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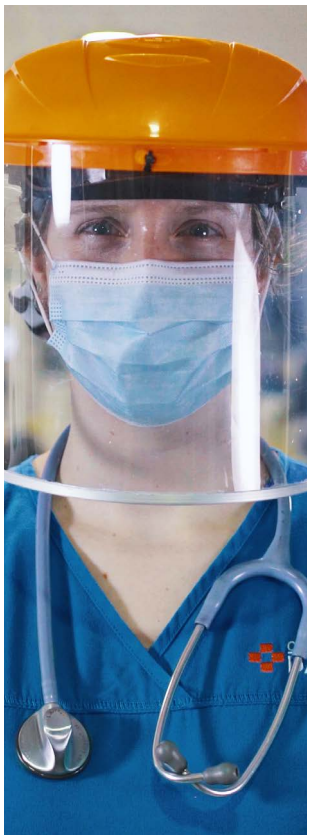

COVID-19 Response and Learnings

Volume 3, December 2020 – English Edition

United Healthcare® Global

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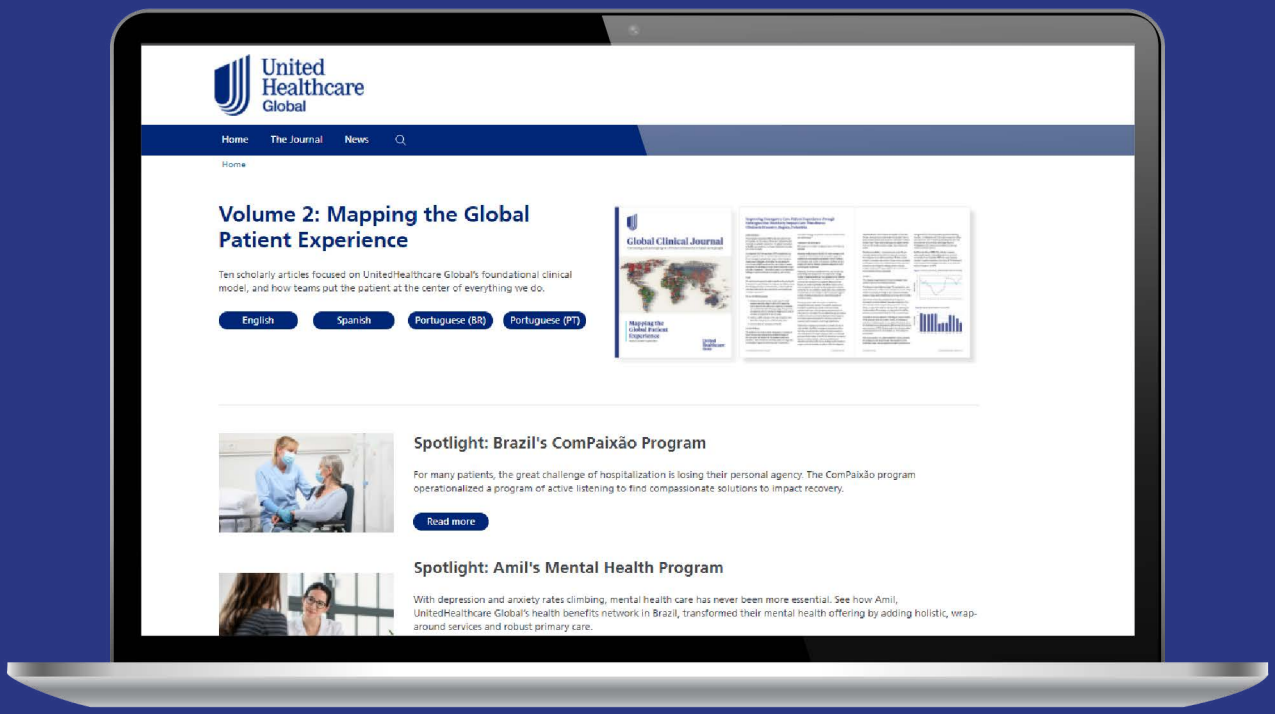

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On the cover:

UnitedHealthcare Global clinicians, from left: Johana Caballero, Ambulatory Services Nurse, Clínica del Country, Empresas Banmédica, Colombia; **Rosane do Carmo,** Nurse, Americas Medical City, Americas Serviços Médicos, Brazil; **Dr. Isidora Arregui Lehuedé,** Pediatric Emergency Physician, Clínica Dávila, Empresas Banmédica, Chile; **Dr. Josue Monteiro,** Emergency Services Physician, Hospital de Cascais, Lusíadas Saúde, Portugal; **Jorge Troncoso,** Laboratory Technician, Precisa, Empresas Banmédica, Peru

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A message from the
Chief Medical Officer

It likely comes as little surprise that the third volume of the *Global Clinical Journal* is centered on our response, reaction and learnings from the COVID-19 pandemic. While countries around the world find themselves at varying phases of the pandemic, we have gained so much valuable knowledge and experience over the past 12 months. This journal is a compilation of some of those learnings: How did our health care workers shift quickly to care for our patients and members? What strategies were developed — and acted upon — that led to high-quality care in uncertain times?

Before you begin reading this incredible body of work, I want to express my most sincere gratitude to all the teams who have rallied together during this pandemic. Their resilience, innovative thinking and dedication to carrying out our mission has not wavered.

When you close your eyes and picture the articles in the *Global Clinical Journal*, I hope you see more than a single physician working one-on-one with a patient. I challenge you to see beyond that physician. I hope you see the thousands of people, both in and out of a clinical setting, who play a vital role in the UnitedHealthcare Global response to the pandemic. Do you see the nurses, the lab technicians, the administrative staff? Do you see the supply chain team ensuring personal protective equipment and critical materials are delivered or the sales teams educating our customers and members about coverage options and policies? Do you see the communications and marketing teams drafting collateral and talking points to keep everyone informed?

Every single one of these individuals touch health care. This is perhaps one of the most important lessons we have learned during these unprecedented times: that each of us, across teams, businesses, countries and continents, plays a critical role in overcoming this challenge. Although we hold different professions, play different roles and speak different languages, it is through our commitment to the people we serve — and to each other — that we will persevere.

We are all in this together. And I couldn't be prouder to be part of this team.

Estamos juntos.

Margaret-Mary G. Wilson, M.D., MBA, MRCP, FNMCP
Chief Medical Officer & Senior Vice President
UnitedHealthcare Global

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Adapting to COVID-19: A Leader's Perspective from the Front Line

Introduction

There was "life before COVID-19." Now, we are living "life with COVID-19" while anxiously awaiting "life after COVID-19." It was obvious, at the beginning of the pandemic, that the world was caught unaware, unprepared and, in some settings, either naively optimistic or overly pessimistic about the duration and consequences of the pandemic. Organizations had to adapt to a new reality, and we — as clinical leaders in a global business — will have to continue to improve the humanization of care, since social distancing remains imperative.

Insights

When we identified the first cases of COVID-19 in Portugal in early March, we thought we were prepared for the worst. However, little was known about the number of cases expected, and reliable scientific facts were practically non-existent. Leaders were challenged to provide answers, present a stoic and strong front while dealing with fear and uncertainty themselves. Some excelled better than others, as often happens in battle. But while war brings a lot of death, tragedy and grief, it can also stimulate innovation, discover talent where it was not evident before and trigger ingenuity.

As we navigated through the first wave of SARS-CoV-2 virus infections two things became clear. First, communication was key. We are privileged to live in the digital age when communication in most countries is quick and easy, allowing our teams to rapidly exchange information between peers and with patients. This gave us one small sense of relief while everything else remained uncertain — we knew we could continue to provide the care, especially in the ambulatory sector.

Second, we soon realized that we were not alone. It's true that difficult times either make or break teams. The support we received from our local colleagues and corporate partners was a proverbial light in the darkness. There was a true sense of collaboration — we shared our plans with them, and they were generous enough to share their plans with us. For those who were exhausted, working shift after shift, this was a great motivator that provided the courage and grit to carry on fighting.

Lessons Learned

Before COVID-19, we strived to become a high-performing organization with numerous goals, including improving projects with analytics, working in truly multidisciplinary teams, improving circuits with quality, patient safety and efficiency as priorities, and investing in technology. Many of these projects had to be paused. What was once considered a business priority simply wasn't anymore — caring for patients was. I cannot tell you how frustrated we were at the time — so many projects and plans, in which countless hours of work had already been invested, were simply put aside with no promise of when they could be picked up again.

As chief medical informatics officer (CMIO) for Lusíadas Saúde, I am sure the full consequences of this pause are still to come. However, now that we have had some time to learn and appreciate the impact of this surreal break in normality, we have, in essence, gone back to the basics. This has been, very surprisingly, a breath of fresh air. We have been forced to simplify our lives in every aspect, not just as it relates to technology, but also how we live each day as health care providers.

We have learned to better focus on what really matters to the patient and what is truly useful, beneficial and valuable for the system. Everything has to be meticulously thought out. For example, we have to rationalize resources, including personal protective equipment, ventilators and healthy staff.

To have the support and partnership from UnitedHealth Group — such a large and broadly diversified organization — is something that our peers across the country, in other public and private institutions, do not have. The difference in the environment is quite tangible. We have been allowed, and encouraged, to keep our priorities straight with the bonus of a safety blanket. The praise and thanks received, even from the highest and farthest reaches of our long chain of leaders, however distant, allows us to think things through with a different, clearer perspective, to elaborate on plans a little longer term than others can, to ensure things will go as best as possible with what we have. Throughout the summer, a theme emerged within our UnitedHealthcare Global team: We are together — *estamos juntos*.

Although absorbed in our everyday plight, this is something that is always in the back of our minds, whether we consciously realize it or not. There is immense power in those words, knowing we are not alone in our decisions, our fears, our successes, our emotions, our journey.

As we prepare for a potential second wave of infections, we find ourselves challenged to grasp a future of uncertainty but I am confident. I say that with certainty because I can see that we are part of something bigger. We are privileged to work in such a noble and important — albeit sometimes excruciatingly difficult — profession. We, as health care providers, are trained for this. Our goal now is to not only continue to persevere but continue to improve this new form of providing care, of communication and continue to keep it as human as possible. We must share knowledge, ideas, plans and failures, so we can learn, change and grow. Even if it means going back to basics: keeping in mind what's important and why we are in this in the first place — for people.

Conclusion

I cannot conclude yet because we are active in our efforts to cross the finish line. I am, however, convinced that our resilience, mission and the network we are part of will provide us with safe passage through this storm. We are together. #estamosjuntos

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Throughout the summer, a theme emerged within our UnitedHealthcare Global team: We are together — estamos juntos.

Although absorbed in our everyday plight, this is something that is always in the back of our minds, whether we consciously realize it or not.

