

# **REVOLUTIONIZING HEALTHCARE:** THE LATEST TRENDS AND DEVELOPMENTS

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## What discipline do you work in?





# What healthcare trends will be most impactful to the industry?

### WHAT WE WILL BE COVERING









Based on the CPI-U for medical care, what component is driving healthcare cost most?

## **CPI-BASED INFLATION DEFINED**...



Consumer Price Index for All Urban Consumers (CPI-U) is a monthly measure of the average change over time in the prices paid by consumers for a "market basket" of consumer goods. The Medical Care Index being one of the eight major groups in the CPI-U.



The CE defines medical spending as **patient payments made to retail establishments for medical goods and services** and health insurance premiums paid by consumers (both directly and through employee deductions)



Medical Care is divided into two sections: medical care commodities (18%) and medical care services (82%)



Medical care commodities include **medicinal drugs (17%)**, both prescription and non-prescription, **and medical equipment and supplies (1%)**. Medical care services comprise the majority of the index with **professional services** accounting for **45%**, **hospital services** for **28%** and **health insurance** for **9%** 



Health insurance sector and the **retained earnings methodology** in the CPI.

## **HISTORICAL INFLATION AND THE CORRESPONDING MEDICAL CARE INDEX**



Annual percent change in Consumer Price Index for All Urban Consumers (CPI-U), January 2001 - June 2023

https://www.healthsystemtracker.org/brief/how-does-medical-inflation-compare-to-inflation-in-the-rest-of-the-economy/

## A BREAKDOWN OF THE MEDICAL COST INDEX

Annual percent change in Consumer Price Index for All Urban Consumers (CPI-U) for medical care, by category, June 2022 - June 2023

![](_page_10_Figure_2.jpeg)

Note: "All medical care" includes medical services as well as commodities such as equipment and drugs. CPI for medical care is generally lagged farther than other categories. Health insurance CPI presents data that is almost one-year lagged.

https://www.healthsystemtracker.org/brief/how-does-medical-inflation-compare-to-inflation-in-the-rest-of-the-economy/

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## WHAT SHOULD WE CARE ABOUT AS A HEALTH ACTUARY?

#### Clinical healthcare costs are still outpacing inflation

• Despite the relatively flat medical care index CPI-U rate, the clinical costs are still outpacing inflation (hospital and physician services)

#### 2

#### Provider contracting negotiation pressure in the upcoming years

Multi-year provider contract renewals will begin to cascade through the health system.

#### Health insurance premium trends

As providers look to claw back the impact of inflation on their current rate negotiations, unit cost trends may increase further, particularly for commercial blocks

#### Market uniqueness

The market, line of business (Commercial, government sponsored, etc.), and geographic area are affected by these trends very differently.

#### A deeper focus on prescription drug costs

Regulatory changes in prescription drug reform have shifted liability away from members and to other stakeholders, particularly through the IRA in the Medicare sector.

![](_page_12_Picture_0.jpeg)

### **BROADER ADOPTION OF ARTIFICIAL INTELLIGENCE (AI) COULD LEAD TO SAVINGS** OF \$200 BN TO \$360 BN PER YEAR IN HEALTHCARE SPENDING, WITHIN THE NEXT 5 YEARS

Private payers, physician groups, and hospitals could see save roughly 3% and 11% of their total costs

#### Insurance

![](_page_13_Picture_3.jpeg)

Streamlining of claims processing/adjudication and prior authorization

![](_page_13_Picture_5.jpeg)

Improved customer experience and personalization

![](_page_13_Picture_7.jpeg)

Detection and prevention of fraudulent claims and billing errors

![](_page_13_Picture_9.jpeg)

**Reduced processing time for underwriting** 

![](_page_13_Picture_11.jpeg)

Risk assessment, predictive/data analytics, population health management

#### **Healthcare Delivery**

![](_page_13_Picture_14.jpeg)

Identification of adverse events in operating room

Use of virtual reality (VR) and augmented reality (AR)

![](_page_13_Picture_17.jpeg)

Virtual healthcare assistants, chatbots, companions

![](_page_13_Picture_19.jpeg)

Remote monitoring with wearable devices

https://www.forbes.com/sites/bernardmarr/2023/10/03/the-10-biggest-trends-revolutionizing-healthcare-in-2024/?sh=61d5ffea1d13; https://www.healthcaredive.com/news/artificial-intelligence-healthcare-savings-harvard-mckinseyreport/641163/#:~:text=In%20the%20new%20paper%2C%20researchers%20estimate%20that%20broader,next%20five%20years%2C%20without%20sacrificing%20guality%20or%20access

