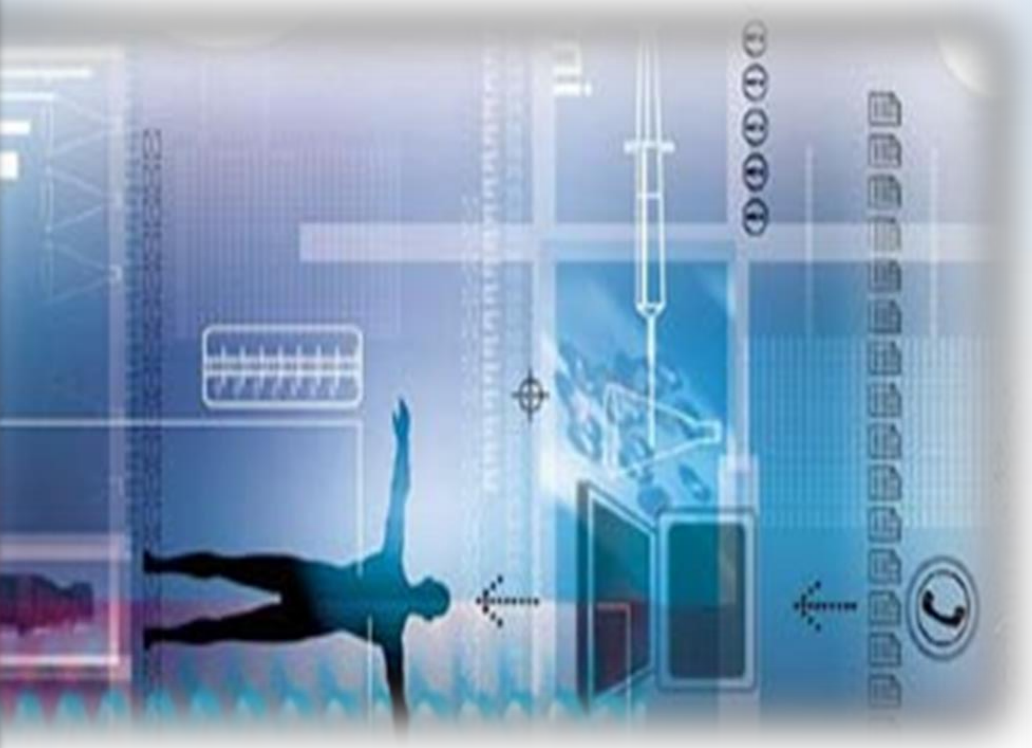


REIMAGINING EDUCATION & RESEARCH IN AN ECONOMETRIC-DRIVEN HEALTH CARE ENVIRONMENT



We help people live well through
innovative research



ASSOCIATION OF SCHOOLS OF
ALLIED HEALTH PROFESSIONS
Fall Conference October 2019

Randall S. Lambrecht, PhD, FASAHP
Senior Vice President, Advocate Aurora Health
President, Aurora Research Institute
Professor (emeritus), Health Sciences Univ of WI-Milw

AdvocateAuroraHealth™

 Advocate Health Care  Aurora Health Care®

Disclosures

No Financial Conflicts
but
A Confession

AdvocateAuroraHealth™

On Leadership

Inspire Trust

“Leadership is a potent combination of strategy and character. But if you must be without one, be without the strategy.”

- **Norman Schwarzkopf**

Champion Change

“I cannot give you the formula for success, but I can give you the formula for failure: Trying to please everybody.” – **Herbert Swope**

Move Forward

“No person will make a great leader who wants to do it all themselves, or get all the credit for doing it.” – **Andrew Carnegie**

Coach & Develop

“Your people are your greatest resource; listen to their feedback and encourage their dreams. The best leader chooses good people to do the job, and the self-restraint to keep from meddling with them while they do it.” – **Theodore Roosevelt**

Before you are a leader, success is all about you. When you become a leader, success is all about growing others. –**Jack Welch**

About Advocate Aurora Health



- **ADVOCATE AURORA HEALTH, INC**
- 9th largest non-profit health system in US.
- **\$13B** revenues
- 27 hospitals (5 Level-1 trauma ctrs, 1 Peds, 1 Psych)
- 500 outpatient locations
- 70,000 talented team members
- 3,200 employed physicians
- 4,800 aligned physician partners
- 3.5 million unique patients

THE AURORA RESEARCH INSTITUTE LLC:

- 290 institute researchers & team members
- 1,620+ credentialed investigators
- 1,250 research studies, 650+ clinical trials
- 511 published articles and abstracts
- 10,000+ patients consented to research studies
- **\$40.1M** in annual expenditures
- **\$15M** NIH grant funding
- 7 Research Laboratories/Centers (FACT facilities)
- **250K** tissues in a World Class Biorepository
- 2 vivariums

Comprehensive Approach to Patient-Centered Research

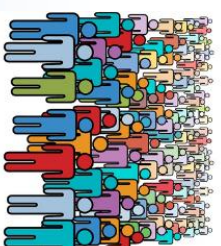


Discovery Laboratory

Spectrum of AAH's Research Program



Precision Medicine &
Population Health

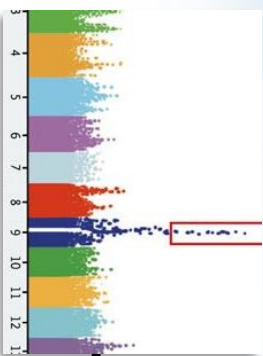


AdvocateAuroraHealth™

ARI'S BIOREPOSITORY AND SPECIMEN RESOURCE CENTER (BSRC)

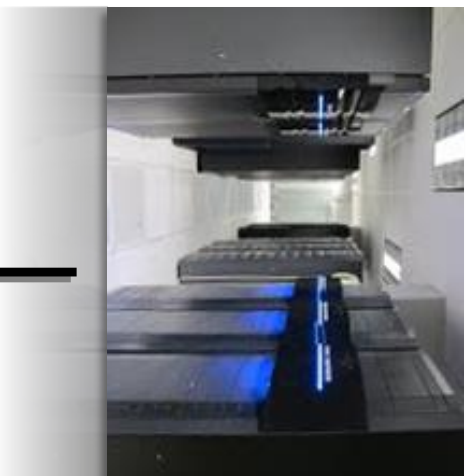
(Fully automated and computerized – linked to the EMR)

Current knowledge



**EHR, Literature, SNPs,
FDA, CPIC, Prof societies**

Aurora's EMR 3.7 M patients



**250,000 DNA and
Tissue Specimens**



Integration of EHR and BSRC



Query new knowledge

Support Medical Decision



Biorepository and EMR are valuable resources for translation of genomic discoveries into personalized medicine for better diagnosis and treatment

LARGEST NOT-FOR-PROFIT HEALTH SYSTEMS

Largest Non-profit US Health Systems By Net Patient Revenue

#	Largest US Health Systems By Revenue	Ttl Operating Revenue (Billions)
1.	Common Spirit	\$28.5
2.	Ascension Health	\$21.7
3.	Providence St. Joseph Health	\$18.9
4.	Trinity Health	\$16.3
5.	University of Pittsburgh Medical Center	\$14.8
6.	Partners HealthCare	\$13.4
7.	Sutter Health	\$12.3
8.	Mayo Clinic Health System	\$11.8
9.	AdvocateAurora Health	\$11.7
10.	University of California Health	\$10.4
11.	Northwell Health	\$9.9
12.	Adventist Health System	\$9.7
13.	Baylor Scott & White Health	\$8.4
14.	Cleveland Clinic Health System	\$8.0

Normalized data from 2017-18 *Definitive Healthcare and Modern Healthcare* based on reports from the Centers for Medicare and Medicaid Services (CMS). Net Patient Revenue listed in billions of U.S. dollars. Excludes HCA @ \$36.9M. Because of publication date, Advocate and Aurora revenue were combined

