#### PERSPECTIVE



# Columbia COVID-19 Student Service Corps: Harnessing student skills and galvanizing the power of service learning

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#### Abstract

The COVID-19 pandemic in New York City led to the forced rapid transformation of the medical school curriculum as well as increased critical needs to the health system. In response, a group of faculty and student leaders at CUIMC developed the COVID-19 Student Service Corps (Columbia CSSC). The CSSC is an interprofessional service-learning organization that galvanizes the skills and expertise of faculty and students from over 12 schools and programs in the response to the COVID-19 pandemic, and is agile enough to shift and respond to future public health and medical emergencies. Since March 2020, over 30 projects have been developed and implemented supporting needs identified by the health system, providers, faculty, staff, and students as well as the larger community. The development of the CSSC also provided critical virtual educational opportunities in the form of service learning for students who were unable to have any in-person instruction. The CSSC model has been shared nationally and nine additional chapters have started at academic institutions across the country.

#### KEYWORDS

COVID-19, medical education, service learning

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#### 1 | OVERVIEW OF CSSC

The COVID-19 pandemic's rapid spread in New York City (NYC) in early March 2020 not only caused disruption to hospital systems, but also to medical schools and medical students as well. NYC rapidly became the epicenter of the COVID-19 pandemic and resources were quickly stretched thin. On March 8, all educational programs, including the medical school, at the Columbia University Irving Medical Center moved to remote learning. On March 15, clinical students were pulled from any in-person clinical engagement. Our community faced a number of unprecedented hurdles including how to utilize limited remaining resources for an increasing number of unique and urgent health-care needs while simultaneously providing medical education and preparing to effectively engage the incoming class of students. Health professions students, while unable to be present in-person in the hospital system, sought to contribute to the pandemic response and immediately started exploring ways that they could use their time, education, and resources to help their educational, hospital, and local community. It was in these unique circumstances that the Columbia COVID-19 Student Service Corps (Columbia CSSC) was founded.

Figure 1 outlines the timeline of the creation and expansion of the Columbia CSSC. The original planning meeting of the Columbia CSSC took place on March 15 with a small group of medical students and medical school faculty and administration. A few days later the Mailman School of Public Health joined as a partner, establishing the essential interprofessional component of CSSC. Over the course of the next few months, over 12 Columbia University schools and programs would sign on as partners creating a network of over 2000 students and faculty, ranging from health science backgrounds to undergraduates, working together to fill critical gaps in our health-care system and larger community as a result of the pandemic.

Figure 2, the CSSC toolkit, outlines the organizational mission, guiding principles, and overall structure of the

CSSC. The mission of the CSSC is to "support health systems facing the COVID-19 pandemic and their patients, workforce and communities through interprofessional student service-learning projects." The five guiding principles of CSSC include:

 Needs are identified by the health-care system and larger community.<sup>1</sup>

All of the CSSC projects are built around needs that were clearly identified and articulated by health-care workers in the hospital system, faculty working with students or programs, and/or individuals who have established relationships in the local community. This allowed projects to be built with a sustainable framework and ensured that students could work remotely and employ the resources of their collaborating partners.

2. A service-learning model is used,<sup>2</sup> assuring that students and faculty move beyond volunteering and are active participants in their learning and growth through service.

Service learning has long been a model at the medical center campus, particularly through student-run clinics. The CSSC projects gave the students opportunities to learn and lead at a time when other clinical educational opportunities were not available. Additionally, CSSC allowed students to gain academic credit for their work and avoid falling behind in their educational requirements.

3. Students and faculty colead the organization and projects at each level.

Critical to the success of CSSC has been collaborative work with students and faculty at each level of the organization. The oversight leadership is a combination of students and faculty, and all projects have student and faculty leadership involved in training of volunteers and project management.



FIGURE 1 Columbia COVID-19 Student Service Corps timeline of development

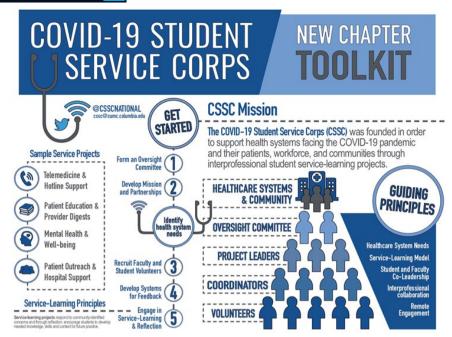


FIGURE 2 COVID-19 Student Service Corps new chapter toolkit

This toolkit was shared nationally and adopted by nine additional academic centers. These nine national chapters include: University of Washington, UNC-Chapel Hill, UNC-Wilmington, University of Arizona, University of Florida, Oregon Health and Science University, George Mason University, University of Virginia, and the University of Richmond. The CSSC has provided a unique opportunity to partner with, learn from, and collaborate with academic centers across the country. Weekly national meetings are held with student leaders from each chapter where presentation and resources are shared. As the COVID-19 pandemic evolves, these partnerships have proven critical in helping academic institutions and hospital systems adapt innovations in clinical practice, medical education, and community-based interventions.