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Timely Implementation of a Molecular Laboratory in Brazil to Detect SARS-CoV-2 by RT-PCR

Introduction

The first case of COVID-19 in Brazil was diagnosed on Feb. 25, 2020. In the midst of the rapid global spread of SARS-CoV-2, and in an attempt to control the infection, the World Health Organization (WHO) advised all countries to test as many people as possible.[1] Thus, molecular tests that directly detect the ribonucleic acid of the novel coronavirus by Reverse Transcription Polymerase Chain Reaction (RT-PCR), which has been defined as the gold-standard methodology, became critical to identify infected individuals.

Brazil has only a few laboratories that perform molecular analyses, and because of the surge in global demand for supplies, the difficulty in meeting these needs became evident. In São Paulo and its surrounding area, the region most affected at the onset of the pandemic, UnitedHealth Group Brasil has a care delivery system of 19 hospitals which were treating over 600 new cases of suspected COVID-19 across the system each day. Third-party laboratories performing the tests for these hospitals were only unable to meet the demand for testing. In addition, the turnaround time (TAT) for results was unacceptably long: between five to 10 calendar days.

Consequently, we recognized the need to set up an internal UnitedHealth Group Brasil Institutional Laboratory that could meet the emergency demand for testing. The entire process, from planning to implementation — a process during which all the requirements of best practices were followed — took only 30 days. In this article, we describe our experience in setting up the molecular laboratory and the importance of making decisions that favor quality and excellence in patient care in times of great emergency.

Purpose

The scarcity of COVID-19 tests and lengthy delay in obtaining test results caused challenges to our ability to provide optimal care to our patients and increased the potential risk of further community transmission. These limitations also had a potential significant adverse effect on the efficiency of our health care professionals and increased their care delivery burden. While there was an increasing need to expand the workforce, adequate testing capacity and timeliness of results were also necessary to guarantee the safety of health care professionals and our patients. Thus, with the goal of creating a structure to meet both our current and future testing demands, we started a plan to set up, equip and make ready a laboratory with the capacity to perform SARS-CoV-2 molecular diagnostic tests.

Methodology

A strategic approach and focus on execution allowed us to create a laboratory dedicated to meeting the demands of COVID-19 patients from scratch. The business plan was designed dynamically by the stakeholders and included a partnership with a leading company in the molecular biology market. The project's unprecedented strategic aspect was complemented by our leadership's swift approval of the required investment.

The plan was executed in record time because we focused our efforts on a detailed catalogue of its requirements, as well as on identifying critical pathways and priority areas — with emphasis on supplies, human capital, information technology, construction and regulatory requisites. This all took place in a synchronous and coordinated manner.

The construction team worked 24/7 for two weeks to deliver a laboratory that met all mandatory regulatory specifications to ensure best practices and the safety of our team members. The acquisition of equipment and supplies was also precisely coordinated, in order to guarantee meeting all our hospital testing demands, even in the midst of an increasing number of COVID-19 cases.

Team members were hired via a partnership between human capital and the laboratory director's office — already part of the UnitedHealth Group Brasil organization. Hiring processes included virtual interviews and followed a structured methodology that focused on the specific skills required for each position. Analysts had to demonstrate substantial experience in RT-PCR and virology.

The laboratory was ready to receive the equipment 15 days after the start of the tasks to prepare the physical space; most of this equipment had been imported in record time, thanks to substantial help from our corporate offices in the United States. Having been trained, team members were ready to start validating methods following national and international guidelines.

Our partner laboratories made positive and negative samples available so they could be used in the validation process. In addition, commercially available positive controls were used. All the laboratory's standard operating procedures and employee handbooks were developed during that same time period.

Simultaneously, in the hospitals, nurses were being trained to correctly collect and process samples, including how to send samples to the laboratory. With the entire operation validated, we were able to have the laboratory and testing process officially certified. Subsequently, within two weeks we obtained the Ministry of Health's official approval to perform RT-PCR tests to detect SARS-CoV-2.

Results

From the start of the laboratory's operations we saw a steady and progressive increase in testing capacity (Figure 1). The number of daily tests increased from 150 to 600 while the TAT for results decreased from 15 hours at the onset of operations to 10 hours over the course of four months (Figure 2). The number of hospitals served increased from 5 to 14. The hospitals are located in seven different cities within a 100-kilometer (62-mile) radius of the laboratory. The mean positivity rate in the first weeks of testing was 44%, reflecting the critical moment of the pandemic we were going through. At the time of submission of this article, four months later, our positivity rate is 25% (Figure 3). Although lower, it shows that the pandemic still requires substantial efforts and resources.

Lessons Learned and Conclusion

This unprecedented achievement arose from the focused commitment and great dedication of all professionals involved. It was the result of a process of constant adaptation to evolve towards the defined goal. The lessons learned were that an in-house laboratory, within the Brazilian health care system, has a very positive effect on the hospital efficiency and effectiveness, because it resulted in a significant decrease in turnaround time of testing, allowed for precise cost control and made population health information available. This, in turn, helped to enhance care management plans and clinical decision-making. These improvements resulted in better care for our patients and a better health care system for everyone.

[1]World Health Organization (2020). Laboratory testing strategy recommendations for COVID-19: interim guidance, 21 March 2020. World Health Organization. https://apps.who.int/iris/handle/10665/331509

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Figure 1. Number of Tests Performed per Month

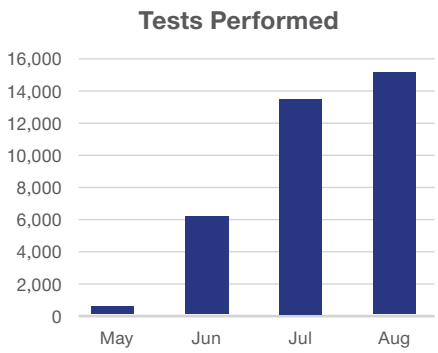
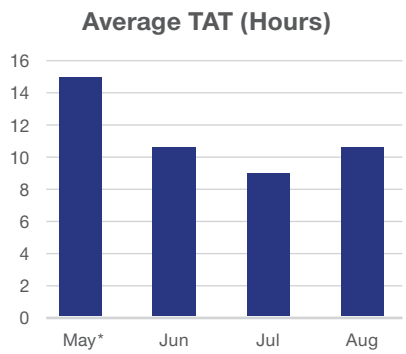
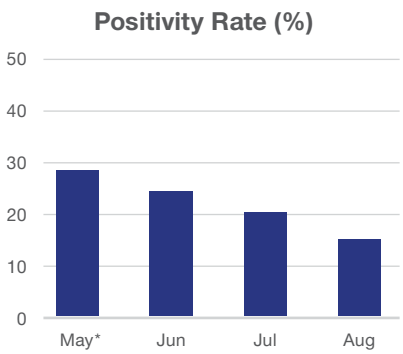


Figure 2. Average Test Turnaround Time (TAT) per Month



**Five days of work*

Figure 3. Test Positivity Rate per Month



**Five days of work*

Ambulatory Treatment and Clinical Outcomes of COVID-19 Patients in Clínica Dávila, Chile

Introduction

Once we started receiving the first cases of COVID-19 at Clínica Dávila in Santiago, Chile, we designed a telephone follow-up program for patients who did not require hospitalization or were discharged from the hospital. The goal of this program was to manage their care, evaluate the course of their symptomatology and detect possible risk conditions that warranted urgent medical evaluation.

The follow-up program was categorized according to the patient's risk group, as follows:

- **Patients with COVID-19 who did not require hospitalization:** Patients received a telephone call in the first 48 hours after the test result to inform them of positivity, educate them about the measures to be taken and when to visit the hospital; then telephone follow-up on days 7, 10 and 14.
- **COVID-19 patients discharged from hospital:** Patients received telephone calls on days 2, 6, 10 and 14.
- **High-risk COVID-19 patients:** Patients with comorbidities such as obesity, hypertension, diabetes and immunosuppression, or discharged patients who required invasive ventilation, received additional telephone follow-up on days 21 and 28.

At the end of follow-up, if the patient was in good general condition with no symptomatology, a discharge document was sent.

If, during telephone follow-up, the patient was found to be experiencing a complication, such as shortness of breath (seated or resting) or a fever that did not respond to indicated measures, the patient was referred to the emergency department or for outpatient evaluation, depending on symptom severity.

After the referral, the patient's clinical records were checked for clinical care plans to find out if the patient was treated and to confirm the diagnoses that were made. If no information was found in the clinical record or if the patient was referred home, a call was made after 24 hours to follow up on their clinical condition.

Goals

- Detect possible complications in a timely manner and facilitate referral to the relevant level of care.
- Support and educate the population affected by COVID-19 treated at Clínica Dávila.
- Learn the clinical evolution of a recent-onset disease with little scientific evidence to-date.

Results

From April 14 to Sept. 3, we assessed all of the positive cases managed at Clínica Dávila:

- 7,754 cases with positive COVID-19 polymerase chain reaction (PCR) tests were considered eligible for this program.
- Of these, 825 cases were ruled out because they corresponded to duplicate cases (more than 1 PCR in the system).
- Employees were ruled out, since they used their own distinct follow-up program.

Of the remaining 6,929 managed cases, 487 did not enter telephone follow-up because they were still hospitalized, died during hospitalization, were transferred to another care center or could not be located during follow-up.

After analyzing the 6,442 final cases eligible for the program, the following results were obtained:

- 4,113 patients were male (59.4%), and the highest number of positive cases was observed in patients between 15 and 49 years of age (Table 1).
- 62% of the patients were Chilean nationals and the rest were foreign nationals, with Peruvian (24%) and Venezuelan (8%) nationals being most frequent in this category.
- The majority of patients were from the communities of Recoleta, Independencia, Santiago and Conchalí, the communities close to our hospital.
- Follow-up was performed on 5,251 patients (81.5%) undergoing outpatient treatment and 1,191 patients (18.5%) were followed-up on after hospital discharge.

During the outpatient follow-ups:

- 286 patients (5.4%) were referred due to a complication and hospitalized to continue treatment; in 43% of these cases, the referral occurred between three and seven days after receiving positive PCR test results.
- Of the 286 patients referred to the hospital, 100% reached the hospital within 24 hours from the time they received our phone call.

Mortality by follow-up group and age range (Table 2) was significantly higher in those over 70 years of age. In the ambulatory group, the deaths were in patients older than 70 years or in end-of-life treatment.

28% of patients were asymptomatic when they started follow-up. However, all patients developed some form of symptomatology throughout the follow-up period. The symptoms most frequently reported by patients in the first week were cough, headache, anosmia and myalgia. The cough and headache continued for a longer period.

Lessons Learned

It is important to emphasize how quickly this type of follow-up should be established, in line with existing national regulations. The challenge was not only the design, but the ability to reach out to a large number of patients.

The follow-up program was appreciated by the health team and patients, since it became an expedited channel of communication and allowed for continuity of care.