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## **HOW IS GENERATIVE AI DIFFERENT FROM TRADITIONAL AI?**

Both can be used together in various applications as they have different strengths and limitations

#### **Traditional AI**

![](_page_14_Picture_3.jpeg)

Pattern recognition

Responds to a particular set of inputs based on data specific to their intended

![](_page_14_Picture_6.jpeg)

Analyzes data and makes predictions - cannot learn and adapt on its own

Requires data scientists who understand the AI design and implementation

... I don't think I've seen anything as transformational since the iPhone or Google", John Brownstein, chief innovation officer at Boston Children's Hospital

Generative AI

![](_page_14_Picture_11.jpeg)

I want physicians to recognize that AI is here. This is a really exciting time for us to be in medicine.", Dr Tiffany Kung, researcher at Ansible Health

... light years ahead", Michael Hasselberg, chief digital health officer at U of Rochester Medical Center

https://www.modernhealthcare.com/digital-health/chatgpt-healthcare-everything-to-know-generative-ai-artificial-intelligence; https://www.modernhealthcare.com/technology/ansiblehealths-tiffany-kung-chatgpts-healthcare; https://www.forbes.com/sites/bernardmarr/2023/07/24/the-difference-between-generative-ai-and-traditional-ai-an-easy-explanation-for-anyone/?sh=1b28e7b3508a

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![](_page_15_Picture_0.jpeg)

![](_page_15_Picture_1.jpeg)

# As actuaries, how often do you use generative AI?

## MAJOR COMPANIES ARE INVESTING HEAVILY IN THE DEVELOPMENT OF GENERATIVE AI

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## MANY INSURERS ARE ALREADY TESTING GENERATIVE AI SOLUTIONS

26% of them plan to have solutions in production by the end of 2023

## Generative AI has revolutionized large-scale experimentation by making consumer solutions more accessible, capturing worldwide media attention, and promising immediate benefits

![](_page_17_Figure_3.jpeg)

Source: Oliver Wyman/Celent poll surveying C suite executives in the insurance industry, conducted from May 15, 2023 to May 22, 2023. 33 executives responded, with eight representing companies over \$5 billion in revenue. Questions include: (1) "Are you currently developing large language models in a test environment for future usage?" (2) "Are you currently using large language models in any production applications?"

- These statistics are significantly higher for larger insurance companies
- They are likely to keep increasing as enterprise generative AI solutions and platforms become more accessible
- Insurers will persist in their exploration, experimentation, and scaling of specific solutions to maintain a competitive edge and anticipate future trends

## **CURRENT BENEFITS OF GENERATIVE AI IN HEALTHCARE ARE MAINLY IN ROUTINE TASKS**

![](_page_18_Picture_1.jpeg)

#### **DOCUMENTATION SUPPORT**

62% of healthcare practitioners' working hours are spent on electronic medical records and not on the patients. Generative AI can save doctors and nurses about 3 hours a day through:

- Powerful summarizing capability of large documents, including medical records and patients' history on a timeline
- Note-taking and listening devices in the room can detect voice and create visit takeaway summary
- Automation of follow-up communication with patients very empathetic almost 10 times more often than human responses
- Creation of prior authorization letters to payers

![](_page_18_Picture_8.jpeg)

#### WORKFLOW OPTIMIZATION

- Detection and correction billing errors
- Efficient allocation of healthcare resources, especially during shortages of staff
- Reduction of burnout rates of healthcare practitioners

https://www.forbes.com/sites/bernardmarr/2023/10/03/the-10-biggest-trends-revolutionizing-healthcare-in-2024/?sh=61d5ffea1d13; https://aimi.stanford.edu/events/2023-aimi-symposium; https://www.modernhealthcare.com/digital-health/chatgpt-tech-healthcare-redundancies-microsoft-nuance; https://www.modernhealthcare.com/digital-health/chatgpt-tech-healthcare-artificial-intelligence; https://news.yahoo.com/chatgpt-answers-patients-online-questions-150000656.html?guccounter=1&guce\_referrer=aHR0cHM6Ly93d3cuYmluZy5jb20v&guce\_referrer\_sig=AQAAAML1qU1QqMh71l-7e2gA-ikZKsGUv\_4MYLmdgD1K5W8iTQQqxqDNx5v0NM1UQKCmsxJ43F6ZWsSitg1Dk907zP0JmRxXcQOsokqlwn-PAFOoUpEldB5sy06tJYW1EwErlsuQWllc618sdBNrasyWLCgGK1Z28u24meLgDAonmkF

