents a milestone in the era of precision medicine, using genomic information to target treatments based on a person's genetic makeup.

Innovation has also occurred at hospital institutions like Aurora. Dr. Jasbir Sra, medical director of Aurora Healthcare's Atrial Fibrillation Ablation Center, and Dr. David Kress, the chief of Cardiothoracic Surgery at Aurora St. Luke's Medical Center pioneered a new hybrid ablation technique to treat atrial fibrillation.¹¹⁰ Dr. Kress commented that "[w]e're able to . . . reduce future instances of arrhythmias [i]t's a model other health care systems across the country are looking at."¹¹¹ Additionally, at Aurora St. Luke's Medical Center, Drs. O'Hair and Bajwa implanted the new Medtronic CoreValve Evolut PRO, a new valve approved by the FDA in 2017, making Aurora St. Luke's the third hospital in the nation, and first in Wisconsin, to apply this new valve.¹¹²

Wisconsin has also played an important role in the early days of biotechnology, with companies like Promega, founded in Madison in 1978 by Bill Linton. Promega provided restriction enzymes, the primary tools needed to do genetic cloning work,¹¹³ and now Promega has over 2000 products that

TIMES (Oct. 30, 2016), <https://www.nytimes.com/2016/10/31/health/dudley-johnson-dead-coronary-bypass.html?mcubz=0> [https://perma.cc/L9KC-NLA8]; LARRY STEPHENSON, STATE OF THE HEART: THE PRACTICAL GUIDE TO YOUR HEART AND HEART SURGERY 113 (The Society of Thoracic Surgeons, 1999), https://www.ctsnet.org/book/soth/chapt08_rev.pdf [https://perma.cc/P6VA-JGBS].

109. Susan Okie, *A Boy's Mysterious Illness, a Bold Gamble and a Breakthrough in Genetic Medicine*, THE WASH. POST (Apr. 20, 2016), https://www.washingtonpost.com/opinions/a-boys-mysterious-illness-a-bold-gamble-and-a-breakthrough-in-genetic-medicine/2016/04/20/13f20b16-e638-11e5-bc08-3e03a5b41910_story.html?utm_term=.d7069c5bab87 [https://perma.cc/TF5R-KTLD]. Mark Johnson & Kathleen Gallagher, *A Baffling Illness*, MILWAUKEE J. SENTINEL (Dec. 18, 2010), <http://archive.jsonline.com/news/health/111641209.html> [https://perma.cc/ZWT5-9F2D]; Howard Jacob, PRECISION MED. WORLD CONF., [https://perma.cc/WFJ2-69UJ] (last visited Oct. 2, 2017).

110. *Aurora St. Luke's Medical Center Pioneers Hybrid Procedure to Improve Lives of People with Atrial Fibrillation*, AURORA HEALTH CARE (Jun. 06, 2016), <https://www.aurorahealthcare.org/media-center/news-releases/aurora-st-lukes-medical-center-pioneers-hybrid-procedure-to-improve-lives-afib-patients> [https://perma.cc/PJ7V-Q97R].

111. *Id.*

112. *Aurora Health Care Heart Experts Among First in Nation to Implant New Heart Valve to Treat Aortic Stenosis*, AURORA HEALTH CARE (Apr. 5, 2017), <https://www.aurorahealthcare.org/media-center/news-releases/aurora-health-care-heart-experts-among-first-in-nation-to-implant-new-heart-valve> [https://perma.cc/FJK7-BEAD].

113. Judy Newman, *Madison Bio-Giant Promega Helped put Madison on the World's Biotechnology Stage*, WIS. ST. J. (May 25, 2008), http://host.madison.com/business/madison-bio-giant-promega-helped-put-madison-on-the-world/article_4589f664-3abe-58f9-9a7e-4904445045d2.html [https://perma.cc/7P8K-GSPA].

it sells in thirteen countries. This long history of serving the industry has earned Promega the title as the “granddaddy of biotechnology.”¹¹⁴ The most prominent HealthTech company with roots in Wisconsin is Epic Systems, started in by Judith Faulkner, a UW–Madison computer science graduate.¹¹⁵ Epic developed the EMR (electronic medical record) systems used in 26% of all hospitals in the United States,¹¹⁶ giving it the largest market share of any EMR company. In 2015, Epic had over \$1.8 billion in sales and 9500 employees,¹¹⁷ and its founder Judith Faulkner was ranked as the third wealthiest self-made woman in the United States in 2016,¹¹⁸ with a net worth of \$2.4 billion.

B. HealthTech Startups and the Entrepreneurial Ecosystem in Southeast Wisconsin

While Madison-based Epic Systems may be the largest and most prominent HealthTech in Wisconsin, it is certainly in the company of other HealthTech companies, many of which are located in southeast Wisconsin. GEHealthcare, a pioneer in imaging and associated analytics technology, is located in Waukesha (and previously had been headquartered there).¹¹⁹ BioForward is the trade organization representing the healthcare (e.g., medical devices and diagnostics), biotechnology and HealthTech (e.g., digital health) industries for Wisconsin, and in 2015 BioForward commissioned Ernst & Young to do analysis of the economic impact of these industries in the state.¹²⁰ These industries produce \$27 billion in economic impact (2013), while directly

114. *Id.*

115. Katelyn Ferral & Erik Lorenzonn, *Her way: Epic Systems CEO Judy Faulkner Talks about Trusting Her Vision*, WIS. ST. J. (Apr. 12, 2017), http://host.madison.com/ct/news/local/her-way-epic-systems-ceo-judy-faulkner-talks-about-trusting/article_7fafd560-d5fd-5a7f-8ef8-59d6bd4cf452.html [https://perma.cc/GP8D-A3LA].

116. Engel, *supra* note 89.

117. Guy Boulton, *Epic Systems Soars with Transition to Electronic Health Records*, MILWAUKEE J. SENTINEL (Jan. 24, 2016), <http://archive.jsonline.com/business/epic-systems-soars-with-transition-to-electronic-health-records-b99642837z1-366328781.html> [https://perma.cc/B3F8-VPH5].

118. Forbes Corporate Communications, *Forbes' 2016 List of America's Richest Self-Made Women*, FORBES (June 1, 2016), <https://www.forbes.com/sites/forbespr/2016/06/01/forbes-2016-list-of-americas-richest-self-made-women/#768320c51747> [https://perma.cc/89ZZ-EN7J].

119. Thomas Content, *GE Healthcare to Move Global Headquarters from United Kingdom to Chicago*, MILWAUKEE J. SENTINEL (Jan. 11, 2016), <http://archive.jsonline.com/business/ge-healthcare-to-move-global-headquarters-from-united-kingdom-to-chicago-b99649839z1-364927371.html> [https://perma.cc/J8LK-M878].

120. *2015 Wisconsin Bioscience Report*, BIOFORWARD, <https://www.bioforward.org/strength-wisconsin-biohealth/> [https://perma.cc/DAX6-983W].

creating 37,000 jobs (and 70,000 total jobs, due to a multiplier effect).¹²¹ The report established that the largest concentration of companies (based on revenue) is in the Madison (Dane County), Milwaukee and Waukesha regions, with southeast Wisconsin (Milwaukee and Waukesha) having a particular strength in medical devices and HealthTech in general (**Fig. 3**).¹²² For that reason, this article will provide a deeper analysis of the HealthTech industry in southeast Wisconsin.

Southeast Wisconsin has a large and growing number of new HealthTech companies, founded by Wisconsin HealthTech entrepreneurs (summarized in Table 2). One of Milwaukee's most prominent HealthTech entrepreneurs is Andy Nunemaker.¹²³ Previously, Nunemaker¹²⁴ founded EMSystems (acquired by Intermedix) and is now CEO and founder of Dynamis Corporation. EMSystems (now Intermedix) provides web-based solutions for emergency healthcare providers and is used in forty-five states and in over 1500 hospitals for emergency dispatch, reporting, and related applications.¹²⁵ Nunemaker's¹²⁶ new company, Dynamis, produces software that facilitates communication between healthcare insurance brokers and customers (e.g., employers, and their human resource administrators), to enable competitive shopping for health insurance.¹²⁷ Another southeast Wisconsin HealthTech success is Spaulding Clinical, founded by Randy Spaulding and focused on providing quality-based ECGs (electrocardiograms) with web-based remote monitoring, to give more reliable and real-time information to physicians, along with better access to care and information for patients, such as in medical homes.¹²⁸ Another serial HealthTech entrepreneur in Milwaukee is Jay Mason, founder of HealthTech MKE,¹²⁹ which is a group that supports HealthTech entrepreneurs. Mason has formed six companies, his most recent being

121. *Energizing Wisconsin's Economy 2015 Wisconsin Bioscience Economic Development Report*, BIOFORWARD 5, http://www.srhwebdev.com/wp-content/uploads/2016/02/BFOR-0002_EY_White_Paper_W0.pdf [<https://perma.cc/QW2V-TUZK>].

122. *Id.* at 10.

123. *Andy Nunemaker*, XCONOMY, <http://www.xconomy.com/author/anunemaker/> [<https://perma.cc/H99H-VQ4M>] (last visited Oct. 2, 2017).

124. *Id.*

125. *Intermedix Corp Acquires EMSystems, LLC*, KAYNE ANDERSON CAPITAL ADVISORS, <http://kaynecapital.com/intermedix-corp-acquires-emsystems-llc/> [<https://perma.cc/32Y4-CM4G>] (last visited Oct 2, 2017).

126. XCONOMY, *supra* note 120.

127. *About*, DYNAMIS, <https://dynamiscorp.com/about> [<https://perma.cc/AA8Z-ZRXT>] (last visited Oct. 2, 2017).

128. *ECG Solution*, SPAULDINGCLINICAL, <http://www.spauldingclinical.com/index.php/ecg-solution> [<https://perma.cc/2W9G-EWE5>] (last modified 2016).

