

Healthcare Systems and Services Practice

Understanding the hidden costs of COVID-19's potential impact on US healthcare

While the direct impact of COVID-19 has already been substantial, additional layers of delayed or indirect impact have the potential to dwarf the immediate effects. These additional layers of impact related to COVID-19 could result in \$125 billion to \$200 billion in incremental annual US health system cost.

Erica Hutchins Coe, Kana Enomoto, Patrick Finn, John Stenson, and Kyle Weber



COVID-19 has already taken a staggering toll in the United States, with more than 178,000 lives lost as of mid-August 2020.¹ In the coming months, more deaths will undoubtedly occur as a direct result of the virus. However, there will likely be additional layers of delayed or indirect impact that result from deferred or canceled treatment, longer-term and unknown health impacts of those who recover from COVID-19, the physical and behavioral health impact of sheltering in place, and the tertiary health effects stemming from an economic downturn.

In this article, we examine two independent and potential drivers of delayed or indirect impact: exacerbations of certain chronic and episodic conditions that result from deferred or canceled treatment, and new and worsening behavioral health conditions.

The immediate and direct impact of COVID-19

The immediate and direct potential impact of COVID-19 has already resulted in thousands of lives lost and significant incremental cost to the healthcare system. However, as has already been reported,^{2,3} a distinct possibility exists that the number of lives lost has been understated. In any given year, the number of people that die in the United States follows a relatively stable curve that varies predictably over the course of the year. In 2020, the United States has deviated noticeably from this curve.

In a typical year, approximately 953,000 Americans would have been expected to die from any cause from March 1 to the end of June. This year, roughly 163,000 “extra

deaths” have occurred during this same time period, an increase of 17 percent.⁴ While a portion of this excess can be connected to reported COVID-19 fatalities, roughly 35,000 “extra deaths” are unexplained. This gap could be the result of randomness in the data, an unknown source of increased death rate, or deaths that have resulted directly or indirectly from COVID-19 but have not yet been included in official counts because of data lags or underreporting (Exhibit 1).

In addition to the human toll, treating patients with COVID-19 has a financial impact. While the true number of individuals that have contracted COVID-19 is difficult to quantify given certain limitations in testing, the number of people seeking treatment for COVID-19 is better understood. Of individuals seeking care, roughly 76 percent receive testing and basic treatment or services. Seventeen percent are hospitalized with mild to moderate conditions. The remaining 7 percent are treated for severe conditions.⁵ For every million people that seek treatment, the US health system will incur roughly \$5.3 billion in direct cost (Exhibit 2).⁶

The impact of deferred or canceled treatment on chronic and episodic conditions

Once the immediate and direct impact of COVID-19 in a particular geography has passed, the effects from deferred care will likely create new challenges for individuals and the healthcare system that could increase annual costs in the United States between \$30 billion and \$65 billion.⁷ In a recent McKinsey Consumer Healthcare Insights

¹ Coronavirus Resource Center, “COVID-19 Dashboard by the Center for Systems Science and Engineering at Johns Hopkins University,” Johns Hopkins University, 2020, coronavirus.jhu.edu.

² Wu J et al., “60,000 missing deaths: Tracking the true toll of the coronavirus outbreak,” *New York Times*, May 6, 2020, nytimes.com.

³ Brown E, Tran A, and Thebault R, “Excess U.S. deaths hit estimated 37,100 in pandemic’s early days, far more than previously known,” *Washington Post*, May 2, 2020, washingtonpost.com.

⁴ National Center for Health Statistics, “Excess deaths associated with COVID-19,” Centers for Disease Control and Prevention, updated August 5, 2020, cdc.gov.

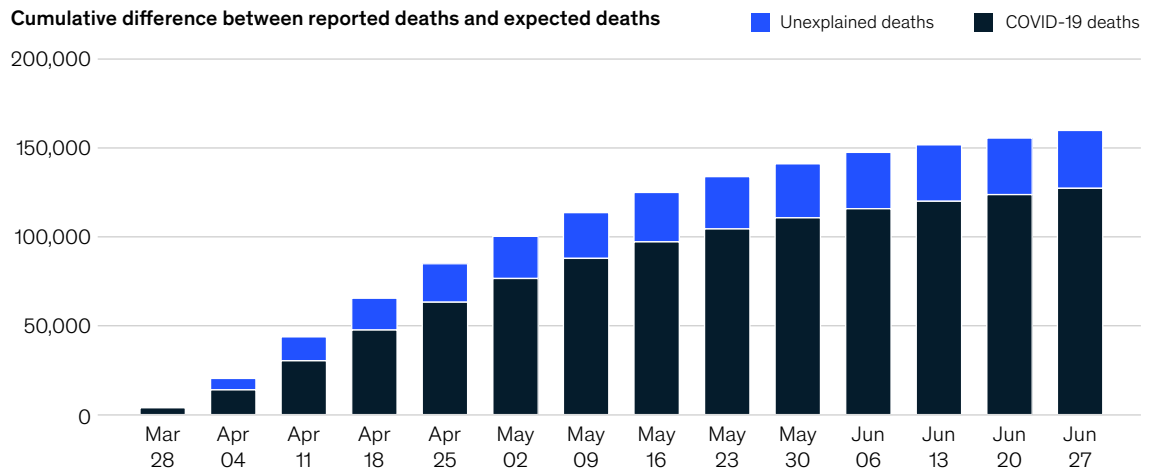
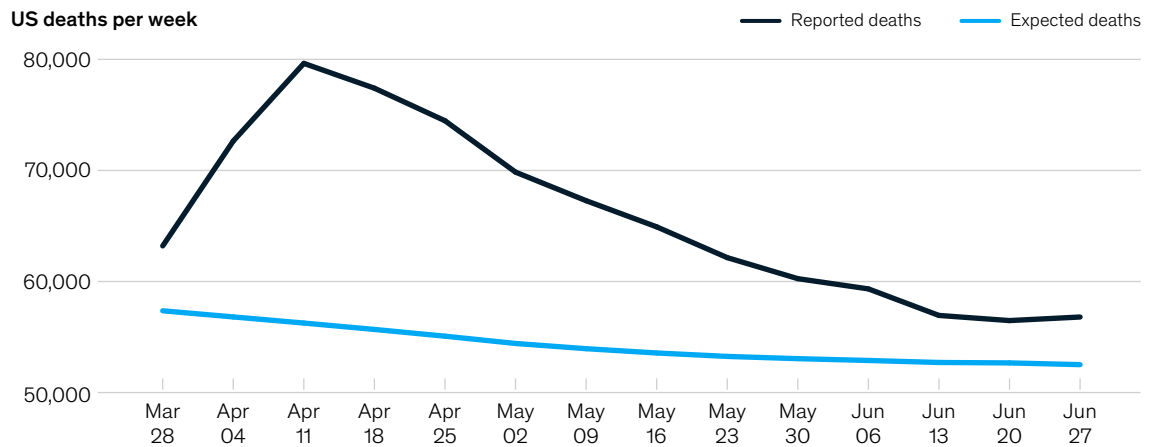
⁵ National Center for Immunization and Respiratory Diseases, “Coronavirus disease 2019 (COVID-19),” Centers for Disease Control and Prevention, updated July 31, 2020, cdc.gov.