## ADOPTION OF AI-BASED TOOLS BY CERTAIN AREAS OF THE HEALTHCARE INDUSTRY HAS BEEN SLOW TO TAKE HOLD COMPARED TO OTHER INDUSTRIES

Experts agree that advanced and independent medical use cases of generative AI are still in development

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#### **BETTER HEALTH OUTCOMES**

- Generating of personalized treatment plans which can lead to more effective and targeted care
- Improved diagnostic accuracy by analyzing large-size patient data/identifying patterns that are difficult for humans to detect
- Improvement of imaging quality to aid radiologist in detecting abnormalities
- Behavioral health support by providing virtual empathetic responses and generating therapeutic content

![](_page_19_Picture_8.jpeg)

#### DATA PRIVACY AND ETHICAL CONSIDERATIONS

- Still too early to have a robust regulatory infrastructure for the use of generative AI in healthcare
- Still exposed to biases and unfairness, lack of transparency and trust, unintended consequences, and unforeseen risks
- Legal requirement for patient's informed consent for the use of generative AI in their healthcare data
- Safeguards must be in place to prevent unauthorized access, data breaches, or misuse of PHI per HIPAA

https://www.forbes.com/sites/bernardmarr/2023/10/03/the-10-biggest-trends-revolutionizing-healthcare-in-2024/?sh=61d5ffea1d13; https://aimi.stanford.edu/events/2023-aimi-symposium; https://www.modernhealthcare.com/digital-health/chatgpt-tech-healthcare-redundancies-microsoft-nuance; https://www.modernhealthcare.com/digital-health/chatgpt-healthcare-everything-to-know-generative-ai-artificial-intelligence;

https://news.yahoo.com/chatgpt-answers-patients-online-questions-150000656.html?guccounter=1&guce\_referrer=aHR0cHM6Ly93d3cuYmluZy5jb20v&guce\_referrer\_sig=AQAAAML1qU1QqMh71l-7e2gA-ikZKsGUv\_4MYLmdgD1K5W8iTQQqxqDN-x5v0NM1UQKCmsxJ43F6ZWsSitg1Dk9O7zP0JmRxXcQOsokqlwn-PAFOoUpEldB5sy06tJYW1EwErIsuQWllc618sdBNrasyWLCgGK1228u24meLgDAonmkF

## **CONSIDERATIONS FOR HEALTH ACTUARIES**

Health actuaries can stay informed about the evolving impact of generative AI in healthcare through various means:

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![](_page_21_Picture_0.jpeg)

## IMPROVING CARE BY ADDRESSING SOCIAL DETERMINANTS OF HEALTH (SDOH)

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![](_page_22_Picture_1.jpeg)

What is the first word that comes to mind when you hear Social Determinants of Health?

## WHAT ARE SOCIAL DETERMINANTS OF HEALTH (SDOH)?

Social Determinants of Health represent non-medical factors that have an impact on overall health and quality of life

#### **Education Access & Quality**

- Education level & literacy
- Access to healthcare information
- Occupation

#### **Economic Stability**

- Income level
- Steady employment
- Net worth
- Food security

![](_page_23_Figure_11.jpeg)

#### Social & Community Context

- Interpersonal relationships at work and at home
- Discrimination and social marginalization

#### Health Care Access & Quality

- Transportation access
- Location relative to healthcare providers and facilities

#### **Neighborhood & Built Environment**

- Stability and quality of housing
- Neighborhood crime level
- Quality of environments

Source: https://health.gov/healthypeople/priority-areas/social-determinants-health

## WHY IS SDOH IMPORTANT IN HEALTHCARE?

Numerous studies have demonstrated SDoH directly contribute to health disparities and influence health outcomes

#### Food insecurity and cost of healthcare

- Individuals with high levels of food insecurity have healthcare costs that are roughly 10-15% higher than individuals with better access
- Individuals with high levels of food insecurity coupled with lower neighborhood quality have healthcare costs that are 40% higher than individuals not subject to these factors
- Analysis\* based on 40,000 Medicare-covered lives

![](_page_24_Figure_6.jpeg)

#### Average Monthly Healthcare Cost per Member

![](_page_24_Figure_8.jpeg)

## **INCORPORATING SDOH FACTORS INTO RISK MODELS LEADS TO IMPROVED RISK PREDICTION CAPABILITIES**

#### Predicted versus actual health expenditure

![](_page_25_Figure_2.jpeg)

• A risk model\*\* that includes SDoH factors was developed by integrating a vendor-owned, third-party comprehensive consumer database with traditional clinical client data

