

How closed system, multi-source data can drive in-depth evidence and insights in a post-pandemic world

—
IBM Watson Health

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ISPOR Educational Symposium



Team Introduction

Luke Boulanger, Lead Product Manager, IBM MarketScan Research Databases

Examination of a closed claims database to understand the impact of health plan design on service utilization

Brenna Brady, Practice Leader, Life Sciences Health Economics Outcomes Research (HEOR)

Understanding differences in the impact of the COVID-19 pandemic on patients with chronic conditions

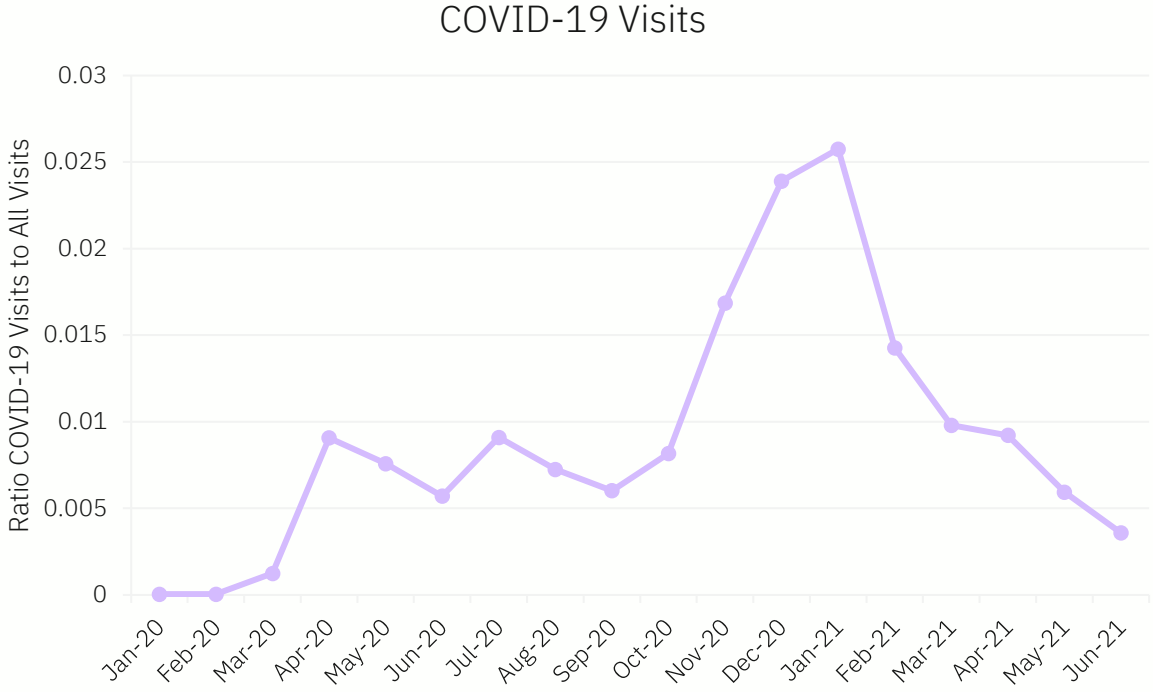
Brandi Hodor, Senior Analytic Advisor, Offering Manager PULSE Healthcare Survey

-Utilizing social determinants of health and patient reported outcome data to gain a deeper understanding of patient healthcare decisions and management

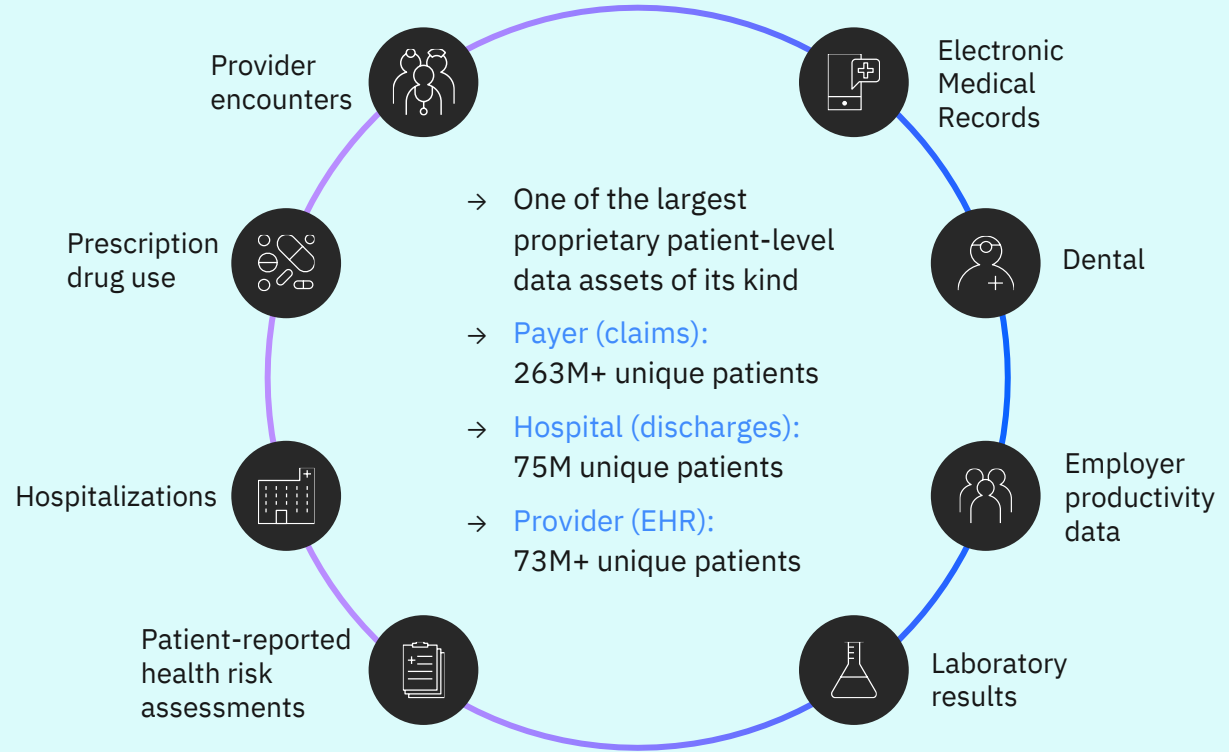
Caleb Alexander, Professor of Epidemiology and Medicine at the Johns Hopkins Bloomberg School of Public Health

Successes and challenges for the current and post-pandemic US healthcare system

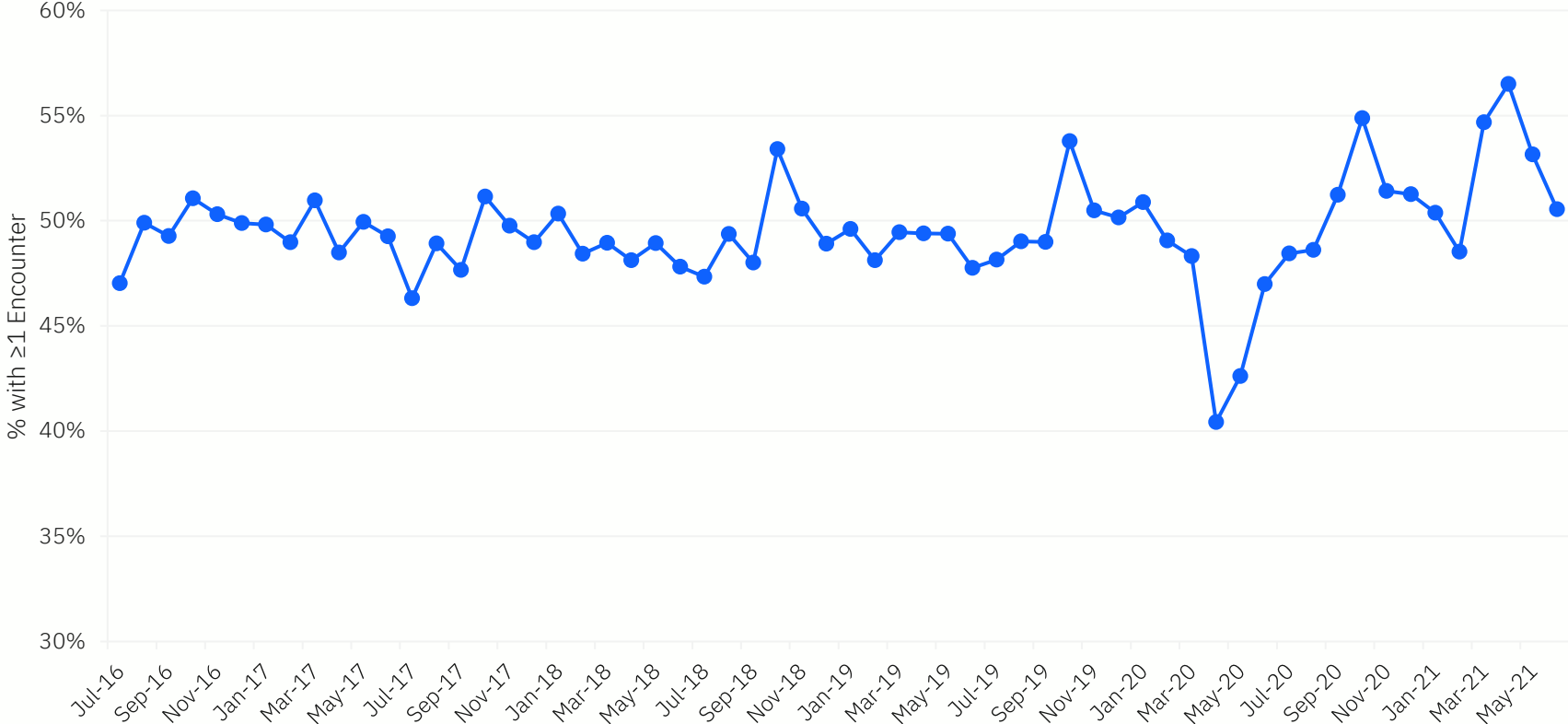
The rise of COVID-19 has had a dramatic impact on our day to day lives as well as health management