⁶ This calculation reflects the direct reimbursable costs incurred by providers and health systems. It does not include additional costs incurred by providers and health systems to respond to COVID-19 (for example, investments in reconfiguring facilities).

⁷ The increase in costs in the United States of \$30 billion to \$65 billion does not take into account the reduction in costs that has resulted from decrease in utilization while care was being delayed or canceled.

Exhibit 1

Unexplained deaths have continued to rise through May and June.



Source: Centers for Disease Control and Prevention

Exhibit 2

Of individuals seeking care for COVID-19, roughly 76% receive testing and basic treatment or services.

Category	Percent who seek treatment	Cost per individual, \$	Cost per 1 million that seek treatment, \$
Basic services	76	~250	~0.2 billion
Mild and moderate conditions	17	~15,000	~2.5 billion
Severe	7	~34,000	~2.6 billion
Total	100		~5.3 billion

Source: Centers for Disease Control and Prevention

survey,⁸ 40 percent of individuals stated they have canceled upcoming appointments (for example, routine checkups, treatment for chronic conditions) and an additional 12 percent reported that they needed care but have not scheduled or received care (Exhibit 3). Furthermore, physicians may anticipate that capacity at health systems could be constrained in the future as a result of incoming COVID-19 patients and therefore may elect to defer commencing treatment because of legitimate concerns that a treatment regimen may need to be discontinued. For patients with chronic and episodic conditions, this delay could lead to harmful exacerbations of their conditions.

The impact of deferred care across different conditions will likely vary. For example, a patient with diabetes may rely more heavily on prescription medication. A cancer patient, however, may need to re-

ceive chemotherapy or radiation treatment at an acute care facility while also being immunocompromised. Even small delays or variations in oncology or radiation treatment regimens could impact the outcome of the cancer, yet patients must balance that with concerns of contracting COVID-19. Ultimately the impact on patients is expected to depend on the likelihood that treatment is canceled or delayed and how much a cancellation or delay could exacerbate a condition (Exhibit 4).

If the impact of delayed or canceled treatments is extrapolated across the types of common conditions, it becomes clear that the resulting cost to the health system could be substantial. For example, the average cost of treating a patient with chronic obstructive pulmonary disease has the potential to increase by between 7 and 11 percent, going

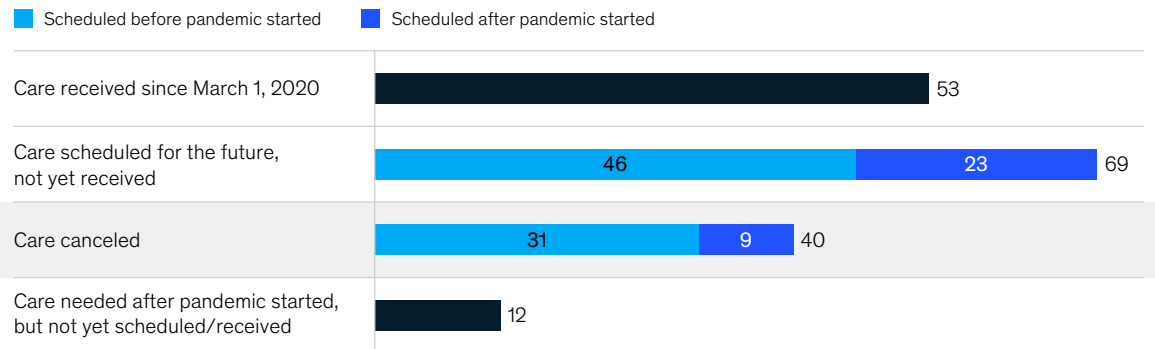
⁸ Cordina J, Stein G, and Levin E, "Helping US healthcare stakeholders understand the human side of the COVID-19 crisis: McKinsey Consumer Healthcare Insights," July 27, 2020, McKinsey.com.

Exhibit 3

Cancellations or intent to cancel upcoming healthcare appointments.