Conclusion

Implementing this follow-up program allowed us to provide safe care to a large number of people, which would not have been possible on the same scale in-person. Patients appreciated being heard and supported during the course of their illness.

Analyzing the information obtained retrospectively allows us to show that our COVID-19 patient experience and the behavior of this infection is similar to what is described worldwide.

Table 1: Age Range Follow-Up Group

Age Range	No. of Patients	Percentage
< 15 years	295	4.5%
15-39 years	2,978	46.2%
39-49 years	1,151	17.8%
49-59 years	1,061	16.4%
59-69 years	603	9.3%
>70 years	354	5.4%
TOTAL	6,442	100%

Table 2: Mortality by Follow-Up Group and Age Range

Follow-Up Group	Age Range	Total	Death	Mortality Rate
Ambulatory care	**Total**	**4965**	**11**	**0.2%**
	< 15 years	274	0	0 %
	15-39 years	2604	0	0 %
	39-49 years	911	0	0 %
	49-59 years	735	1	0.1%
	59-69 years	299	4	1.3%
	>70 years	142	6	4.2%
Ambulatory care referred to inpatient	**Total**	**286**	**18**	**6.3%**
	< 15 years	2	2	0 %
	15-39 years	81	2	2.5%
	39-49 years	50	0	0%
	49-59 years	68	1	1.5%
	59-69 years	54	6	11.1%
	>70 years	31	9	29%
Post-discharge follow-up	**Total**	**1191**	**12**	**1%**
	< 15 years	19	0	0%
	15-39 years	293	0	0%
	39-49 years	190	2	1.1%
	49-59 years	258	4	1.6%
	59-69 years	250	1	0.4%
	>70 years	181	5	2.8%
TOTAL		6442	41	0.6%

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Cross-Market Operational Readiness, Continuity of Care and Supply Chain Management During COVID-19

Introduction

COVID-19 has challenged health care systems globally and highlighted critical gaps in their ability to rapidly respond to a pandemic.[1] During times like these, health care leaders must provide clear direction and a systematic approach that will enable their organizations to evaluate critical needs, identify risks and prioritize actions, using a framework that optimizes standardization while allowing for local adaptation.

As a global company that operates 53 hospitals and 216 outpatient/ambulatory clinics and manages the benefits of about 7.5 million members across 13 countries, UnitedHealthcare Global was uniquely positioned to address COVID-19 using global expertise and local resources.

The pandemic presented several key challenges which our teams sought to solve by leveraging our global operating model. First, the pandemic emerged at different times within different countries and continents and spread at different rates. As with any emerging virus, information and guidance were extremely limited, continually evolving and varied by country. Due to the clinical presentation and treatment requirements of COVID-19, ventilators and personal protective equipment (PPE) were mission-critical supplies; nearly every health care system and country around the world was competing for these scarce resources.

As clinicians and leaders, we sought to use the best evidence to provide clear direction and a systematic requirements-evaluation approach. This enabled our organization to identify our critical needs and risks. It also empowered us to prioritize action and mitigation strategies, which harnessed our global strengths while allowing for local adaptation.

Methods

In preparation for the rapid development and spread of COVID-19 in our Brazil, Chile, Colombia, Peru and Portugal markets, a cross-functional clinical and supply chain work group assembled to identify, support and monitor our respective markets' readiness to mitigate this pandemic. Operations adaptations, the provision for continuity of care and acquisition of needed ventilators, supplies and medications were all systematically evaluated.

Teams created and deployed an evidenced-based readiness report (Figure 1) to ensure readiness for clinical operations and continuity of care. 74 clinical readiness indicators were developed and measured in each market using a simple red, yellow, green indicator report. Weekly team huddles enabled us to share best practices and on-the-ground experiences, which resulted in additional indicators being developed.

We also implemented a novel global and local supply chain and procurement process to maximize all supply chain relationships and import and export medical supplies and equipment across borders. By applying World Health Organization and Centers for Disease Control guidance, UnitedHealthcare Global's corporate supply chain and clinical leaders partnered to develop an estimated PPE demand forecast. We incorporated historical patient volumes and membership rates with anticipated COVID-19 contraction rates to estimate how much PPE each market would need in peak and near-peak conditions.

As the infection rates slowed and our health systems returned to performing elective procedures, an additional set of guidelines and monitoring expectations were implemented to ensure patient, member, visitor and employee safety was maintained, and the spread of the virus contained (Figure 2).

Results

- Clinical Operational Readiness (COR) and Continuity of Care (COC) Indicator Reports.
- All care delivery services were in a full state of readiness on all 74 readiness indicators.

Supply Chain Forecasting and Supplies

All care delivery services maintained adequate stock of all PPE supplies. Each care delivery area was able to obtain the needed number of additional ventilators requested by clinical leadership to increase the intensive care unit support required to treat patients with COVID-19.

Best Practices

We identified a patient safety officer in each of our hospitals who promoted, reminded and educated staff on the correct use of PPE.

Care delivery teams assessed their ability to deliver isolation/ quarantine and appropriate home care support in patients' homes as an alternative to an inpatient admission.

We also established dedicated equipment, teams and ambulances to transport suspected and confirmed COVID-19 cases to prevent cross-contamination of patients during emergency transportation.

Our market leaders created an inventory of each market's capabilities to provide telemedicine as an alternative to office visits and hospitalizations. We rapidly recruited physicians and nurses, who typically worked in the outpatient setting, to provide telemedicine services and expanded this capability dramatically. This resulted in a reduction in unnecessary patient travel and sped up the diagnosis of suspected cases without patients having to leave their homes.

Conclusion

Prior to COVID-19, our sharing of best practices and experiences across our markets was an integral component of our operating model. With the onset of the pandemic, the importance of working together took on much greater significance as we urgently sought to understand, share and deploy best practices; leverage an expanded supply chain infrastructure to provide life-saving resources such as PPE, ventilators and medications; and support our businesses as they work to safely reopen health services.

Today we are a more resilient, empowered and agile global clinical "team of teams" with a shared consciousness, aligned common purpose and documented best practices. We are operationally ready to address the next national or international health emergency.

[1]Blumenthal D, Fowler EJ, Abrams M, Collins SR. Covid-19 — Implications for the Health Care System. N Engl J Med 2020; 383:1483-1488. DOI: 10.1056/NEJMsb2021088

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Figure 1. Example of COR COC Readiness Assessment by Market

Figure 2. Example of Readiness Assessment to Resume Elective Procedures

Reconstructing the Medical Management Model in a Resource-Constrained Environment During the Pandemic: The Clínica San Felipe Experience in Peru

Introduction

This article describes managing COVID-19, a previously unknown disease, in the context of scarce resources (intensive care unit [ICU] beds, emergency room capacity, health care professionals, protective personnel equipment and mechanical ventilators). As part of our pandemic preparedness efforts, we anticipated resource constraints and chose to rethink our open critical care unit model, where the physician responsible for the care of the patient was the staff physician and the intensivist functioned as a consultant.

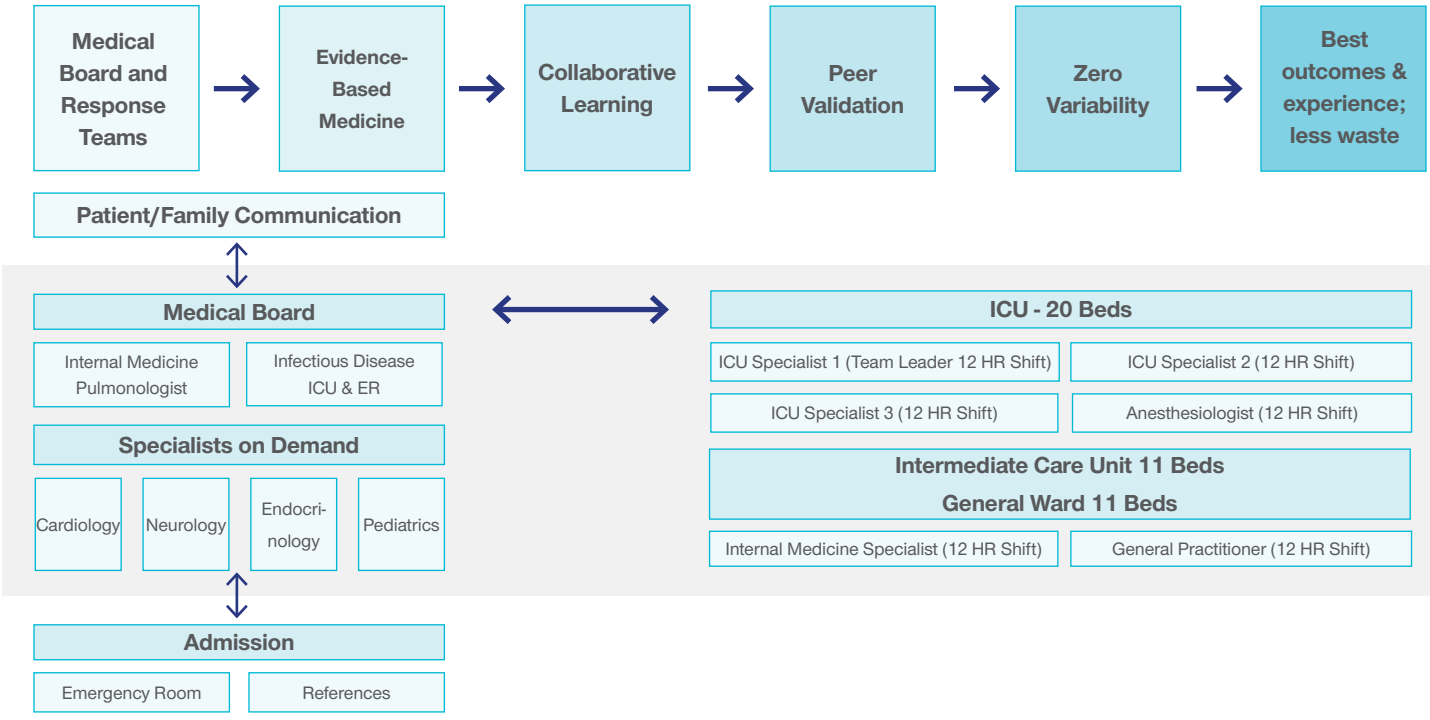
This decision was made to standardize the quality of care of patients admitted with COVID-19. Our decision was driven by the realization that the possibility of variation in care during the COVID-19 pandemic was high because a significant amount of emerging information was not validated and was without scientific rigor or robust systematic review.[1] In addition to this, side effect reports of empirical treatments placed patients with COVID-19 at risk for adverse events.[2]

Framework of COVID-19 Medical Management Model

We established a medical board to support management of critical care patients. The board was comprised of a specialist in internal medicine, an infectious disease specialist, a pulmonologist, heads of the emergency department, directors of the intensive care units and the chief medical officer. The medical board met daily to review the patients' cases and coordinate with the direct care team of three intensivists and an anesthesiologist. Daily care planning allowed the patients to receive the right treatment at the right time. Treatment protocols were discontinued if they did not demonstrate effectiveness or were not supported by recent and emerging evidence-based guidance. The focus of the medical board and direct care team was to maintain patient safety and improve clinical outcomes without inappropriate delays in care, wasteful use of resources, supply chain disruption and unnecessary increase in cost of care.