Annual Research Expenditure Comparison of Select Hospital Systems By Tier

TIER 1 HOSPITALS	
<p>Mayo Clinic (\$250M) Cleveland Clinic (\$258M) John's Hopkins (\$310M) Mass General Hosp St. Judes Hosp (\$610M)</p>	<p>≥ \$250M</p>
TIER 2 HOSPITALS	
<p>New York Presbyterian Hosp Methodist Hosp - Houston Mount Sinai Hosp - NY Medical College of WI Providence Health</p>	<p>\$100-\$200M</p>
TIER 3 HOSPITALS	
<p>Geisinger Health System Banner Health System Spectrum Health system Catholic Health System Marshfield Clinic</p>	<p>\$50-100M</p>
TIER 4 HOSPITALS	
<p>< \$50 M</p>	<p>Most Hospitals</p>

AdvocateAuroraHealth™

Econometrics:

Use of statistical strategies and analytics to understand economics and drive future growth

Academia, & Health System

Health Professions Education/Training

Workforce Development

Biomedical & Health Research

Shifting Roles & Partnerships

Econometrics Driving Innovation

The Value Proposition:

(revenue/equity, cost-savings, asset-utilization)

Integrity, Quality, Oversight

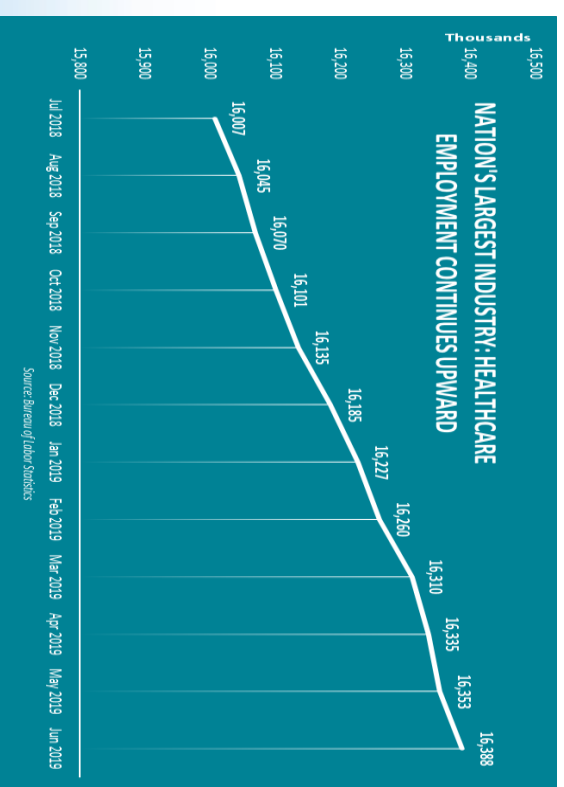
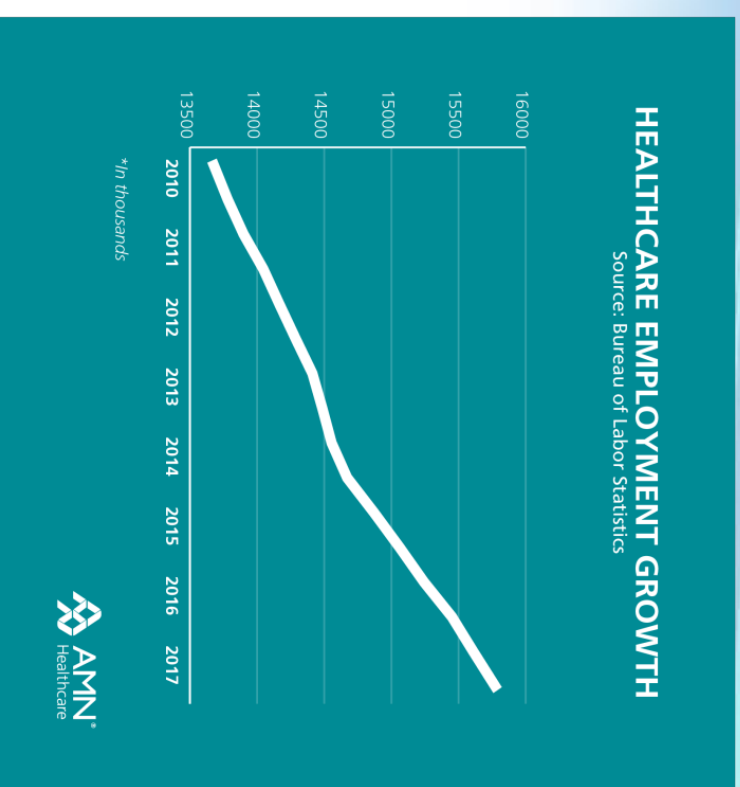
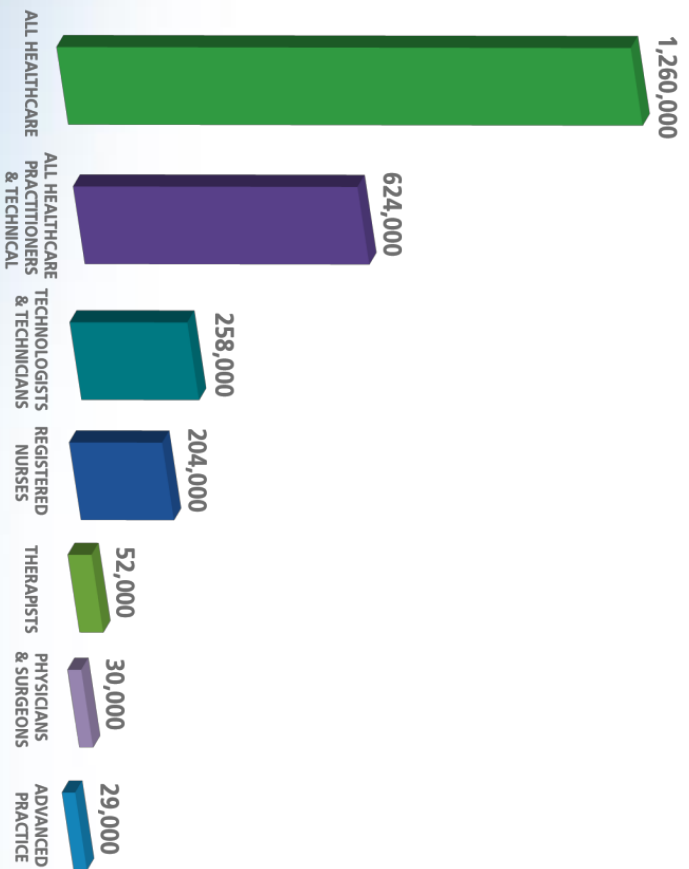
Education & Workforce Development



The Good News.....