Breakdown of respondents' receiving, scheduling, and canceling care

Percent of respondents that reported that status (n = 1,297)



Questions asked:

Care type 1: Which, if any, of the following types of care have you received since March 1, 2020?

Care type 2: For which, if any, of the following types of care do you have an appointment scheduled in the future that you plan to keep and are not considering canceling?

APPT1_CV: For each of the following types of care below for appointments you scheduled in the future that you plan to keep and are not considering canceling, indicate when you first decided to seek care for the medical condition you experienced.

S19_NEW: As a result of the coronavirus/COVID-19, have you had appointments canceled or do you anticipate a cancellation of any upcoming appointments with a doctor, mental health, or other medical professional?

APPT1_CV2: For each of the following types of care below, indicate when you first decided to seek care for the medical condition you experienced.

S23: Since the coronavirus/COVID-19 pandemic began (March 1, 2020), have you developed any new medical conditions or symptoms for which you would ordinarily seek treatment by visiting a medical professional in person but decided to not get or postpone getting care?

QCARETYPE1: Which, if any, of the following types of care have you received since March 1, 2020?

Source: McKinsey COVID-19 consumer survey, June 8, 2020

from approximately \$38,000 per patient per year to approximately \$41,000 per patient per year (Exhibit 5). This increase in cost is largely driven by an expected increase in the severity of a patient's symptoms due to care deferral. A different story emerges for patients with diabetes, where the impact could be relatively modest: the average cost of treating a patient has the potential to increase by just 1 to 4 percent. This relatively low impact is projected because of enhanced ability to manage diabetes costs using pharmaceutical and lifestyle interventions.

The long-term impact of behavioral health exacerbations

Longer-term effects of COVID-19 are already beginning to emerge: the behavioral health toll of anxiety and depression related to the virus itself, the extended lockdown, and the ensuing economic downturn. Additionally, the rates of anxiety and depression for all populations have continued to rise since early June, reaching all-time highs from July 16–21, with Latinx, Asian, Black, and multi-racial groups expressing higher levels of symptoms than

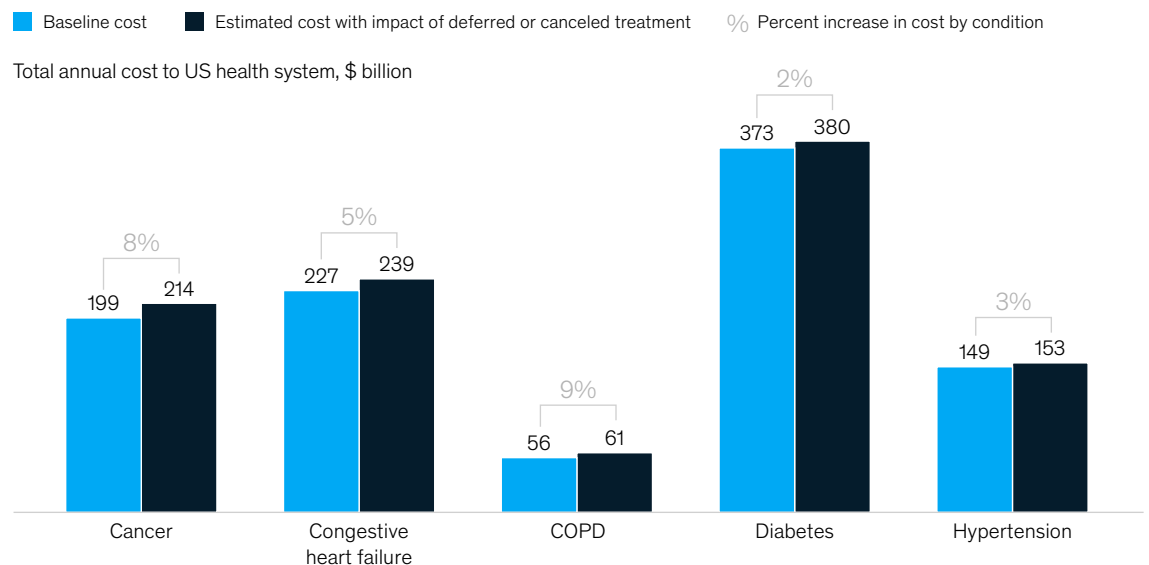
Exhibit 4

The qualitative impact of deferred or canceled treatment on total US spend by condition type varies in severity.

Condition	Likelihood of delaying or canceling treatment	Consequences of delaying or canceling treatment	Total impact
Cancer	Low	Very high	High
Congestive heart failure	Medium	High	Medium
Chronic obstructive pulmonary disease	Medium	High	High
Diabetes	Low	Medium	Low
Hypertension	Low	Medium	Low

Exhibit 5

Deferred treatment for COPD could make the condition 9% costlier to treat.



COPD, chronic obstructive pulmonary disease.
Source: Centers for Disease Control and Prevention

non-Hispanic whites, according to the Census Bureau and the Centers for Disease Control and Prevention's National Center for Health Statistics.⁹

This culminating impact is likely to extend far beyond that of the acute effects of COVID-19-related hospital and other medical care. In addition to significantly more people reporting symptoms of depression and anxiety, data also indicate higher rates of binge drinking and insomnia with a large pharmacy benefit management organization reporting a 21 percent increase in prescriptions for medications to treat depression, anxiety, and insomnia.^{10,11,12} COVID-19 has not only interrupted the treatment of people already managing mental or substance use disorders, but also placed broader segments of the population at risk for developing conditions such as depression, anxiety, alcohol use disorder, and post-traumatic stress disorder (PTSD).