Leveraging IBM real-world data to understand how COVID-19 changed the full patient experience

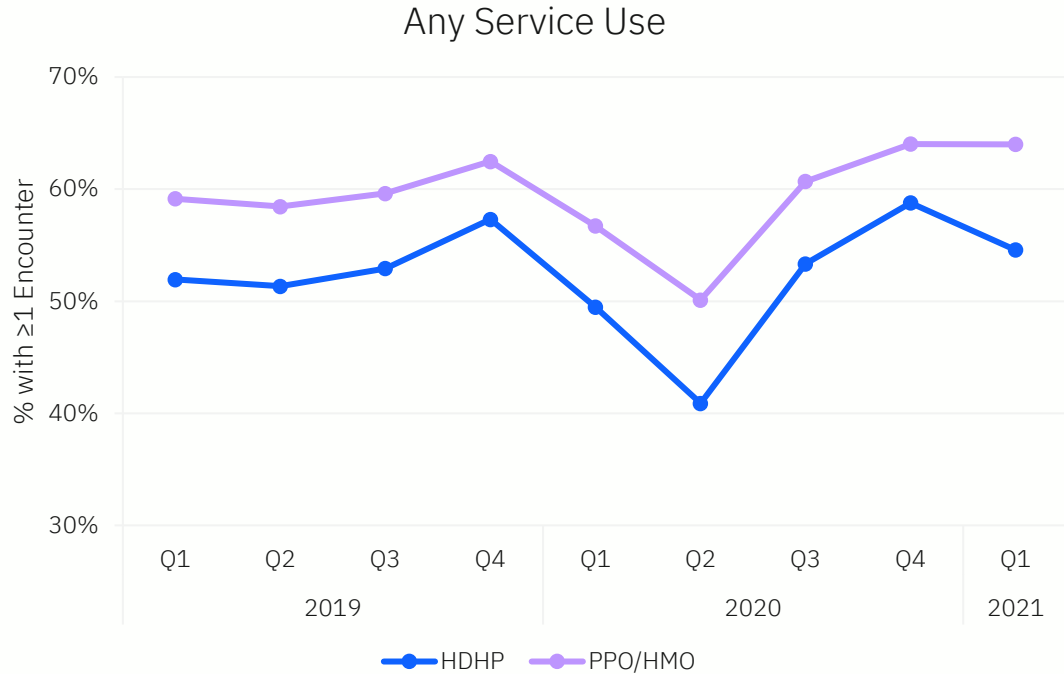


Patients reduced their utilization of healthcare services during the pandemic



Data from the MarketScan Commercial and Medicare Database

Resource utilization patterns vary across plan types



Differences in health plan design and benefits have always influenced patient resource patterns

- Historically, patients with HDHP plans tended to exhibit less resource utilization than patients on HMO or PPO plans
- Changes to perceived risk and service accessibility during the pandemic may have impacted patients similarly, regardless of health plan type

Differences in service use based on plan type diverge based on site of care

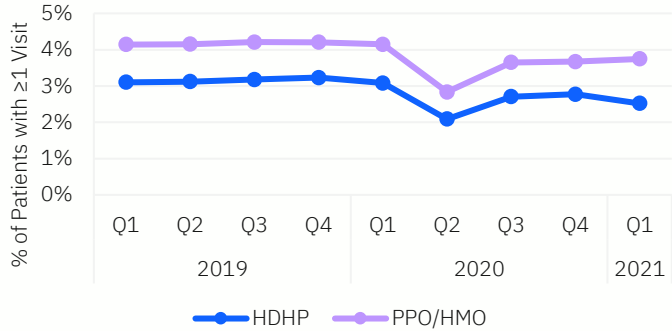
- Outpatient visit rates are more similar between patients with HDHP vs. PPO/HMO insurance compared to higher cost services such as inpatient admissions or ER visits

Alterations were observed in all sites of care

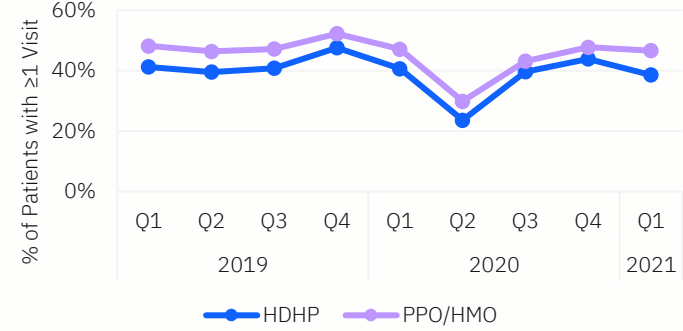
Inpatient



Emergency Room



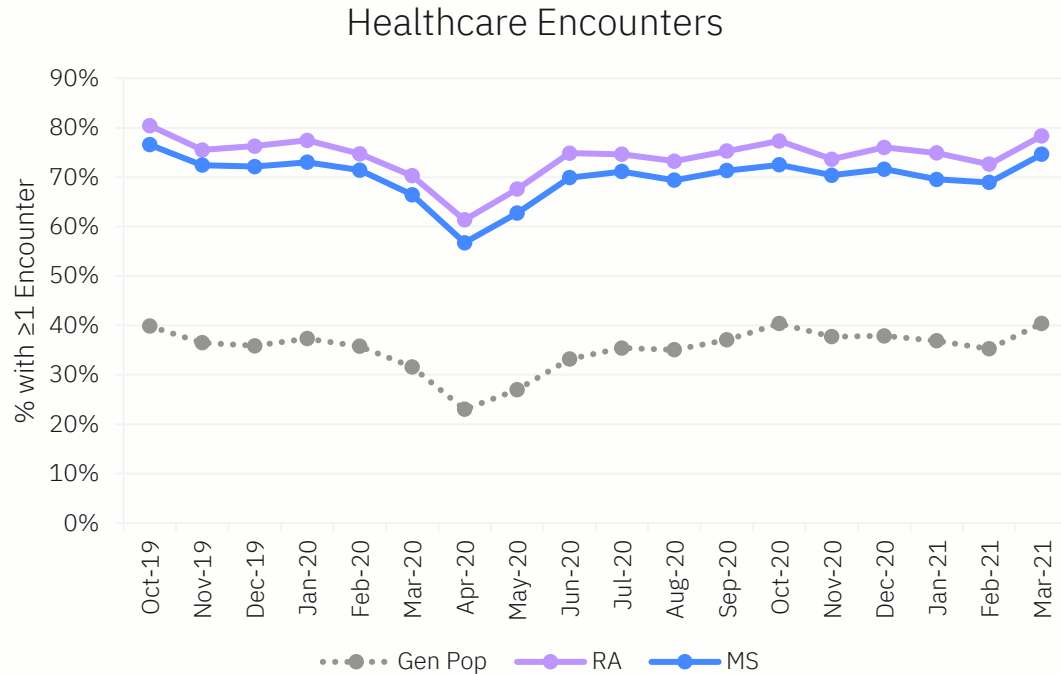
Outpatient Visits



The role chronic conditions play in healthcare management patterns

How has the pandemic impacted patients with chronic disease?

