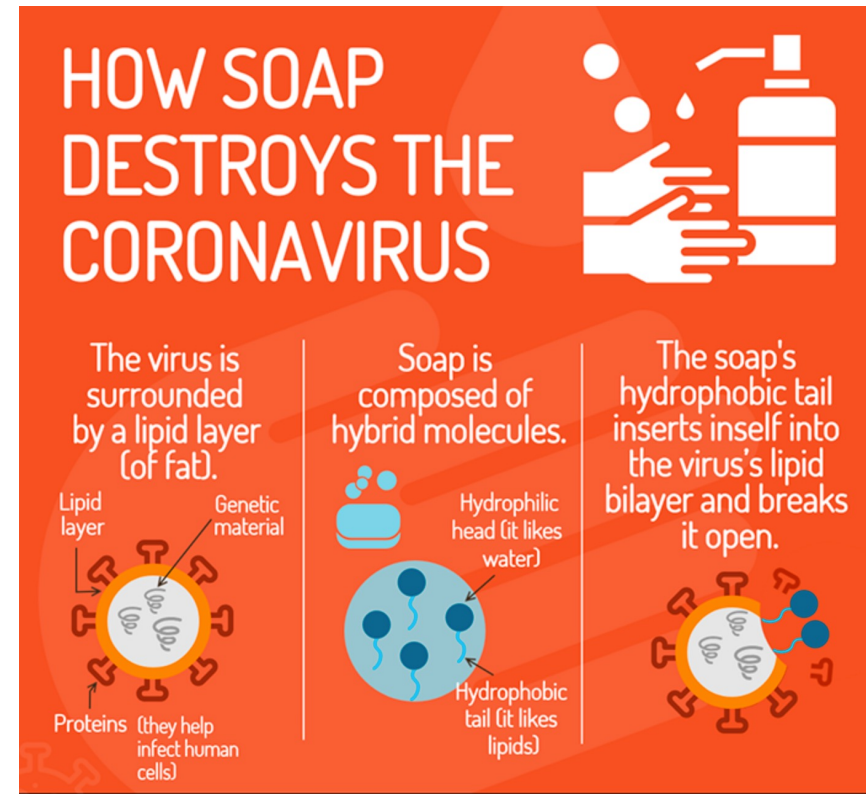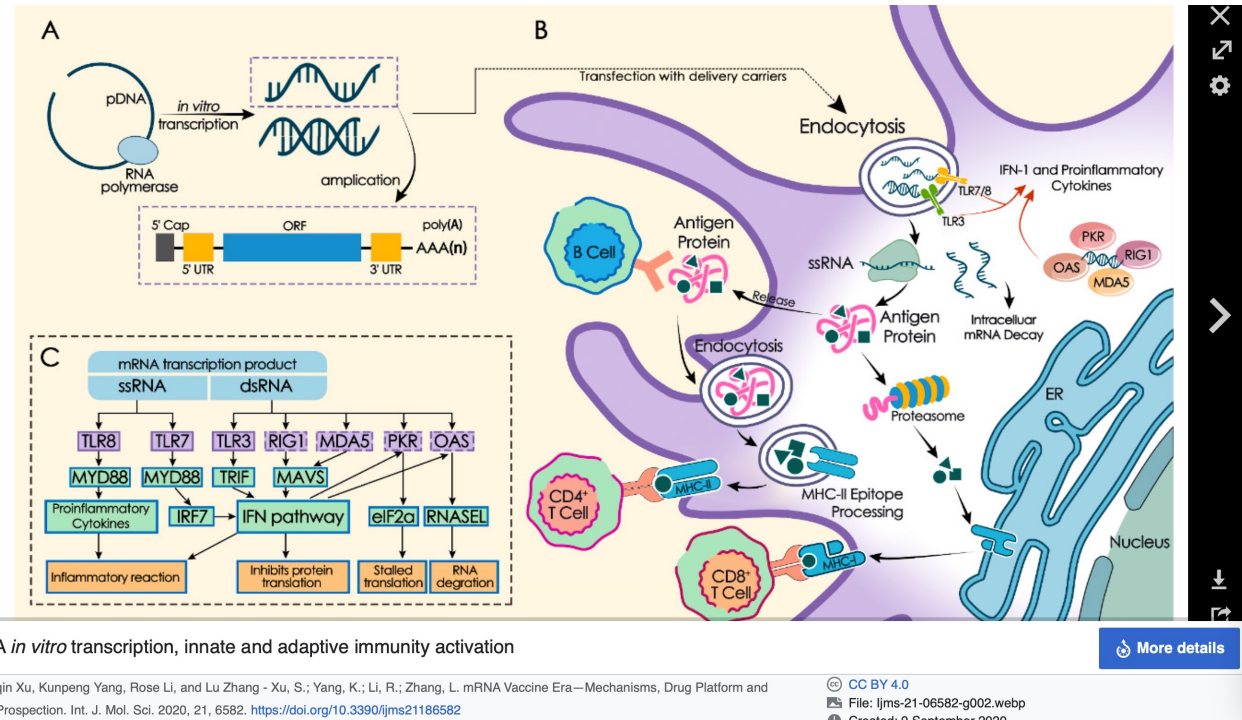# Innovation in HealthCare

Jay Srini. jsrinij@gmail.com

Feb 14 2024

What is Innovation- RTB-> GTB-> TTB

- Innovation can be defined as invention + adoption + diffusion.

- In healthcare, it may be a novel idea, product, service or care pathway that has clear benefits when compared to what is currently done.

- Successful innovations often possess two key qualities: they are both usable and desirable.

- No different in healthcare except…. Usable and desirable to who whom what ?

Covid taught us :
Innovation can last for ever or not.
Innovation can be complex or elementary.

in vitro transcription, innate and adaptive immunity activation

HOW SOAP DESTROYS THE CORONAVIRUS

The virus is surrounded by a lipid layer (of fat).

Lipid layer
Genetic material
Proteins (they help infect human cells)

Soap is composed of hybrid molecules.

Hydrophilic head (it likes water)
Hydrophobic tail (it likes lipids)

The soap's hydrophobic tail inserts inself into the virus's lipid bilayer and breaks it open.

THE HEALTH CARE MESS

HOW WE GOT INTO IT AND WHAT IT WILL TAKE TO GET OUT

Julius B. Richmond, M.D.
Rashi Fein, Ph.D.

Foreword by Jimmy Carter

Is Healthcare Crying Out for Innovation?

The Health Care Mess: How We Got Into It and What It Will Take To Get Out

Agenda

What do we know about the Macro Economics of Healthcare ?

Understanding the Market and Business of Healthcare. (Heatlh & Care and all in between)

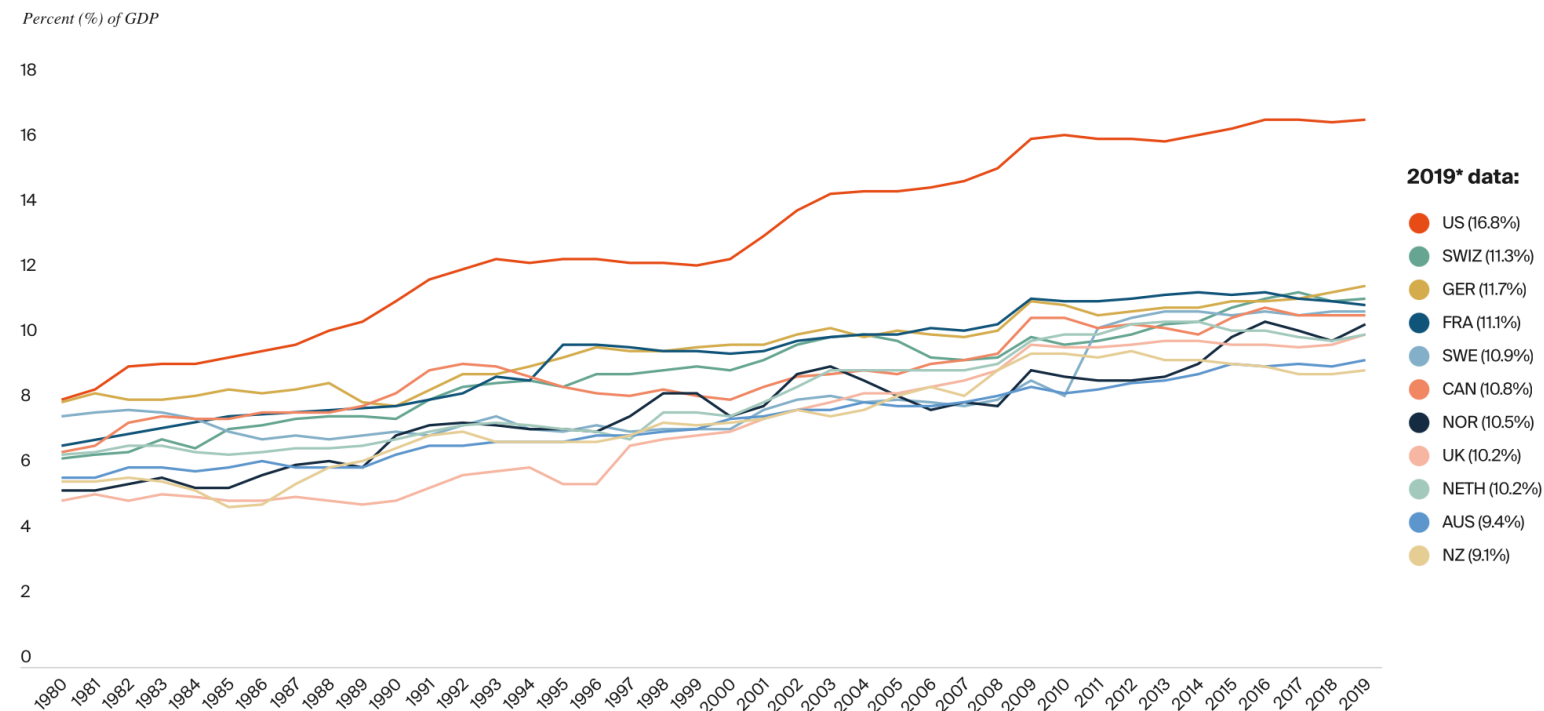**Health Care is not a Zero sum Game ?**

Perverse Economics and Incomprehensible Value Chain

Innovation in Health Care-

# Healthcare costs as percentage oF GDP will approach 20% in 2030

- health care spending grew 4.1 percent in 2022, reaching $4.5 trillion or $13,493 per person. health spending accounted for **17.3 percent of GDP.**

Health Care Spending as a Percentage of GDP, 1980–2019

Percent (%) of GDP
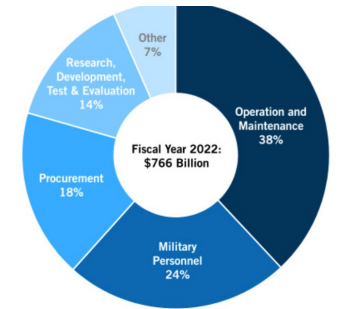
2019* data:

- US (16.8%)
- SWIZ (11.3%)
- GER (11.7%)
- FRA (11.1%)
- SWE (10.9%)
- CAN (10.8%)
- NOR (10.5%)
- UK (10.2%)
- NETH (10.2%)
- AUS (9.4%)
- NZ (9.1%)

GDP Vs healthcare Costs

Average annual growth rate of GDP per capita and total national health spending per capita, 1970-2022

GDP **Health spending**
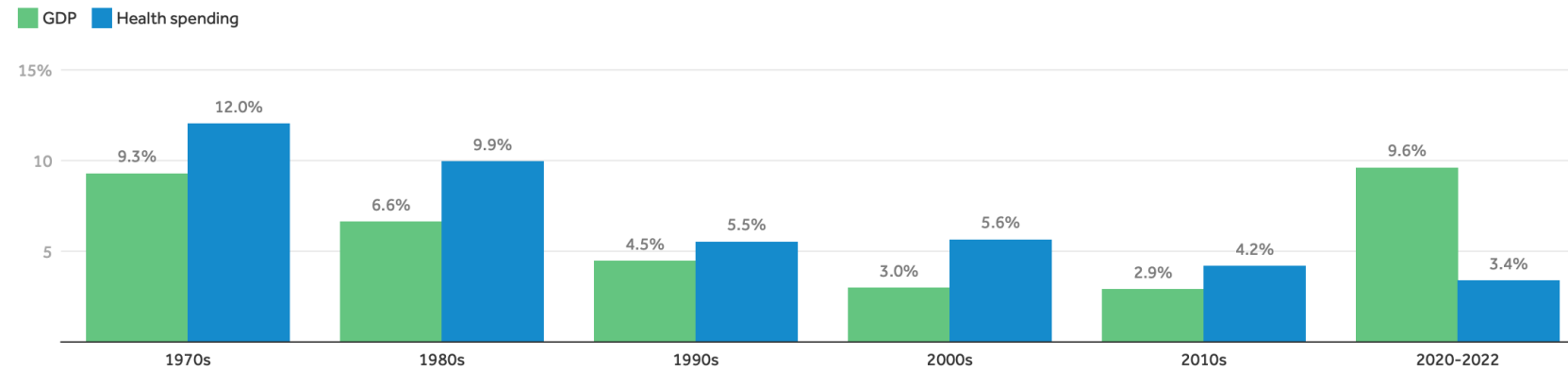
Note: 2020-2022 represents a 2-year change.

Source: KFF analysis of National Health Expenditure (NHE) data • Get the data • PNG
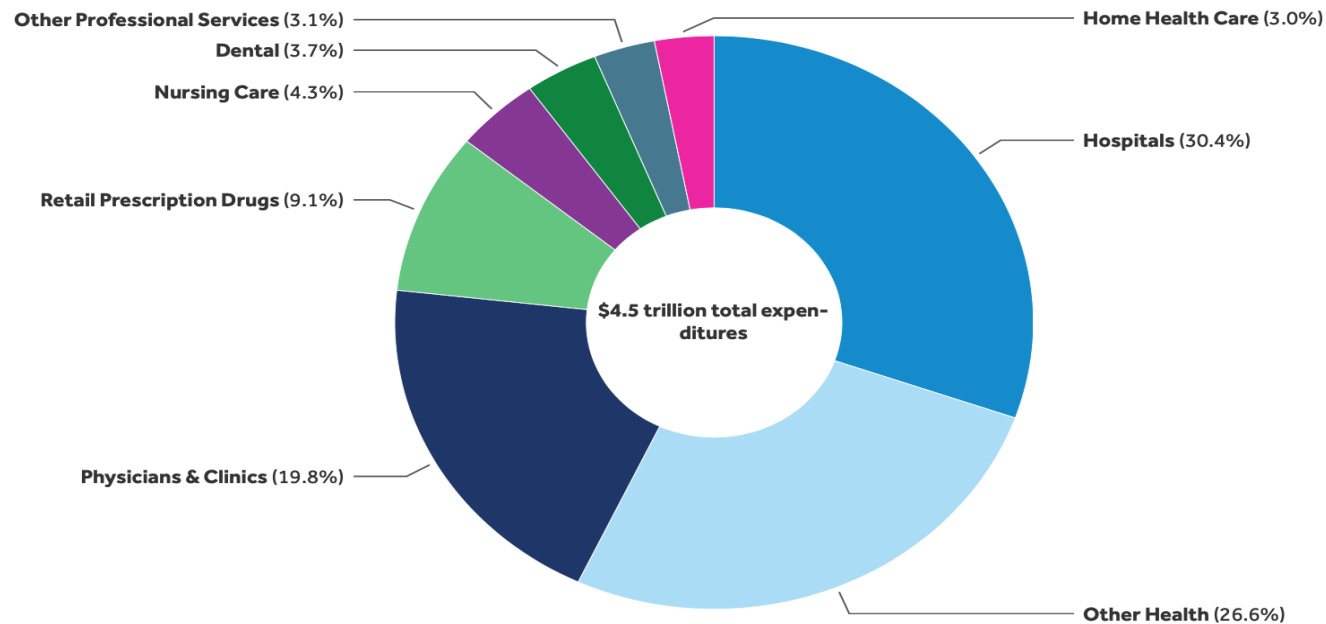
SOURCE: Office of Management and Budget, *Public Budget Database, Budget of the United States Government: Fiscal Year 2024,* March 2023.
NOTES: Numbers may not sum to 100 percent due to rounding. The data presented above are for mandatory and discretionary defense spending. All Other Defense Spending includes military construction; family housing; atomic energy defense activities; defense-related activities; and other smaller miscellaneous outlays.

From 1970 through 1980, the average annual per capita growth in the U.S. economy was 9.3% per year, compared to per capita health spending growth of 12.0%. Although health spending growth rate has since moderated, it generally continues to outpace growth of the economy. After a period of recession during the first year of the COVID-19 pandemic, the economy recovered in 2021 and 2022, with GDP per capita increasing at an average rate of 9.6%. Per capita national health expenditures increased by 3.4% on average from 2020 to 2022.

What makes up HealthCare Cost?

Health Spending

Relative contributions to total national health expenditures, by service type, 2022

Every Segment has a lobby Group

Other Professional Services (3.1%)
Dental (3.7%)
Nursing Care (4.3%)
Retail Prescription Drugs (9.1%)
Physicians & Clinics (19.8%)

Home Health Care (3.0%)
Hospitals (30.4%)

$4.5 trillion total expenditures

Other Health (26.6%)

Note: "Other Health" includes spending on durable and non-durable products; residential and personal care; administration; net health insurance; and other state, private, and federal expenditures. "Other professional services" includes spending for services provided by chiropractors, optometrists, physical, occupational, and speech therapists, podiatrists, private-duty nurses, and others. Nursing care represents expenditures for nursing care facilities and continuing care retirement communities.