This surge of people experiencing acute behavioral health problems—both those with new symptoms and those with existing conditions—has the potential to further impact the healthcare system for years to come. Analysis shows that people with behavioral health diagnoses have around four times the average healthcare spending of those without, due to factors such as medical complications, reduced access to preventive care, and challenges with illness manage-

ment. Although this analysis is a correlation and does not imply causation, individuals with behavioral health conditions consistently have higher spending for physical healthcare than individuals without behavioral health conditions (Exhibit 6).

While national events such as Hurricane Katrina or the Great Recession provide some sense of the long-term impact of traumatic stress on behavioral health, COVID-19 is in its own category. Across different segments of the population (for example, frontline health-care workers, people who become unemployed), the likelihood of developing a mental or substance use disorder could be influenced by current or past traumatic stress exposure as well as by preexisting health and social vulnerability. Taking these factors into consideration, along with analysis of studies of the behavioral health impact from natural disasters, quarantines, and economic downturns, we estimate that some 35 million people could develop a new behavioral health condition due to the COVID-19 pandemic (Exhibit 7).

This estimate is conservative and does not include the disproportionate impact of COVID-19 on already vulnerable or at-risk populations, areas with concentrated pandemic impact may see even higher rates of behavioral health need. For example, 35 percent of US deaths to COVID-19 have occurred in long-term care facilities.¹³ While data on race and ethnicity

⁹ National Center for Health Statistics, "Mental health: Household Pulse Survey," Centers for Disease Control and Prevention, reviewed July 29, 2020, cdc.com.
¹⁰ Coe E and Enomoto K, "Returning to resilience: The impact of COVID-19 on mental health and substance use," April 2, 2020, McKinsey.com.
¹¹ National Center for Health Statistics, "Mental health: Household Pulse Survey," Centers for Disease Control and Prevention, reviewed July 29, 2020, cdc.com.
¹² "America's state of mind report," Express Scripts, April 16, 2020, express-scripts.com.
¹³ National Center for Immunization and Respiratory Diseases, "Preparing for COVID-19 in nursing homes," Centers for Disease Control and Prevention, updated June 25, 2020, cdc.com.

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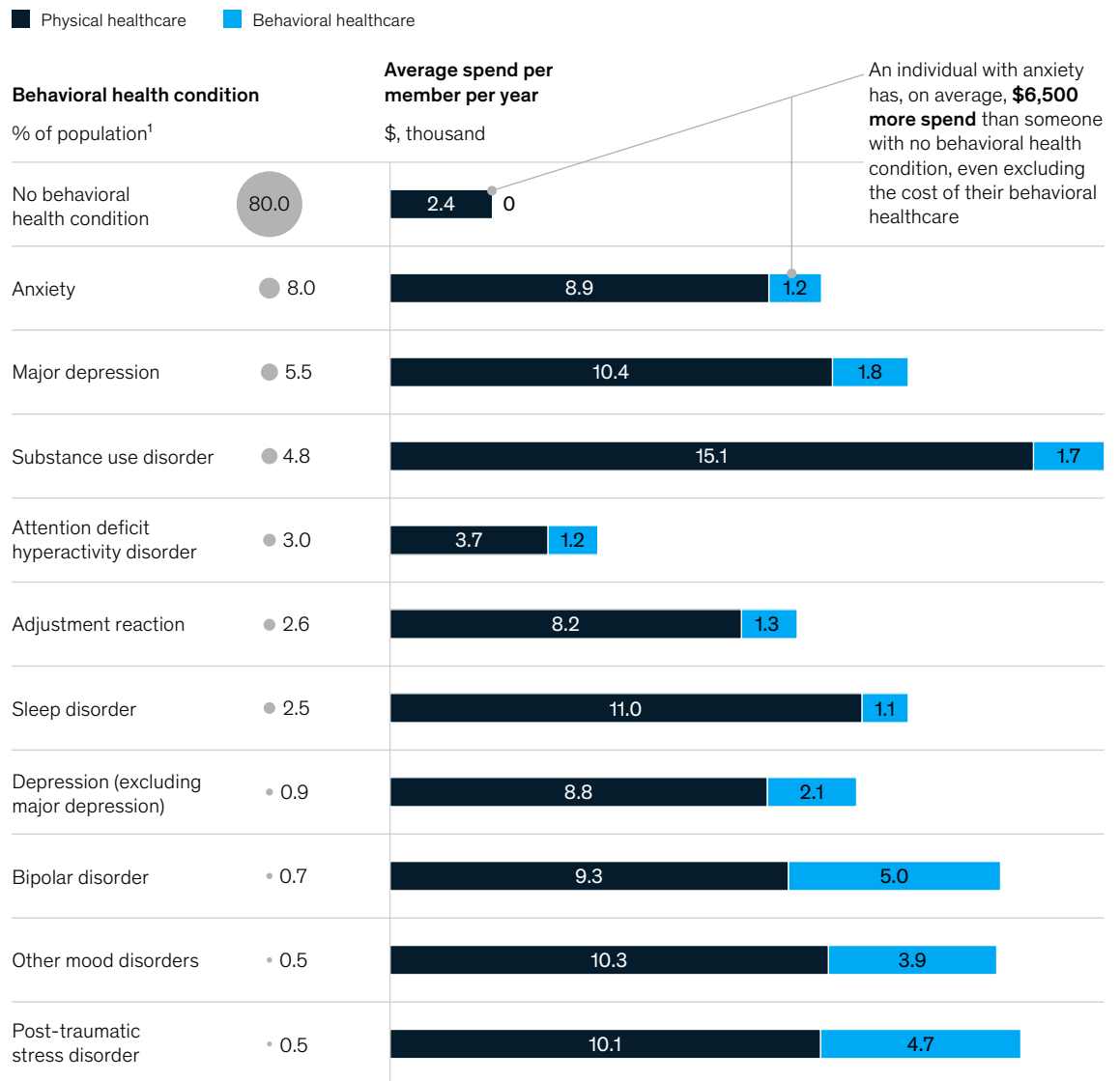
are not yet complete, early studies indicate dramatic disparities in mortality relative to white Americans for Black, Latinx, and some Native American populations.^{14,15} In addition, there may be adverse impact from other

confounding factors, such as natural disasters or civil unrest. Finally, the influence of COVID-19 on the behavioral health of children and adolescents isolated at home for extended periods is not yet known, but questions