AVERAGE ANNUAL JOB OPENINGS 2016-2026

Source: Bureau of Labor Statistics

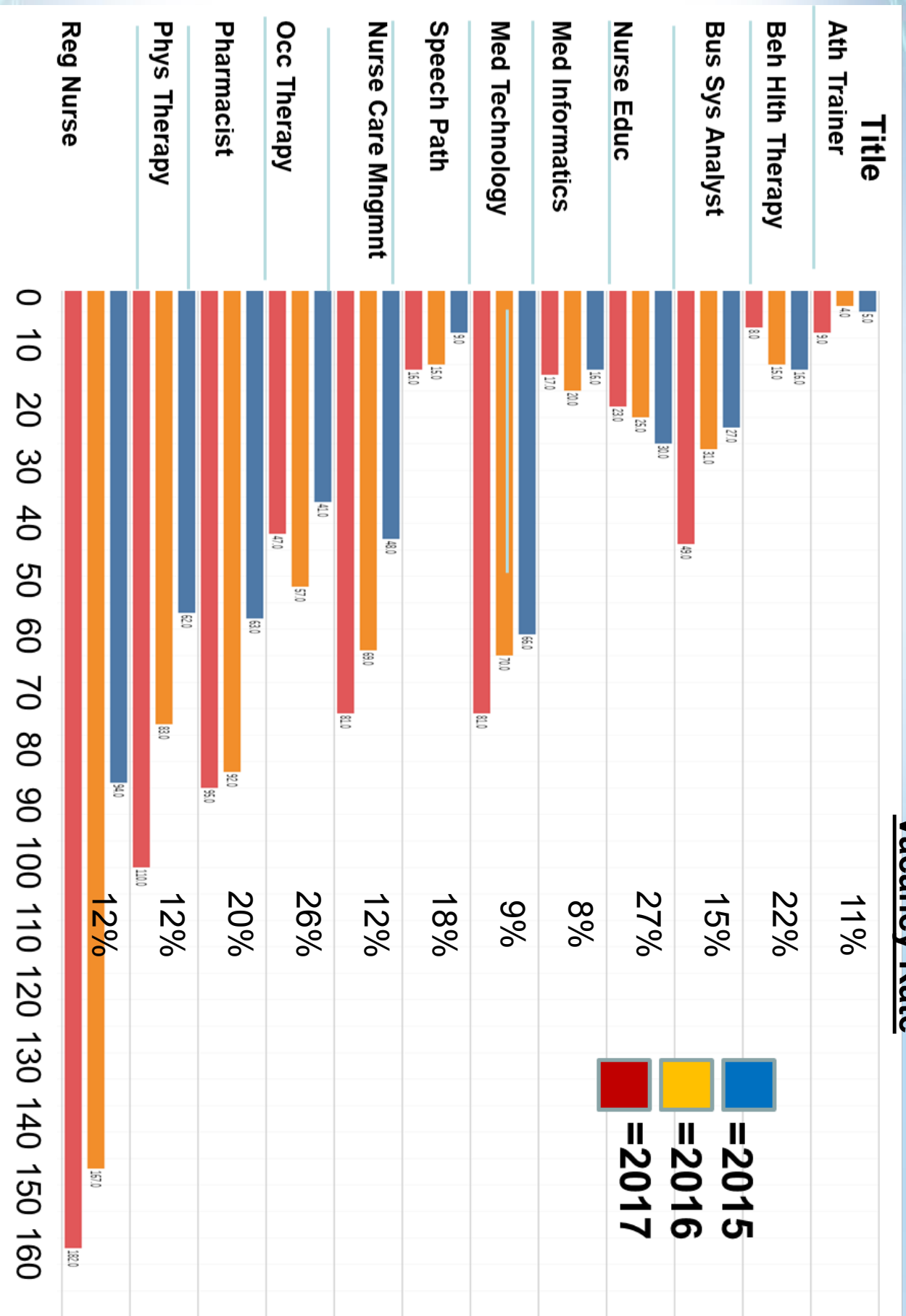




Aurora Health Care Workforce Needs

Current Status & Projected Needs March 2017

Current
Vacancy Rate





WI LABOR STATISTICS 2015-17

Occupation	Base Year Employed Est	Projected Year Emp Est	Annual Growth Rate	Period Employment Chg	Period % Chg	Annual Openings Due to Growth	Annual Openings Due to Replacement	Total Annual Openings
Nurse Practitioners	2340	2443	2.18	103	4.4	52	52	104
Occupational Therapists	3322	3427	1.57	105	3.16	52	46	98
Physical Therapists	4512	4649	1.51	137	3.04	68	108	176
Radiation Therapists	375	381	0.8	6	1.6	3	8	11
Speech-Language Pathologists	3330	3448	1.76	118	3.54	59	77	136
Anesthesiologists	553	563	0.9	10	1.81	5	14	19
Audiologists	187	192	1.33	5	2.67	2	4	6
Diagnostic Medical Sonographers	1108	1147	1.74	39	3.52	20	18	38
Medical and Clinical Laboratory Technicians	2794	2865	1.26	71	2.54	36	68	104
Medical and Clinical Laboratory Technologists	3820	3913	1.21	93	2.43	46	93	139
Medical Records and Health Information Technicians	4079	4165	1.05	86	2.11	43	80	123
Nurse Anesthetists	531	542	1.03	11	2.07	6	12	18
Pharmacists	5629	5624	-0.04	-5	-0.09	0	120	120
Physician Assistants	1702	1766	1.86	64	3.76	32	34	66



U.S. Employment Projections 2014-2024 (projected)

Occupational Title	Employment, 2014	Projected Employment, 2024	Change, 2014-24	10 yr Percent Change
Audiologists	13,200	16,900	3,700	29%
Diagnostic medical sonographers and cardiovascular technologists and technicians, including vascular technologists	112,700	140,200	27,500	24%
Clinical laboratory technologists and technicians	328,200	380,300	52,100	16%
Medical records and health information technicians	188,600	217,600	29,000	15%
Nurse anesthetists	38,200	45,600	7,400	19%
Nurse midwives	5,300	6,600	1,300	25%
Nurse practitioners	126,900	171,700	44,800	35%
Occupational therapists	114,600	145,100	30,500	27%
Pharmacists	297,100	306,200	9,100	3%
Physical therapists	210,900	282,700	71,800	
Physician assistants	94,400	123,200	28,800	30%
Speech-language pathologists	135,400	164,300	28,900	21%

