2022 Health Care Program



The Future of Health Care, the Next Pandemic and Beyond: What's Next for the Industry?

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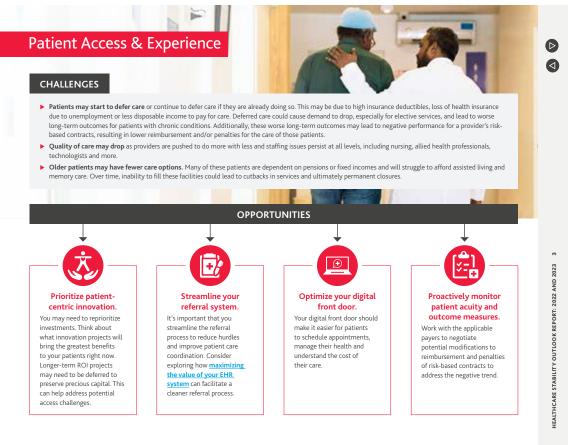
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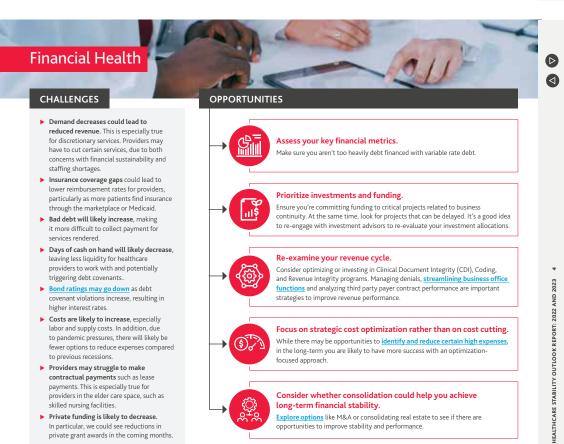
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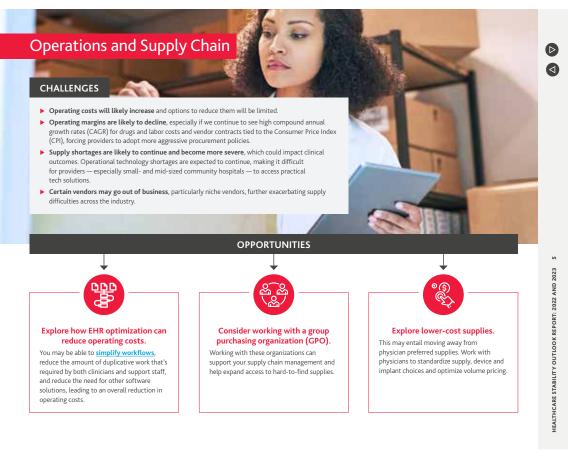


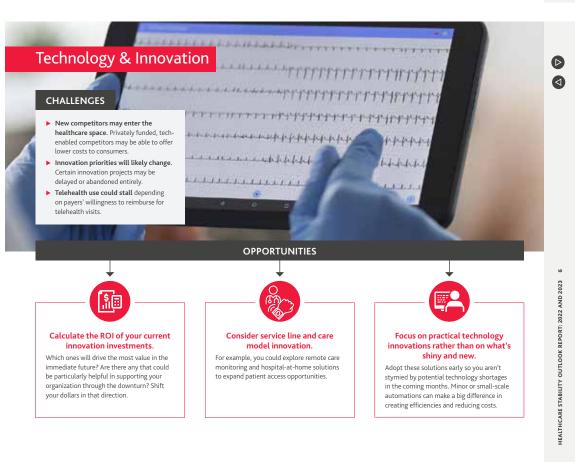
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CHALLENGES

- Pricing scrutiny is likely to increase. The public awareness and skepticism of both pricing policies and executive compensation levels will probably increase. Congress is also likely to continue focusing attention on enforcement of federal pricing mandates.
- Government funding may dry up. It's possible that the government will cease to provide funding, which some providers have come to rely on in the past several years.
- Providers may face new reporting requirements. Some requirements could be industry-wide, such as ESG reporting requirements.
 Additional requirements could also be created for specific institutions.
 Skilled nursing facilities, for example, are likely to face new reporting requirements in the coming years.
- Medicare will be able to negotiate lower drug prices. As part of the Inflation Reduction Act, Medicare will be able to negotiate drug prices for 10 high-cost (yet to be determined) drugs starting in 2026. Other provisions of the act include free vaccines for Medicare recipients and three-year extensions for subsidies from the Affordable Care Act (ACA).

OPPORTUNITIES



Enhance your cost-estimate capabilities.

Explore tech solutions that can make your cost estimates more accurate and attainable. This will make it easier to comply with existing and potential future pricing mandates.



Look to Europe for reporting trends.

The U.S. often follows Europe in certain reporting trends, especially those around ESG. Stay up to date on what's happening across the ocean to better predict the future we might face in the states.





HEALTHCARE STABILITY OUTLOOK REPORT: 2022 AND 2023

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SECULAR TRENDS SUGGEST LOWER YIELD FOR EVERY HEALTH ECONOMY STAKEHOLDER

As a health economist, I study healthcare through the lens of demand, supply, and yield. Even though markets for healthcare products and services deviate from what we economists would call the ideal market, the core principles offer a valuable framework for examining secular trends.

The health economy creates more data than any other part of the economy. New findings emerge daily, whether it be MedPAC's latest payment rate update, the AAMC's physician shortage estimates, Rock Health's report on digital health investments, or McKinsey's survey of consumer preferences, to name a few. While I enjoy studying these analyses, the challenge is synthesizing seemingly unrelated data to understand implications for the health economy. Does a finding that MedPAC makes based on analysis of only traditional fee-for-service Medicare data mean we should assume the same to be true for Medicare Advantage? Absolutely not. Are behaviors observed among Medicare beneficiaries predictive of what we can expect to see from commercially insured or Medicaid patients? Not exactly.

And yet, as an industry, we are satisfied with data that is "directionally correct" instead of demanding data that is "statistically representative" and market specific. Moreover, the industry habitually extrapolates a discrete data point, something that is true of 5% or 10% of the population, to 100% of the population. We say healthcare is local and yet rely on national trends that fail to account for geographical nuances, even though what is true of one market is rarely reflective of another.

I have long thought our industry has lacked a comprehensive, data-driven view of emerging trends applicable to numerous segments of the health economy (i.e., payers, providers, investors, life sciences, new entrants, policymakers). Connecting dots between individual analyses of a topic like telehealth in individual states or within one health plan can be somewhat helpful, but it is more valuable to compare telehealth trends to other services such as urgent care and behavioral health. What are the similarities and differences in utilization rates and patient characteristics by service line?

The 2022 Trends Shaping the Health Economy Annual Report provides datadriven insight into 13 secular trends that the COVID-19 pandemic has significantly amplified or accelerated. These trends are relevant to every stakeholder and understanding them has never been more important. To contextualize these trends, we present a range of demand and supplyrelated data points. Demand refers to both the exogenous and endogenous factors that influence consumer preferences (e.g., location) and need (e.g., genetic predisposition) for services; whereas supply refers to all the providers of health services ranging from hospitals and physician practices to retail pharmacies, new entrants (e.g., Amazon) and virtual care platforms.

The intersection of demand and supply informs the expected yield in terms of patients and, therefore, revenue. The cumulative impact of the 13 secular trends: every stakeholder from health systems to medical device companies will be impacted by reduced yield.

Whether the industry is prepared for the dire consequences of reduced yield is an open question. Amid the accelerating forces catalyzed by the pandemic, I encourage you to read this report (a few times), in order. Supporting each secular trend are a handful of data stories grounded in facts about the past along with projections about the future based upon sophisticated machine learning models, with minimal reliance on survey data.

Armed with this research, I encourage you to think critically about what each trend means for your organization's future. While this study is not intended to provide all the answers, I hope that you will use it as a tool to ask the right questions. What trends have you not considered, and how will they impact the markets that your business serves? How well prepared are you compared to your current competitors? Are you prepared to compete against new entrants? How can understanding these trends improve your organization's capital allocation strategies? How can you compete in an era of declining yield?



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INTRODUCTION

Table of Contents

HILKODE	JUTTON	- 4
KEY TRE	NDS SHAPING THE HEALTH ECO	NOMY 5
TREND	1: Shrinking TAM	6
TREND	2: Illusory Volume Rebound	15
TREND	3: Higher Acuity	23
TREND	4: Tepid Growth	31
TREND	5: Variation By Population	52
TREND	6: Individual As Consumer	64
TREND	7: Unaffordability Suppressing Demand	72
TREND	8: Accelerating Ambulatory Migration	81
TREND	9: Low Acuity Commoditization	94
TREND	10: Commoditization Impacts	103
TREND	11: Exacerbated Physician Supply Challenges	112
TREND	12: Losing Monopolies	120
TREND	13: More Provider Competition	127
CONCLU	SION: YIELD	134
METHOD	OLOGY	141

2022 TRILLIANT HEALTH

3

INTRODUCTION

The Evolving Health Economy



The U.S. health economy is the largest sector of the largest global economy and has changed dramatically over the last 30 years. Healthcare spending totaled \$4.1T in 2020, representing 19.7% of U.S. gross domestic product. Hospitals and health systems constitute the largest segment of the U.S. health economy, serving both as the provider of last resort and a vital part of the local economy in every community, as the COVID-19 pandemic painfully reminded us. Moreover, everything in the health economy begins with a provider decision, whether an admission to a hospital or the use of a medical device or a prescription for a drug.

For decades, the U.S. health economy has operated as if the fundamental rules of economics – **demand, supply, and yield** – do not apply. Our thesis is that any health economy stakeholder whose business depends on commercially insured patients can no longer ignore these economic fundamentals. The U.S. healthcare system is what game theorists call a "negative-sum game," and the rules of that game are immutable.

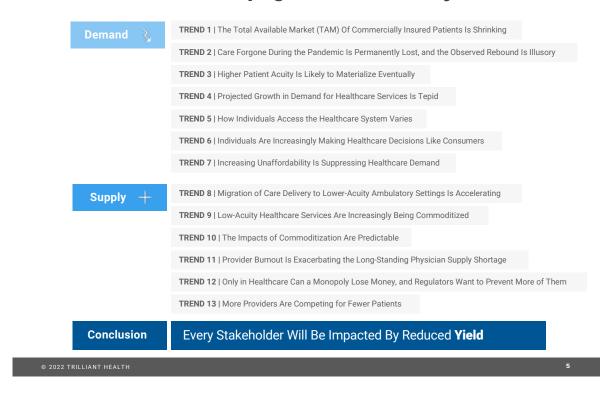
In this second installment of our annual *Trends Shaping the Health Economy* series, we hope to persuade stakeholders in the health economy to re-examine their longstanding assumptions about the basic economics of their business. In the words of Sun Tzu, "in the midst of chaos, there is also opportunity."

2022 TRILLIANT HEALTH 4

2022 HEALTH CARE PROGRAM

INTRODUCTION

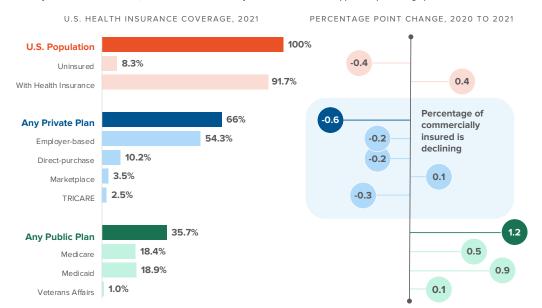
2022 Secular Trends Shaping the Health Economy





The Number of Commercially Insured Americans Is Declining

From a financial perspective, commercially insured Americans account for the majority of profitable revenue across health economy stakeholders. However, the share of commercially insured Americans dropped 0.6 percentage points from 2020 to 2021.



Note: Percentages do not sum to 100% due to dual enrollment.
Source: U.S. Census Bureau, Current Population Survey, 2021 and 2022 Annual Social and Economic Supplements (CPS ASEC)

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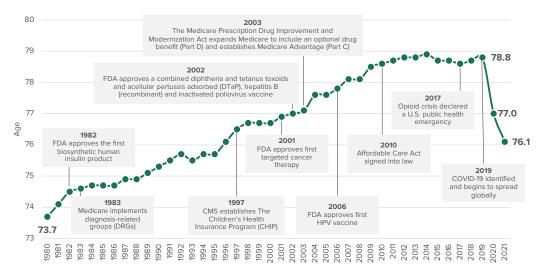
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TREND 1: SHRINKING TAM

Life Expectancy Declines for the Second Consecutive Year

Between 2019 and 2021, U.S. life expectancy declined 2.7 years from 78.8 to 76.1, the lowest age since 1996. The decline is largely attributed to the COVID-19 pandemic, overdose deaths, and heart disease.



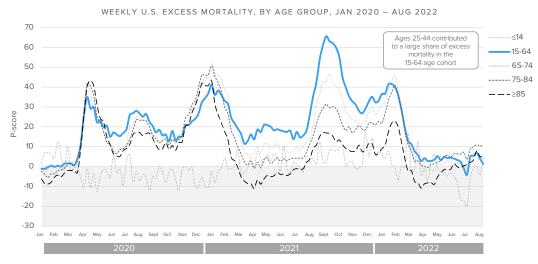


Source: Centers for Disease Control and Prevention, National Center for Health Statistics.

2 2022 TRILLIANT HEALTH 8

The Impact of Excess Mortality During the Pandemic Will **Have a Long Tail Effect**

Throughout 2021, there was significant excess mortality among the U.S. adult population. Young and working-age adults (ages 15-64) account for a disproportionately large share of excess mortality.



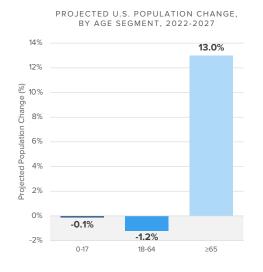
Note: The P-score is the percentage difference between the reported number of weekly or monthly deaths in 2020-2022 and the projected number of deaths for the same period based on previous years. The P-scores were calculated using the reported deaths data from Human Mortality Database and World Mortality Dataset and the projected deaths for 2020–2022 from World Mortality Dataset.

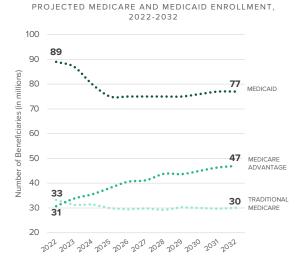
Source: Our World in Data COVID-19 dataset; Centers for Disease Control and Prevention.

TREND 1: SHRINKING TAM

The Medicare-Eligible Population Is Growing Faster Than **Other Cohorts**

Projected births will not offset the continued aging of the Baby Boomers. The "silver tsunami" will result in a larger number of Medicare beneficiaries and a smaller number of commercially insured working-age adults.





Note: 2022-2032 Medicare and Medicaid enrollment numbers represent projections.
Source: Trilliant Health national consumer database. U.S. Congressional Budget Office Baseline Projections for Medicare and Medicaid.

Older Commercially Insured Patients Are Moving

Americans ages 45-64 are leaving areas of the Northeast and West at a high rate and migrating to states such as Florida, Colorado, and Georgia.

MIGRATION OF AMERICANS AGES 45-64 BY ZIP CODE, 2020 - 2025



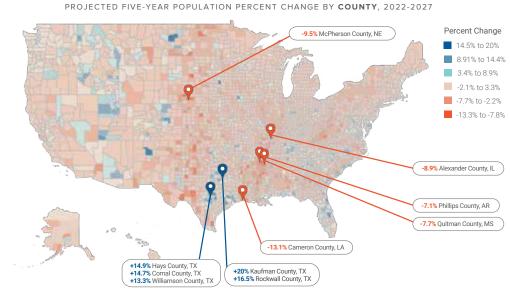
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11

TREND 1: SHRINKING TAM

Migration Patterns Foreshadow Changing Healthcare Demand

The American population is increasingly concentrated in the Sunbelt. Over the next five years, high growth is expected in the Carolinas, Orlando, Houston, Austin, Dallas-Ft Worth, and Phoenix because of population migration patterns, not underlying population growth.



Source: Trilliant Health national consumer database.

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105

High-Growth CBSAs Are Concentrated in the Sunbelt

Most CBSAs (68%) will experience population growth between 2022 and 2027, averaging 1.5% nationally. Among CBSAs with population over 750K, the percent change ranges from -1.6% in San Francisco, CA to +9.3% in Austin, TX.

CBSAs OVER 750K WITH GREATEST AND LEAST PROJECTED POPULATION CHANGE, 2022-2027



Note: These 20 CBSAs represent selected markets with populations over 750K that are projected to increase or decrease significantly between 2022 and 2027. The share of CBSAs projected to increase or decrease in population include all metropolitan CBSAs. Source: Trilliant Health national consumer database.

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13

TREND 1: SHRINKING TAM

Demographic Composition Varies Across High-Growth CBSAs

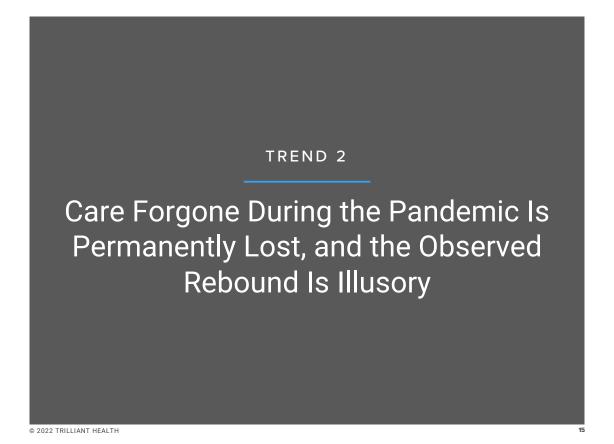
Of the select CBSAs over 750K with significant projected aggregate change in population over the next five years, the changes in minority groups and elderly population are higher than the national average. The 65+ population is growing most in Austin (+22.4%).

5-YEAR PROJECTED CHANGE IN POPULATION DEMOGRAPHICS FOR 10 METROPOLITAN CBSAs WITH GREATEST TOTAL PROJECTED POPULATION CHANGE

METROPOLITAN CBSA	TOTAL POPULATION	0-17 POPULATION	18-64 POPULATION	≥65 POPULATION	BLACK POPULATION	ASIAN POPULATION	HISPANIC POPULATION
Austin-Round Rock-Georgetown, TX	9.3%	8.5%	7.1%	22.4%	9.5%	11.7%	10.7%
Raleigh-Cary, NC	7.0%	4.9%	5.0%	20.9%	6.3%	7.9%	9.4%
Lakeland-Winter Haven, FL	6.5%	7.0%	3.3%	14.3%	7.6%	11.1%	12.4%
Cape Coral-Fort Myers, FL	5.9%	7.0%	1.8%	12.9%	6.3%	9.5%	11.3%
Charleston-North Charleston, SC	5.9%	6.2%	2.8%	17.2%	2.5%	11.4%	8.8%
Nashville-Davidson-Murfreesboro- Franklin, TN	5.7%	4.7%	2.8%	19.3%	4.1%	7.7%	10.0%
Dallas-Fort Worth-Arlington, TX	5.4%	4.4%	3.3%	17.9%	4.7%	9.2%	7.1%
Jacksonville, FL	5.2%	5.1%	2.1%	16.8%	5.1%	9.1%	9.5%
San Antonio-New Braunfels TX	5.2%	4.3%	17.2%	2.6%	5.3%	10.0%	5.9%
Houston-The Woodlands- Sugar Land TX	5.1%	4.7%	17.5%	2.7%	4.9%	7.8%	7.3%
NATIONAL	1.5%	-0.1%	-1.2%	13.0%	1.0%	5.7%	3.5%

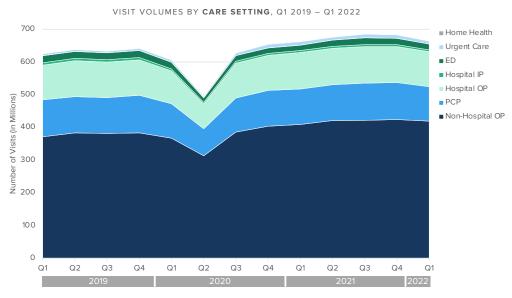
Note: These 10 CBSAs represent the markets with populations over 750K that are projected to increase most between 2022 and 2027. Source: Trilliant Health national consumer database.