¹⁴ National Center for Immunization and Respiratory Diseases, "Health equity considerations and racial and ethnic minority groups," Centers for Disease Control and Prevention, updated July 24, 2020, cdc.com.
¹⁵ "Dikos Ntsaaigif-19 (COVID-19)," Navajo Department of Health, updated August 06, 2020, ndoh.navajo-nsn.gov.

Exhibit 6

Physical healthcare costs tend to increase when individuals have behavioral healthcare needs.



¹ These percentages are not additive—individuals with more than one behavioral health condition appear in every row for which they qualify. Behavioral health condition includes mental or substance use disorders.
 Source: International Business Machines Corporation's Truven MarketScan Commercial Database. Any analysis, interpretation, or conclusion based on these data is solely that of the authors and not International Business Machines Corporation

arise about their educational and social development. Youth in isolation may also face more serious risks of psychological traumatic stress known to lead to negative behavioral and physical health outcomes as an adult.¹⁶

When we extrapolate the known cost impact of having a mental or substance use disorder across this striking increase in the number of people experiencing a behavioral health need, the result is significant: a potential 50 percent increase in the prevalence of behavioral health conditions could lead to \$100

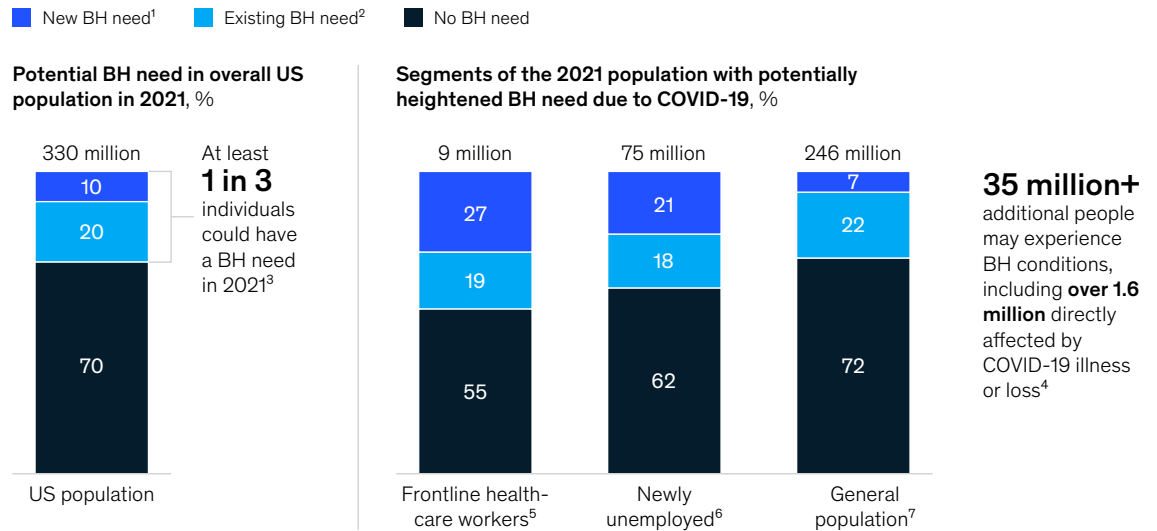
billion to \$140 billion of additional spend in the first 12 months post-onset of the COVID-19 pandemic (Exhibit 8). (See methodology in the appendix for further detail.)

Finally, it is important to consider that the behavioral health impact of the pandemic is likely to last well beyond 2020. Some conditions, such as sleep-wake disorders, may resolve quickly, but others, such as PTSD, may not even appear until 2021 and may last for a number of years beyond. Unless rapid and far-reaching action is taken to address

¹⁶ Felitti VJ et al., "Relationship of childhood abuse and household dysfunction to many of the leading causes of death in adults: The Adverse Childhood Experiences (ACE) Study," *American Journal of Preventive Medicine*, 1998, Volume 14, Number 4, pp. 245–58, ajpmonline.org.

Exhibit 7

Impact of COVID-19 on behavioral health across different population segments.



BH, behavioral health; PTSD, post-traumatic stress disorder. Figures may not sum to 100%, because of rounding.

¹ Individuals with new onset of a BH condition (~6% increase in BH population) as a result of experiences related to COVID-19 pandemic (eg, depression, anxiety, PTSD).

² Existing BH need extrapolated to total US population based upon Medicare limited data set, blinded state Medicaid data, and Truven Commercial data. Assumes ~51.1 million existing low BH needs and ~1.7 million existing high BH needs.

³ Likely an underestimate, as current reports of BH need in overall population as high as 25% (see Substance Abuse and Mental Health Services Administration, *Key substance use and mental health indicators in the United States: Results from the 2018 National Survey on Drug Use and Health*, Center for Behavioral Health Statistics and Quality, Substance Abuse and Mental Health Services Administration, August 2019, samhsa.gov). The percentages here are based upon extrapolating BH condition prevalence for populations for whom we have claims data to the general population.

