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Descriptive Report

The Transition to Telehealth: A Pilot Model in a New York City Student-Run Free Clinic During the COVID-19 Pandemic

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Abstract

Here we describe the development and implementation of a telehealth model for vulnerable, uninsured residents of East Harlem in New York City during the coronavirus disease 2019 (COVID-19) pandemic at a student-run, physician-supervised free clinic. The East Harlem Health Outreach Partnership completed 43 primary care follow-up and 78 urgent telehealth encounters during a six-week trial period during the COVID-19 outbreak, and 40 patients were managed for either suspected or confirmed COVID-19 diagnoses. Telehealth is a useful tool to provide rapid, high-quality care to a large patient population during a pandemic. Challenges include the lack of access to updated technology among patients of lower socioeconomic status and rapidly evolving management guidelines for COVID-19. Telehealth is essential for supporting vulnerable populations during times of reduced physical contact, including the COVID-19 pandemic, but can be applied broadly to all free clinics to augment access.

Background

The novel coronavirus disease 2019 (COVID-19) pandemic has inundated emergency medical services[1], challenged existing models of health care delivery[2], and is likely to fundamentally change patient care.[2] Despite the novel nature of the virus, its effects have followed a predictable pattern for health and social issues in the United States, affecting the most vulnerable and disadvantaged communities that have had limited access to quality healthcare.[3–7] The duty of free clinics—to provide responsive high-quality care to these populations—has never been more urgent.

This pandemic is forcing healthcare delivery systems to rapidly evolve to serve patients effectively.[8–10] This response has included closure of outpatient medical services to protect patients and healthcare workers from avoidable exposure. Furthermore, to protect their safety, medical students have been banned from direct patient contact.[11,12] These changes have forced student-run free clinics across the United States (US) to close, further limiting access to care for vulnerable persons when the need for it is surging.

Existing care models that do not require in-person visits can be particularly useful in addressing both COVID-19-related and non-pandemic

related healthcare issues. Telehealth, an umbrella term for remote healthcare delivery through a telephone or video-enabled device, is a viable model for remote care during the pandemic.[13–15] Even before COVID-19, telehealth was viewed as a promising tool for healthcare delivery, with studies demonstrating access to effective, high-quality care in a variety of clinical settings for patients who otherwise might not be able to receive it.[15,16] However, given the dearth of published literature on successful telehealth implementation in low-resource urban settings in the US, and well-documented barriers, including limited access to broadband internet or smartphones,[17] it remains an open question whether this model can be implemented successfully during the current pandemic.

Residents of the East Harlem neighborhood in New York City, New York have a high prevalence of chronic health conditions such as obesity, diabetes, and hypertension, and are more likely than other residents to be poor, unemployed, or suffer from avoidable hospitalization or premature death.[18] The East Harlem Health Outreach Partnership (EHHOP) is a free primary-care clinic run by medical students and supervised by attending physicians from the Icahn School of Medicine at Mount Sinai (ISMMS) in East Harlem.[19] On Saturdays, EHHOP student volunteers, including clinic managers, laboratory technicians, a social services team, and student clinicians, provide longitudinal primary-care, mental health services, and extensive social services to approximately 30 patients per week. Here, we outline the design and implementation of a telehealth model for primary care at a student-run free clinic in East Harlem that ensured continuous and responsive care during the COVID-19 pandemic.

Methods

In March 2020, medical students at ISMMS were restricted from direct patient interaction. This posed serious limitations at EHHOP, where medical students provide frontline care and oversee clinic operations. A telehealth model with student-led, physician-supervised care was adopted.

Step 1: Triage

Senior medical students, in conjunction with volunteer attending physicians, triaged all scheduled clinic appointments for the upcoming three months based on medical urgency. Triaging decisions occurred via discussion between the clinic's chief attending physician and chief medical student officer. Thorough assessment of patient history, including level of control of chronic conditions, directed risk-benefit analysis of appointment delay. The Saturday clinic patient load was reduced from 30 to 10 scheduled primary care visits. Existing student roles were adjusted to reflect altered care delivery (Table 1). Clinic managers informed patients of appointment changes via phone.

Step 2: Telehealth Platform Adoption and Development

The CareMessage (caremessage.org) electronic communication platform was utilized to send mass messages to all clinic patients in both English and Spanish during the transition to telehealth (Table 2). Grant funding covers the cost of the CareMessage platform.

