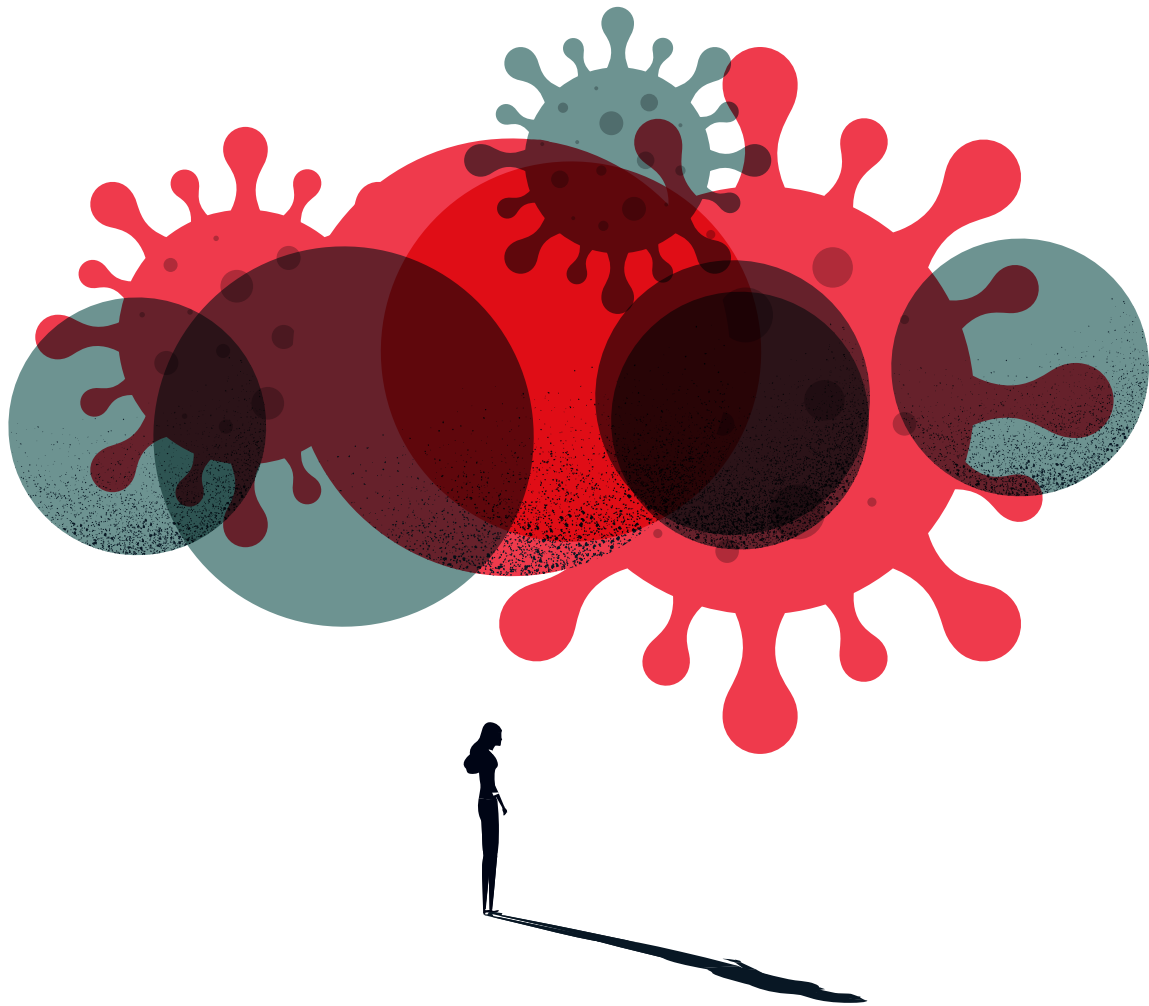


State of Health 2023

# In The Aftermath



**Comorbid effects of COVID-19  
and other conditions to watch**



## Overview

As we approach the third anniversary of the global pandemic, a picture of our changing landscape has finally begun to crystallize. While the vast majority of Americans have quietly resumed a “new normal” for daily life, the world of healthcare lags behind, continuing its slow recovery. Though great gains have been made in COVID-19 vaccinations and treatment, rampant staffing shortages persist, care teams continue to burn out, and hospital operating costs have hit a historic high—while margins have reached an all-time low.