129. HEALTHTECH, www.healthtechmke.com [<https://perma.cc/9MP7-9DJS>].

Intellivisit, which uses artificial intelligence to provide diagnostic information to physicians and a “digital front door” for patients seeking on-demand doctor visits.¹³⁰ Access HealthNet, founded by yet another southeast Wisconsin serial HealthTech entrepreneur, Eric Haberichter, uses the cloud to create a virtual healthcare marketplace, where Access HealthNet has bundled thousands of healthcare services from various providers to secure the best price and quality (i.e., value) possible for healthcare consumers. They are effectively acting like a broker that provides complete transparency in pricing and outcomes—as a service for self-funded entities¹³¹ and their benefit administrators.

A general theme for southeast Wisconsin’s HealthTech companies is to provide software-based technology that gets information in the hands of consumers, typically patients, so they can receive better access to healthcare that is higher quality and lower cost. Many of the tools also enable more transparency in healthcare (e.g., price, outcomes), which enables competition by empowering consumers with information and the ability to use that information to shop for better healthcare value.

C. The Major Challenge Facing the Healthcare Industry in the United States is Cost and Access

The current political debate over healthcare, as it pertains to the *Affordable Care Act*,¹³² is focused on who should get insurance coverage and how much that coverage should be. It is about insurance. This debate includes an important discussion regarding coverage for the poor or uninsured, including those on Medicaid. The latter debate has emerged since there is discussion of states being allocated limited funds in the form of block grants to cover the expense of providing healthcare coverage for their Medicaid populations,¹³³ leaving states to figure out how to cover healthcare expenses for their vulnerable populations with increasingly limited funds (especially since there

130. *Home*, INTELLIVISIT, <http://intellivisit.com> [<https://perma.cc/C2DX-FVW3>] (last visited Oct 2, 2017); Jeff Buchanan, *Intellivisit Lands New Customers, Expects New Financing in October*, XCONOMY (Sept. 2, 2015), <http://www.xconomy.com/wisconsin/2015/09/02/intellivisit-lands-new-customers-expects-new-financing-in-october> [<https://perma.cc/X3VR-XGLA>].

131. *About Us*, ACCESSHEALTHNET, <http://www.accesshealthnet.com/about/> [<https://perma.cc/T6JB-THRX>] (last visited Oct. 2, 2017).

132. H.R. 3590 (111th): Patient Protection and Affordable Care Act, 42 U.S.C. § 18001 et seq. (2012).

133. Capital Flows, *The Case For Medicaid Block Grants*, FORBES (July 18, 2017, 12:31 PM), <https://www.forbes.com/sites/realspin/2017/07/18/the-case-for-medicaid-block-grants/#4042a37b3ddb> [<https://perma.cc/BKV2-QXQB>]; Shefali Luthra, *Everything You Need to Know about Block Grants—The Heart of GOP’s Medicaid Plans*, KAISER HEALTH NEWS (Jan. 24, 2017), <https://khn.org/news/block-grants-medicaid-faq> [<https://perma.cc/A6QT-34VA>].

is concern that Medicaid expansions will not continue indefinitely). This causes many to fear that vulnerable populations will begin to lose coverage or receive lower quality healthcare.¹³⁴

While these concerns about coverage are extremely important questions that must be addressed by policy makers, it misses the most important point that underlies all of these problems—which is that healthcare spending in the United States is excessive (approaching 20% of GDP) and must be contained somehow, while not sacrificing quality of, or access to, care. If healthcare costs are not contained, then a tipping point will someday be reached where there is not enough money to pay for care for anyone, including but not limited to Medicaid populations. The cost problem in healthcare is therefore the focus of the remainder of this article, with emphasis on how HealthTech can help address the problem, while ensuring high quality and access to care is maintained.

How expensive is healthcare in the United States? According to Kaiser, health expenditures per capita as a percent of GDP have risen from 5.2% in 1960 to 17.9% in 2010 and continue to rise. Furthermore, these numbers are significantly higher than in any other developed country (e.g., UK, Germany, Switzerland, Austria, and Canada).¹³⁵ As of 2015, government spending on healthcare (Medicaid and Medicare) represented 24% of all mandatory federal spending,¹³⁶ with \$539 billion spent on Medicare (administered by the federal government) and \$350 billion spent on Medicaid (administered by states), with Medicaid currently covering seventy million people (one in five Americans).¹³⁷ In 2015, Wisconsin's share of Medicaid spending was \$8 billion, which provides support for 17% of Wisconsin's 5.7 million people and 60% of those living in nursing homes.¹³⁸ State-level Medicaid spending represents 16% of

134. Kaiser Family Foundation, *5 Ways the Graham-Cassidy Proposal Puts Medicaid Coverage At Risk*, KAISER FAMILY FOUNDATION (Sept. 19, 2017), <https://www.kff.org/medicaid/fact-sheet/5-ways-the-graham-cassidy-proposal-puts-medicaid-coverage-at-risk> [https://perma.cc/C6ND-FRZ9].

135. *Health Spending: Trends and Impact*, KAISER FAMILY FOUNDATION, <https://www.kff.org/slideshow/health-spending-trends-and-impact/> [https://perma.cc/CB8A-KN56] (last visited Oct. 2, 2017).

136. *The Federal Budget in 2015*, CONGRESSIONAL BUDGET OFFICE (Jan. 2016), <https://www.cbo.gov/sites/default/files/114th-congress-2015-2016/graphic/51110-budget1overall.pdf> [https://perma.cc/FHZ8-M3ZH].

137. Capital Flows, *supra* note 129.

138. *The Wisconsin Health Care Landscape*, KAISER FAMILY FOUNDATION (Oct. 7, 2015), <https://www.kff.org/health-reform/fact-sheet/the-wisconsin-health-care-landscape> [https://perma.cc/RX7T-KKN3]; *Medicaid in Wisconsin*, KAISER FAMILY FOUNDATION, <http://files.kff.org/attachment/fact-sheet-medicaid-state-WI> [https://perma.cc/KQW6-RMEJ] (last visited Apr. 14, 2018).

the total state budget.¹³⁹ In addition to federal and state spending on healthcare, individual and employer out of pocket expenses are continuing to rise as well, both in terms of employer (\$10,944 in 2011) and worker (\$4129 in 2011) contributions to insurance premiums.

This level individual, employer, state, and federal spending on healthcare cannot continue forever. At the federal level, so-called mandatory federal spending from just the three major entitlement programs, Medicare, Medicaid, and Social Security (ignoring defense, interest, etc.), will exceed revenue (20% of GDP) by 2080.¹⁴⁰ Clearly, the most serious underlying problem in healthcare in the United States is that cost is increasing at a rate reaching a level that cannot be sustained. Why is it that healthcare costs more in the United States than in any other developed country? While the answer to this question is not clear and is the subject of much political debate—a solution must be found.

One challenge in healthcare that may be contributing to cost increases is a lack of true competition in free and transparent markets. While there may be competition at the level of insurance companies (i.e., the health insurance markets, or “exchange”),¹⁴¹ there is no competition at the actual level of the consumer—who is the patient (or their employer) purchasing the healthcare product or service. In other words, “buying decisions” are made at the level of a patient seeing a physician, where the decision—without knowing price—is made to purchase a healthcare services, such as: a clinical assay (e.g., blood panel), a hip surgery, an MRI, or some other procedure. Typically, neither the patient nor the physician has any idea how much these procedures or services cost, relying simply on the notion or hope that they are reimbursed on the back end by the insurance company or government,¹⁴² only later to discover there are large copays or unreimbursed services. That would be analogous shopping in a grocery store of products without prices because you are falsely under the impression everything is being “reimbursed.” In this scenario, there is no incentive for healthcare providers, such as hospitals, to control price, as long as the products or services are reimbursed by insurance. Thus, there are no market

139. *State Expenditure Report*, NAT'L ASS'N OF STATE BUDGET OFFICERS 49 (2016), [https://higherlogicdownload.s3.amazonaws.com/NASBO/9d2d2db1-c943-4f1b-b750-0fca152d64c2/UploadedImages/SER%20Archive/State%20Expenditure%20Report%20\(Fiscal%2014-2016\)%20-%20S.pdf](https://higherlogicdownload.s3.amazonaws.com/NASBO/9d2d2db1-c943-4f1b-b750-0fca152d64c2/UploadedImages/SER%20Archive/State%20Expenditure%20Report%20(Fiscal%2014-2016)%20-%20S.pdf) [https://perma.cc/H48N-M89R].

140. *2008 Financial Report of the United States Government—A Citizen's Guide*, GOVERNMENT ACCOUNTABILITY OFFICE 7, http://www.gao.gov/financial_pdfs/citizensguide2008.pdf [https://perma.cc/DS6H-CRFL].

141. *Exchange*, HEALTHCARE.GOV, <https://www.healthcare.gov/glossary/exchange/> [https://perma.cc/5K7T-8GZ5] (last visited Oct. 2, 2017).

142. David E. Beck & David A. Margolin, *Physician Coding and Reimbursement*, 7 THE OSCHNER J. 1, 8–15 (2007), <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3096340/pdf/i1524-5012-7-1-8.pdf> [https://perma.cc/CL3T-MEV7].

forces where they need to be and no empowerment of consumers (i.e., patients) with information and ability to make decisions based on that information. To support this market dysfunction, hospitals have teams of administrative staff members devoted to coding medical services and seeking reimbursement from the government or third-party payers. U.S. hospitals spend on average 25% (\$200 billion) of their budget on administrative costs (which includes coding and billing), which is more than other countries. Therefore, hospitals devote significant resources to ensuring their services get reimbursed by insurance companies (or Medicaid), and insurance companies are incentivized to find reasons not to reimburse, while the patient often gets stuck in the middle with no input, and increasingly needing to pay more out of pocket for large copays or for uninsured procedures.¹⁴³ Consumerization of healthcare¹⁴⁴ would mean providing the patient with access to more information upfront, via HealthTech tools, and empowering them to make decisions based on that information. They could shop for the best healthcare values, which means access to the best quality care at the lowest price, and they could play a more active role in their care.