Figure 1 provides a high-level overview of the medical board operating model and communication process.

Figure 1: Medical Board Engagement and Communication Process



Overview of Clinical Presentation of Patients with COVID-19

Between March 13 and Oct. 1, we treated 392 patients with suspected or confirmed COVID-19. Table 1 provides an overview of the admission level of care, admission appropriateness and eventual COVID-19 test result. Thirty percent of all admissions were potentially avoidable, all of whom turned out to be COVID-19 negative patients who were assumed to be COVID-19 positive on admission to hospital.

Table 2 provides an overview of length of stay. The length of stay of patients with confirmed COVID-19 admitted to the intensive and intermediate care units was almost double the length of stay of patients with COVID-19 admitted to the general ward.

Our length of stay experience is fairly comparable with the experience of other countries, including China.[3]

Tables 3 and 4 indicate length of stay based on time to presentation, mechanical ventilation status and treatment regimen. Our data suggests that male COVID-19 patients had a longer duration of illness prior to presentation. They also had longer lengths of stay and spent more days on mechanical ventilation. Additionally, patients with COVID-19 who received Tocilizumab had the longest length of stay compared with other drug therapeutic categories. This may have been related to the increased severity of illness. Our sample size precludes robust statistical validation.

Article continues on the next page.

Table 1. Level of Care (LOC) Upon Admission and Clinical Appropriateness of Admission

Results Of SARS-CoV-2 RT-PCR	Number of Patients	Variance	
		Medically Necessary	Potentially Avoidable*
Hospitalization	**278**	**155**	**85**
Negative**	125	16	85
Positive	152	139	0
Intensive Care Unit	**44**	**39**	**7**
Negative**	7	2	7
Positive	37	37	0
Intermediate Care Unit	**94**	**65**	**25**
Negative**	30	2	4
Positive	64	63	0
TOTAL	392	275	117

Table 2. Regular Hospitalization, Intensive and Intermediate Unit Length of Stay (LOS)

Length of Stay of Each Level of Care at Admission			
Results of SARS-CoV-2 RT-PCR	Number of Patients	Length of Stay (LOS days)	Time of Illness at Admission (Days)
Hospitalization	**278**	**9.5**	**4.0**
Negative**	125	3.8	0.6
Positive	152	12.6	7.6
Intensive Care Unit	**44**	**27.0**	**8.5**
Negative**	7	13.6	6.3
Positive	37	29.5	8.9
Intermediate Care Unit	**94**	**18.1**	**6.2**
Negative**	30	6.9	2.3
Positive	64	25.9	8.7

Table 3. Length Of Stay (LOS) Related to Time of Illness Before Admission and Average Mechanical Ventilation Days

Results Of SARS-CoV-2 RT-PCR	Average Age of Admited Patients (Years)	Length of Stay (LOS Days)	Time of Illness on Admission to Hospitalization (Days)	Average Days of Mechanical Ventilation (Days)
Negative**	45.71	4.72	1.18	1.91
Female	37.68	3.06	0.52	1.82
Men	48.34	5.79	1.57	1.96
Positive	55.33	19.08	7.79	7.60
Female	57.05	12.52	5.78	2.30
Men	54.86	20.80	8.38	9.01
TOTAL	52.62	13.20	5.00	5.44

***Negative PCR results on patients managed as clinical COVID-19 diagnosis*

Table 4. Length of Stay Related to Treatment

Type of Treatment other than Support	Percentage of Patients treated (%)	Length of Stay (Days)
Hydroxychloroquine	7.39%	14.48
Hydroxychloroquine+ Azithromycin + ceftri-axone	1.02%	9.25
Hydroxychloroquine+ Azithromycin	5.61%	19.55
No specific treatment for COVID-19	83.16%	12.54
Tocilizumab	7.60%	24.81
Remdesivir	1.0%	N/A (***)

****Not applicable because treatment was irregular and doses insufficient*

Reconstructing the Medical Management Model in a Resource-Constrained Environment During the Pandemic: The Clínica San Felipe Experience in Peru, Continued

Total mortality rate in our COVID-19 patient cohort (suspected and confirmed) was 13.35%. Patients who required intubation and mechanical ventilation had a mortality rate of 29.4%. Although our data compares favorably with observational mortality data from across Asia, North America and Europe, it is difficult to draw a valid conclusion due to the wide variability in reported mortality rates and the demographic and clinical differences in the reported samples.

Lessons Learned

Having an integrated medical board that engaged and interacted with the hospital administrative team, and physicians delivering direct care at the point of service allowed us to:

- Take advantage of the best available evidence-based guidance to develop therapeutic plans. Team members identified best practices by collectively solving problems, completing tasks, engaging in authentic, collaborative learning and seeking peer validation. The final result was minimal variability, sustained clinical outcomes and reduced waste.
- Communicate effectively and efficiently with patients and family members. Each medical board member was accountable for communicating with designated patients' relatives. The medical board member communicated with the assigned family members after each daily meeting. This facilitated consistent communication by a single point of contact and significantly reassured the patient, family and caregivers. The medical board member also worked with the physicians caring for the patient at point of service to coordinate FaceTime calls between the patient and patient's family to confirm ongoing recovery or at critical points in the patient's care — for example, before the patient is placed on mechanical ventilation.
- Efficiently coordinate transition of patients into the emergency room and determine admission appropriateness and level of care under the supervision of a member of the medical board. This helped ensure that procedures and consultations were carried out at the right time and also facilitated efficient resource utilization.

Conclusion

We believe that our COVID-19 collaborative medical management model has generated efficiencies by focusing on application of available evidence-based guidance, driving appropriate resource utilization and mitigating waste. Our communication processes within the model allowed us to engage on a personalized, human and individualized level with patients and families, despite the physical barriers of personal protective equipment and the psychological barriers of fear driven by limited information about a novel disease. Finally, we believe that our COVID-19 medical management model did not adversely impact quality outcomes as our mortality ratios are comparable with available global mortality benchmarks.

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[3] Rees, E.M., Nightingale, E.S., Jafari, Y. et al. COVID-19 length of hospital stay: a systematic review and data synthesis. BMC Med 18, 270 (2020). https://doi.org/10.1186/s12916-020-01726-3

[4] Large Study of COVID-19 NYC Hospital Cases Shows High Mortality https://www.medscape.com/viewarticle/929375

[5] Characteristics and Mortality of Hospitalized Patients With COVID-19 in Iran: A National Retrospective Cohort Study. URL : https://www.acpjournals.org/doi/10.7326/M20-2911

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Educational Opportunities & Clinician Resources

Ignite Site

Visit **uhc.care/globalCOVID** for important updates, clinical resources and COVID-19 information created specifically for UnitedHealthcare Global clinicians.

Estamos Juntos LinkedIn Group

The phrase *We are Together — Estamos Juntos* is a simple reminder that although miles, oceans and languages may separate us, we stand together as one team in the fight against COVID-19. Visit **uhc.care/together** to join the Estamos Juntos LinkedIn Group and connect with fellow UnitedHealthcare Global clinicians.

OptumHealth Education

OptumHealth Education (OHE), a UnitedHealth Group company, offers free web-based, accredited medical education. OHE is one of the few jointly accredited organizations in the world, having been simultaneously accredited to provide continuing education activities in the following areas: medical, nursing, pharmacy, psychology and social work.

Create an account on optumhealtheducation.com and access nearly 100 hours of free continuing education (content currently availablein English).

Preparation, Strategies and Response of Amil Hospital Intensive Care Units to COVID-19

Introduction

The first case of COVID-19, a disease that would impact all of humanity, was reported in December 2019.[1] Globalization has played a fundamental part, not only in the spread of the virus, but also in the near-instantaneous exchange of experiences between countries. We have collectively learned about COVID-19 in the "classroom of the global community."

Since early 2020, the Amil insurance company, part of UnitedHealth Group Brasil, has been actively working on a plan to combat the pandemic and ensure that our patients receive best quality care. Amil has 15 integrated hospitals in Brazil, distributed in the states of Rio de Janeiro and São Paulo, and serves 3.4 million beneficiaries. This article describes strategies deployed between March and August 2020, during the height of the COVID-19 pandemic, to support optimal care for all patients in the intensive care units (ICUs) of Amil hospitals.

Results

The strategies used to increase the capacities and capabilities of Amil hospitals' ICUs were based on three pillars: space, team and materials. The actions were divided into two levels: 1.) Physical structure and supply guarantee 2.) Personnel crisis management.

Level 1 — Physical Structure and Supply Guarantee: Execution of Level 1 included the creation of a Crisis Committee, composed of the Amil upper management, with the goal of collecting data and coordinating actions in support of hospitals leadership.

The COVID-19 Technical Committee, made up of specialists from multiple lines of service, was set up to collate and disseminate updated evidence-based COVID-19 care management guidelines. This initiative provided safety for our frontline health care professionals and supported their care delivery and patient care activities in the face of large amounts of new and often contradictory information.

The Amil leadership team developed an operational dashboard and centralized the distribution of a large supply inventory to prevent materials shortages. The inventory management plan addressed the acquisition of mechanical ventilators and high-flow catheters and their transfer between hospitals, allowing us to meet all needs.

Our system for monitoring ICU beds and resources to predict the risk of overwhelming hospital capacity was essential to inform hospitals of the need to add beds and perform situational analysis. This system was based on the Government Plan of the state of São Paulo, which provided a warning system when hospital and ICU capacity was at risk of being exceeded and helped hospital administrators manage occupancy to make decisions regarding opening up more beds. The warning system leveraged four color-coded categories: Maximum Alert (red); Control (orange); Flexibility (yellow) and Partial Opening (green). The São Paulo plan leveraged key indicators including:

- Average ICU occupancy in the last seven days
- Number of ICU beds per 100,000 habitants
- Number of new cases in the last seven days compared with the preceding seven days
- Number of new hospitalizations in the last seven days related to the preceding seven days
- Number of deaths in the last seven days related to the preceding seven days

Our dashboard included the following indicators (Figure 1):

- Average ICU occupancy in the preceding seven days
- Number of new admissions in the preceding seven days
- Number of patients on mechanical ventilation in the preceding seven days.

These three criteria were used to monitor the risk of exceeding hospital and ICU capacity by calculating the following simple composite risk score ([New hospitalizations in seven days X3] + [MV in seven days X1])/4].