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Pandemic-Era Care Is Forgone Rather Than Delayed

While urgent care volumes were 31% higher in Q1 2022 than Q1 2019, this increase is driven by COVID-19 testing and treatment. In contrast, emergency department visits remain 30% below pre-pandemic levels.

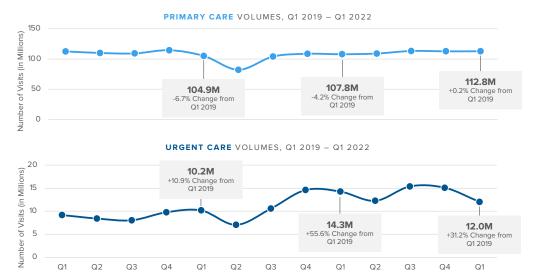


Note: IP denotes Inpatient; OP denotes Outpatient; PCP denotes Primary Care Provider; ED denotes Emergency Department. Source: Trilliant Health national all-payer claims database.

2022 TRILLIANT HEALTH 16

Total Primary Care Volume Has Finally Returned to 2019 Levels

After more than two years of below-average national primary care utilization, volumes in Q1 2022 were 0.2% higher than in 2019. However, primary care trends vary significantly by market. Urgent care volumes are higher and primary care is approaching prepandemic levels, driven by COVID-19-related care.



Source: Trilliant Health national all-payer claims database.

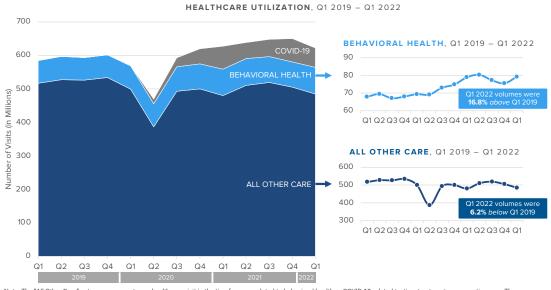
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17

TREND 2: ILLUSORY VOLUME REBOUND

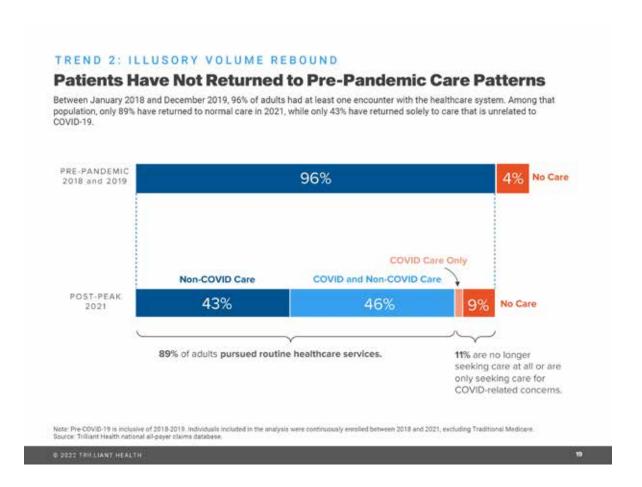
Omitting Care for COVID-19, Healthcare Utilization Is Down

COVID-19-related care (i.e., testing, treatment, and vaccination) is driving the appearance of a post-pandemic return to care. With COVID-19 omitted, behavioral health volumes are up 16.8% from Q1 2019, while all other healthcare encounters are down by 6.2%.



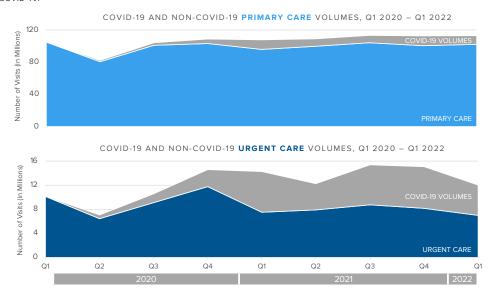
Note: The "All Other Care" category represents any healthcare visit in the timeframe unrelated to behavioral health or COVID-19-related testing, treatment, or preventive care. The COVID-19 category is likely underrepresented due to the prevalence of at-home testing, self pay encounters, and non-specific coding of COVID-19 encounters. Source: Trilliant Health national all-payer claims database.

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COVID-19 Care Underpins Increase in Primary Care and Urgent Care Volumes

While total urgent care volume is up, almost half (47%) of urgent care volumes in Q1 2021 are related to treatment and/or testing of COVID-19.



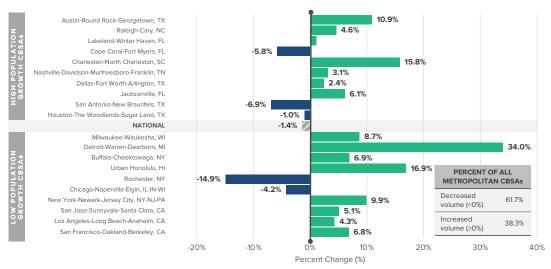
Source: Trilliant Health national all-payer claims database.

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61.7% of Markets Exhibit Sustained Declines in Primary Care

Primary care volumes in most (61.7%) CBSAs are below pre-pandemic levels. The percent change of visits from January 2019-March 2020 to January 2021-March 2022 ranges from -14.9% to +34.0% among the selected CBSAs, averaging -1.4% nationally.

MARKET-LEVEL PRIMARY CARE VOLUMES, PERCENT CHANGE JAN 2019-MAR 2020 TO JAN 2021-MAR 2022



Note: These 20 CBSAs represent selected markets with populations over 750K that are projected to increase or decrease significantly between 2022 and 2027. The share of CBSAs projected to increase or decrease in population include all metropolitan CBSAs. Source: Trilliant Health national all-payer claims database.

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21

TREND 2: ILLUSORY VOLUME REBOUND

Limited Access Does Not Fully Explain the Sustained Declines in Routine Care Utilization

56% of Americans agree or strongly agree that individuals can access the primary care they need. This suggests that the observed declines in primary care volume are likely driven by fear or other individual reasons (e.g., insurance/deductibles, provider availability).

PERCENT OF AMERICANS THAT AGREE WITH THE FOLLOWING STATEMENTS ABOUT THE U.S. HEALTHCARE SYSTEM, DECEMBER 2021

	STRONGLY AGREE	AGREE	DISAGREE	STRONGLY DISAGREE
The quality of healthcare in the U.S. is good.	31%	31%	18%	16%
People in the U.S. can access the primary care they need.	26%	30%	20%	20%
People in the U.S. can access the medications they need.	23%	28%	22%	23%
People in the U.S. have access to the health insurance coverage they need.	22%	28%	24%	23%
People in the U.S. can access the specialty care they need.	22%	28%	19%	26%
The U.S. healthcare system provides equitable care for all.	21%	24%	18%	32%
Healthcare in the U.S. offers good value for the cost.	19%	22%	20%	35%

Note: Data reflects responses from a nationally representative sample to the following survey question: "When it comes to providing information about critical health issues, how much do you trust seach of the following people, or oganizations, and companies a great deal, a fair amount, very much, or not at all?" Source: Public Opinion Strategies National Survey of 800 Registered Voters, conducted December 1–0, 2021.

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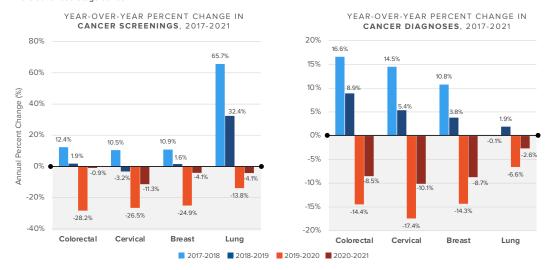


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TREND 3: HIGHER ACUITY

Fewer Cancer Screenings May Signal Increased Disease Acuity

Across cancer types, preventive screenings have declined since 2017. If the decline in incidence of associated cancer diagnoses over the same period results from underdiagnosis, then it is likely that patients will increasingly receive an initial diagnosis of a more advanced stage cancer.



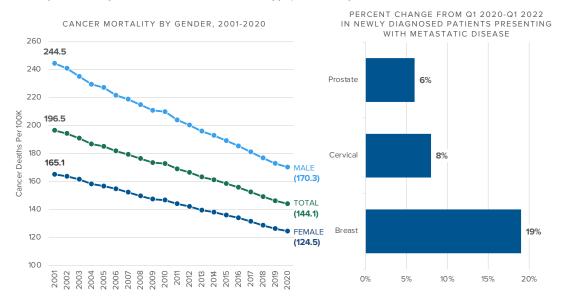
Note: Analysis is limited to adult patients (18+) without a personal history of cancer with at least three years of continuous insurance coverage; coverage sources include commercial, Medicaid, Traditional Medicare, Medicare Advantage. Cancer screening rates are calculated at the unique patient level, rather than the episode level. Rates for breast and cervical cancers are limited to the adult female population, while rates for colorectal and lung cancers are inclusive of the entire adult population. Multiple screening methods (e.g., colonoscopy, bloodbased, stool-based screenings for colorectal cancer) were included for each cancer type, identified through both CPT and HCPCS codes indicating screening for these cancers.

Source: Trilliant Health national all-payer claims database.

TREND 3: HIGHER ACUITY

Decreasing Cancer Mortality May Be Jeopardized by Care Delays

While the total cancer case count is increasing, overall incidence of cancer has remained relatively flat. The cancer death rate declined by 27% between 2001 and 2020, from 196.5 to 144.1 deaths per 100K population. However, the combination of delayed screening and increasing rates of incident metastatic disease may jeopardize these gains.



Source: Centers for Disease Control and Prevention; IQIVIA 2022 Oncology Trends Report

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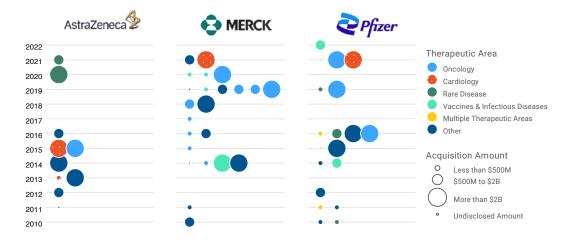
25

TREND 3: HIGHER ACUITY

Recent Life Sciences Investments Signal Focus On Cardiology and Oncology

The M&A activity of select biopharmaceutical manufacturers indicate strategic shifts. Despite recent declines in cardiovascular R&D spending, two of the four largest M&A transactions in 2021 were focused on cardiovascular disease.

M&A ACTIVITY BY THERAPEUTIC AREA FOR THREE MAJOR BIOPHARMACEUTICAL MANUFACTURERS, 2010-2022



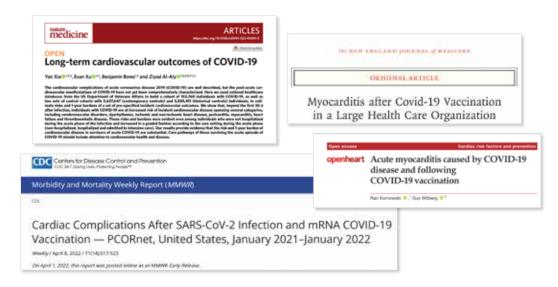
Note: "Multiple" indicates the acquired company specialized in more than one therapeutic area. "Other" includes areas such as immunology, pain, respiratory, ophthalmology, neurology, blosimilars, etc.
Source: Analysis of company press releases.

26 2022 TRILLIANT HEALTH

TREND 3: HIGHER ACUITY

In Line With Life Science M&A Activity, a Growing Body of Research Cites Increasing Cardiovascular Risk

According to a *Nature* Portfolio supplement, as of November 30, 2021, there were at *least* 159 peer-reviewed research studies that find a positive relationship between COVID-19 infection and vaccination and new cardiac conditions.



Source: Analysis of peer-reviewed literature, Nature supplements (DOI:0.1038), and Centers for Disease Control and Prevention website

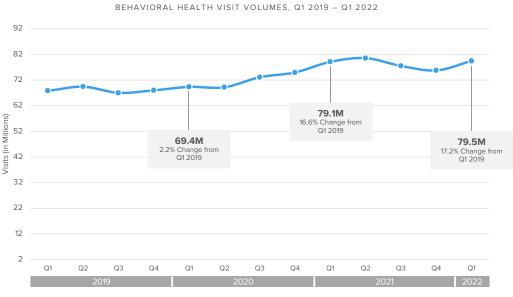
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27

TREND 3: HIGHER ACUITY

Behavioral Health Demand Has Increased

At the height of the pandemic, behavioral health volumes were 2.2% higher than in Q1 2019 and have remained more than 15% above pre-pandemic levels. Increasing prevalence of behavioral health can exacerbate other medical comorbidities and drive higher spending.



Source: Trilliant Health national all-payer claims database.

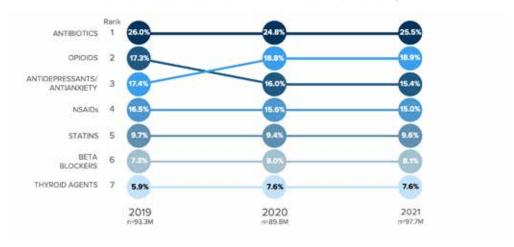
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TREND 3: HIGHER ACUITY

Mental Health Related Prescribing on the Rise

Following the onset of the pandemic, prescribing of antidepressants and antianxiety medications increased in 2020 and 2021, accounting for 18.8% and 18.9% of select prescription volume, respectively, up from 17.3% in 2019.

SELECT DRUG CATEGORIES RANKED BY PRESCRIPTION VOLUME, 2019-2021



Note: Percentages reflect the share of drug categories shown here, rather than all prescriptions dispensed annually. Opioids are inclusive of hydrocodone Source: Trilliant Health national all-payer claims database.

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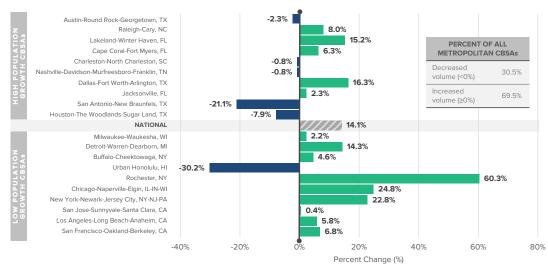
29

TREND 3: HIGHER ACUITY

Behavioral Health Demand Varies by Market

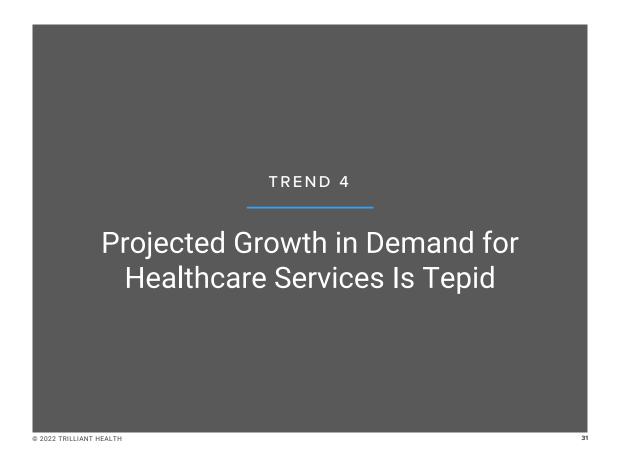
The national post-pandemic increase in behavioral health utilization is concentrated in 69.5% of markets, averaging +14.1% nationally.

MARKET-LEVEL BEHAVIORAL HEALTH VOLUMES, PERCENT CHANGE JAN 2019-MAR 2020 TO JAN 2021-MAR 2022



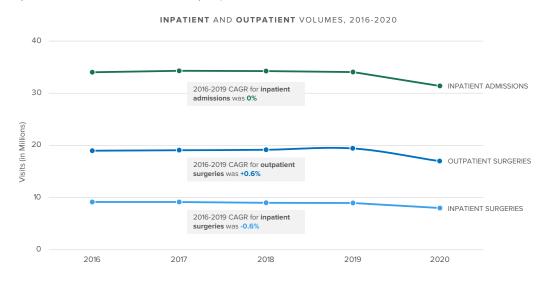
Note: These 20 CBSAs represent selected markets with populations over 750K that are projected to increase or decrease significantly between 2022 and 2027. The share of CBSAs projected to increase or decrease in population include all metropolitan CBSAs. Source: Trilliant Health national all-payer claims database.

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Even Prior to the Pandemic, Hospital Inpatient and Outpatient Volumes Have Been Relatively Flat for Years

Inpatient hospital admissions (0% CAGR) 2016-2019 and outpatient surgeries (0.6% CAGR) 2016-2019 have been flat to declining for years, a trend has been further accelerated by the pandemic.

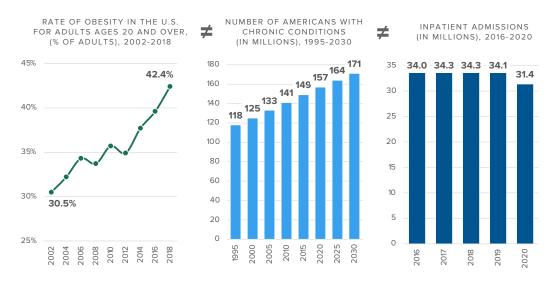


Source: Analysis of 2022 American Hospital Association data.

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Burden of Disease Is Not Directly Correlated With Demand for Services

While the prevalence of obesity and chronic disease among Americans continues to increase, the rate of demand for healthcare services remains flat to declining.



Source: RAND Corporation; Centers for Disease Control and Prevention National Center for Health Statistics; American Hospital Association.

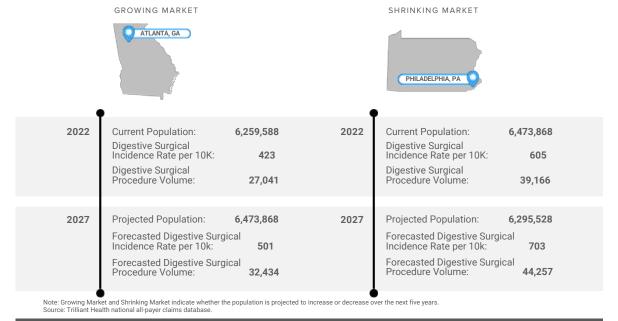
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33

TREND 4: TEPID GROWTH

Healthcare Demand Is a Function of Incidence of Disease and Population Characteristics

Because healthcare is local, markets with a similar population size can have widely divergent demand for healthcare services.