What about access to the care itself, for those without insurance, or those who are the underinsured? What can they do, and what do they do?

D. Healthcare Access Challenges for the Poor—Universal Care via Emergency Rooms?

In 1986, Congress passed legislation that permits anyone to get medical care in emergency rooms, irrespective of their ability to pay. This legislation, termed the *Emergency Medical Treatment and Active Labor Act*¹⁴⁵ (“EMTALA”), was passed in the Reagan administration,¹⁴⁶ and effectively provides a kind of universal healthcare. People without any healthcare insurance, perhaps because they are unemployed, or their employer does not

143. Kate Ashford, *Out-Of-Pocket Hospital Costs Up 37%, Study Finds*, FORBES (June 27, 2016, 2:07 PM), <https://www.forbes.com/sites/kateashford/2016/06/27/hospital-costs/#2097580aa42f> [https://perma.cc/359F-KA6S];

Catherine Lane, *Are Out-of-Pocket Medical Costs Too High?*, THE WALL STREET J. (Apr. 10, 2016, 10:03 PM), <https://www.wsj.com/articles/are-out-of-pocket-medical-costs-too-high-1460340176> [https://perma.cc/TZ4S-DQ7Y].

144. Sam Myers, *The Consumerization of Healthcare*, TECHCRUNCH (June 5, 2017), <https://techcrunch.com/2017/06/05/the-consumerization-of-healthcare/> [https://perma.cc/AKJ8-EHKV].

145. Emergency Medical Treatment & Labor Act, 42 U.S.C. § 1395dd(b)(1) (2012); *Emergency Medical Treatment & Labor Act (EMTALA)*, CTRS. FOR MEDICARE & MEDICAID SERVS. (Mar. 26, 2012 8:43 AM), <https://www.cms.gov/Regulations-and-Guidance/Legislation/EMTALA/> [https://perma.cc/SL6U-ZJYH].

146. Emily Friedman, *The Law That Changed Everything—and it Isn't the One You Think*, HOSPITALS AND HEALTH NETWORKS (Apr. 05, 2011), <http://www.hhnmag.com/articles/5010-the-law-that-changed-everything-and-it-isn-t-the-one-you-think>.

provide insurance, often seek care by going to an emergency room (also referred to as an emergency department, or “ED”). According to the EMTALA law,¹⁴⁷ an ED cannot turn away any patient. Thus, while there is debate in the United States as to whether healthcare is a right, it seems that universal care is already being provided but in the most expensive manner possible.¹⁴⁸ Who pays for this? Hospitals do not get reimbursed when uninsured people use their emergency rooms; subsequently, this means other healthcare consumers or taxpayers end up paying, which was estimated to be \$46 billion in 2013.¹⁴⁹

E. Healthcare Access Challenges for the Poor—A HealthTech Solution

One could argue that use of EDs by the uninsured, made possible by EMTALA, is a form of universal care, and given the expense, this makes a strong case that a universal healthcare safety net is urgently needed for these underserved populations, as it would provide a more cost-effective alternative to the misuse and overuse of EDs. Furthermore, given that states may soon be moving to a block grant system of reimbursement for Medicaid expenses¹⁵⁰ (coupled to more limited Medicaid expansion), less funds will be available for the most vulnerable populations (e.g., on Medicaid). However, these factors are already conspiring to create strong incentives for hospitals (which bear the brunt of expenses associated with ED overuse) to find solutions that address the needs of these vulnerable populations. Indeed, the major healthcare providers in Chicago have already begun to work together in an Accountable Care Organization (“ACO”), with a nonprofit called “*Medical Home Network*,” that is providing a HealthTech-enabled care coordination for underserved populations (and ED over-users). The hospitals, which normally compete intensely with each other, are incentivized to work together because helping the underserved populations in Chicago improves their bottom lines—because the underserved populations are using their EDs less often. *Medical Home Network*, which uses HealthTech created by Texture Health,¹⁵¹ a pioneer in population health management, is able to provide very effective care

147. 42 U.S.C. § 1395dd(b)(1) (2012); *Emergency Medical Treatment & Labor Act (EMTALA)*, *supra* note 141.

148. Nolan Caldwell et al., “How Much Will I Get Charged for This?” *Patient Charges for Top Ten Diagnoses in the Emergency Department*, 8 PLOS ONE 2 (2013), <https://doi.org/10.1371/journal.pone.0055491> [<https://perma.cc/S7PF-KZF9>].

149. Christopher Pope, *Assuring Hospital Emergency Care Without Crippling Competition*, HEALTH AFFAIRS BLOG (July 6, 2015), <http://healthaffairs.org/blog/2015/07/06/assuring-hospital-emergency-care-without-crippling-competition/> [<https://perma.cc/3TRJ-52XW>].

150. Luthra, *supra* note 129.

151. MEDICAL HOME NETWORK, <http://www.medicalhomenetwork.org> [<https://perma.cc/JDR5-M8AD>]; TEXTURE HEALTH, <http://www.texturehealth.com> [<https://perma.cc/46K6-DVD8>].

coordination to these populations using a software tool they call *MHN Connect*. *Medical Home Network's* goal was to provide cost-effective care that is high quality and accessible, using technology-enabled care coordination in a network of primary care providers and hospital systems. Over a period of two years, they were able to save providers \$11 million, while providing care for 1,189,195 Medicaid enrollees in Chicago. This was better care at lower cost and represents the kind of approach states may need to explore if they are going to be put in a situation where Medicaid dollars become more limited via block grants and constraints on expansion, effectively putting states on a budget.¹⁵²

F. Healthcare Solutions: Transparent Pricing, Medical Homes and Bundling

While the average healthcare consumer in the United States does not receive primary medical care in an ED and does not have insurance (typically through their employer), they generally have no, or limited, ability to shop for the best healthcare value (whether for insurance or directly for medical services). Rather, it is employers (HR administrators) that shop for insurance. At the level where buying decisions are made, at the patient (consumer)-physician interface, neither party knows how much a treatment or medical service costs, nor what the relative outcomes are if the treatment or service is obtained from one source over another. In effect, there is no competition where it needs to be, so there are no market forces to constrain costs and increase value to the consumer. The trend towards changing this, by putting information and buying power in the hands of patient consumers using HealthTech tools, is called the “consumerization of healthcare.”¹⁵³

Advocates for the consumerization trend and transparent pricing include John Torinus, Wisconsin-based healthcare thought leader and author of “The Grassroots Health Care Revolution.”¹⁵⁴ Torinus argues that if such transparent

152. Sally Pipes, *Yes, We Should Block-Grant Medicaid*, NATIONAL REVIEW (July 28, 2017), <http://www.nationalreview.com/article/449926/medicaid-block-grants-would-put-states-budget> [<https://perma.cc/XE5M-UL9B>].

153. Steve Maylish & Nick Rakhshani, *The Consumerization of Healthcare*, MEDICAL PRODUCT OUTSOURCING (Jan. 30, 2017), https://www.mpo-mag.com/issues/2017-01-01/view_columns/the-consumerization-of-healthcare [<https://perma.cc/7KY3-QXCR>]; *Consumerization*, STRATEGY &, <https://www.strategyand.pwc.com/global/home/what-we-think/consumerization> [<https://perma.cc/SD7P-UEU4>]; Girish Navani, *How Big Data is Driving the Consumerization of Health Care*, U.S. NEWS HEALTHCARE (Aug. 14, 2015 7:00 AM), <https://health.usnews.com/health-news/patient-advice/articles/2015/08/14/how-big-data-is-driving-the-consumerization-of-health-care> [<https://perma.cc/MD7X-PJDW>]. Thomas Glannulli, *Millennials and the Consumerization of Healthcare*, WIRED INSIGHTS (Feb. 26, 2015 12:48 PM), <http://insights.wired.com/profiles/blogs/millennials-and-the-consumerization-of-healthcare#axzz4uSAtxfPe>.

154. JOHN TORINUS, *THE GRASSROOTS HEALTH CARE REVOLUTION: HOW COMPANIES ACROSS AMERICA ARE DRAMATICALLY CUTTING THEIR HEALTH CARE COSTS WHILE IMPROVING CARE* (2014).

pricing and markets were in place, healthcare consumers would ultimately get better care at lower cost since what patient-consumers get (outcomes) would be better linked to price, if patient-consumers were incentivized to shop for value (e.g., through high deductible plans and associated copays). Yet, at present, there is no such transparency in pricing or outcomes, leading to healthcare cost varying dramatically¹⁵⁵ with no logical or transparent connection to outcomes. For example, **Table 3** shows the dramatic variation in price for four different procedures at five different hospitals in Los Angeles.¹⁵⁶

Torinus views the healthcare consumer as being not just the patient seeking care but also the employer that pays for that person's insurance. Employers are incentivized—in the long term—for their employees to have good health, if only because it costs them less since treating chronic diseases is extremely costly. Torinus notes the importance of the private sector as a healthcare payer because it is companies that provide (and pay for) most people's health insurance in the United States, as they currently split the cost of the nation's nearly \$3 trillion medical bill with the public sector.¹⁵⁷ So, employers often have the strongest incentive to find better care at lower cost (and they try to pass those incentives, along with the associated benefits, on to their employees). Companies feel the pressure intensely since, according to Torinus (who was also former CEO of Serigraph), healthcare hyperinflation “has driven 40 percent of U.S. companies, mostly smaller firms, out of coverage”¹⁵⁸ and into self-insurance. Indeed, the trend in U.S. companies is away from commercial insurance, towards direct pay by the companies, with the companies now shopping for the best healthcare value. Currently, over 40% of U.S. companies do not offer health care insurance due to the increasing cost.¹⁵⁹ If companies self-insure, then they are empowered and incentivized to shop for the best value—the best healthcare outcomes at the lowest cost. Torinus notes that price variation for healthcare procedures is significant and bears no connection to the quality of care or outcomes, with variations of 300% for the same procedure.¹⁶⁰ In the company where Torinus served as CEO, Serigraph, he was able to save significant money and provide better care¹⁶¹ for his employees by shopping, on

155. Melinda Beck, *How to Bring the Price of Health Care Into the Open*, THE WALL STREET J. (Feb. 23, 2014 5:03 PM), <https://www.wsj.com/articles/what-does-health-care-really-cost-1393020966> [<https://perma.cc/X5NZ-DXYT>].