⁴ Includes increased BH prevalence (~1.5–1.9X) among those hospitalized due to COVID-19 or those that had a close family member die from COVID-19.

⁵ Increase in BH condition prevalence (~1.5–1.9X) among hospital and residential care facility healthcare workers primarily driven by PTSD, anxiety, and depression.

⁶ Assumes ~24% unemployment rate in 2021 (total unemployment of ~75 million) due to economic impact of COVID-19 and ~1.3X increase in BH prevalence for this population.

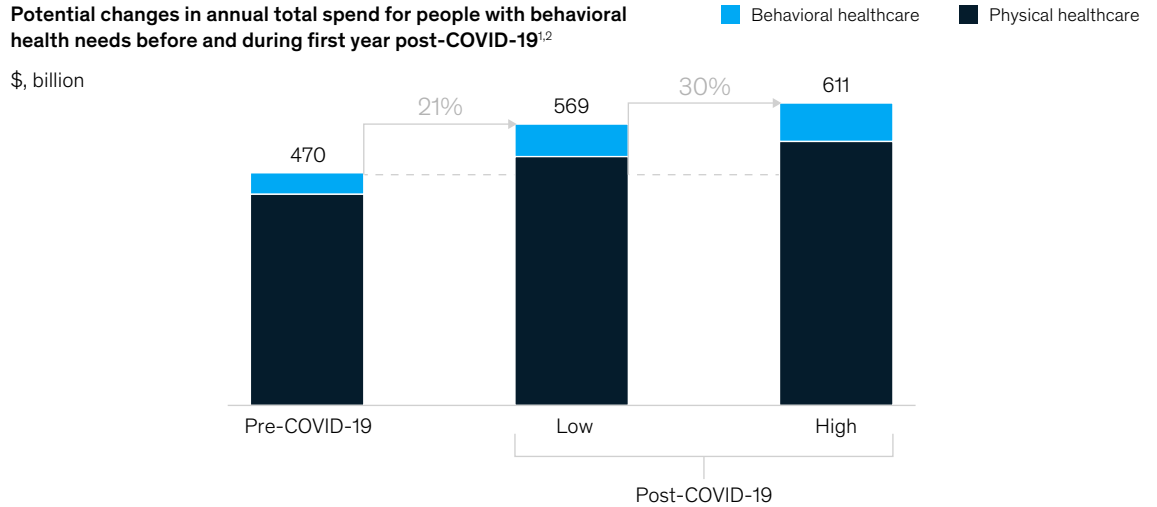
⁷ Individuals with existing or new BH needs that are not either newly unemployed or frontline healthcare workers (eg, individuals and families sheltering in place, essential workers).

Source: Analysis includes claims data from the Medicare fee-for-service limited data set from the Centers for Medicare & Medicaid Services, deidentified Medicaid data, and the International Business Machines Corporation's Truven MarketScan Commercial Database. Any analysis, interpretation, or conclusion based on these data is solely that of the authors and not International Business Machines Corporation

Exhibit 8

Current and potential healthcare spending for people with behavioral health conditions is expected to rise.

Potential changes in annual total spend for people with behavioral health needs before and during first year post-COVID-19^{1,2}



¹ This does not include Tricare, individual market, or uninsured populations.

² Accounts for reduction in spend for people losing employment and not gaining Medicaid coverage.

Source: Analysis includes claims data from the Medicare fee-for-service limited data set from the Centers for Medicare & Medicaid Services, deidentified Medicaid data, and the International Business Machines Corporation's Truven MarketScan Commercial Database. Any analysis, interpretation, or conclusion based on these data is solely that of the authors and not International Business Machines Corporation

behavioral health at a population level, negative psychological effects of the COVID-19 pandemic, including deaths by overdose and suicide, are likely to persist for more than 24 months, contributing not only to increased healthcare spending but also to substantial economic and social cost.¹⁷

The direct impact COVID-19 is having on mortality and cost to the healthcare system is significant. For those individuals who have suffered and recovered from this life-threatening condition, the effects of the physical disease may resolve in a matter of weeks. Unfortunately, however, the ripple effects for physical and behavioral health will continue long after the immediate crisis has subsided. Healthcare organizations and leaders can

consider taking action now to understand, quantify, and prepare for these additional layers of impact to support their members, patients, own employees, and the broader communities they serve. Specifically, organizations may consider the following steps:

- Developing virtual health offerings and capabilities beyond the traditional “tele-urgent” that are better able to care for chronic patients
- Increasing virtual, remote, and home health capacity to treat patients with chronic or episodic conditions
- Developing an approach (often involving collaboration between payers and providers) for prioritizing high-risk individuals to traditional facilities deemed safe and appropriate

¹⁷ Spending estimates shown here account for growth in US unemployment from 20 to 25 percent and a migration to Medicaid of roughly 11 million to 14 million new members. Estimates of behavioral health (BH) service utilization were based on findings from the disaster literature or current population rates (for example, one out of nine people with a substance use disorder or two out of three people with depression). Time horizon for service utilization was also drawn from longitudinal studies of 9/11, the Great Recession, and the Deepwater Horizon Gulf Oil Spill of 2010, which showed that these kinds of stresses and BH service utilization as well as adverse outcomes such as suicide can remain elevated for up to three years following the index (disaster) event.