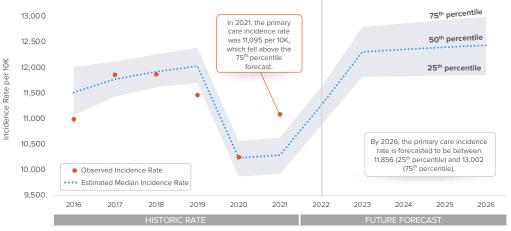
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Nationally, Demand for Primary Care Is Projected to Increase Slightly

The national median incidence rate for primary care is projected to increase at 1.7% CAGR between 2022 and 2026. This indicates that by 2026, on average, Americans are expected to need 1.2 primary care visits per year, which is 0.1 more visits above observed 2021 levels



NATIONAL HISTORIC & FORECASTED PRIMARY CARE DEMAND, 2016-2026



Note: CAGR denotes compound annual growth rate. Source: Trilliant Health Demand Forecast.

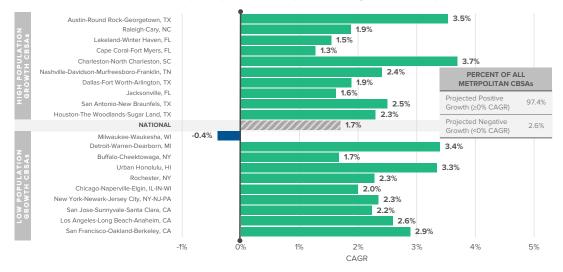
13,500

TREND 4: TEPID GROWTH

Primary Care Demand Is Projected to Increase Slightly in Most Markets

While most markets (97.4%) reflect positive 5-year growth in primary care demand, only 55.9% are projected to grow at a CAGR above 2%, and 18.6% are projected to grow at a CAGR above 3%.



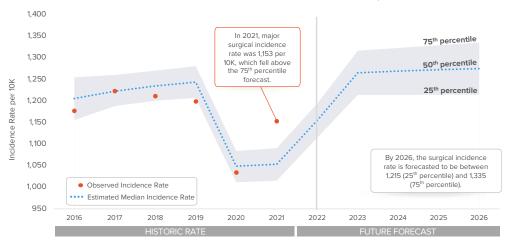


Note: These 20 CBSAs represent selected markets with populations over 750K that are projected to increase or decrease significantly between 2022 and 2027. The share of CBSAs projected to increase or decrease in population include all metropolitan CBSAs. CAGR denotes compound annual growth rate. Source: Trilliant Health Demand Forecast.

Demand for Major Surgical Services Is Projected to Be Significantly Less Than 3% CAGR

The national median incidence rate for major surgical service lines is projected to increase at 2.0% CAGR between 2022 and 2026, with digestive surgical services contributing the most by volume. This indicates that by 2026, 12.8% of the U.S. population will require major surgical services, which is 1.2 percentage points above observed 2021 levels.





Note: Surgical service lines reflected are OB/GYN, Orthopedic, Digestive, Heart/Vascular, and Neuro/Spine, inclusive of inpatient and outpatient procedures. CAGR denotes compound annual growth rate.

Source: Trilliant Health Demand Forecast.

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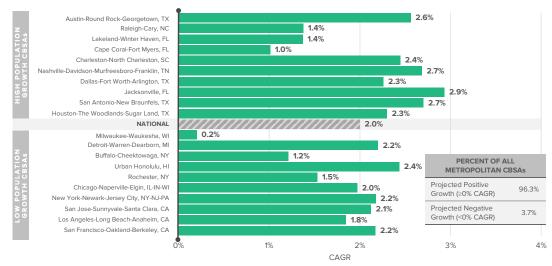
37

TREND 4: TEPID GROWTH

Projected Surgical Demand Growth Varies by Market

At the market level, the projected five-year CAGR for surgical services ranges from -1.6% to 6.6%, averaging 2% nationally. However, even in the fastest growing CBSAs, median projected growth in surgical demand is less than 3% CAGR.

MARKET-LEVEL FORECASTED MAJOR SURGICAL DEMAND, 2022-2026 CAGR



Note: These 20 CBSAs represent selected markets with populations over 750K that are projected to increase or decrease significantly between 2022 and 2027. The share of CBSAs projected to increase or decrease in population include all metropolitan CBSAs. CAGR denotes compound annual growth rate.

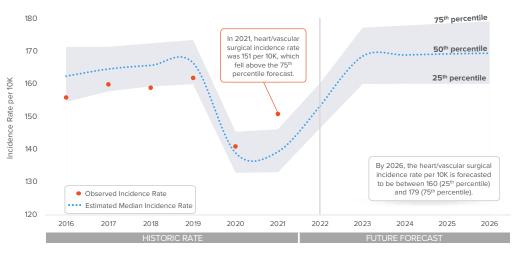
Source: Trilliant Health Demand Forecast.

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Heart/Vascular Surgical Demand Projected to Be Significantly Less Than 3% CAGR

Despite the stark increase in obesity in America, the national median incidence rate for heart/vascular surgical services is projected to increase at 2.0% CAGR between 2022 and 2026. This indicates that by 2026, 1.7% of the U.S. population will require heart/vascular surgical services, which is 0.2 percentage points above observed 2021 levels.

NATIONAL HISTORIC & FORECASTED HEART/VASCULAR SURGICAL DEMAND, 2016-2026



Note: CAGR denotes compound annual growth rate. Source: Trilliant Health Demand Forecast.

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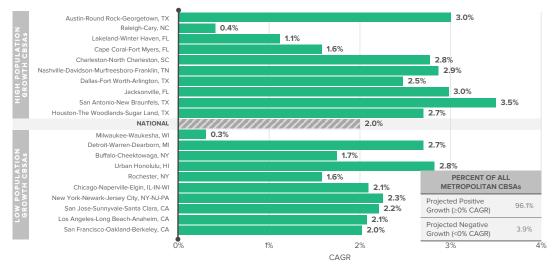
39

TREND 4: TEPID GROWTH

Heart/Vascular Surgical Demand Varies Geographically

At the market level, the projected five-year CAGR for heart/vascular surgical services ranges from -2.3% to 4.6%, averaging 2% nationally. However, even in the fastest growing CBSAs, median projected growth in surgical demand is at most 3.5% CAGR.

MARKET-LEVEL FORECASTED HEART/VASCULAR SURGICAL DEMAND, 2022-2026 CAGR



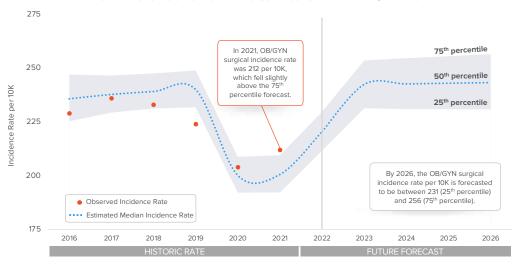
Note: These 20 CBSAs represent selected markets with populations over 750K that are projected to increase or decrease significantly between 2022 and 2027. The share of CBSAs projected to increase or decrease in population include all metropolitan CBSAs. CAGR denotes compound annual growth rate. Source: Trilliant Health Demand Forecast.

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OB/GYN Surgical Demand Projected To Increase Slightly

The national median incidence rate for OB/GYN surgical services is projected to increase at 2.0% CAGR between 2022 and 2026. This indicates that by 2026, 2.4% of Americans will require OB/GYN surgical services, which is 0.3 percentage points above observed 2021 levels.

NATIONAL HISTORIC & FORECASTED OB/GYN SURGICAL DEMAND, 2016-2026



Note: CAGR denotes compound annual growth rate. Source: Trilliant Health Demand Forecast.

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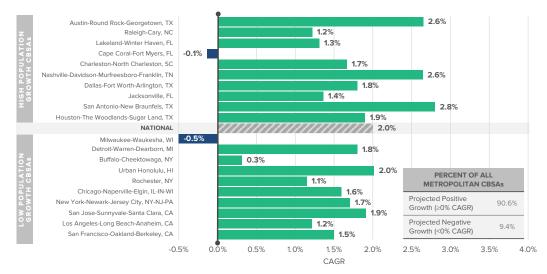
41

TREND 4: TEPID GROWTH

OB/GYN Surgical Demand Growing Slightly in Most Markets

At the market level, the projected five-year CAGR for OB/GYN surgical services ranges from -2.2% to 4.9%, averaging 2.0% nationally. However, even in the fastest growing CBSAs, median projected growth in surgical demand is less than 3% CAGR.

MARKET-LEVEL FORECASTED OB/GYN SURGICAL DEMAND, 2022-2026 CAGR

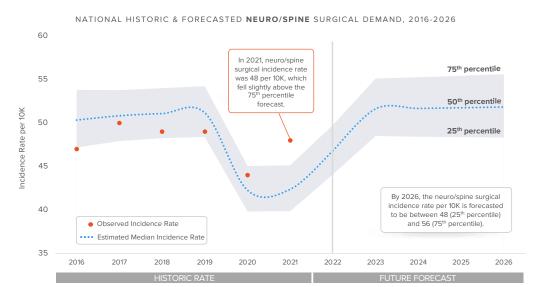


Note: These 20 CBSAs represent selected markets with populations over 750K that are projected to increase or decrease significantly between 2022 and 2027. The share of CBSAs projected to increase or decrease in population include all metropolitan CBSAs. CAGR denotes compound annual growth rate. Source: Trilliant Health Demand Forecast.

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Neuro/Spine Surgical Demand Will Increase Slightly

The national median incidence rate for neuro/spine surgical services is projected to increase at 2.1% CAGR between 2022 and 2026. This indicates that by 2026, 0.5% of the U.S. population will require neuro/spine surgical services, which is .02 percentage points above observed 2021 levels.



Note: CAGR denotes compound annual growth rate. Source: Trilliant Health Demand Forecast.

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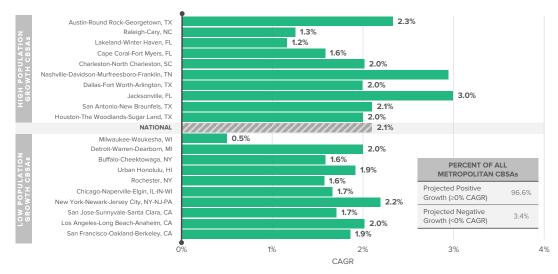
43

TREND 4: TEPID GROWTH

Neuro/Spine Surgical Demand Growing in Almost All Markets

At the market level, the projected five-year CAGR for neuro/spine surgical services ranges from -0.9% to 3.7%, averaging 2.1% nationally. However, even in the fastest growing CBSAs, median projected growth in surgical demand is at most 3% CAGR.

MARKET-LEVEL FORECASTED NEURO/SPINE SURGICAL DEMAND, 2022-2026 CAGR



Note: These 20 CBSAs represent selected markets with populations over 750K that are projected to increase or decrease significantly between 2022 and 2027. The share of CBSAs projected to increase or decrease in population include all metropolitan CBSAs. CAGR denotes compound annual growth rate.

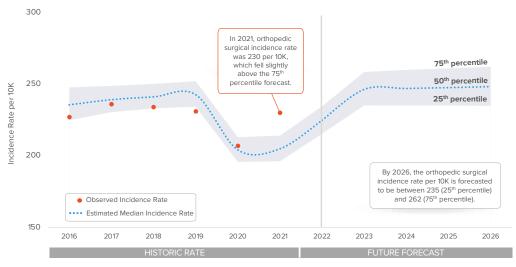
Source: Trilliant Health Demand Forecast.

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Orthopedic Surgical Demand Will Increase Slightly

The national median incidence rate for orthopedic surgical services is projected to increase at 2.0% CAGR between 2022 and 2026. This indicates that by 2026, 2.5% of the U.S. population will require orthopedic surgical services, which is 0.2 percentage points above observed 2021 levels.

NATIONAL HISTORIC & FORECASTED ORTHOPEDIC SURGICAL DEMAND, 2016-2026



Note: CAGR denotes compound annual growth rate. Source: Trilliant Health Demand Forecast.

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45

TREND 4: TEPID GROWTH

Orthopedic Surgical Demand Growing in Most Markets

At the market level, the projected five-year CAGR for orthopedic surgical services ranges from -1.6% to 4.0%, averaging 2.0% nationally. However, even in the fastest growing CBSAs, median projected growth in surgical demand is less than 3% CAGR.

MARKET-LEVEL FORECASTED ORTHOPEDIC SURGICAL DEMAND, 2022-2026 CAGR



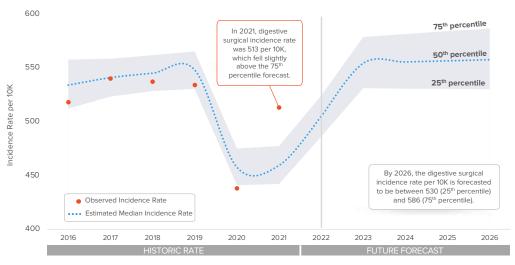
Note: These 20 CBSAs represent selected markets with populations over 750K that are projected to increase or decrease significantly between 2022 and 2027. The share of CBSAs projected to increase or decrease in population include all metropolitan CBSAs. CAGR denotes compound annual growth rate. Source: Trilliant Health Demand Forecast.

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Digestive Surgical Demand Will Have Highest Volume Growth

The national median incidence rate for digestive surgical services is projected to increase at 2.0% CAGR between 2022 and 2026. This indicates that by 2026, 5.6% of the U.S. population will require digestive surgical services, which is 0.4 percentage points above observed 2021 levels.

NATIONAL HISTORIC & FORECASTED DIGESTIVE SURGICAL DEMAND, 2016-2026



Note: CAGR denotes compound annual growth rate. Source: Trilliant Health Demand Forecast.

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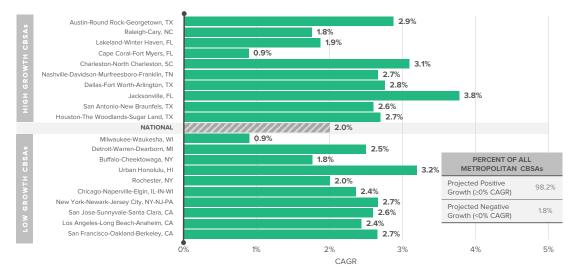
47

TREND 4: TEPID GROWTH

Digestive Surgical Demand Growing in Almost All Markets

At the market level, the projected five-year CAGR for digestive surgical services ranges from -1.1% to 4.4%, averaging 2.0% nationally. However, even in the fastest growing CBSAs, median projected growth in surgical demand is rarely higher than 3% CAGR.

MARKET-LEVEL FORECASTED DIGESTIVE SURGICAL DEMAND, CAGR 2022-2026



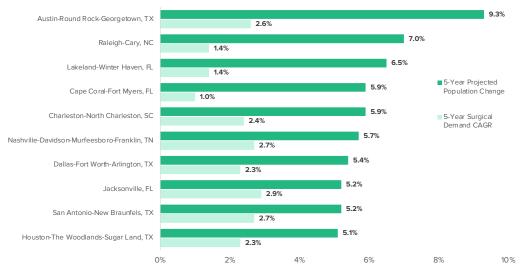
Note: These 20 CBSAs represent selected markets with populations over 750K that are projected to increase or decrease significantly between 2022 and 2027. The share of CBSAs projected to increase or decrease in population include all metropolitan CBSAs. CAGR denotes compound annual growth rate. Source: Trilliant Health Demand Forecast.

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Population Change Is Not Directly Correlated to Surgical Demand

While projected population growth among these select CBSAs ranges from 5.1% to 9.3%, the median forecasted 5-year CAGR for surgical services ranges from only 1.0% to 2.9%.

FORECASTED SURGICAL DEMAND AND POPULATION GROWTH FOR 10 HIGH-GROWTH CBSAS



Note: CAGR denotes compound annual growth rate. Source: Trilliant Health Demand Forecast; Trilliant Health national consumer database.

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49

TREND 4: TEPID GROWTH

Projected Growth in Demand Is Below Industry Expectations

While the population of San Francisco, CA is projected to decline by 1.6% over five years, the CAGR for orthopedic surgical demand is higher in San Francisco than in Austin, TX, where the population is projected to increase by 9.3%.

SUMMARY OF 5-YEAR SURGICAL DEMAND FORECAST

CATEGORY	CAGR (2022-2026)	RATIO OF OP:IP	TOP AGE BAND BY GROWTH RATE	CAGR IN AUSTIN, TX (5-YEAR POPULATION CHANGE +9.3%)	CAGR IN SAN FRANCISCO, CA (5-YEAR POPULATION CHANGE -1.6%)	TOP OUTPATIENT SURGICAL PROCEDURE DRIVING DEMAND
HEART/ VASCULAR	2.0%	2:1	65-84 (3.4%)	3.0%	2.0%	Cardiac Catheterization
OB/GYN	2.0%	1:1	65-84 (3.5%)	2.6%	1.5%	Surgical Procedures on the Corpus Uteri
NEURO/ SPINE	2.1%	1:1	65-84 (3.5%)	2.3%	1.9%	Surgery on Nerves and Nervous System
ORTHOPEDIC	2.0%	3:1	65-84 (3.5%)	1.3%	1.4%	Endoscopy/ Arthroscopy Procedures on the Musculoskeletal System
DIGESTIVE	2.0%	5:1	65-84 (3.5%)	2.9%	2.7%	Colonoscopy
ALL	2.0%	3:1	65-84 (3.5%)	2.6%	2.2%	Colonoscopy

Note: CAGR denotes compound annual growth rate. Source: Trilliant Health Demand Forecast.

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TREND 4: TEPID GROWTH

The Magnitude of a 1% CAGR Difference Is Significant

Incremental percent differences in a service demand forecast based on compound annual growth rates result in significantly different projections. The difference between a 1% CAGR and a 5% CAGR equates to an almost 60% difference in volume over 10 years.

SCENARIOS FOR DIFFERENT FORECASTED CAGRS

	SCENARIO	2022 FORECASTED MAJOR SURGICAL VOLUME	10-YEAR CAGR	2031 FORECASTED MAJOR SURGICAL VOLUME	
1	Major surgical service lines will grow at a CAGR of 1% (HYPOTHETICAL)	38,000,000	1%	+10.5%	
2	Major surgical service lines will grow at a CAGR of 2% (ACTUAL 50 TH PERCENTILE FORECAST)	38,000,000	2%	+21.9%	
3	Major surgical service lines will grow at a CAGR of 3% (HYPOTHETICAL)	38,000,000	3%	+34.4%	The differe between 1% (and 5% CA equates to almost 60% v difference ov
4	Major surgical service lines will grow at a CAGR of 4% (HYPOTHETICAL)	38,000,000	4%	+48.0%	years
5	Major surgical service lines will grow at a CAGR of 5% (HYPOTHETICAL)	38,000,000	5%	+69.2%	

Note: CAGR denotes compound annual growth rate. Source: Trilliant Health Demand Forecast; Trilliant Health national consumer database

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51

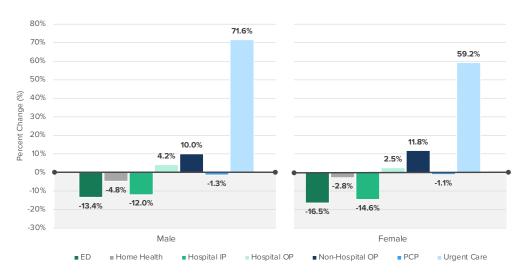
How Individuals Access the Healthcare System Varies

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Men and Women Are Returning to Different Care Settings

Compared to pre-pandemic utilization, men are disproportionately using urgent care (+71.6%), and women are using non-hospital outpatient settings at a higher volume (+11.8%).

