

Cain Brothers' Comments

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Health Tech to the Rescue: Combatting COVID-19 with Virtual Care and Predictive Analytics

by Jill Frew and David W. Johnson

With stunning swiftness, COVID-19 knocked America's healthcare delivery system to its knees.

A month into the crisis, normal hospital operations are in upheaval. Avoiding In-person care has become the norm and the volume of admissions, surgeries and ER visits are significantly reduced at most hospitals.

Overwhelming demand for ICUs, ventilators and personal protective equipment (PPE) has strained delivery and supply chains to the breaking point.

The human drama has been tragic, heroic and heart-warming. Separated from their loved ones, many patients are dying alone. In regions where spread is rampant, front-line clinicians work non-stop at risk of their own lives. To make their gratitude known, New York City's locked-in residents applaud, whoop and bang pots and pans outside their windows every evening at seven.

America's fragmented, uncoordinated healthcare system has proven to be highly vulnerable to the coronavirus that spreads quickly across regions and borders. The impediments to sharing data and information between systems and across regions are more frustrating and lethal than ever. Government and public health leaders struggle to determine the availability of critical resources, and face systemic obstacles to allocating needed resources effectively.

In response to this new reality, however, healthcare is reconfiguring itself in real-time.

Most providers are using virtual care delivery platforms to connect with patients. Government agencies have eased regulatory restrictions to expand virtual care access and delivery. Public health officials and researchers are also turning to big data and analytics to identify hotspots, track disease spread, predict severity and allocate resources as efficiently as possible.



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In a fascinating twist, health IT startups are meeting these expanded service demands with proven but under-utilized tech-based solutions that can scale quickly and massively.

Unlike more innovation-friendly industries, healthcare IT companies struggle mightily, often for years, to break through cultural, regulatory, reimbursement and workforce barriers to adoption. The urgency of COVID-19 has swept those barriers away. Health IT is bridging the gaps in a system under siege.

Elastic Demand for Virtual Care

Healthcare organizations of all types are applying virtual care solutions to reduce the burden on care providers, limit the spread of infection, and engage patients in real time. They have many options to choose from. Today, nearly 300 U.S. vendors offer virtual care services. They range from patient-doctor video-links to sophisticated platforms that incorporate AI, chatbots and other advanced technologies.

The government is helping. CMS implemented emergency changes to telemedicine licensure¹ and reimbursement laws² to facilitate telemedicine adoption in response to COVID-19. Providers have quickly encountered a new problem, however: the volume of demand already shows signs of exceeding capacity³.

The nation's largest independent telemedicine provider, Teladoc, experienced a 50% increase in demand for its services through March 20. As a result, patients are reporting lengthy wait times even as Teladoc scrambles to add more physicians.

This is a predictable outcome. Like many new technologies, the traditional approach to telemedicine replicates rather than leapfrogs existing processes, exchanging office visits and in-person care for virtual waiting rooms, real-time video conferencing/data entry, and follow-on prescriptions.

In contrast, Minneapolis-based Zipnosis offers an innovative approach that has proven to be timely and highly valuable for health systems.

Launched 10 years ago by CEO Jon Pearce, Zipnosis is a SaaS provider of white label telemedicine software. Health system clients use Zipnosis as their virtual gateway for care delivery. As Pearce notes, "We started Zipnosis because we knew traditional telemedicine didn't have the ability to truly scale."

The Zipnosis platform automates triage, guiding patients to the most appropriate level of care based on their symptoms. Some conditions or circumstances necessitate direct clinical attention via video, telephone or in-person. Roughly ninety percent of patients, however, receive care through an asynchronous visit.