Effective triage, resource allocation and efficient transfer of patients between hospitals were essential to quality care. By monitoring the data dashboard, the operational capacity of ICU beds at Amil was increased by 58% (from 264 to 418 beds) and the average occupancy rate did not exceed 85% even at the peak of the pandemic, giving credibility to risk management and quality of care. As background, Amil used 85% as a threshold limit for safe occupancy.

As of Aug. 31, there were 2,282 ICU admissions of COVID-19 patients, with 1,382 recovered and 900 deaths; the Amil hospital mortality rate was 39%. Around 54% (1,244) of patients required invasive ventilation and the mortality rate was 62%.[2]

Level 2 — Personnel Crisis Management: Managing absenteeism and avoiding presenteeism (working while sick)

was a major challenge exacerbated by surge demand for additional beds, staff and resources.

Several professionals were asked to step away from their tasks, either because they had been exposed to COVID-19 or because they belonged to a high-risk group. As a result, we needed to hire 1,002 additional staff across the system. The new hires were assigned to closed units such as the ambulatory surgery centers.

The proper use of personal protective equipment (PPE) was the cornerstone of training for the infection control service. In addition, we instructed teams on monitoring for early detection of symptoms and indications for immediate isolation in order to avoid cross-transmission and mitigate the risk of health care professionals' infection.

"The Safety Promoters" was a group formed by local care delivery professionals composed of quality and infection control teams. They were responsible for performing daily rounds, monitoring staff adherence to infection control precautions and PPE use protocols. Any gaps identified by these teams were immediately remediated by real-time coaching and training reinforcement. The impact of the collective actions by the clinical teams and back office employees resulted in a 51.7% decrease in the rate of health care professional absenteeism. The number of workers who were unable to perform their duties decreased from 2,406 (April 1-May 31) to 1,245 (June 1-July 31). During this period there were no deaths reported on the nursing team in the Amil Group, despite the fact that Brazil was one of the countries with the highest mortality rates among nurses during the COVID-19 pandemic.

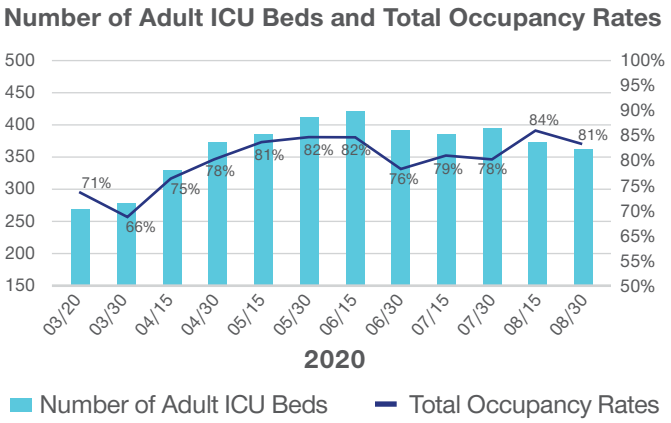
Lessons Learned

In times of crisis, we learned the importance of encouraging creativity and innovation to meet the changing demands of an unprecedented virus.

Without a doubt, the pandemic taught us that we are all connected and dependent on one another. The integration of hospitals in different regions of Brazil, following a single plan and providing mutual support, allowed for the exchange of experiences and rapid problem-solving. This was possible because our work groups were highly motivated and united in pursuit of a common purpose.

The use of real-time information systems was crucial to integrate and facilitate rapid transmission of accurate information, confirming that data science technology can indeed revolutionize health care. Focused training programs, carried out to improve professional skills in recently hired workers, and the support of more experienced personnel, helped to sustain the staff.

Figure 1: Weekly Monitoring of ICU Admissions and Occupancy Rates



One of our great tests was ensuring the quality of all PPE products and suppliers prior to procurement and acquisition. At the peak of the pandemic crisis, PPE with varying degrees of quality was being manufactured across the globe. Despite these challenges, working with our corporate partners, we were able to provide the crucial optimal-quality PPE for all of our hospital staff, ensuring the protection of our staff and the credibility of our institutions.

Conclusion

The COVID-19 pandemic has tested the capacity and resilience of health care systems around the world. The experience of the Amil network was grounded in proactive risk assessment, cross-functional planning, organizational agility, rapid decision-making, quick actions and interdisciplinary collaboration — and ensured that our system was resilient and provided a safe working environment for our employees.

We remain engaged with the task of maintaining a team committed to the goal of offering quality services with safety. We continue to learn about COVID-19 and about living with the risk of in-hospital contamination. We continue to focus on strengthening our processes and increasing our technical capacity, in order to return to our pre-pandemic performance and resume our elective activities.

[1]Sohrabi C, Alsafi Z, O'Neill N et al. World Health Organization declares global emergency: A review of the 2019 novel coronavirus (COVID-19) International Journal of Surgery. 2020, 76: 71-71.

[2]Epimed ICU Monitor system

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Follow-Up Home Monitoring of COVID-19 Patients in Peru

The Problem

The COVID-19 pandemic response demanded efficient health care infrastructure, resilience and agility in the face of uncertainty and rapidly emerging scientific evidence. The demand for care delivery services stressed health care systems, including emergency rooms (ERs) in Peru and around the world. In Peru, many of these patients lived in health resource-poor areas and returned to their homes without follow-up care. This dilemma mandated the creation of innovative ways to manage low-complexity patients in order to prevent bottlenecks for those who needed to access the health care system for urgent or emergent care.

The Program

The objective of the Clínica San Felipe's COVID-19 Home Monitoring Follow-up Program is to identify and facilitate care of high risk COVID-19 patients outside of the hospital. Specifically, this program targets those living in health resource-poor areas who need quality emergency or urgent care in a timely and efficient manner.

The Process

After a suspected COVID-19 patient undergoes the COVID-19 test and is discharged from the emergency room (ER), the hospital epidemiologist delivers the patient's COVID-19 test swab samples to the national laboratory (Instituto Nacional de Salud) along with the patient's epidemiological records (according to local regulations). The patient's relevant personal information is entered into the hospital database: name, telephone, results and clinical follow-up data.

In February 2020, early in the pandemic, access to clinical test results reported by the national laboratory took seven days. Therefore, it was necessary for the home monitoring team to conduct clinical follow-up prior to obtaining the results to monitor the patient for signs and/or symptoms of COVID-19. Our first call to the patient was made within one day of discharge from the ER. Teams would continue follow up every two to three days until negative results were returned. If the test results were positive, the patient would continue to be monitored until resolution of symptoms, or for 14 days if the patient was asymptomatic.

By March, the National Clinical Laboratory COVID-19 test results reporting time had decreased from seven days to two to three days. With the faster turnaround, the home monitoring team was able to make the first call to patients as soon as they were notified of the results.

During the first call to the patient the following actions were taken by the follow-up team:

1. Notification of the test result, leveraging the SPIKES/NURSE tools to support communication of bad news and establishment of an emotional connection with the patient[1]
2. Training in biosafety and infection prevention measures for the home environment
3. Documentation of the patient's clinical background and identified risk factors, including obesity, diabetes and cardiovascular diseases
4. Confirmation of the duration of symptoms, if any, including counting the number of days with symptoms. Teams took into consideration that days 9 through 12 were a critical time period when the patient was at risk of sudden clinical deterioration
5. Documentation of household contacts including persons with whom they live, ages, symptoms and background
6. Assignment of care staff to continue follow-up based on complexity

Follow-up was done by ER doctors for patients with high complexity, including patients on polypharmacy and patients with clinical high-risk factors. Risk rating color code: **Red.**

Follow-up was done by nurses for patients with low complexity: with or without risk factors, but with mild symptoms and/or good clinical progress. Risk rating color code: **Yellow** (for symptomatic with mild or controlled disease) or risk rating color code: **Green** (for asymptomatic or symptomatic without previous medical history).

For patients who develop moderate symptoms, patients who are hospitalized in other institutions, or patients who have severe symptoms but are unable to be hospitalized due to lack of resources, follow-up was done by the ER doctor.

Making Contact

Teams made every effort to make initial contact with a patient once they returned home, citing this as a crucial step in the continuation of appropriate care. First, the follow-up team attempted a phone call. If there was no response, the team made repeat calls twice for three days. If the call did not reach the patient, the team left a voice message or sent a text. If the patient did not return the call or respond to the text, the team would send an email with contact information.

Once first contact was established, the patient was classified according to level of risk and a care staff was assigned to continue with follow-up until discharge (in 14 days or three asymptomatic consecutive days).

Those patients in follow-up who did not respond to calls on three consecutive days or by the 12th symptomatic day, as well as those patients where no contact was established, were registered as without follow-up (N/A). Additionally, if a discharge call was not completed in patients with good clinical outcomes beyond their 12th symptomatic day, the patient would be registered as without response (WR).

The telephone triage classification tool for the COVID-19 home monitoring follow-up program was derived from the Sepsis screening tool[2] (Table 1).

Table 1. COVID-19 Home Monitoring Telephone Triage Screening Tool

Telephonic Screening	
RED	Evidence of altered mental status Cannot stand or walk Cannot speak or breathe Very rapid breathing Marked paleness or cyanosis
YELLOW	Less activity or more sleep Immunosuppressed Breathing faster Decreased urine output Temperature < 36 ° Pleuritic pain Persistent fever > 5 d
GREEN	Mild respiratory symptoms Fever that subsides with antipyretics Cough General discomfort No rapid breathing

Green, yellow or red risk classification were determined by the patient's risk factors, medical history, days of symptoms, severity of symptoms, usual medication and contacts. Teams used the color stratification to determine subsequent actions during the first call. The triage team's action recommendations based on risk classification were as follows:

- **Red:** ER consultation or twice-a-day follow-up, on call by ER doctor is needed
- **Yellow:** Daily calls, consider ER doctor consultation
- **Green:** Follow-up every other day

Results

Between inception of the program in February and August, 5,619 COVID-19 patients were treated in the emergency room. Of this number, a total of 4,387 patients, 78% of patients, enrolled in the home monitoring program.

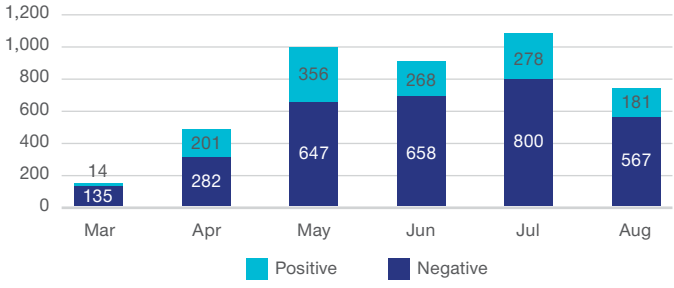
Inclusion Criteria: Patients seen in the Clínica San Felipe ER between February and August who had undergone a molecular nasopharyngeal swab RT-PCR test.