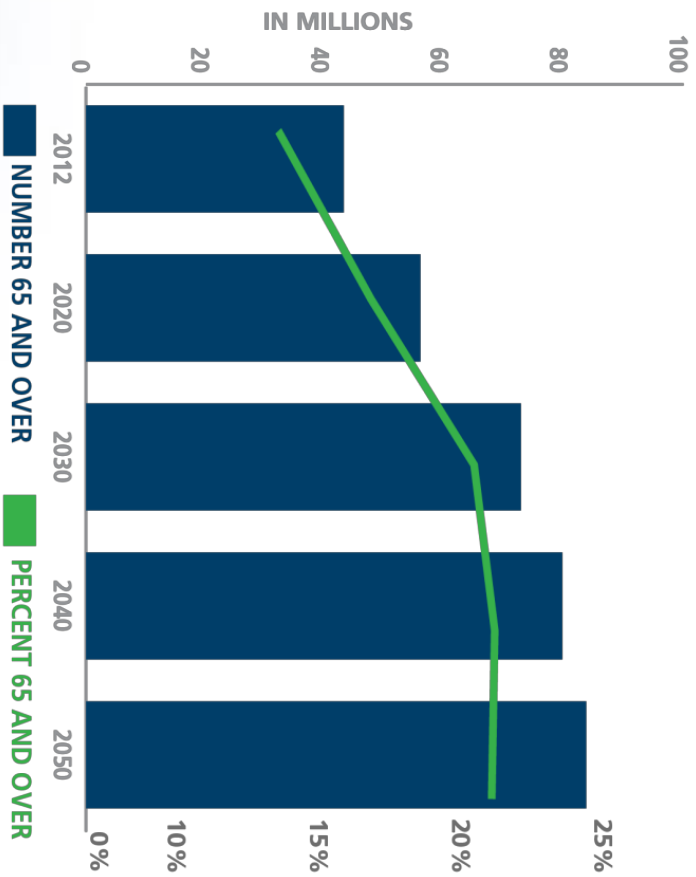
Source: U.S. Bureau of Labor Statistics



Not Enough Health Professionals to Fill the Need

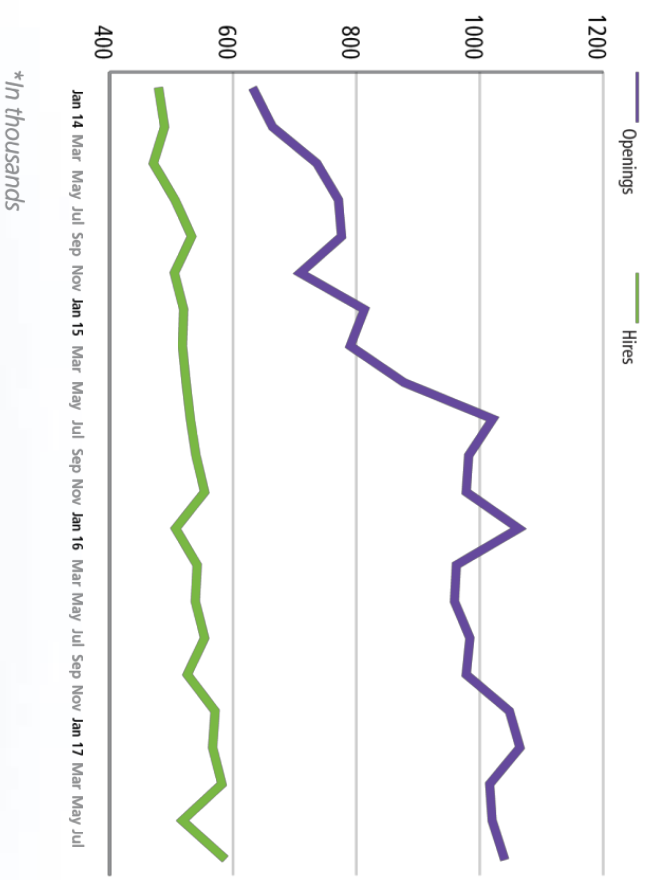
AGING US POPULATION

Source: US Census Bureau



GAP GROWS BETWEEN HEALTHCARE JOB OPENINGS & HIRES

Source: Bureau of Labor Statistics



*In thousands

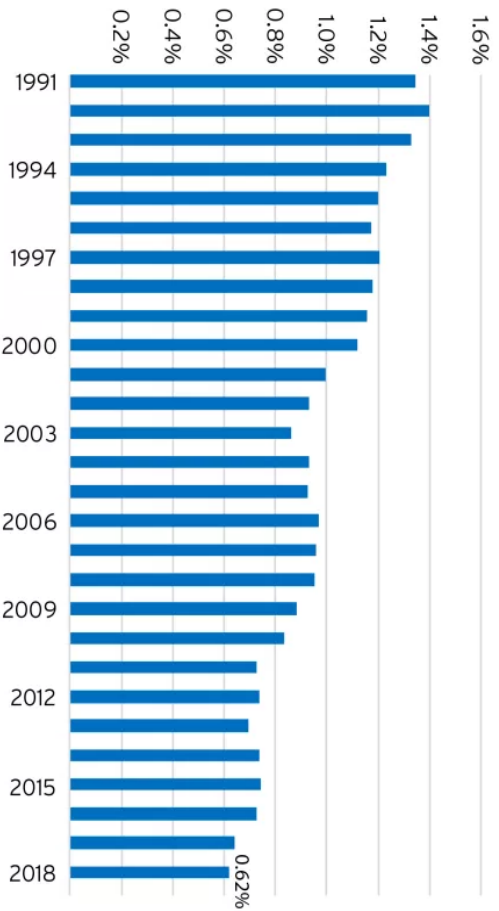




Population Declining (lower birth rate)

FIGURE 1

U.S. annual population growth 1990-2018



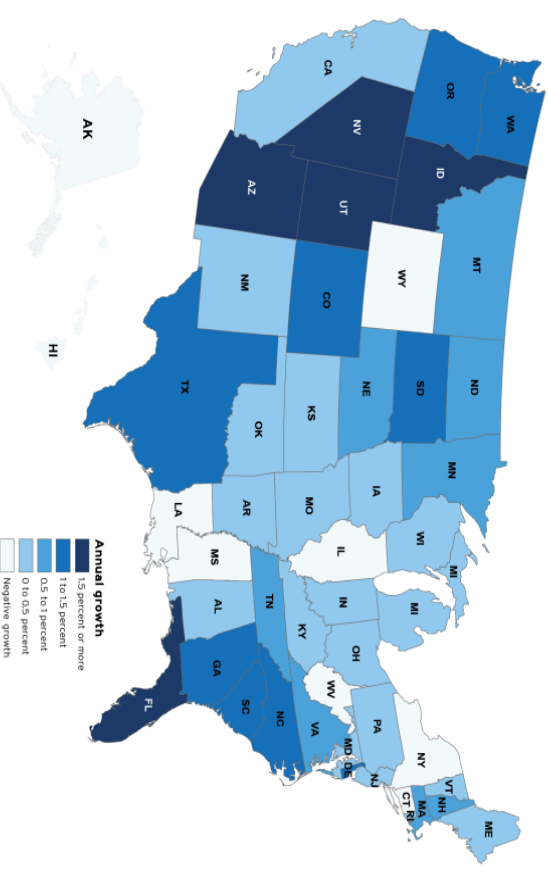
Note: Year shown represents the preceding 12 month period ending July 1.

Source: William H. Frey analysis of U.S. Census Bureau population estimates, released December 19, 2018

B Metropolitan Policy Program
at BROOKINGS

MAP 1

Population growth U.S. states, 2017-2018*



Source: William H. Frey analysis of U.S. Census Bureau population estimates, released December 19, 2018
*Percent change over the 12 month period ending July 1, 2018

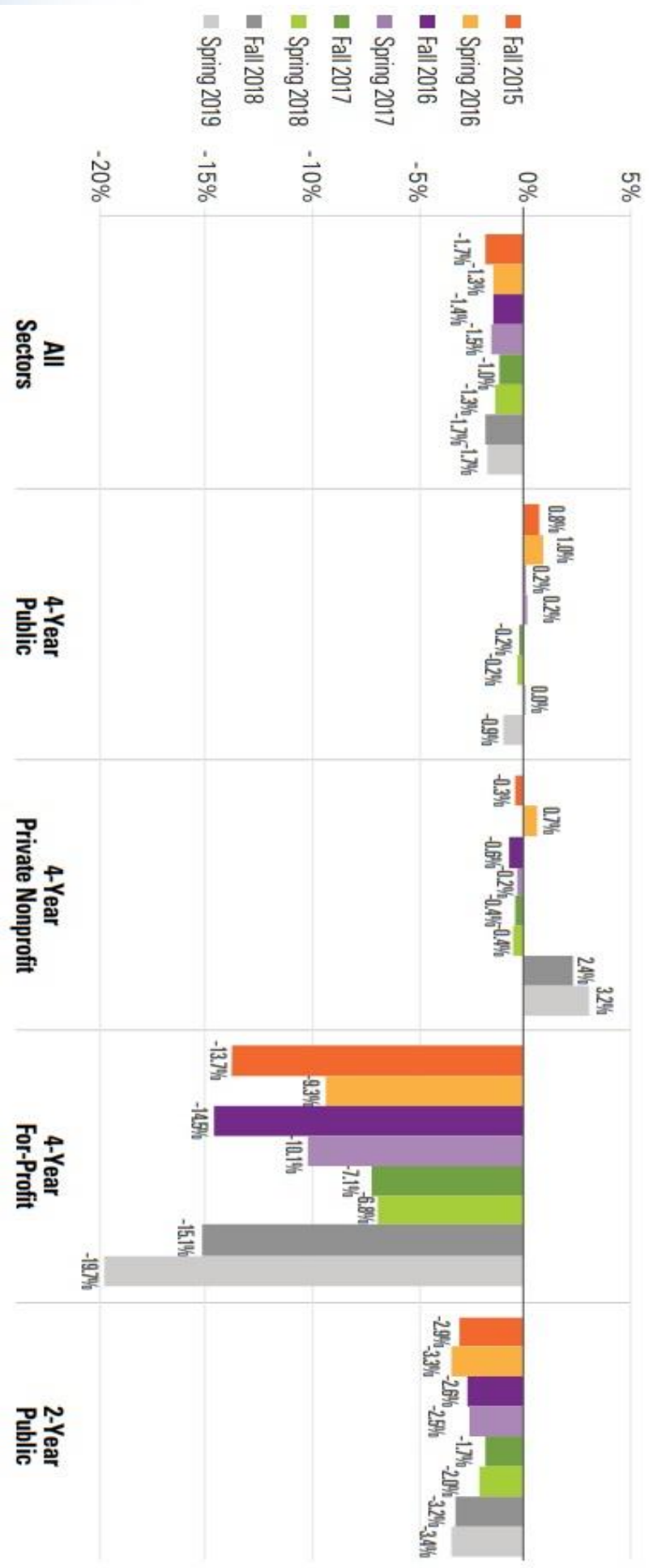
B Metropolitan Policy Program
at BROOKINGS

- Population growth declining
- International student visas decline
- Tuition & cost concerns
- Generational attitudes
- More proprietary and on-line competition

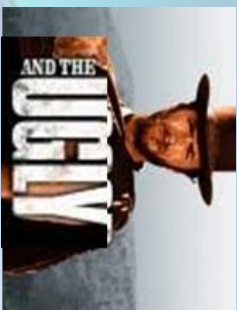


Lower Student Enrollment Declining (Loss of Tuition Dollars)