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Health Care expenditures – Prescriptions cost

Average annual expenditures growth rate for select service types, 1970-2022

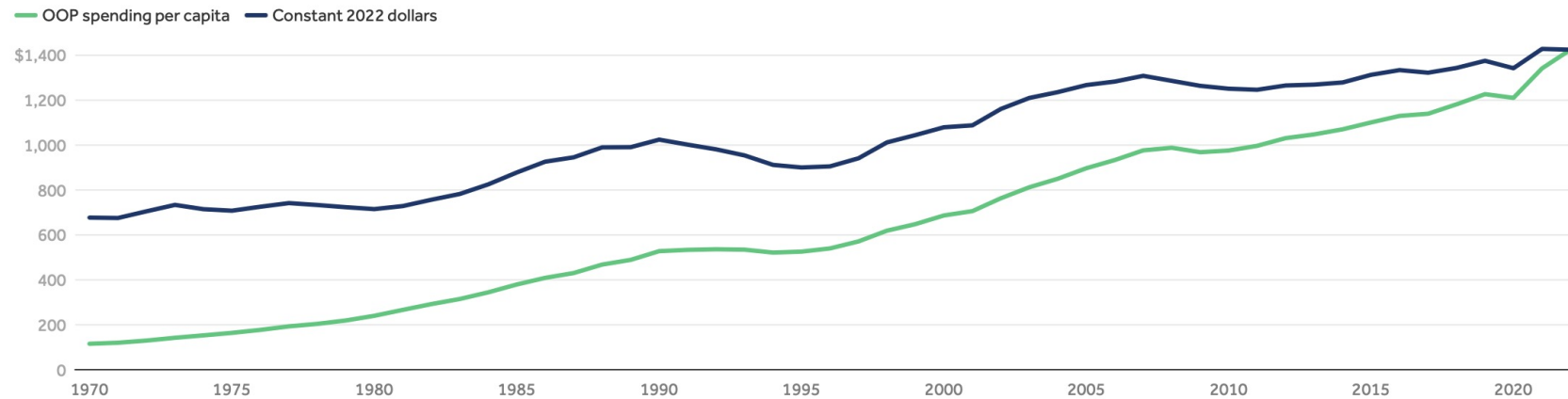■ Hospitals ■ Physicians & clinics ■ Retail prescription drugs
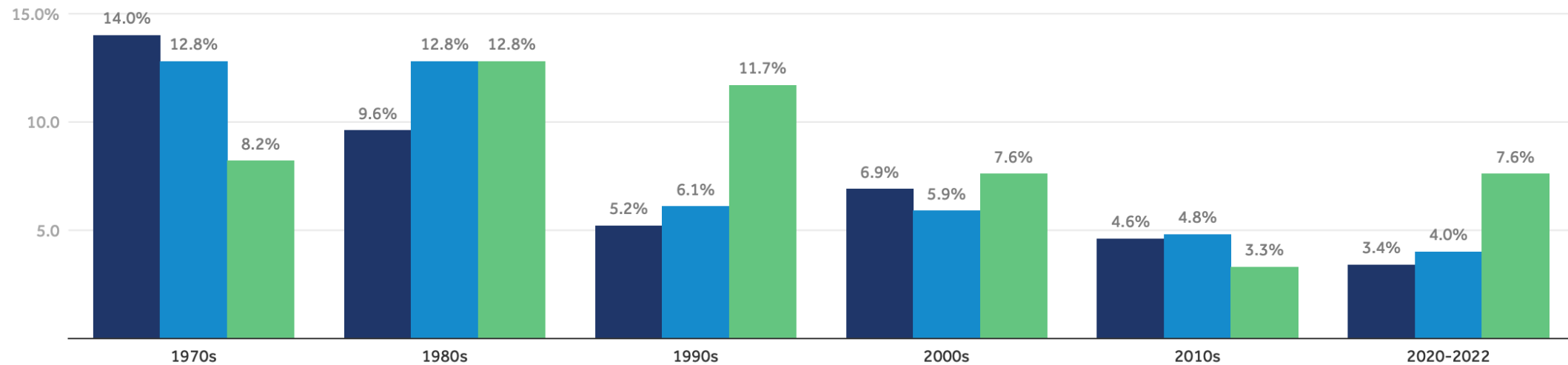
Source: KFF analysis of National Health Expenditure (NHE) data • Get the data • PNG

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Health System Tracker

How much does it cost the individual ?

Per capita out-of-pocket expenditures increased in 2022

Per capita out-of-pocket expenditures, 1970-2022
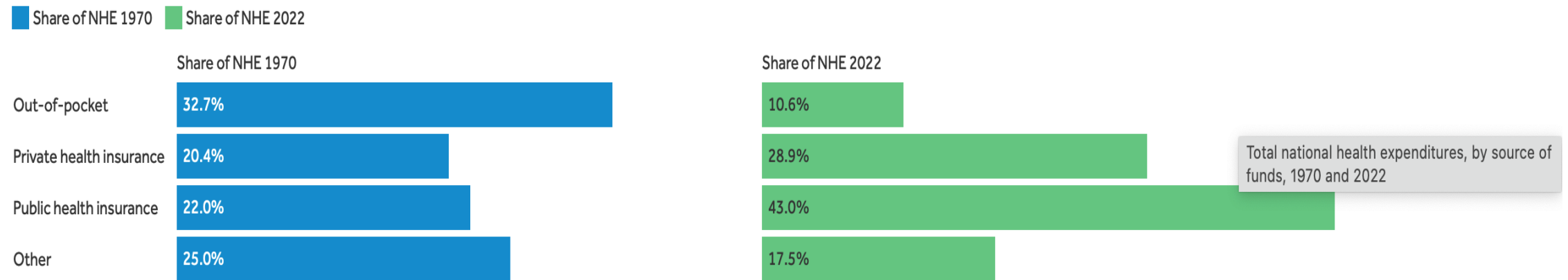
— OOP spending per capita   — Constant 2022 dollars

Note: A constant dollar is an inflation adjusted value used to compare dollar values from one period to another.

Source: KFF analysis of National Health Expenditure (NHE) data • Get the data • PNG

Peterson-KFF
Health System Tracker

Total national health expenditures source of funds

Total national health expenditures, by source of funds, 1970 and 2022

■ Share of NHE 1970   ■ Share of NHE 2022

	Share of NHE 1970	Share of NHE 2022
Out-of-pocket	32.7%	10.6%
Private health insurance	20.4%	28.9%
Public health insurance	22.0%	43.0%
Other	25.0%	17.5%

Total national health expenditures, by source of funds, 1970 and 2022

Notes: Public insurance in 1970 includes Department of Veterans Affairs, Department of Defense, Medicare, and Medicaid. In 2022, public insurance includes the same categories listed for 1970, with the addition of CHIP. "Other" includes spending on public health activities, investment, and third party payers and programs like worksite health care, the Indian Health Service, and other state and local programs.

Source: KFF analysis of National Health Expenditure (NHE) data • Get the data • PNG

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Health System Tracker

Do you you really get what you paid for?

EXHIBIT 1

Health Care System Performance Rankings

	AUS	CAN	FRA	GER	NETH	NZ	NOR	SWE	SWIZ	UK	US
OVERALL RANKING	3	10	8	5	2	6	1	7	9	4	11
Access to Care	8	9	7	3	1	5	2	6	10	4	11
Care Process	6	4	10	9	3	1	8	11	7	5	2
Administrative Efficiency	2	7	6	9	8	3	1	5	10	4	11
Equity	1	10	7	2	5	9	8	6	3	4	11
Health Care Outcomes	1	10	6	7	4	8	2	5	3	9	11

Data: Commonwealth Fund analysis.

Source: Eric C. Schneider et al., *Mirror, Mirror 2021 — Reflecting Poorly: Health Care in the U.S. Compared to Other High-Income Countries* (Commonwealth Fund, Aug. 2021). https://doi.org/10.26099/01DV-H208

All Cause age adusted mortality

All cause age-adjusted mortality rate per 100,000 population, 1980-2020

United States

All cause age-adjusted mortality rate per 100,000 population, 1980-2020
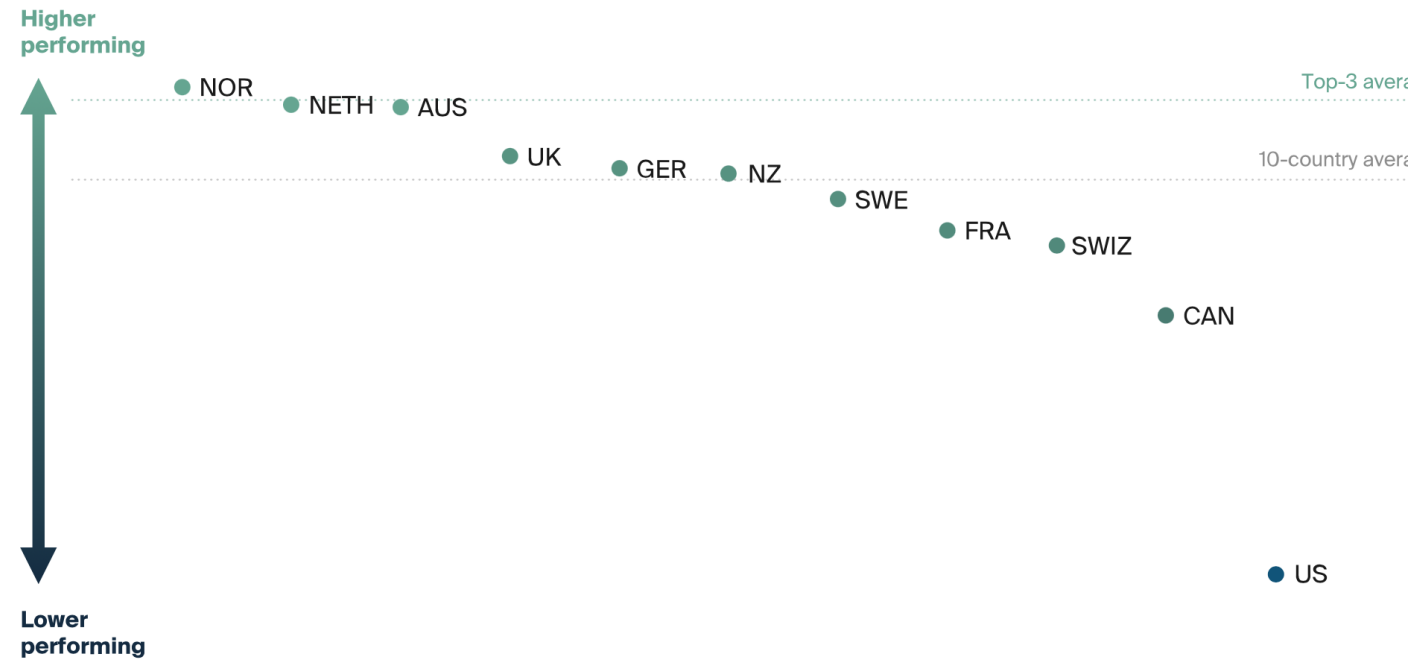
Comparable Country Average
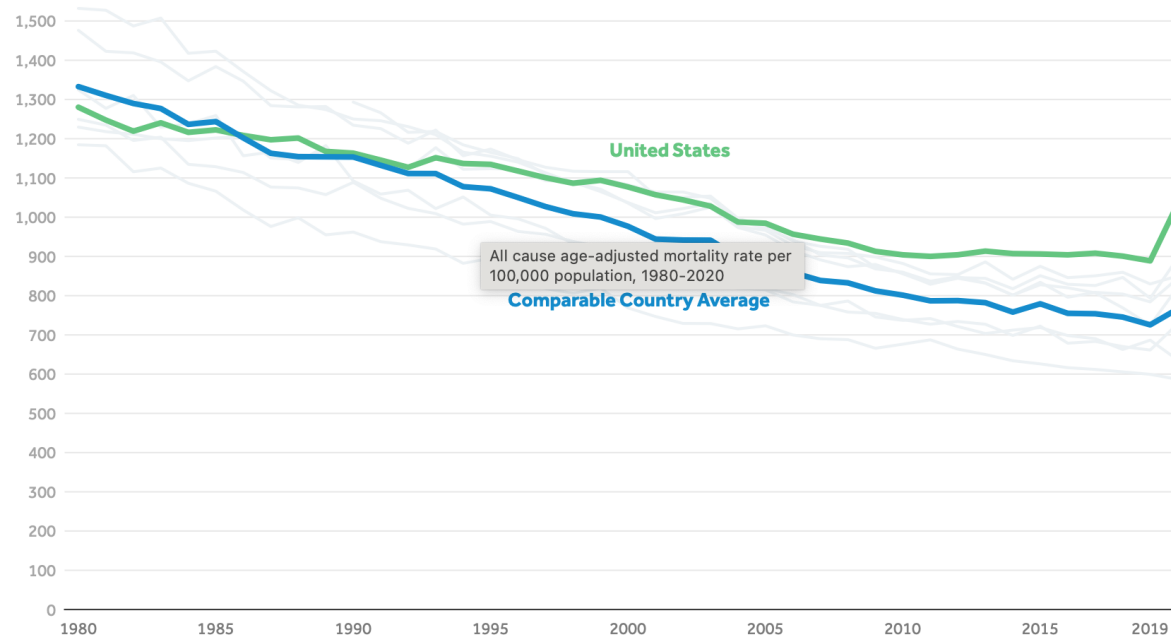
Notes: Comparable countries include Australia, Austria, Germany, Japan, the Netherlands, Switzerland, and the U.K. Belgium, Canada, France, and Sweden excluded due to a lack of 2020 data. Data not available for Germany prior to reunification in 1990.

Source: KFF analysis of OECD data • Get the data • PNG

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Health System Tracker

Clearly demonstrates spending and quality not related

EXHIBIT 2

Comparative Health Care System Performance Scores

Higher performing

NOR
NETH AUS
Top-3 avera

UK
GER NZ
10-country avera

SWE
FRA
SWIZ

CAN

US

Lower performing

Note: To normalize performance scores across countries, each score is the calculated standard deviation from a 10-country average that excludes the US. See How We Conducted This Study for more detail.

Data: Commonwealth Fund analysis

Where is the waste?

- Computations yielded the following estimated ranges of total annual cost of waste: failure of care delivery, $102.4 billion to $165.7 billion; failure of care coordination, $27.2 billion to $78.2 billion; overtreatment or low-value care, $75.7 billion to $101.2 billion; pricing failure, $230.7 billion to $240.5 billion; fraud and abuse, $58.5 billion to $83.9 billion; and administrative complexity, $265.6 billion.

- The estimated annual savings from measures to eliminate waste were as follows: failure of care delivery, $44.4 billion to $97.3 billion; failure of care coordination, $29.6 billion to $38.2 billion; overtreatment or low-value care, $12.8 billion to $28.6 billion; pricing failure, $81.4 billion to $91.2 billion; and fraud and abuse, $22.8 billion to $30.8 billion. No studies were identified that focused on interventions targeting administrative complexity. The estimated total annual costs of waste were $760 billion to $935 billion and savings from interventions that address waste were $191 billion to $286 billion.

TYPES OF WASTEFUL HEALTHCARE SPENDING (BILLIONS OF DOLLARS)

Administrative Waste

Administrative Complexity
$266

Fraud and Abuse
$84

Inefficient Spending

Failures of Care Delivery
$166

Low-Value Care
$101

Failures of Care Coordination
$78

Operational Waste

Pricing Failure
$241

SOURCE: Journal of the American Medical Association, *Waste in the US Health Care System: Estimated Costs and Potential for Savings*, October 2019.
NOTES: Data represent the upper threshold of estimates by Shrank and colleagues. Total sum may be different due to rounding.
© 2023 Peter G. Peterson Foundation

PGPF.ORG

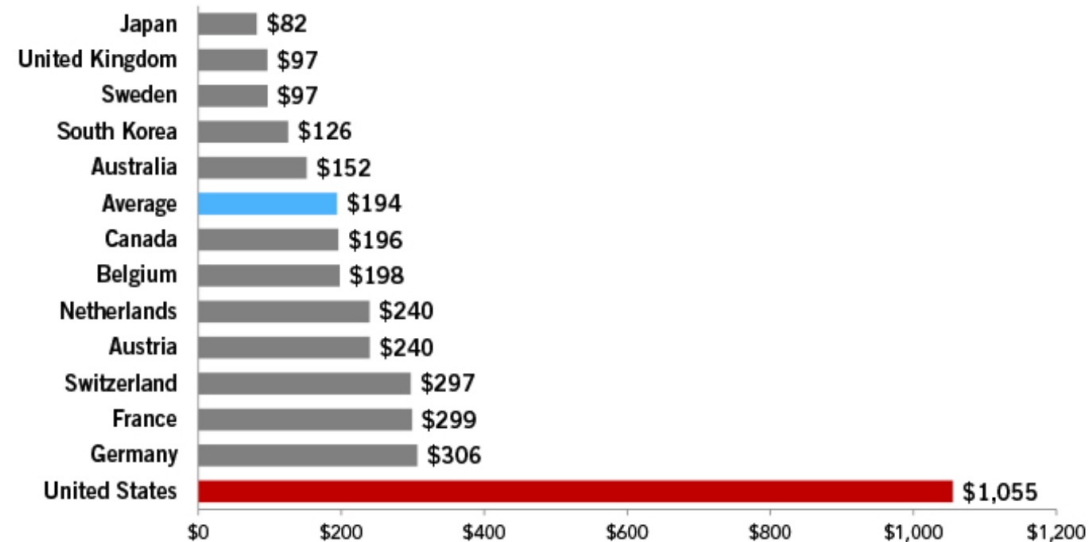In 2021, U.S. healthcare spending totaled $4.3 trillion, which averages to about $12,900 per person.

Approximately 25 percent of healthcare spending in the United States is considered wasteful, and about one-fourth of that amount could be recovered through interventions that address such waste.

