Can the Covid-19 Natural Experiment Teach Us About Care Value and System Preferences?

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The direct impact of Covid-19 on the health of Americans is the primary concern of health care providers, policy makers, and payers. However, the indirect impacts on health and health care are also profound. Social distancing requirements and state closures led to a collapse in the utilization of hospital and clinical services in the second quarter of 2020. The pandemic constitutes a valuable and unplanned natural experiment about the effectiveness of $3.6 trillion in annual health care spending.

When various types of care are abruptly curtailed, or the form of delivery changes, what are the health consequences for patients? The answer to this question could inform the way in which health care is delivered for the next decade.

UnitedHealth Group is one of the largest payers and providers of health care services in the United States, supporting the health care of tens of millions of individuals. Our databases allow us to estimate the amounts and types of care that were not provided during the early months of the pandemic by comparing actual 2020 utilization data with projections based on multiple years of historical data. Our assessment began as an attempt to anticipate and prioritize the post-Covid-19 demand for clinical services. However, the scope of changes made it clear that, independent of its direct effects, the pandemic will provide unexpected information about system behavior and the effectiveness of routine medical care for chronic conditions.
What We Did

In a data set comprising >1.3 billion insurance benefit claims in our Medicare Advantage population, we focused on six common chronic conditions: congestive heart failure (CHF), chronic obstructive pulmonary disease (COPD), type-2 diabetes, hypertension, end-stage kidney disease (ESRD), and cancer. We compared claims for care delivered in the first 6 months of 2020 with the care that would be expected on the basis of conservative projections from prior years. We examined physician visits that occurred in outpatient and hospital settings, nonphysician outpatient (e.g., lab and imaging) visits, and common procedures associated with these visits.

To establish baseline estimates of care for patients with the six chronic conditions, we trained the publicly available Facebook Prophet algorithm on data collected from January 1, 2017, through February 28, 2020, and then forecasted expected utilization through June 30, 2020. Facebook Prophet was chosen because it is designed to produce reliable forecasts for time-series data for the purposes of planning. Prophet is suited to forecasting with very large data sets when several seasons of data are available; as such, it is an excellent tool for predicting health care services by day, week, and month.

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Using actual utilization data for March to June allowed us to quantify the care that was not delivered but that would have been expected in the absence of the pandemic (Figure 1), and using forecasts based on multiple years allowed us to smooth over the effects of policy changes, weather phenomena, and other factors that could otherwise compromise data interpretations based on a single year.
We also examined the relationship between the issuing of stay-at-home orders in several states and the decreases in care delivery during the initial 8 weeks of the pandemic when those orders were being issued.² We focused on two states with early closures, California and New Jersey, and two states with later closures, Texas and Nevada.

**What We Found**

Across all six clinical conditions, service types, and associated procedures, reductions in utilization occurred beginning in March 2020. The reductions increased dramatically after March 13 when Covid-19 was declared a national emergency and states began to issue stay-at-home orders. Utilization steadily decreased throughout March and early April. Across the U.S., reductions in care for these six chronic conditions stabilized at roughly 50% in mid- to late April. For diabetes care, physician and nonphysician visits were reduced by about 60% the in the 5-week period beginning on March 1. In the same period, physician and nonphysician in-person visits for cancer care services were reduced by about 30%–40% (Figure 2).
From the beginning of the pandemic through early May 2020, the reduction in physician visits and nonphysician outpatient visits across the U.S. were very similar (Figure 2). However, in the May–June period, physician visits recovered more than outpatient nonphysician visits across all conditions. While there was large variation among the chronic conditions, in-person physician visits were approximately 70%–85% of pre–Covid-19 levels by the end of June. In contrast, outpatient nonphysician visits recovered to only 55% of pre–Covid-19 levels in the same period. Notably, physician visits for chronic conditions associated with high Covid-19 mortality — COPD, CHF, and ESRD — showed the lowest recovery of physician and nonphysician visits by the end of June (Figure 2). With regard to cancer care, we found that breast cancer screenings were reduced by >90% during the initial months of the pandemic. During the same period, new breast cancer diagnoses were reduced by 45%.
At no point did combining telehealth visits and in-person physician visits for diabetes or any other chronic condition reach the utilization that was predicted on the basis of historical data.

Our examination of the relationship between state closures and declines in care during the initial 17 weeks of the pandemic are shown in Figure 3. In the four states displayed, the timing of the care reductions closely reflected the date of each state’s stay-at-home orders. California and New Jersey, states with earlier stay-at-home orders, had the largest reduction in care during the first half of March. California demonstrated an 8% reduction in care during the week of March 8, whereas neighboring Nevada showed a 35% increase in health care utilization in the same week. Texas, another late-closure state, showed a later decline in health care services, although by early April the magnitude of the reduction in care in Texas was approaching those seen in the early closure states. However, declines in care in Texas were not sustained in the second quarter relative to those in California and New Jersey. Nevada showed a unique pattern in that very large decreases in care were never seen in that state. By early May, visits by week were exceeding predictions and, by the end of the second quarter, in-person visits in Nevada were 93% greater than would have been expected in the absence of a pandemic.

**FIGURE 3**

The Overall Reduction in Physician-Visit Claims in Four States

The overall reduction in physician-visit claims in four states; negative values indicate reductions. CA, and NJ had the largest initial decline and the largest decline and earliest state “Stay at Home” orders. Conversely, the declines in care delivery in NV and TX were later and smaller over the initial pandemic period.

Source: United Health Care databases.