This is the aftermath of the pandemic, in which healthcare organizations—now under existential threat—must embrace transformation or face closure. With public health experts optimistically predicting the worst is behind us, providers and payers have a unique opportunity to address the current challenges with truly transformative care delivery models. In the aftermath, the only way out of the industry’s destabilizing crisis is through it.

This third annual State of Health Report, released by predictive healthcare analytics company Prealize Health, identifies the top health conditions and utilization spikes that healthcare stakeholders across the industry must proactively address in 2023. Throughout the report, industry leaders weigh in on the predictions, future care needs, and the types of delivery transformation we’re likely to see in 2023.

## Methodology

The 2023 predictions featured in this report are based on Prealize’s analysis of data from more than 3.6 million lives and over 110 million claims between Jan 1, 2019 and Oct 31, 2022, the latest time frame for which claims data was available at press time. To ensure that the sample reflected the broader U.S. population, the analysis included patients of all ages across all lines of business, including Commercial, Medicare Advantage, Medicaid and Managed Medicaid.

To predict future healthcare costs and utilization at the individual level, Prealize uses advanced artificial intelligence, specifically proprietary supervised machine

learning models, trained on four or more years of medical claims, prescription claims, lab data and population outreach data. The suite of models, built from the largest feature set in the industry, work in concert to form a full picture of risk trajectory at the individual and population levels, and include over 35 clinical drivers of future healthcare utilization. Predictions include specific dollar estimates of cost over the next 12 months, identification of patients likely to become newly high cost, where the patients are likely to utilize (e.g., emergency department, inpatient), and identification of the previously diagnosed and undiagnosed

conditions that will drive the areas of increased utilization.

The unprecedented impact of the global pandemic caused what many healthcare professionals call the data drift. The pandemic resulted in a significant decrease in the number of Americans utilizing the healthcare system for routine and non-routine care which resulted in a large decline in the volume of healthcare data. Despite this data drift, the Prealize models have continued to perform with high positive predictive values (typically above 70%) across millions of lives from numerous health plans since the global pandemic’s onset.



## Key Findings at a Glance

### 2023 Overall Predictions

Year-over-year predicted increases in healthcare utilization (between 2022 and 2023). These are the top diagnoses that Prealizer expects will be on the rise in the year ahead for all age groups and insurance types.

Diagnosis	Predicted Increase
<b>Cardiovascular conditions</b>	
Cardiorenal	29%
Cardiomyopathy	26%
Cardiac block	20%
Ischemic heart disease	19%
Congestive heart failure	13%
Cardiac dysrhythmias	7%
Valvular disorders	7%
<b>COPD</b>	21%
<b>Intellectual and Developmental Disorder</b>	19%
<b>Diabetes</b>	13%

### 2023 Predictions by Insurance Type

Health plans can prepare for predicted increases in care based on insurance type. Some populations, such as Medicare Advantage and Commercial, are at much higher risk for a broader array of severe conditions. Others, such as Managed Medicaid, are provided with clear directional insight to focus on a certain subset of their population.

Insurance Type	Diagnosis	Predicted Increase
<b>Medicare Advantage</b>	Parkinson's disease	37%
	Cardiomyopathy	29%
	Renal impairment	24%
<b>Managed Medicaid</b>	Pregnancy with complications	33%
	Substance abuse	10%
	Valvular disorder	9%
<b>Medicaid</b>	Valvular disorder	14%
	Renal impairment	8%
	Pregnancy with complications	5%
<b>Commercial</b>	Cardiorenal	42%
	Cardiomyopathy	34%
	COPD	31%

## Is America's Health Worsening in the Pandemic's Aftermath?



*This year's predictions reflect just how unequipped we are to handle the lingering and persistent effects of COVID-19. For the first time, we're tracking substantial connections between SARS-CoV-2 infection and extreme comorbidities, such as acute myocarditis or cardiorenal syndrome. Along with projected increases for behavioral health and substance abuse utilization, we are seeing the long-term effects of a system built on episodic care. These volume increases underscore the crucial need to invest our resources, energy, and focus in holistic and preventative care. Without investing in workflows and preventative care for the whole person, we cannot expect our national health to improve."*

**- LINDA HAND,**  
CEO of Prealizer Health



## Key Drivers at a Glance



### COVID COMORBIDITY: From Initial Recovery to Secondary Diagnoses

Now, almost three years into the pandemic, substantial patterns in the long-term effects of COVID-19 are beginning to emerge. While the causes of long COVID remain a mystery, theories abound as to why the virus appears to plague some individuals for months—and even years—after initial infection.<sup>1</sup>

Outside of lingering symptoms, persistent fatigue, and long-lasting brain fog, there is another class of COVID patient emerging: those who appear to recover fully, but who experience new medical problems shortly after healing. Many of these individuals experienced only a mild case of COVID—or no symptoms at all.