156. *Id.*

157. TORINUS, *supra* note 150, at 3.

158. *Id.* at 9.

159. *Id.* at 24.

160. *Id.* at 116.

161. See JOHN TORINUS, THE COMPANY THAT SOLVED HEALTH CARE: HOW SERIGRAPH DRAMATICALLY REDUCED SKYROCKETING COSTS WHILE PROVIDING BETTER CARE, AND HOW

their behalf, for the best healthcare. However, shopping requires a bundling of prices for a healthcare procedure, which medical providers typically have not done (e.g., one cannot simply ask how much a knee replacement costs, because there are a range of undefined expenses, such as operating room cost, surgeon, anesthesia, etc.). Companies like Torinus' Serigraph will negotiate bundled prices for various procedures like knee surgery upfront for their employees, and they also have onsite clinics to provide a range of routine medical services. The onsite clinic is considered a kind of *Medical Home*¹⁶²—essentially patient-centered care that is implemented and coordinated by a healthcare team. This model of using bundled prices and providing an on-site clinic/medical home is being adopted broadly in companies across the United States but was actually pioneered by a Milwaukee company, Quad Graphics, which formed QuadMed to address its own healthcare costs. Now, QuadMed is growing nationally and has been adopted by companies like Kohls and Briggs & Stratton.¹⁶³ Companies that want to implement the kind of savings that Serigraph obtained, but need help, can contract with companies like Milwaukee's QuadMed.

G. Enabling HealthTech Technology: Consumerizing Healthcare

Bundling of pricing to enable shopping can enable competition, and provide better care at lower cost, as Torinus did for his Serigraph employees. Can HealthTech (e.g., healthcare IT; digital medicine; connected medicine; telemedicine) facilitate this process? By negotiating bundled prices upfront and shopping, Torinus found the lowest bundled price for his Serigraph employees for knee replacements to be \$27,500; whereas, in the Milwaukee market, knee replacement prices range arbitrarily from \$27,500 to \$70,586, with a median of \$44,422.¹⁶⁴ Likewise, for MRIs, he found bundled prices as low as \$525, which compared favorably with the \$2000 or \$4000 commonly charged by some large healthcare providers. However, shopping in this manner is labor intensive and outside of the scope of what most healthcare consumers (whether

EVERY COMPANY CAN DO THE SAME, 14–15 (2010).

162. *Defining the Medical Home*, PATIENT-CENTERED PRIMARY CARE COLLABORATIVE, <https://www.pcpcc.org/about/medical-home> [https://perma.cc/F5T8-LTZY].

163. *Company History*, QUADMED, <http://www.quadmedical.com/company/history> [https://perma.cc/S4FF-2SSM];

Douglas McCarthy, *Case Study: QuadMed—Transforming Employer-Sponsored Health Care Through Workplace Primary Care and Wellness Programs*, THE COMMONWEALTH FUND (Sept. 2009), <http://www.commonwealthfund.org/publications/newsletters/quality-matters/2009/september-october-2009/case-study> [https://perma.cc/T6X7-24LB]; Rich Kirchen, *Quad/Graphics Unit QuadMed in Growth Mode*, MILWAUKEE BUS. J. (June 23, 2016 8:35 AM), <https://www.bizjournals.com/milwaukee/news/2016/06/23/quad-graphics-unitquadmed-in-growth-mode.html> [https://perma.cc/T6FC-W3FS].

164. John Torinus, *supra* 150, at 92.

individuals or the companies that employ them) expect. To this end, Milwaukee HealthTech startup Smart Choice MRI,¹⁶⁵ founded by Eric Haberichter, is revolutionizing the MRI industry in Wisconsin by bundling prices for direct-pay consumers (individuals or employers, and sometimes even other providers) because they offer some of the highest quality MRIs at \$600, whereas most hospitals had been charging the much higher with an average price of \$2600.¹⁶⁶ This is strong evidence of how transparent pricing and competition can lead to lower cost and high-quality care and how a Milwaukee HealthTech company is addressing that problem. Another Milwaukee HealthTech startup founded by Haberichter, Access HealthNet,¹⁶⁷ has now bundled over 1000 procedures, to expand the savings that can be obtained from bundled and transparent pricing more broadly across healthcare, including procedures like carpal tunnel surgery (where prices vary from carpal tunnel surgery from \$4003 to \$8936) and lower back surgery (where prices vary from \$69,259 to \$109,432).¹⁶⁸ A web portal has been created to allow consumers to mine these price variations,¹⁶⁹ although Access HealthNet acts as a broker to shop for and negotiate the best bundled and transparent prices for healthcare consumers (typically employers that self-insure).¹⁷⁰

Other southeast Wisconsin HealthTech companies working to improve healthcare delivery and to create more transparent and competitive markets include Dynamis, Intellivisit, YourMD, and RemedyNow (**Table 2**). Milwaukee startups YourMD¹⁷¹ and RemedyNow¹⁷² are providing individuals (rather than companies) with the information and power to make their own primary and urgent care healthcare buying decisions, but in a self-pay business model where patient-consumers pay out of pocket for expenses. Often the expenses associated with this direct-pay model, which bypasses insurance,¹⁷³

165. SMARTCHOICEMRI, <https://smartchoicemri.com/> [<https://perma.cc/9KSV-XL3Y>].

166. Kenneth Kaufman, *A Clear and Present Disruption*, KAUFMAN HALL (May 10, 2016), <https://www.kaufmanhall.com/resources/clear-and-present-disruption> [<https://perma.cc/2WZQ-C9LV>].

167. ACCESS HEALTHNET, <http://accesshealthnet.com/> [<https://perma.cc/9ZP9-HLQ4>].

168. Guy Boulton, *Milwaukee Start-up Makes Health Care More Efficient*, MILWAUKEE J. SENTINEL (Jan. 12, 2017, 8:09 PM), <http://www.jsonline.com/story/money/business/health-care/2017/01/12/milwaukee-startup-makes-health-care-more-efficient/96268824/> [<https://perma.cc/724K-WMM8>].

169. GUROO, <https://www.guroo.com> [<https://perma.cc/MRP7-RA59>].

170. ACCESS HEALTHNET, *supra* note 163.

171. YOURMD, <https://www.yourmdmequon.com> [<https://perma.cc/CJ4K-BK53>].

172. REMEDYNOW, <https://remedynow.net> [<https://perma.cc/D2JL-QNM2>].

173. Lydia Ramsey, *A New Kind of Doctor's Office Charges a Monthly Fee and Doesn't Take Insurance—and it Could be the Future of Medicine*, BUSINESS INSIDER (Mar. 19, 2017 9:19 AM), <http://www.businessinsider.com/direct-primary-care-a-no-insurance-healthcare-model-2017-3> [<https://perma.cc/37Y2-8TRA>].

are less than the copays associated with insurance plans. For those that would like to shop for the best insurance value, Milwaukee serial entrepreneur has created Dynamis,¹⁷⁴ which provides an insurance plan optimization resource for brokers, reminiscent of what is offered in Switzerland to general healthcare consumers.¹⁷⁵ Another important HealthTech tool in consumerizing care is telemedicine, along providing a digital front door to primary care, such as is being offered by Intellivisit.¹⁷⁶

H. Barriers to Healthcare Reform and Consumerization

In order for healthcare to be consumerized, with patients having freedom to shop for value-based care based in transparent and competitive markets, patients must be empowered to shop for the healthcare they want. They may know what they want, but can they actually get it? If they decide they want the Smart Choice MRI because they feel it is better quality and they prefer the \$600 price tag over the \$2600 price tag, are they empowered to make that choice? The reality is that they are not always free to do so. Hospitals often strongly encourage internal referrals for procedures (e.g., to use the MRI services in the hospital even if it is lower quality and more expensive). In fact, there is such a string concern about referring outside of the hospital, referred to as “leakage,” that hospitals expend resources to prevent this from happening since it costs them revenue.¹⁷⁷ This lack of outside referral decreases value-based competition and likely contributes to the lack of correlation between cost and outcomes (see above and **Table 3**), while also increasing healthcare costs. Adding to this issue is a trend toward increasing consolidations, making for a smaller pool of large healthcare providers with increasing levels of market power in a given community. As was noted in a law review article by one of the architects of the *Health Maintenance Organization Act* of 1973, this trend towards hospital consolidation could be characterized as anticompetitive and is hurting healthcare consumers who “face increased hospital prices as result of decreased price competition.”¹⁷⁸ A third barrier to free markets and

174. DYNAMIS, <https://dynamiscorp.com/> (last visited Oct. 3, 2017); Molly Dill, *Dynamis Software raises \$1.3 million round*, BIZTIMES (Mar. 6, 2017 12:12 PM), <https://www.biztimes.com/2017/industries/banking-finance/dynamis-software-raises-1-3-million-round> [<https://perma.cc/LS82-3YP3>].

175. See *infra* Section IV.A.

176. Buchanan, *supra* note 126.

177. See e.g., *Accurate Information Using ReferralMD Provider SmartMatch Reduces Leakage*, REFERRALMD, <https://getreferralmd.com/track-patient-referral-leakage/> [<https://perma.cc/7S6N-JUVZ>] (last visited Oct. 3, 2017); *Network Leakage*, PROPHIT INSIGHT, <http://www.prophitinsight.com/network-leakage> (last visited Oct. 3, 2017).