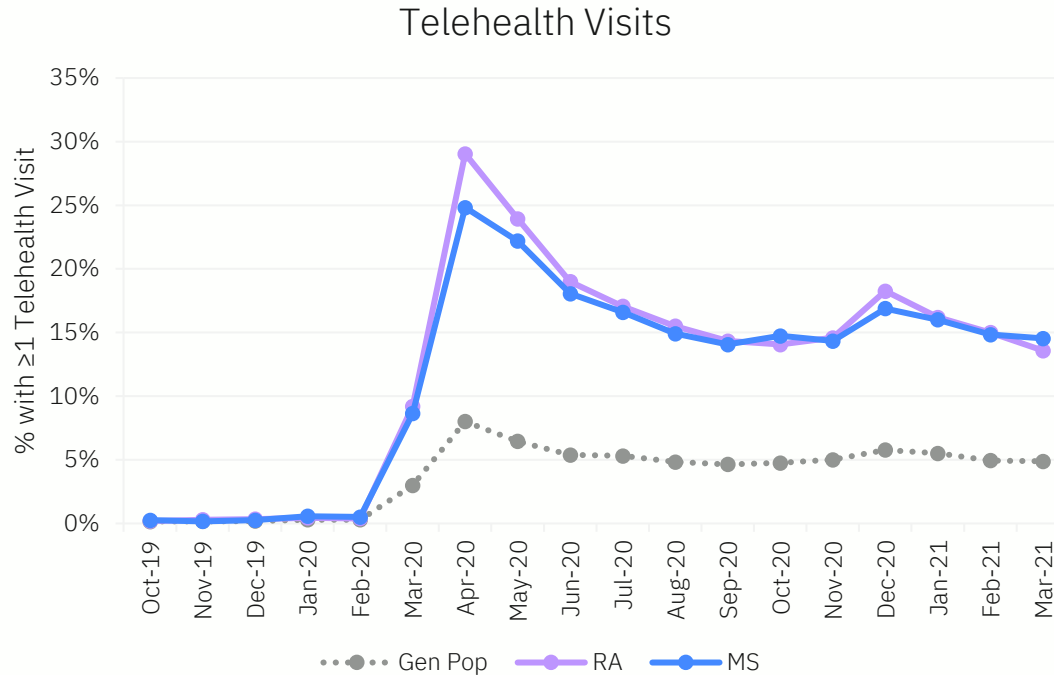
Understanding service use across conditions



How did the pandemic impact patients with chronic conditions exhibit differential patterns of service use compared to the general population?

- Were patients with risk factors less likely to seek out care?
- Compared to October 2019 service use in April 2020 declined:
 - General population: 42%
 - RA patients: 24%
 - MS patients: 26%
- Were patients' disease management practices impacted by reduced access to care?

In contrast, telehealth emerged during the pandemic

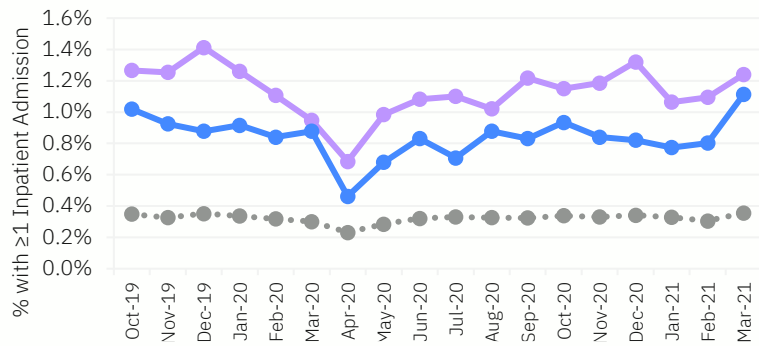


Telehealth services allowed patient provider interaction without risks associated with in office visits during social distancing

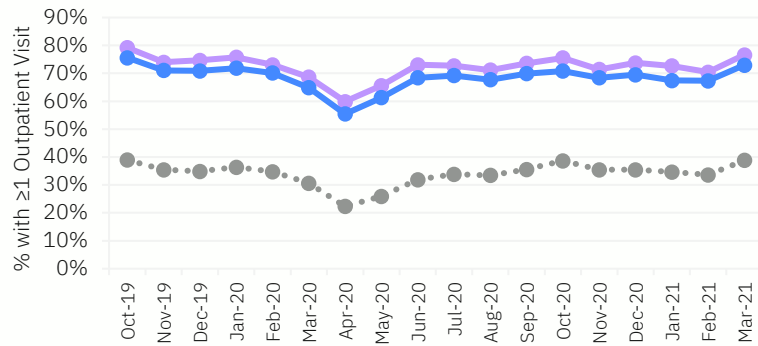
- Utilization of telehealth exploded in late Q1 2020
- Compared to October 2019 the number of patients with at least one telehealth visit rose dramatically in April 2020:
 - General population: >50-fold
 - RA patients: >150-fold
 - MS patients: >90-fold
- We are seeing declines in telehealth use over time, but will it persist as an alternative care option?

Reductions in 'regular' resource utilization were primarily observed at in person services

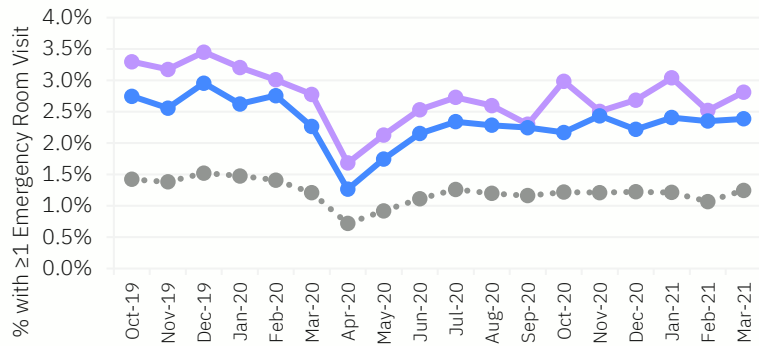
Inpatient Admissions



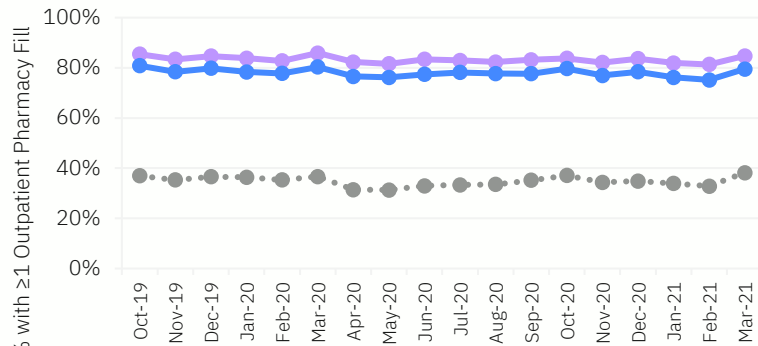
Outpatient Visits



Emergency Room Visits



Pharmacy Fills

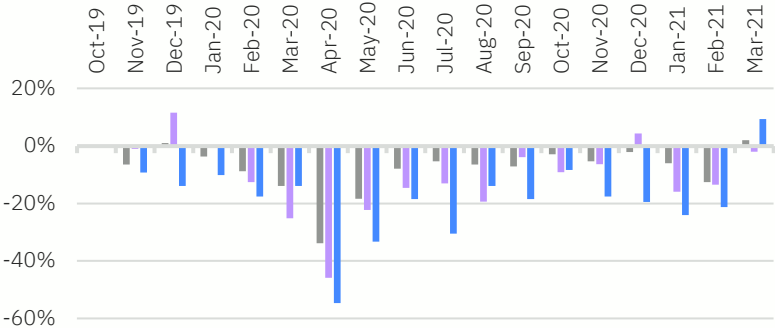


●●● Gen Pop ●— RA ●— MS

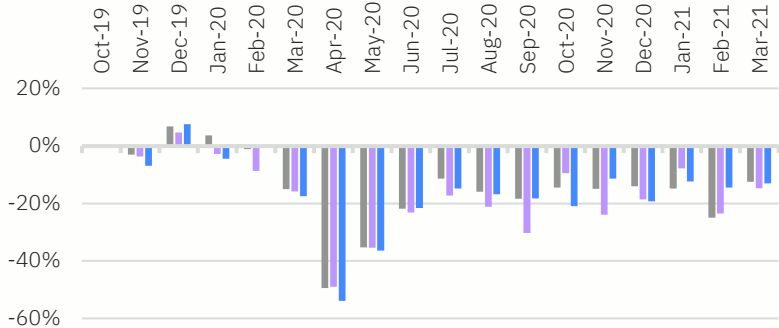
●●● Gen Pop ●— RA ●— MS

Patients with chronic conditions were less likely to forgo preventative healthcare