In one analysis of two million individuals who contracted the coronavirus, researchers found that nearly one-quarter sought medical treatment for a secondary diagnosis 30 days or more following infection.<sup>2</sup> These health problems affected individuals of all ages, and included nerve and muscle pain, difficulty breathing, high blood pressure, heart abnormalities, and mental health conditions. Similarly, another study reported that the estimated probability of a mental health diagnosis within three months of COVID-19 infection was 18%, significantly higher than for all of the control events. The two most common diagnoses reported within study participants were anxiety disorder, followed by other mood disorders.<sup>3</sup>

Prealize's own data show significant spikes in cardiovascular care utilization over the three year period since the pandemic's onset, which is expected to persist. Cardiac blockages, specifically, are on the rise. In 2022, Medicare Advantage members had more primary care appointments for cardiac blockages than the year before. Even with the spike in office visits, a growing number of these members are ending up at the emergency department and inpatient setting for care related to their cardiac blockages. While commercially covered individuals are also increasingly seeking primary care for cardiac blockages, their condition is less severe; the data do not reveal an increase in emergency or surgical care for this population.

1. Bull-Otterson, L., Baca, S., Saydah, S., Boehmer, T. K., Adjei, S., Gray, S., & Harris, A. M. (2022). Post-COVID conditions among adult covid-19 survivors aged 18–64 and ≥65 years — United States, March 2020–November 2021. *MMWR. Morbidity and Mortality Weekly Report*, 71(21), 713–717. <https://doi.org/10.15585/mmwr.mm7121e1>
2. New York, NY : FAIR Health, Inc. (2021, June 15). A detailed study of patients with long-haul COVID: An analysis of private healthcare claims. U.S. National Library of Medicine. Retrieved from <http://resource.nlm.nih.gov/9918334383006676>
3. Taquet, M., Luciano, S., Geddes, J. R., & Harrison, P. J. (2021). Bidirectional associations between covid-19 and psychiatric disorder: Retrospective cohort studies of 62 354 COVID-19 cases in the USA. *The Lancet Psychiatry*, 8(2), 130–140. [https://doi.org/10.1016/s2215-0366\(20\)30462-4](https://doi.org/10.1016/s2215-0366(20)30462-4)



Younger patients are also expected to receive more cardiovascular disease related care in 2023. The three highest predicted health risks for pediatric patients are cardio-related:

**Top Three Predicted Health Risks for Pediatric Patients**

*Forecasted year-over-year increase in risk by condition*

<b>Cardiac block</b>	45%
<b>Cardiac dysrhythmias</b>	39%
<b>Congenital heart disease</b>	27%

For young adults aged 18 through 39, the risk of cardiac-related diagnoses jumps even higher.

**Top Five Predicted Health Risks for Individuals Aged 18 – 39**

*Forecasted year-over-year increase in risk by condition*

<b>Ischemic heart disease</b>	67%
<b>Cardiomyopathy</b>	51%
<b>Chronic heart failure</b>	47%
<b>Cardiorenal syndrome</b>	46%
<b>Congenital heart disease</b>	39%

**"It is concerning when even young individuals who should fully recover are coming in with cardiac issues in the weeks following a COVID diagnosis. More and more we are learning that this diagnosis may be only the beginning of an individual's health journey. We need to rethink how we follow individuals who contract the virus so we can be proactive about identifying and treating conditions to limit long-term adverse outcomes."**

- Lee Sacks, Former CMO, Advocate Aurora Health

We now know that younger individuals who have experienced COVID-19 infections more than once have a significantly greater risk of adverse health conditions in multiple organ systems. These risks include: hospitalization; disorders affecting the lungs, heart, brain, and the body's blood, musculoskeletal and gastrointestinal systems; and even death. Reinfection also contributes to diabetes, kidney disease, and mental health issues.<sup>4</sup>

4. Sauerwein, K. (2022, November 10). Repeat COVID-19 infections increase risk of organ failure, death. Washington University School of Medicine in St. Louis. Retrieved from <https://medicine.wustl.edu/news/repeat-covid-19-infections-increase-risk-of-organ-failure-death/>



While COVID-19 may previously have been regarded by younger individuals as more of a minor nuisance than a serious health risk, that perception is ill informed. We now know it is as important for younger adults to obtain appropriate COVID-19 immunization and observe infectious precautions as it is for older adults with chronic conditions, especially following an acute episode of COVID-19 infection.