Administrative Cost Inefficiencies

The United States has the highest healthcare administrative costs per capita compared to OECD countries

ADMINISTRATIVE COSTS PER CAPITA (DOLLARS)

Country	Cost
Japan	$82
United Kingdom	$97
Sweden	$97
South Korea	$126
Australia	$152
Average	$194
Canada	$196
Belgium	$198
Netherlands	$240
Austria	$240
Switzerland	$297
France	$299
Germany	$306
United States	$1,055

SOURCE: Organisation for Economic Co-operation and Development, *OECD Health Statistics 2022*, July 2022.
NOTES: Data are for 2020 except in cases for which 2019 was the latest available. Average does not include the United States. The five countries with the largest economies and those with both an above median GDP and GDP per capita, relative to all OECD countries, were included. Chart uses purchasing power parities to convert data into U.S. dollars.
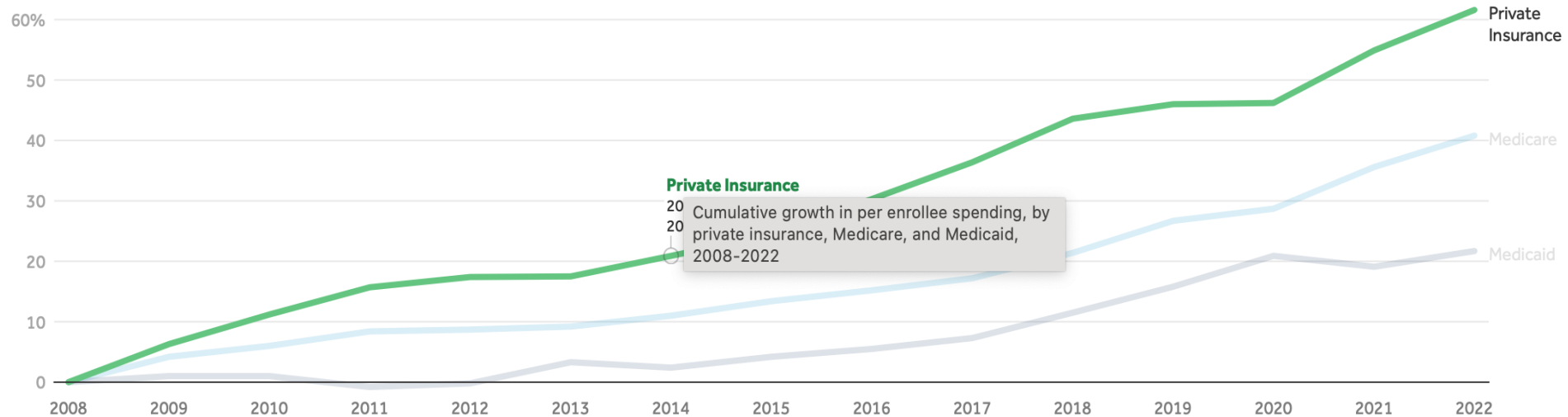© 2023 Peter G. Peterson Foundation

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In 2021, U.S. healthcare spending totaled $4.3 trillion, which averages to about $12,900 per person.

Growth in medical Spending-so according to bus principles- growing market is great

Cumulative growth in per enrollee spending, by private insurance, Medicare, and Medicaid, 2008-2022

Private Insurance
Cumulative growth in per enrollee spending, by private insurance, Medicare, and Medicaid, 2008-2022

Source: KFF analysis of National Health Expenditure (NHE) data • Get the data • PNG

Peterson-KFF
Health System Tracker

Granted Utilization is based on several factors- good and bad

Health utilization increased in 2022 at a rate similar to pre-pandemic

Annual change in price and quantity indexes of health services, 1980-2022, index numbers 2017=100
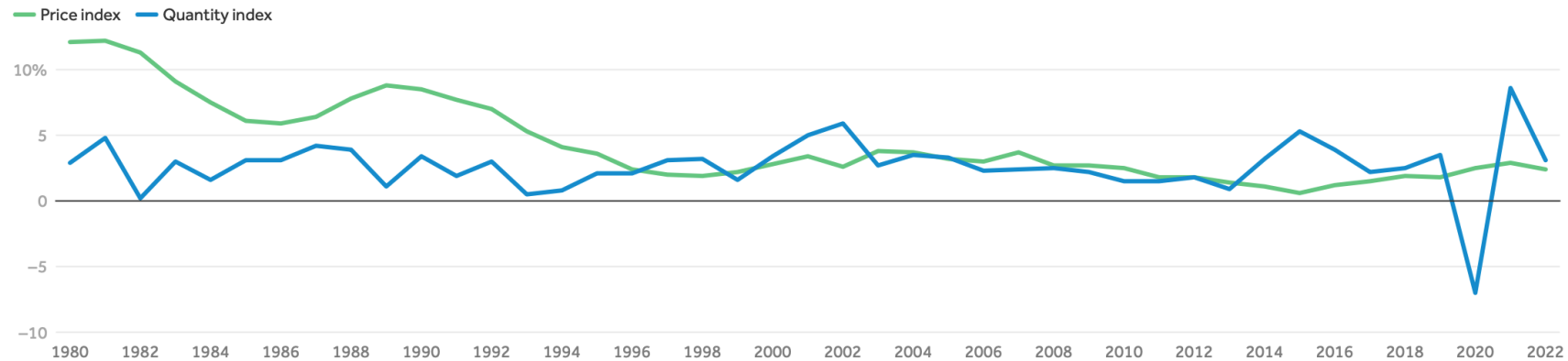
Note: Price and quantity indices are for health services consumption.

You can find all the data to show healthcare is in disarray from the data

- https://www.healthsystemtracker.org/chart-collection/u-s-spending-healthcare-changed-time/#Annual%20percent%20change%20in%20price%20and%20quantity%20indexes%20of%20pharmaceutical%20and%20other%20medical%20products,%201990-2022,%20index%20numbers%202017=100

So let us fix healthcare – we have the data – what is stopping us from finding solutions and implementing them?

Agenda

What do we know about the Macro Economics of Healthcare ?

Understanding the Market and Business of Healthcare. (Heatlh & Care and all in between)

Health Care is not a Zero sum Game ?

Perverse Economics and Incomprehensible Value Chain
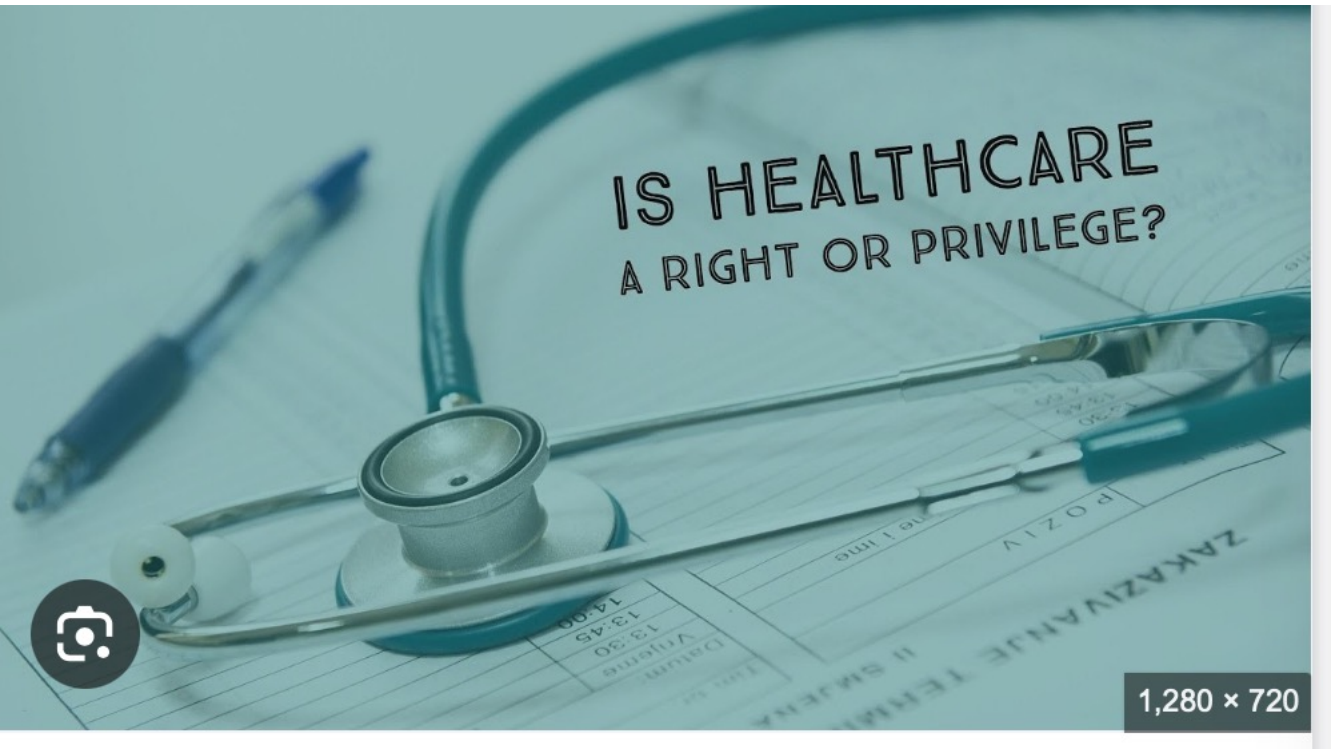
Innovation in Health Care-

Problem 1

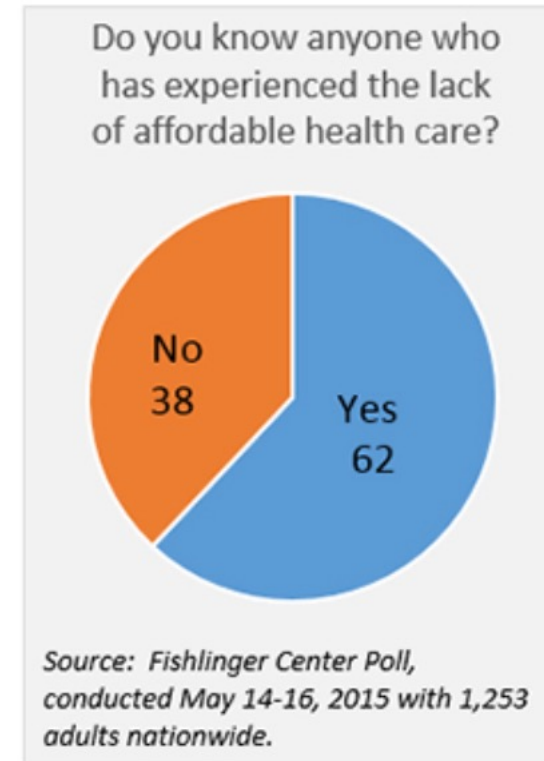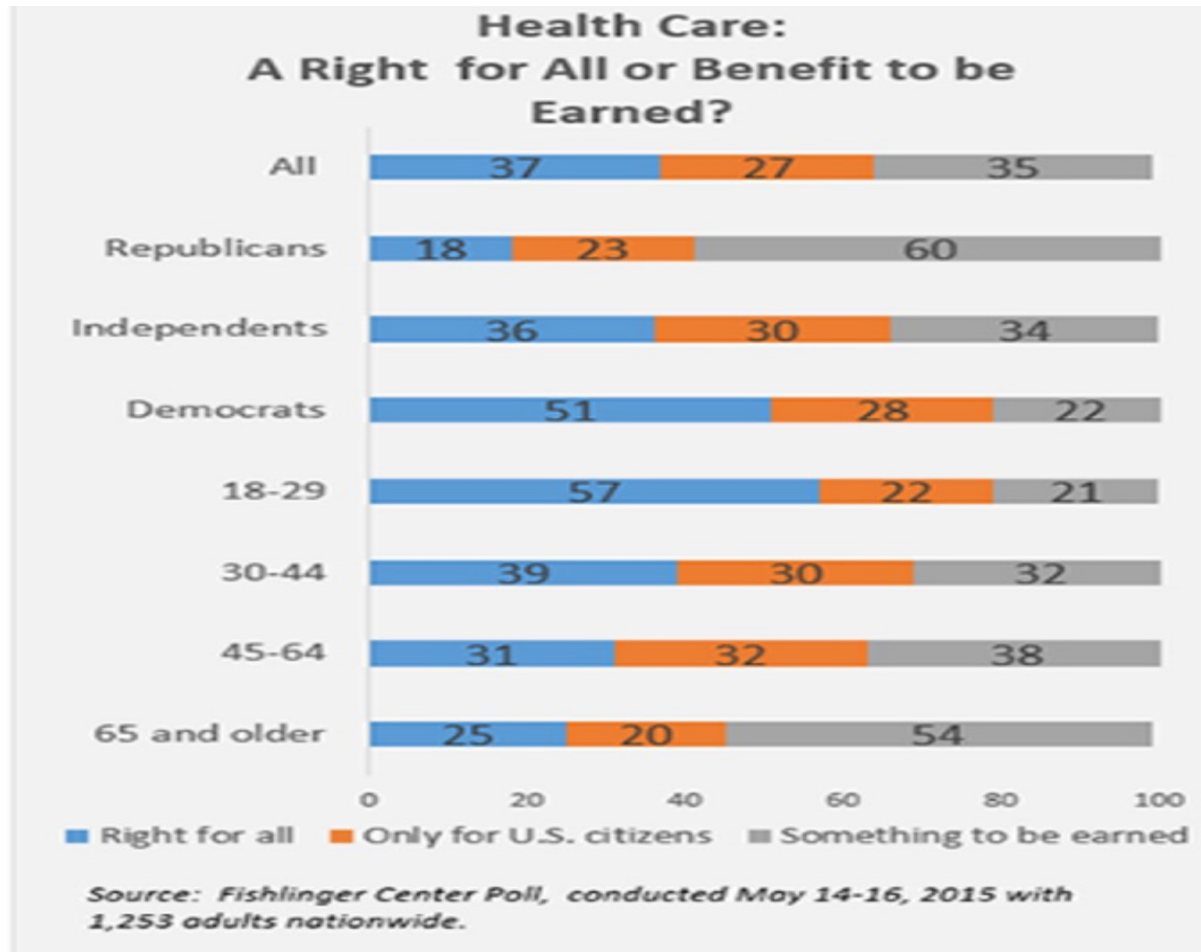## Understanding the Market and Business of Healthcare. (Heatlh & Care and all in between)

Fundamental question to be answered- Who is the customer ?

Access to
health care
should not be
a privilege.

So if not a privilege is it a right?

IS HEALTHCARE A RIGHT OR PRIVILEGE?

1,280 × 720

HEALTHCARE FOR ALL
LEAVE NO ONE BEHIND

Who understands the problem? All of a sudden politics enters healthcare .

Health Care:
A Right for All or Benefit to be Earned?

	Right for all	Only for U.S. citizens	Something to be earned
All	37	27	35
Republicans	18	23	60
Independents	36	30	34
Democrats	51	28	22
18-29	57	22	21
30-44	39	30	32
45-64	31	32	38
65 and older	25	20	54

Source: Fishlinger Center Poll, conducted May 14-16, 2015 with 1,253 adults nationwide.

Do you know anyone who has experienced the lack of affordable health care?

No 38

Yes 62

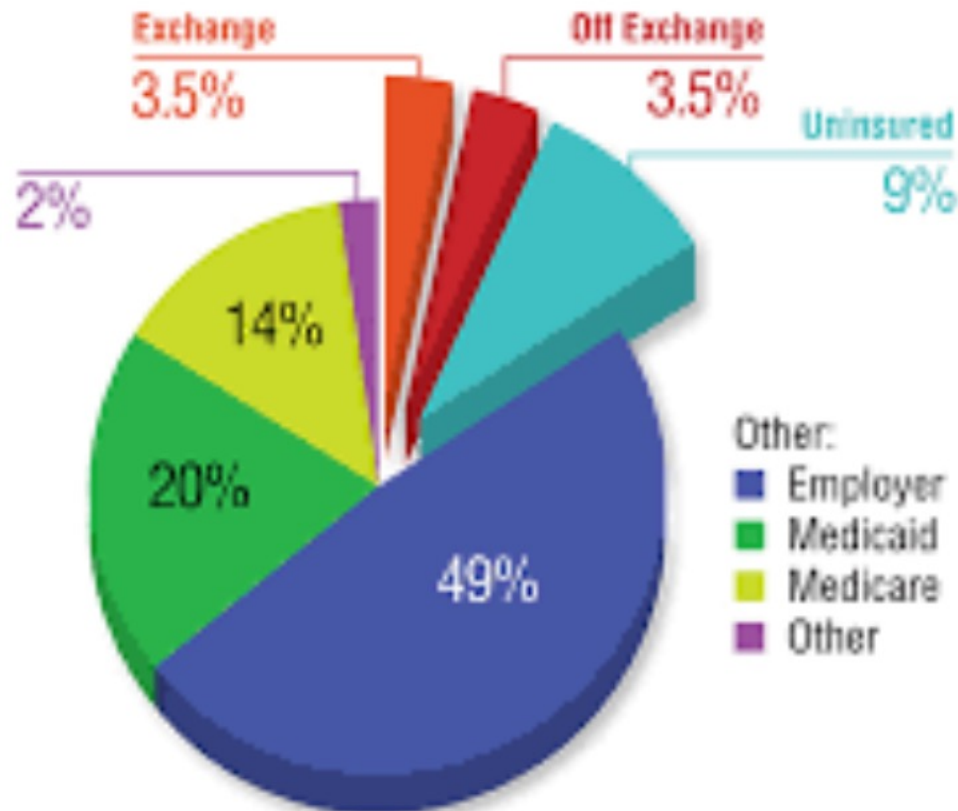Source: Fishlinger Center Poll, conducted May 14-16, 2015 with 1,253 adults nationwide.

Personal investment in healthcare? Should individuals have no skin in the game?

- Physical inactivity also costs the nation $117 billion a year for related health care.

- Alcohol abuse cost the U.S. health care system $85.8 billion in 1988. The tab for cigarette smoking totals over $65 billion annually.

- Costs related to obesity now surpass $27 billion per year.

So lets get back to who is the customer ?

Who is Insured and Uninsured?