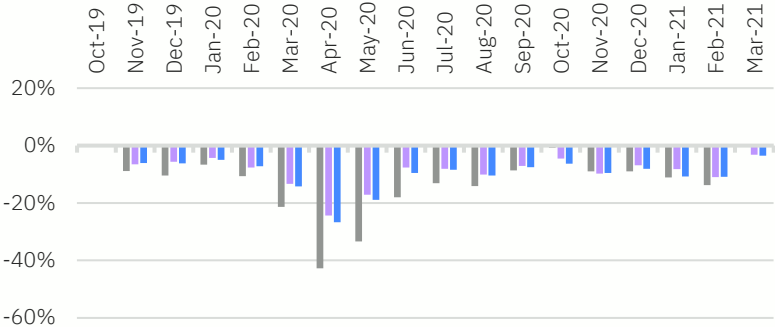
Change in Inpatient Admissions



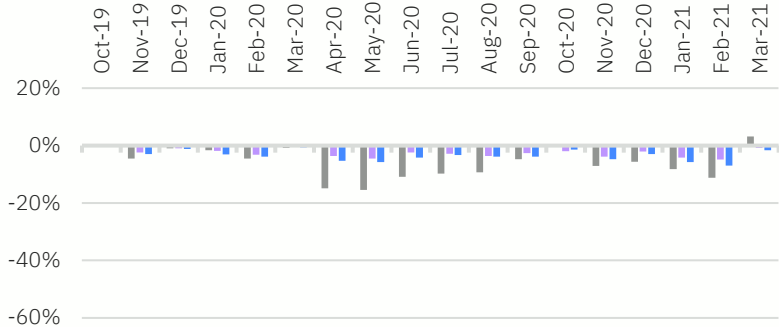
Change in Emergency Room Visits



Change in Outpatient Visits



Change in Pharmacy Fills



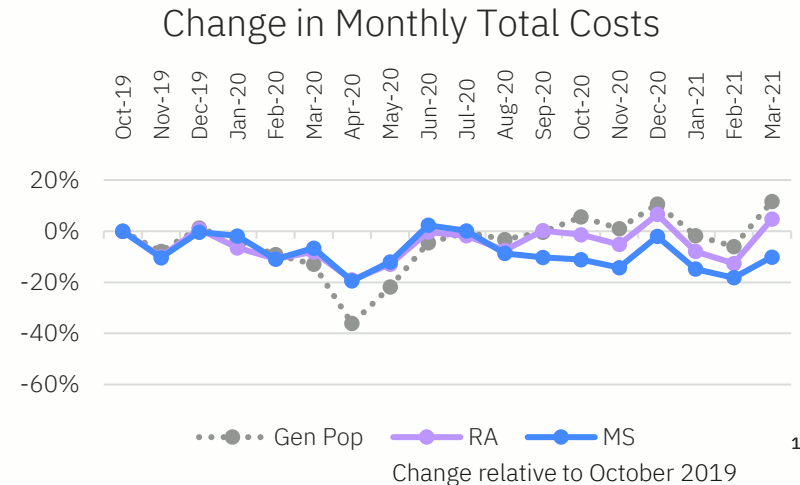
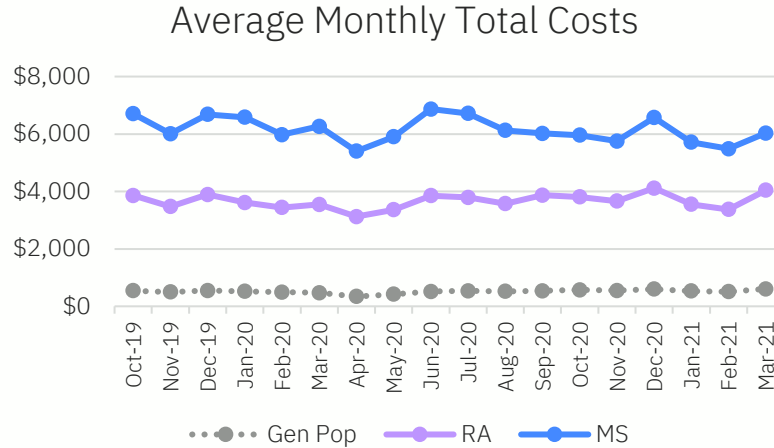
■ Gen ■ RA ■ MS

■ Gen ■ RA ■ MS

Alterations in healthcare use led to reductions in monthly spending

As expected, reductions in healthcare resource utilization during the COVID era resulted in reduced healthcare costs

- However, total cost trends were not as dramatic as healthcare resource utilization trends
- Consistent with patients with chronic conditions continuing to use services, the general population had greater swings in monthly total healthcare costs during the pandemic

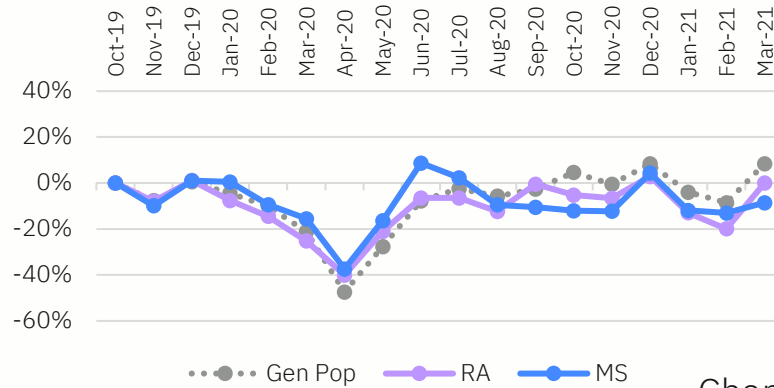


Ongoing prescription use mitigated reductions in total healthcare costs

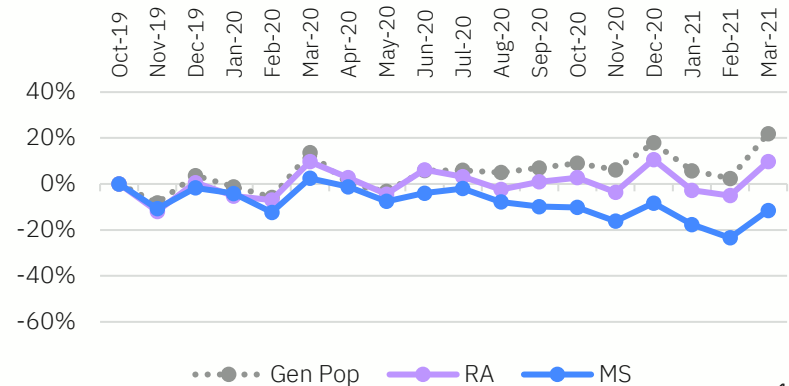
Notable decreases in monthly medical costs were observed in Q2/Q3 of 2020 consistent with reductions in healthcare resource utilization

- Pharmacy costs were far more stable during this period, leading to the more limited reductions in total costs observed
- Decreasing pharmacy costs in the MS population towards the end of the study period are partially due to slight decreases in the proportion of patients with ≥ 1 pharmacy fill over that period
 - October 2019: 80.8%
 - February 2021: 75.2%