¹ <https://www.wheel.com/blog/up-to-date-emergency-licensing-for-clinicians-1/>

² <https://www.cms.gov/newsroom/fact-sheets/medicare-telemedicine-health-care-provider-fact-sheet>

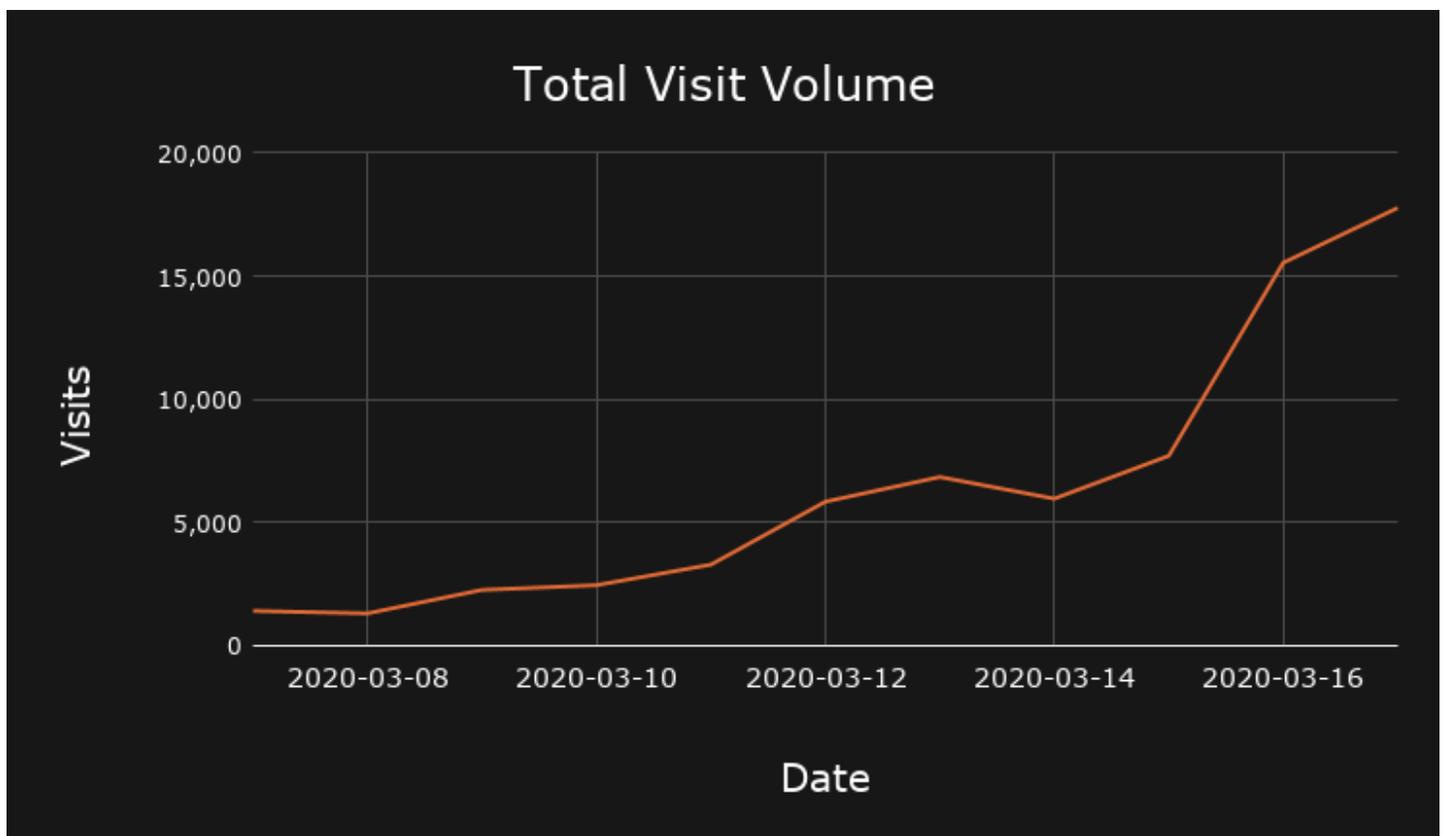
³ <https://www.wsj.com/articles/telemedicine-once-a-hard-sell-cant-keep-up-with-demand-11585734425>

An asynchronous visit means that a patient, on their own time, answers a series of interview questions that adapt based on responses. Those answers are sent to a provider to review on their own time. The provider then reaches out to the patient through the most appropriate channel to provide diagnosis and a treatment plan.