178. William G. Kopit, *Price Competition in Hospital Markets, The Significance of Managed Care*, 35 J. OF HEALTH LAW 292, 320 (2002).

competition is the *Electronic Medical Records* (EMRs) used in hospitals, which are provided predominantly by two companies (Epic and Cerner) and which, when adopted exclusively by one or two major providers in a community, can also be used as a way to exclude competition, since access to patient health records is limited or excluded. Some have argued and even litigated that this can also be characterized as anticompetitive behavior.¹⁷⁹ It is true that under HIPAA requirements patient data cannot be shared (without consent), but extreme limiting of access to medical record data, that arguably belongs to the patient, is going to be a strong barrier to the consumerization of healthcare. Somehow, patients need to be empowered to have access to and control of their healthcare data and to make healthcare buying or other decisions based on that data. This includes data about the various providers and insurance companies that are (or should be) competing for their business. This is the vision for the consumerization of healthcare.

IV. HEALTHTECH-ENABLED HEALTHCARE REFORM: A ROADMAP FOR THE UNITED STATES

A. Learning from Best Practices in the Rest of the World

The current debate about healthcare in the United States often focuses on single payer (government) versus multi-payer (competition) and the benefits and downsides of each.¹⁸⁰ However, what does the rest of the world do, and how well is it working? There are four major models of healthcare delivery used throughout the world: (a) the *Beveridge Model* with predominantly government control (e.g., Great Britain; Spain; most Scandinavian countries; Cuba), the *National Health Insurance Model* with private-sector providers and government run insurance (Canada, South Korea, and Taiwan), the *Out-of-Pocket Model* (rural areas of Africa and India) where consumers pay directly

179. EPIC, <http://www.epic.com/> [<https://perma.cc/Y2J9-BZGJ>] (last visited Oct. 3, 2017). Marla Durben Hirsch, *Paul Levy Urges Investigation of Epic for Antitrust Violations*, FIERCE HEALTHCARE (Sept. 1, 2015 12:43 PM), <http://www.fiercehealthcare.com/ehr/paul-levy-urges-investigation-epic-for-antitrust-violations> [<https://perma.cc/7HNJ-RS53>]; Mike Miliard, *Former Hospital CEO Calls for Epic Antitrust Probe*, HEALTHCARE IT NEWS (Aug. 31, 2015 10:28 AM), <http://www.healthcareitnews.com/news/former-hospital-ceo-calls-epic-antitrust-probe> [<https://perma.cc/9F68-XF66>]; Brandon Glenn, *Why Epic's Market Dominance Could Stifle EHR and Health IT Innovation*, MEDICAL ECONOMICS (Apr. 25, 2013), <http://medicaleconomics.modernmedicine.com/medical-economics/content/tags/electronic-health-records/why-epics-market-dominance-could-stifle-ehr> [<https://perma.cc/L8W6-6ASJ>]; Anne Ziegler, *Is Epic Stifling Health IT Innovation?*, HOSPITAL EMR & EHR (April 30, 2013), <http://www.hospitalemrandedhr.com/2013/04/30/is-epic-stifling-health-it-innovation/> [<https://perma.cc/YY7B-G4DU>].

180. Alicia Adamczyk, *What Is Single-Payer Healthcare and Why Is It So Popular?*, MONEY (Apr. 13, 2017), <http://time.com/money/4733018/what-is-single-payer-healthcare-system> [<https://perma.cc/4TWN-B4SF>].

for care, and the *Bismarck Model* with nonprofit insurance that covers everyone but uses private doctors and providers and often allows consumers to “shop” for the best healthcare values (Germany, Switzerland, Japan).¹⁸¹ The final model is a type of hybrid model that allows for and often encourages consumerization of care by providing consumers with information and allowing them to shop for the best healthcare value (price and outcomes). Even though this can be described as a “universal government-guided healthcare system,” it is not a single payer system. There is still some form of competition, and consumers are given information to permit shopping. Germany has the *Bismarck Model* and also has the *Institute for Quality and Efficiency in Healthcare* (“IQWiG”),¹⁸² which was created in 2004 to provide healthcare consumers with information on cost and benefits of different health services.¹⁸³ It is advisory to Germany’s *Federal Joint Committee*, which makes decisions regarding reimbursements, based on evidence. Since under German law all needed medical procedures must be covered, this information is only used to compare relative cost and benefits of comparable treatments, so that the best and also most cost-effective treatments can be chosen. This is a kind of healthcare information sharing, to foster competition. Switzerland, by many accounts, has one of the best healthcare systems in the world.¹⁸⁴

181. *Health Care Systems—Four Basic Models*, PHYSICIANS FOR A NAT’L HEALTH PROG., http://www.pnhp.org/single_payer_resources/health_care_systems_four_basic_models.php [<https://perma.cc/4TWN-B4SF>] (last visited Oct. 3, 2017).

182. INSTITUTE FOR QUALITY AND EFFICIENCY IN HEALTH CARE, www.iqwig.de/en/home.2724.html [<https://perma.cc/NTP9-UCDV>].

183. Mona Nasser & Peter Sawicki, *Institute for Quality and Efficiency in Health Care: Germany*, THE COMMONWEALTH FUND (July 2009), http://www.commonwealthfund.org/~media/Files/Publications/Issue%20Brief/2009/Jul/Chalkidou/1294_Nasser_CER_Germany_issue_brief_724.pdf [<https://perma.cc/MNQ3-SW2E>].

184. Avik Roy, *Why Switzerland Has the World’s Best Health Care System*, FORBES (Apr. 29, 2011 5:27 PM), <https://www.forbes.com/sites/theapothecary/2011/04/29/why-switzerland-has-the-worlds-best-health-care-system/#503b78bb7d74> [<https://perma.cc/AP7X-JESX>]; *About the Independent Association Hospital Comparison Switzerland, Zurich*, WHICHHOSPITAL.CH, <https://which-hospital.ch/hospital-comparison-switzerland.php> [<https://perma.cc/CK37-U3SX>] (last visited Oct. 3, 2017).

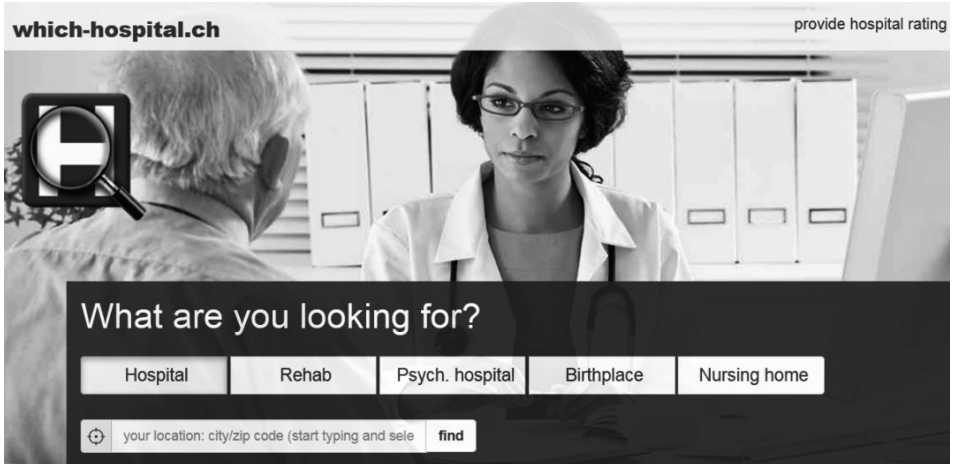


Fig. 4. Web-based portal in Switzerland for healthcare consumers to research and compare providers, in terms of quality metrics and price (Which-hospital.ch).

Like Germany, it also provides a mechanism for consumer-based research on the quality of medical services, via a web portal (**Fig. 4**) that is maintained by *Hospital Comparison Switzerland*, an independent association. This resource allows patients to query and compare metrics such as: infection rate, mortality rate, number of patients treated, patient satisfaction, and number of staff per patient. There are also resources to help Swiss healthcare consumers compare and shop for hospital insurance coverage for procedures with filters that permit identification of hospitals where procedures are fully covered.¹⁸⁵ What is unique about the Swiss system is that individuals shop for and purchase their own insurance, rather than being limited to plans provided by their employers or the government (as in the United States), and there are copays to encourage shopping for the best healthcare value by consumers. The Swiss government spends only 2.7% of GDP on healthcare, compared to 7.4% in the United States, and Switzerland achieves this with some of the best health outcomes in the world, access to cutting edge medical technology in the clinic,

185. *Hospital Insurance: Compare Premiums and Services*, MONEYLAND, <https://www.moneyland.ch/en/hospital-insurance-comparison> [https://perma.cc/WA5H-DL68] (last updated Apr. 2018).

and low wait times for procedures.¹⁸⁶ The Swiss model might make for a politically expedient compromise in the United States, since it has elements that could satisfy both conservatives (privately-managed care; low government spending) and liberals (universal care; regulated insurance market).¹⁸⁷ While Germany and Switzerland have hybrid models of care, they both have an insurance mandate (as is the case in the United States, under the *Affordable Care Act*).¹⁸⁸ In contrast, countries like Australia and New Zealand, which could also serve as models for the United States, have a two-tier system,¹⁸⁹ which is considered by some to be a possible improvement to the Canadian system—by providing a self-pay private market layer on top of the government-funded universal care safety net.¹⁹⁰

Whether shopping for insurance or hospitals in the Swiss system, or healthcare services generally in New Zealand's system, consumers looking for the best healthcare value need information and to be empowered to use that information. The HealthTech tools being developed by Wisconsin HealthTech entrepreneurs (**Table 2**) can address those needs in whatever healthcare system is ultimately implemented in the United States.