Exclusion Criteria:

- Patients with RT-PCR molecular tests that were not processed or were rejected by the National Institute of Health
- Asymptomatic health personnel tested as part of the institutional epidemiological surveillance
- Patients who were unable to be contacted by phone at least once

A total of 1,298 patients tested positive for COVID-19 (29.59%) (Figure 1). Of them, 124 (10%) were hospitalized in various public and private institutions (public hospitals 22%, private institutions 27% and in Clínica San Felipe 52%).

Figure 1. Results of Nasopharyngeal Swab Tests for Patients at Clínica San Felipe



Follow-Up Home Monitoring of COVID-19 Patients in Peru, Continued

Of the 1,298 positive patients, 886 (68.25%) patients were discharged from follow-up, 223 (17.18%) patients were unable to complete follow-up, 13 (1%) patients died, 80 (6.16%) are pending discharge at the time this article was submitted, and 96 (7.40%) patients had improving symptoms but could not be contacted to provide discharge from follow-up (Figure 2).

Of the1,298 positive patients in follow-up, 686 (52.85%) patients were classified as green, 247 (19.03%) as yellow and 136 (10.48%) as red. A total of 229 patients (17.64%) did not provide enough information to enable classification (Figure 3). As predicted, all patients classified as red were hospitalized. 28 of the 686 green patients (4.08%) and 4 of the 247 yellow patients (1.61%) required hospitalization.

The Clínica San Felipe COVID-19 Home Monitoring Follow-Up Program was a critical component of our surge capacity management planning.

Use of the home monitoring risk classification tool in conjunction with the team's clinical judgement facilitated prediction of which patients would develop severe symptoms and when they would be appropriate for hospitalization.

This facilitated timely access to clinically appropriate care in the most efficient setting.

1Baile WF, Buckman R, Lenzi R, Glober G, Beale EA, Kudelka AP (2000) SPIKES – A Six Step Protocol for Delivering Bad News: Application to the Patient with Cancer. Oncologist 5:302-311

[2]Gräff I, Goldschmidt B, Glien P, et al, Validity of the Manchester Triage System in patients with sepsis presenting at the ED: a first assessment Emergency Medicine Journal 2017;34:212-218.

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Figure 2. Follow-Up of Positive Patients

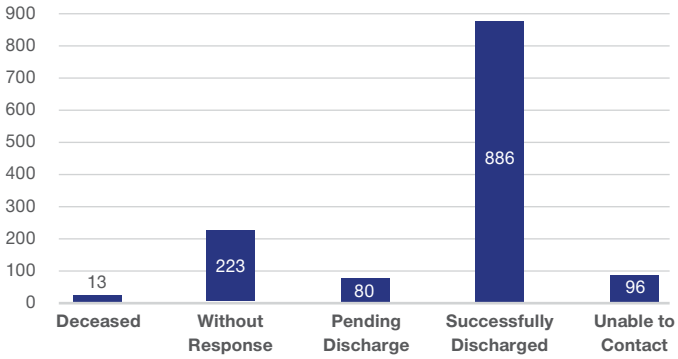
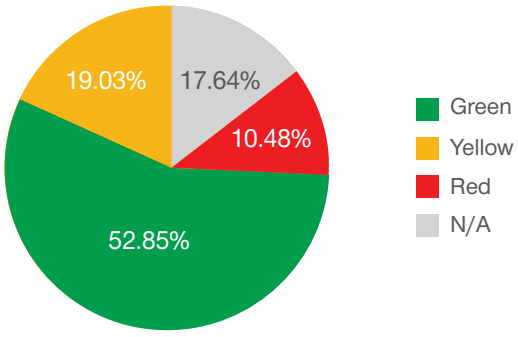


Figure 3. Classification of Positive Patient Follow-Up



Select Recent Publications

The following articles are recommended for enhancing knowledge related to COVID-19 and other clinical developments.

1. "A Systematic Review and Meta-Analysis of Published Research Data on COVID-19 Infection-Fatality Rates." Meyerowitz-Katz, G., & Merone, L., medRxiv, 2020 July 7.
2. "Atypical chest pain due to multiple coronary arteries fistulas occluded with percutaneous interlock coils: A case report." Ida, G. I., Kalansky, M. A., Luciana de Pádua, S. B., Jamus, M., Garcia, J. C. T., Furlan, V., ... & Ribeiro, H. B., Journal of Cardiology Cases, 2020 Sept 11.
3. "Collaborating Across Private, Public, Community, and Federal Hospital Systems: Lessons Learned from the Covid-19 Pandemic Response in NYC." Schaye, V. E., Reich, J. A., Bosworth, B. P., Stern, D. T., Volpicelli, F., Shapiro, N. M., ... & Sauthoff, H., NEJM Catalyst Innovations in Care Delivery, 2020 Dec.
4. "Coronavirus disease 2019 (COVID-19): a systematic review of imaging findings in 919 patients." Salehi, S., Abedi, A., Balakrishnan, S., & Gholamrezanezhad, A., American Journal of Roentgenology, 2020 July.
5. "Cost Modifications during the Early Years of the Use of the National Cardiovascular Data Registry for Quality Improvement." Barros, P. G. M. D., Li, J., Tremblay, C., Okada, M. Y., Sznejder, H., Furlan, V., & Vasconcellos, R,. Clinics, 2020 Aug 26.
6. "COVID-19 in Africa: The nuances of social distancing and handwashing." Asombang, A. W., Akintola-Ogunremi, O., Mateyo, K. J., Mwabe, J., Kpodo, J., Ani-Amponsah, M., ... & Wilson, M. M. Medical Journal of Zambia, 2020 September 9.
7. "COVID-19 pandemic and mental health consequences: systematic review of the current evidence." Vindegaard, N., & Benros, M. E., Brain, Behavior, and Immunity, 2020 Oct.
8. "Development and Implementation of a Clinical Pathway to Reduce Inappropriate Admissions Among Patients with Community-Acquired Pneumonia in a Private Health System in Brazil: An Observational Cohort Study and a Promising Tool for Efficiency Improvement." Moreira, R. C., Mendonca-Filho, H. T., Farias, A. M., Sznejder, H., Lang, E., & Wilson, M. M., Open Access Emergency Medicine: OAEM, 2020 July 30.
9. "Neurological manifestations of COVID-19 and other coronavirus infections: A systematic review." Montalvan, V., Lee, J., Bueso, T., De Toledo, J., & Rivas, K. Clinical Neurology and Neurosurgery, 2020 July.
10. "Obesity in Patients with COVID-19: a systematic review and meta-analysis." Huang, Y., Yao, L. U., Huang, Y. M., Min, W. A. N. G., Wei, L. I. N. G., Yi, S. U. I., & Hai-Lu, Z. H. A. O., Metabolism, 2020 Dec.
11. "One year follow-up Assessment of Patients Included in the Brazilian Registry of Acute Coronary Syndromes (ACCEPT)." Silva, P. G. M. D. B., Berwanger, O., Santos, E. S. D., Sousa, A. C. S., Cavalcante, M. A., Andrade, P. B. D., ... & Paola, A. A. V. D., Arquivos Brasileiros de Cardiologia, 2020 June 29.
12. "Physical distancing, face masks, and eye protection to prevent person-to-person transmission of SARS-CoV-2 and COVID-19: a systematic review and meta-analysis." Chu, D. K., Akl, E. A., Duda, S., Solo, K., Yaacoub, S., Schünemann, H. J., ... & Hajizadeh, A. The Lancet, 2020 June 1.
13. "Redesigning COVID 19 care with network medicine and machine learning: A review." Halamka, J., Cerrato, P., & Perlman, A., Mayo Clinic Proceedings: Innovations, Quality & Outcomes, 2020 Oct 5.
14. "Remdesivir for the treatment of Covid-19—preliminary report." Beigel, J. H., Tomashek, K. M., Dodd, L. E., Mehta, A. K., Zingman, B. S., Kalil, A. C., ... & de Castilla, D. L., The New England journal of medicine, 2020 Oct 8.
15. "REPLICCAR II Study: Data quality audit in the Paulista Cardiovascular Surgery Registry." Orlandi, B. M. M., Mejia, O. A. V., Borgomoni, G. B., Goncharov, M., Rocha, K. N., Bassolli, L., ... & de Sousa Vilarinho, K. A., Plos One, 2020 July 10.
16. "Strategy to Enable and Accelerate Kidney Transplant in Small Children and Results of the First 130 Transplants in Children≤ 15 kg in a Single Center." de Santis Feltran, L., Genzani, C. P., Fonseca, M. J. B. M., da Silva, E. F., Baptista, J. C., de Carvalho, M. F. C., & Koch-Nogueira, P. C., Transplantation, 2020 Aug.

COVID-19: UnitedHealthcare Global Medical Virtual Health Service Support of the Oil, Gas and Seismic Industry

The Problem: COVID-19 presented complex challenges to the oil, gas and seismic industry. There was widespread fear and anxiety about potential outbreaks in off-shore environments. Initially, there was minimal COVID-19 specific guidance or recommendations. When that information did become available, the guidance was often driven by rapidly changing evidence and required frequent reappraisal. Teams had to quickly review and tailor guidelines and recommendations to ensure relevance to the off-shore industry.

The Program: The UnitedHealthcare Global Virtual Health Service (VHS) physician team in the United Kingdom (UK) was implemented in July 2017 to advance the quality and safety of topside medical care given to remote workers. The team was put to the test during COVID-19, using its "collective brain" to support the off-shore industry. The team had four main objectives:

- Keep UnitedHealthcare Global off-shore medics and workers safe
- Reduce the impact of potential outbreaks in off-shore locations
- Maintain operational resilience
- Assist clients to better understand the science and medicine of COVID-19

The VHS team continuously reviewed and leveraged guidance from the Centers for Disease Control, World Health Organization, European Centre for Disease Control, UK public health guidance and research papers from the National Centre for Biotechnology Information.

Outcomes Achieved: We developed successful guidance algorithms. The first guidance on March 17, 2020 was simple and stressed safety. Initially, the focus was on robust infection prevention and control (IPC) processes. The guidance was reviewed weekly and updated as it evolved. *The learning point:* Frequency of review and updates of clinical guidance in an evolving situation should be dictated by new information rather than timelines.

COVID-19 presented the UnitedHealthcare Global United Kingdom VHS physician team with an opportunity to ***leverage their diverse clinical knowledge, resilience and experience to deliver health care solutions for an essential workforce.***

We conducted review of existing off-shore medical operations IPC procedures to ensure they were fit for purpose. All remote working environments have documented procedures for the management of infectious disease outbreaks. However, it was apparent that the systems had not evolved to a level that would cope with this novel pandemic. Isolation, quarantine and movement of suspected cases became significant issues due to the lack of location-specific plans for segregated areas and transport.