#### 2 | SERVICE-LEARNING MODEL

CSSC was built as a service-learning organization, which follows the P.A.R.E. model.<sup>2</sup> Preparation, action, reflection, and evaluation are vital components of a successful service-learning project and a meaningful experience for students.

#### 2.1 | Preparation

All CSSC projects go through a project proposal phase. In this phase the person/people who identify the project are asked to outline the need to be addressed, the basic organization of the project, how many students and what expertise would be ideal, and any potential faculty and student leaders for the project. The CSSC Oversight committee, made up of faculty, students, and administrators, works with individuals proposing the project to solidify faculty and student leaders, develop processes and protocols, and assign students to the project.

Students are onboarded to teams by the faculty and student leaders of each project. This onboarding includes relevant training regarding the goals of the project, processes, and protocols. All patient-facing projects, for example, have strict and clear escalation procedures so that students know who to go to in the event that they encounter an unexpected event, question, or concerning patient situation.

#### 2.2 | Action

The flexibility of the CSSC model allows for each project to create and identify the best processes to achieve the identified goals. There are multiple mechanisms in place to facilitate communication between project leaders so that best practices and problem-solving can be shared between projects. For example, the Columbia CSSC has weekly student and faculty leadership meetings that bring together the leaders of all projects to discuss their progress, successes, and challenges, and future directions. This allows for inter-project shared growth and resources while facilitating interprofessional learning. Students who received elective credit for their time with CSSC were required to participate in their service project for 15 h per week. Students who are now a part of CSSC through the first-year medical clerkship are required to contribute

between 2 and 4 h per week on their service project. All hours are tracked through a centralized monitoring and evaluation survey that is sent to students weekly.

#### 2.3 Reflection

A key component of the service-learning model is reflection. Students are not simply volunteers, but are learners, and therefore, it is imperative for them to have the space and encouragement to reflect on the service they are providing, how it is impacting those the service is aimed toward, and how it is affecting their personal and professional development.

Reflection as part of CSSC is interdisciplinary and multifaceted. Students are encouraged to participate in discussion board posts as well as video conferencing reflection groups led by trained narrative medicine facilitators as part of the reflection component of CSSC. The discussion board prompts have ranged from questions like: "how are you responding to the pandemic so far, in terms of what you feel you can and cannot control" to "write about an assumption you held that has been challenged during the pandemic and through your service." These types of questions allowed students to reflect on their service and experience while also connecting and responding to their peers who may have different experiences, thoughts, and reflections. The video conferencing discussion groups are inter-project and interdisciplinary and asked students to reflect on artwork, quotes, and other prompts and allowed for a deeper level of engagement and reflection with peers and faculty that students might not usually have a chance to meet or interact with. The discussion groups also allow for community building as well as helping students see their work as part of a larger interprofessional effort that is sometimes difficult to see due to the remote nature of their work.

#### 2.4 Evaluation

The final piece of the P.A.R.E. model is evaluation and monitoring which are critical to ensure the success of the organization and to track student participation and outcomes. The evaluation plan includes two major components—student service-learning outcomes and project impact and outcomes. Student service-learning outcomes are tracked through a weekly distributed survey which asks questions about project assignment, number of hours worked, engagement in reflection, and general feedback.

Project-level impact and outcomes are tracked through a monthly distributed survey that is sent to project leaders for their individual projects. The CSSC Oversight committee in conjunction with the student leaders decide on a set of metrics that the project will track over time. These items are then collected monthly and stored in a centralized master data set

with all project outcomes. Some example project metrics for completed projects can be seen in Table 1.

### 3 | OVERVIEW OF PROJECT AREAS AND COMPLETED PROJECTS

On March 15 when the CSSC began, there was a group of six core projects that had been identified as urgent. However, over the past 6 months the Columbia CSSC has developed over 30 projects. These projects fit into four major categories: patient-facing; system-facing; faculty, staff, and student-facing; and finally, community-facing. The patientfacing domain includes projects where students are directly interfacing with patients or family members in a number of diverse ways. These projects did not all require clinical experience and have been open to interdisciplinary students with proper training, preparation, and escalation procedures. The system-facing branch was created to support our hospital system and its staff members, in response to the significant strain that the pandemic placed on our health-care system, the CSSC created a branch specifically focused on supporting our hospital system and its staff members. The faculty, staff, and student-facing arm of the Columbia CSSC responds to health and well-being needs of faculty, staff, and students through a multitude of projects that address the isolation, anxiety, and information overload in populations ranging from frontline workers to students. Finally, the goal of the community-facing branch of the Columbia CSSC is to address the changing needs of our surrounding community throughout the COVID-19 pandemic. The development of this branch leveraged longstanding relationships between hospital programs and community-based organizations.