Change in Monthly Medical Costs



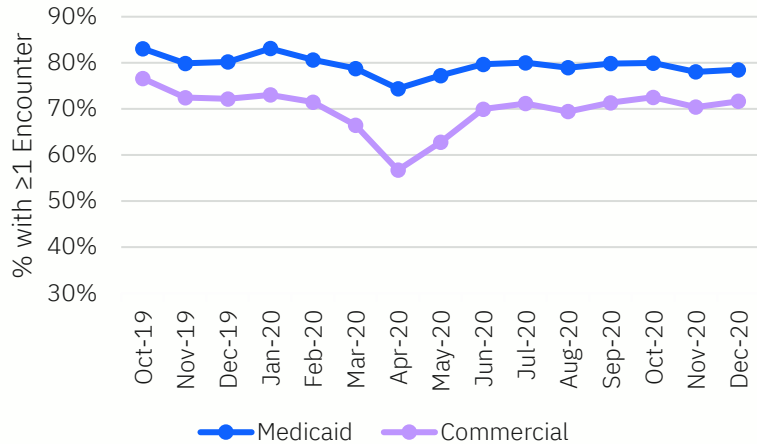
Change in Monthly Pharmacy Costs



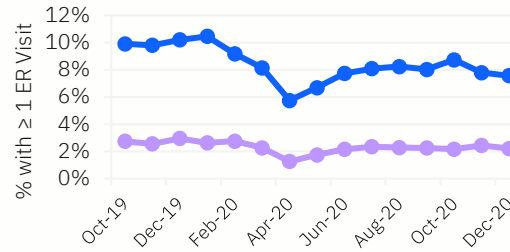
All change relative to October 2019

MS patient resource use varies with insurance

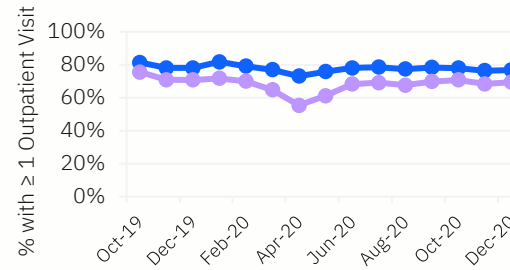
Healthcare Encounters



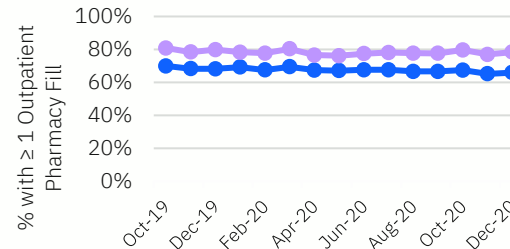
Emergency Room Visits



Outpatient Visits



Pharmacy Fills

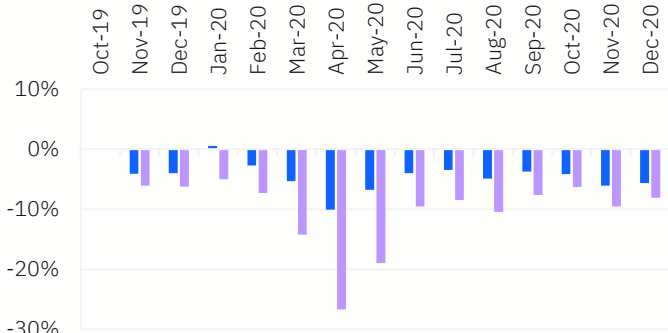


The pandemic has also increased awareness of health equity by highlighting challenges in patient's access to care

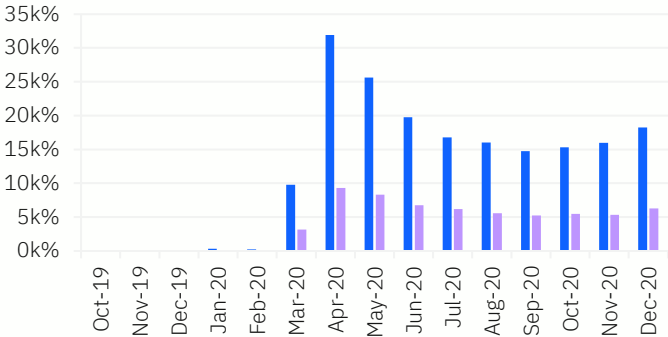
- MS patients insured through commercial or Medicaid plans have always demonstrated different levels of resource use
 - Medicaid patients generally demonstrate higher resource use compared to commercial patients
 - The exception is in the outpatient pharmacy setting

Medicaid patients maintained preventative care routines and embraced telehealth

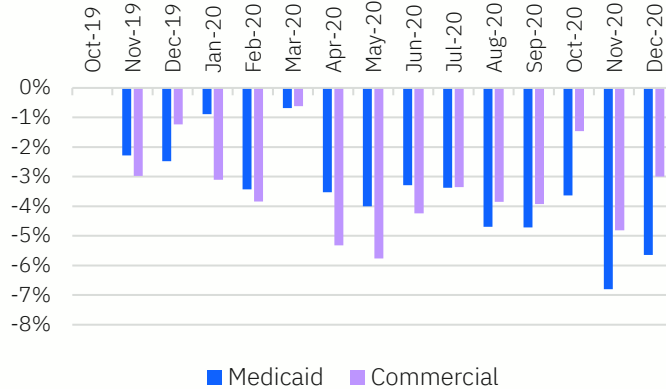
Change in Outpatient Visits



Change in Telehealth Visits



Change in Pharmacy Fills



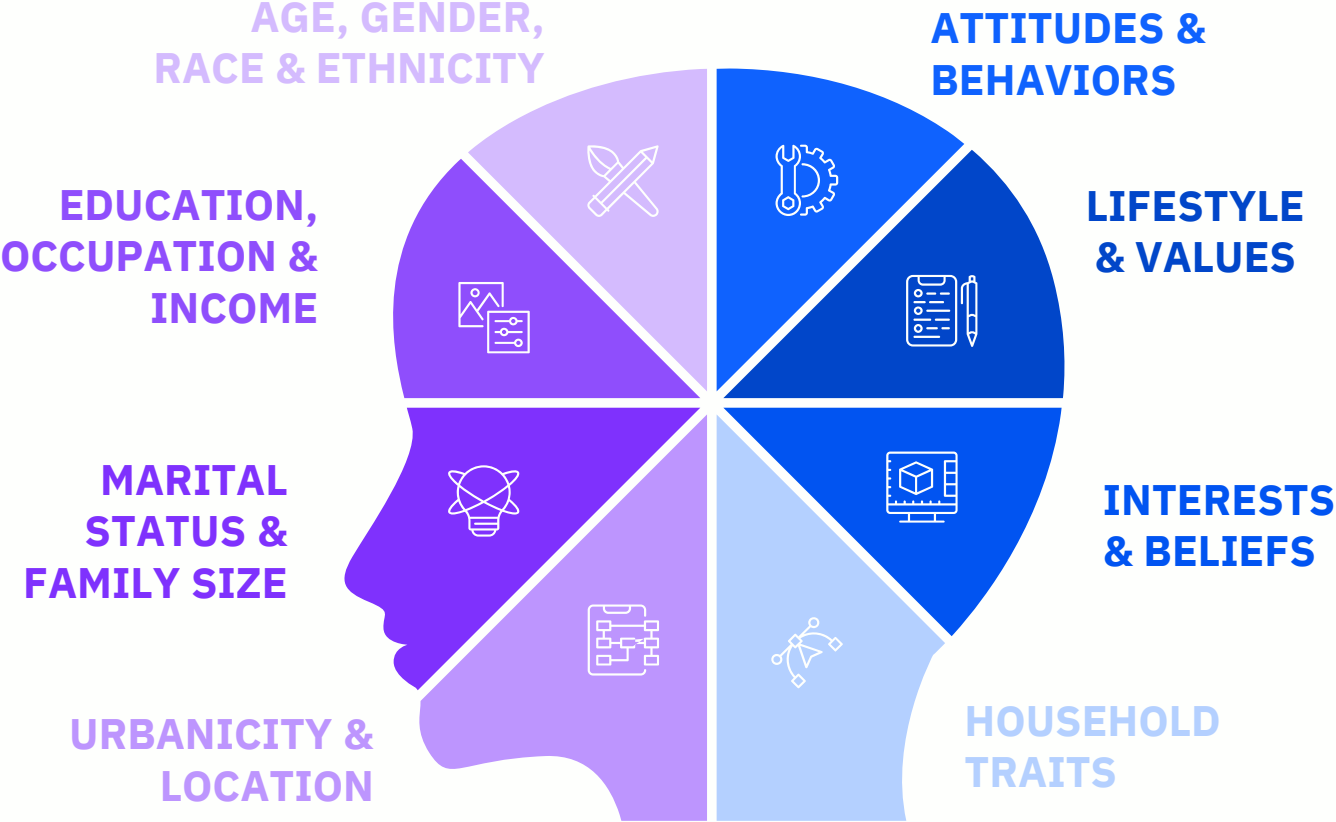
MS patients with Medicaid insurance had notably reduced decreases in monthly outpatient visits compared to commercial patients during the pandemic