CHANGE IN VOLUMES BY CARE SETTINGS & GENDER, JAN 2019-MAR 2020 TO JAN 2021-MAR 2022



Note: IP denotes Inpatient; OP denotes Outpatient; PCP denotes Primary Care Provider; ED denotes Emergency Department Source: Trilliant Health national all-payer claims database.

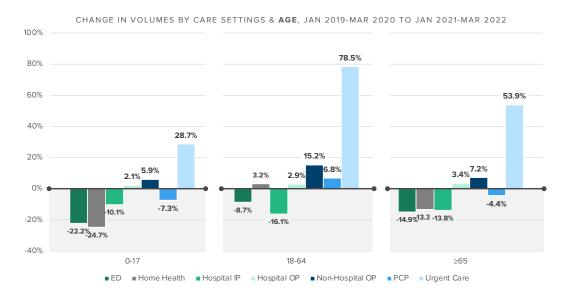
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53

TREND 5: VARIATION BY POPULATION

Return to Healthcare Is Concentrated in Working-Age Adults

Inpatient care is tracking consistently below pre-pandemic levels, with adult patients ages 18-64 showing a -16.1% drop, while non-hospital outpatient care has increased by 15.2%.



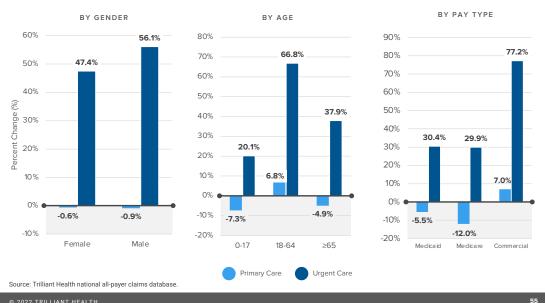
Note: IP denotes Inpatient; OP denotes Outpatient; PCP denotes Primary Care Provider; ED denotes Emergency Department Source: Trilliant Health national all-payer claims database.

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Driven by COVID-19, Urgent Care Use Has Grown Across Groups

Working-age adults are the patient population that is returning to primary care. However, a high proportion of this care is related to COVID-19 testing and treatment rather than preventive services.

CHANGE IN PRIMARY CARE AND URGENT CARE VOLUMES, JAN 2019-MAR 2020 TO JAN 2021-MAR 2022

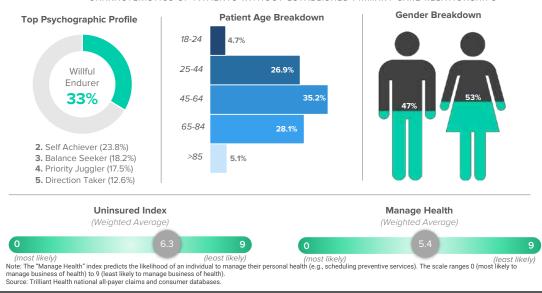


TREND 5: VARIATION BY POPULATION

Psychographics Influence Likelihood of Established Primary Care Relationship

Individuals whose primary psychographic profile is Willful Endurers (33%), which is characterized by living in the "here and now," are less likely to have established primary care relationships than Direction Takers (12.6%), who believe a physician is the most credible source of healthcare information.

CHARACTERISTICS OF PATIENTS WITHOUT ESTABLISHED PRIMARY CARE RELATIONSHIPS

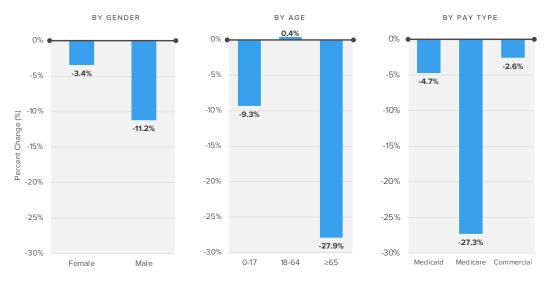


56 56 10 2022 TRILLIANT HEALTH

Older Patients Are Forgoing Telehealth

While telehealth utilization by adults ages 18-64 remained at a similar rate following the peak of the pandemic, seniors and children utilized telehealth well below peak pandemic levels, at -9.3% and -27.9%, respectively.

CHANGE IN TELEHEALTH VISIT VOLUMES, JAN 2020-MAR 2021 TO JAN 2021-MAR 2022



Source: Trilliant Health national all-payer claims database.

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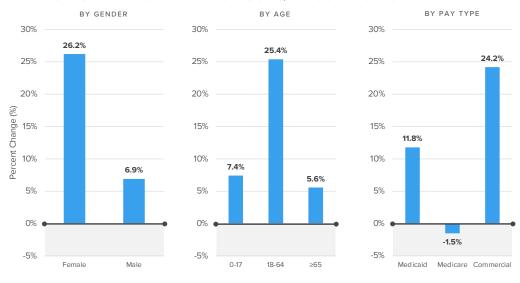
57

TREND 5: VARIATION BY POPULATION

Behavioral Health Demand Is Higher Across Most Patient Segments

Compared to pre-pandemic volumes, demand for behavioral health services has increased most for females (+26.2%) and adults ages 18-64 (25.4%).

CHANGE IN BEHAVIORAL HEALTH VISIT VOLUMES, JAN 2019-MAR 2020 TO JAN 2021-MAR 2022

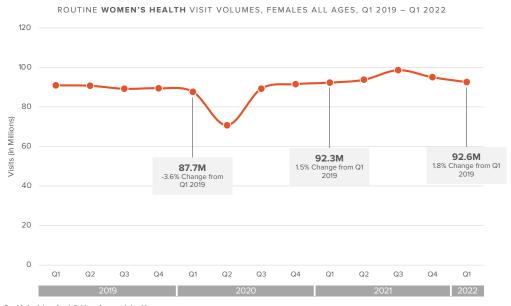


Source: Trilliant Health national all-payer claims database.

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Demand for Women's Health Now Exceeds 2019 Levels

Despite a 3.6% decline in routine women's preventive care (e.g., services such as cancer screenings) in Q1 2020, total visit volumes have stabilized above pre-pandemic levels.



Note: See Methodology for definition of women's health. Source: Trilliant Health national all-payer claims database.

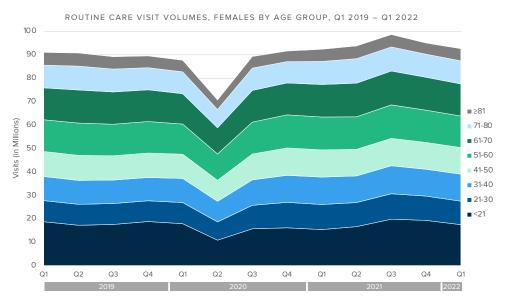
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59

TREND 5: VARIATION BY POPULATION

Return to Preventive Women's Health Varies by Age

The 31-40 age cohort has seen the greatest volume increase in routine women's health, up 11.7% in Q1 2022 from Q1 2019.



Note: See Methodology for definition of women's health. Source: Trilliant Health national all-payer claims database.

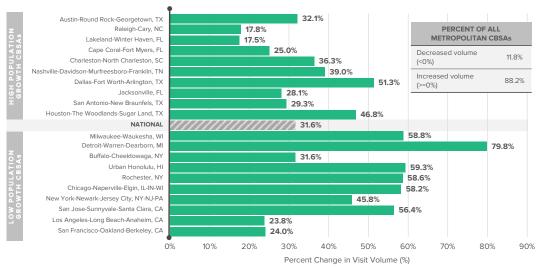
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TREND 5: VARIATION BY POPULATION

Demand for Women's Health Is Increasing in Most Markets

Nationally, demand for routine women's healthcare services is up 31.6% compared to pre-pandemic, with volumes higher in 88% of markets.

ROUTINE WOMEN'S HEALTH VISIT VOLUMES, PERCENT CHANGE JAN 2019-MAR 2020 TO JAN 2021-MAR 2022



Note: These 20 CBSAs represent selected markets with populations over 750K that are projected to increase or decrease significantly between 2022 and 2027. The share of CBSAs projected to increase or decrease in population include all metropolitan CBSAs. See Methodology for definition of women's health.

Source: Trilliant Health national all-payer claims database.

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61

TREND 5: VARIATION BY POPULATION

Growth in National Surgical Demand Driven by Older Adults

While CAGR for older populations (65+) reflect the highest growth rates, surgical demand for adults ages 25-44 is projected to grow at a higher rate than adults ages 45-64.

CAGR FOR MAJOR SURGICAL SERVICES BY AGE BAND, 2022-2026



Note: CAGR denotes compound annual growth rate. Source: Trilliant Health Demand Forecast.

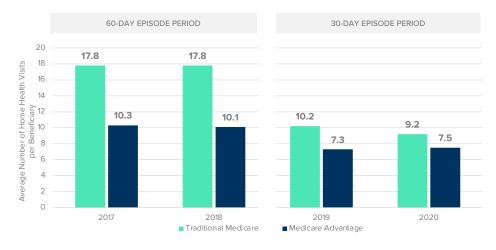
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TREND 5: VARIATION BY POPULATION

Home Health Utilization Varies Between Traditional Medicare and MA Beneficiaries

In 2018, Traditional Medicare beneficiaries had 17.8 visits per 60-day payment period as compared to 10.1 visits for Medicare Advantage (MA), on average. Traditional Medicare utilization of home health is declining slightly, while MA remains flat to minimally increasing.

HOME HEALTH VISITS PER EPISODE, TRADITIONAL MEDICARE VS MEDICARE ADVANTAGE, 2017-2020



Note: 2021 was excluded due to reporting lags for traditional Medicare from CMS and MedPAC.
Source: Trilliant Health national all-payer claims database. Medicare Payment Advisory Commission (MedPAC) March Reports to Congress (2020, 2021, 2022)

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63

TREND 6

Individuals Are Increasingly Making Healthcare Decisions Like Consumers

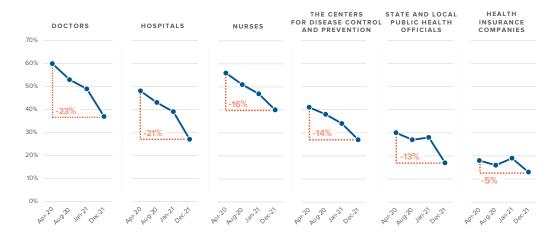
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TREND 6: INDIVIDUAL AS CONSUMER

Patients are Losing Trust in Providers

Health insurance companies have consistently earned the least amount of consumer trust. From April 2020 to December 2021, while all stakeholders saw declines in trust among American consumers, doctors (-23%) and hospitals (-21%) were disproportionately affected.

PERCENT OF AMERICANS WHO TRUST RECEIVING HEALTH INFORMATION A GREAT DEAL BY STAKEHOLDER



Note: Data reflects responses from a nationally representative sample to the following survey question: "When it comes to providing information about critical health issues, how much do you trust each of the following people, organizations, and companies a great deal, a fair amount, not very much, or not at all?" Percent change values (i.e., -23% for doctors) represent the difference in trust between April 2020 and December 2021.

Source: Public Opinion Strategies. National Survey of 800 Registered Voters, conducted December 1-6, 2021.

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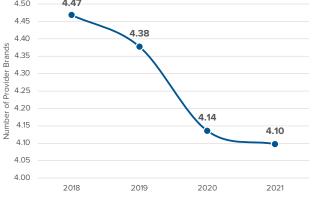
65

TREND 6: INDIVIDUAL AS CONSUMER

Earning Consumer Loyalty Is Harder in Competitive Markets

As more care options become available, "splitting" behavior among provider brands will likely increase. Consumers in more competitive markets tend to visit a greater number of provider brands (4.57) than those in highly concentrated markets (4.03 - 4.24). Lower provider loyalty has implications for effective care coordination.





BRANDS PER CONSUMER BY MARKET CONCENTRATION, 2021						
MARKET TYPE	AVERAGE NUMBER OF PROVIDER BRANDS PER CONSUMER					
Competitive (HHI <1,500)	4.57					

AVERAGE NUMBER OF PROVIDER

Moderately Concentrated (HHI 1,500-2,500)	4.43
Highly Concentrated (HHI > 2,500)	4.14

Note: Patients included in the calculations were required to have at least five or more claims within a given year and to be located in a metropolitan CBSA to more accurately measure consumer loyalty. Data excludes lab and pathology services. Provider brands were defined as the unique number of rendering provider primary organization names. This finding does suggest whether a higher or lower "brand per consumer count" is ideal; additional quality and cost data is needed to draw further conclusions. Source: Trilliant Health national all-payer claims database.

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TREND 6: INDIVIDUAL AS CONSUMER

Cleveland Clinic Had the Highest Patient Loyalty in 2021

Patient loyalty ranges from 68.7% (Ochsner Health System) to 79.4% (Cleveland Clinic) among the large health systems with the highest loyalty.

PROVIDER BRANDS WITH MOST LOYAL PATIENTS IN 2021

HEALTH SYSTEM	SHARE OF LOYAL PATIENTS
Cleveland Clinic	79.4%
SENTARA"	74.8%
*NorthShore	73.0%
Indiana University Health	72.8%
Beth Israel Lahey Health	72.8%
CHRISTUS Health.	71.6%
MICHIGAN MEDICINE UNIVERSITY OF MICHIGAN	71.1%
MAYO CLINIC	70.7%
Atrium Health	69.7%
[∨] Ochsner	68.7%

Note: Loyalty by health system reflects the average proportion of care delivered at the patient level at each health system annually. Patients included in the loyalty calculations were required to have at least three annual visits within between 2018 and 2021. Health systems with at least 100,000 associated patients were included in the analysis. Source: Trilliant Health national all-payer claims database.

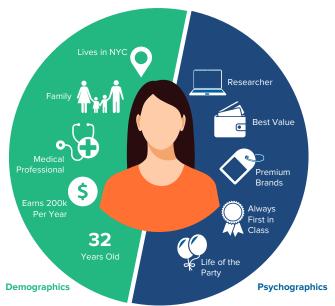
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67

TREND 6: INDIVIDUAL AS CONSUMER

Psychographics Transcend Demographics

Demographics describe facts about a person in this moment and vary over time. Psychographics describe why a person makes the decisions they do and persist over time.

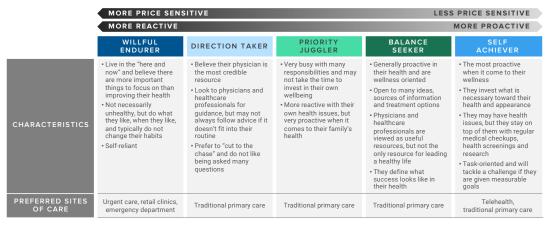


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TREND 6: INDIVIDUAL AS CONSUMER

Psychographics Can Predict Healthcare Decision Making

Psychographics provide insight into the "why" behind consumer choices.



SEGMENTATION INSIGHTS DRIVE SPECIFIC MESSAGINGS



Source: Trilliant Health national consumer database

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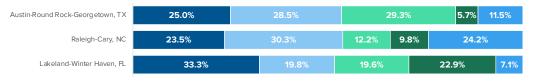
69

TREND 6: INDIVIDUAL AS CONSUMER

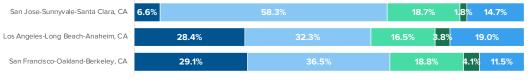
Psychographic Mix Varies by Market

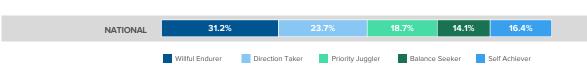
Despite having similar population growth trajectories, psychographic mix in high- and low-growth markets does not follow a consistent pattern.

DISTRIBUTION OF PSYCHOGRAPHIC PROFILES OF TOP THREE CBSAs OVER 750K BY 2022-2027 PROJECTION POPULATION CHANGE



DISTRIBUTION OF PSYCHOGRAPHIC PROFILES OF ${\tt BOTTOM}$ THREE CBSAs OVER 750K BY 2022-2027 PROJECTION POPULATION CHANGE





Source: Trilliant Health national consumer database

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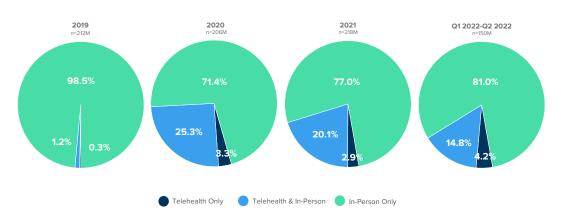
AMERICAN BANKRUPTCY INSTITUTE

TREND 6: INDIVIDUAL AS CONSUMER

More Patients Returning to Solely In-Person Care

The pandemic revealed patient preferences for omni-channel care. Compared to the 2020 peak of the pandemic, the proportion of patients in virtual-only or hybrid arrangements is declining.

PERCENT OF IN-PERSON, TELEHEALTH & IN-PERSON, AND TELEHEALTH-ONLY PATIENTS, 2019-2022



Source: Trilliant Health national all-payer claims database.

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71

Increasing Unaffordability Is Suppressing Healthcare Demand

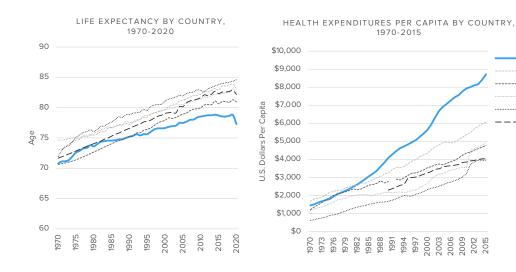
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2022 HEALTH CARE PROGRAM

TREND 7: UNAFFORDABILITY SUPPRESSING DEMAND

The U.S. Outspends on Healthcare Without Better Outcomes

Healthcare spending is the result of price and utilization. Comparing U.S. spending and life expectancy vs. other OECD countries reveals that the U.S. has the highest per capita healthcare spending (\$8,714.90) and the lowest life expectancy (77.3 years).



Source: Our World in Data Life Expectancy vs. Health Expenditure 1970-2015.

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73

United States

- Switzerland

---- Germany

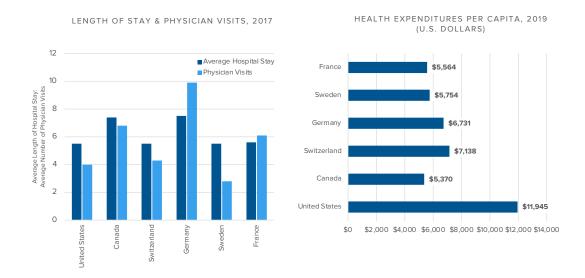
_ _ _ France

Sweden

TREND 7: UNAFFORDABILITY SUPPRESSING DEMAND

U.S. Healthcare Prices Are Uniquely High

U.S. healthcare utilization (e.g., physician visits per person, average length of stay) is comparable to other OECD countries. In contrast, the U.S. per capita health expenditures are twice that of other countries. Similar volume and dissimilar spending suggests that U.S. healthcare prices are uniquely high.



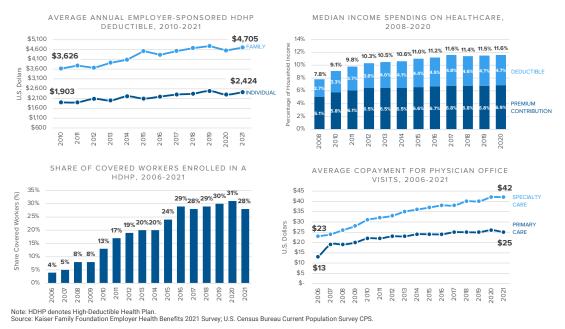
Source: Commonwealth Fund. Kaiser Family Foundation. Centers for Medicare and Medicaid Services National Health Expenditures.