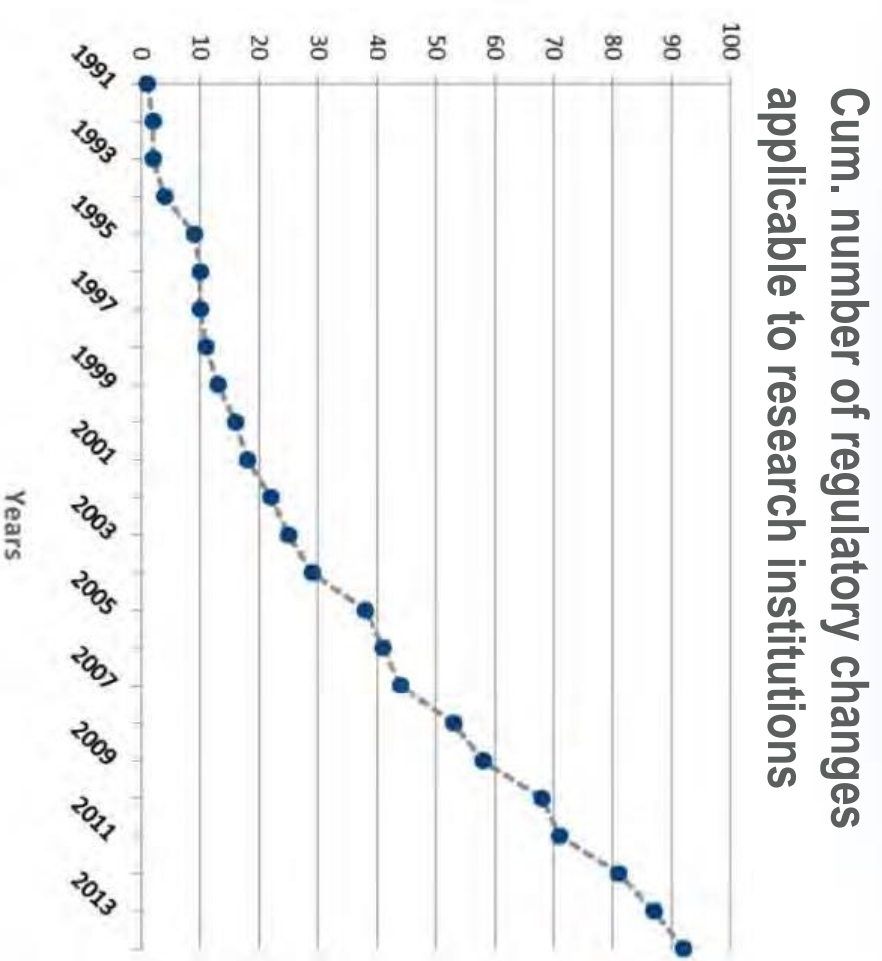
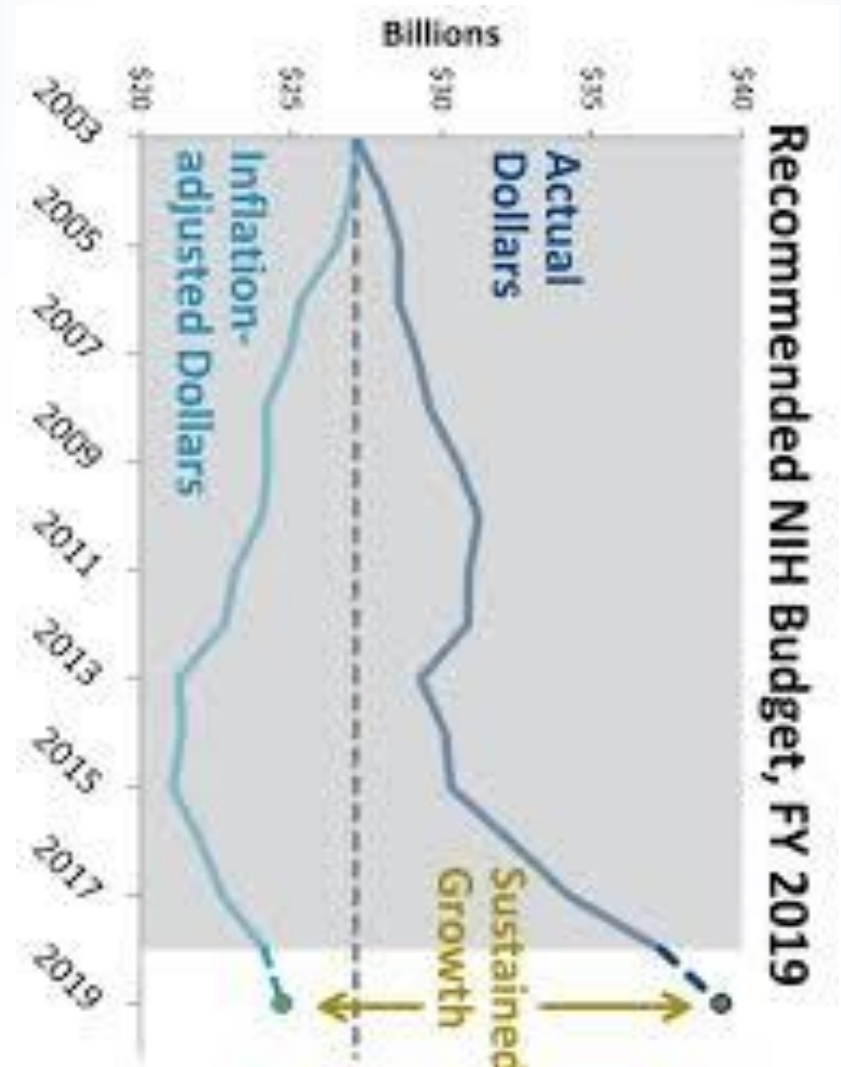
Figure 1: Percent Change from Previous Year, Enrollment by Sector (Title IV, Degree-Granting Institutions)



Source is AMN Management Services



Stagnant Research Funding



Source : Natl Institutes of Health Budget Office

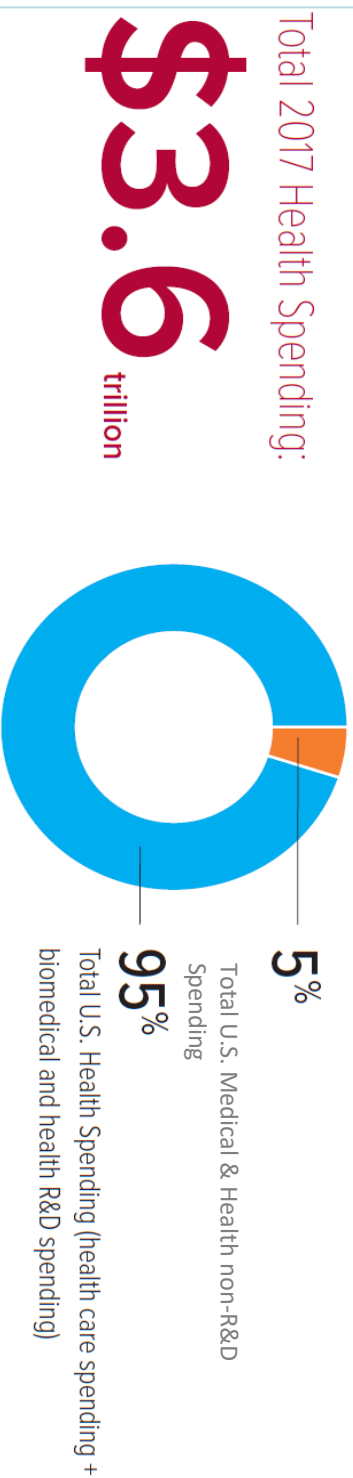


Research Represents 5% Health Care Investment Dollars Billion\$ At Stake:

Table 1: Total Health Spending versus Medical and Health R&D Investments (\$ in millions)