Table 1 outlines completed CSSC projects in each of these major categories of the Columbia CSSC. These projects are considered completed because they met the identified need, allowing resources to be shifted toward new projects in other domains. All completed projects have developed guides and clear records for re-implementing their projects again quickly if the needs arise. This allows the start-up time to be more expedient when being renewed. An example of this is the relaunching of the virtual tutoring program, Learning Together, with the new school year. Some of the social media posts that have been made by various Columbia CSSC projects can be seen in Figure 3.

Select metrics in Table 1 demonstrate the impact these teams and projects have made on our patients and health system, for the faculty, staff, and students on the CUIMC campus, and for our community in Northern Manhattan. Leaders of all projects have worked to increase the visibility of their projects and the impact they are having in order to increase student participation and to boost morale during challenging and isolating times.



TABLE 1 Descriptions and key outcomes of 15 completed Columbia COVID-19 Student Service Corps projects

Project	Description	Key outcomes
Patient-facing projects		
COVID-19 community information hotline	Medical and Nurse Practitioner students who met minimum clinical training requirements took over the staffing of the New York Presbyterian Hospital's COVID-19 community hotline when full-time employees were redeployed. The students provided full-time staffing support for the informational community hotline to answer community questions about COVID-19.	6952 staffing hours 5655 calls answered
Obstetrics antepartum outreach calls	Medical and Public Health students partnered with the Obstetrics and Gynecology Department to conduct outreach to pregnant women from the clinic network and provide anticipatory public health guidance on COVID-19 and pregnancy, logistic details on clinic and policy changes, and reassurance as appropriate. Students followed predetermined algorithms to appropriately escalate clinical questions to supervising providers when indicated.	876 patient conversations 17 clinical escalations 156 telehealth referrals
Obstetrics postpartum outreach calls	Medical and Nurse Practitioner students who met minimum clinical training requirements partnered with the Obstetrics and Gynecology Department to call recently discharged women who delivered in the preceding 72 h. Students used a standardized script to review postpartum systems and conduct outreach and screenings for newborn well-being and maternal and neonatal care.	562 patient conversations 100+ clinical escalations
Remote patient monitoring	Medical and Nurse Practitioner students who met minimum clinical training requirements engaged in follow-up monitoring of discharged patients with COVID-19. Students received daily assignments of discharged patients referred by inpatient clinical teams via email or a newly instituted EMR order. These student volunteers conducted daily calls, typically for 7–14 days after discharge, to evaluate patients using a standardized questionnaire assessing clinical symptoms and key vital signs (for patients with at-home monitoring devices). Clinical supervision and escalation for further care was coordinated with licensed on-call providers.	890 patients assigned to Telehealth Guides 890 patients followed per protocol
Telehealth patient assist	Clinical and nonclinical students on the health sciences campus partnered with outpatient clinics to rapidly onboard patients onto institutional telehealth platforms. Students received EMR training and patient lists, and called patients to virtually assist with the sign up and use of telehealth applications. This project allowed for more efficient clinical flow and reduction of in-person encounters.	3883 total patients contacted 1882 patients successfully onboarded to telehealth platform
Workforce health and safety employee hotline	Students on the health sciences campus provided staffing support for the hospital service tasked with receiving calls regarding occupational health, including potential COVID-19 exposures and cases, procedural inquiries, return-to-work, and other related issues among staff and providers.	3129 h worked
Faculty, staff, and student	facing	
"Hero Meals"	Students engaged with donors, restaurants, and hospitals to provide free meals for hospital staff working at NYC hospitals. Funds covered food and labor costs of local restaurants, with a focus on Black-owned businesses, that agreed to make and individually package food at cost for health-care workers and hospital staff. They also coordinated in-kind donations of food and snacks to provide frontline workers staying in temporary housing.	\$240,000 raised for meals Provided 20,000 meals for 9 hospitals
Medical education	Senior medical students partnered with medical school faculty to act as teaching assistants for first-year students in the preclinical curriculum. This team of students worked to enhance the virtual curriculum to ensure high-quality ongoing curricular experiences as faculty were redeployed into clinical settings.	72 class sessions held 210 direct teaching hours completed