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Telehealth physician visits for diabetes and cancer prior to and through the first 6 months of 2020 are shown in Figure 1. In 2019, telehealth visits for both conditions were so low as not to be evident. In late March 2020, telehealth visits began increasing, and, by late April, telehealth visits for diabetes began to approach in-person physician visits. In May, as in-person visits increased, telehealth visits decreased steadily through June. At no point did combining telehealth visits and in-person physician visits for diabetes or any other chronic condition reach the utilization that was predicted on the basis of historical data. The pattern of telehealth uptake for cancer care
showed the same temporal trend for onset, peak utilization, and decline. However, unlike diabetes, telehealth visits never approached in-person visits. Similarly, combining telehealth and in-person cancer visits did not equal pre–Covid-19 utilization of physician cancer services.

**What Care Adds Value?**

The indirect effects of Covid-19 allow us to reconsider how care is delivered and, indirectly, give us insight into system behavior. Even after herd immunity is reached, the Covid-19 experience will influence consumer perception and choice.

Changes flowing from the pandemic provide an opportunity to reengineer service models to be effective under evolving consumer expectations. Most prominent is telehealth, for which the pandemic has broadened applications, improved technologies, and increased consumer and provider comfort.\(^3\)\(^,\)\(^4\) This opportunity will be wasted if we simply replicate the traditional models with technology-enabled approaches.

Before fully embracing any new solution, we must determine which care adds value, which care does not add value, and which care delivery models customers prefer. Without the latter, we are likely to create service models that are not effective.

While it is difficult to draw and test conclusions in a natural experiment, our data provide four primary observations. First, for multiple chronic conditions, the Covid-19 pandemic resulted in a dramatic decline in health care utilization, followed by a substantial but incomplete rebound of face-to-face services by the end of the second quarter. Second, changes in utilization and recovery of services differed by type of chronic condition. Third, telemedicine variably compensated for declines in face-to-face visits, depending on condition. Fourth, in June, telehealth utilization rapidly declined as face-to-face visits recovered.

The contrasts between diabetes and cancer care suggest different future directions for care delivery. Diabetes care showed the largest decline in terms of in-person care among all six chronic health conditions and, by the end of the second quarter, had returned to in-person physician care, equaling 84% of what was predicted by the model. Cancer care showed the smallest overall reduction in terms of in-person physician care, and telemedicine did not compensate for the declines in in-person services. As the background rate of cancer in the population would be unchanged, the reduction in new cancer diagnoses that we observed indicates that some care should not be missed and is unlikely to be replaceable.

The suitability of the care model — in-person, telemedicine, or asynchronous — is a function of the type of problem to be solved, the decision required, the data required for a decision, the relative urgency of decision-making, and the predictability of the response to the decision or treatment. While these are important questions, as suggested by diabetes care, the first question is, “What care adds value?”

While our data for the second half of 2020 are still pending, reductions in care will persist. It remains to be seen whether the acute care reductions of the spring or the sustained decreases in
utilization will result in increased deaths, hospitalizations, or emergency room visits. We can track the development of adverse outcomes in differing populations over time and evaluate whether changes in adverse outcomes are proportional to the decreases in different types of services.

If adverse outcomes are lower than expected, as we hypothesize may be the case for diabetes or hypertension, this finding may suggest that a portion of historical utilizations is not evidence-based and is perhaps unnecessary. Furthermore, we may find (as has been shown with excessive testing) that “overmedicalization” may be associated not only with hundreds of billions of dollars in unnecessary costs, but also with worse outcomes. An extended analysis of the collateral health consequences of this pandemic probably will point to high-value, zero-value, and negative-value care. These observations will have profound implications for policy makers, providers, payers, and the public.

While our report only provides data on care delivery to individuals covered under Medicare Advantage plans, the relationship between the timing of state stay-at-home orders and the decline in health services strongly suggests that our observations for Medicare Advantage participants would be very similar in Medicare fee-for-service and commercially insured populations.

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The return to face-to-face care and the decline in telemedicine in June 2020 deserve attention. While medical factors, such as cancer, will inform the optimal format of service delivery, it is also likely that nonmedical drivers contributed to the return to in-person visits that were observed in June. Regulatory tightening and return to pre-pandemic payment rules for telehealth was not the driver of the system behavior observed in June. Billing for expanded Medicare telehealth services began March 1, 2020, and will extend through the end of the public health emergency.

As the Medicare telehealth liberalization persisted through June 2020, the return to in-person physician visits is likely to have been a function of provider and/or consumer preferences rather than medical necessity; whether this return was provider or consumer-driven is an important determination. It is likely that, within the boundaries of appropriate care, some consumers prefer in-person care, others prefer telemedicine, and others prefer a hybrid of these models. As the effectiveness of care will align strongly with the consumer’s preference, it is important that consumer choice of their care model is preserved and augmented. As such, the pandemic will allow us to discover what care adds value and, if choice is preserved, what form of care consumers prefer and why.

If choice is preserved and payment models are revised, the Covid-19 pandemic will facilitate the transformation of the care of conditions such as diabetes and hypertension. Arguably, the health system has failed the American public in the management of chronic diseases in large part because of its legacy fee-for-service and episodic service design. Face-to-face visits are inadequate to
address health conditions that derive from the frequent choices of daily living, which will be better served by high-frequency, light-touch care that is delivered virtually, at lower cost, by individuals other than physicians or advanced-practice providers. If the Covid-19 pandemic has accelerated this transition, that transition is something for which we can be grateful.

There is a natural inclination to seek normalcy after a period of extraordinary stress. However, a return to business as usual is unlikely and perhaps is not in the best public interest. In the tragedy of this pandemic and its natural experiment, there are learning opportunities that stakeholders and investigators must seize — and that payers, providers, and health systems must be willing to respond to. If we do, we can accelerate the transformation of health care and reset the table at which we all sit.

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