## **DERAILED CARE JOURNEYS: A New COVID-Recovery Norm**

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In Prealize's analysis, a telling trend emerged: across care types, preventive PCP visits and specialty care visits tended to decrease in the weeks and months following a COVID diagnosis. In turn, just as preventive office visits decreased, the utilization of care for severe conditions increased between 2021 and 2022.

Among Commercial and Medicare Advantage populations, episodic costs for musculoskeletal care skyrocketed between 2021 and 2022, likely in part due to lingering backlogs of deferred care. Interestingly, among the Medicare Advantage and Commercial populations diagnosed with COVID-19, primary care and physical therapy utilization experienced significant falls (19.2%), suggesting individuals pause their routines and MSK care management habits once they fall sick.

Among the same groups, both fall and fracture risk increased by 15.5%, and ED and inpatient care needs post-COVID diagnosis skyrocketed—between 23% and 63% for the Medicare Advantage population and between 19% and 32% for the Commercial cohort after contracting COVID.

**"The pandemic obviously disrupted countless discretionary procedures and other care. But it also caused a dramatic reduction in routine screening, prevention, and chronic care maintenance activities,"** noted Mark Smith, Professor of Clinical Medicine, UCSF. **"In 2023, health plans and providers will need to work together to re-engage individuals in their care journeys and re-establish the importance of ongoing healthy habits and well visits."**

## **PATIENT ACCESS: Care Deserts Limit Options For Millions of Americans**

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A medical desert is defined as a community at least 30 miles away from the nearest trauma care center. For the millions of Americans living in these medical deserts, when crisis strikes, care is simply too far away. One national projection places a whopping 16% of Americans at least 30 miles from the nearest hospital; another estimates that



around 30 million Americans live in medical deserts where the nearest trauma care center is more than an hour away.<sup>5,6</sup>

**"If we truly want outcomes to improve, we must expand our networks to ensure coverage for individuals living in remote or inaccessible areas, and for whom transportation poses an insurmountable challenge," said Jeffrey Bailet, Former President & CEO, Altais; EVP Health Care Quality & Affordability Blue Shield of California. "Plans and providers must learn to work together to establish virtual care protocols and care management workflows to ensure chronic disease management and preventative care visits are easy to access. Stakeholders should consider emerging modalities, such as remote patient monitoring devices to extend access to care."**

When access to maternal care specialists and resources is highly limited or non-existent, a community is defined as a "maternal care desert." According to the March of Dimes, these deserts are expanding, and now represent 36% of communities nationwide, leaving millions of women without viable options for family planning, prenatal, pregnancy, delivery, and postpartum care.<sup>7</sup>

Alarming, Prealize forecasts a drastic increase in obstetric emergencies for new moms covered by Managed Medicaid. For this population, the risk of pregnancy with complications is forecast to increase 33% in 2023. While time may reveal how limited care access impacts outcomes, generally higher levels of stress and depression, rising incidences of obesity and gestational diabetes, and a national disruption to family planning services may contribute.

**"The maternity desert sprawl is highly alarming. America already has the worst maternal mortality record of all developed nations. As access to care continues to shrink and resources dry up, women will be left without the care they need to ensure a healthy pregnancy and start to life. We need practical interventions to help support new moms."**

- Julie Murchinson, Partner at Transformational Capital

5. Ostroff, C., & Frisbie, C. B. (2017, August 3). Millions of Americans live nowhere near a hospital, jeopardizing their lives. CNN. Retrieved from <https://www.cnn.com/2017/08/03/health/hospital-deserts/index.html>
6. Carr, B. G., Bowman, A. J., Wolff, C. S., Mullen, M. T., Holena, D. N., Branas, C. C., & Wiebe, D. J. (2017). Disparities in access to trauma care in the United States: A population-based analysis. *Injury*, 48(2), 332-338. <https://doi.org/10.1016/j.injury.2017.01.008>
7. Nowhere To Go: Maternity Care Deserts Across the U.S. March of Dimes. (2022, October). Retrieved from <https://www.marchofdimes.org/maternity-care-deserts-report>



## 2023 Forecast: Conditions Most At Risk of Increased Utilization

### CARDIOVASCULAR DISEASES

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**Our models forecast large spikes in individuals seeking care for cardiovascular diagnoses in 2023 across the board. Conditions including cardiorenal syndrome (29% increase), cardiomyopathy (26% increase), cardiac block (20% increase), ischemic heart disease (19% increase), chronic heart failure (13%), cardiac dysrhythmias (8%), and valvular disorder (7%) will be increasingly common in 2023.**

Prealize predicted alarming increases in utilization for a variety of cardiovascular conditions in the 2022 report—and forecasts the trend in cardiac care will continue to grow in prevalence in the year ahead.