B. Proposal for a HealthTech-enabled Hybrid and Tiered Healthcare System in the United States

This article has presented arguments in favor of the consumerization of healthcare, by giving consumers access to transparent pricing and outcomes, and empowering them to shop for the best healthcare value based on that information. It is argued, based on examples, that this would lower cost and increase quality and access to care, as long as anticompetitive behavior of large healthcare providers does not block this trend. Based on the above arguments and data from other countries, especially New Zealand and Switzerland, a hybrid and two-tiered system is suggested as being the best model for the United

186. Roy, *supra* note 178.

187. *Id.*

188. Praveenghanta, *List of Countries with Universal Healthcare*, TRUE COST (Aug. 9, 2016), <https://truecostblog.com/2009/08/09/countries-with-universal-healthcare-by-date> [<https://perma.cc/XU9H-JE9C>] (last updated Jan. 21, 2013).

189. *Id.*

190. See Colleen M. Flood & Lorian Hardcastle, *A Two-Tier Health Care System: The New Zealand Story* (Ottawa Faculty of Law Working Paper No. 2015), available at https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2627709 [<https://perma.cc/6G6H-CRVD>]; Brandon Waugh, *What are the Benefits of a Two-Tier Healthcare System*, QUORA (Oct. 8, 2017), <https://www.quora.com/What-are-the-benefits-of-a-two-tier-healthcare-system> [<https://perma.cc/4JT4-SGXX>]; Stuart Bramhall, *The New Zealand Health Care System*, PHYSICIANS FOR A NATIONAL HEALTH PROGRAM (Jan. 3, 2003), http://www.pnhp.org/news/2003/january/the_new_zealand_heal.php [<https://perma.cc/BLM7-GPVX>].

States. Consumers in such a system could be the direct healthcare consumers (i.e. the patient), or their employer (e.g., Serigraph or QuadMed). Either party could choose to pay directly for care (as in New Zealand, and as with YourMD or RemedyNow in Wisconsin), or to shop for insurance (as in Switzerland and as with Dynamis in Wisconsin). Information to guide consumer decision-making could be provided by HealthTech tools, as discussed above, and these tools could resemble the portal used in Switzerland (**Fig. 4**) to shop for the best insurance value; or, for the best healthcare value, defined as cost and quality of the service, as is provided in Germany by the *Institute for Quality and Efficiency in Healthcare* (and analogous to what Access HealthNet offers in Wisconsin, or via web portals like Guroo and WISHIN).¹⁹¹

So, the first tier in this proposed two-tier healthcare system is market driven with competition (as in New Zealand) and could be direct pay or paid via individual insurance (unlike New Zealand). However, if a healthcare consumer is in charge of care and is getting care from multiple sources (e.g., a medical home-like clinic at work, such as a QuadMed clinic, and also via direct pay options, like YourMD), it will be important to have care coordination like that offered by *Medical Home Network*, using an open EMR that sits on top of the various provider EMRs. This would require a type of HIPAA-compliant sharing of patient data that is currently difficult. Ultimately, patients need to be empowered to have access to and use this information and should also have access to a care coordinator that is not affiliated with (and biased by) any one provider that has commercial interests (e.g., avoidance of leakage). Primary and urgent care could be provided in this way, with referrals to more expensive and specialized care (e.g., hip surgery; MRIs) by shopping for the best value, using the help of a broker and portal system like Access HealthNet, done directly by the consumer, or by a consumer representative, such as a care coordinator.

Many would argue that healthcare should be universal, and that the above system is flawed, being especially unfair to vulnerable populations who cannot afford care. Those populations may then choose to get care only when absolutely needed, and in the most expensive way possible by using EDs, made possible because of EMTALA regulations. There is also concern about meeting the needs of the poor, especially Medicaid populations—which includes the 60% of people in nursing homes who ultimately end up on Medicaid (and therefore in poverty). To address the needs of this population, as well as of any person who needs access to basic medical care in very dire and expensive situations, it is argued that there should also be a second tier that acts as a safety

191. GUROO, *supra* note 169; WISHIN, www.wishin.org [<https://perma.cc/J8LB-RYV7>].

net, and functions like the *Medical Home Network* in Chicago does. That system uses HealthTech to provide a unique coordinated care system that was able to improve outcomes, and even saved \$11 million for the over 1 million Medicaid patients served over two years. This second tier, as in the Canadian system, would be universal, so it might eventually suffer from some of the same limitations as the Canadian system (i.e. long waiting times and more limited access to care), but it would provide a safety net for everyone that is currently not available in the U.S. healthcare system. This second tier could be financed by the major healthcare providers from the savings they enjoy (as was the case in the Chicago-based *Medical Home Network* model) or by the government, in a single payer model.

The above proposal is two-tiered, resembling the system in New Zealand, and offering elements that would likely be considered compromise by both political parties in the United States, so it may be the only politically viable solution. Even the individualistic and free market economist Friedrich Hayek, in his book *The Road to Serfdom*, agreed there is value in having a safety net:

There is no reason why, in a society which has reached the general level of wealth ours has, the first kind of security should not be guaranteed to all without endangering general freedom; that is: some minimum of food, shelter and clothing, **sufficient to preserve health**. Nor is there any reason why the state should not help to organize a **comprehensive system of social insurance** in providing for those common hazards of life against which few can make adequate provision.¹⁹²

The poor or those confronted with medical situations or expenses which are excessive and unanticipated should have some safety net but done in a way that also preserves the American passion and commitment to free markets and competition. Maybe this is something Democrats and Republicans, albeit reluctantly, could actually agree to—or at least compromise on.

C. The Remedium eXchange (Rx) Think Tank—Helping to Consumerize Healthcare

The above article is based on and derived from a meeting on March 21, 2017, entitled the “Healthcare Economics Summit,” attended by over 100 thought leaders and practitioners in healthcare in Wisconsin.¹⁹³ Out of this event grew a healthcare economics think tank, called the *Remedium eXchange*

192. Dylan Matthews, *Hayek on Social Insurance*, THE WASH. POST (July 9, 2010, 2:57 PM), http://voices.washingtonpost.com/ezra-klein/2010/07/hayek_on_social_insurance.html [<https://perma.cc/M64G-LVFE>] (emphasis added).

193. REMEDIUM EXCHANGE, rxthinktank.org/healthcare-economics-summit-meeting-summary [<https://perma.cc/3VQK-Z4L4>] (last visited Oct. 02, 2017).

(Rx) *Think Tank*,¹⁹⁴ where over forty members have engaged in conversations about healthcare reform,¹⁹⁵ with a focus on consumerizing healthcare. This think tank exists to serve as a catalyst for discussions on healthcare reform, with a goal to address healthcare challenges in the United States, especially cost, quality, and access.

The mission of the *Rx Think Tank* is to “to provide information, resources, and support to policy makers, healthcare innovators, patients, and providers, to help them consumerize healthcare, and to accomplish this by incentivizing, educating, and empowering patients and providers so they can make their own healthcare decisions—so market forces can drive down cost and increase quality.”¹⁹⁶ The vision of the *Rx Think Tank* is to “to increase Quality, Access, and Affordability of healthcare for all, in a patient-centered and consumer-driven healthcare delivery model.”¹⁹⁷ In short, it is focused on helping to consumerize and reform healthcare, by partnering with and learning from Wisconsin healthcare leaders and innovators, including southeast Wisconsin’s HealthTech community.

V. CONCLUSION

At a recent “*Celebrating the Wisconsin Entrepreneur*” event, an expert panel described Wisconsin entrepreneurs as “innovative, capital efficient, hard-working, values-driven, humble and reliable.”¹⁹⁸ These traits are valuable in creating sustainable businesses that last, but they may sometimes work against the creation of very high-risk and high-reward startups that need large amounts of venture capital to scale. In particular, the Wisconsin entrepreneur is sometimes risk averse and may not excel at sales (and, in the extreme, hype and puffery), but they are “more enduring and robust—often more the distance-runner than the sprinter.”¹⁹⁹ This may be why the Wisconsin entrepreneur is a national leader in *Main Street Entrepreneurship*, even if Wisconsin ranks low for overall startup activity. However, a vibrant Wisconsin entrepreneurial ecosystem, with associated resources, is working hard to change that latter statistic.

A survey of Wisconsin companies and the entrepreneurs that founded

194. REMEDIUM EXCHANGE, rxthinktank.org/about-us [https://perma.cc/G4YG-YVQ6] (last visited Oct. 02, 2017).

195. REMEDIUM EXCHANGE, rxthinktank.org/our-staff/ [https://perma.cc/4R4J-MASC] (last visited Oct. 02, 2017).

196. REMEDIUM EXCHANGE, *supra* note 187.

197. *Id.*

198. Sem, *supra* note 4.

199. *Id.*

them profiled in the *Wisconsin Entrepreneur Exhibit*TM, reveals a “common theme of values amongst Wisconsin companies, including trust, honesty, integrity, hard work, and quality.”²⁰⁰ Mission statements reflect these values, and on occasion also state the centrality of the founders’ faith and religious values as drivers of corporate culture, often blending faith, business and economics. Over 150 Wisconsin companies were profiled, with the largest number of companies in sectors that included: manufacturing and engineering, and food and beverage, with a significant number in the law, insurance, and retail sectors, but the future trends that are most exciting and impactful may be in the healthcare, and the technology and biotechnology sectors, which includes the HealthTech industry. Wisconsin, and particularly southeast Wisconsin, has a large number of HealthTech companies that are proposing solutions to some of the challenges in healthcare delivery, and are leading the efforts at consumerizing healthcare. Based on their efforts, and leaders in healthcare thought that are part of the *Rx Think Tank*,²⁰¹ a two-tier healthcare system has been proposed for the United States. This system would have transparent pricing and competition in a market driven system in one tier, coupled to a second safety net tier that is universal, and both tiers are modeled after successes in other countries, and also by Wisconsin HealthTech businesses that are pioneering new ways to deliver patient-centered healthcare more efficiently.