- Strengthening community prevention of behavioral health conditions through risk-stratified crisis counseling support and broader outreach to promote resilience
- Leveraging data and technology through predictive analytics to direct prevention and clinical resources to those most at risk for behavioral health issues and unmet basic needs
- Integrating behavioral and physical health services, including expanding behavioral health capacity through increased behavioral health competency of primary care providers and expanded

use of peer counselors, implementing universal screening for mental and substance use disorders, and initiating or accelerating efforts to reduce stigma

Despite a desire to return to “normal” life, COVID-19 will clearly continue to shape a next normal. Healthcare stakeholders may first prioritize addressing urgent cases related to delayed care, such as those with cardiac or oncology conditions. However, a robust framework for addressing behavioral health concerns will be necessary to manage demand on the system, acknowledging that the full healthcare impact of COVID-19 may not be known for years to come.

For questions about the methodology used for the calculations in this article, see the appendix and contact the authors for further detail.

Erica Coe (Erica_Coe@mckinsey.com) is a partner in McKinsey’s Atlanta office. **Kana Enomoto** (Kana_Enomoto@mckinsey.com) is a consultant in the Washington, DC, office. **Patrick Finn** (Patrick_Finn@mckinsey.com) is a senior partner in the Detroit office. **John Stenson** (John_Stenson@mckinsey.com) is a partner in the New York office and serves as McKinsey’s Chief Actuary. **Kyle Weber** (Kyle_Weber@mckinsey.com) is a partner in the Chicago office.

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Appendix

Methodology

Methodology for determining cost increases for direct COVID-19 care spending

The direct COVID-19 care spending estimates provided in this paper are from our analysis of the populations that have sought care. The percentage of patients that fall into each category is based upon the emerging experience of those who directly sought care in the United States. The average cost for those who seek basic services is a national average reimbursement estimate for an average provider encounter that includes diagnostic lab services. The average costs for mild and

moderate and intensive services are based upon national average reimbursements for the following Diagnosis Related Groups (DRGs):

- 177 RESPIRATORY INFECTIONS AND INFLAMMATIONS WITH MCC
- 207 RESPIRATORY SYSTEM DIAGNOSIS WITH VENTILATOR SUPPORT >96 HOURS
- 208 RESPIRATORY SYSTEM DIAGNOSIS W VENTILATOR SUPPORT ≤96 HOURS

(continued)

Methodology *(continued)*

Methodology for determining cost increases for chronic condition patients

The cost estimates of the impact of care deferral on the cost of chronic care condition patients is based upon analyzing the different conditions and estimating the costs of needed additional episodes because of care disruption during the crisis.

We assumed the cost impact from care deferral would be more significant for the higher cost quintiles than the lower cost quintiles. Using input from clinical experts, we estimated ranges of additional care needs for each quintile, for each chronic care condition, over the 12-month period once care access was restored. The range of additional service needs includes those members that would require additional emergency room services, diagnostic testing, inpatient care, and potential intensive care unit and coronary care unit services.

We used traditional Hierarchical Care Condition (HCC) risk adjustment techniques to identify the chronic care condition groups that we selected for analysis. Once the patient populations were identified, we aggregated all their claims to develop average over and under age 65 annual cost estimates. We then segmented these cohorts into quintiles, from lowest cost to highest cost. For the populations under age 65, we used the International Business Machines Corporation's Truven Market-Scan Commercial Database. For populations over age 65, we used Medicare fee-for-service limited data set.

Methodology for determining increase in behavioral health condition prevalence and spend

The behavioral health condition prevalence and spend estimates provided in this paper derive from our analysis of populations potentially affected by the COVID-19 pandemic, academic literature regarding past similar events and their impacts on populations, and medical and pharmacy claims data.

Populations potentially affected. We divided the US population into distinct groups of individuals who are likely to experience the COVID-19 pandemic in different ways based on the behavioral health literature concerning disasters. We modeled the impact on these groups separately, and considered individuals as falling into only one of the groups, although overlap between populations could exist. Furthermore, some groups, such as essential workers, did not have independent estimates and were subsumed in the other groups to which they belong. For modeling purposes, we used the following hierarchy:

- *Frontline healthcare workers:* We used publicly available estimates of the number of healthcare practitioners in US hospitals and residential facilities. This approach may slightly overestimate the true number of frontline healthcare workers, although all hospital and residential facility workers may experience fear and anxiety regarding potential infection at work and grief or loss of their colleagues on the frontlines. Additionally, a significant number of volunteers and/or retirees reentered the frontline work-

Methodology *(continued)*

force during the height of the COVID-19 outbreak. We arrived at a conservative estimate of impacted frontline workers, as many essential workers (for example, cafeteria workers, maintenance staff, security) also experience heightened distress about taking the virus home to their families.

- *Newly unemployed individuals:* The COVID-19 pandemic has led to historic rates of unemployment in the United States already. We assumed an approximately 25 percentage point increase above the roughly 5 percent unemployment rate pre-COVID-19, in line with current estimates as of July 2020. For purposes of our analysis, we used current economic projections to divide this segment into: (1) individuals enrolling in Medicaid and (2) individuals not enrolling in Medicaid.¹
- *Individuals with existing behavioral health needs:* Individuals who already have a behavioral health condition may experience exacerbations in their conditions and/or new onset of another behavioral health condition. These exacerbations could be due to, among other things, delays in seeking care during the pandemic, heightened symptoms, or new COVID-19-related feelings of distress, including fear, grief, or anxiety. For modeling purposes, we considered individuals with high behavioral health needs (for example, history of serious mental illness, overdose,

suicide attempt, emergency department/inpatient utilization) distinct from individuals without high behavioral health needs (for example, dysthymia). This modeling is derived from spend profiles and potential exacerbations for these high health needs individuals based upon our claims analyses and published research.