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TREND 7: UNAFFORDABILITY SUPPRESSING DEMAND

Healthcare Affordability Increasingly Affects Most Americans

With healthcare affordability an increasing concern for most Americans, the barriers to re-engaging patients in necessary medical care will be even greater.

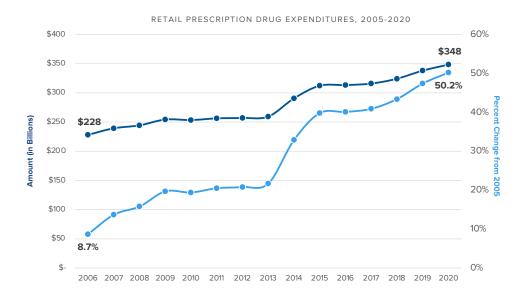


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TREND 7: UNAFFORDABILITY SUPPRESSING DEMAND

High and Growing Drug Prices Contribute to Affordability Issues

Retail prescription drug expenditures increased 50.2% from 2005 to 2020, accounting for 8% of national health expenditures.



Source: Centers for Medicare and Medicaid Services National Health Expenditures

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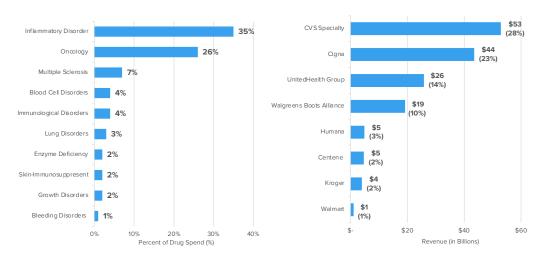
TREND 7: UNAFFORDABILITY SUPPRESSING DEMAND

Specialty Pharmacy Spending Concentrated in Oncology and Immunology

Inflammatory disorders contribute to a disproportionate amount of specialty pharmacy spending (35%). CVS, Cigna, and UnitedHealth Group account for 27% of estimated U.S. prescription revenues attributed to specialty drugs.

SPECIALTY PHARMACY CATEGORIES BY DRUG SPEND

PHARMACY PARENT ORGANIZATIONS REVENUE AMOUNT (SHARE OF PRESCRIPTION REVENUES FROM SPECIALTY DRUGS)



Source: Pharmaceutical Strategies Group. 2022 Artemetrx State of Specialty Spend and Trend Report. Dallas, TX

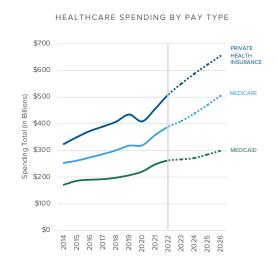
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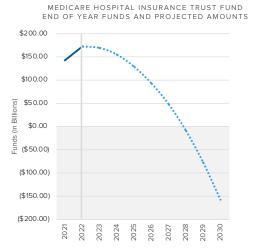
77

TREND 7: UNAFFORDABILITY SUPPRESSING DEMAND

Current and Projected Healthcare Spending Is Unsustainable

Healthcare spending is projected to continue to grow through 2026 across all payers. In tandem, the Medicare Hospital Insurance Trust Fund is depleting, projected to expire by 2028.





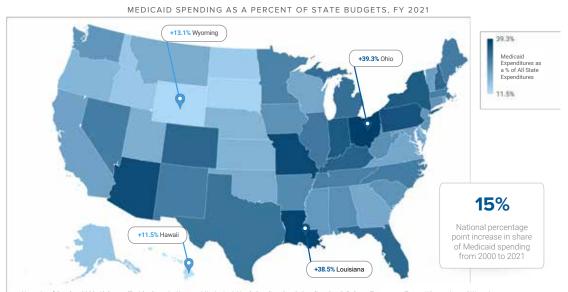
Source: Centers for Medicare and Medicaid Services (CMS) National Health Expenditures Projections, 2019-28

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TREND 7: UNAFFORDABILITY SUPPRESSING DEMAND

Medicaid Spending Growing as A Share of State Spending

For FY 2021, 24 states spent more than 25% of total spending on Medicaid. Nationally in FY 2022, 27.2% of state expenditures went towards Medicaid, a 15-percentage point increase from 2000 spending.



Note: As of October 2022, Alabama, Florida, Georgia, Kansas, Mississippi, North Carolina, South Carolina, South Dakota, Tennessee, Texas, Wisconsin, and Wyoming have not yet expanded Medicaid. FY denotes fiscal year. Source: Mational Association for State Budget Officers; The Pew Charitable Trusts.

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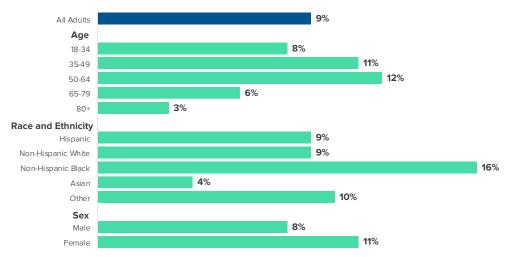
79

TREND 7: UNAFFORDABILITY SUPPRESSING DEMAND

U.S. Medical Debt Reaches \$140B

Although over 90% of Americans have health insurance, 17.8% had medical debt in June 2020. Medical debt is highest among individuals in the South and zip codes in the lowest income deciles. High deductibles and other forms of cost sharing can contribute to an individual's inability to afford their medical bills.





Source: Kluender et al JAMA, 2021; KFF Analysis of Survey of Income and Program Participation.

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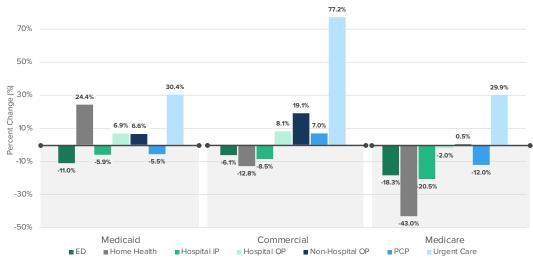
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TREND 8: ACCELERATING AMBULATORY MIGRATION

Non-Hospital Outpatient Volumes Are Higher Across Pay Types

Across payers, volumes are only consistently above pre-pandemic levels in urgent care and non-hospital outpatient settings. Commercial volumes are up 77.2% for urgent care and 19.1% for non-hospital outpatient care. Much of this increase is driven by COVID-related care.

CHANGE IN VOLUMES BY CARE SETTINGS & PAY TYPE, JAN 2019-MAR 2020 TO JAN 2021-MAR 2022



Note: IP denotes Inpatient; OP denotes Outpatient; PCP denotes Primary Care Provider. Source: Trilliant Health national all-payer claims database.

ource. Timant realitriational air payer claims database.

Volume Increases Are Concentrated in Non-Hospital Outpatient Settings

The only settings of care with a positive growth rate from 2019 to 2021 are urgent care and non-hospital outpatient departments. Notably, almost half (47%) of urgent care volumes in Q1 2021 are related to treatment and/or testing of COVID-19.

PERCENT CHANGE IN VISIT VOLUMES, JAN 2019-MAR 2020 TO JAN 2021-MAR 2022

CATEGORY	OVERALL POST-COVID VOLUMES	COMMERCIAL INSURANCE	AGES 18-64	WOMEN
PRIMARY CARE	-	7.0%	6.8%	-0.6%
URGENT CARE		77.2%	78.5%	59.2%
EMERGENCY DEPARTMENT	•	6.1%	-8.7%	-16.5%
HOME HEALTH		12.8%	3.2%	-2.8%
INPATIENT	-	8.5%	-16.1%	-14.6%
OUTPATIENT (HOSPITAL)	-	8.1%	2.9%	2.5%
OUTPATIENT (NON-HOSPITAL)		19.1%	15.2%	11.8%
TELEHEALTH	+	37.0%	0.4%	-3.4%
WOMEN'S HEALTH		9.9%	N/A	N/A
BEHAVIORAL HEALTH		24.2%	25.4%	26.2%

Note: Telehealth reflects the percent change from January 2020-March 2021 to January 2021-March 2022. Source: Trilliant Health national all-payer claims database.

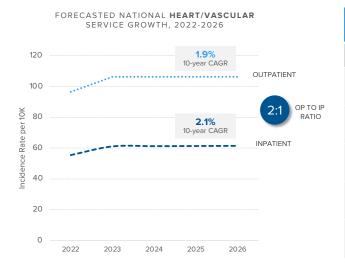
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83

TREND 8: ACCELERATING AMBULATORY MIGRATION

Outpatient Heart/Vascular Growth Outpacing Inpatient 2:1

Inpatient and outpatient demand for heart/vascular surgical services is projected to increase slightly at 2.1% and 1.9% CAGR, respectively. Cardiac catheterization is the top procedure contributing to demand growth in both inpatient and outpatient settings.



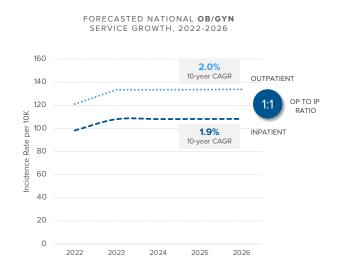
	TOP SURGICAL HEART/VASCULAR PROCEDURES CONTRIBUTING TO FORECASTED DEMAND						
	INPATIENT	OUTPATIENT					
1	Cardiac Catheterization	Cardiac Catheterization					
2	Other Vascular Procedures	Percutaneous Cardiovascular Procedures					
3	Other Procedures on Arteries and Veins	Other Procedures on Arteries and Veins					
4	Pacemaker or Pacing Cardioverter- Defibrillator Procedures	Pacemaker or Pacing Cardioverter-Defibrillator Procedures					
5	Percutaneous Cardiovascular Procedures	Other Therapeutic Cardiovascular Services and Procedures					

Source: Trilliant Health Demand Forecast.

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Inpatient OB/GYN Growth Similar to Outpatient

Inpatient and outpatient demand for OB/GYN surgical services is projected to increase slightly at 1.9% and 2.0% CAGR, respectively. Vaginal delivery and surgical procedures on the corpus uteri are the top procedures contributing to demand growth for inpatient and outpatient settings, respectively.



	TOP SURGICAL OB/GYN PROCEDURES CONTRIBUTING TO FORECASTED DEMAND						
	INPATIENT OUTPATIENT						
1	Vaginal Delivery	Surgical Procedures on the Corpus Uteri					
2	Cesarean Delivery Procedures	Surgical Procedures on the Cervix Uteri					
3	Surgical Procedures on the Corpus Uteri	Surgical Procedures on the Vagina					
4	Surgical Procedures on the Cervix Uteri	Surgery of the Breast					
5	Surgical Procedures on the Cervix Uteri	Mastectomy					

Source: Trilliant Health Demand Forecast.

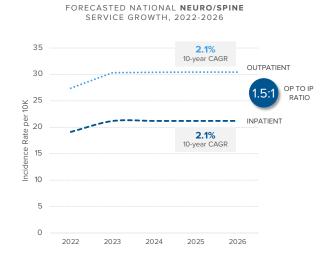
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85

TREND 8: ACCELERATING AMBULATORY MIGRATION

Outpatient Neuro/Spine Surgery Outpacing Inpatient 1.5:1

Inpatient and outpatient demand for neuro/spine surgical services is projected to increase slightly at 2.1% CAGR for each. Spinal fusions and surgeries on nerves and nervous system are the top procedures contributing to demand growth in both inpatient and outpatient settings, respectively.



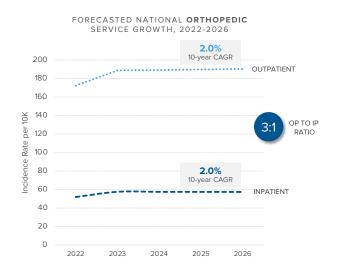
	TOP SURGICAL NEURO/SPINE PROCEDURES CONTRIBUTING TO FORECASTED DEMAND							
	INPATIENT	OUTPATIENT						
1	Spinal Fusion	Surgery on Nerves and Nervous System						
2	Surgery on the Spine and Spinal Cord	Surgery on the Spine and Spinal Cord						
3	Surgery of Brain and Skull	Surgery of Brain and Skull						
4	Craniectomy or Craniotomy	Spinal Fusion						
5	Surgery on Nerves and Nervous System	Ventricular Shunt Procedures						

Source: Trilliant Health Demand Forecast

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Outpatient Orthopedic Surgery Outpacing Inpatient 3:1

Inpatient and outpatient demand for orthopedic surgical services is projected to increase slightly at 2.0% CAGR for each. Joint replacements of knee or hip and endoscopy/arthroscopy procedures on the musculoskeletal system are the top procedures contributing to demand growth in both inpatient and outpatient settings, respectively.



	TOP SURGICAL ORTHOPEDIC PROCEDURES CONTRIBUTING TO FORECASTED DEMAND						
	INPATIENT	OUTPATIENT					
1	Joint Replacement of Knee or Hip	Endoscopy/Arthroscopy Procedures on the Musculoskeletal System					
2	General Surgical Procedures on the Musculoskeletal System	Joint Replacement of Knee or Hip					
3	Repair Revision and/or Reconstruction Procedures on the Femur (Thigh Region)	Fracture and/or Dislocation Procedures on the Forearm and Wrist					
4	Fracture and/or Dislocation Procedures on the Pelvis and Hip Joint	Other Surgical Procedures on the Hand and Fingers					
5	Amputation of Limb	General Surgical Procedures on the Musculoskeletal System					

Source: Trilliant Health Demand Forecast.

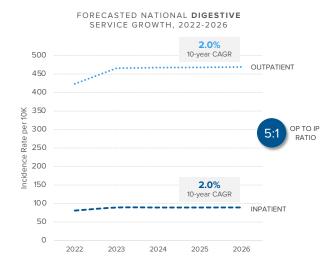
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87

TREND 8: ACCELERATING AMBULATORY MIGRATION

Outpatient Digestive Surgery Outpacing Inpatient 5:1

Inpatient and outpatient demand for digestive surgical services is projected to increase at 2.0% CAGR for each. Upper GI endoscopies and colonoscopies are the top procedures contributing to demand growth in both inpatient and outpatient settings.



	TOP SURGICAL DIGESTIVE PROCEDURES CONTRIBUTING TO FORECASTED DEMAND							
	INPATIENT	OUTPATIENT						
1	Upper GI Endoscopy	Colonoscopy						
2	Colonoscopy	Upper GI Endoscopy						
3	Procedures on the Abdomen Peritoneum and Omentum	Procedures on the Abdomen Peritoneum and Omentum						
4	Major Small and Large Bowel Procedures	Anal and Stomal Procedures						
5	Laparoscopic Procedures on the Biliary Tract	Hernia Procedures						

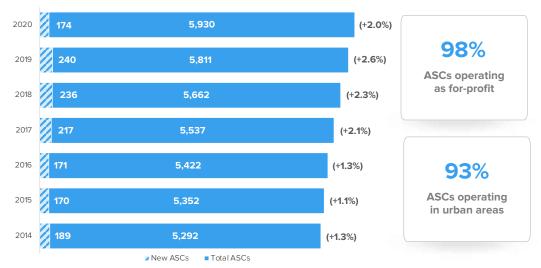
Source: Trilliant Health Demand Forecast.

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Supply of ASCs Is Increasing, But The Rate of Growth Slowed in 2020

The number of Medicare-certified ASCs continues to grow steadily.

NUMBER OF NEW AND TOTAL ASCs, 2014-2020 (NET % GROWTH)



Note: Median values represent ASC counts for all 50 states and Washington, D.C. Source: Medicare Payment Advisory Commission (MedPAC) July 2022 Data Book: Chapter 7.

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89

TREND 8: ACCELERATING AMBULATORY MIGRATION

Most ASC Procedures Are Lower Acuity and Commodity-Like

Over time, changes to the CMS inpatient-only list rule will further accelerate the shift from inpatient to outpatient settings. In terms of volume, upper GI endoscopies moved from the fourth position in 2019 (9.5% of all volume) to the third position in 2021 (9.9% of all volume).

TOP SURGICAL PROCEDURES PERFORMED IN ASCs, 2019 & 2021

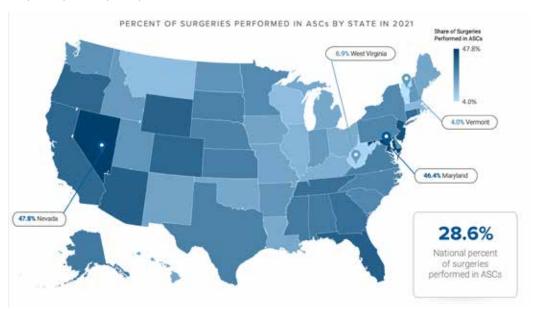
	2019		2021	
SURGICAL PROCEDURE	% OF VOLUME	RANK	% OF VOLUME	RANK
Colonoscopy	17.5%	1	18.1%	1
Intraocular Procedures	13.0%	2	13.3%	2
Other Skin Subcutaneous Tissue and Breast Procedures	11.2%	3	9.9%	4
Upper GI Endoscopy	9.5%	4	9.9%	3
Epidural and Nerve Root Blocks	4.9%	5	4.9%	6
Vitreous Procedures on the Posterior Segment of the Eye	4.8%	6	4.9%	5
Paravertebral Facet Injection/Nerve Block	3.2%	7	3.0%	8
Endoscopy/Arthroscopy Procedures on the Musculoskeletal System	3.0%	8	3.1%	7
Other Ear Nose Mouth and Throat O.R. Procedures	2.6%	9	2.0%	9
Sinus and Mastoid Procedures	2.2%	10	1.9%	10

Note: Columns do not sum to 100% as list of procedures were capped to the top 15. Source: Trilliant Health national all-payer claims database.

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Almost 30% of Surgeries Are Performed at ASCs

Nationally, 28.6% of all surgeries are performed in ambulatory surgical centers. At the state level, this percentage ranges from 4.0% (Vermont) to 47.8% (Nevada).



Source: Trilliant Health national all-payer claims database.

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91

TREND 8: ACCELERATING AMBULATORY MIGRATION

Reimbursement for the Same Service Varies by Payer and Setting

Reimbursement for the same healthcare service varies significantly by payer, care setting, and geography. Across payers, private prices are 1.4X-2.5X Medicare prices. Within the same payer, reimbursement for an inpatient procedure is 2.1X-7.5X more than an outpatient procedure. This variation drives higher spending without improving patient outcomes.

MEDICARE AND COMMERCIAL REIMBURSEMENT RATES FOR HIGH-VOLUME SURGICAL PROCEDURES

	MEDICARE			COMMERCIAL			COMMERCIAL : MEDICARE RATIO	
PROCEDURE CATEGORY	Average IP Reimbursement	Average OP Reimbursement	IP : OP Ratio	Average IP Reimbursement	Average OP Reimbursement	IP : OP Ratio	IP	OP
CARDIAC PROCEDURES WITH CARDIAC CATHETERIZATION	\$50,298	\$6,669	7.5	\$70,892	\$14,055	5.0	1.4	2.1
SPINAL FUSION	\$32,790	\$6,540	5.0	\$52,497	\$11,774	4.5	1.6	1.8
TOTAL JOINT REPLACEMENT KNEE/HIP	\$16,107	\$5,577	2.9	\$39,099	\$12,356	3.2	2.4	2.2
HYSTERECTOMY	\$15,617	\$7,502	2.1	\$39,118	\$12,998	3.0	2.5	1.7

Source: Trilliant Health national all-payer claims database.