While real-time “synchronous” telemedicine visits take 18 minutes of clinical work time on average, a Zipnosis asynchronous visit averages only 89 seconds of clinician time⁴. This has enabled health system customers to meet the surge in demand for virtual care. For example, a single physician using the Zipnosis platform in Seattle, WA diagnosed 1,077 patients in a week (12 patients per hour for 12 hours per day for 7 days).

In addition to managing elastic demand, the Zipnosis platform adds new practitioners with ease. In the midst of the COVID-19 crisis, one health system client trained 600 new clinicians to use the Zipnosis technology.

The surge in the volume of patient visits handled by the Zipnosis technology has been breathtaking.



Zipnosis saw a 3,600% increase in utilization across its platform in the first 11 days of the COVID-19 crisis. In March, Zipnosis logged 412,553 total visits, with daily volume surging as high as 36,000. 88.2% of those visits were asynchronous adaptive interviews with

⁴ Based on 2019 visit averages

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3.4% chat, 4.5% phone and 3.9% video. Zipnosis was the highest capacity telemedicine provider in the country during March, serving four times as many patients as Teladoc Health.

Zipnosis is helping to maximize clinician and health system capacity, minimize in-person contact, capture longitudinal data, and steer the most symptomatic or vulnerable patients to nearby labs for testing. Pearce observes,

"When people say they don't have enough doctors at a national level, that's simply not true. What they need are more efficient processes. We've now proven the power asynchronous visits have in handling astronomical patient volumes."

Better Data, Better Predictions, Better Resource Allocation

When the COVID-19 crisis hit, the CDC released guidance for assessing exposure risk. Zipnosis immediately updated its automated triage process with 11 new questions that screen for COVID-19.

Currently, 33 of Zipnosis' 51 health system clients are screening for COVID-19 and 21 are offering free COVID-19 virtual visits. Following CDC guidelines, Zipnosis conducts as many as 21,000 daily COVID-19 screenings. Their asynchronous screening process takes 4 minutes.

The Zipnosis platform categorizes patients completing the 11 COVID-related questions into five risk groups. Of the 192,915 patients screened in March:

- 14% were asymptomatic/low risk with no need for an in-person visit or test.
- 7.5% were asymptomatic/high risk
- 4.3% were asymptomatic but had exposure risk
- 7.5% had a cough only
- 66.6% were symptomatic

This is valuable information not just for patients and care providers but for the nation in the fight against COVID-19. With the right analytics and tools, such data creates insights that can save lives and resources.

Carrot Health, another Minneapolis-based health IT company, applies structured data and predictive analytics to assess COVID-19 exposure risk at the county level nationwide.

Founded 6 years ago, Carrot Health uses robust consumer and demographic data to develop health profiles for nearly every American adult (262 million people). Carrot's payer and provider customers rely on those profiles and data-driven models to select more appropriate interventions, improve health outcomes, reduce care costs, design better products and enhance engagement and marketing.

As COVID-19 appeared in the U.S., Carrot Health recognized that accurate data would be critical in predicting the disease's spread and impact. Carrot analyzed its own dataset in the light of research coming out of China and around the world to see if it would be possible to identify individuals and communities most vulnerable to critical infection.