	2013	2014	2015	2016	2017 (est.)
Total U.S. Medical and Health R&D Spending	143,492	154,435	162,659	172,078	182,290
Total U.S. Health Spending ³	2,975,861	3,134,704	3,317,023	3,461,656	3,620,941
Medical & Health R&D as % of U.S. H					

Figure 1: Health Spending versus R&D Investments (\$ in millions)



Total U.S. medical and health R&D spending in 2017 = **\$182.3B**

- **\$121.8 billion** = Total U.S. Industry spending medical/health R&D 67% .
- **\$ 39.5 billion**, = Federal agencies inc. National Institutes of Health (NIH), etc.
- **\$ 20 billion** = Foundations, other

¹ Source: Research America

Research Dollars By Funding Source

Shift to Health Systems Prepared to Partner

Table 5: Estimated U.S. Medical and health Research Expenditures (\$in millions) and percentage Change

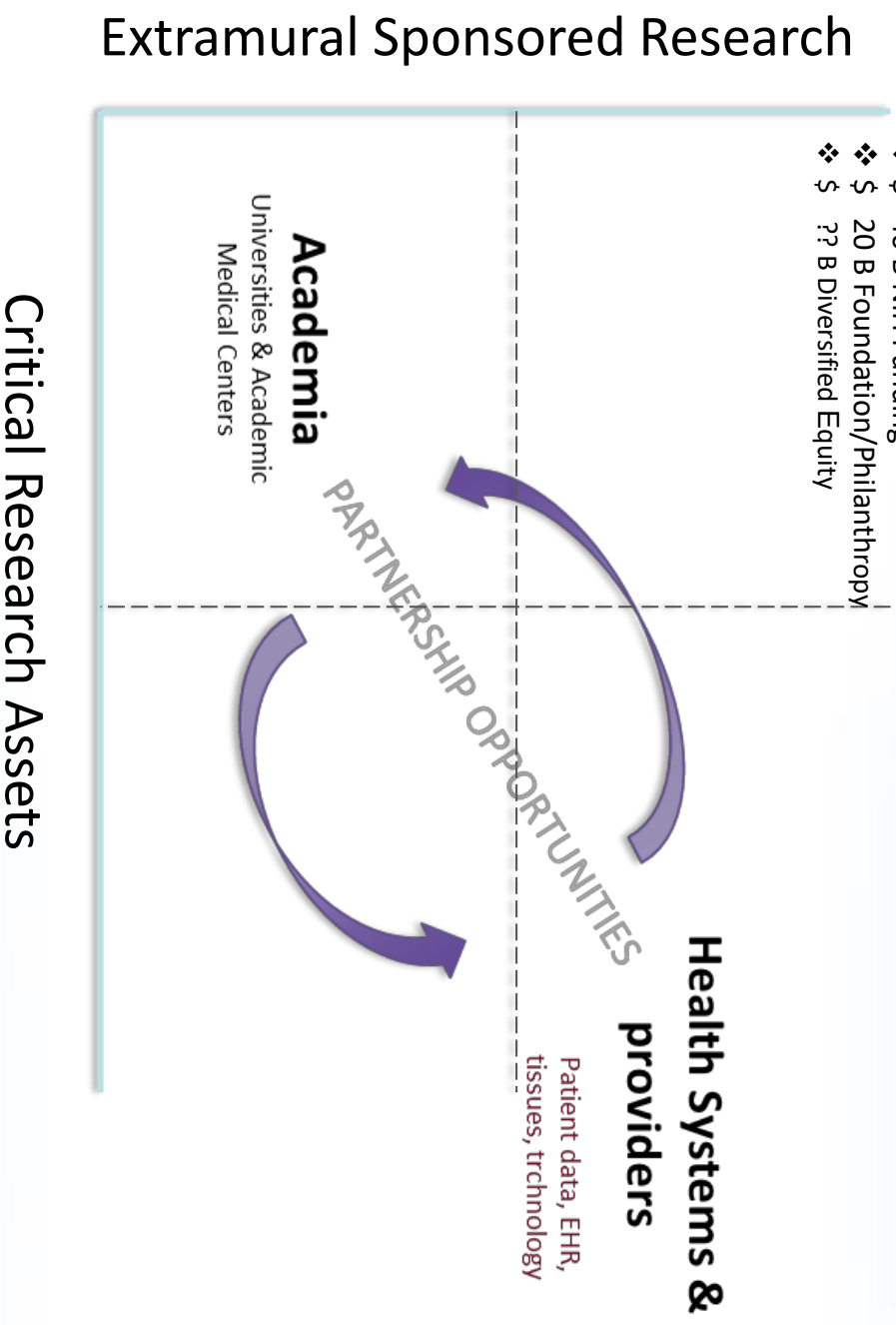
	2013	2017	2013-17 (5yr) Est % Change
Academic Research institutions			
Colleges & universities	7,130	9,644	35.27%
Independent Research Centers	2,2802	2,798	-0.015%
Independent Hospital Medical Research Institutes	1,273	1,806	41.81%
Total	11,205	14,248	27.6%



Research Paradigm Shift

AT STAKE:

- ❖ \$ 121 B Industry Funding
- ❖ \$ 40 B NIH Funding
- ❖ \$ 20 B Foundation/Philanthropy
- ❖ \$?? B Diversified Equity





INNOVATIVE RESEARCH VALUE PROPOSITION



1. Consumerism:

- Clinical trials attracts patients
- Provides patients with options & overall better outcomes
- Consumers equate research with excellence



2. Economics & Revenue Growth

- Research grants & contracts generate revenue (direct & downstream)
- Research is at the core of discovery & innovation
- Access to revenue generating technologies (*think TAVR, leadless, pacemaker*)
- Philanthropic dollars for research are a mechanism for grateful patients to give back



3. Reputation & Scholarship

- Research defines a hospital's reputation, ranking
- The "Top 100" hospital systems in U.S. all have **research** in common"
- 'Top talent' seek out institutions with research programs
- Research invites & seizes partnership opportunities



4. Culture of Excellence & Inclusion

- research creates a culture of diversity and creativity

AdvocateAuroraHealth™

BUT... MOST NON-ACADEMIC HEALTH SYSTEMS DON'T NECESSARILY SHARE THE TRIPARTITE MISSION OF ACADEMIA: RESEARCH, TEACHING, PRACTICE

Med School's Business Model is Officially Dead

"The slaughter of academic medicine"

- Milton Packard MD



- 1950-1970s Congress allocated vast funds to the NIH to support clinicians to advance research.
- Research floated medical schools which proudly proclaimed a tripartite mission “research, teaching, and patient care.”
- Now, (even at most “academic” medical schools) clinical faculty are employed, paid and managed directly by health systems to generate clinical revenue, not research.

“Traditional academic medical schools represent a money-losing relic of an honorable past”

Physician Compensation Incentive

Academic medicine and health system physicians are incentivized by a corporate model that promotes revenues.

What are RVUs? Part of the system Medicare uses to decide how much it will reimburse physicians for each of the 9,000-plus services and procedures covered under its Physician Fee Schedule, and which are assigned current procedural terminology (CPT) code numbers.

The dollar amount for each service is determined by three components: physician's work, practice expenses, and malpractice insurance

RELATIVE VALUE UNIT-BASED PRODUCTIVITY

The following table illustrates the calculation of RVU productivity ratios for physicians in a multi-specialty practice.