**While last year's increase was largely attributed to care deferrals, new claims data draws an alarming correlation between recent COVID-19 infection and a cardiovascular diagnosis.** Elevated levels of inflammation and strain on the heart, resulting in organ damage, are likely to be contributing factors. The pandemic also intensified existing socioeconomic stressors, including job instability, food and housing insecurity, and personal safety-related concerns, which may further contribute to heart disease.

Regardless of age, pre-existing condition, or risk factor, the SARS-CoV-2 virus appears to leave a mark on the heart. "We know that patients who have recently contracted COVID-19 are more likely to experience some heart damage," said Gordon Norman, MD, Chief Medical Officer, Prealize Health. "Prior to the pandemic's onset, heart disease had been on a steady, decade-long decline. Now, it seems like even a mild case of the coronavirus accelerates cardiovascular disease risk. We are experiencing a reversal in fortune, and this time, no one is immune. This does not only impact the elderly or those living with a chronic disease—the effects appear across the board."

Nature Medicine published a study that tracked the long-term effects of COVID-19 on the heart. The authors noted that even individuals who were not hospitalized were at an increased risk of varied cardiovascular disease beyond the first 30 days following infection. They found a 72% increased risk of heart disease in recovered COVID-19 patients—and that even with a mild case, risk persists for at least a year following diagnosis.<sup>8</sup>

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8. Xie, Y., Xu, E., Bowe, B., & Al-Aly, Z. (2022). Long-term cardiovascular outcomes of COVID-19. *Nature Medicine*, 28(3), 583–590. <https://doi.org/10.1038/s41591-022-01689-3>





"It appears that the long-term impact of COVID-19 will continue to surprise us," said John Espinola, CEO, Kinwell Physician Network and President, Kinwell Medical Group. "We've never seen a virus impact overall health this acutely. New complications are likely to emerge—only time will tell. We can expect to see cardiovascular episodes persist, especially as time marches on and the virus evolves. We know we will see new variants, and to protect the overall health of the general public, we must remain vigilant. Proactive and preventative measures become the best course of action: vaccination, boosting, and masking will help us all in the long run."

## BEHAVIORAL HEALTH

*(Intellectual & Developmental Disorders, Substance Abuse & Overdose)*

**Prealze predicts an increase in behavioral healthcare across the board, especially in the prevalence of pediatric substance abuse (24.5% risk increase) and intellectual & behavioral disorder (13.7% increase) diagnoses.**

Prealze predicts an 18% increase in substance abuse disorder among the Commercial population. While it does not rank as a top 10 risk increase for this group, it does represent a significant increase from the year before. Meanwhile, the analysis forecasts an 11% increase in substance abuse for the Medicaid population, and a 10% increase for the Managed Medicaid group—notably, the disorder ranks as a top three risk increase for both cohorts.

Tragically, the biggest impact of all may rest with the youngest portion of the population. The 17 and under cohort is forecast to see a 24.5% increase in substance abuse disorder.

"Our nation's youth internalized an inordinate amount of stress over the last few years," noted Alan Glaseroff, Adjunct Professor, Clinical Excellence Research Center, Stanford School of Medicine. "At a time when they needed more direct care and social interaction, demand vastly outpaced capacity, meaning that access to much needed behavioral care is sorely lacking for too many kids today. Adverse childhood experiences are major triggers of risky behaviors that can last into adulthood and can be passed down to the next generation (including eating disorders, drug use, smoking, depression and suicide), and COVID greatly increased the stress within families. We must act immediately to train primary care teams in trauma-informed care and expand mental health resources for children to ensure healthy development for generations to come."