- It remains to be seen if this will translate into improved disease control and reduced progression in the long-term
 - Medicaid MS patients also embraced telehealth as a new method for provider interaction
 - Although Medicaid patients kept up with outpatient pharmacy fills initially, a lag in the proportion of patients with a monthly fill started to lag towards the end of 2020

Health behaviors and social determinants of health

Lessons from the PULSE survey and PRIZM segments

Household Psychographic Segmentation



PULSE® Healthcare Survey

- **60,000+** households surveyed each year since 1988
- Insights on consumer healthcare behaviors, utilization and attitudes

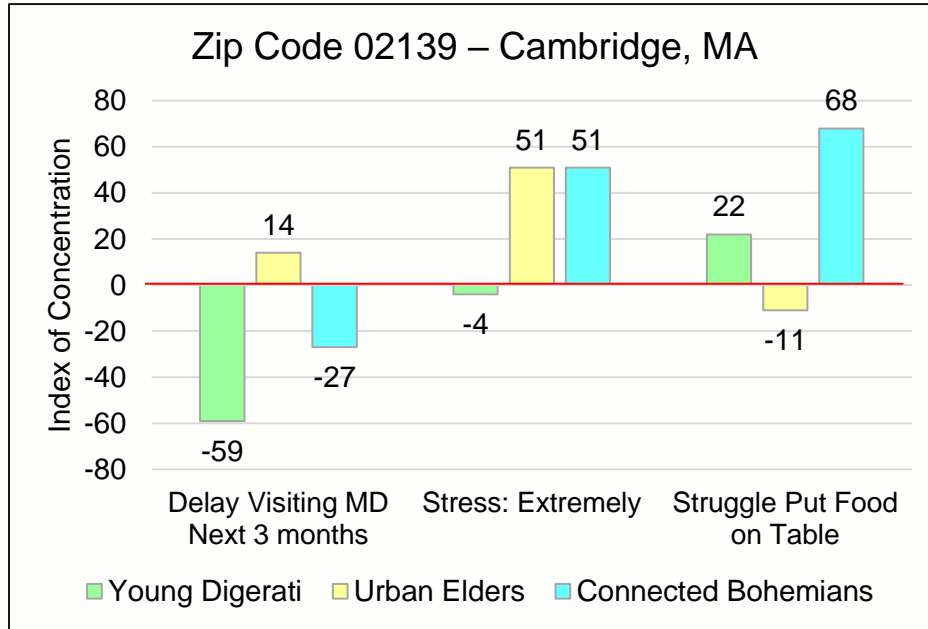
Claritas PRIZM® Premier Segmentation

- Industry leading consumer segmentation system
- Defines every U.S. household as one of 68 demographic behavior types

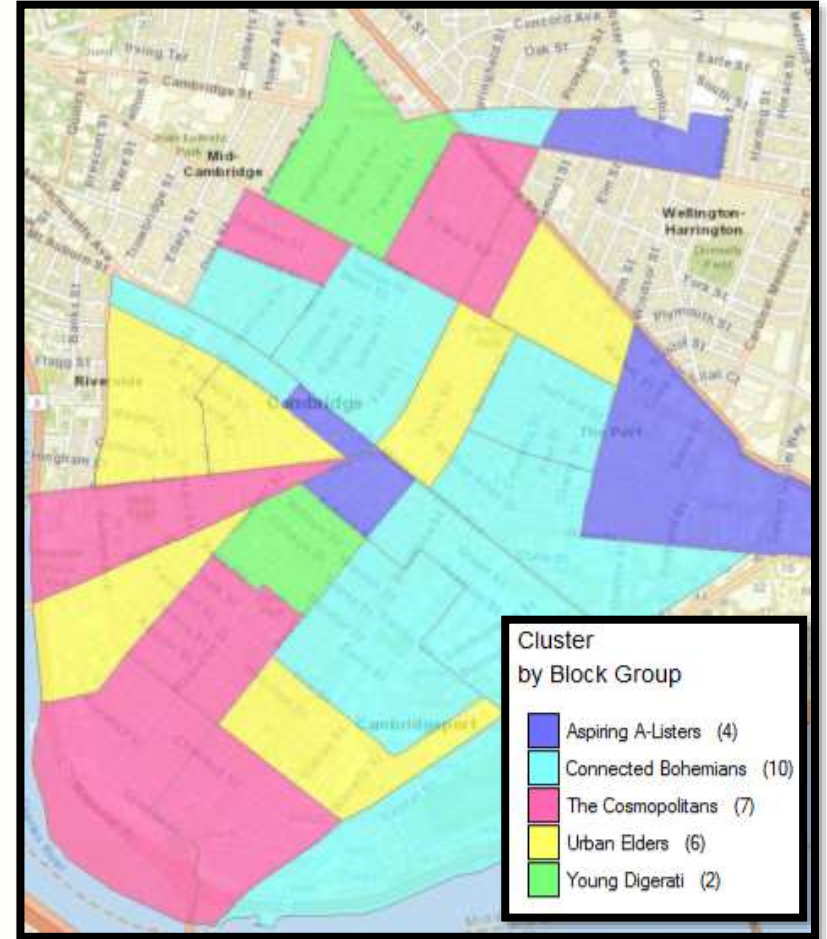
- ✓ How hard is it for you to **pay for the very basics** like food, housing, medical care and heating?
- ✓ How often do you feel **depressed**? Have recent events in your life caused you to feel depressed?
- ✓ How **stressful** is your life? How effective are you at **dealing with stress**?
- ✓ Have you used **telemedicine**? Would you be willing to use telemedicine?
- ✓ For the most recent visit to a primary care physician, approximately how many **miles were traveled**, one way, to visit the physician? To visit a specialty care physician?
- ✓ In the past 12 months, have you **avoided** getting any kind of healthcare? What was the **main reason for avoiding** healthcare?
- ✓ How would you describe your **home life**? How would you describe your **living situation**?

Targeting Engagement

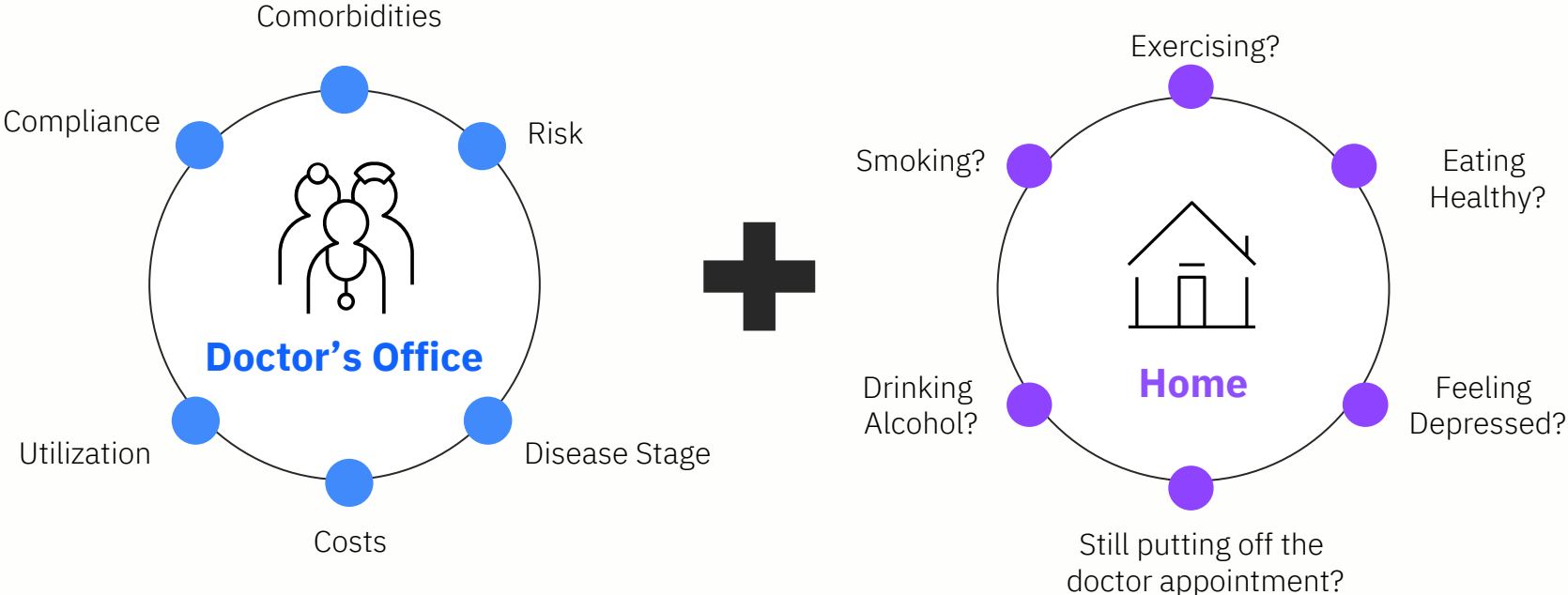
→ Socio-demographic data allows us to understand behaviors, preferences and lifestyles that members are “more likely to have” based on household location.