All kept appointments were transitioned from in-person visits to video- or telephone-based encounters. Video platforms used include: Zoom (Version 3.6.5, Zoom Video Communications, San Jose, CA), FaceTime (Version macOS 10.15, Apple Computer, Inc., Cupertino, CA), and WhatsApp Messenger (Version 2.20.9 beta, Facebook, Menlo Park, CA) (in light of the Department of Health and Human Services' (HHS) relaxation of the Health Insurance Portability and Accountability Act (HIPAA) telehealth regulations enforcement during the pandemic).[20] Real-time language interpretation services were arranged via phone or video by student volunteer interpreters. When needed, student coordinators and language interpreters contacted patients prior to their visits to arrange for proper device set-up and videoconferencing mobile application installation. Student coordinators arranged the schedule of appointments, assigned patients to student and physician volunteers for encounters, and informed all involved parties.

Patients with urgent concerns were evaluated via midweek telehealth visits (quick visits). These encounters consisted of a 30-minute telehealth call (phone or video), during which the issue was triaged by a medical student, with input from an attending physician. Following these visits, stu-

Table 1. In-clinic EHHOP medical student roles prior to and during telehealth implementation

Role	Key responsibilities prior to telehealth	Key telehealth responsibility
Chief medical student officer	Manage longitudinal clinical care, including chronic disease follow-up, medication management, and communication with specialists. Oversees senior clinicians.	Manage clinical issues, including overseeing medication management and development of telehealth plans of care.
Social services team	Facilitate referrals and provide social support to patients as needed	Ensures continuity of social support offerings during COVID-19 through grocery deliveries and direct cash grant assistance
Senior clinicians	See 1-3 patients per Saturday in-person at clinic	Conduct phone or video-based telehealth visits with 2 patients per Saturday.
Clinic managers	Oversee patient scheduling, out-of-clinic communication, and clinic flow	Manage appointment cancellations, telehealth scheduling, and coordination of calls between physicians, medical students, and patients
Student interpreters	Provide in-clinic Spanish interpretation services	Provide Spanish interpreter services over video-based telehealth platforms

EHHOP: East Harlem Health Outreach Partnership

Table 2. Mass test message patient communications during the COVID-19 pandemic

Data sent	CareMessage (English)	CareMessage (Spanish)
3/18/2020	To protect your health during the coronavirus outbreak, Mount Sinai, including EHHOP, is changing all scheduled visits to phone and video calls. If you think you need to be seen in person or are unsure, please call XXX-XXX-XXXX. EHHOP is committed to your health and we have doctors available to care for you. For more information about coronavirus: www.cdc.gov/COVID19	Para proteger su salud durante el brote de coronavirus, Mount Sinai, incluido EHHOP, está cambiando todas las visitas regulares a llamadas telefónicas y de video. Si cree que necesita hacer cita en persona o no está seguro, llame al XXX-XXX-XXXX. EHHOP está a su servicio y tenemos médicos disponibles para atenderlo. Para obtener más información de coronavirus: www.cdc.gov/COVID19-es
3/25/2020	See the EHHOP Coronavirus (COVID-19) Resource Guide. Feeling sick or have concerns? Call the EHHOP main line and leave a message. Someone will return your call as soon as possible.	Ver los Recursos Para Coronavirus (COVID-19. ¿Se siente enfermo o tiene preocupaciones? Llame a la línea principal de EHHOP y deje un mensaje. Alguien le devolverá la llamada lo antes posible.

EHHOP: East Harlem Health Outreach Partnership

dent clinicians scheduled future appointments, arranged for urgent laboratory tests, and organized medication delivery.