Provider name	Specialty	Percent of practice revenue	Percent of practice RVUs	RVU productivity ratio
Smith	Family medicine	13.47%	12.56%	1.07
Jones	Family medicine	13.93%	16.10%	0.87
Barnes	Family medicine	4.11%	5.77%	0.71
Adams	Pediatrics	13.14%	9.81%	1.34
Frey	Pediatrics	8.66%	8.74%	0.99
Leary	OB-GYN	12.25%	13.14%	0.93
Baron	OB-GYN	9.96%	14.86%	0.67
Singer	Orthopedics	6.81%	6.16%	1.11
Corsi	Orthopedics	17.66%	12.86%	1.37

- Calculate revenue per provider as a percent of total practice revenue
- Calculate total RVUs per provider as a percent of total practice RVUs
- Divide percent revenue by percent RVU to calculate productivity ratio

Source: The Frank Cohen Group

Academic & Health Care Partnerships May Be Difficult, But Are Necessary



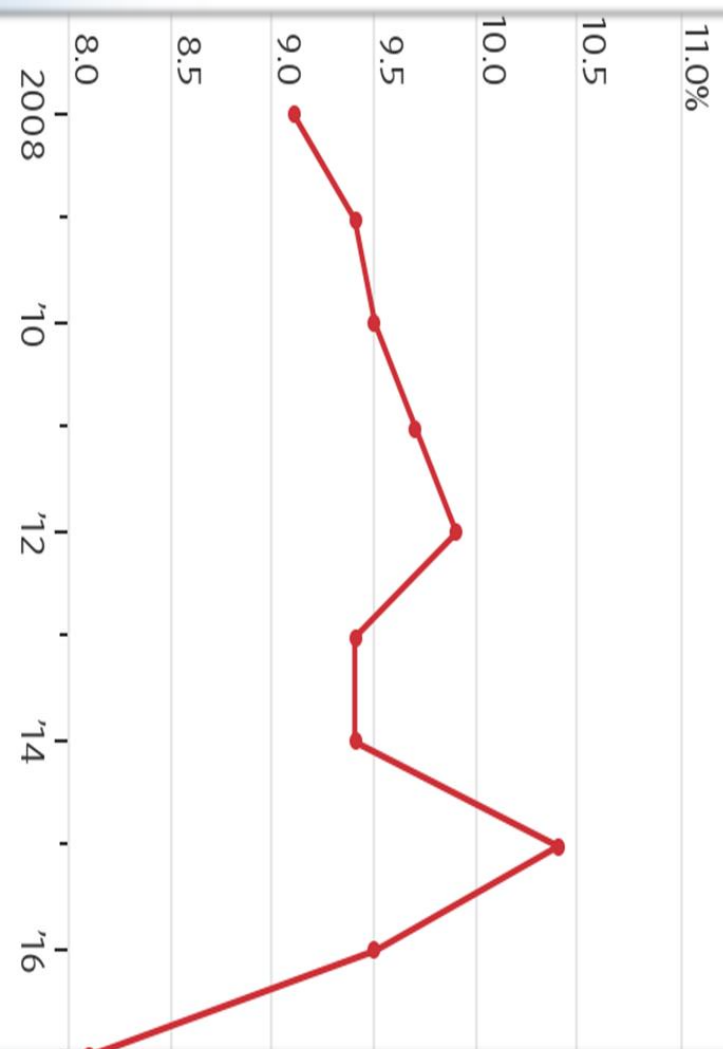
"You make a good point; we both hate the cat.
I'm just not sure what it is you'd bring to a partnership."

Health System Operating Margins Falling



Margins Fall
U.S. hospital operating profit declined in 2017, a preliminary analysis of nonprofit and public hospitals shows.

Median operating cash flow margin



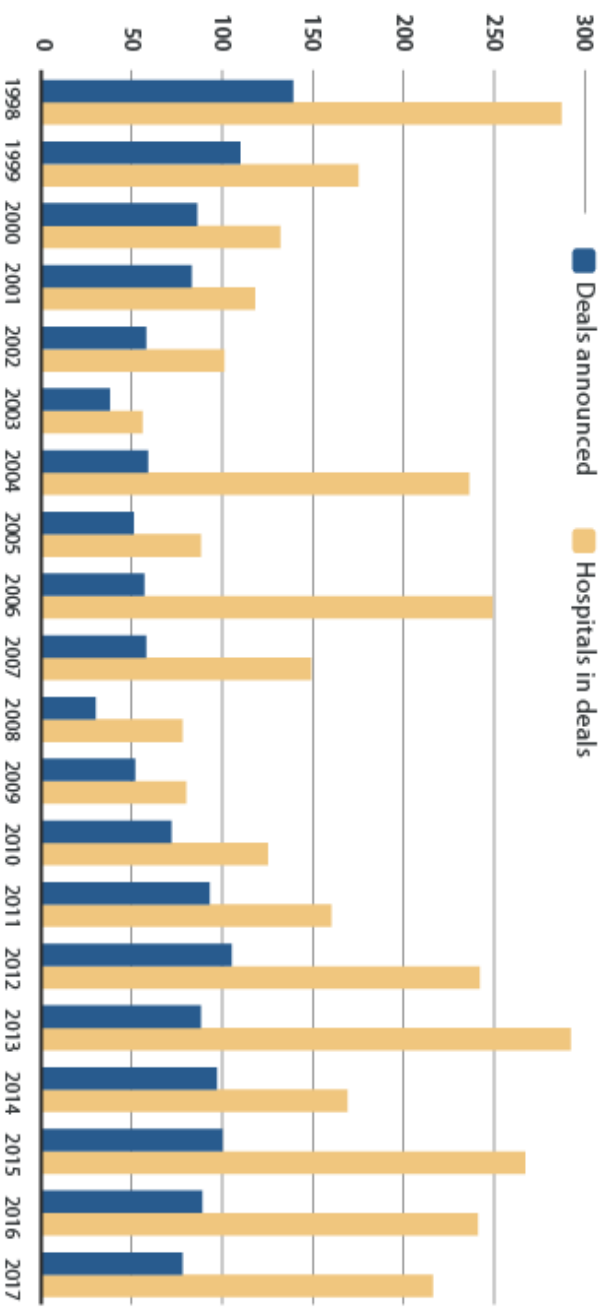
Source: Moody's Investors Service





Hospitals Look for Growth Through M&As and “Innovation”

FIGURE 3
Hospital consolidation shows no signs of slowing
 Number of announced hospital mergers and acquisitions, 1998–2017



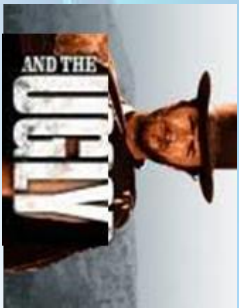
Source: American Hospital Association, “Trendwatch Chartbook 2016” (2016), available at <https://www.aha.org/system/files/2018-01/2016-chart-book.pdf>; idem; American Hospital Association, “Trendwatch Chartbook 2018” (2018), Chart 2.9: Announced Hospital Mergers and Acquisitions, 2005–2017, available at <https://www.aha.org/system/files/2018-05/2018-chartbook-chart-2-9.pdf>



Tout Moving from VOLUME to VALUE-Based Care

- Cost Savings
- Supply Chain
- Efficiencies
- Price transparency
- Data security
- Interoperability

“Transformation” “Synergies” “Opportunities”



The Largest Health System Merger

CommonSpirit 

=

 Catholic Health Initiatives +  Dignity Health.

\$29B Total Revenues

(\$20B Operating + \$ 9B Investment asset reporting)

\$582M Operating Loss

(\$290M operating + \$272M Merger costs)



CommonSpirit Ends Fiscal Year with \$582M operating loss, lays out plan for improvement

October 08, 2019

BY Tina Reed

CommonSpirit Health which operates 142 hospitals in 21 states, posted a \$582 million loss last year in the wake of the merger that created the Catholic health giant, officials reported this week.

The new health system—the largest nonprofit health system in the country by revenue—was created in February through a merger between Catholic Health Initiatives and Dignity Health.