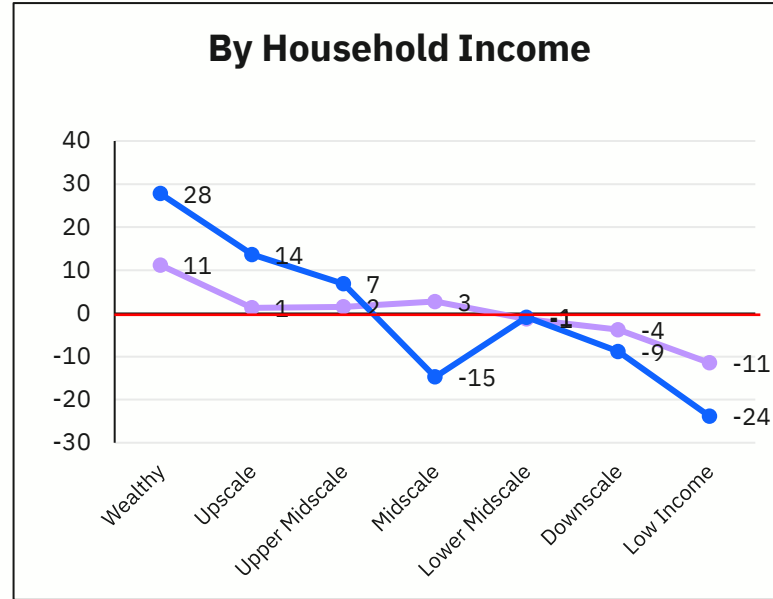
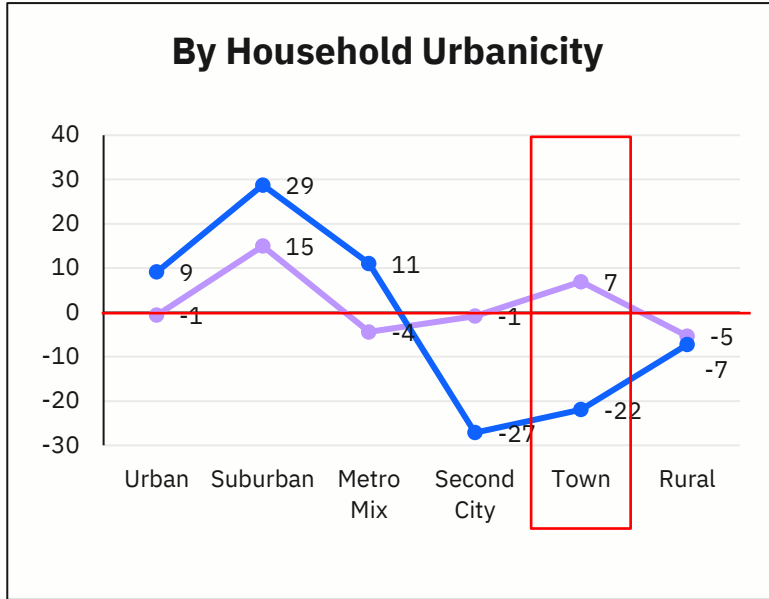
Index of Concentration: 0 = Average Utilization for the Local Market.



Socio-demographic data provides insight into the population's Social Determinants of Health



Rural & lower income areas less likely to get vaccines



More Likely

Average

Less Likely

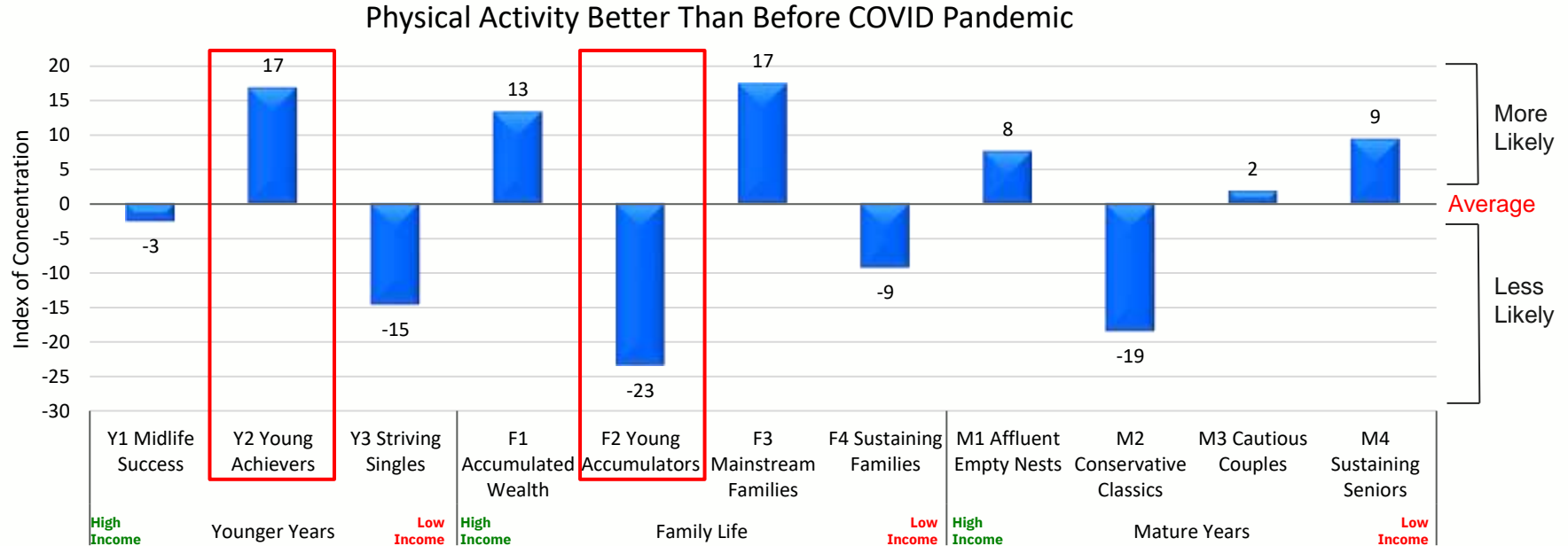
Received Flu Vaccine in Past 12 Months

Will Get COVID Vaccine When Available

IBM Watson Health PULSE® Survey July 1-15, 2020 (n 3,003; error +/-1.8%)