200. *Id.*

201. REMEDIUM EXCHANGE, <http://www.rxthinktank.org> [<https://perma.cc/PD77-W9Z9>].

APPENDIX—TABLE 1

Corporate Name HQ Year Founder Website

Construction and Building Trades

ABC Supply	Beloit	1982	Ken and Diane Henricks	abcsupply.com
Gustave A Larson Company	Pewaukee	1936	Gus Larson	galarson.com
Jos. Schmitt Construction	Sheboygan	1899	Joseph Schmitt	jschmitt.cc
PG Miron	Neenah	1918	Patrick G. Miron	miron-construction.com
Richardson Industries	Sheboygan Falls	1848	Joseph and Carolyn Richardson	richardson-industries.com
The Boldt Company	Appleton	1889	Martin Boldt	theboldtcompany.com

Energy (gas, electric, transmission, pipelines, mining)

Us Venture Inc.	Appleton	1951	Art, Ray, and Bill Schmit	usventure.com
WEC Group	Milwaukee	1896		wecenergygroup.com

Finance, Accounting and Support

Associated Banc- Corp	Green Bay	1970		associatedbank.com
Baker Tilly Virchow Krause L.L.C.	Chicago	2000		bakertilly.com
Fiserv	Brookfield	1984	Bill Nasgovitz	heartlandadvisors.com
Johnson Bank	Racine	1970	Samuel C. Johnson	johnsonbank.com
Manpower	Milwaukee	1948	Elmer Winter and Aaron Scheinfeld	manpowergroup.com
Marshall & Ilsey (BMO Harris)	Chicago	1882		bmoharris.com
Robert W. Baird	Milwaukee	1919	Robert Wison Baird	rwbaird.com
Spectrum Investing	Mequon	1995	James F. Marshall	spectruminvestor.com

Food and Beverage

Ambrosia Chocolate	Wayzata, Minnesota	1894	Otto J. Schoenleber	buybulkchocolate.com
BelGioioso Cheese	Green Bay	1979	Errico Auricchio	belgioioso.com
Cousins Subs	Menomonee Falls	1972	Bill Specht and Jim Sheppard	cousinssubs.com
Culvers	Prairie du Sac	1984	George, Ruth, Craig and Lea Culver	culvers.com
Eat Street	Madison	2010	UW-Madison Students	eatstreet.com
Festival Foods	Wisconsin	1946	Paul and Jane Skogen	festfoods.com

General Beverage	Madison	1933		genbev.com
Good Humor-Breyers	Green Bay	1866	William A. Breyer	breyers.com
BelGioioso Cheese	Green Bay	1979	Errico Auricchio	belgioioso.com
Hillshire Farms	Peoria, IL	1934	Fritz Bernegger	hillshirefarm.com
Johnsonville Foods	Sheboygan Falls	1945	Ralph F. and Alice Stayer	johnsonville.com/home.html
Kopp's Frozen Custard	Greenfield	1950	Elsa Kopp	kopps.com
Kwik Trip	La Crosse	1965	Don Zietlow	kwiktrip.com
Ma Baensch	Milwaukee	1932	Baensch family	mabaensch.com
Masters Gallery Foods	Plymouth	1974	Leonard Butch	mastersgalleryfoods.com
MillerCoors	Chicago	1855	Frederick Miller	millercoors.com
Milo's Sandwiches	Madison	1989	Mike Liautaud	milios.com
Natural Ovens	Manitowoc	1976	Paul A. Stitt	naturalovens.com
New Glarus Brewing	New Glarus	1993	Deborah Carey	newglarusbrewing.com
Omanhene Cocoa Bean Company	Milwaukee	1991	Steven C. Wallace	omanhene.com
Organic Valley	La Farge	1988	George Siemon	organicvalley.coop
Oscar Mayer	Madison	1873	Oscar F. Mayer	oscarmayer.com
Pabst	Los Angeles	1844	Jacob Best	pabstbrewingco.com
Palermo's	Milwaukee	1964	Gaspare and Zina Fallucca	palermospizza.com
PDQ Food Stores	Middleton	1949	Sam Jacobsen	pdqstores.com
Rocky Rococo	Oconomowoc	1974		rockyroccoco.com
Roundy's	Milwaukee	1872		roundys.com
Sargento Cheese	Plymouth	1953	Leonard Gentine	sargento.com
Schreiber Foods	Green Bay	1945	L.D. Schreiber	schreiberfoods.com
Sendik's Food Market	Milwaukee	1926	Balistreri	sendiks.com
Sentry Foods	Milwaukee	1960	Godfrey Family	sentryfoods.com
Sprecher Brewery	Glendale	1985	Randal Sprecher	sprecherbrewery.com
Steven's Point Brewery	Steven's Point	1857	Frank Wahle and George Ruder	pointbeer.com/about/history
Usingers	Milwaukee	1880	Fred Usinger	usinger.com
Woodmans	Janesville	1920	John Woodman	woodmans-food.com

Insurance (life, health, casualty, flood)

Aurora Health Care	Milwaukee	1984		aurorahealthcare.org
Blood Center of Wisconsin	Milwaukee	1947	The Junior League of Wisconsin	bcw.edu
Children's Hospital of Wisconsin	Milwaukee	1894		chw.org
CSM	Milwaukee	1848	Daughters of Charity	columbia-stmarys.org
GE Healthcare	Waukesha	1956		gehealthcare.com

Quad Med	Sussex	1990	Harry V. Quadracci	quadmedical.com
Shopko Pharmacy	Green Bay	1962	James Ruben	shopko.com
Aurora Health Care	Milwaukee	1984		aurorahealthcare.org
Blood Center of Wisconsin	Milwaukee	1947	The Junior League of Wisconsin	bcw.edu
Children's Hospital of Wisconsin	Milwaukee	1894		chw.org
Acuity Insurance	Sheboygan	1925		acuity.com
American Family Insurance	Madison	1927	Herman Wittwer	amfam.com
M3 Insurance	Madison			m3ins.com
Northwestern Mutual	Milwaukee	1857	John Johnston	northwesternmutual.com

Law

DeWitt, Ross & Stevens	Madison	1903	William R. Bagley	dewittross.com
Foley & Lardner, LLP	Milwaukee	1842	Asahel Finch, Jr. and William Pitt Lynde	foley.com
Godfrey & Kahn	Milwaukee	1957	Dudley Godfrey and Jerry Kahn	gklaw.com
Gruber Law Offices LLC	Milwaukee	1984	David Gruber	gruber-law.com
Hupy & Abraham, S.C.	Milwaukee	1969	Michael F. Hupy	hupy.com
Michael Best	Milwaukee	1848	Edward G. Ryan	michaelbest.com
Quarles & Brady	Chicago	1974		quarles.com

Manufacturing and Engineering

Allen Bradley	Milwaukee	1903	Lynde Bradley and Stanton Allen	rockwellautomation.com
Allis Chalmers	Milwaukee	1847		allischalmerslawn.com
Amsoil	Superior	1978		amsoil.com
AO Smith	Milwaukee	1874	Charles Jeremiah Smith	aosmith.com
Appvion	Appleton	1907	Charles Boyd	appvion.com
Ashley Furniture Industries	Arcadia	1945	Carlyle Weinberger	ashleyfurniture.com
Allen Bradley	Milwaukee	1903	Lynde Bradley and Stanton Allen	rockwellautomation.com
Allis Chalmers	Milwaukee	1847		allischalmerslawn.com
Amsoil	Superior	1978		amsoil.com
AO Smith	Milwaukee	1874	Charles Jeremiah Smith	aosmith.com
Appvion	Appleton	1907	Charles Boyd	appvion.com

Ashley Furniture Industries	Arcadia	1945	Carlyle Weinberger	ashleyfurniture.com
Badger Meter	Milwaukee	1905		badgermeter.com
Bemis	Neenah	1858	Judson Moss Bemis	bemis.com
Brady Corporation	Milwaukee	1914	Will H. Brady	bradycorp.com
Briggs & Stratton	Milwaukee	1908	Stephen Briggs and Harold Stratton	briggsandstratton.com
Charter Manufacturing	Mequon	1936	Alfred Mellows	chartermfg.com
Evco Plastics	Deforest	1948	Don Evans	evcoplastics.com
Falk Corporation	Auburn	1892		falk.rexnord.com
Green Bay Packaging Corp.	Green Bay	1933		gbp.com
Harley-Davidson	Milwaukee	1903	William S. Harley, Arthur Davidson, and Walter Davidson	harley-davidson.com
HUSCO	Waukesha	1985	Agustin Ramirez, Jr.	huscointl.com
Hydrite Chemical	Brookfield	1929		hydrite.com
Johnson Controls	Milwaukee	1885	Warren Johnson	johnsoncontrols.com
KAPCO Metal Shaping	Grafton	1972	Tom Kacmarcik Sr	kapcoinc.com
KI	Green Bay	1941	Al Krueger	ki.com
Kohler	Kohler	1873	John Michael Kohler	us.kohler.com
Manitowoc Cranes	Manitowoc	1902		manitowoccranes.com
Master Lock	Oak Creek	1921	Harry Soref	masterlock.com
Menasha Corp	Neenah	1849	Elisha D. Smith	menashacorporation.com
Mercury Marine	Fond Du Lac	1939		mercurymarine.com
New Plastics Corp.	Luxemburg	1968	Irvin Vincent	newplasticscorp.com
Oshkosh Corp.	Oshkosh	1917		oshkoshcorporation.com
Plenco	Sheboygan	1934	Frank G. Brotz	plenco.com
Rexnord	Milwaukee	1892		rexnord.com
Rite Hite	Milwaukee	1965		ritehite.com
SC Johnson	Racine	1886	Samuel C. Johnson	scjohnson.com
Snap-on	Kenosha	1920		snapon.com
Trane	Piscataway, NJ	1988		trane.com
Trek	Waterloo	1976		trekbikes.com
Trombetta	Milwaukee			trombetta.com
Uline	Chicago	1980		uline.com
KI	Green Bay	1941	Al Krueger	ki.com
Kohler	Kohler	1873	John Michael Kohler	us.kohler.com
Manitowoc Cranes	Manitowoc	1902		manitowoccranes.com
Master Lock	Oak Creek	1921	Harry Soref	masterlock.com
Menasha Corp	Neenah	1849	Elisha D. Smith	menashacorporation.com
Mercury Marine	Fond Du Lac	1939		mercurymarine.com
New Plastics Corp.	Luxemburg	1968	Irvin Vincent	newplasticscorp.com