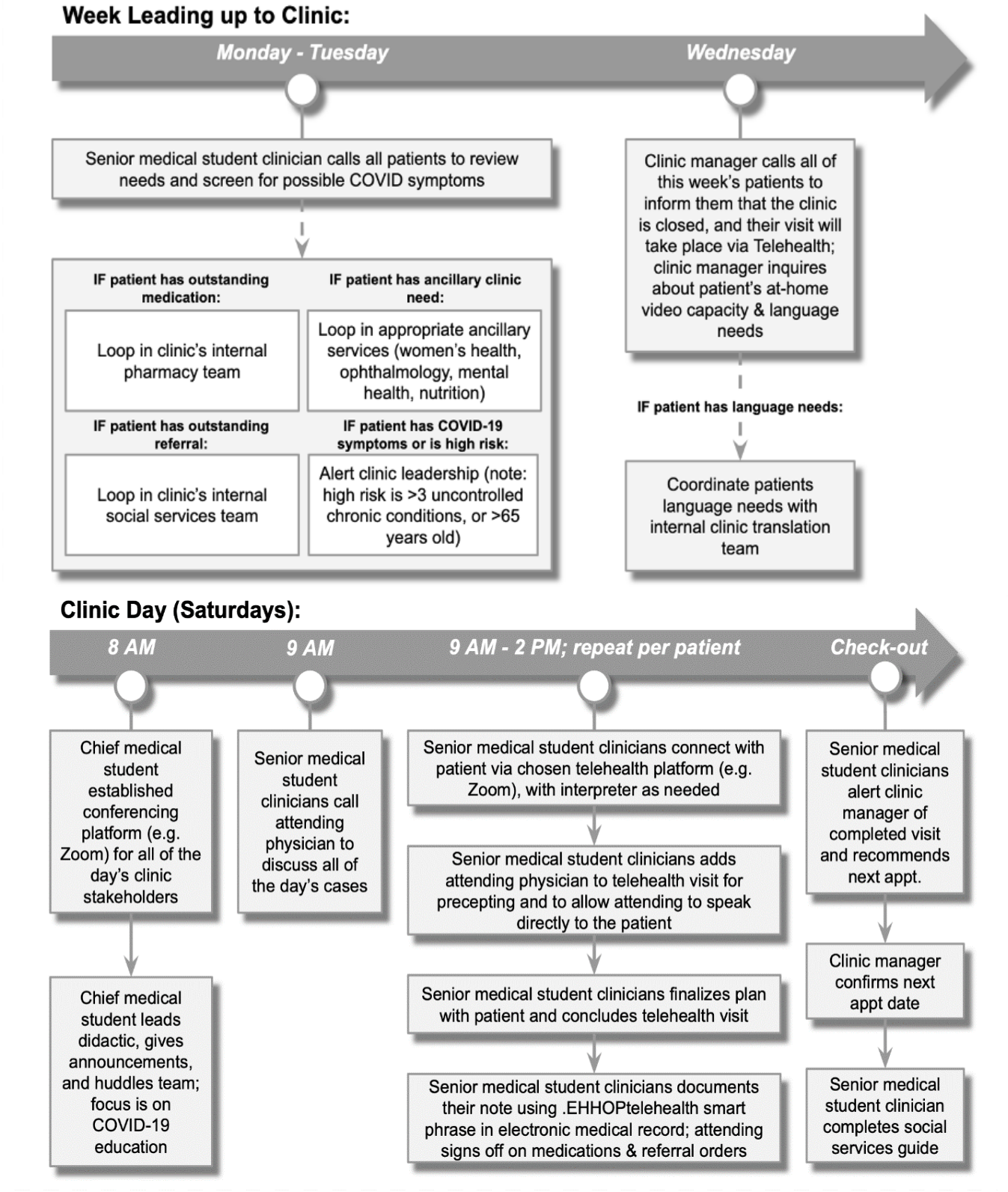
Step 3A: Telehealth Logistics for a Routine Clinic

The entirety of medical student involvement in patient management took place remotely. Clinic flow is outlined in Figure 1. Six days prior to the clinic, the chief student medical officer created a plan of care to share with the student clinician for each patient visit. This plan of care included relevant tips for history-taking surrounding pertinent issues, and counseling about how to obtain physical exam findings via electronic methods (e.g., scripts for coaching patients through heartrate and respiratory rate measurements). A standardized script for COVID-19 counseling was included in each visit plan.

Clinic day began with a meeting via Zoom, used for both medical student teaching and review of logistical flow of the day. The next four hours were spent conducting visits, which were documented in the electronic medical record.

When visits were complete, student clinicians reviewed cases with the supervising senior medical student clinician, who arranged for follow-up and documented a formal plan of care in the electronic medical record. Clinic managers were responsible for scheduling the patient's next clinic visit. A final team-wide video meeting took place once all visits were complete to ensure that all patients had been seen, encounters documented, and follow-up arranged. At the conclusion of the clinic day, medical student feedback

Figure 1. Weekly EHHOP telehealth clinic flow



EHHOP: East Harlem Health Outreach Partnership

was elicited via electronic survey and patient feedback was elicited via phone survey. EHHOP student leadership oversaw longitudinal care and connection to follow-up laboratory evaluations, medical specialists, and social resources.