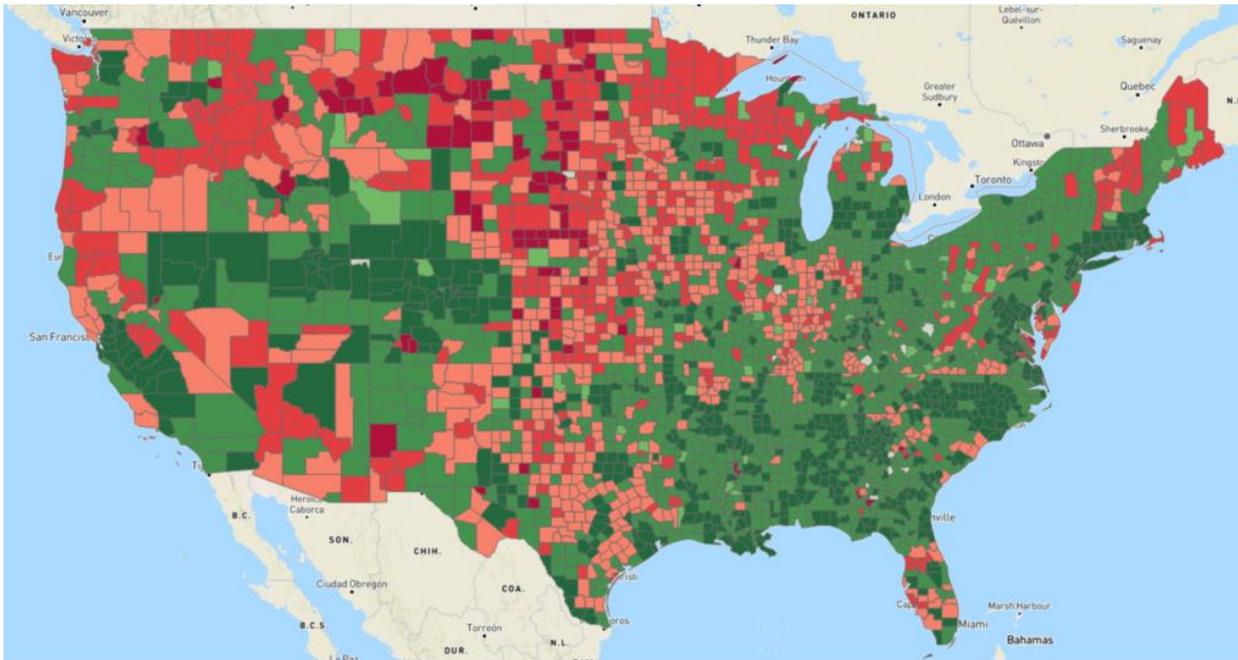
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Using this information and following CDC guidelines, Carrot selected the risk factors most associated with the spread and severity of the virus. These included: age, gender, smoking, and the presence of diabetes, hypertension and COPD. Carrot then produced and made publicly available a predictive risk dashboard to identify individuals and communities most vulnerable to the COVID-19 contagion.

To view the dashboard visit this [link](#).

The dashboard's purpose is not to predict disease outbreak or transmission per se, but to assess the criticality risk for individuals who contract the illness. In this way, Carrot can help identify which counties will be hardest hit and which individuals are at greatest risk for needing ICU care.

The following chart provides a visual representation of regions around the country with the highest risk of severe impact.



Overlaying real-time data with available resources revealed that many counties are ill-prepared to handle projected infection rates. For example, St. Louis county in northern Minnesota, has 170,000 adults. A 10% infection rate translates into 17,000 COVID-19 cases with 1,820 requiring ICU care. Since St. Louis county only has 78 ICU beds, it must adopt active measures to prepare to treat critical COVID-19 patients.

Carrot's predictive risk models are Bayesian in nature, meaning that models improve as more outcomes data becomes available. Carrot regularly updates its COVID-19 risk predictor as more case data compiles and clinicians increase their understanding of the disease's underlying risk factors. This is where Zipnosis comes back into the picture.

Carrot has partnered with Zipnosis to incorporate COVID-19 data collected through their virtual care platform. This new data affects the weighting Carrot applies to COVID-19 risk factors, enhancing the accuracy of Carrot's predictive analytics.

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Virtual screening and predictive analytics are helping to assess the risk and severity of infection for hundreds of thousands of people. This enables providers, testers, and local governments to be more efficient and effective in allocating resources to improve treatment outcomes and slow disease spread. As Carrot CEO Kurt Waltenbaugh notes:

“Currently, Carrot’s risk predictor modeling focuses on criticality and the potential need for ICU care and ventilators. New data sets from Zipnosis and other sources will help Carrot understand where testing is taking place, where new outbreaks are likely, and how resources can be directed most effectively.”