The VHS team advised on set up of isolation areas, infection prevention plus control and isolation of close contacts. We translated learning from previous infectious disease outbreaks into systems that would enable safe management of potential COVID-19 outbreaks, despite the initial lack of global consensus. *The learning point:* The systems had not been designed to large scale, despite IPC being an integral component of modern medicine. It highlighted that industry pandemic planning needs to be prepared in advance, rapidly deployable and agile enough to flex to new challenges.

We reduced risk to off-shore personnel and medics. Personal protective equipment (PPE) supplies were limited and prioritized to governmental health care systems; however, it was key to ensure our UnitedHealthcare Global workers received appropriate-level PPE.

PPE was procured and delivered using the UK-based UnitedHealthcare Global Medekit team and supplies warehouse. The first priority was the safety of our off-shore UnitedHealthcare Global clinicians, and this was achieved with the existing stocks of PPE. The Medekit team was able to scale up procurement of PPE supplies as production increased. PPE guidance was issued to UnitedHealthcare Global medics based on current guidance to mitigate the risk of contracting COVID-19 in a variety of clinical scenarios, for example higher-level PPE when undertaking aerosol generating procedures such as intubation.

We advised surgical masks, gloves, eye protection and aprons for all clinical contacts, then upgraded this to FFP3/N95 masks, double gloving and fluid impermeable suits for high-risk cases. Client pre-deployment screening tools were reviewed to ensure they captured at-risk travelers and identified clinically vulnerable workers for occupational health assessment. Safe travel guidance was also issued. *The learning point:* Capture the thought processes that occurred in real time to refine future responses.

COVID-19 testing in the challenging off-shore landscape: The UnitedHealthcare Global VHS team promoted an evidence- and risk-based stance to testing, which helped the off-shore industry understand testing limitations. A significant challenge was the rapid emergence of COVID-19 tests in the market — some of which lacked robust validation. Clients and operators were under huge pressure to deliver testing solutions for personnel and ensure a COVID-free environment.

Ongoing education by the VHS team was critical in helping our clients understand that testing strategies alone could not mitigate the risk of COVID-19 completely and that ongoing adherence to broad infection control guidance remained critical. *The learning point:* Evidence-based medical principles are key, even when evidence is inconclusive and there are external pressures to provide solutions.

Conclusion: COVID-19 presented the UnitedHealthcare Global United Kingdom VHS physician team with an opportunity to leverage their diverse clinical knowledge, resilience and experience to deliver health care solutions for an essential workforce. Additionally, our collective engagement, and evidence-based systemic solutioning during the crisis, facilitated enhancement of our processes which will help us achieve robust pandemic preparedness for the future.

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Convalescent Plasma: Empresas Banmédica Provider Experience

Problem: Without a specific treatment or therapy for COVID-19, the trend for use of certain drugs continues to change as we search for effective therapeutics. Antibiotics (azithromycin), antimalarials (hydroxychloroquine) and corticosteroids (dexamethasone) have all shown uneven results.[1] Several countries mounted research efforts directed toward development of new treatment strategies and refined therapeutics. One of these research efforts was the development of SARS-CoV-2 antibodies contained in convalescent plasma. These were obtained from recovered patients for use in the treatment of COVID-19 patients.[2]

Program: The use of convalescent plasma transfusions is seen as an effective, safe and available alternative to treat COVID-19 patients.[2,3] Research indicates that it may be especially important in the near-term while waiting for an effective vaccine. Between March and August, the Empresas Banmédica care delivery physicians used convalescent plasma transfusions (CPT) in 121 COVID-19 patients across four hospitals (Table 1). Plasma donors were patients who had recovered from COVID-19 infection. One month after discharge from care, their plasma donation was approved for infusion into COVID-19 patients based on a compassionate therapeutic intervention protocol. The indication, dosage and timing of administration was determined by each provider. Patients under 18 years of age and pregnant women were excluded from this protocol.

Results: Patients who received CPT were admitted after an average of 7.09 days from the onset of symptoms. The most frequent symptoms were dyspnea (83.19%), fever (76.47%) and cough (75.63%).

Patient admission in 14.88% of the cases was directly to the intensive care unit, while 10.74% went to the intermediate care unit and 74.38% to the medical floor. Notably, 46.28% of all patients required at least one day's stay in the intensive care unit during their hospitalization. Patients who received CPT had an average length of stay of 16 days (max. 67 days, min. 2 days), and 95.87% of CPT recipients required ventilator support.

Table 1. CPT Usage Across All Hospitals

Hospital	Number of Patients	% of Total
Dávila	40	33%
Santa María	78	64.5%
Vespucio	2	1.65%
Ciudad del Mar	1	0.83

Within the group of patients receiving CPT, 34.71% received vasoactive drugs, 4.96% required dialysis, 53.72% required therapeutic anticoagulation, 49.49% received azithromycin, 9.92% received hydroxychloroquine and 95.87% received corticosteroids. The case fatality rate of patients who received a convalescent plasma transfusion was 21.49%. Cohort comparison is not possible as only the sickest patients qualified for this treatment.

Conclusion: Where we stand now, the clinical picture of COVID-19 is still evolving. Continuing to use robust scientific methods to track patient condition and response to treatment is an essential tool to remediation of this pandemic. As we continue to learn more about therapeutics, we look forward to finding safe and effective treatment regimens for patients with COVID-19.

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The Challenge of Reopening an Outpatient Clinic During the COVID-19 Pandemic

The year 2020 will be remembered worldwide for the COVID-19 pandemic and the stressful impact it caused on health care systems and businesses. Following abatement of the surge of COVID-19 cases in Portugal, the UnitedHealthcare Global's Lusíadas Saúde care delivery teams recognized the need to re-examine and revise clinical and non-clinical policies, protocols and procedures in order to ensure safe resumption of elective care delivery services and activities consistent with our quality of care standards and expectations. In order to address this need, the Lusíadas "Back on Track" program was implemented. This program put in place specific processes based on evidence-based and data-driven guidelines, establishing a systematic model for approving, implementing and monitoring the operational planning of the phased re-opening of elective care delivery activities.

At the Clínica Lusíadas Sacavém (CLS), clinic administration leaders, the clinical director and coordinators of the different departments collaborated to conduct a self-assessment of processes and completed a form for each activity line that was to be re-opened. The outcome of the assessment was submitted for review and approval by the senior executive team, and then a decision was made to implement phased re-opening.

Post-implementation weekly meetings were conducted to monitor the phased re-opening process. The Lusíadas Quality and Patient Safety (QPS) team audited the fulfillment of safety and quality requirements and provided daily updates. The reception areas were reorganized and equipped to perform mandatory symptom screenings and temperature checks, offer hand sanitizing stations and provide filtering facepiece Class 1 (FFP1) surgical masks. Area sanitizing standards and processes were established and informational signage, designed by the marketing department, was positioned strategically throughout all areas of the clinic. We invested in mandatory training and education for all employees — including training that focused on the appropriate use of personal protective equipment (PPE).

Our efforts have resulted in safer and simpler spaces for our clients and professionals, with greater emphasis on the use of technology to provide remote virtual patient appointments via video link. We adjusted scheduling of appointment times and times allocated to procedures and exams (Table 1). To minimize crowding in our clinic, the schedule included in-person visits, remote appointments and exam scheduling. We also changed the way in which we deliver exam results to minimize patient entry into the clinic.

Optimization of our care delivery operational and clinical processes enabled us to resume satisfactory levels of productivity, without compromising patient safety and quality. There have been significant positive clinical and operational enhancements at Clínica Lusíadas Sacavém, (CLS) driven by our pandemic-response learnings. Our focus continues to be providing the best care in a safe, organized and optimized manner. Clients now have an improved experience when they come to Clínica Lusíadas Sacavém (CLS).

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Table 1. Comparison Between Length of Time for Exams and Appointments Pre- and Post-Pandemic

Specialty	Activity	Appointment in minutes	
		Pre-COVID	Post-COVID
Consultations	Consultations	15	30
	Treatments	30	45
Imaging	Conventional Radiology/ Ultrasound/Orthopantomography	10	20
	Computerized Tomography/Osteodensitometry	15	30
	Magnetic resonance imaging	30	60
Cardiology	Echocardiogram/Holter/ MAP/Event Detector	15	30
	Effort trial	30	60
	ECG	7	15
Ophthalmology	OCT/Biometry/Pachymetry/Tonometry/Keratometry	15	30
	Specular Biomicroscopy	20	40
	Orthoptic	60	60
	Computer Perimetry	30	45
	YAG Laser	10	30
ENT	Audiogram/Tympanogram/ Impedance/Search for acoustic reflexes	15	30
	Vocal Audiogram	30	60
Neurology	Electroencephalogram	40	60
Vascular surgery	Echo Doppler	10	20
Urology	Flowmetry	15	30

Customization of the New York Department of Health Ventilator Allocation Protocol to Support Resource Use Under COVID-19 at Clínica San Felipe, Peru

Problem: In times of crisis and constrained health care resources, human factors lead medical teams to feel responsibility and guilt about the prioritization and allocation of resources to different patients.[1] During the COVID-19 pandemic, we sought to mitigate the risk and burden of these negative emotions within our clinical teams by leveraging an objective clinical assessment tool for evidence-based decision-making, resource allocation and clinically appropriate care. Objective clinical assessment would allow the medical team to allocate resources, maintain clear communication with family members and align patient prognosis with patient and family expectations from admission through hospitalization. Objective clinical assessment would also help prioritization of patient transfer requests from other institutions and facilitate efficient management of critically ill COVID-19 patients in the Emergency Department (ED) when hospital bed capacity is exceeded.

Program: The goal of the program was to enable clinically appropriate and objective allocation of resources, (mainly Intensive Care Unit beds and mechanical ventilators). For ventilator allocation, we relied on the Ventilator Allocation Guidelines used by New York's Department of Health (Table 1).[2] These criteria were used to evaluate admission appropriateness and guide ventilation management for all patients with a diagnosis of SARS-CoV-2 infection (pediatric patients under 15 years of age were excluded):

- Adult patient with a presumptive or definitive diagnosis of COVID-19
- Acute respiratory failure requiring oxygen therapy
- Hemodynamic instability
- Failure or dysfunction of other organs or systems
- Decompensated comorbidities with high risk of mortality

The evaluation consists of two phases:

Phase 1: Upon patient admission, clinical evaluation included assessment for exclusion criteria — serious conditions, serious disease or comorbidities that, despite aggressive therapy, showed little or no chances of recovery:

- Cardiac arrest: not witnessed, recurrent, with hemodynamic instability, non-responding, and related to trauma.
- Irreversible hypotension that does not respond to fluids or vasopressors
- Head trauma without motor response to painful stimulus
- Severe burns
- Other conditions that result in immediate or near mortality

Phase 2: Forty-eight to 120 hours after admission, mortality risk was approximated based on the Sequential Organ Failure Assessment (SOFA) scale (Table 1).[3]

This evaluation was conducted by the COVID Committee of Clínica San Felipe, made up of five doctors (pulmonologist, infectious disease specialist, internal medicine, intensivist) and the chief medical officer. Physicians who were directly involved in first line patient care did not participate in patient stratification in order to mitigate the risk of emotional bias in clinical decision-making and treatment. The patients were categorized and color-coded as shown in Table 2.