Step 3B: COVID-19 Screening & Counseling

Patients with suspected COVID-19 were evaluated based on standardized criteria, which was distributed to senior medical student volunteers via a Smart Phrase within the electronic medical record. Clinical diagnosis (fever and respiratory symptoms) was made in accordance with United States Centers for Disease Control and Prevention (CDC) guidelines. Day one of diagnosis consisted of a formal telehealth encounter with a medical student and physician volunteer. Patients were counseled about home isolation and conservative management of symptoms in the home. After a suspected diagnosis was made, no-contact delivery of a health kit consisting of acetaminophen, a one-week supply of surgical masks and gloves, a thermometer, and informational pamphlet was sent to the patient's home. Medical students followed up with these patients daily for two weeks. If severe respiratory issues arose during the two-week follow-up period, stepwise escalation of care followed: alert of senior medical student leadership, formal telehealth encounter with attending physician, emergency department presentation, and, if deemed necessary, hospital admission.

Step 4: Student Didactics and Training

Student clinicians underwent an hour-long telehealth training, delivered by EHHOP student leadership, which included a discussion of focused visit planning, detailed history-taking, and exploration of physical exam findings through electronic means. Training also included a weekly didactic given by the senior medical student about outpatient management of COVID-19. Management guidelines were updated weekly in accordance with the most up-to-date CDC and New York State government recommendations.

Medical students conducting telehealth visits had extensive one-to-one precepting by attending physicians. Precepting took place both before the visit, during which the anticipated plan for the visit was discussed, and at the conclusion of the visit, during which the patient assessment and management was arranged. This allowed for remote education, in which students shut out from in-person training were able to continue learning about management of chronic conditions and gained an understanding of COVID-19.

Step 5: Social Needs Assessment and Resource Allocation

Social needs were addressed by a medical student social services team ("access to care team") during all visits. A standardized phone survey was administered to all patients to screen for food and financial insecurity. Patients with the highest-acuity food insecurity had no-contact grocery deliveries arranged (completed by medical students) and were connected to citywide food resources. Those with the highest acuity of financial insecurity were provided with $400 cash grants via money order. Both initiatives were funded by direct medical student fundraising efforts. Social needs that could not be addressed by student volunteers were triaged to licensed social workers.

Step 6: Pharmacy

All prescribed medications are provided to patients free of charge via the Mount Sinai hospital pharmacy. Due to the inability of patients to physically enter the hospital during the COVID-19 outbreak, a medical student volunteer workforce completed medication deliveries via no-contact drop off at patient homes (in pairs). Medications for chronic conditions (e.g., insulin, blood pressure medications, etc.) and medications for COVID-19 symptom management were delivered.

Results

A total of 43 primary care and 78 quick visits were completed during March and April 2020. The majority (60.5%) of patients seen for primary care visits were female, with an average age of 50.7±10.6 years. Nearly all (93.0%) patients preferred Spanish, and 79.1% lived in East Harlem, with the remaining patients residing in the Bronx (Table 3).

Primary Care Visits

In the first six weeks of the telehealth model, 40 student clinicians and 13 attending physicians completed 43 primary care visits. The average reported visit time was 49.7 minutes (range: 15-120 minutes). The average number of medical issues addressed during each visit was 3±1.5. Phone visits (88.4%, n=38) were more common than video (11.6%, n=5) visits. Live video language student interpreters were used for 5 (11.6%) visits, while telephone interpreters were used for 25 (58.1%) visits (Table 3).

Urgent Visits

In the first six weeks of the telehealth model, EHHOP clinicians completed 78 non-COVID-19 urgent issue visits, utilizing 33 student clinicians and 8 attending physicians. One patient required emergency department-level care for a non-COVID-19 urgent issue.

Table 3. Demographics of EHHOP telehealth patients, March and April 2020

Demographics	Number of patients, n=387 (%)
Telehealth transition	
Patients scheduled for telehealth	52 (13.4)
Telehealth visit no-shows	9 (17.3)
Completed telehealth visits	43 (82.7)
Teleheath format	
Telephone	38 (88.4)
Video (Zoom or Facetime)	5 (11.6)
Age of telehealth patients (years):	
<45	16 (37.2)
45-54	8 (18.6)
55-64	16 (37.2)
>65	3 (7.0)
Sex	
Female	26 (60.5)
Male	17 (39.5)
Preferred language	
Spanish	40 (93.0)
English	2 (4.7)
Other	1 (2.3)
Interpreter usage per visit	
Live video	5 (11.6)
Telephone	25 (58.1)

EHHOP: East Harlem Health Outreach Partnership

COVID-19 Management

Throughout March and April 2020, 41 patients (10.6%) were diagnosed with suspected or confirmed COVID-19 (at New York City (NYC) public testing centers for confirmed diagnoses). A total of 34 senior medical students communicated with 39 COVID-19 patients daily for a minimum of two weeks. Escalation of care to the level of mid-course telehealth visit (during acute illness period but after initial diagnostic assessment) was required 21 times, escalation to emergency department care occurred 11 times, and inpatient admission was required 8 times.