- *Individuals who experience severe COVID-19 or death of a loved one due to COVID-19:* For this group, we considered that individuals hospitalized due to COVID-19 (about 20 percent of cases) and individuals who have lost a loved one from COVID-19 would be at increased risk of PTSD, persistent complex bereavement, or other behavioral health conditions. We assumed a low end and high end for these numbers, using the COVID-19 case and death rates as of August 4, 2020, as a low end and projections for the end of 2020 as a high end, based upon the University of Basel Epi Model estimates that assume the virus and some intervention measures (for example, use of masks, distancing in public places) are sustained until the end of the year.
- *Individuals sheltering in place:* The COVID-19 pandemic brought about sweeping shelter-in-place orders for the US population, which can lead to isolation, fear, anxiety, and depression.^{2,3}

¹ McKinsey projections.

² Lai J et al., "Factors associated with mental health outcomes among health care workers exposed to coronavirus disease 2019," *JAMA Open Network*, 2020, Volume 3, Number 3, e203976, jamanetwork.com.

³ Mihashi M et al., "Predictive factors of psychological disorder development during recovery following SARS outbreak," *Health Psychology*, 2009, Volume 28, Number 1, pp. 91–100.

Methodology *(continued)*

Research literature. To determine how the COVID-19 pandemic might lead to an onset of new mental or substance use disorders and/or exacerbation of existing behavioral health conditions for these populations, we reviewed the relevant behavioral health literature concerning disasters. Referenced events included infectious disease outbreaks (for example, prior SARS outbreaks, early COVID-19), natural disasters (for example, Hurricane Katrina), and economic downturns (for example, the Great Recession). Based on these studies, we estimated timing of symptom onset, service use, and persistence of conditions across population segments. Examples include:

- *Frontline healthcare workers:* Increases in depression, anxiety, and PTSD prevalence
- *Newly unemployed individuals:* Increases in mental and substance use disorders, binge drinking, and suicidal behavior (which may be influenced by the duration of federal unemployment supplements and growth in income inequality)⁴
- *Individuals with pre-disaster behavioral health needs:* Increases in inpatient stays for schizophrenia, addiction, and suicidal ideation, while those without high behavioral health needs see onset of PTSD and increased outpatient utilization of behavioral health services
- *Individuals directly impacted by severe COVID-19 or loss due to COVID-19:* This group is similar to the frontline healthcare workers, experiencing increases in persistent complex bereavement, depression, anxiety, substance use, and PTSD prevalence
- *Individuals sheltering in place:* There is a slight increase in behavioral health condition prevalence, mostly due to increases in depression and anxiety

Medical and pharmacy claims data.

Once we estimated condition prevalence changes in the population segments, we used medical and pharmacy claims data to model potential changes in spend for these population segments. We used 2017 data to provide a baseline for behavioral healthcare utilization and level of spend for people with behavioral health conditions, applying weighted averages across data sets as required for population segments including individuals from multiple data sets. We looked at spend directly for treating behavioral health conditions as well as spend for treating physical health conditions in these individuals (non-behavioral health spend). Additionally, for individuals with new behavioral health conditions, we performed a longitudinal analysis to determine how spend ramps up for individuals with a new condition compared with steady-state spend for individuals with existing conditions. Finally, we applied utilization assumptions⁵ to account for the ramp-up of needs over the

⁴ Ganong P, Noel P, and Vavra JS, "US unemployment insurance replacement rates during the pandemic," Becker Friedman Institute for Economics, May 14, 2020, bfi.uchicago.edu.

⁵ Based upon phases of psychological reactions to disasters, adapted from Zunin & Myers as cited in DeWolfe, 2000 and appearing in SAMHSA 2015 report "Traumatic stress and suicide after disasters."

Methodology *(continued)*

first 12 months, and assumed a sufficient supply of practitioners available to meet the increased demand. The specific claims data sources we used include:

- *Medicare fee-for-service limited data set:* We applied this data set to the following segments: individuals with existing behavioral health needs, those impacted by severe COVID-19 or loss due to COVID-19, and the general population sheltering in place.
- *International Business Machines Corporation's Truven MarketScan Commercial Database:* For all population segments, we calculated baseline per-member-per-month spend using this data set, and when we recalculated spend for those who are newly unemployed, we did not include data from this data set, as they would no longer have commercial coverage.

Note, this data set does not include all individuals in the Commercial market.

- *Blinded Medicaid data from one state:* We applied this data set to all population segments except frontline healthcare workers. When we recalculated spend for newly unemployed individuals, we included only those individuals projected to enroll in Medicaid from McKinsey's Payer Economics Model. Note, this data set provides Medicaid claims data for one state, and we used it as a proxy for all new Medicaid enrollees who are recently unemployed, extrapolating the number of lives covered and spend to represent all new potential Medicaid enrollees and assuming similar profiles. This calculation does not account for population and utilization differences between states, which may exist due to managed care policies, enrollment eligibility, etc.

Disclaimer: *These materials are being provided on an accelerated basis in response to the COVID-19 crisis. These materials reflect general insight based on currently available information, which has not been independently verified and is inherently uncertain. Future results may differ materially from any statements of expectation, forecasts or projections. These materials are not a guarantee of results and cannot be relied upon. These materials do not constitute legal, medical, policy, or other regulated advice and do not contain all the information needed to determine a future course of action. Given the uncertainty surrounding COVID-19, these materials are provided "as is" solely for information purposes without any representation or warranty, and all liability is expressly disclaimed. References to specific products or organizations are solely for illustration and do not constitute any endorsement or recommendation. The recipient remains solely responsible for all decisions, use of these materials, and compliance with applicable laws, rules, regulations, and standards. Consider seeking advice of legal and other relevant certified/licensed experts prior to taking any specific steps.*