Exchange 3.5%
Off Exchange 3.5%
Uninsured 9%
2%
14%
20%
49%

Other:
- Employer
- Medicaid
- Medicare
- Other

Sources: Kaiser Family Foundation estimates based on the Census Bureau's March 2014, March 2015, and March 2016 Current Population Survey (CPS: Annual Social and Economic Supplements).
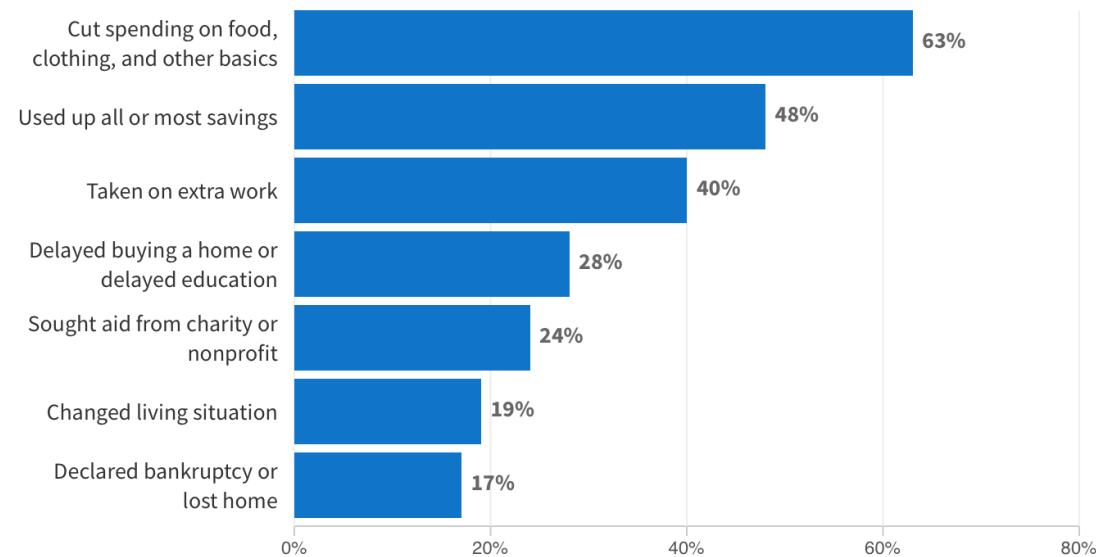
Here in lies the problem:

- Too many customers too many demands and too siloed

- Too many external players like government employers ……

- So is the individual out of the picture – Not really

In the past five years, more than half of U.S. adults report they've gone into debt because of medical or dental bills, the KFF poll found.

What People Sacrificed

Share of indebted adults who have done the following because of health care debt:

Category	Percentage
Cut spending on food, clothing, and other basics	63%
Used up all or most savings	48%
Taken on extra work	40%
Delayed buying a home or delayed education	28%
Sought aid from charity or nonprofit	24%
Changed living situation	19%
Declared bankruptcy or lost home	17%

Source: KFF Health Care Debt Survey of 2,375 U.S. adults, including 1,674 with current or past debt from medical or dental bills, conducted Feb. 25 through March 20. The margin of sampling error for the overall sample is 3 percentage points.

Credit: Daniel Wood/NPR and Noam N. Levey/KHN

100 million people in America are saddled with medical debt
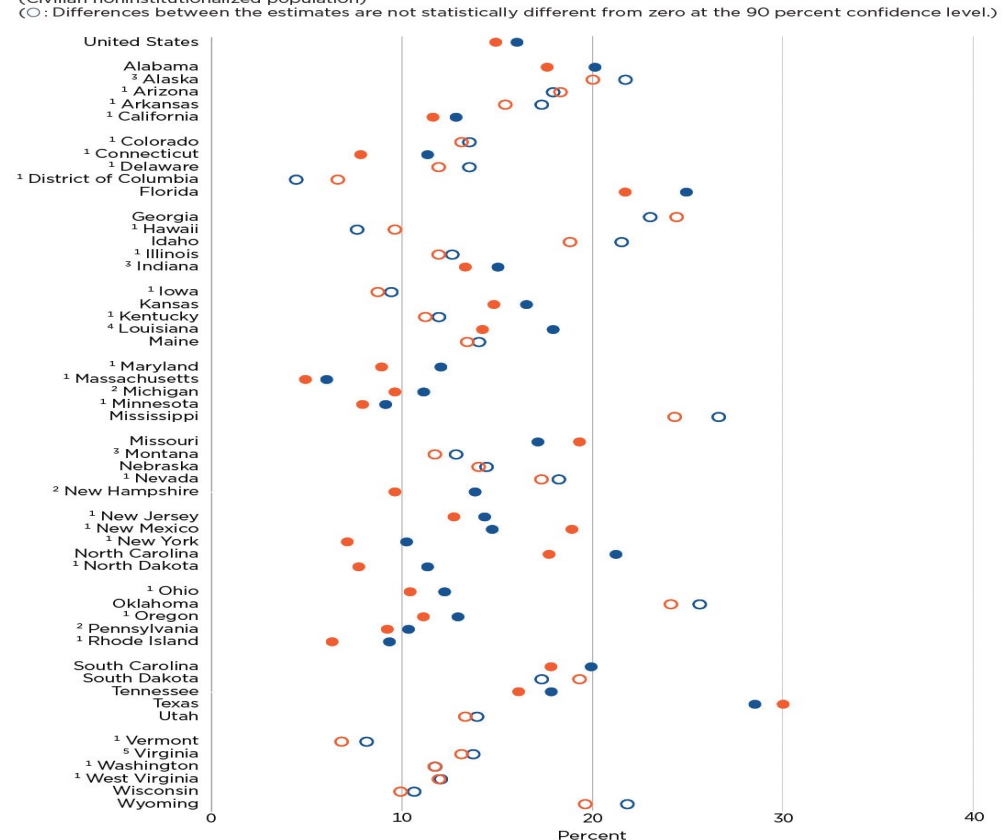
Distribution of medical Debt with age and state

https://www.census.gov/content/dam/Census/library/stories/2020/10/uninsured-rates-highest-for-young-adults-aged-19-to-34-figure-2.jpg

Uninsured Rate by Single Year of Age: 2018 and 2019¹
(Civilian noninstitutionalized population)
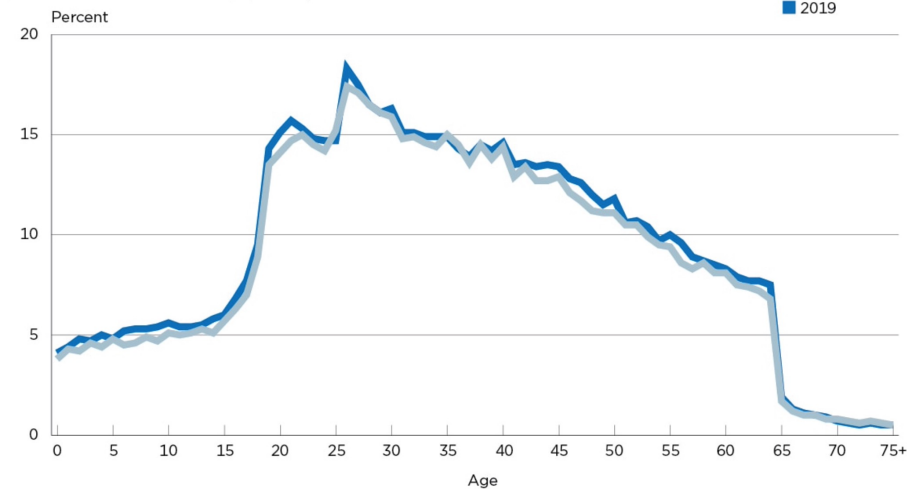
¹ Change between 2018 and 2019 is statistically significant for people aged 0, 2, 4, 6–12, 14, 16–21, 24–26, 41, 43, 44, 46–48, 50, 53, 55–57, 59, 61, 63, and 64 years.
Note: For information on confidentiality protection, sampling error, nonsampling error, and definitions in the American Community Survey, see <https://www2.census.gov/programs- surveys/acs/tech_docs/accuracy/ACS_Accuracy_of_Data_2019.pdf>. Classification is based on unrounded estimates.
Source: U.S. Census Bureau, 2018 and 2019 American Community Survey, 1-Year Estimates.

Uninsured Rate and Difference in Uninsured Rate Among Young Adults Aged 19 to 25 and 26 to 34 Years by State: 2019
(Civilian noninstitutionalized population)
(○: Differences between the estimates are not statistically different from zero at the 90 percent confidence level.)

¹ Expanded Medicaid eligibility as of January 1, 2014.
² Expanded Medicaid eligibility after January 1, 2014 and on or before January 1, 2015.
³ Expanded Medicaid eligibility after January 1, 2015 and on or before January 1, 2016.
⁴ Expanded Medicaid eligibility after January 1, 2016 and on or before January 1, 2017.
⁵ Expanded Medicaid eligibility after January 1, 2018 and on or before January 1, 2019.
Note: For information on confidentiality protection, sampling error, nonsampling error, and definitions, see <https://www2.census.gov/programs-surveys/acs/tech_docs/accuracy/ACS_Accuracy_of_Data_2019.pdf>
Source: U.S. Census Bureau, 2019 American Community Survey.

So is the Government responsible –How has Britain fared with its approach?

The moral test of government is how that government treats those who are in the dawn of life, the children; those who are in the twilight of life, the elderly; and those who are in the shadows of life, the sick, the needy and the handicapped.

Donald Berwick

BooKey

ASPE | OFFICE OF HEALTH POLICY
ASSISTANT SECRETARY FOR PLANNING AND EVALUATION

DATA POINT
August 3, 2023
HP-2023-20

National Uninsured Rate Reaches an All-Time Low in Early 2023 After the Close of the ACA Open Enrollment Period

The uninsured rate in early 2023 has reached an all-time low of 7.7% among all U.S. residents, indicating that 6.3 million people have gained health insurance coverage since 2020.

Agenda

What do we know about the Macro Economics of Healthcare ?

Understanding the Market and Business of Healthcare. (Heatlh & Care and all in between)
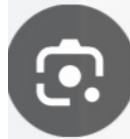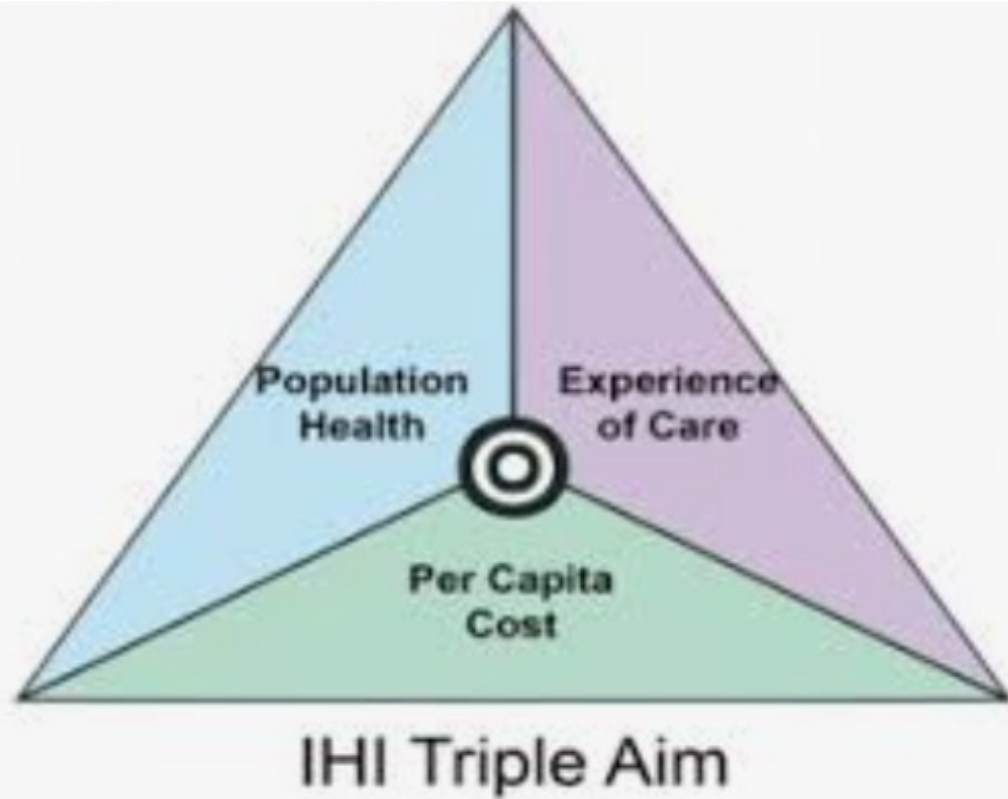
Health Care is not a Zero sum Game ?

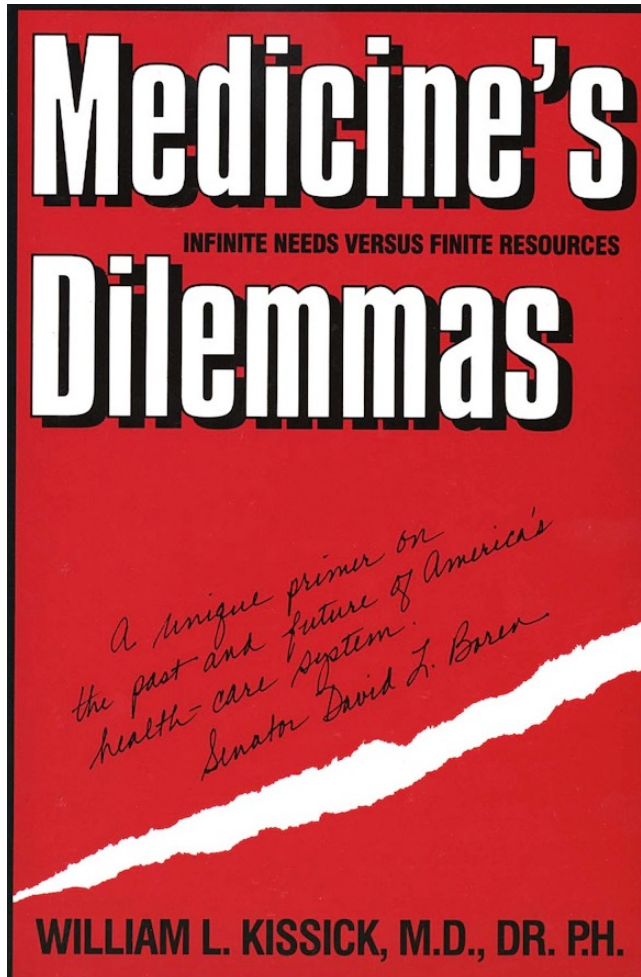Perverse Economics and Incomprehensible Value Chain

Innovation in Health Care-

Problem 2: Health Care is not a zero sum game

Holy Grail of success in Healthcare

IHI Triple Aim

Quadruple Aim

Is it an aspiration or it is feasible?

The iron triangle of health care proposes that the tradeoff among cost, quality, and access is such that improvements in one area (e.g., decreasing costs) make it incredibly difficult, if not impossible, to see improvements in the other two areas (e.g., increasing quality and access).

Healthcare's "Iron Triangle"
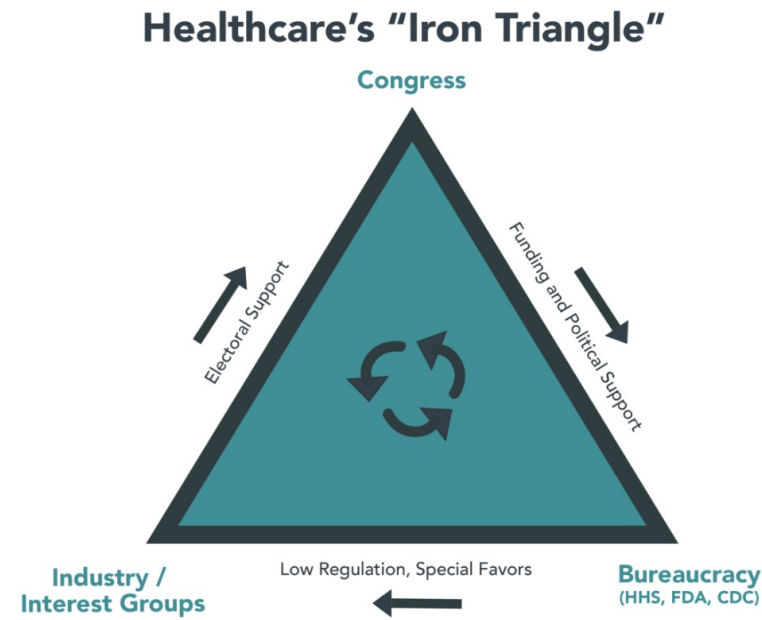
The System sustains itself through market concentration, lax regulatory oversight and influence peddling. It steals resources from more productive sectors of the American economy to feed its voracious appetite. More importantly, the System fails to deliver the health and healthcare services the American people need, want and desire.

Medicine's Dilemmas
INFINITE NEEDS VERSUS FINITE RESOURCES

A unique primer on the past and future of America's health-care system.
Senator David L. Boren

WILLIAM L. KISSICK, M.D., DR. P.H.

Iron Triangle vs Triple Aim- contradictory ?

First, the two ideas are fundamentally different as one is a framework, while the other is considered a concept.

Second, the Iron Triangle is based on the foundation of element tradeoffs, whereas the Triple Aim supports the position that all framework components can be achieved together.