Education

Fifty medical students underwent telehealth training at the onset of the program. During the first six weeks of the model, 12 senior medical students oversaw clinic operations, delivered COVID-19 focused didactics to peers, and created personalized medical plans for patients with scheduled visits. Over forty students participated in these didactics and were the recipients of peer-led and physician-led educational discussions regarding patient visits.

Discussion

East Harlem residents have borne a disproportionate share of COVID-19, with 39.5% test positivity rate compared to 25.8% for the rest of Manhattan.[21–23] During the pandemic, EHHOP was able to implement a telehealth model to provide care to a historically underserved population. Ensuring our patients are equipped with unlimited access to medical students, attending physicians, pharmacists, and social workers is essential to lower the burden on the NYC public healthcare system and improve the morbidity and mortality of this population.

This free-clinic telehealth model was successful in two main areas: medical management and medical trainee education. The model allowed for continued care for chronic conditions and successful management and prevention of COVID-19. Over 100 patients were able to communicate with medical students and attending physicians to update medical plans relating to conditions di-

agnosed prior to the COVID-19 outbreak, most commonly type 2 diabetes mellitus and hypertension. Changes to prescribed medication regimens were implemented without physical interaction between patients and providers. The model also managed COVID-19 symptoms in 38 patients and ensured the delivery of targeted protective gear and educational materials surrounding the pandemic to over 300 patients. Patient surveys further exemplified the success of the model, as a large majority of patients were highly satisfied with the care received.

This model is unique in its flexibility. The most basic level of technology required for routine follow-up was access to a telephone. Smartphones, video cameras, and application downloads were not required. This is in large part due to the relaxation of HIPAA regulations for telehealth by HHS, allowing for use of FaceTime, WhatsApp, and Zoom for healthcare workers during the pandemic.[20] This is particularly important for low-income patient populations, who often lack ready access to unlimited wireless internet or smartphone technology.[17] While platform flexibility was crucial for maintaining contact with patients during the COVID-19 outbreak, standardization of a unified, HIPAA-compliant technological model will be important for continued adoption. Further, despite this relaxation of stringent HIPAA rules, the majority of patients at this clinic chose to participate in telephone only telehealth visits, without video component. This highlights some important considerations of telemedicine, namely lack of access to video technology in underserved communities as well as patients' discomfort of invasion of privacy associated with video visits.

EHHOP is further unique in that it allowed for continued medical student education, despite lack of physical contact between patients and students. The model includes ample educational opportunities, including peer-led seminars and physician-directed learning. Senior medical students worked with junior peers to create individualized medical plans for each telehealth visit, a process which involves peer teaching and self-directed learning. More formalized educational opportunities include a large seminar about telehealth best practices, delivered by EHHOP student leadership, as well as weekly didactics about COVID-19 management and prevention at the start of each clinic day. Attending physicians used electronic platforms to communicate with medical students before and after each telehealth visit. This unique educational opportunity perhaps allows even greater individualized attention than medical students receive during in-person operations.

Despite successes of this system, it was not without limitations. Technological difficulties were seen, varying from lack of patient access to telephones to dropped calls. Reliance on technology for provider-patient interaction has the potential to further alienate patients from low-resource backgrounds who do not have any form of telephone or technology access. An additional area for improvement is provider training. Management of patients via phone or video visit is not widely taught in traditional United States medical school curriculum.[24] Although a peer-led telehealth training was given upon implementation of this model, further development of validated training materials is crucial for successful expansion of this system of care.

Future directions of this work include further data collection. Patient and provider satisfaction, as well as long-term objective clinical outcomes data, can help clinics understand the extent of chronic condition management that can be achieved without physical interaction between providers and patients. This will be crucial in sustaining telehealth operations after the pandemic. An overarching long-term goal of this work is to embed telehealth as an alternative model of care for patients with historically low access to physicians. In our free clinic setting, where patients have a variety of mobility and financial barriers that impede physical presentation to the clinic, telehealth will be critical in reducing barriers to care. We hope this description of the clinic structure can inform the efforts of other providers and will contribute to the discussion of how to employ telehealth to enhance care after COVID-19 has subsided.

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