- Matching characteristics must include last name, first initial, age, gender, zip code and/or address within 2 miles of radius
- In an analysis of over 40,000 Medicare-covered lives in Central Florida, SDoH attributes were linked at a rate of nearly 80% at the consumer level

\*\*By Oliver Wyman Predictive Insights

## AS GATEKEEPERS OF CARE, PROVIDER SYSTEMS NEED DATA-DRIVEN SOLUTIONS TO DRIVE IMPACTFUL CHANGE ACROSS THE HEALTHCARE INDUSTRY

#### Improving health outcomes in SDoH-affected communities

• Providers are best positioned to make an impact through patient outreach and can reinvest the higher reimbursements resulting from SDoH features of value-based contracts back into the affected communities, utilizing the additional funds to enhance care and decrease overall costs

![](_page_26_Figure_3.jpeg)

![](_page_27_Picture_0.jpeg)

## LABOR SHORTAGES AND WORKFORCE BOTTLENECKS, PROVIDERS ARE INCREASINGLY CHALLENGED WITH STAFFING

![](_page_28_Picture_0.jpeg)

![](_page_28_Picture_1.jpeg)

# How concerned should we be with the current buzz around workforce shortages?

## HEALTHCARE WORKFORCE SHORTAGES AND THE LABOR CRISIS

![](_page_29_Picture_1.jpeg)

#### The US is suffering a healthcare worker shortage. Experts fear it will only get worse.

An aging population and healthcare workforce are contributing to the shortage.

![](_page_29_Picture_4.jpeg)

#### Figure 2

Share of Nursing Facilities Reporting Staffing Shortages, as of March 20th, 2022

<15% (6 states) 15-30% (16 states + DC) 30-50% (20 states) 50% or More (8 states)</p>

![](_page_29_Figure_8.jpeg)

checks performed by the Centers for Medicare & Medicaid Services (CMS). SOURCE: KFF analysis of CMS COVID-19 Nursing Home Data, as of the week ending on 3/20/202

#### Press Releases

#### Carter, Dunn introduce bill addressing health care workforce shortage

Washington, August 18, 2023 Tags: Health Care

AD 🕁 🖂

### **PROJECTED NURSING NEEDS IN 2030**

#### Registered Nurse Shortages by State (Projected)

Difference between supply and demand expected by 2030

Most Severe Shortages						
Rank	State	Supply (2030)	Demand (2030)	Difference		
1	California	343,400	387,900	-44,500		
2	Texas	253,400	269,300	-15,900		
3	New Jersey	90,800	102,200	-11,400		
4	South Carolina	52,100	62,500	-10,400		
5	Alaska	18,400	23,800	-5,400		
6	Georgia	98,800	101,000	-2,200		
7	South Dakota	11,700	13,600	-1,900		
8	Montana	12,300	12,100	200		
9	North Dakota	9,900	9,200	700		
10	New Hampshire	21,300	20,200	1,100		

Source: U.S. Health and Human Services, Health Resources and Services Administration, National Center for Health Workforce Analysis, "Supply and Demand Projections of the Nursing Workforce: 2014-2030," 2017: https://bhw.hrsa.gov/sites/default/files/bureau-health-workforce/data-research/nchwa-hrsa-nursing-report.pdf

#### **The Retirement Drain**

"When COVID hit, many people retired or were given an early retirement package... Now they are so understaffed that they are paying bonuses for people not to call out or use their vacation for the next three months."

https://www.usa.edu/blog/nursing-shortage/

## **BREAKING DOWN WORKFORCE COST AND LABOR SHORTAGE**

	Nursing Labor	Purchased Service Expenses	Supply and Pharmacy Expenses
Defined	Defined as salaries, wages, and incentive payments for hospital employed nurses	Non-labor spend associated with contracted or outsourced cost	Medical devices, general supplies and pharmacy drug cost
Key Observations	<ul> <li>US Bureau of Labor and Statistics reported that 275,000 more nurses are needed from 2020- 2030.</li> <li>FTE per occupied bed ratios</li> <li>Specializations of skill sets and overall lack of supply are key contributors here.</li> <li>Subsidization, travel nurse substitutes, and overtime pay</li> </ul>	<ul> <li>Can account for a large portion of hospital non-labor cost</li> <li>A secondary impact forged from the economic inflationary pressures</li> <li>Administrative costs such as appointment scheduling, billing, recruitment continue to contribute</li> </ul>	<ul> <li>Medical supply costs account for apprx. 20% of hospital expenses</li> <li>Largely driven by ICU med supplies and respiratory care</li> <li>Surgical supplies, diagnostics, PPE, implants also key drivers</li> <li>Pharmacy cost continue to be affected by large list price increases similar to the insurance industry</li> </ul>

#### Change in Year-to-Date Expenses per Adjusted Discharge Compared to Pre-Pandemic Levels

![](_page_31_Figure_3.jpeg)

Source: Kaufman Hall's October 2021 National Hospital Flash Report

The largest portion of potential extra healthcare costs are introduced to the system in 2022–23.