Healthcare Ecosystem

Illustration for the extended healthcare ecosystem.
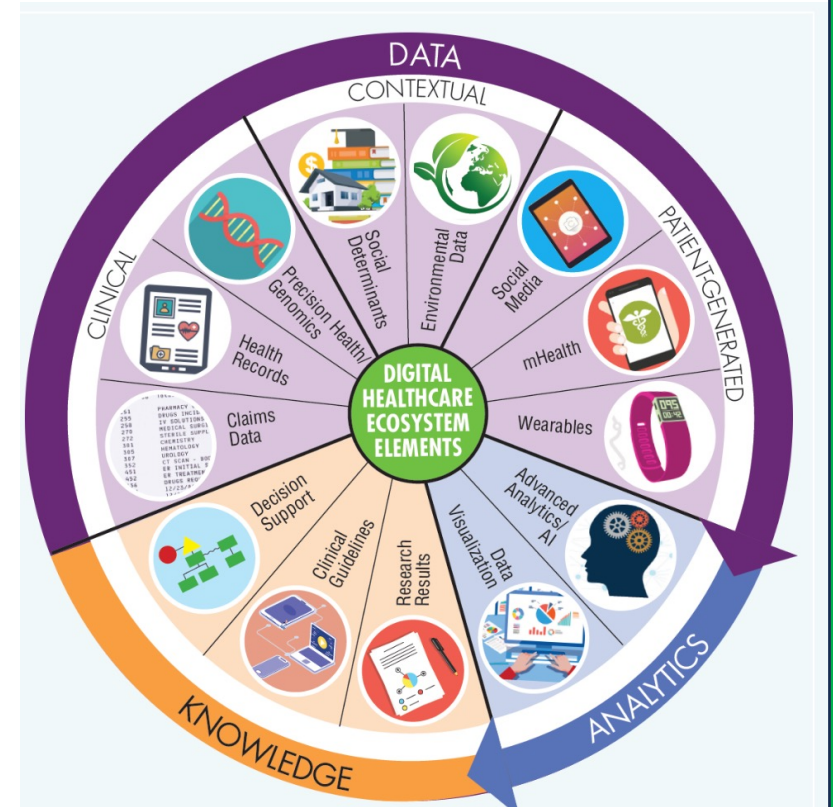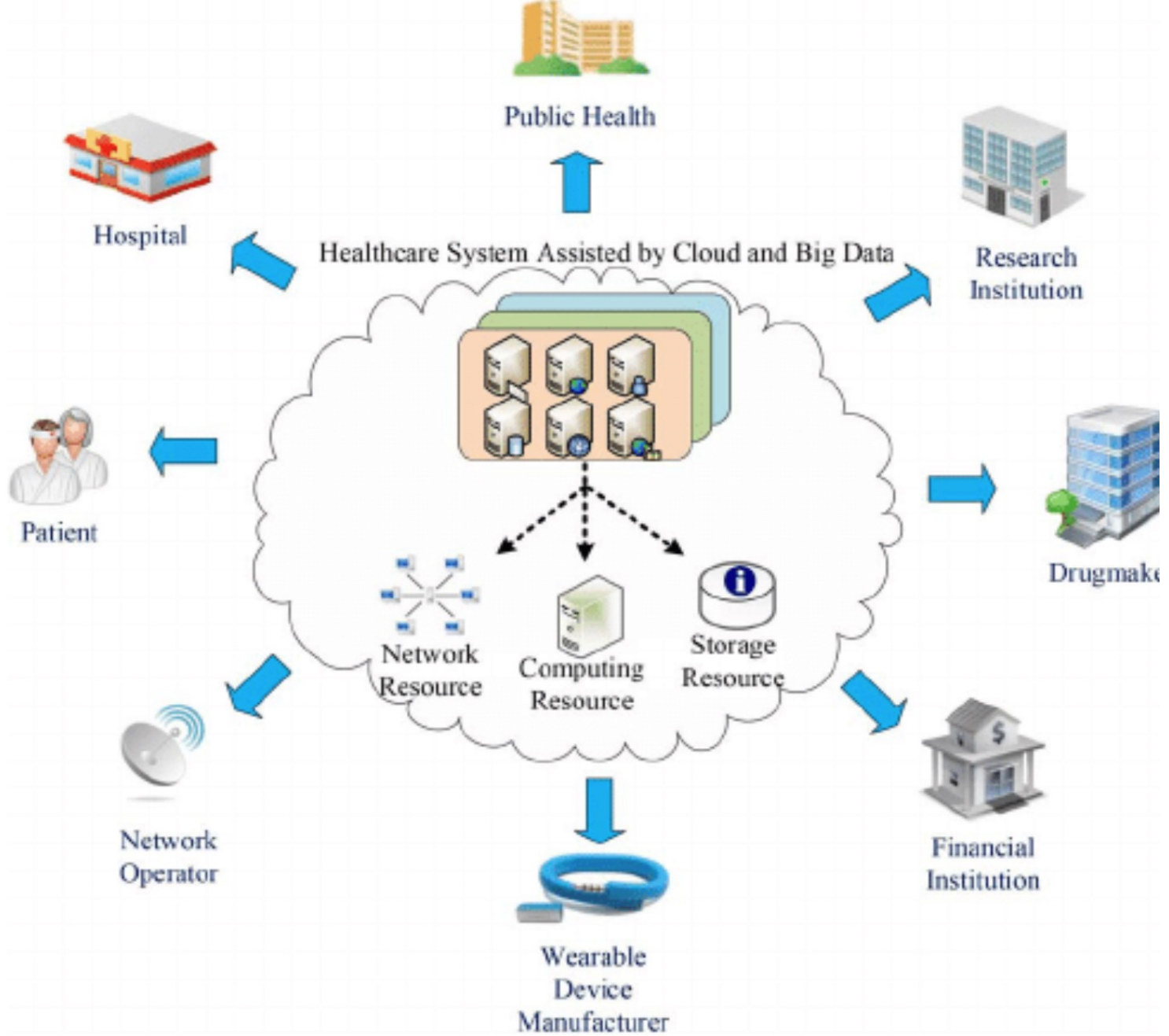
Disparate players
Disparate goals
Disparate data
Disparate approaches

Consumer in center is for
marketing purposes

Cost Cutting or cost shifting strategies by stakeholders ?

Where and how do you target your product and take care of the domino effect across stake holders?

What regulations do you need to be aware of?

What payment streams intersect with your product?

What are social determinants of health?

Social determinants of health (SDOH) are the conditions in the environments where people are born, live, learn, work, play, worship, and age that affect a wide range of health, functioning, and quality-of-life outcomes and risks.

SDOH can be grouped into 5 domains:

Economic Stability

Education Access and Quality

Health Care Access and Quality

Neighborhood and Built Environment

Social and Community Context

Social Determinants of Health

- Education Access and Quality
- Health Care Access and Quality
- Neighborhood and Built Environment
- Social and Community Context
- Economic Stability

Mergers and Acquisitions have not simplified the ecosystem

Creation of IDFS is just one concept

How do you reduce risk innovating in this environment?

Knowing that SDOH are Critical aspects to address How do we prevent a 2 tier or 3 tier system of care- Does Govt play even a bigger part now?

Figure 1 Information, Power Relationships and Incomplete Vertical Integration in the Health Sector

Intrinsic information asymmetry; possible dominance relationship

Possible dominance

Normal relationship likely including price based transactions

No relationship

Other:
Technology endogenous
Advertising socialisation
Omitted possible relationships: endogenuity of technology; effects of advertising; socialising affecting perception of 'norms'

. Evidence shows that progressive economic models, international frameworks, government regulation, compliance mechanisms for commercial entities, regenerative business types and models that incorporate health, social, and environmental goals, and strategic civil society mobilisation together offer possibilities of systemic, transformative change, reduce those harms arising from commercial forces, and foster human and planetary wellbeing. In our view, the most basic public health question is not whether the world has the resources or will to take such actions, but whether humanity can survive if society fails to make this effort

MODEL OF THE COMMERCIAL DETERMINANTS OF HEALTH (CDOH)

Climate control
Pollution
Microplastics
Nuclear weapons
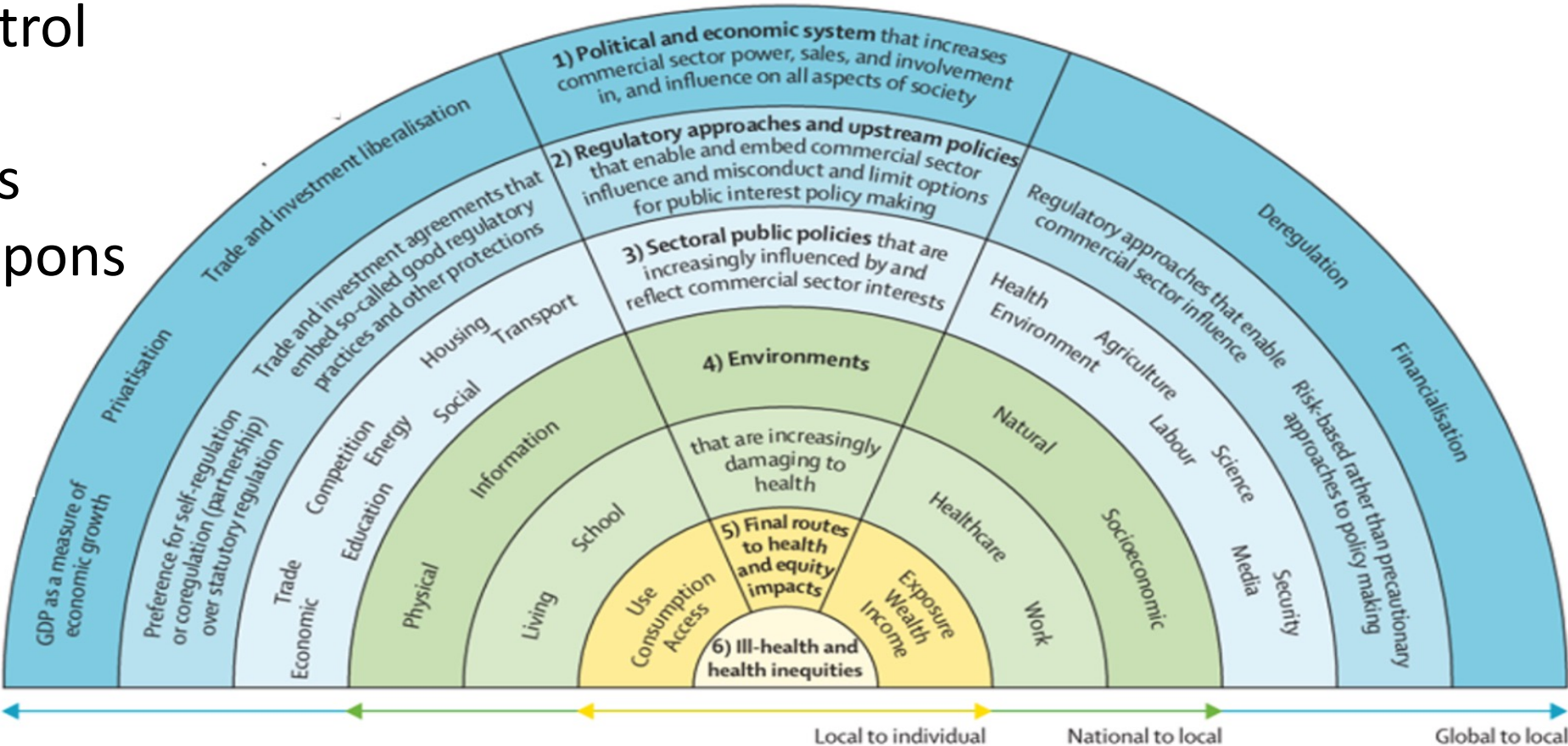
Source: Gilmore AB, et al. Defining and conceptualizing the commercial determinants of Health, The Lancet, March 23, 2023

Agenda

What do we know about the Macro Economics of Healthcare ?

Understanding the Market and Business of Healthcare. (Heatlh & Care and all in between)

Health Care is not a Zero sum Game ?

Perverse Economics and Incomprehensible Value Chain

Innovation in Health Care-

Problem 3

Perverse economics in healthcare

Incomprehensible Value Chain

Let us talk about consumer products
Iphone. Car etc

You pay more you get a better
product
Govt does not pay manufacturers
subsidies to build quality better
product
Market economics determines
pricing

Perverse Incentives in healthcare

They are rewarded for more services, not better services. They are rewarded for more care, not better care," said Dr. Elliott Fisher, a lead researcher for the Dartmouth University Atlas of Health. "Most of the U.S. health system is paid simply for each service, regardless of the results of that service."

n McAllen, health care spending is growing faster than anywhere else in the country. When the researchers at the Dartmouth Atlas used Medicare's most recent numbers to compare health care usage across the country, they found that McAllen spends almost twice as much per beneficiary as the national average. Many providers use more of everything -- more tests, more hospital stays, more procedures.

Culture eats Strategy for Breakfast – Peter Drucker

Culture Wins over Technology in HealthCare every time

Define purpose – If the culture we want to create is one that delivers positive outcomes and unparalleled service to the patient, then metrics must be developed and recognition provided for those that contribute most effectively to patient satisfaction and positive patient outcomes, as well as financial success.**Embrace change** – Emphasize innovation, provide incentives for new ideas, and create an environment where it is safer to take risks than it is to maintain the status quo. Value-based care is synonymous with risk, which must be rewarded rather than avoided.**Lead by example** – Building an organization that allows employees to be part of something bigger than themselves means that leadership needs to create opportunities for collaboration, become transparent in its communication, and acknowledge the contribution of those that form the core of the business.

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What do we know about the Macro Economics of Healthcare ?

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Innovation in Health Care-

So what about innovation in healthcare?

Innovation is the systematic practice of developing and marketing breakthrough products and services for adoption by customers.

Mckinsey: Analysis of innovation

Aspire — Do you regard innovation-led growth as critical, and do you have cascaded targets that reflect this?

Choose — Do you invest in a coherent, time- and risk-balanced portfolio of initiatives with sufficient resources to win?

Discover — Do you have differentiated business, market, and technology insights that translate into winning value propositions?

Evolve — Do you create new business models that provide defensible and scalable profit sources?

Accelerate — Do you beat the competition by developing and launching innovations quickly and effectively?

Scale — Do you launch innovations at the right scale in the relevant markets and segments?

Extend — Do you win by creating and capitalizing on external networks?

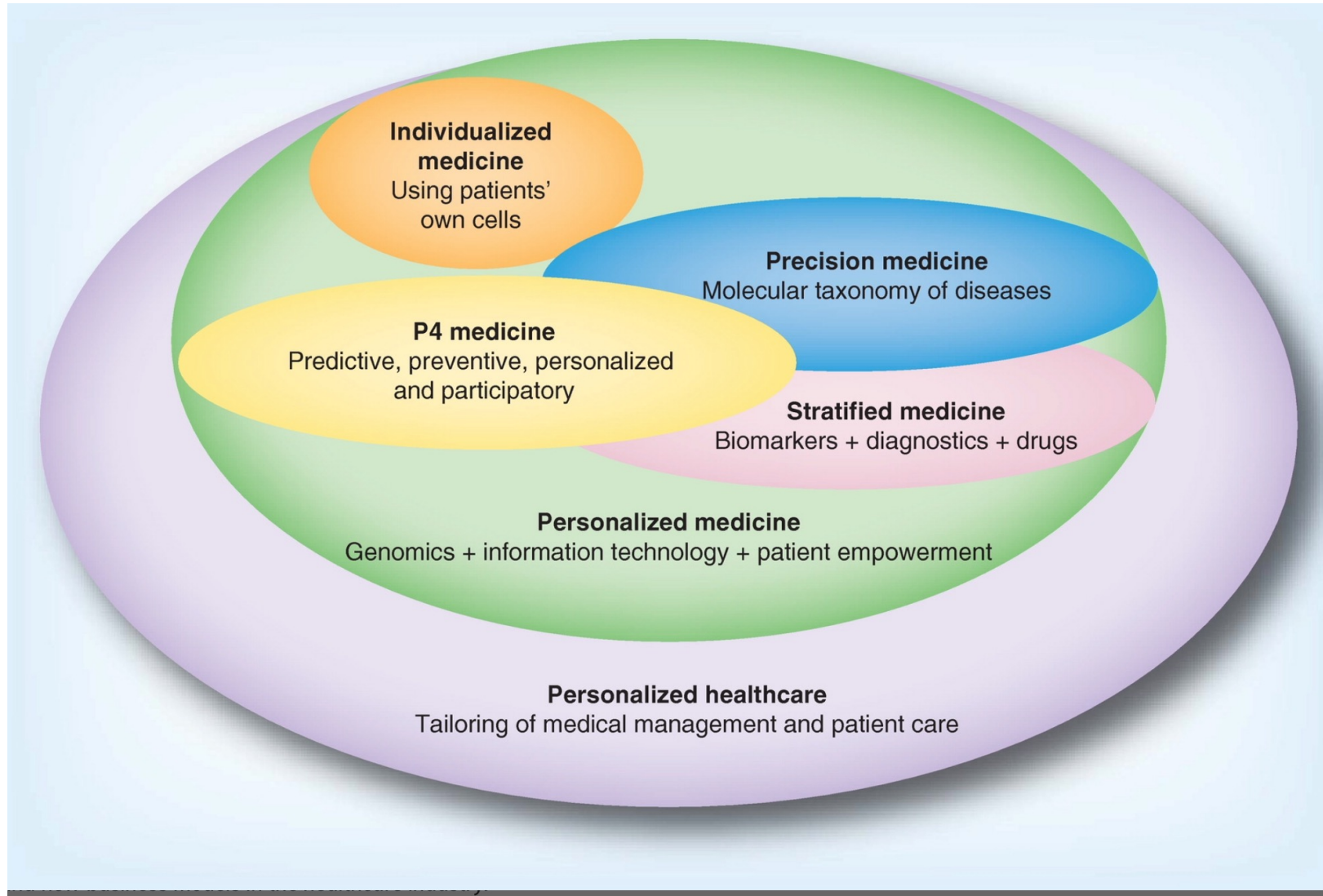**Mobilize** — Are your people motivated, rewarded, and organized to innovate repeatedly?

Source: McKinsey analysis

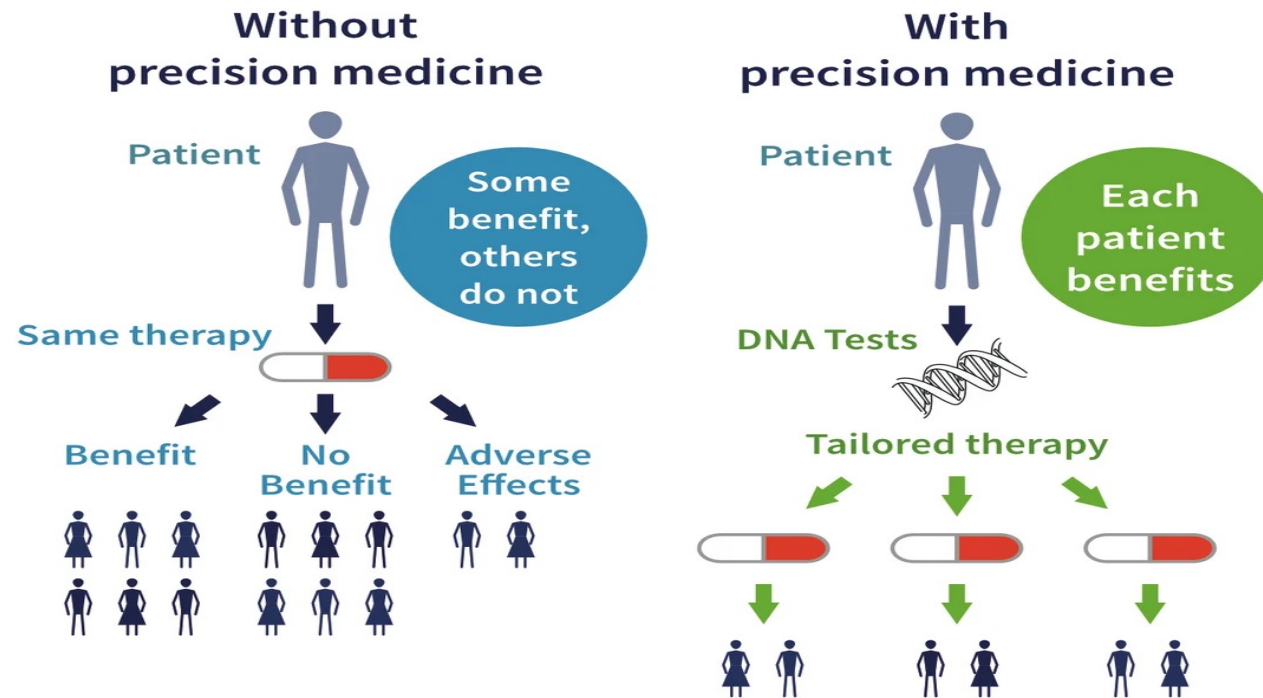# Areas of Innovation- Personalized Medicine

Precision Medicine- Innovation

- Use precision Medicine :
- **Learn your disease risk.** Testing your genes can reveal which conditions run in your family and how likely you are to get them.
- **Prevent disease.** Once you know you carry a certain gene, you may be able to make lifestyle changes or get medical treatment so you don't get sick. For example, women who carry the BRCA1 or BRCA2 gene mutation are at higher risk for breast cancer. To lower their risk, they may choose to have surgery to remove both breasts, called a mastectomy.
- **Find disease.** If you know you're at risk for a certain disease, you can get tested for it. The earlier you find diseases like cancer, the easier they are to treat.
- **Target treatments.** Your genetic makeup can help guide your doctor to the drug that's most likely to work for you and cause the fewest side effects. Precision medicine can even help you decide what dose of a drug you should take.
- **Monitor your response.** Doctors can use precision medicine techniques to see how well your condition responds to a treatment.

