Disruption and the Broader Economy: Demographics and the Case of Health Care

Mark Duggan

Stanford University, NBER, and SIEPR

May 2018

Significant Demographic Change Underway in the U.S.

Aging of baby boom population and lower mortality probabilities Consider most recent Census population projections 2016-35

<u>Age Group</u>	<u>% Growth</u>
Ages 0-17	4%
Ages 18-44	9%
Ages 45-64	0%
Ages 65-84	55%
Ages 85+	85%

Ratio of 18-64 to 65+ projected to fall from 4.1 to 2.7 as a result

Recent research => this will increase automation / use of robots

- Acemoglu and Restrepo (2018) focus on manufacturing sector
- Services may be even more affected

Aging of the population => less innovation (Lazear, 2014)

"Can Robots Make Up for Japan's Home Care Shortfall?"



Grin and bear it: the Robear robot can lift elderly people or hospital patients off their bed into a wheelchair

Source: Financial Times 10/17/2017

Recent and Predicted Trends for the Health Care Sector

A large and steadily growing share of the economy

- GDP share has grown from 13% in 2000 to 18% in 2016
- Driven by intro and diffusion of new and more expensive treatments

BLS projects rapid further employment growth in this sector Small impact of automation / AI / other disruptions to date

Some predictions that this will change in the near future

- Apps that can make certain appointments unnecessary
- Radiologists replaced by visual pattern recognition software
- Biometric sensors / wearables that allow easy monitoring

Enormous scope to reduce waste and increase quality

- Massive variation in practice patterns across providers
- Harness the available data to increase efficiency

Health Care Employment Largely Unaffected by Great Recession

Chart 1: Total nonfarm employment and healthcare and related employment, January 2004–14 (in thousands)



Note: Health care and related include series CEU6562000101, CEU9091622001, CEU9092262201, and CEU9093262201. January 2014 data are preliminary.

Source: U.S. Bureau of Labor Statistics, Current Employment Statistics (wage and salary employment, seasonally adjusted).

Health Care Just Became the U.S.'s Largest Employer

In the American labor market, services are the new steel.

DEREK THOMPSON | JAN 9, 2018

HUMAN CAPITAL

Source: The Atlantic Jan 9, 2018



Projected to Remain Very Strong in the Years Ahead



Where Does the Money Go? Data for 2016 (in billions of \$, CMS)

U.S. Total	\$3,337
Personal health care	\$2,834
Hospital care	\$1,083
 Physician / clinical services 	\$665
 Prescription drugs 	\$329
 Nursing and home health care 	\$255
Dental services	\$124
 Other medical products 	\$113
 Other personal health care 	\$265
Investment	\$157
Administrative Costs	\$264
Public health	\$82

Source: CMS 2018

Source of Expenditures: Data for 2016 (in billions of \$, CMS)

U.S. Total	\$3,337	
Private health insurance	\$1123 (33%)	
Medicare	\$672 (20%)	
Medicaid	\$566 (17%)	
Out-of-pocket	\$353 (11%)	
VA and DoD	\$126 (4%)	
Other 3 rd party payers	\$341 (10%)	
Investment	\$157 (5%)	

More than \$10k in per-capita spending

Effects for Employers in the U.S.

Most U.S. residents covered by private ESI plans

- Through their own employment or spouse / parent's
- Represents a substantial component of employee compensation

Less cost pressure on employers recently for three reasons

- Declining share of U.S. residents with ESI coverage
- Slowdown in ESI premium growth
- Larger % of premiums paid by employees

May reduce price increases and/or increase wage growth

Rising efficiency of private health insurance?

• Consumers now have more "skin in the game"

Declining ESI Coverage has Recently Accelerated

	1996	2006	2016
Private Health Insurance	69.3%	66.1%	61.0%
- Employer-Sponsored Insurance	61.3%	60.0%	53.8%
- Direct purchase	4.6%	3.8%	2.3%
- Medigap	3.4%	2.9%	2.3%
- Exchange	0.0%	0.0%	3.1%
Medicare	13.8%	14.2%	17.3%
Medicaid or CHIP	11.9%	16.8%	24.1%
Other Public Insurance	3.1%	3.4%	4.1%
Uninsured	13.1%	14.2%	8.9%

Source: CMS 2018

Declining % of Firms Offer Health Insurance Coverage

Figure G

Percentage of Firms Offering Health Benefits, by Firm Size, 1999-2017



* Estimate is statistically different from estimate for the previous year shown (p < .05).

NOTE: As noted in the Survey Design and Methods section, estimates presented in this figure are based on the sample of both firms that completed the entire survey and those that answered just one question about whether they offer health benefits.

SOURCE: Kaiser/HRET Survey of Employer-Sponsored Health Benefits, 1999-2017

Employees Paying for a Steadily Increasing Share of Premium

Figure 6.4

Average Annual Worker and Employer Contributions to Premiums and Total Premiums for Family Coverage, 1999-2017



* Estimate is statistically different from estimate for the previous year shown (p < .05).

SOURCE: Kaiser/HRET Survey of Employer-Sponsored Health Benefits, 1999-2017

Policy Changes Have Been A Key Disruptor to Health Care Sector

Large increase in fraction with Medicare and especially Medicaid

- 60 million now on Medicare with this rising to 80+ million soon
- 80 million on Medicaid (driven by ACA) 32% in CA vs. 18% in TX

Substantial enrollment (11 million) in ACA exchanges

Impact on role of technology-enabled disruption in this sector unclear

• Consider pricing of (expensive) drugs to treat Hepatitis C

Medicare reimbursement rate changes

- Substantial reduction in automatic rate increase each year (\$350 billion savings)
- Spillover effects to private health insurance (Clemens and Gottlieb, 2016)

Medicare has increased quality incentives

• Substantial penalties for above-average readmission rates

Rising insurance coverage makes consumers less price-sensitive

• Likely to focus more on quality, where metrics are highly imperfect

Technology-Enabled Disruption in U.S. Health Care Sector

Can technology-enabled disruption reduce health care costs?

• Virtual physician visits, biometric sensors, etc.

Can it increase quality of care?

- Yelp for physician ratings, software to interpret mammograms, etc.
- Genomics, precision medicine
- Effects on consumer experience (e.g. lower wait time)

Will it impact employment?

- For each doctor, there are 16 non-doctors in health care sector
- Most are non-clinical (e.g. receptionists, office clerks)

Can disruption increase productivity of care?

- Need a measure of output and a value per unit
- AI and big data analytics to get to the quality / \$ frontier
- Blockchain technology may be a more secure way to share data

Many factors beyond health care influence health

Changes in Health Not Captured in National Statistical Measures



Source: 1970–2010 data from Arias et al., 2017, Table 19; 2016 data from Kochanek, Kenneth D., Sherry L. Murphy, Jiaquan Xu, and Elizabeth Arias. 2017. "Mortality in the United States, 2016." *National Center for Health Statistics Data Brief*, Figure 1.

Some Troubling Trends in the Mortality Data





¹Significant increasing trend from 1999 to 2016 with different rates of change over time, p < 0.005.

²2016 rate was significantly higher than for the rate for age groups 15–24, 55–64, and 65 and over, p < 0.05.

NOTES: Deaths are classified using the *International Classification of Diseases*, Tenth Revision. Drug-poisoning (overdose) deaths are identified using underlying cause-of-death codes X40–X44, X60–X64, X85, and Y10–Y14. Access data table for Figure 2 at: https://www.cdc.gov/nchs/data/databriefs/db294_table.pdf#2. SOURCE: NCHS, National Vital Statistics System, Mortality.