Care delays are likely to blame for the forecasted increase in risk of intellectual and developmental disorders in the year ahead, which currently affect about 17% of the



pediatric population.<sup>9</sup> Pandemic-related disruptions in therapies for attention deficit/hyperactivity disorder (ADHD), autism spectrum disorder (ASD), intellectual and physical disabilities are expected to have far-reaching consequences to children's emotional and behavioral health for years to come.<sup>10</sup> For youth under 18, Prealze predicts a 14% increase in intellectual and developmental disorders, and for individuals between 18 and 39 years of age, it predicts a 34% jump in these diagnoses. In 2023, it will be critical for health plans and providers to encourage resumption of any interrupted or postponed screenings and services to ensure individuals can resume regular therapies that promote personal well-being and growth.

While Prealze data indicates that pediatric emergency care and telehealth utilization dropped slightly from 2021 into 2022, office visits and specialized behavioral healthcare visits are up, suggesting that youth are beginning to receive the preventative or recurring care they need. Mirroring visits, the cost of an office and in-person specialist visit increased significantly year over year.

## CHRONIC CONDITIONS

*(COPD, Diabetes, Obesity & Asthma)*

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**Prealze forecasts that chronic conditions will maintain a diagnostic stronghold. The analysis predicts a 21% increase in diagnoses of COPD across all age groups and payment types. Diabetes is also expected to see a substantial uptick, up 13% from the year before, while obesity is predicted to increase by 11%. Asthma's prevalence is predicted to increase 6% year-over-year.**

The current analysis builds on the hypothesis from last year's report that *delayed care is the new chronic condition*, which suggests that the effects of skipped wellness visits and chronic condition check-ups linger. At the same time that new incidence of diabetes and asthma are forecasted at lower rates than they were the year before—diabetes was at 17% in 2022 and obesity at 14%—regular chronic care management office appointments appear to be increasing, especially among the Medicare Advantage, Commercial, and Medicaid populations, suggesting that individuals are returning to the healthcare system, and protocols that help them maintain healthy A1C levels and a higher quality of daily life.

In this year's analysis, COPD returns as a top prediction for the first time since 2021, with a strikingly high predicted utilization increase (21% across all analyzed populations). Most notably, the forecasted increase is relatively low among the

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9. Zablotsky, B., Black, L. I., Maenner, M. J., Schieve, L. A., Danielson, M. L., Bitsko, R. H., Blumberg, S. J., Kogan, M. D., & Boyle, C. A. (2019, October). Prevalence and trends of developmental disabilities among children in the United States: 2009–2017. *Pediatrics*. <https://doi.org/10.1542/peds.2019-0811>

10. Zhang, S., Hao, Y., Feng, Y., & Lee, N. Y. (2022, March). Covid-19 pandemic impacts on children with developmental disabilities: Service Disruption, transition to telehealth, and child wellbeing. *International Journal of Environmental Research and Public Health*, 19(6). <https://doi.org/10.3390/ijerph19063259>



Medicaid and Managed Medicaid cohorts, but spikes by 31% for the Commercial and 15% for the Medicare Advantage populations. While COVID-19 has notable impacts on the respiratory system and may have long-term detrimental effects on lung health, only the most severe cases are likely to directly cause COPD.<sup>11</sup>

A more indirect explanation may be traced to spikes in stress-related cigarette smoking during the early pandemic's social distancing phase. Individuals between the ages of 18 and 39 are forecasted to have the highest need for COPD care in 2023 (35% increase in utilization), followed by those between the ages of 40 and 64 (25% increase in utilization).

## Conclusion

In 2023, health plans must seize the opportunity to help catapult the industry into the future of care delivery. "With the industry at a crossroads, plans can lead the way by embracing predictive analytics to help forecast risk, mitigate costs, inform and motivate members, and equip caregivers with proactive and preventive care options," said John Coughlin, Vice President, Informatics & Analytics, Sentara Health Plans. "Predictive analytics is the best tool available for organizations looking to drive transformational change."



## About Prealize

Prealize marries state-of-the-art AI-enabled data science with "next-best action" health insights. Based in San Francisco, Calif., the company was founded by two industry thought leaders from Stanford University. Committed to transforming healthcare from reactive to proactive, reducing healthcare costs and enabling more people to live healthier lives, Prealize partners with health plans, specialty care management companies, healthcare technology companies, employers, and providers across the nation to positively influence the health trajectory of millions of people.

For more information, visit [www.prealizehealth.com](http://www.prealizehealth.com) or email [info@prealizehealth.com](mailto:info@prealizehealth.com).

11. Lippi, G., & Henry, B. M. (2020). Chronic obstructive pulmonary disease is associated with severe coronavirus disease 2019 (COVID-19). *Respiratory Medicine*, 167, 105941. <https://doi.org/10.1016/j.rmed.2020.105941>