Oshkosh Corp.	Oshkosh	1917		oshkoshcorporati on.com
Plenco	Sheboygan	1934	Frank G. Brotz	plenco.com
Rexnord	Milwaukee	1892		rexnord.com
Rite Hite	Milwaukee	1965		ritehite.com
SC Johnson	Racine	1886	Samuel C. Johnson	scjohnson.com
Snap-on	Kenosha	1920		snapon.com
Trane	Piscataway, NJ	1988		trane.com
Trek	Waterloo	1976		trekbikes.com
Trombetta	Milwaukee			trombetta.com
Uline	Chicago	1980		uline.com
KI	Green Bay	1941	Al Krueger	ki.com
Kohler	Kohler	1873	John Michael Kohler	us.kohler.com
Manitowoc Cranes	Manitowoc	1902		manitowoccranes .com
Master Lock	Oak Creek	1921	Harry Soref	masterlock.com
Menasha Corp	Neenah	1849	Elisha D. Smith	menashacorpor ation.co m
Mercury Marine	Fond Du Lac	1939		mercurymarine. com
New Plastics Corp.	Luxemburg	1968	Irvin Vincent	newplasticscorp. com
Oshkosh Corp.	Oshkosh	1917		oshkoshcorporati on.com
Plenco	Sheboygan	1934	Frank G. Brotz	plenco.com
Rexnord	Milwaukee	1892		rexnord.com
Rite Hite	Milwaukee	1965		ritehite.com
SC Johnson	Racine	1886	Samuel C. Johnson	scjohnson.com
Snap-on	Kenosha	1920		snapon.com
Trane	Piscataway, NJ	1988		trane.com
Trek	Waterloo	1976		trekbikes.com
Trombetta	Milwaukee			trombetta.com
Uline	Chicago	1980		uline.com

Printing, Publishing and Communications

Journal Communications	Franklin, TN	1988	Alex Haley	jnlcom.com
Quad Graphics	Sussex	1971		qg.com

Retail

Allen Edmonds Shoes	Mequon	1922		allenedmonds. com
Ashley Furniture	Arcadia	1945		ashleyfurniture. com
Bergstrom Automotive	Neenah	1974		bergstromauto. com
Boucher Automotive		1956		boucher.com
Florsheim Shoes	Glendale	1892		florsheim.com
Jockey International	Kenosha			jockey.com
Kohls Corporation	Menomonee Falls	1962	Max Kohl	corporate.kohls. com

Land's End	Dodgeville	1963	Gary Comer	landsend.com
Menards	Eau Claire	1962		menards.com
Mills Fleet Farm	Appleton	1955		fleetfarm.com
Pacific Cycle	Madison	1977		pacific-cycle.com
Shopko (Retail) (Includes Pharmacy info)	Green Bay	1962	James Ruben	shopko.com

Sports, Hospitality, and Entertainment

Marcus Corp	Milwaukee	1935		marcuscorp.com
Milwaukee Brewers	Milwaukee	1964		mlb.com/brewers
Milwaukee Bucks	Milwaukee	1968		nba.com

Technology and Biotech

Alcami (AAIPharma Services and Cambridge Major Laboratories)	Wilmington, NC	2009		alcaminow.com
Aldrich Chemicals	Saint Louis, MO	1975		sigmaaldrich.com
Carma Laboratories, Inc.	Franklin	1937		mycarmex.com
Covance	Conshohocken, PA	1997		covance.com
Cray	Seattle, WA	1972	Seymour Cray	cray.com
Dohmen	Milwaukee	1858	Friedrich W. Dohmen	dohmen.com
Epic Software	Verona	1979		epic.com
Nimblegen/Roche	Madison	1999		nimblegen.com
Promega	Fitchburg	1978		promega.com
Rockwell Automation	Milwaukee	1903		rockwellautomati on.com

Transportation (rail, trucking, air, water)

Air Wisconsin	Appleton	1965		airwis.com
Freight Runners Express	Milwaukee	1985		freightrunners. com
Lake Express	Milwaukee	2004		lake-express.com
N&M Transfer Co., Inc.	Neenah	1964		nmtransfer.com
Schneider National	Green Bay	1935		schneider.com
The DeLong Company	Clinton	1913		delongcompany. com

APPENDIX—TABLE 2

Name	HQ	Year	CEO	Website	Product
Access HealthNet	Milwaukee	2014	Eric Haberichter	accesshealthnet.com	The Super Option
Accuray	California	1990	Joshua H. Levine	accuray.com	CyberKnife-Radixact-TomoTherapy
Blue Diagnostics	Madison	2015	Sarah Katherine Brenner	bludiagnosics.com	BluDiagnostics Fertility Finder
Bluetree Network	Madison	2012	Jeremy Schwach	bluetreenetwork.com	Network
Carex Consulting Group	Madison	2016	Rachel Neill	carexconsultinggroup.com	Consulting
Centerx	Madison	2009	Joe Reinardy	centerx.com	e-prescribing network
Consortiex	Milwaukee	2013	Neal Long	consortiex.cco	ConsortiEX
Datica	Madison	2013	Travis Good, MD, and Mohan Balachandran,	datica.com	IT service
Easy Way to Health	Madison	2015	Renato Romani	easywaytohealth.com	Scally-My Easy Weight app-The challenge to change behavior- Virtual market place
Ensodata	Madison	2015	Chris Fernandez	ensodata.io	EnsoSleep
Envision ADHD Clinic	Milwaukee	2016	Jacob Behrens	envisionadhd.com	ADHD Clinic
Extract Systems	Madison		David Rasmussen	extractsystems.com	Extract Systems Platform
Forward Health Group	Madison	2009	Michael Barbouche	forwardhealthgroup.com	PopulationManager -PopulationCompass
GrandCare	West Bend	2005		grandcare.com	GrandCare System
Gregor Diagnostics	Madison	2016	Tobias Zutz	gregordiagnosics.com	Prostate Cancer screening test
Health Eflings	Madison		Robert Hopton	healthefilings.com	MIPS Accelerator
HEAL THFINCH	Madison	2011	Jonathan Baran	healthfinch.com	Platform Charlie
Healthx Ventures	Madison	2015	Mark Bakken	healthxventures.com	digital healthcare-focused seed fund

Highfive Health	Madison	2014	Sal Braico	highfiverx.com	Prioritize - Predict - Reconcile - Persist
Hps	Milwaukee	2005	Jay Fulkerson	hps.md	Technology and Services Solution
Idavatar	Mequon	2013	Norrie Daroga	idavatars.com	Intelligent virtual assistants (IVA)
Intellivisit	Waukesha	2014	Jeff Miller	intellivisit.com	intellivisit app
Lynx Biosciences	Madison	2013	Dr. Chorom Pak	lynxbiosciences.com	MicroC3
Moxe	Madison	2012	Dan Wilson	moxehealth.com	Moxe's clinical data
mpirik	Milwaukee	2010		mpirik.com	
National Decision Support Company	Madison	2012	Michael Mardini	nationaldecisionsupport.com	CareSelect Imaging
nestCARE Inc.	Milwaukee	2016	Sanjay Mohan	mynest.care	healthio
Nobo	Milwaukee			nobo.io	B60
Oax Health	Milwaukee	2015		oaxhealth.com	
ONKÖL		2013	Erich Jacobs	onkol.net	OnKöl
Practice Velocity	Machesney Park	2002	David Stern	practicevelocity.com	VelociDoc
Predictimed /US Health Center, Inc.		1998		ushealthcenterinc.com	
Propeller Health	Madison	2010	David Van Sickle	propellerhealth.com	Propeller
ReadyList, Inc.	Milwaukee	2015		readylist.com	ReadyList
Redox	Madison	2014	Luke Bonney	redoxengine.com	Redox Platform (healthcare data exchange solution)
Remedy Analytics	Milwaukee	2012	Scott Martin	remedyanalytics.com	Remedy
Remedy Now	Delafield	2016	Aamir Siddiqi	remedynow.net	Health service
Spaulding Clinical Research, LLC	West Bend	2007	Randy Spaulding	spauldingclinical.com	clinical research
Speechtails	Elm Groves/wisconsin		Amy Reno	speechtails.com	SpeechTails
Swallow Solutions	Madison		Eric Horler	swallowsolutions.com	Swallow Strong
TAI Diagnostics, Inc.	Milwaukee	2015	Frank Langley	taidiagnostics.com	Diagnostic test
Valiant Health	Milwaukee	2011	Joy Casterton	valianthealth.com	Data services
Wellbe	Madison	2009	James Dias	wellbe.me	CarePaths

APPENDIX—TABLE 3

Hospital	Brain Hemorrhage	Heart Failure & Shock	Chest Pain	Kidney Failure
Sherman Oaks Hospital	\$31,688	\$39,795	\$13,133	\$21,106
Garfield Medical Center	\$178,435	\$146,428	\$52,580	\$77,719
Cedars-Sinai Medical Center	\$167,860	\$125,036	\$43,715	\$88,191
Harbor-UCLA Medical Center	\$85,156	\$57,735	\$15,835	\$53,128
Los Angeles Community Hospital	\$60,167	\$52,110	\$15,356	\$21,864
Sherman Oaks Hospital	\$31,688	\$39,795	\$13,133	\$21,106