![](_page_31_Figure_6.jpeg)

Inflation and clinical labor wage growth are significantly above baseline trends in **2022 and 2023** before returning to a lower rate of growth on this elevated baseline

Source: https://www.aha.org/system/files/media/file/2021/11/data-brief-health-care-workforce-challenges-threaten-hospitals-ability-to-care-for-patients.pdf https://www.mckinsey.com/industries/healthcare/our-insights/the-gathering-storm-the-transformative-impact-of-inflation-on-the-healthcare-sector

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![](_page_33_Picture_0.jpeg)

![](_page_33_Figure_1.jpeg)

Prescription drug trends have been top of the news articles lately. Which of these trends will impact our industry the most?

## **TRENDS IN BIOSIMILARS HAVE EMERGED RECENTLY**

Many biologic drugs are opening market share for biosimilars which present lower cost and equal efficacy options

#### Biosimilars have recorded impressive growth in recent years.

![](_page_34_Figure_3.jpeg)

#### Global biosimilars market, \$ billion

![](_page_34_Figure_5.jpeg)

<sup>1</sup>Based on data from IQVIA Analytics.

<sup>2</sup>Based on data from EvaluatePharma.

Source: EvaluatePharma, February 2021, Evaluate Ltd.; IQVIA Analytics Link, February 2021; US Food and Drug Administration; McKinsey analysis

#### Top 3 biosimilars by market share in France, Germany, Italy, Spain, and the United Kingdom, %

![](_page_34_Figure_10.jpeg)

Source: IQVIA Analytics Link, May 2020; McKinsey analysis

https://www.mckinsey.com/industries/life-sciences/our-insights/an-inflection-point-for-biosimilars

## WHAT'S THE BUZZ AROUND GLUCAGON-LIKE PEPTIDE 1 (GLP-1)

## Glucagon-like peptide-1 analogues promote weight loss in obese, non-diabetic individuals

A randomized, double-blind, controlled, phase 2 study (N=957)

Estimated percentage mean weight loss after 52 weeks of therapy 0% -5% -10% -15% -20% • Semaglutide 0.05 mg • Semaglutide 0.1 mg • Semaglutide 0.2 mg • Semaglutide 0.3 mg • Semaglutide 0.4 mg • Liraglutide • Placebo As a healthcare actuary, we are primarily concerned with utilization patterns, cost structures and impacts on future morbidity levels

## **OVERVIEW OF THE KEY COMPONENTS OF PRESCRIPTION DRUG PRICING REFORM IN THE INFLATION REDUCTION ACT OF 2022**

![](_page_36_Picture_1.jpeg)

#### 2023 – Inflation Caps and Insulin Copays

- Inflation caps on prescription drugs limit year-over-year increases to CPI-U (also impacts Part B Rx) and are anchored to 2021
- Cap of \$35 on member cost sharing for a 30-day supply of Insulin (for 2023 only, plans will be retroactively reimbursed if not participating in the Senior Savings Model)

#### 2025 - Full Redesign of the Part D Benefit

- **Reduction in the Federal Reinsurance** percentage and increase in catastrophic liability for plans and manufacturers
- Elimination of the coverage gap with manufacturers' liability being moved into the Initial Coverage and Catastrophic phases (and extended to low-income beneficiaries)
- Catastrophic phase will begin after **\$2,000 member OOP maximum** based on the basic benefit design

![](_page_36_Picture_9.jpeg)

#### **2024** – Premium and Cost Sharing Changes

- Legislation eliminates coinsurance for members in the catastrophic phase
- Resulting from the CMS Final Rule (NOT a component of legislation but timeline overlaps with the Inflation Reduction Act) Pharmacy DIR will be eliminated in 2024
- \$0 coverage of ACIP-recommended vaccines
- The threshold for low-income members to receive full premium and cost sharing assistance is raised from 135% to 150% of FPL
- Premium stabilization program limits increases on the Base Beneficiary Premium to 6% per year, potentially increasing the direct subsidy

![](_page_36_Picture_16.jpeg)

#### **2026+ – Price Negotiations**

- Government **price negotiations** begin on the most expensive Part D drugs, with certain exclusions
- Similar negotiations will begin for Part B drugs starting in 2028

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# Using one word, how would you classify the content of this presentation?

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