Individualized medicine
Using patients' own cells

Precision medicine
Molecular taxonomy of diseases

P4 medicine
Predictive, preventive, personalized
and participatory

Stratified medicine
Biomarkers + diagnostics + drugs

Personalized medicine
Genomics + information technology + patient empowerment

Personalized healthcare
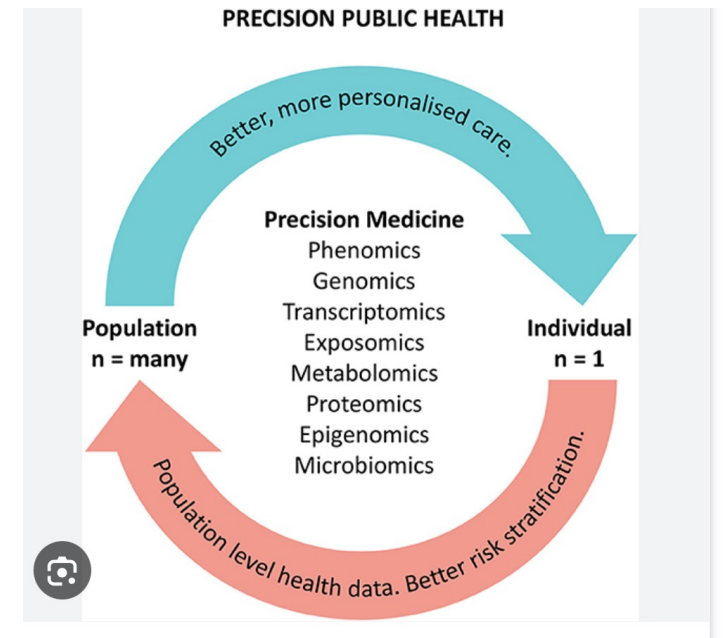Tailoring of medical management and patient care

Precision Medicine – Individualized Medicine Stratified Medicine -

onclusion

Precision health is expanding
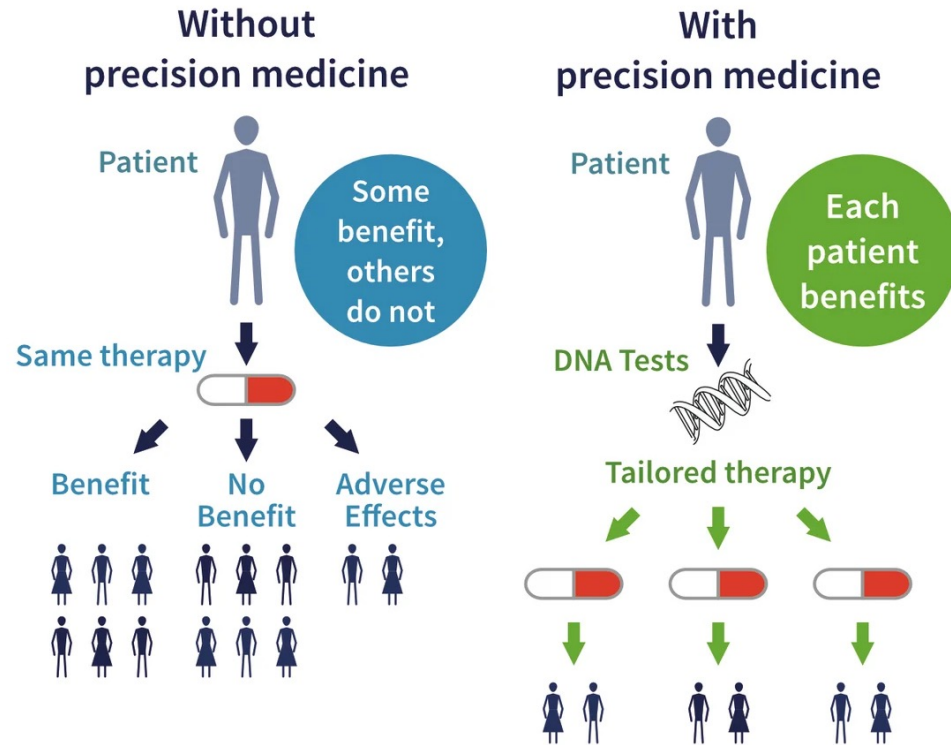
The good physician treats the disease; the great physician treats the patient who has the disease." - William Osler

Functional Medicine Complimentary vs Alternative = Integrative Medicine
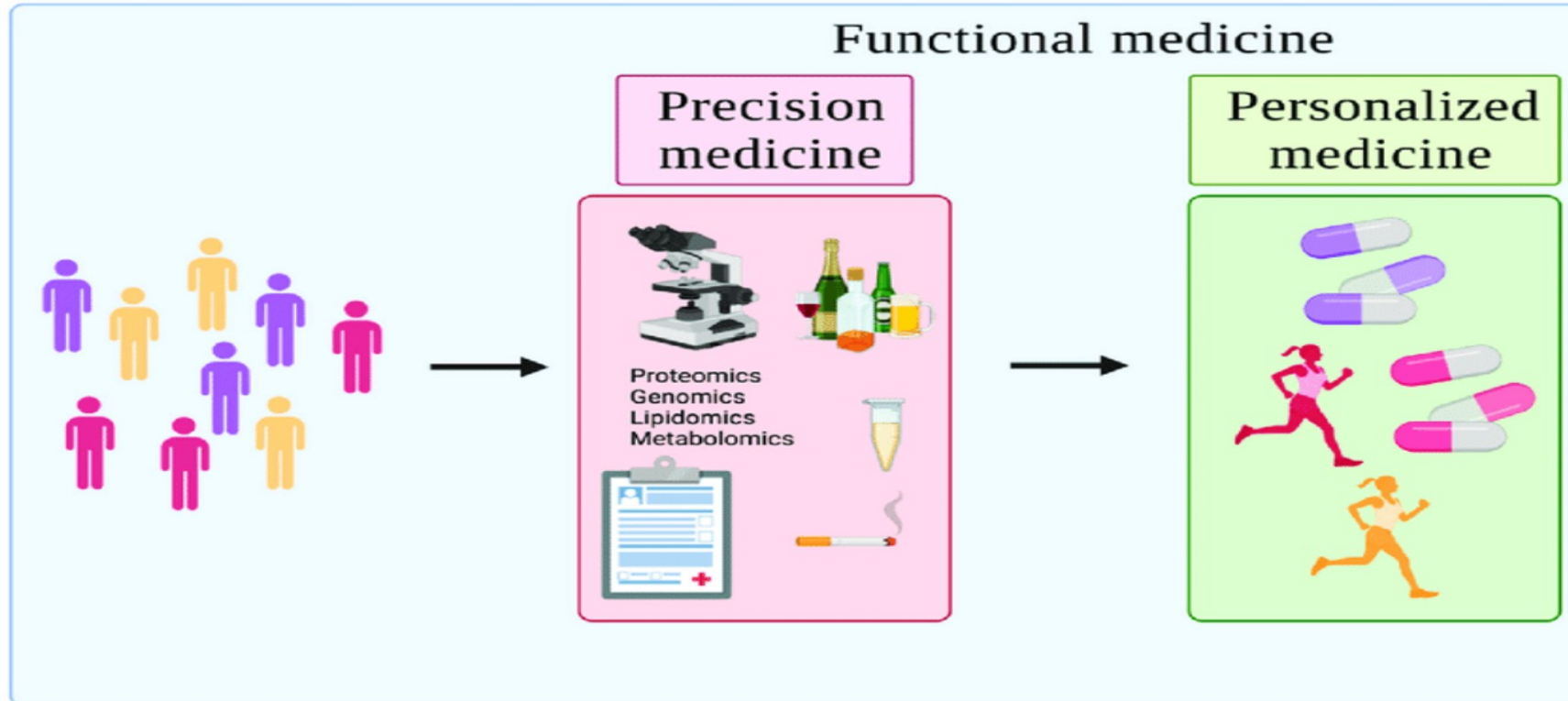
Precision vs. personalized vs. functional medicine. Precision medicine identifies differences in individuals, categorizing based on environmental, biological, and psychosocial factors. Personalized medicine takes these differences and implements preventions/treatments tailored to the individual. Functional medicine is an overarching term that seeks to encompass both precision and personalized medicine.

New Medicine Discovery

Innovation in finding new medicines

- New study in 2020 estimated that the median cost of getting a new drug into the market was $985 million, and the average cost was $1.3 billion, which was much lower compared to previous studies, which have placed the average cost of drug development as $2.8 billion.

-
    Developing new, innovative drugs takes time – a very long time. On average, the journey from discovery to market takes 12 years, however, in newer areas of medicine, like gene therapy, it can take up to 30 years.

Show me the money!! When innovation outpaces the affordability?

•

Vertex Pharmaceuticals set the list price of Casgevy, the first CRISPR-based therapy approved by the Food and Drug Administration, at $2.2 million dollars.   Dec 8, 2

Hemgenix

Company: CSL Behring, uniQure
Disease: Hemophilia B
Cost per dose: $3.5 million

With a whopping $3.5 million price tag, CSL Behring and uniQure have the world's new most expensive drug in Hemgenix.

Company: Chiesi Farmaceutici
Disease: Leptin deficiency
Cost per year: $1.26 million

For years, leptin deficiency drug Myalept commanded a leading position in annual rankings of the world's most expensive medicines. That is, until gene therapies came into the picture.

Still, with a yearly cost of about $1.26 million, the product makes a name for itself as one of the most expensive pharmacy-dispensed drugs. One vial of the drug goes for $5,867.52, and patients use an average of 18 vials per month, according to Chiesi.

GLP-1 Medications – new way to tackle weight loss

GLP-1 medications comparison chart

Here's a quick look at how the above GLP-1 agonists compare:

Brand name	List price*	Dose frequency	Approved use
Wegovy (semaglutide)	$1,349.02	once weekly	weight loss
Saxenda (liraglutide)	$1,349.02	once daily	weight loss
Ozempic (semaglutide)	$935.77	once weekly	type 2 diabetes
Rybelsus (semaglutide)	$935.77	once daily (orally)	type 2 diabetes
Trulicity (dulaglutide)	$930.88	once weekly	type 2 diabetes
Victoza (liraglutide)	$744.54	once daily	type 2 diabetes
Byetta (exenatide)	$940	twice daily	type 2 diabetes
Bydureon BCise (exenatide)	$855	once weekly	type 2 diabetes
Mounjaro (tirzepatide)	$1,023.04	once weekly	type 2 diabetes

Health Effects of Overweight and Obesity
- All-causes of death (mortality).
- High blood pressure (hypertension).
- High LDL cholesterol, low HDL cholesterol, or high levels of triglycerides (dyslipidemia).
- Type 2 diabetes.
- Coronary heart disease.
- Stroke.
- Gallbladder disease.

Quantum computing with AI- New technologies do provide new opportunities

- The symbiotic relationship between AI and quantum technologies has paved the way for a novel analytic tool: quantum machine learning (QML). Unlike traditional machine learning, QML embraces larger datasets while generating faster and more accurate results. These techniques are particularly useful when faced with complex optimization challenges, like searching for appropriate molecular binding orientations or improving drug absorption.

-

Innovation with Guard rails

- 1. The importance for companies to create detailed, customized risk mitigation plans, prioritizing transparency, documentation and justified procedural variations.

- 2. Regular assessments of AI models, vigilant data management to prevent biases and a robust data strategy to maintain integrity in the drug development process.

- 3. Clear communication with regulators and a multidisciplinary approach in designing solutions are inherent trust-building mechanisms for robust integration of these technologies.

- 4. A focus on safety and adherence to guiding principles throughout the drug discovery cycle is paramount, advocating for a broader industry-wide adoption of these principles.

- 5. Ethical cooperation and sharing best practices during the early stages of AI and quantum integration are vital for responsible adoption.

- 6. Educating the entire workforce on ethical principles and risk mitigation strategies is a priority.

- 7. Moving forward with a shared vision that balances the benefits and risks of these technologies is crucial to maintain trust and ensure faster access to drugs.

New technologies will help the cost quality Conundrum

Robots in healthcare

1. The *da Vinci* ® Surgical Robot

It is unthinkable, but true: More than 250,000 people die in the U.S. each year from medical errors, some of which are likely preventable.[1] While this is a broad category encompassing a range of different problems, it's certainly true that the more control surgeons have in their operations, the better. The *da Vinci* Surgical System, a multi-armed wonderbot, is being used to reduce surgical errors and make surgery less invasive for thousands of patients.

The *da Vinci* Surgical System gives surgeons more precise control for a range of procedures. Using magnified 3D high-definition vision and controls that strap to a surgeon's wrists and hands, the *da Vinci* System makes tiny, exact incisions that human hands might not otherwise be able to make. This offers enhanced control to surgeons and, since the surgery is less invasive than traditional surgery, a faster healing time for patients.[2]

2. The Xenex Germ-Zapping Robot

Along with minimizing medical and surgical errors, hospital-acquired infections (HAIs) are another widespread problem in healthcare that could be improved with robots. The CDC reported that there were 722,000 HAIs in U.S. acute care hospitals in 2011.[3] HAIs often occur because hospitals can't always clean rooms with 100 percent sterility between patients, whether due to time constraints or the simple invisibility of germs. Whatever the reason, patients who are already immunocompromised are more susceptible to bacterial infection.

To combat this elemental problem, the Xenex, an automated and portable robot, is used to disinfect entire hospital rooms in minutes using pulsed, full-spectrum UV rays that kill a range of infectious bacteria. It's designed to reduce HAIs such as Methicillin-resistant Staphylococcus aureus (MRSA) by killing the microorganisms that cause them, which can be particularly resistant to treatment. Plus, the robot is kind of cute—it looks like an R2-D2 designed to save lives.

3. The PARO Therapeutic Robot

Unlike the first two robots, this one is not designed to save lives per se, but to improve quality of life during recovery from surgery or treatment for depression or other mental illness. The PARO Therapeutic Robot is an interactive device that looks like a baby harbor seal and is designed to provide the benefits of animal therapy without relying on live animals. Animal therapy is a common tool for easing patient stress, but there are not always trained animals available to satisfy current needs. Friendly, animal-like PARO fits the bill.

PARO is used extensively with elderly patients with dementia, and has been proven to reduce stress and provide comfort to anxious patients.[4] The fuzzy PARO can respond to its name, enjoys being stroked, and, over time, develops a customized, pleasing personality tailored by its memory of previous interactions. PARO also naps, blinks, wiggles its flippers and makes funny little noises, especially for its owner. Bonus: it charges by "sucking" on a charger shaped like a pacifier.

4. The CyberKnife

The Cyberknife is a robotic surgery system that delivers radiation therapy to tumors with sub-millimeter precision.[5] Invented in the 1990s, the CyberKnife system is now being used to treat cancer at hospitals and treatment centers all over the U.S. Not a knife per se, the system is a radiation source mounted on a robot, which allows for a targeted beam of radiotherapy that maneuvers and adapts quickly. It can deliver radiation to a tumor (malignant or benign), repositioning itself at many minutely different angles to target the tumor from all sides without having to reposition the patient.

The CyberKnife has allowed for treatment of tumors in areas of the body that were once surgically complex to operate on, including the prostate, head, neck and liver. This "surgery" is actually non-invasive and minimizes the exposure of healthy organs and tissues to radiation. What's more, the CyberKnife has been shown to be remarkably effective in the long term for prostate cancer, although long-term control of other cancers have not been studied.[6]

5. The TUG

You may never think about it, but transporting supplies, meals and other materials around the hospital is a drag on efficiency. One estimate shows that a typical 200-bed hospital moves meals, linens, lab samples, waste and other items the equivalent of 53 miles per day.[7] Enter TUG, an autonomous mobile robot developed by Aethon Inc. to ferry supplies to where they are needed, freeing employees from heavy physical loads and allowing them to focus on patient care.

When the University of California, San Francisco Medical Center at Mission Bay opened in 2015, it rolled out 25 TUG robots to improve their transportation operations.[8] They are programmed with the hospital's floor plan and are also equipped with a variety of sensors to ensure they don't run into anything on their way to the lab. They also kindly ask people to stand aside as they move into congested hallways.