Habits during early COVID

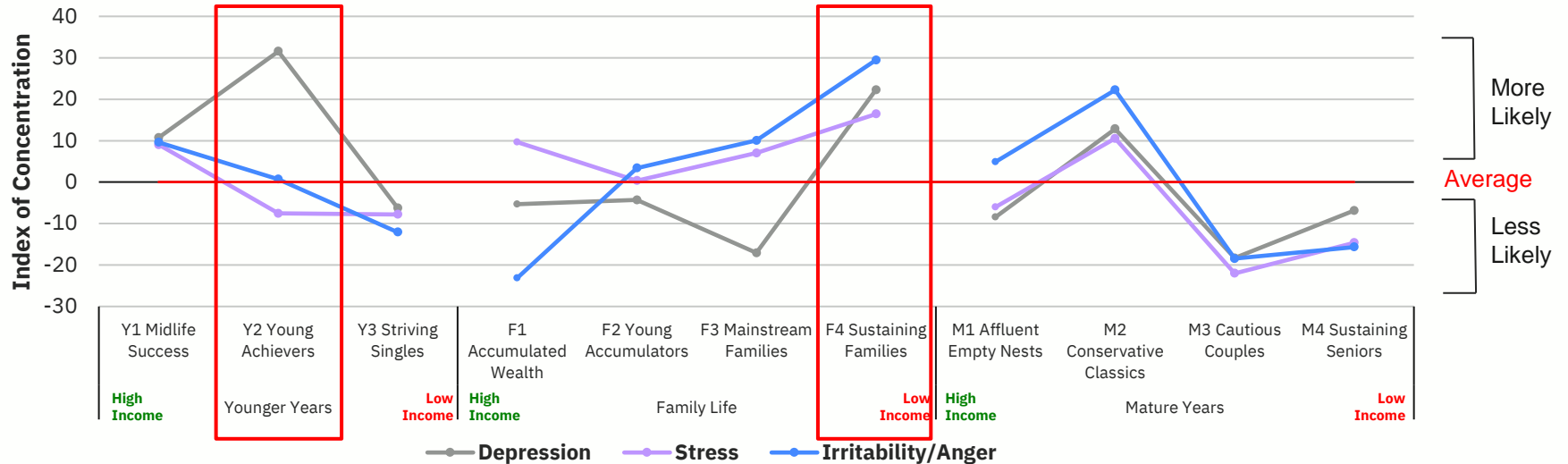
Most groups saw an improvement with physical activity in the first few months of COVID with the Young Accumulators and the Conservative Classics seeing the least improvement. Striving Singles also did not see physical activity improve as great as the Young Achievers that are in the next tier up from them.



Feelings Experienced During COVID Pandemic

The younger, middle-income population was the group most likely to experience depression during the early COVID months, while we saw the lower income families and the middle-income older households the most likely to experience stress and anger.

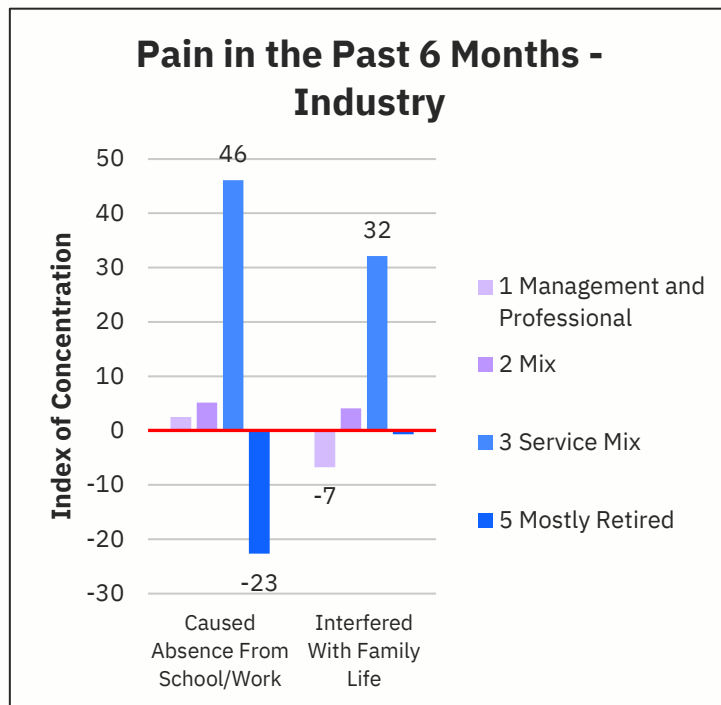
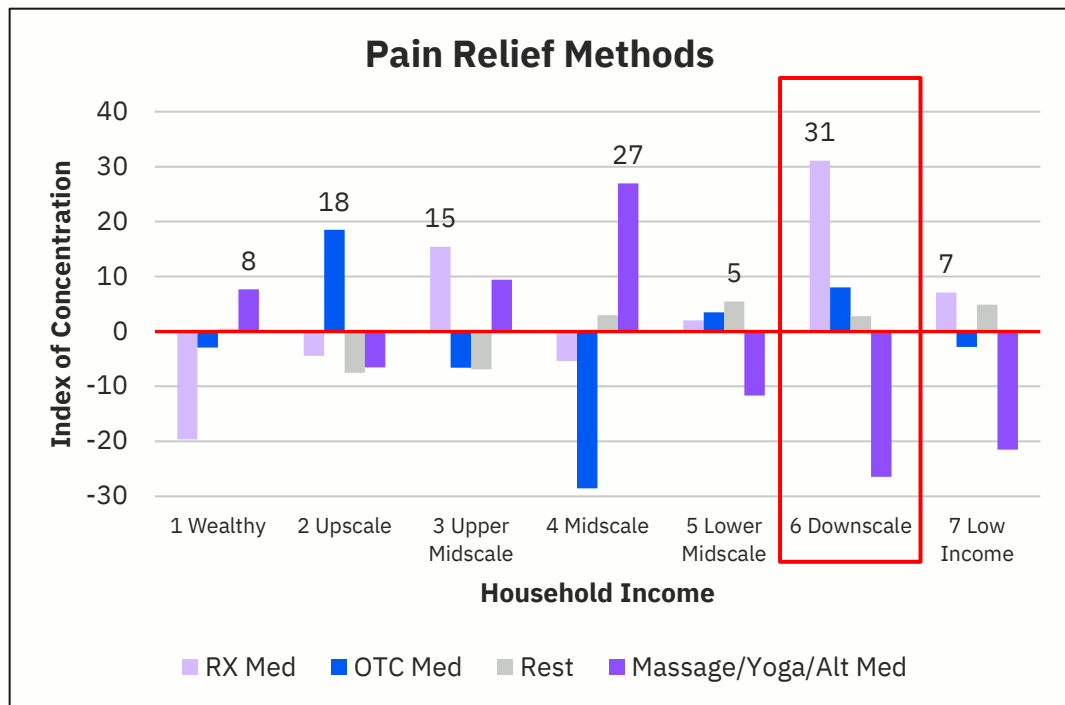
Mental Health During Early COVID – May 2020



Index of Concentration: 0 = Average Utilization for the United States by Block group
 IBM Watson Health PULSE® Survey May 1-15, 2020 (n 3,011; error +/-1.8%)

Pain during pandemic

Understanding how populations deal with pain can allow organizations to target treatment journeys for the different types of patients.



SVI Data with PULSE/PRIZM

Sample below is taken from a population with claims data. Members are mapped into the neighborhood and Race/Ethnicity is assigned based on census data.

Integrating socio-demographic data sources to:



Identify health disparity trends, impacts, and opportunities



Monitor impact to health, risk, utilization, and cost – iterate and refine

Race/Ethnicity Group	SVI Flag Below Poverty	Members	Pats Depression per 100	Pats Hypertension per 100	Delay/Not Fill a Rx Next 3 Months	Cigarette Smoker	Home Life: Stressful	Difficulty Paying For Svcs
Black	0	19%	8	14	-7	-2	14	-2
Black	1	4%	9	17	45	21	32	37
Hispanic	0	6%	7	13	8	5	15	3
Hispanic	1	1%	5	9	82	27	32	65
White	0	69%	8	12	-12	-14	-10	-12
White	1	2%	6	15	25	28	39	37

PULSE/PRIZM*

Data-driven insights for improving population health and the lives of the people you serve.

IBM PULSE® Healthcare Survey

Since 1988, one of the largest consumer health surveys in US



Claritas PRIZM® Premier Segmentation

Industry leading consumer segmentation system



CDC Social Vulnerability Index (SVI)

A tool to identify socially vulnerable communities

*This data is derived from the Pulse/PRIZM Consumer Segmentation data

Successes and challenges for the current and post-pandemic US healthcare system

Reactions from Dr. Caleb Alexander

Questions



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