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2022 HEALTH CARE PROGRAM

TREND 8: ACCELERATING AMBULATORY MIGRATION

Site Neutral Payments Reduce Spend Without Impacting Quality

Payment rates often vary for the same service provided to similar patients in different settings. Aligning payment rates across ambulatory care settings—hospital outpatient departments, ambulatory surgical centers, and freestanding offices—could reduce spending without impacting patient care. In the below example, site neutral payment for a level 2 nerve injection provided in a hospital outpatient department is \$444.88 less per service.

ACTUAL 2019 AND SITE-NEUTRAL PAYMENT RATES FOR LEVEL 2 NERVE INJECTION RATES IN MEDICARE

ACTUAL 2019 PAYMENT RATES		PAYMENT RATES UNDER SITE NEUT REIMBURSEMENT POLICY	RAL
Service in Physician's Office		Service in Physician's Office	
Physician work	\$64.87	Physician work	\$64.87
Non-facility practice expense	\$185.64	Non-facility practice expense	\$185.64
Professional liability insurance	+ \$5.77	Professional liability insurance	+ \$5.77
Total payment	\$256.28	Total payment	\$256.28
Control Harriston Latin Development		Control House Control Control	
Service in Hospital Outpatient Department (HOPD)		Service in Hospital Outpatient Department (HOPD)	
Physician work	\$64.87	Physician work	\$64.87
Facility practice expense	\$31.71	Facility practice expense	\$31.71
Professional liability insurance	+ \$5.77	Professional liability insurance	+ \$5.77
Payment to physician	\$102.35	Payment to physician	\$102.35
Payment to HOPD	+ \$598.81	Payment to HOPD (non-facility PE – facility PE)	+ \$153.93
Total payment	\$701.16	Total payment	\$256.28

Source: Medicare Payment Advisory Commission (MedPAC) analysis of physician fee schedule and outpatient prospective payment system rates for 2019.

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TREND 9

Low-Acuity Healthcare Services Are Increasingly Being Commoditized

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Large Retailers Have Established Loyalty With Healthcare Consumers for Commodity Services

While healthcare delivery is not the core business of Walmart or Amazon, each possesses strong brand loyalty, consumer reach, and ability to drive scale to commoditize products and services.

Loyalty Programs

(Number of Members)

Membership Programs (Annual Fees)









Source: CVS, Walgreens, Amazon and Walmart websites.

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95

TREND 9: LOW ACUITY COMMODITIZATION

Retailers Offer Commodity Prices for Commodity Healthcare Services

While prices vary among retailers, their rates consistently fall below that of traditional non-retail urgent care. In addition, consumers may be attracted to the price transparency offered by large retailers.

COST COMPARISONS FOR SELECT COMMODITY HEALTHCARE SERVICES

		ESTABLISHED			
SERVICE	♥CVS Health.	Walgreens	Walmart *	URGENT CARE	
Office Visit	\$99-\$139	\$89	\$40	\$137	
Flu Test	\$70-\$100	\$66	\$20	\$102	
Strep Test	\$35-\$45	\$25	\$20	\$102	
Lipid Panel	\$37	\$35	\$10	\$102	

Source: Publicly available company information.

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Amazon Further Expands Its Healthcare Footprint

Although Amazon Care was shuttered amid the One Medical acquisition, many markets overlapped between the two entities, expanding Amazon's geographic healthcare reach and solidifying its brick-and-mortar presence in healthcare.

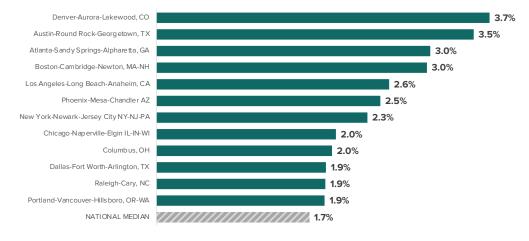


TREND 9: LOW ACUITY COMMODITIZATION

Forecasted Growth in Primary Care Demand in One Medical Markets Is Higher Than the National Average

While median forecasted demand for primary care is projected to nominally increase (1.7% CAGR) between 2022 and 2026, this demand in select One Medical markets is growing faster than the national median, ranging from 1.9% to 3.7%.



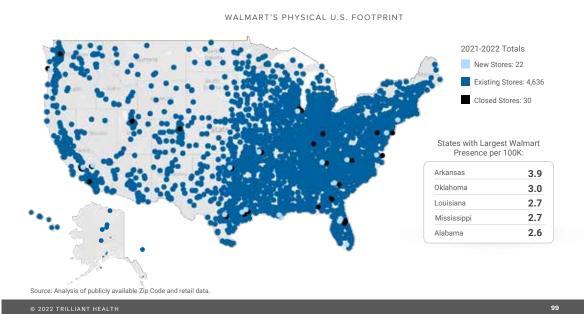


Note: CAGR denotes compound annual growth rate. Source: Trilliant Health Demand Forecast.

98 2022 TRILLIANT HEALTH

Walmart Continues to Distinguish Itself From Other Retailers in Bringing Quality Care to Underserved Areas

The migration of residents during the pandemic to Texas and Florida suggests competition with Walmart for greater share of care among traditional and new entrant providers will intensify, especially for Medicaid and Medicare beneficiaries.



TREND 9: LOW ACUITY COMMODITIZATION

New York, Chicago, and Washington D.C. Represent Key High Volume Markets for Multiple New Entrants

The lack of new entrant volume in other major cities identifies potential CBSAs for expansion, such as Miami or Phoenix. Across new entrants, Walmart has carved out a unique presence in the Midwest and Southwest.





Note: VillageMD featured due to partnership with Walgreens. Source: Trilliant Health national all-payer claims database.

2022 TRILIIANT HEALTH 100

New Entrants Are Competing on Price and Service Offerings

CVS MinuteClinics and Walmart tend to deliver higher acuity services relative to Walgreens/Village MD and One Medical.

PRICING AND MOST COMMON SERVICES OVERVIEW FOR NEW ENTRANTS





Note: Most common care concerns were determined using a representative sample of patient claims attributed to each new entrant. Source: Publicly available company information and Trilliant Health all-payer claims database.

2022 TRILLIANT HEALTH

101

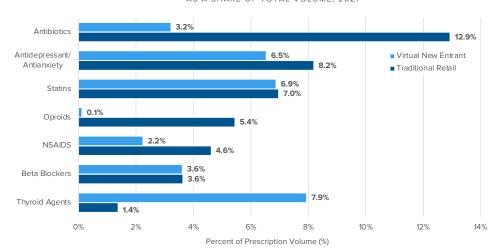
TREND 9: LOW ACUITY COMMODITIZATION

Share of Prescription Volume Differs at Virtual Pharmacies

While antibiotics account for 12.9% of the drugs dispensed at traditional retail, they only account for 3.2% of prescription volume at virtual pharmacies. Conversely, thyroid agents account for 7.9% of drugs dispensed at virtual pharmacies and only 1.4% at retail pharmacies.

SHARE OF DRUG CLASSES DISPENSED BY RETAIL AND NEW ENTRANT PHARMACIES

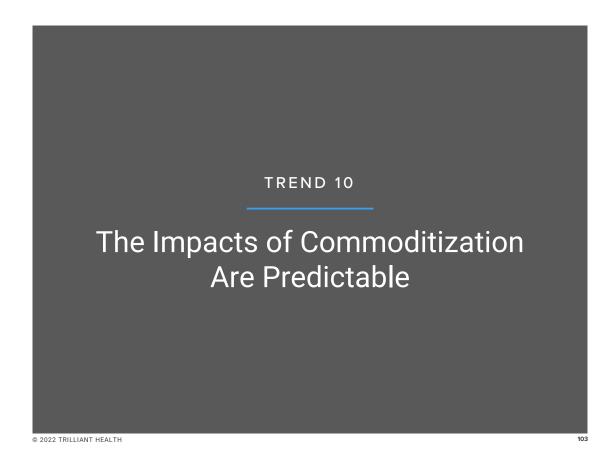
AS A SHARE OF TOTAL VOLUME, 2021



Note: Virtual new entrants include pharmacy claims from Amazon and Truepill; traditional retail is inclusive of CVS, Walgreens, and Kroger. Source: Trilliant Health national all-payer claims database.

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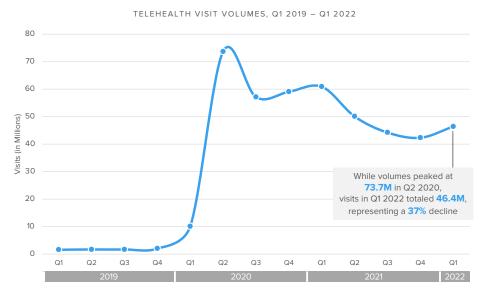
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TREND 10: COMMODITIZATION IMPACTS

Telehealth Demand Continues to Track Below Pandemic Peak

The 37% drop in telehealth visit volumes from the peak in Q2 2020 to Q1 2022 suggests that expanded availability of virtual care options has not shifted widespread consumer preferences.



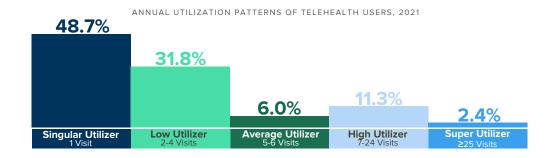
Source: Trilliant Health national all-payer claims database

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TREND 10: COMMODITIZATION IMPACTS

Almost Half of Telehealth Patients Used It Only Once

80.5% of telehealth patients had between one and four visits in 2021, with less than 3% of telehealth patients falling into the "Super Utilizer Category" of having 25 or more telehealth visits in the same timeframe.



AGE AND GENDER BREAKDOWN OF TELEHEALTH USERS, 2019-2022

	AGES 0-17		AGES 18-64		AGES 65+		ALL AGES	
	Male (%)	Female (%)	Male (%)	Female (%)	Male (%)	Female (%)	Male (%)	Female (%)
2019	52.3%	47.7%	34.4%	65.6%	44.5%	55.5%	38.3%	61.7%
2020	51.8%	48.2%	38.3%	61.7%	43.1%	56.9%	41.5%	58.5%
2021	51.4%	48.6%	36.9%	63.1%	41.8%	58.2%	40.3%	59.7%
Q1 2022	48.8%	51.2%	68.1%	31.9%	62.7%	37.3%	64.2%	35.8%

Source: Trilliant Health national all-payer claims database

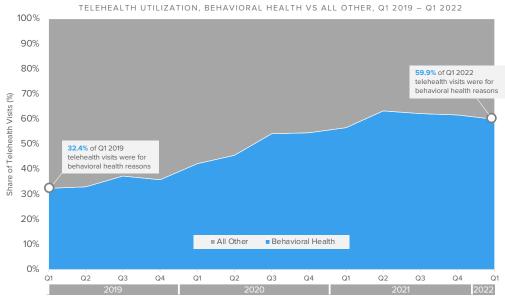
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105

TREND 10: COMMODITIZATION IMPACTS

Behavioral Health Accounts for Majority of Telehealth Use

In a declining telehealth market, behavioral heath accounts for a greater share of a smaller number of visits over time. From Q1 2019 to Q1 2022, behavioral health telehealth utilization as a proportion of the total increased by over 27 percentage points.



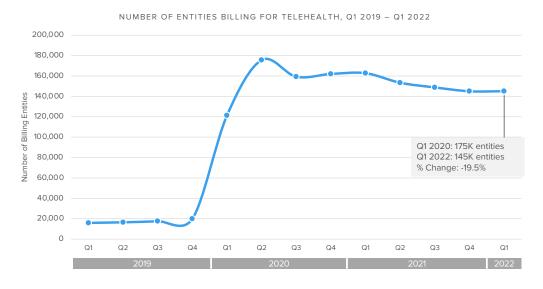
Source: Trilliant Health national all-payer claims database

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TREND 10: COMMODITIZATION IMPACTS

Entities Billing for Telehealth Continue to Taper

In response to the pandemic, the number of provider entities billing for telehealth services skyrocketed. Since then, the number of billing entities has been declining (-19.5% from Q1 2020 to Q1 2022). While many aspects of telehealth were touted to in part provide more scale to physicians (as a way to minimize the supply shortage), the data suggests otherwise.



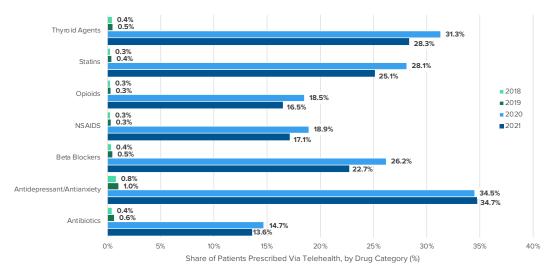
Source: Trilliant Health national all-payer claims database

TREND 10: COMMODITIZATION IMPACTS

Telehealth-Enabled Prescribing Is Up Post-Pandemic

Post-pandemic, telehealth prescribing has become more common. In 2020 and 2021, approximately 35% of antidepressants and antianxiety drug prescriptions were associated with a telehealth visit compared to just 1% in 2019.

SHARE OF PRESCRIBING VIA TELEHEALTH FOR SELECT DRUG CATEGORIES, 2018-2021



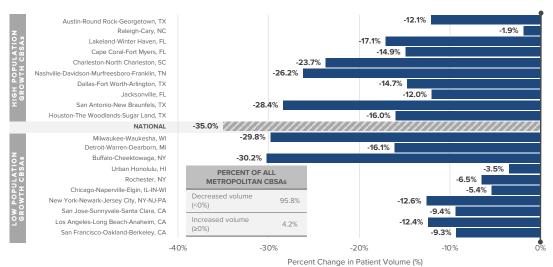
Note: Opioids are inclusive of hydrocodone. Source: Trilliant Health national all-payer claims database

TREND 10: COMMODITIZATION IMPACTS

Telehealth Volumes Have Declined in Over 95% of Markets

Compared to the peak of the pandemic (Q1 2020 to Q1 2021), telehealth volumes are down in 95.8% markets, with a national average decline of -35%.

MARKET-LEVEL TELEHEALTH VOLUMES, PERCENT CHANGE JAN 2020-MAR 2021 TO JAN-MAR 2022



Note: These 20 CBSAs represent selected markets with populations over 750K that are projected to increase or decrease significantly between 2022 and 2027. The share of CBSAs projected to increase or decrease in population include all metropolitan CBSAs. Source: Trilliant Health national all-payer claims database.

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109

TREND 10: COMMODITIZATION IMPACTS

Telehealth TAM Will Be Constrained by Increasing Supply, Decreasing Demand, and Decreasing Marginal Cost of Delivery

Because telehealth supply exceeds demand, the price of a telehealth visit will likely continue to decline, and the total addressable market will slowly approach \$0 in the commercially insured market.

SCENARIO		PATIENT VISIT COST	TELEHEALTH PATIENTS	TOTAL ADDRESSABLE MARKET FOR TELEHEALTH	
1	The current price-setter in a market where <i>all</i> 2020 and 2021 telehealth patients continue telehealth use	\$67	77M	\$67 × 77M × 5 visits = \$26B	
2	Walmart is the price-setter in a market where <i>only</i> Average, High, and Super Utilizers continue telehealth use	\$67	12M	\$67 × 12M × 5 visits = \$4B	
3	Access to telehealth services becomes part of an Amazon Prime membership (hypothetical)	\$15/month	148M	\$15 × 148M = \$2B	
4	Commercial health plans (e.g., United Healthcare) offer telehealth for enrollees at no cost, bringing the effective marginal cost down to \$0 in a market where <i>all</i> commercially insured individuals could use that benefit	~\$0*	217M	\$0 × 217M × 5 visits = \$0	

*Not accounting for monthly enrollee premiums

Note: TAM represents Total Addressable Market

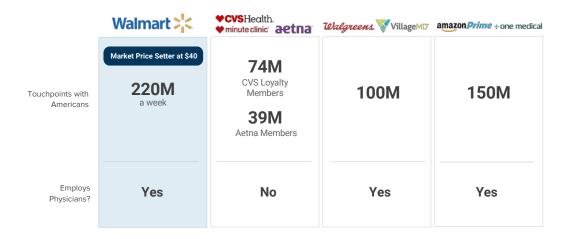
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TREND 10: COMMODITIZATION IMPACTS

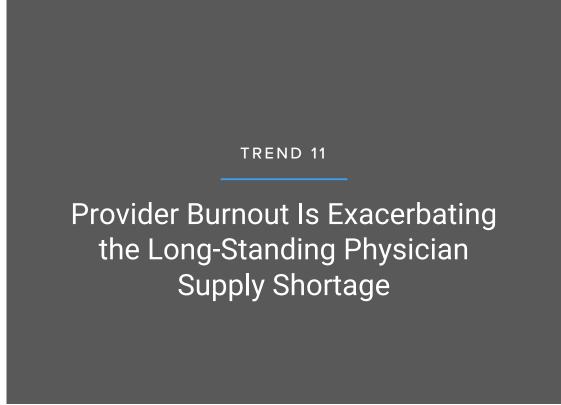
What if Retailers View Primary Care as a Loss Leader?

Given the sizeable share of retail-based primary care services that could be considered essential health benefits, heightened competition among new entrants, and effectively zero marginal cost of delivery for retail players, how will large retailers compete on price? Will their scale and larger loyal consumer base be able to generate margin at such prices?



Note: Touchpoint numbers are likely underestimates and are intended to illustrate the disproportionate share of U.S. consumers that large retailers have relative to traditional providers (e.g., health systems). The question posed is in relation to the fact that margins on primary care businesses are very low, making it historically difficult business to operate as a stand alone (at least for traditional providers). Source: Publicly available company information.

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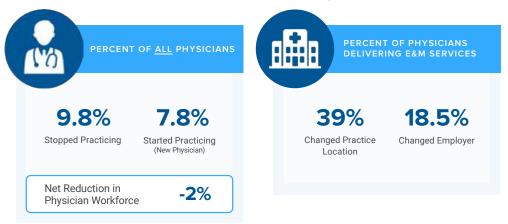


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The Pandemic Effect Compounded With Long-Standing Burnout Resulted in 9.8% Of Physicians "Retiring"

The net number of physicians starting and stopping practice from 2019 to 2022 led to a 2% workforce reduction. Among practicing physicians delivering E&M services, 18.5% of physicians changed employer organization or type (e.g., hospital, new entrant).

CHANGES IN U.S. PHYSICIAN WORKFORCE, 2019-2022



Note: Physicians denote both M.D. and D.O. Data through June 2022. Analysis of practice location changes was limited to physicians delivering office-based E&M services (N= 600,285) in 2019 to glean a more conservative estimate. Changes in physician employer is inclusive of those that changed employer due to M&A activities (e.g., lora Health to One Medical).

Source: Trilliant Health Provider Directory.