AI in health care is an area which will grow exponentially

- AI is poised to generate transformative and disruptive advances in healthcare through its unparalleled ability to translate large amounts of data into actionable insights for improving detection, diagnosis, and treatment of diseases, enhancing surveillance and accelerating public health responses, and now, for rapid drug discovery as well as interpretation of medical scans

AI is making significant impact on healthcare

- a deep-learning algorithm developed by health-tech company Qure.ai is [enabling the early detection of lung cancer](). The firm says a study demonstrated a 17% improvement when using AI to interpret chest x-rays compared to conventional radiology readings. It has formed a partnership with drug giant AstraZeneca that aims to scale up the technology to reduce lung cancer mortality rates around the world.

HOWEVER

- "An algorithm that determines coverage based on a larger data set instead of the individual patient's medical history, the physician's recommendations, or clinical notes would not be compliant [with Medicare rules enacted in April]," CMS said in the memo. The rule affects Medicare coverage from the start of 2024.

AI and Healthcare Framework for Low Income Countries

Key Elements of an AI Enabled Health System
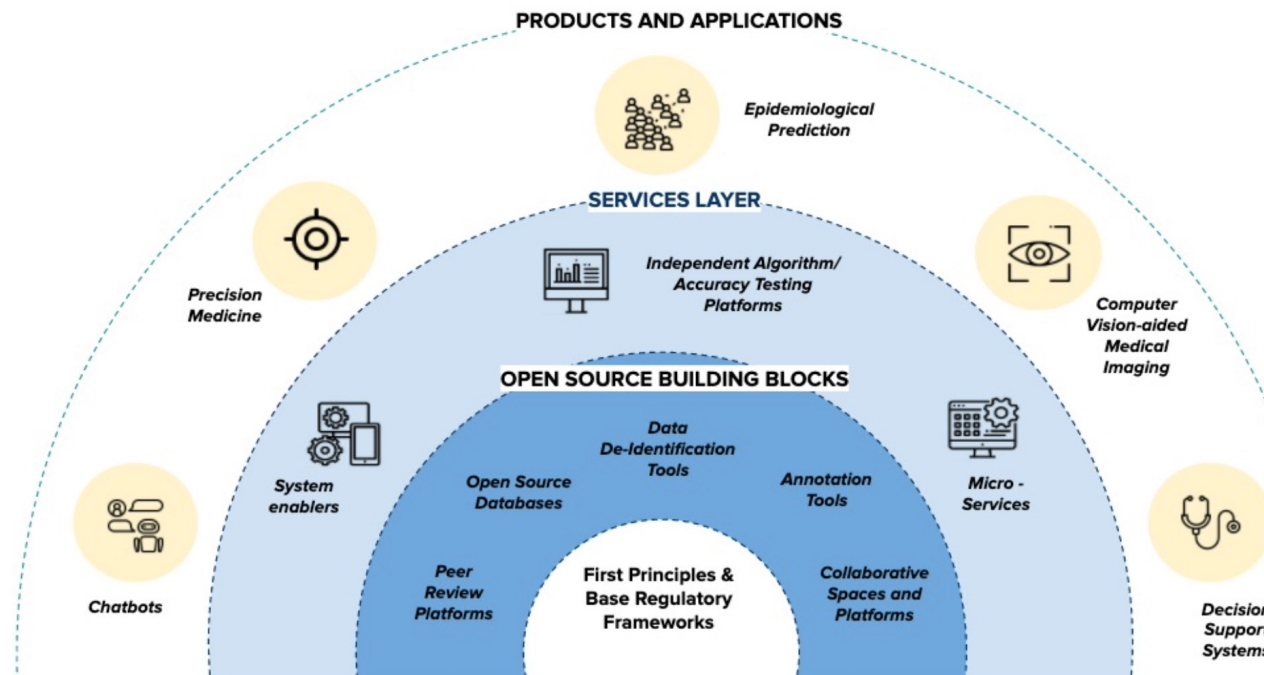
Figure 1: Representation of building blocks of an AI in healthcare ecosystem

Presently, WHO reveals that over 40% of all countries have fewer than 10 medical doctors per 10,000 people and over 55% have fewer than 40 nursing and midwifery personnel per 10,000 people. Only one-third to half of the world's population was able to obtain essential health services as of 2017. It is not a surprise then that key health indicators such as maternal mortality varies as much as 495 (out of 100,000 live births) in LICs as opposed to 17 in HICs. This is also the case with under-five mortality (69 per 1000 live births in low-income nations (LICs) versus 5 in HICs) and incidences of communicable diseases like malaria (189.3 per 1000 population at risk in LICs to nil in HICS).

Yes generative AI has its uses ... see reference section

THE HILL News

The accuracy of ChatGPT's diagnoses was determined by whether they aligned with physicians' diagnoses. Two physician researchers scored the diagnoses as either correct, incorrect or "did not fully capture diagnosis."

Overall, 83 percent of the AI-generated diagnoses were found to be in error, with 72 percent being incorrect and 11 percent being "clinically related but too broad to be considered a correct diagnosis."

Despite the high rate of diagnostic errors detected by the researchers, the study recommended continued inquiry into physicians' use of large language models, noting it could help as an administrative tool.

Primary Care Transformation is all about integrating data technology and process

Primary care transformation will usher in a new era of advanced team-based care with extensive roles beyond the physician to build authentic healing relationships with patients. Smart technology will support these relationships, empower and engage patients, and build
confidence that their health care team will take excellent care of them. Investments need to shift from catastrophic hospital-based care to proactive prevention and wellness, pushing us to think of health beyond health care. Systems need to build a culture of continuous improvement, supported by data-driven improvement science, and keep a sharp focus on the patient experience of care.

CVS Health® Virtual Primary Care™ is a new virtual care offering that provides primary care, 24/7 on-demand care1 and scheduled mental health services. If in-person follow-up care is needed, a patient can seek care at any in-network provider, including MinuteClinic®.

Country: **USA** | Funding: **$52.2M**
Firefly Health is a virtual-first health care company that provides primary healthcare services that redefine high-quality patient care.

Weforum.org

World Economic Forum
Swiss nonprofit foundation

The World Economic Forum is an international non-governmental organization for public–private sector collaboration based in Cologny,

- https://www.weforum.org/agenda/2023/02/health-future-innovation-technology/

Other areas of innovation

CRISPR gene editing

- Clustered Regularly Interspaced Short Palindromic Repeats (CRISPR) gene-editing technology can potentially transform how diseases are treated. It could help make significant advances against killer diseases like cancer and HIV in a matter of years.

- **Virtual reality (VR)**

The VR and AR (augmented reality) market is booming worldwide, and both technologies are being used increasingly in healthcare applications. The technology can be deployed in various ways, such as performing more advanced surgery, helping with pain relief, and treating mental health conditions.

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Smart Bandages

Smart bandages

A bandage that uses sensors to monitor wound healing has been developed by researchers in the US. It "promotes faster closure of wounds, increases new blood flow to injured tissue, and enhances skin recovery by significantly reducing scar formation", according to the Stanford University team behind it.
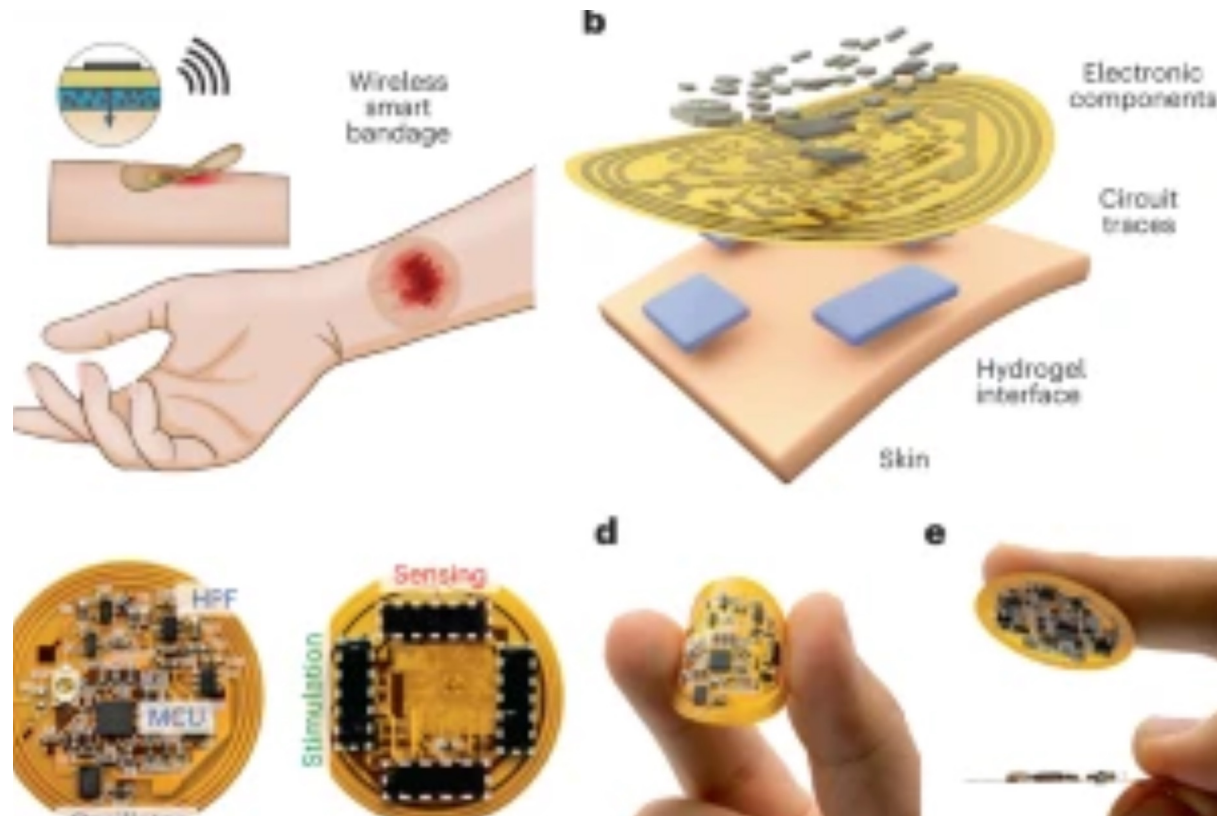
3D printing is expanding across hospitals

Implants nd Prosthetics
Dental implants
Anatomical models
Medical equipment

Number of US hospitals with a centralized 3D printing facility
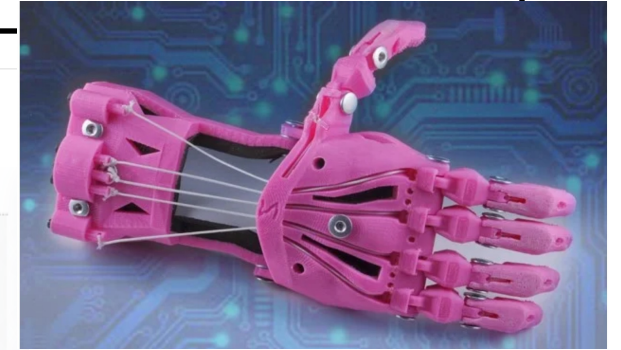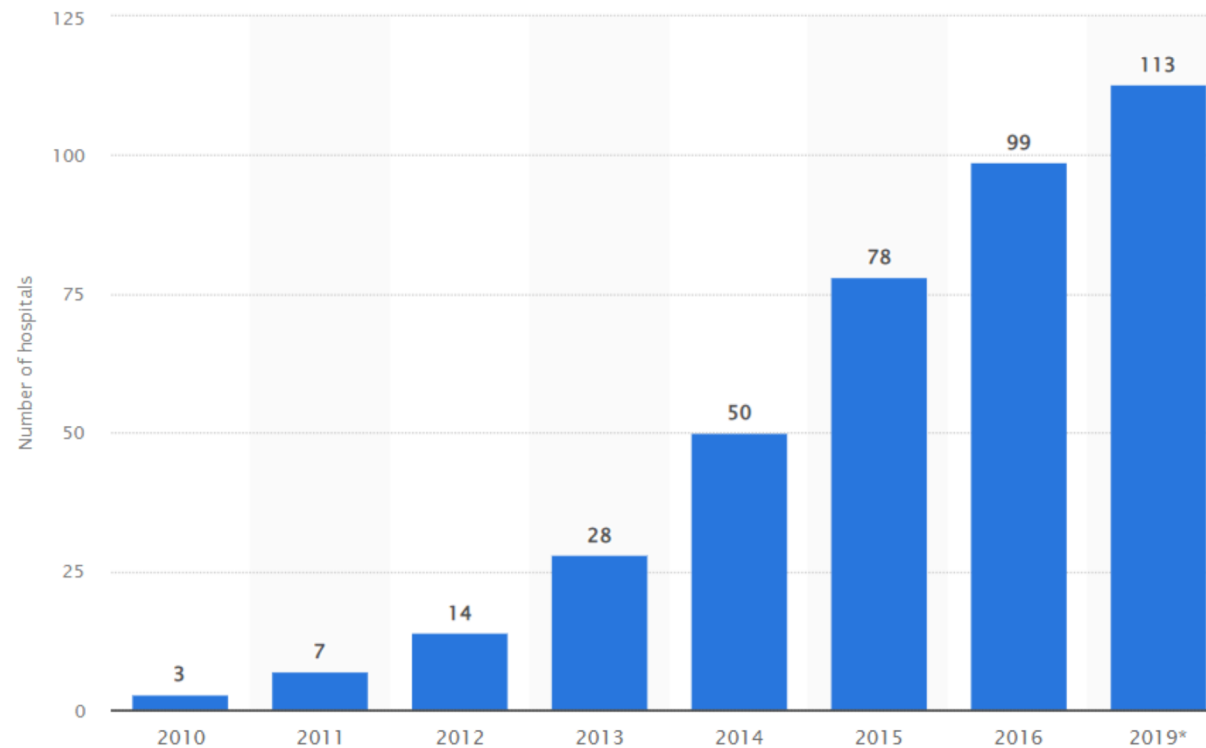
New area -Brain Computer Interface

Elon Musk's Neuralink just announced its first human brain implant — and its workforce is rising quickly as it revs up

Headcount

453 ▲16% (6 mo change) ▲9% (1 yr change) ▲120% (2 yr change)

500
400
300
200
100
0

Jan 2021 — Jan 2022 — Jan 2023 — Jan 2024
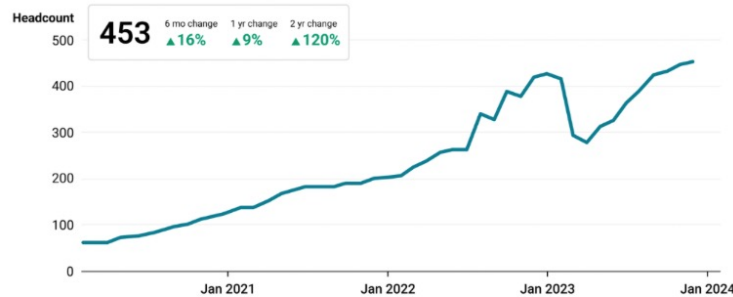
Source: CB Insights company profile — Neuralink.

85 / **CB**INSIGHTS

Machine minds. Elon Musk's Neuralink has developed an implantable brain-computer interface (BCI) designed to allow folks to control external devices with their thoughts. One of its first goals is to help restore autonomy for paralysis patients — and just last month, the company announced its first implant in a human brain. Its workforce is rising quickly as it revs up. Dive deeper into the development in our Tech Trends 2024 Report.

Brain Computer Interface

Investors are betting on brain-computer interfaces to initially help motor-impaired patients, and human trials are kicking off

Company	Headquarters	Total equity funding	Latest funding round	Recent milestone
NEURALINK	US	$680M	Series D (08/07/2023)	Human trial in progress
synchron	US	$125M	Series C (12/15/2022)	Human trial in progress
Paradromics	US	$96M	Series A (11/01/2023)	Received FDA Breakthrough Device designation
Precision	US	$53M	Series B (12/19/2022)	Received FDA Breakthrough Device designation

Source: CB Insights — deals data for select brain-computer interface companies.

86 / CBINSIGHTS

Brain brawl. Neuralink isn't the only company innovating in this space. There are a number of brain-computer interface startups working on solutions to address mobility — and they are drawing the eyes of investors. For example, Synchron raised a $75M Series C round in December 2022. To implant its BCI, the company uses a minimally invasive procedure to avoid open brain surgery. Discover the other companies attracting

Changing the wings on a plane in flight is very difficult- as Google Amazon Intel have found out

Image: © Erau/Fotolia

Why success is slow and few in between in healthcare?

- Cost of failure is very high
- Too many intersection domains
- Too many players involved and final impact of a solutions is hard to isolate.
- Healthcare is local and global and in between!!
- Distributed cottage industry with limited standards and siloes of data
- Perverse economics
- Value chain complicated and inverted at itmes
- Regulation is complex and is ever changing and occurs at county state and federal levels

Success Stories

- Gavi, a public–private partnership founded to save children's lives and protect their health by broadening access to immunization, [used nonfinancial targets to help drive its innovation efforts](#)—and this helped the organization broaden its aspiration for impact in a way that was bold, specific, measurable, and time bound.

Tremendous progress in child and maternal health has been achieved over the past decades. More children today live to celebrate their fifth birthday, while fewer women lose their lives during pregnancy and childbirth.

Medrespond- Conversational Coaching

- **https://www.youtube.com/watch?v=nfIfOLbwN7A**

Fit for Surgery Outcomes
Case Study: 50% Cost Reduction

Open heart surgery program delivers unmatched outcomes with leading healthcare systems

50%
reduction in 30-day post-discharge costs

30%
reduction in 180-day post-discharge costs

90
average minutes of engagement per patient

93-99%
Improved patient satisfaction scores

Patients report that the Conversational Coach eases their anxiety and provides their families critical guidance to know how to support them

medrespond
conversational℠ engagement

Unicorns in healthcare- There are many players who have cracked the code

Hinge Health offers online exercises and educational resources to help people live better with chronic conditions.

Details of the startup:

- Valuation: $6.20B (January 2021)
- Country: United States
- State: California
- City: San Francisco
- Started in: 2015
- Founders: Daniel Perez, Gabriel Mecklenburg
- Number of employees: 1,000-5,000
- Funding: $853.85M
- Funding rounds: 9
- Number of investors: 15

You can find their website **here**.

- https://www.failory.com/startups/health-care-unicorns

Hinge Health

- [Hinge Health](#) is reshaping chronic pain care through innovative digital health solutions, treatment plans, and virtual appointments. The startup's unique approach is transforming medical equipment, patient care, and healthcare providers while modernizing healthcare systems and mental health care.