Results: Between March and July, there were 3,001 patients with a primary diagnosis of COVID-19 treated in the emergency room: 8.8% required hospitalization, 1.7% required mechanical ventilation. During this same period, there was a mortality rate of 1.5% for all patients and 12% for those patients admitted.

After analyzing the data, 3.7% of patients had a change in their mortality risk in the first 48 hours, patients with a blue classification did not change and 10 patients showed improvement in their clinical condition, progressing from red classification to yellow. Patient mortality rate according to the mortality risk classification is described in Table 3.

In a short survey, all members of the clinical team confirmed that the mortality risk tool empowered their decision-making and eliminated the feeling of guilt when prioritizing resources. This tool improved communication and allowed clinicians to align clinical expectations with those of the patient and their families. Additionally, this tool allowed for objective evaluation of patients prior to accepting their transfer from other institutions and further strengthened communication with clinics and hospitals in the public sector.

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Table 1. Sequential Organ Failure Assessment (SOFA) Score

System	0	1	2	3	4
Respiration PaO2/FiO2, mmHg	>=400	≤400	≤300	≤200	≤100
Coagulation Platelets, x 103/uL	<=150	≤150	≤100	≤50	≤20
Liver Bilirubin, mg/dL	≤1.2	1.2 – 1.9	2.0 -5.9	6.0 – 11.9	>12.0
Cardiovascular MAP, mmHg	>=70	<70	Dopamine <5 or Dobuta-mine	Dopamine 5.1 – 15 or Norepinephrine / Epinephrine <=0.1	Dopamine >15 or Norepinephrine / Epinephrine >0.1
CNS GCS Score	15	13 - 14	10 - 12	6 - 9	<6
Renal Creatinine	<1.2	1.2 – 1.9	2.0 – 3.4	3.4 – 4.9	>5.0

Table 2. Mortality Risk

BLUE Does not require ventilator Use alternative forms of medical interventions or palliative care	Exclusion criteria or SOFA > 11
RED High risk of mortality Use ventilator (if available)	SOFA < 7 Or Failure Of One Organ Only
YELLOW Intermediate mortality risk Use ventilator (if available)	SOFA 8 – 11
GREEN Use alternative forms of medical intervention or discharge Reevaluate when necessary	No organ dysfunction and/or does not require vital resources

Table 3. Mortality Rate According to Mortality Risk Classification

Allocation	Patients	Deceased	Rate
BLUE	40	28	70%
RED	66	14	21%
YELLOW	13	2	15%
GREEN	146	1	1%

COVID-19 Risk and Trend Predictor Dashboard: Development and Use of an Epidemiological Decision-Making Tool to Enhance Therapeutic Strategies in the Inpatient Unit

Introduction: During the coronavirus pandemic, the speed at which the SARS-CoV-2 virus spread challenged health systems around the world. Health professionals on the front lines, for the first time in decades, faced a new disease with unknown epidemiology and treatment.[1] We understood this reality early at Hospital Jacarepaguá in Rio de Janeiro, part of the Amil system, and moved to create a dashboard with trend predictors to help care teams make quick, informed decisions. These ranged from the allocation of intensive care unit beds to timing of orotracheal intubation in patients who were clinically deteriorating.[2,3]

The dashboard tool aimed to allow the multidisciplinary team to:

- Clearly visualize patient risk and trends
- Promote greater confidence in clinical decision making
- Track and understand the response to the chosen therapy
- Anticipate clinical deterioration and facilitate proactive determination of alternative therapeutic strategies.

Methodology: Trend predictors for the dashboard included:

1. Mallampati score to assess the risk for difficult intubations and to anticipate the management strategy[2]
2. Analysis of serial arterial blood gas values
3. Changes to the need for supplemental oxygen therapy
4. Disease evolution
5. Timeline of disease presentation and therapy determination
6. Serial QT interval to assess risk for the use of hydroxychloroquine
7. General clinical condition

Even during periods when we approached maximum critical care unit occupancy with ventilated patients, ***we had no unanticipated intubations or cardiorespiratory arrests.***

Results: In the period evaluated between April and May, there were 321 COVID-19 hospital discharges. During that time, teams were able to effectively anticipate clinical deterioration. Even during periods when we approached maximum critical care unit occupancy with ventilated patients, we had no unanticipated intubations or cardiorespiratory arrests.

Patients who required intubation in a closed unit were anticipated and planned. Patients were followed by telemedicine for seven days post-discharge with no readmissions required. We maintained an average length of stay of 7.7 days in April and 9.4 days in May.

Lessons Learned: During the COVID-19 crisis we were challenged with limited knowledge of the disease, maximum occupancy and a critical bed shortage. The COVID-19 dashboard proved to be more than an informational and data tracking tool. The dashboard provided essential clinical and management guidance and promoted trust and engagement of the multidisciplinary team early in the decision-making process. Even when a transfer to the intensive care unit was necessary, use of the dashboard facilitated confident and proactive critical care management, including elective preparation of difficult airways for intubation. This provided greater safety for both the patient and the health professional.

Conclusion: The use of epidemiology-based clinical evolution predictors has grown worldwide and has fueled several mechanisms to aid decision-making, such as the use of control panels and artificial intelligence.[4,5] In our unit, the use of our dashboard with visual access by the care teams, and the availability of trend predictors based on COVID-19 epidemiology, had a positive impact on the outcome of patients admitted to Hospital Jacarepaguá.

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COVID-19 Pandemic and Our Digital Line of Business: The New Normal

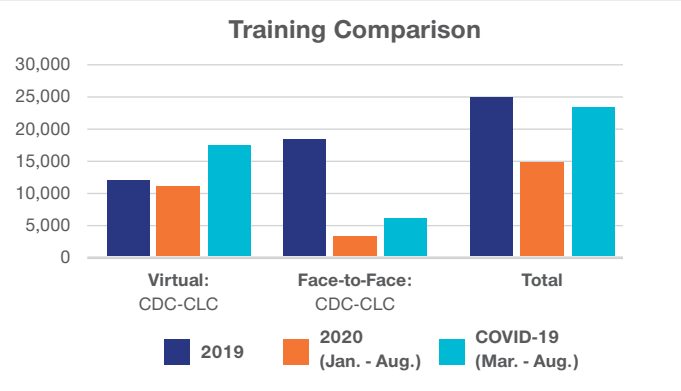
Problem: From March 6, 2020, following confirmation of the first case of COVID-19 in Colombia, one of the main needs of the Empresas Banmédica care delivery system in Colombia was maintaining the continuity of patient care. 9,156 COVID-19-related visits were conducted at Clínica La Colina and Clínica del Country as of Sept. 14, with more than 3,300 confirmed cases of COVID-19. For the safety of health personnel, virtual care capabilities needed to be strengthened through remote work, virtual meetings and virtual trainings. The Clínica Remote Guidance Program, leveraging remote consultation and virtual guidance was implemented to mitigate the risk of infection in both patients and workers, without impacting the hospitals' cost of care burden.

Program: The Clínica Remote Guidance Program was established to provide telephone guidance to patients regarding COVID-19 symptoms, treatment, monitoring and prevention, as well as general information about the hospitals. This program was created by the Information Technology (IT) and Education & Investigation (E&I) teams. Google G-suite applications were used to create data entry templates that the patient was required to complete with relevant clinical information.[1] This information could then be viewed and accessed by all providers involved in the patient's care. Cisco Jabber technology was used to contact and communicate with the patient.[2]

The remote consultation component of the program focused on continuity of care, monitoring and treatment of patients with chronic disease and outpatient monitoring of institutional staff who contracted COVID-19. Among the specialties covered in this program are oncology, pain and palliative care, anesthesiology and nephrology. A dedicated team of general physicians, led by a general surgeon, was assigned to monitor all patients with COVID-related symptoms, especially respiratory symptoms. This program was set up on the Meet platform to facilitate interconnection with the patient.[3]

The Clínica Remote Guidance Program also motivated us to leverage enhanced remote capabilities to transform health care professional education in our hospitals. There was a critical need for health care professionals training during the COVID-19 pandemic. Our training efforts during the pandemic were specifically focused on ensuring sustainability and maintenance of hospital care delivery operations. COVID-19 was a novel disease with rapidly emerging evidence and guidance that required rapid dissemination of information to clinicians. Additionally, a specific need during the pandemic crisis was to support cross-training in order to execute on our pandemic staffing model which focused on expanding critical care staffing capacity. We leveraged technology and digital capabilities to significantly expand and scale our training capability to meet staff training needs during the pandemic.

Figure 1. Comparative Analysis of Virtual and Face-to-Face Health Care Professional Training 2019 – 2020



For example, surgical assistants received remote training in respiratory therapy and surgeons and anesthesiologists received virtual refresher training in critical care to provide support for critical care physicians. In order to support these virtual training needs during the pandemic we migrated from face-to-face training to virtual platforms, with tools such as Cisco Webex and the Internal Education Platform (Moodle),

achieving an increase in the number of topics, trainings and beneficiaries of training.[4,5] These virtual platforms also allowed access to training information and educational resources through an institutional site that was accessible by all team members and medical staff.

Results: Following the onset of the COVID-19 pandemic in Colombia, 220 remote guidance sessions have been conducted, mainly focused on COVID-19 counseling. 279 telemedicine sessions were conducted, of which 40% were nephrology patients and 31% were oncology patients. The telemedicine sessions facilitated patient continuity of care, despite the limitations of in-person outpatient visits.

Figure 1 provides a comparative analysis of training sessions between 2019 and 2020 (pre- and post-COVID-19). In 2020, there was a trend reversal in training settings with more trainings occurring in virtual settings compared with face-to-face settings. Additionally, there was an overall increase in the total number of trainings in 2020 compared with 2019.

Conclusion and Lessons: The COVID-19 pandemic is the greatest health care challenge faced in recent history. At Clínica La Colina and Clínica del Country, our response and preparedness demonstrated our capacity for change management, teamwork, agility and resilience and exemplified our motto: *We are together. Estamos juntos*.

Our greatest learnings were:

- We can adapt, we are resilient.
- We must leverage technology and digitalization to advance health care.
- We must look to the future and be ready for change.
- We can use technological tools to optimize processes.
- We can work remotely from home and sustain productivity.
- We can reinvent and transform ourselves.

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