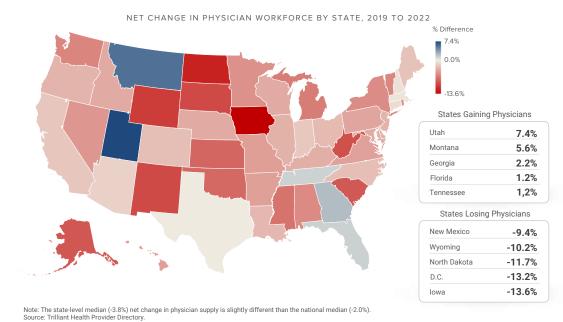
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113

TREND 11: EXACERBATED PHYSICIAN SUPPLY CHALLENGES

Net Change in Physician Workforce Varies by State

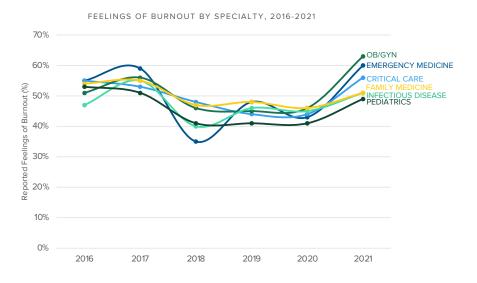
At the state level, the median net change – reflective of retirements, new graduates, and relocation - to the physician workforce was -3.8%. Utah and Montana gained the most physicians, while Iowa and D.C. lost the most physicians.



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OB/GYNs Report Level of Highest Burnout

While all specialties reported feelings of burnout, five specialties reported rates higher than 50%: OB/GYN (62%), emergency medicine (60%), critical care (56%), infectious disease (51%), and family medicine (51%). From 2018 to 2021, physicians in emergency medicine experienced the greatest increase (35% in 2018 to 60% in 2021).



Source: Association of American Medical Colleges (AAMC) Physician Supply and Demand Projection Reports, 2021. Medscape Physician Burnout and Depression report, 2022

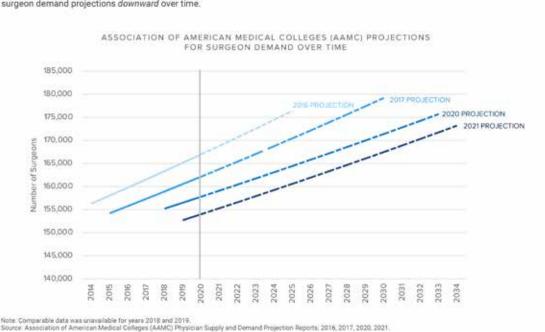
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115

TREND 11: EXACERBATED PHYSICIAN SUPPLY CHALLENGES

AAMC Has Consistently Overestimated Growth in Demand

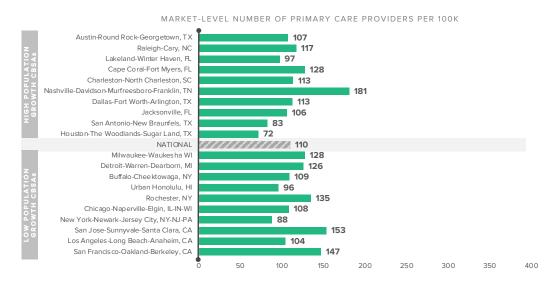
While much has been made of increasing demand and decreasing physician supply, the AAMC has consistently revised their surgeon demand projections downward over time.



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Supply of Primary Care Providers Varies Locally

While the median rate of primary care providers is 110 per 100K, each geography will vary in need for these providers based on demand, consumer preference, and disease burden.



Note: These 20 CBSAs represent selected markets with populations over 750K that are projected to increase or decrease significantly between 2022 and 2027. The definition of primary care physicians is limited to board-certified physicians, though acknowledge the role physician assistants and nurse practitioners serve in delivering primary care services. 2020 Census population was used to calculate a per 100K rate. Source: Trilliant Health Provider Directory.

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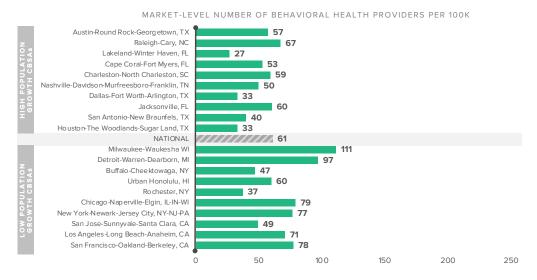
158

117

TREND 11: EXACERBATED PHYSICIAN SUPPLY CHALLENGES

Supply of Behavioral Health Providers Varies Locally

While the median rate of behavioral health providers is 61 per 100K, each geography will vary in need for these providers. Within a few years, the U.S. will experience a shortage of between 14,280 and 31,109 psychiatrists, psychologists, and social workers, which is likely to grow given the newly released USPSTF recommendations for widespread anxiety screening in children and adults.



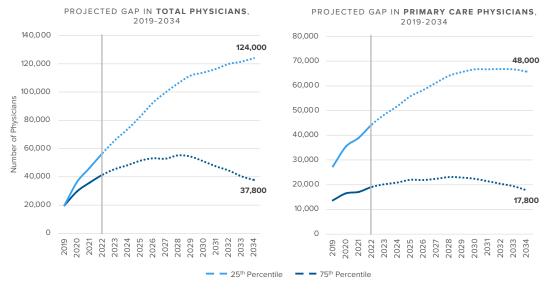
Note: These 20 CBSAs represent selected markets with populations over 750K that are projected to increase or decrease significantly between 2022 and 2027. 2020 Census population was used to calculate a per 100K rate. USPSTF denotes the U.S. Preventive Services Taskforce.

Source: Trilliant Health Provider Directory, Association of American Medical Colleges (AAMC).

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Will CBO's Price Cap Framework Increase Physician Shortage?

By 2024, the primary care physician gap is projected to range from 17.8K (25th percentile) to 48K (75th percentile). However, if prices are capped for hospital and physician services per the CBO's recent policy recommendation, the downstream impact on physician compensation may amplify supply shortages.



Source: Association of American Medical Colleges (AAMC); Congressional Budget Office (CBO), Policy Approaches to Reduce What Commercial Insurers Pay for Hospitals' and Physicians' Services, 2022.

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119

TREND 12

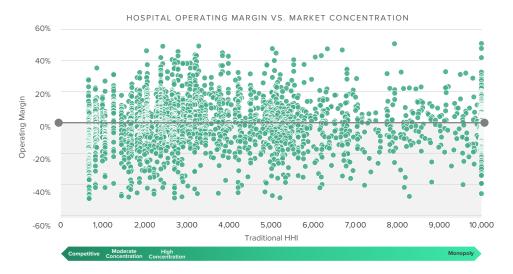
Only in Healthcare Can a Monopoly Lose Money, and Regulators Want to Prevent More of Them

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TREND 12: LOSING MONOPOLIES

The Average Monopoly Generates Negative Operating Margins

In 44 of the 225 CBSAs "controlled by a single firm," that single firm has an operating margin higher than 10%; in contrast, in 132 CBSAs "controlled by a single firm," that single firm's operating margin is negative. The average operating margin of a hospital with a maximum HHI score of 10,000 is -0.98%.



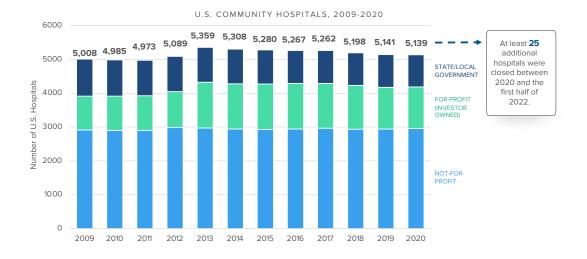
Note: Comparison of the operating margin of 2,717 short-term acute care hospitals with their Herfindahl-Hirschman Index (HHI) score. A HHI below 1,500 indicates a competitive market, between 1,500 and 2,500 indicates a moderately concentrated market, whereas a value greater than 2,500 indicates a highly concentrated market. See more detailed HHI definition in footnote. Traditional HHI refers to the standard measure focused on Source: Operating margins calculated from Healthcare Cost Report Information System (HCRIS); HHI calculated from Trilliant Health's national all-payer claims database.

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TREND 12: LOSING MONOPOLIES

The Number of U.S. Hospitals Continues to Decline

220 hospitals have closed or been repurposed since 2013, reflecting the reduction of inpatient demand and growing financial pressures. While funding provided to hospitals during the public health emergency likely reduced the magnitude of this trend temporarily, the risk of increasing closures still looms.



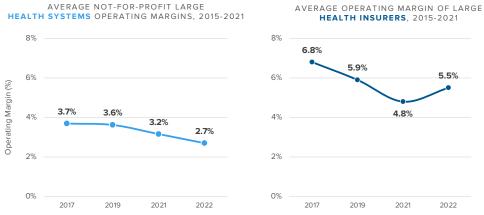
Note: The American Hospital Statistics 2022 reports data to 2020. Source: American Hospital Association Statistics. The Cecil G. Sheps Center for Health Services Research.

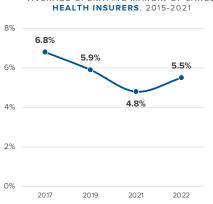
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TREND 12: LOSING MONOPOLIES

Health System Generate Lower Operating Margins (And Less Revenue) Than Payers

While both health systems and health insurers have seen declines in average operating margin, health systems are trending towards below 3% with reports of more hospitals experiencing negative margins in 2022, suggesting greater downward pressure ahead.





Note: The top 5 health insurers average operating margins were calculated using the average of Aetna, Anthem, United HealthCare, Cigna, and Humana operating margins from 2013 to 2021. Health system margins were calculated using data provided by a representative sample of large not-for-profit health system senior executives and their financial statements. The margins are likely to be on the higher end given the sample leans towards larger organizations. Data for 2022 is reflective of mid-year performance and is subject to change through December 31, 2022

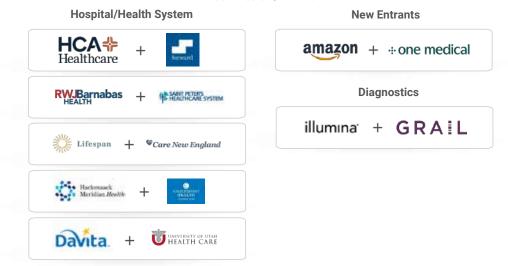
Source: American Hospital Association Chartbook; Financial Statements of health insurers and health systems

TREND 12: LOSING MONOPOLIES

Providers Continue to Face FTC Scrutiny With Regard to Competition

Regulatory agencies continue to express concerns regarding anti-competitive impacts of various hospital/health system deals despite continued financial losses and risk of hospital closures.

> SELECT HEALTHCARE TRANSACTIONS UNDER COMPETITION REVIEW BY THE FEDERAL TRADE COMMISSION, 2021-2022



Source: Publicly available Health Care Competition case filings from the Federal Trade Commission.

TREND 12: LOSING MONOPOLIES

Expanding Traditional Measures of Market Concentration (HHI) to Include the Shift to Outpatient Care Delivery Reveals More Variation

Segmenting sites of care and type of care changes the HHI within a market. For example, Atlanta's inpatient surgical market is highly concentrated (2,651), but when including outpatient surgeries, Atlanta's surgical market is considered competitive (1,341).

HHI FOR SELECT CBSAs, INPATIENT AND OUTPATIENT, MEDICAL AND SURGICAL

CBSA	Inpatient Surgical	Inpatient Medical and Surgical	Inpatient Medical	Inpatient Surgical and Outpatient Surgical	Outpatient Surgical	
NATIONAL MEDIAN	5,479	5,290	5,294	3,683	3,278	
New York-Newark-Jersey City, NY-NJ-PA	794	680	650	349	278	
Pittsburgh, PA	1,646	1,448	1,400	1,046	922	
Oklahoma City, OK	1,299	1,819	2,314	1,198	1,219	
Baltimore-Columbia-Towson, MD	1,979	1,892	1,896	912	767	
San Diego-Chula Vista-Carlsbad, CA	2,328	1,938	1,801	1,611	1,421	
Urban Honolulu, HI	2,475	2,124	2,213	1,989	1,880	
Atlanta-Sandy Springs-Alpharetta, GA	2,651	2,061	1,883	1,341	1,054	
St. Louis, MO-IL	2,681	2,453	2,353	1,656	1,433	
Tampa-St. Petersburg-Clearwater, FL	2,721	2,697	2,796	1,292	967	
Boston-Cambridge-Newton, MA-NH	2,328	2,708	2,882	1,824	1,719	
Nashville-Davidson-Murfreesboro-Franklin, TN	3,024	3,226	3,510	1,580	1,233	
Louisville/Jefferson County, KY-IN	3,670	3,318	3,459	2,766	2,489	
Durham-Chapel Hill, NC	3,886	3,635	3,667	3,253	3,076	
Bellingham, WA	10,000	10,000	10,000	4,835	3,640	
Low Concentration (<1,500) Moderate Concentration (1,500 – 2,500) High Concentration (>2,500)						

Note: HHII is a commonly accepted measure of market concentration. A concentration value below 1,500 indicates a competitive market; between 1,500 and 2,500 indicates a moderately concentrated market. Rows of CBSAs are sorted from less concentrated to more concentrated. Source: Trilliant Health national all-payer claims database.

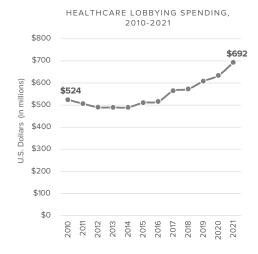
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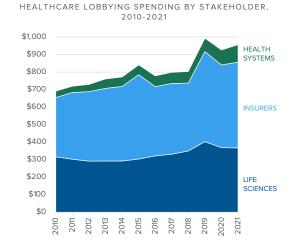
125

TREND 12: LOSING MONOPOLIES

Large Insurers Spend the Most on Health Sector Lobbying

The amount spent on total healthcare lobbying increased 44% from 2010 to 2021 with a 9.3% increase between 2020 and 2021 alone. Among stakeholders, large health insurers constitute the greatest share of lobbying influence, with spend increasing 28.5% from 2019 to 2021 and 32.1% from 2000 to 2021.





Note: Healthcare lobbying spending by sector was calculated using the annual sum of lobbying spending among a sample of five primary stakeholders within each sector: Life Sciences (Johnson & Johnson, Pfizer, Bristol-Myers Squibb, Merck & Co, and AbbVie Inc.); Health Systems (HCA Healthcare, Ascension Health, Trinity Health, Tenet Healthcare, and University of Pittsburgh Medical Center); Insurers (Humana, Inc., Blue Cross/Blue Shield, Aetna Inc. Centene Corporation, and UnitedHealth Group). HCA Healthcare and AbbVie Inc. 2010-2012 data is not reflected in the health system's total.

Source: The Senate Office of Public Records Lobbying Disclosure Act (LDA) Reports.

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TREND 13: MORE PROVIDER COMPETITION

Existing Consumer Loyalty Increases Competitive Pressures on Traditional Providers

While health system consolidation is growing, there is not meaningful customer concentration among a single national provider. Amazon and Walmart, which continue to expand their presence in healthcare, have a unique opportunity to acquire their existing customer base as patients.



62%
of American adults have an active prime membership

42%
of Americans shop at a
Walmart location weekly

Walmart

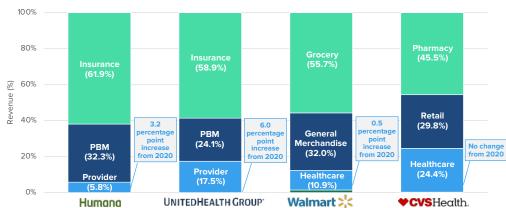
Note: Hospital admissions at each health system as a percentage of all hospital admissions was used as a proxy Source: Business Insider; analysis of Walmart press releases; Trilliant Health national all-payer claims database.

TREND 13: MORE PROVIDER COMPETITION

Payers Are Becoming Providers...and So Are Retailers

New market entrants have extensive experience in consumer marketing and engagement, whether Medicare Advantage or retail. Entrants like UnitedHealth Group and Walmart are teaming up in their provider-based efforts.

PERCENT OF 2021 REVENUE DEDICATED TO HEALTHCARE SERVICES FOR NON-TRADITIONAL PROVIDER ENTITIES



- Humana recently announced plans to acquire senior-focused primary care clinics for roughly \$500M, and plan to add upwards of 50 additional clinics by 2025.
- UnitedHealth Group and Walmart entered into a ten-year collaboration to serve seniors and Medicare Advantage beneficiaries. The partnership is beginning in Florida and Georgia in 15 Walmart Health locations, and by 2023 will offer a co-branded Medicare Advantage plan in Georgia. Both companies have committed to eventual expansion into the Medicaid and commercial markets.
- Beyond its existing network of MinuteClinic locations and HealthHUB locations, CVS has expressed intentions to acquire an existing primary care provider to expand its stake as a primary care provider.

Source: Analysis of publicly available financial statements.

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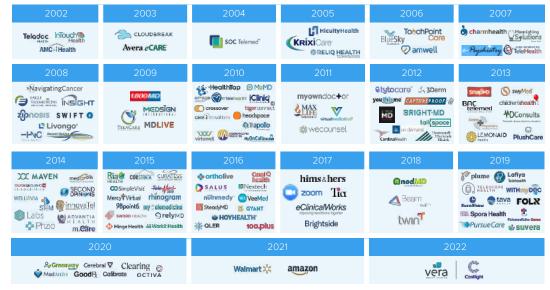
29

TREND 12: MORE PROVIDER COMPETITION

The Number of Tech-Enabled Care Providers Has Grown

While telehealth volumes spiked in 2020, many operators have been in the ecosystem for years; more are projected to come.

TIMELINE OF SELECT SUPPLIERS OFFERING TELE-CAPABILITIES



Note: Dates notate when company began offering telehealth services Source: Publicly available company information.

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TREND 13: MORE PROVIDER COMPETITION

The Number of Retail-Based Care Providers Has Grown

Retail clinic operators have steadily increased to capitalize on the transition to outpatient care delivery and demand.

TIMELINE OF SELECT SUPPLIERS OFFERING RETAIL-BASED CARE



Source: Publicly available company information.

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131

TREND 13: MORE PROVIDER COMPETITION

The Number of Home-Based Care Providers Has Grown

Healthcare provided in the home began over a century ago out of necessity. Consumer survey data indicates that it is preferable to in-office care due to convenience and cost.

TIMELINE OF SELECT SUPPLIERS OFFERING HOME-BASED CARE



Source: Publicly available company information.

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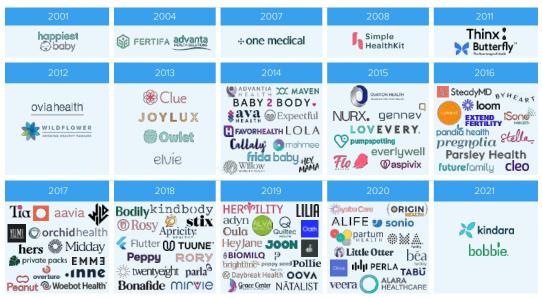
2022 HEALTH CARE PROGRAM

TREND 13: MORE PROVIDER COMPETITION

The Number of Women's Health Care Providers Has Grown

A space that was historically deemed "too niche" for significant investment, the number of women's health focused providers has increased since 2014.

TIMELINE OF SELECT SUPPLIERS OFFERING WOMEN'S HEALTH SERVICES



Source: Publicly available company information.

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133



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CONCLUSION

2022 Secular Trends Shaping the Health Economy



CONCLUSION: REDUCED YIELD

Changes in Supply and Demand Have Altered Healthcare

Nationally, non-COVID-related care is down 6%, urgent care utilization is up 31%, care is shifting from the inpatient to outpatient setting, there are more new entrants than ever before, and patients are facing high deductibles in an uncertain economy. Due to the combination of these factors, the healthcare status quo is no longer—the average patient is interacting with the healthcare system in a different way.