- Their platform is revolutionizing patient outcomes, leveraging technology to provide efficient and effective care, saving healthcare providers and patients less time, and offering groundbreaking support groups to those in need.

- **Notable Features of Working with Hinge Health**

- **Personalized Pain Relief:** Tailored joint and muscle pain care, reducing reliance on opioids.

- **Advanced Technology Integration:** Utilizes Enso® and computer vision for effective Musculoskeletal (MSK) care.

- **Member-Centric Approach:** Focuses on personalized experiences for every user.

- **Comprehensive Resources:** Offers articles, case studies, webinars, and clinical studies for continuous learning.

- **Hinge Health's Pricing Plans**

- Hinge Health offers flexible pricing plans tailored to your requirements. Reaching out to their support team via email or phone might be helpful to get specific pricing information for the services you're interested in

What is needed for successful healthcare innovation?

- Design thinking is a systemic, intuitive, customer-focused problem-solving approach that organizations can use to respond to rapidly changing environments and to create maximum impact.

- Isolate a single Problem- Dig deep and dive deep to understand all facets associated with it

- Understand the impact on the ecosystem and do your homework in understanding scope competitor snd co-opitors Remember how it impacts people or eliminates people from their jobs

- Understand your revenue streams – Doing good does ot imply it will be paid for

- Start small with a narrow scope .. Think global act local – Involve domain experts from the start

- Ask for advice but make sure you are focusing on the problem you are trying to solve and if necessary reframe your problem

- Clinical side of innovation is more complicated than revenue cycle focused solutions.

QUESTIONS ?

If you want to explore further on your own....
Additional Slides

zWhat is greatest medical innovation of all. times

- The discovery of antibiotics stands as one of the most critical advances in medical history. They were discovered in 1928 when Alexander Fleming returned home from vacation to find a petri dish on his workbench filled with a strain of mold that was not only thriving but also limiting the growth of bacteria

What do serial entrepreneurs say about innovation

- **"AI will inform the experience."**
- **"Care will happen in 60 seconds."**
- **"Health systems will be the hub...maybe."**
- **"At risk is no risk."**

Glen Tullman — CEO of care navigation company [Transcarent](), as well as former CEO of [Allscripts]() and [Livongo]() — discussed what he thinks the future of healthcare

Medical advances in 2023-other perspectives

Here are some of the biggest medical advances in 2023

- Green light for CRISPR gene editing. ...
- Slowing down Alzheimer's. ...
- A gene therapy for muscular dystrophy. ...
- Guarding against RSV. ...
- A pill for postpartum depression. ...
- Birth control, no prescription required. ...
- A shot against chikungunya. ...
- Narcan over the counter.

Dec 14, 2023

Generative AI

The development of virtual assistants to aid patients in managing their health is another important application of ChatGPT in medicine. It can be utilized to generate automated summaries of patient interactions and medical histories, making the medical recordkeeping process more streamlined for doctors and nurses. By dictating their notes, medical professionals can leverage ChatGPT to automatically summarize key details, such as symptoms, diagnoses, and treatments, as well as extract relevant information from patient records, such as lab results or imaging reports.,

It can also aid in clinical trial recruitment by analyzing large amounts of patient data to identify individuals who meet the trial's eligibility criteria. In addition

ChatGPT can also assist patients in managing their medications by providing reminders, dosage instructions, and information about potential side effects, drug interactions, and other important considerations (Marr, n.d.). According to a recent article on the benefits of artificial intelligence for the self-management of sickle cell disease, ChatGPT can serve as a reliable conversational agent to collect information from patients with a diverse range of diseases (Issom et al., 2021).

What are the big opportunities for using ChatGPT in health care?
There are several potential opportunities for using ChatGPT in healthcare:
1.
Virtual assistants for patient care: ChatGPT could be used to create virtual assistants that can help patients schedule appointments, answer medical questions, and provide information on symptoms and treatments.
2.
Clinical documentation: ChatGPT could be used to automate the process of creating clinical documentation, such as medical charts and progress notes, ...
3.
Medical research: ChatGPT could be used to analyze large volumes of medical data and assist in the discovery of new treatments and cures.
4.
Medical education: ChatGPT could be used to create interactive educational tools for medical students, ...
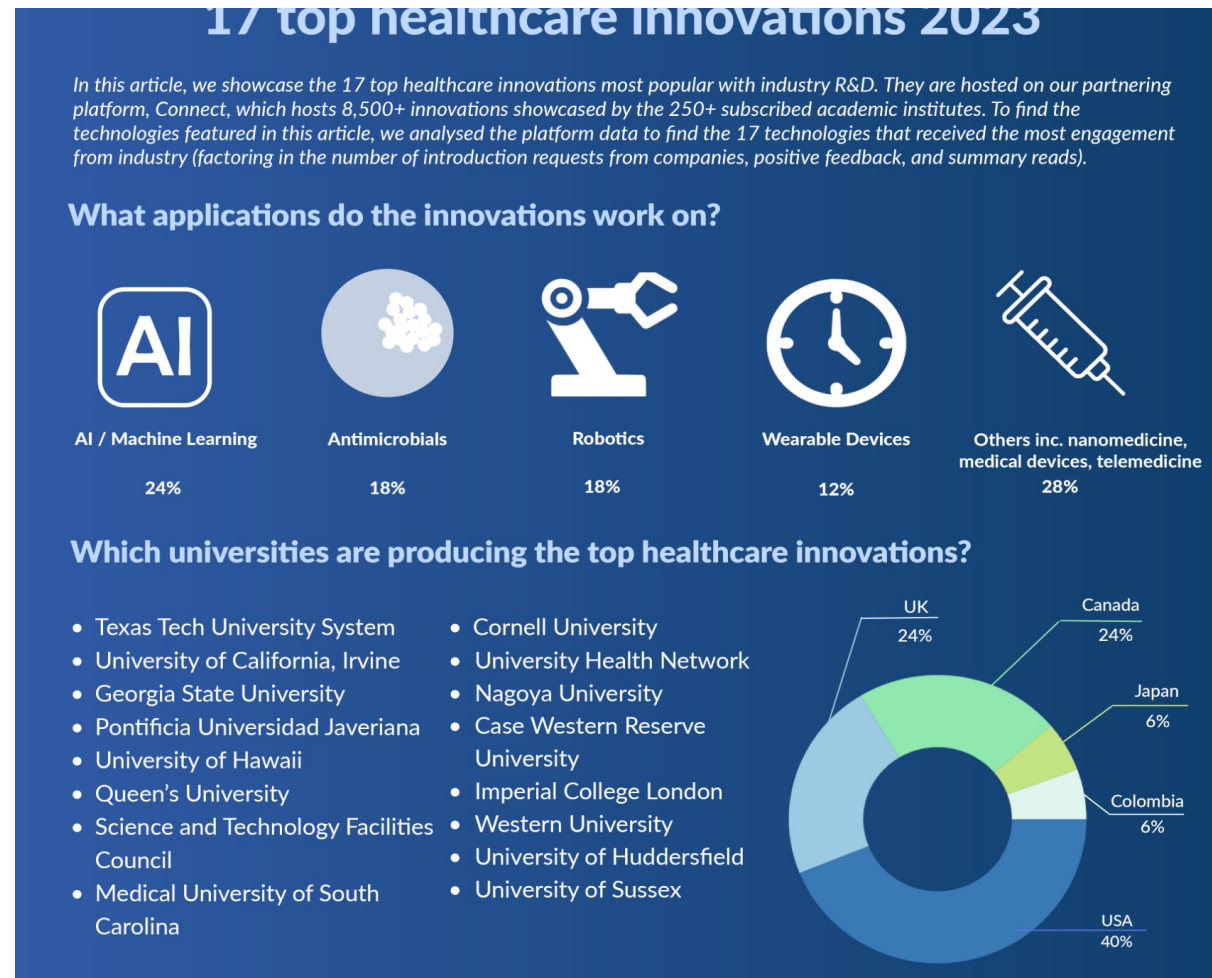5.
Patient engagement: ChatGPT could be used to create chatbot-based applications for patient engagement, providing patients with real-time feedback and support for self-management of their care.

https://in-part.com/blog/17-top-healthcare-innovations-2023-identified-by-the-global-rd-community/

- 17. Tracking gazes to assist with surgery
- 16. Using nanocomposite seaweed in sensors to monitor health
- 15. Making veins easier to access
- 14. Detecting neurodegenerative diseases earlier with machine learning
- 13. Delivering drugs in red blood cell-derived vesicles
- 12. A human-machine interface that communicates through breath patterns
- 11. Inactivating viruses with air curtains
- 10. Intravenous training arm with tactile feedback and motion control
- 9. Enriching mental health treatment with machine learning
- 8. A recovery program for trauma clinics
- 7. Mapping the microbiome onto personalised healthcare products with AI
- 6. A multi-system approach to improve breast cancer treatment
- 5. Real-time detection of health conditions
- 4. Personalised, AI-informed orthopaedic insoles for diabetes patients
- 3. An anti-biofilm agent that prevents antimicrobial resistance
- 2. Novel antibiotics for gram-positive bacteria
- 1. A new enzyme-based method for treating biofilm-associated infections

17 top healthcare innovations 2023

In this article, we showcase the 17 top healthcare innovations most popular with industry R&D. They are hosted on our partnering platform, Connect, which hosts 8,500+ innovations showcased by the 250+ subscribed academic institutes. To find the technologies featured in this article, we analysed the platform data to find the 17 technologies that received the most engagement from industry (factoring in the number of introduction requests from companies, positive feedback, and summary reads).

What applications do the innovations work on?

- AI / Machine Learning — 24%
- Antimicrobials — 18%
- Robotics — 18%
- Wearable Devices — 12%
- Others inc. nanomedicine, medical devices, telemedicine — 28%

Which universities are producing the top healthcare innovations?

- Texas Tech University System
- University of California, Irvine
- Georgia State University
- Pontificia Universidad Javeriana
- University of Hawaii
- Queen's University
- Science and Technology Facilities Council
- Medical University of South Carolina
- Cornell University
- University Health Network
- Nagoya University
- Case Western Reserve University
- Imperial College London
- Western University
- University of Huddersfield
- University of Sussex

- UK 24%
- Canada 24%
- Japan 6%
- Colombia 6%
- USA 40%

Cyber Attacks in healthcare are costly. And disastrous

Cyber attacks left systems down for a week

DIVE BRIEF

88% of healthcare organizations experienced a cyberattack in past year, report finds

The average cost of organizations' most expensive cyberattack increased 13% year over year, according to a survey from the Ponemon Institute.

Published Oct. 11, 2023

Ponnemon report on cyber security

Percent of respondents who reported patient care impacts by type of attack

Legend:
- Delays in procedures and tests
- Longer length of stay
- Increase in patients transferred or diverted
- Increase in complications
- Increase in mortality rate
- Other

Ransomware
- 59%
- 48%
- 46%
- 44%
- 28%
- 3%

BEC
- 71%
- 55%
- 46%
- 56%
- 12%
- 4%

Supply chain
- 50%
- 48%
- 39%
- 45%
- 21%
- 4%

Cloud
- 47%
- 48%
- 37%
- 53%
- 29%
- 3%

Chart: Emily Olsen/Healthcare Dive • Source: 2023 Ponemon Healthcare Cybersecurity Report • Get the data • Created with Datawrapper

Collateral Damage needs to be evaluated

- 88% of organizations experienced an average of 40 attacks in the past 12 months
- The average total cost of a cyber attack was nearly $5 million, a 13% increase from the previous year
- 64% of organizations suffered a supply chain attack in the past two years. Among this group, 77% said these attacks impacted patient care
- 63% of organizations had an average of 21 cloud compromises during the past two years
- Ransomware is no longer considered a top threat—only 48% are worried about these attacks
- Business Email Compromise (BEC) attacks are a growing concern—62% say they're vulnerable
- Malicious insiders are the No. 1 cause of data loss and exfiltration
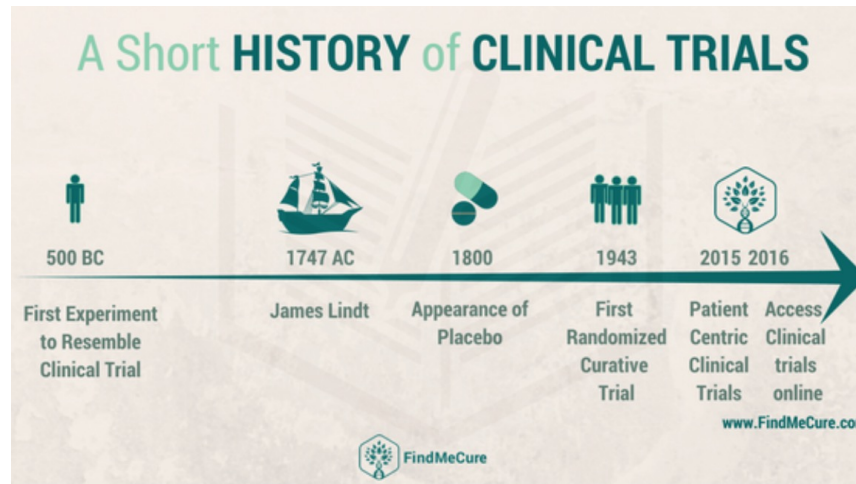
Inadvertent costs ?

Breaches have exposed [385 million patient records from 2010 to 2022](#), according to federal records,
Of those, 46% said it increased mortality rates, while 38% it increased complications from medical procedures.

Cyberattacks that disrupt facility operations can put patients' lives at risk. A ransomware attack [against Chicago-based CommonSpirit Health](#)last year disrupted access to health records and delayed patient care, while a recent [attack against Prospect Medical Holdings](#) forced some ambulances to divert patients to other hospitals.

The average cost for organizations' most expensive cyberattack was $4.9 million. Disruption to normal healthcare operations due to system availability issues was the most significant financial consequence of an attack, according to the report.

Clinical trials

A Short HISTORY of CLINICAL TRIALS

500 BC	1747 AC	1800	1943	2015	2016
First Experiment to Resemble Clinical Trial	James Lindt	Appearance of Placebo	First Randomized Curative Trial	Patient Centric Clinical Trials	Access Clinical trials online

www.FindMeCure.com

FindMeCure

NOW

| LACK of information about treatment options | LESS participants of clinical trials | Billons of dollars LOST | FAILED clinical trials | NO medical PROGRESS | SICK PEOPLE |

Find Me Cure

| ACCESS to information about cures in development | MORE participants of clinical trials | BILLONS of dollars INVESTMENT | SUCCESSFUL clinical trials | Medical PROGRESS | CURED PEOPLE |

Even the Magnificent 7 and other large Tech companies have failed at cracking the healthcare code

- Microsoft health

- Google health

- Haven

- Cisco health

- Intel

- Oracle

"Ultimately, it is about employers and physicians working together to improve the quality and safety of care," said Dr. Jeffrey Rideout, MD, Cisco's Vice President of Healthcare, Internet Business Solutions Group and Corporate Medical Director. "Creating a system that provides patient information and data as well as the results of medications and treatments will help physicians make the best medical decisions."

2006

- **How can leaders decide what innovations to prioritize?**
- Successful innovation has historically occurred at the intersection of several elements, which can guide prioritization efforts. [The three most important elements are the who, the what, and the how]:

1. *An unmet customer need (the 'who'):* Who is the customer and what problem do they need to solve? Are macrotrends such as automation driving changes in customer needs?

2. *A solution (the 'what'):* Is the solution compelling and can it be executed?

3. *A business model that allows for the solution to be monetized (the 'how'):* How will the solution create value? What is the business model?

- Successful innovation requires answers to each of these questions.

Aspire and Choose

- **How do organizations become better innovators?**

- McKinsey conducted research into the [attributes and behaviors behind superior innovation performance](#), which were validated in action at hundreds of companies. This research yielded [eight critical elements](#) for organizations to master:

1. *Aspire:* Do you regard innovation-led growth as critical, and have you put in place cascaded targets that reflect this?

2. *Choose:* Do you invest in a coherent, time- and risk-balanced portfolio of initiatives, and do you devote sufficient resources to it?

3. *Discover:* Are your business, market, and technology R&D efforts actionable and capable of being translated into winning value propositions?

4. *Evolve:* Do you create new business models that provide defensible, robust, and scalable profit sources?

5. *Accelerate:* Do you develop and launch innovations quickly and effectively?

6. *Scale:* Do you launch innovations at the right scale in the relevant markets and segments?

7. *Extend:* Do you create and capitalize on external networks?

8. *Mobilize:* Are your people motivated, rewarded, and organized to innovate repeatedly?

- Of these eight essentials, [two merit particular attention](#): *aspire* and *choose*. Without these two elements, efforts may be too scattershot to make a lasting difference. It's particularly crucial to ensure that leaders are setting bold aspirations and making tough choices when it comes to resource allocation and portfolio moves. To do so successfully, many leaders will need to shift their mindsets or management approaches.

Classic Business theory says :

Why Start Ups Fail

1. No market need   42 percent
2. Lack of cash   29 percent
3. Inappropriate team   23 percent
4. Strong competition   19 percent
5. Pricing and cost issues 18 percent
6. Bad core product   17 percent
7. Lack of a business model 17 percent
8. Bad marketing   14 percent
9. Customer neglect   14 percent
10. Bad timing   13 percent
11. Loss of focus   13 percent
12. Intra-team conflicts   13 percent
13. A pivot gone bad   10 percent
14. Lack of passion   9 percent
15. Bad location   9 percent

- A New Study Reveals the 20 Factors That Predict Startup Failure: Do Any Apply to You?
www.entrepreneur.com/article/308447

1. *Aspire:* Do you regard innovation-led growth as critical, and have you put in place cascaded targets that reflect this?

2. *Choose:* Do you invest in a coherent, time- and risk-balanced portfolio of initiatives, and do you devote sufficient resources to it?

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8. *Mobilize:* Are your people motiva

Not only individuals but healthcare organizations are reaching bankruptcies.

Healthcare bankruptcies reached five-year peak in 2023, report finds

The analysis logged 79 Chapter 11 bankruptcies for companies with liabilities of at least $10 million last year, more than three times the number of filings in 2021.

Published Jan. 26, 2024

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