In their consolidated financial report for their fiscal year ending June 30, the health system reported a net loss of \$290 million on revenue of almost \$29 billion. That is down from \$1.1 billion in earnings on \$29 billion of revenue in fiscal 2019. The health system's operating loss was much higher—the \$582 million loss—when taking into account special charges and merger-related costs

ECONOMETRIC SHIFT TO INNOVATION



The Search for Financial Sustainability & Growth

The Innovation Value Proposition:

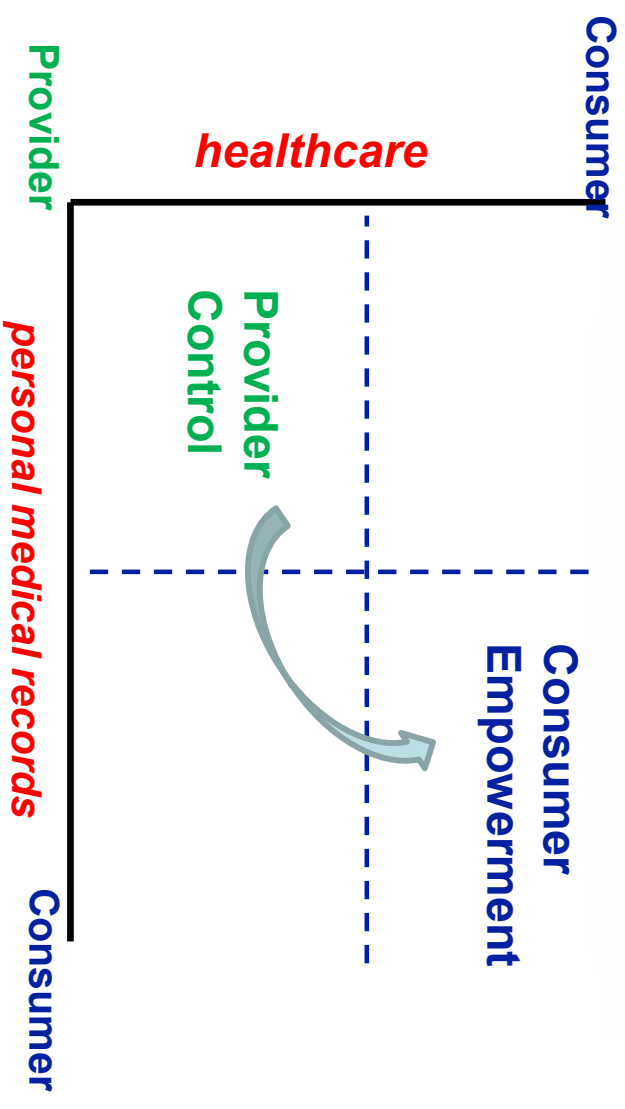
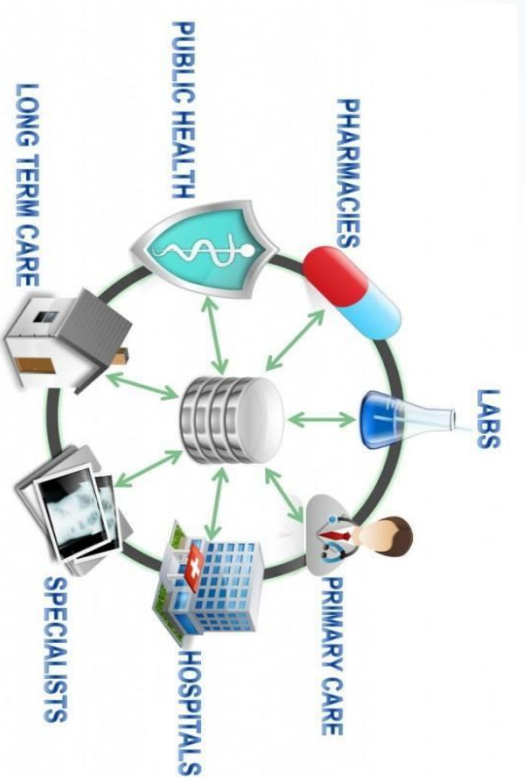
- *Growth: revenue/equity, consumers*
- *Cost-savings*
- *Asset-utilization*

Integrity, Quality, Oversight

Consumer Role?



Consumer Role In Innovative Health Care ?



Patients Want:

- Interoperability
- Price transparency
- Control of their own Health

- *Health Care Current* | July 2, 2019



Who Else Owns or Has Access to Your Data?

Pharma and Device Manufacturing Industry collecting and saving your data from clinical trials.

23andMe Moving Beyond Consumer DNA Tests, Building a Clinical Trial Recruitment Business and in Drug Development - Sept 26, 2019 (10M customers) – 80% contacted and opted in.

Google About 1 in 20 Google searches are health-related and some 72 percent of internet users search online for health information, according to research from [John Hopkins University](#) in collaboration with Google.

Apple: The organization is updating iPhone software with a health records feature so users can share and manage their personal medical records. Also using Apple Watch to collect health data.

Amazon and Other Tech Giants are Using AI to Find Protein Structures in Hunt for New Drugs



HEALTH CARE INNOVATION

Not a substitute or replacement for research



“You don’t want to chase a bunch of things that end up being science projects”

- *Chief Strategy & Growth Officer
Banner Health*

Modern Healthcare June 17, 2019

Innovation Run Amuck

theranos

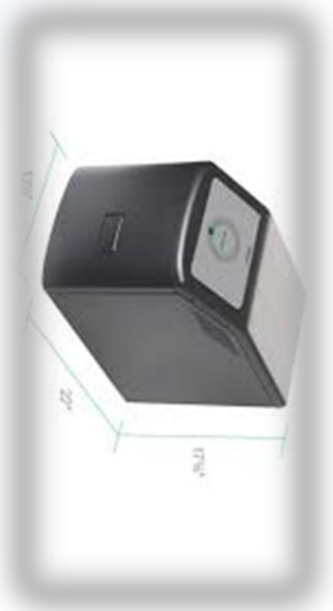


The rise and fall of Theranos

Founded 2003

Partnered with Walgreens 2013

Defunct 2018



The \$9B blood-testing startup that went from Silicon Valley that went defunct



How Did This Happen?

THERANOS BOARD OF DIRECTORS

- 6 former government officials
- 2 former military leaders
- 2 corporation leaders
- 2 Theranos' leaders
- 2 graduates from medical school

George P. Shultz—former U.S. secretary of state

Gary Roughhead—retired U.S. Navy admiral

William J. Perry—former U.S. secretary of defense

Sam Nunn—former U.S. senator, chair of Senate Armed Services Comm

James N. Mattis—retired U.S. Marine Corps general

Richard Kovacevich—former CEO of Wells Fargo

Henry A. Kissinger—former U.S. secretary of state

William H. Frist MD—heart & lung transplant surgeon, former US senator

William H. Foege MD—former Dir CDC and Prevention

Riley P. Bechtel—chairman of the board of the Bechtel Group Inc.,

Sunny Balwani—president and COO of Theranos

Elizabeth Holmes—CEO and chairman of the board of Theranos

SUMMARY

- **Academia and Health Care Systems Are in a Fragile State**
- **A Solid “Value Proposition” must be in place**
- **Leaders Need to Identify Sustainable New Strategies**
- **Partnerships are Absolutely Critical**
- **Consumers Need to be at the Center of Solutions**
- **Innovation is Important, but has Limitations**
- **Integrity, Oversight and Quality Must be Maintained**

How Does Education Keep Ahead of the Curve ?

1. Adopt Recommendations & Strategies from the ASAHP Task Force

- Develop meaningful academic & healthcare partnerships*
- Assess clinical education interprofessional competencies*
- Advocate for interprofessional practice and referrals*
- Incorporate effective use of technology into education*
- Promote research & scholarly activity in clinical education*

2. Explore adding education opportunities in gap areas

3. Insert “Innovation learning” into the curriculum

How Are Large Healthcare Delivery Systems Adopting ?

JP Morgan Conference 2019

Major shift from a traditional strategy of buying and building hospitals and simply providing care, to a strategy that focuses on leveraging the “platform” they already have in place to create more value

Think of it in terms of cell phones (Blackberry) to smartphones (iPhone and Android devices). One was a product, the other was a platform.

Common platforms: Facebook, Amazon, Google, Apple and even Starbucks have always; 1) started with a very small niche, 2) built an audience & trust and 3) added other offerings on top of that platform.

Health System Strategy: Leveraging Your “Platform”

1. Create a Digital Front Door — *or Someone Else Will*
2. Drive Affordability and Reduce Cost — *or Risk Being the Problem*
3. Tackle Social Determinants of Health — *or You Won't Be the Hub for Health in Your Community*
4. Create Partnerships for Healthcare Innovation — *or Lose the Upside*
5. Become the Hub for Targeted Services and Chronic Conditions — *or They Will Go Elsewhere*
6. Leverage Applied (Performance) Analytics — *or You'll Lose Your Way*

THANK YOU !



ASAHP

ASSOCIATION OF SCHOOLS OF
ALLIED HEALTH PROFESSIONS