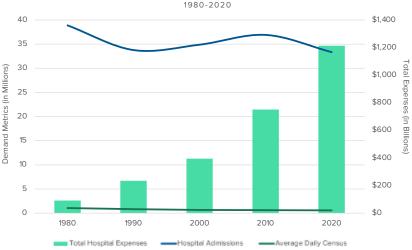
Demographic		Pre-Pandemic Status Quo	>>>	Post-Pandemic Reality	
	52-year-old woman	No primary complaint	Annual Wellness Visit with Established Provider		Delaying Care
Ť	65-year-old man	Knee osteoarthritis	Inpatient Knee Replacement	Contributing Factors	Outpatient Knee Replacement
†	12-year-old boy	Sore throat	Office Visit with Established Pediatrician	 Fear High Deductibles Lack of Provider Loyalty Consumer Preferences 	Urgent Care Visit
†	36-year-old woman	Anxiety	Office-Based Therapy		Telehealth Therapy with New Entrant
Ť	45-year-old man	Hypertension	Annual Cardiologist Visit		Delaying Care

CONCLUSION: REDUCED YIELD

The Paradox of Declining Demand and Rising Price Defies the Laws of Economics

As rising healthcare unaffordability becomes a greater concern for Americans in tandem with declining U.S. life expectancy, how much longer can the health economy get away with defying the laws of economics?





Source: Analysis of 2022 American Hospital Association data.

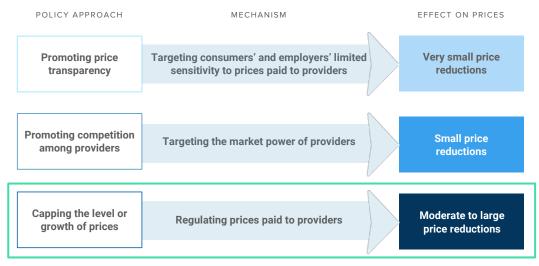
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37

CONCLUSION: REDUCED YIELD

Reducing Healthcare Spending Through Price Controls

Healthcare spending accounts almost 20% of U.S. GDP. The prices that commercial health insurers pay are much higher and are rising more quickly than the prices paid by public insurance programs. The CBO has developed a framework for how Federal legislation might address high commercial prices, which result from negotiations between private payers and hospitals or physician groups. While two of the three proposed approaches are familiar to health economy stakeholders, the CBO's proposal to cap commercial prices is one that would dramatically change the game for every stakeholder.



Source: Congressional Budget Office (CBO), Policy Approaches to Reduce What Commercial Insurers Pay for Hospitals' and Physicians' Services, 2022

CONCLUSION: REDUCED YIELD

The U.S. Government Is Exploring All Options to Reduce Costs

Recent policy analyses from the CBO signal a greater interest in tackling the cost curve and all options are on the table.

Patient-Driven Patient-Driven 1.7 -8.7 -0.2			CHANGE IN AVERAGE HOSPITAL PRICE PAID BY PRIVATE PLANS (%)	CHANGE IN HOSPITAL SPENDING (\$ BILLIONS)	CHANGE IN NATIONAL HEALTH SPENDING (%)	
Patient-Driven -1.4 -11.1 -0.3	PRICE TRANSPARENCY - VERY SMAL	L PRICE REDUCTIO	NS			
A3% Shoppable Services	34% Shoppable Services	Detient Driver	-1.7	-8.7	-0.2	
Median Price Employer-Driven -4.7 -26.6 -0.7 INCREASED COMPETITION – SMALL PRICE REDUCTIONS Small Price Response -1.6 -9.9 -0.3 Medium Price Response -3.1 -19.7 -0.5 Large Price Response -11.2 -68.9 -1.9 CAPPED RATES IN ALL PRIVATE PLANS – MODERATE -43.2 -246.4 -6.8 125 -30.8 -178.5 -4.9 150 -8 Medicare Rates -20.5 -119.1 -3.3 175 -72.8 -2.0	43% Shoppable Services	Patient-Driven	-1.4	-11.1	-0.3	
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1,500 -3.1 -19.7 -0.5 -19.7 -0.5	Small Price Response		-1.6	-9.9	-0.3	
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150 % of Medicare Rates -20.5 -119.1 -3.3 175 -12.7 -72.8 -2.0	100		-43.2	-246.4	-6.8	
150 Rates -20.5 -119.1 -3.3 175 -12.7 -72.8 -2.0	125		-30.8	-178.5	-4.9	
175 -12.7 -72.8 -2.0	150		-20.5	-119.1	-3.3	
200 -7.6 -42.7 -1.2	175		-12.7	-72.8	-2.0	
	200		-7.6	-42.7	-1.2	

CBO estimates that 1% decrease in prices could lead to a **DECLINE** in total spending on commercial health insurance premiums by \$13B by 2032.

Source RAND Corporation Impact of Policy Options for Reducing Hospital Prices Paid by Private Health Plans

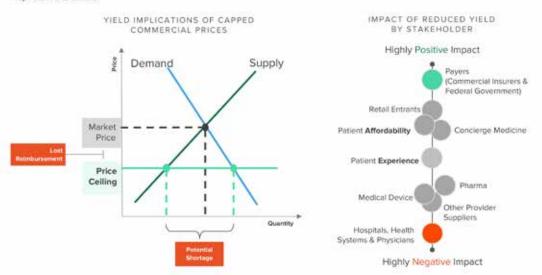
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39

CONCLUSION: REDUCED YIELD

What if Yield Is Arbitrarily Flattened With a Price Ceiling?

A government may implement a price ceiling if it thinks that people need a particular good to live, and that the market price for that good is too high. Because healthcare is not a perfect market, a commercial price ceiling would definitely reduce the per episode reimbursement received by hospitals and providers, and it might lead to increased patient demand in select services. With the CBO's recent analyses to cap commercial prices, every stakeholder must consider and prepare for the implications of reduced yield in a post-pandemic health economy. While every stakeholder would be affected, payers will inevitably come out on top relative to others.



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Study Data

A variety of data sources were leveraged as part of this research, with most insights gleaned from Trilliant Health's proprietary datasets with visibility into patients and providers across the country. Trilliant Health's national all-payer claims dataset combines commercial, Medicare Advantage, traditional Medicare, and Medicaid claims, which provides a nationally representative sample accounting for more than 300M American lives on a deidentified basis. Trilliant Health's consumer dataset includes a range of psychographic (e.g., behaviors, preferences), demographic, social determinants (e.g., broadband), and lifestyle (e.g., wearable) data, inclusive of variables sourced from Choreograph and ESRI. Trilliant Health's proprietary Provider Directory enables a direct view into providers and their practice patterns.

Certain trends exclude traditional Medicare claims due to limitations in time period alignment attributed to data release schedules from the Centers for Medicare and Medicaid Services (CMS). In other analyses, traditional Medicare volume is imputed for Q1 of 2022. Traditional Medicare volume was imputed by multiplying the volume from the previous quarter by the average quarterly growth rate between Q1 and Q3 2021. Additional data were obtained from a variety of publicly available sources (and are noted in respective source notes), including individual health system, health plan, and company financial statements, Census Bureau, Kaiser Family Foundation, the Congressional Budget Office, Commonwealth Fund, American Hospital Association, Centers for Disease Control and Prevention, and the Association of American Medical Colleges.

Most data are presented with a national view, while some were exclusively focused on counties or the largest markets – defined as the Core-Based Statistical Areas (CBSAs) – to illustrate local variation. This research does not include data from self-pay encounters or encounters provided at no cost through commercial insurers. Data for Q2 2022 was excluded due to lack of claims completeness at the time of analysis.

2022 TRILLIANT HEALTH

METHODOLOGY

Analytic Approach

DATA SOURCE	FEATURE	CATEGORY	DESCRIPTION	
TRILLIANT HEALTH NATIONAL ALL-PAYER CLAIMS DATABASE	Volume	Inpatient	Visits associated with medical and surgical care delivered inpatient on the campus of a hospital, reflective payers.	
		Outpatient	Visits associated with medical and surgical care delivered in the outpatient setting, separating care delivered on the campus of a hospital and in non-hospital settings, reflective of all payers.	
		Primary Care	Visits with providers characterized as general practice, family, internal, geriatric, adolescent, and pediatric medicine, excluding hospitalists, reflective of all payers.	
		Behavioral Health	Visits categorized into the Major Diagnostic Categories 19 (Mental Diseases and Disorders) and 20 (Alcohol/Drug Use & Alcohol/Drug Induced Organic Mental Disorders), reflective of all payers.	
		Urgent Care	Visits delivered at medical facilities where the site of service was identified as urgent care, reflective of all payers.	
		Women's Health	Office-based evaluation and management visits for the purposes of preventive and/or acute women's healthcare, reflective of all payers.	
		Telehealth	Synchronous audio-video, audio-only, chat-based and asynchronous chat-based and store-and-forward encounters, delivered off the campus of a hospital, reflective of all payers.	
		Home Health	Visits delivered at a patient's home with the place of service categorized as home health, reflective of all payer	
		COVID-19	Visits associated with the prevention, testing, treatment, or immunization of COVID-19.	
	Competition	Herfindahl-Hirschman Index (HHI)	The Federal government utilizes the HHI as the standard measure of market concentration. HHI is calculated by squaring the market share of each firm competing in a market and then summing the resulting numbers. It approaches zero when a market is occupied by several firms of relatively equal size and reaches its maximum value (10,000) when a market is controlled by a single firm (i.e., monopoly). HHI increases both as the number of firms in the market decreases and as the disparity in size between those firms increases. The U.S. Department of Justice (DOJ) and Federal Trade Commission (FTC) generally consider markets in which the HHI is between 1,500 and 2,500 points to be moderately concentrated and consider markets in which the HHI is in excess of 2,500 points to be highly concentrated. According to DOJ and FTC guidelines, "transactions that increase the HHI by more than 200 points in highly concentrated markets are presumed likely to enhance market power"	
	Pharmacy	Drug Categories	To provide a view of prescription drugs used to treat acute pain, chronic pain, chronic illnesses, infections, and behavioral health conditions, drug classes associated with the following were included in the analysis: Antibiotics, Antidepressants, Antianxiety, Statins, Opioids (including hydrocodone and oxycodone), Non-Steroidal Anti-Inflammatory Drugs (NSAIDs), Beta Blockers, and Thyroid Agents.	
		Tele-Prescribing	Prescriptions resulting from a telehealth visit within three days of an encounter, where the prescribing provider is also the telehealth provider.	

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Analytic Approach cont.

DATA SOURCE	CATEGORY	DESCRIPTION	
TRILLIANT HEALTH DEMAND FORECAST	Service Lines	As a proxy for total demand, the Demand Forecast analysis was limited to the 5 most common surgical service lines (Heart/Vascular, OB/GYN, Neuro/Spine, Orthopedic, and Digestive) given the contributory impact (in terms of volume and revenue for providers.	
	Confidence Intervals	Forecast outputs for the 25th and 75th incidence rate percentiles are shown to provide a broader understanding of potential outcomes. Unless noted otherwise, forecast projections account for the impact of COVID-19.	
	Five-Year CAGR	Forecasted compound annual growth rate of median incidence rate between 2022 and 2026.	
TRILLIANT HEALTH PROVIDER DIRECTORY	Primary Care Provider	Primary care providers (PCPs) per 100K were calculated using Trilliant Health's provider directory. We limited our definition of PCPs, solely including board-certified physicians, though acknowledge the role physician assistants and nurse practitioners serve in delivering primary care services. 2020 Census population was used to calculate a per 100K rate.	
	Behavioral Health Provider	Behavioral health providers (BHPs) per 100K were calculated using Trilliant Health's provider directory. Our definition of BHPs includes board-certified psychiatrists, psychologists, behavioral therapists, social workers, psychiatric nurse practitioners, etc. 2020 Census population was used to calculate a per 100K rate.	
	Providers That Stopped Practicing	Providers (classified as board-certified physicians) with evidence of claims activity in 2019 who no longer had any claims activity as of 2022.	
	Providers That Started Practicing	Providers (classified as board-certified physicians) with evidence of claims activity in 2022 but did not have any claims activity in 2019.	
	Net Provider Change	The delta between providers that stopped practicing and providers that started practicing compared to the total board-cerphysician count in 2019.	
	Changed Practice Location	The primary address that a provider performed E&M services in 2019 was different than the primary address where the provider performed these services in 2022, excluding telehealth visits.	
	Changed Provider Organization	Instances where the billing organization is different for a provider in 2019 compared to 2022 for E&M services.	

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METHODOLOGY

Commonly Used Acronyms

AAMC: Association of American Medical Colleges

BHP: Behavioral Health Provider
CAGR: Compound Annual Growth Rate
CBSA: Core-Based Statistical Area
CBO: Congressional Budget Office

CDC: Centers for Disease Control and Prevention **CMS:** Centers for Medicare and Medicaid Services

CPT: Current Procedural Terminology
E&M: Evaluation & Management
FDA: Food & Drug Administration

HCRIS: Healthcare Cost Report Information System

HHI: Herfindahl-Hirschman Index

ICD-10: International Statistical Classification of Diseases and Related Health Problems

IP: Inpatient

M&A: Mergers and Acquisitions **MA:** Medicare Advantage

MedPAC: Medicare Payment Advisory Commission **MS-DRG:** Medicare Severity Diagnosis Related Groups

OECD: Organization for Economic Co-operation and Development

OP: Outpatient

PCP: Primary Care Provider

Rx: Prescription

TAM: Total Addressable Market

9 2022 TRILLIANT HEALTH 14

METHODOLOLGY

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Distilling more than 70B claim lines, which account for more than 300M lives, into longitudinal data insights is no easy feat. The tremendous efforts of our colleagues in data science and engineering built the foundation upon which we could conduct an analysis of this scale with precision and speed. A special thanks to Grant Anderson, Dimitri Boursinos, Jim Browne, Matt Eby, Kris Enloe, Chris Hebert, Matt Ikard, Cole McKenna, Porter Morton, Chris Rash, and Jamie Supica for their data curation and analytic support.

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2 2022 TRILLIANT HEALTH 146



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healthcare organizations to help improve patient care, reduce costs, increase revenue, and reduce risk.

OMNImed™ SmartOR is just one example of this. OMNImed is a smart operating room that leverages Al, machine learning, Internet of Things (IoT) and computer vision to monitor and document every aspect of a procedure. It can track up to 10 million data points per minute. The goal with this technology is to reduce infections post-surgery.

Al and Machine Learning have been just within reach for a while now. However, with a shortage of data scientists, organizations don't always know where to get started, can't get an ROI quick enough, and once their AI/ML is operational, they don't have the technology to manage and monitor the models. Fortunately, there is a solution to help bridge the gap to these needs.

Here are 5 questions that leaders at healthcare organizations should be asking themselves to help increase revenue, reduce cost and reduce risk within production and planning:



CUSTOMER NEED

1. How can we help improve our procedures for identifying patients who are most at risk of 30day readmission?

BUSINESS IMPACT

According to Kaiser Health News, 9 in 10 general acute-care hospitals have been penalized at least once in the past decade for readmissions.

Reporting based on data from the Centers for Medicare and Medicaid Services shows over the lifetime of the program, 2,920 hospitals have been penalized at least once. That's 93% of the 3,139 general acute hospitals subject to HRRP evaluation, and 55% of all hospitals. Moreover, 1,288 have been punished in all 10 years.



CUSTOMER NEED

2. Are we accurately predicting length of stay (LOS) for patients at admission stage?

BUSINESS IMPACT

The average insured overnight hospital stay costs about \$11,700 and every extra day a patient is at a hospital is a day that a new patient can't be treated.

There is a need to help improve patient outcome by more accurately predicting a patient's (length of stay) LOS at the admission stage. According to the Journal of Healthcare Engineering, researchers were correctly able to predict with 88.31% to 91.53% accuracy the LOS at the preadmission stage for patients with coronary atherosclerosis (CAS) by using an artificial neural network.



3. What can we do to help improve medication adherence among our patients in order to reach compliance with value-based care initiatives? Can we identify a patient's likelihood to admit at the triage stage to adhere with our value-based care policies?

BUSINESS IMPACT

According to a study done by CDC, medication nonadherence is associated with higher rates of hospital admissions, suboptimal health outcomes, increased morbidity and mortality, as well as increased health care costs. In the United States, of the 3.8 billion prescriptions written annually, approximately 20% of the new prescriptions are never filled, and among those filled, approximately 50% are taken incorrectly. Direct health care costs associated with nonadherence have grown to approximately \$100-\$300 billion of US health care dollars spent annually.



CUSTOMER NEED

4. Is there a way to forecast incoming inpatient volume at our hospitals to improve staffing on hospital floors?

BUSINESS IMPACT

60% of hospital operational cost comes from staffing. There is a need to help improve patient care by adequately staffing hospital floors by predicting expected incoming patient volume -

Currently most hospitals use historical averages to forecast expected number of incoming patients. Such forecasts are used to staff hospital floors for the coming day/week/month. According to a study done by researchers at Northwestern University, AI/ML forecasting models outperformed the historical average-based approach by reducing Mean Absolute Percentage Error (MAPE) from 17.2% to 6% in one day ahead forecast and to 8.8% MAPE in a month ahead forecast.



CUSTOMER NEED

5. During which days/times should we double or triple book our outpatient appointments to minimize downtime for our doctors?

BUSINESS IMPACT

There is a need to reduce staff downtime by predicting which outpatient appointments will be cancelled - According to a study published by National Institute of Health, on average, 18.8% of the outpatient appointments are cancelled at the last minute. The cancellation rate was as high as 27% in some cases. According to the same study each cancelled appointment cost the provider \$254.

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Faculty

Hal Andrews is president and CEO of Trilliant Health in Brentwood, Tenn., and has more than 25 years of experience as an entrepreneur, executive and investor. He has served as the president and CEO of Trilliant Health since its founding in June 2017, and he currently serves on the board of directors of Trilliant Health and Mployer Advisor and on the board of advisors for the Nashville Capital Network. Mr. Andrews previously served in executive roles at Aegis Health Group, Digital Reasoning, Shareable Corp., Availity, LLC, RevPoint Healthcare Technologies, Martin Ventures and Data Advantage. Additionally, he previously served on the board of directors of AccuReg, Aegis Health Group, Ascender Software, CareTeamConnect, Leadership Healthcare, Lincor Solutions, Medify, Nashville Health Care Council, Shareable Corp. and RevPoint Healthcare Technologies. Mr. Andrews began his career as an attorney with Waller Lansden Dortch and Davis. He received two undergraduate degrees from Southern Methodist University and his J.D. from the University of Tennessee.

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the Turnaround Process for Healthcare Organizations" was featured as the lead article in the *Journal for Corporate Renewal*, the flagship publication of the Turnaround Management Association. Mr. Shill is a steering committee member of BDO International's Public Sector practice, which is made up of the health care, education, social welfare, and local and central government practices for BDO offices across the globe. He is a member of the American Institute of Certified Public Accountants, California Society of Certified Public Accountants and the Healthcare Financial Management Association's Southern California Chapter. Mr. Shill received his B.S. in commerce from the University of Witwatersrand in South Africa and a post-graduate Honors Degree in accounting science from the University of South Africa.

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