Zipnosis and Carrot are not alone. Other healthcare technology companies are contributing important solutions and data to improve disease spread prediction, assessment and treatment. For example:

- Durham, NC-based Validic⁵, a virtual health and remote monitoring company, has developed a real-time monitoring solution leveraging wearables to observe, analyze, and triage individuals remotely for the emergence of COVID-19 symptoms. Metrics include body temperature, oxygen saturation, difficulty breathing and coughing.
- San Francisco, CA-based Kinsa⁶ developed a smart thermometer to track the spread of flu in real-time and forecast outbreaks 3-4 weeks in advance. Kinsa’s geographic signals are made available to public health agencies, health organizations, health & wellness brands to help stop flu spread. This data helps illuminate the prevalence of possible COVID-19 infection around the country.
- Charlotte, NC-based PeraHealth (The Rothman Index) recently introduced a tool that allows health systems to identify dischargeable COVID-19 patients. Their clinically validated discharge filter improves hospital throughput and ICU utilization, detects deterioration in patient condition and reduces length of stay.
- Apple and Google recently announced a system for tracking the spread of the coronavirus⁷. Likewise, Amazon has created a massive public COVID-19 data set that captures and centralizes disease-specific information from multiple sources⁸. HCA and Google Cloud just introduced the COVID-19 National Response Portal, an open data platform that promotes data-sharing about COVID-19 and its spread to help hospitals and communities prepare and respond⁹.

Balancing societal health with individual privacy is an acute challenge during pandemics. Some nations, including Singapore, Taiwan and Israel, are using cell phone data, wrist monitors, facial recognition cameras that monitor temperature and even drones to track the spread of infection and control movement. The best tech solutions promote health while preserving privacy.

⁵ <https://validic.com/blog/>

⁶ <https://www.kinsahealth.co>

⁷ <https://www.washingtonpost.com/technology/2020/04/10/apple-google-tracking-coronavirus/>

⁸ <https://siliconangle.com/2020/04/08/aws-making-massive-dataset-available-coronavirus-researchers/>

⁹ <https://www.modernhealthcare.com/information-technology/hca-healthcare-opens-up-covid-19-data-portal-googles-cloud>

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Conclusion: American Healthcare at a Crossroads

America has not experienced a pandemic since 1918 and wasn't ready for COVID-19. Better data and data sharing would have enhanced national responsiveness. Given the hard-earned lessons that COVID-19 has taught policymakers, U.S. healthcare clearly needs the following:

- A national commitment to data and information sharing
- A significant shift in care delivery toward virtual solutions
- Better monitoring using IoT and big data
- A permanent loosening of unduly restrictive medical regulations

As Carrot CEO Kurt Waltenbaugh observes, "Data can dramatically enhance decision-making in real time, allowing us to apply AI routines and other predictive tools to look for trends and patterns that address or prevent outbreaks."

Yet, access to healthcare data remains a huge barrier in America. The nation lacks a national, centralized repository for all electronic medical data, and there are significant barriers to sharing even de-identified claims data.

Jon Pearce agrees with Waltenbaugh, "I think that COVID-19 exposes the weak underbelly of our claims-based data reporting system. We should have a national API with a data clearing house into which every digital health company, health plan, and provider has an obligation to share real-time data."

COVID-19 first came to the attention of public health officials, researchers and healthcare leaders in early February. Imagine, at that point, if a real-time national dataset provided actionable information to government and industry decision-makers. Better data leads to timely interventions, less disease spread, less societal disruption and fewer deaths.

Treating basic patient data as a utility would enable innovative companies to develop applications that improve responsiveness, assessment and treatment. Likewise, virtual care delivered through telemedicine, automated triage, remote monitoring and so on, makes our healthcare system safer, cheaper, more accessible and convenient and less administratively burdensome.

In the 1950s, Northcote Parkinson, a British naval historian and management theorist, famously observed, "A luxury, once tasted, becomes a necessity." Today, telemedicine and data analytics are not luxuries but crucial tools in the life-and-death struggle against COVID-19. They have introduced clinicians, patients and administrators to new levels of access, convenience, speed, efficiency, safety, engagement and data-based insights.

These luxuries, now tasted, will become necessities even when the fight against COVID-19 is over. Virtual care and predictive analytics are essential components of a healthcare system that serves patients first. American healthcare will never be the same.

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