#### TABLE 1 (Continued)

Project	Description	Key outcomes
System-facing projects		
Emergency department quality improvement research projects	Public health students partnered with the Department of Emergency Medicine to support rapidly developed quality improvement projects. Students completed chart reviews using the EMR to track key indicators of symptoms and treatments of COVID-19.	304 charts reviewed 90% interrater reliability
Personal protective equipment task force	Students on the health sciences campus organized procurement, donation, and manufacturing of PPE and hand sanitizer from interested parties in the community. This team also efficiently managed the distribution of these items to hospitals and providers in NYC who needed additional equipment, in partnership with other local grassroots PPE organizations.	# of items distributed: 3020 N95 masks 11,091 KN95 masks 26,300 surgical masks 820 sewn masks 2600 face shields 559 tyvek suits 30,000 gloves 118 gallons hand sanitizer
Community-facing proje	cts	
Early childhood kit development and distribution	Public Health students partnered with New York Presbyterian Hospital and two community organizations to develop, procure and distribute kits to promote and assist early childhood development. Kits included bilingual books, child abuse prevention resources, resources to help families cope with stress, and at-home activities for young children.	300 kits developed and distributed to two community organizations in NYC
Food distribution	Public Health and Nutrition students partnered with an existing community program, Choosing Healthy and Active Lifestyles for Kids (CHALK), that had previously engaged in food distribution to families experiencing food insecurity. Students registered eligible families for a new method of contact-less food distribution from CHALK to provide fresh fruits, vegetables, and other items free of charge.	111 families contacted 581 families picked up fresh food Reached organizational capacity
"Mask Check"	An interdisciplinary group of students created "Mask Check," an organization that sources donations of face masks for distribution to community organizations and populations in need including homeless shelters, incarcerated populations, mutual aid groups, and protest organizations. This project effectively used social media to outreach to various commercial donors and facilitated individual sewing of masks through interactive and virtual "sewing circles."	5000 masks distributed 7 community partners and agencies supplied
Virtual tutoring	An interdisciplinary group of students and faculty created "Learning Together"—a virtual tutoring program aimed at providing academic support to children in Northern Manhattan. This team partnered with a local school and three community organizations in the spring, and has since expanded into an ongoing summer enrichment project. The original model will be redeployed this fall.	38 families matched with tutors Average of 2 tutoring sessions per week per child

## 4 | MEETING IMMEDIATE CURRICULAR NEEDS AND TRANSFORMATION AND INTEGRATION INTO FIRST-YEAR CLERKSHIP

When clinical learning was discontinued, a principal question was how to provide medical students with meaningful educational opportunities in this shifting context. Hundreds of medical students had already signed up to be part of the CSSC, driven by the will to apply their newly developed skills to assist the health system and community where they

learn and live. While not seeking academic credit for this work, students wanted to assure that they could complete their education and training on the same timeline to be able to join the workforce. The CSSC, in partnership with the administration, setup a system for utilizing CSSC involvement for elective curricular credit for those medical students graduating in 2020 and others who could benefit from receiving credit. April through June, 2020, 308 medical students received curricular credit through CSSC.

A key contribution to the immediate curricular needs of the medical school was the creation of the Medical Education group within CSSC. This team was comprised of senior

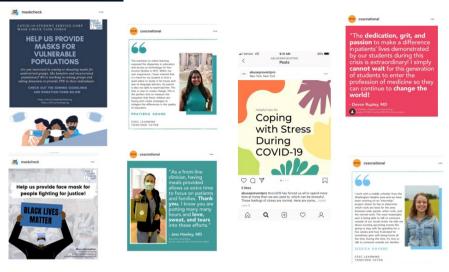


FIGURE 3 Columbia COVID-19 Student Service Corps social media

medical students who acted as teaching assistants for faculty to help rapidly transform their materials to a virtual format and help students adjust to a new mode of learning. A team of 58 medical students covered a total of six courses for first-and second-year medical students. These students held a total of 210 h of virtual individualized instruction, including class sessions, office hours, and workshops. This model of teaching assistants within the medical school was so successful that it is now being built out as a formal component of medical education.

Four months after its inception, CSSC was formally integrated into the structure of the medical school, formalizing the faculty and student leadership, and providing additional administrative support. At this time, the curricular structure of CSSC was also formalized for medical school students as part of the first-year medical student clerkship. For the fall 2020 semester, all first-year medical students at CUIMC are engaged in entirely remote learning for their first semester of medical school. The first-year students engage in a semester-long clerkship during their Foundations of Clinical Medicine course, which has now been adapted for remote learning. The semester-long clerkship portion of the course is made up of two 6-week sessions—the telemedicine clerkship and the CSSC clerkship. This structure ensures that students get both clinical experience through telemedicine clinical encounters and service-learning experience through CSSC project engagement.

The goal of the service-learning clerkship is twofold:

- 1. Align service with curricular objectives to better understand the impact of service on the community and how service contributes to one's own learning.
- 2. Interact with health system teams, community organizations, and community members in order to gain a deeper understanding of the context of care beyond the clinical

encounter. This includes considering health systems, population health initiatives, patient outreach, teams that support patient care, and community organizations and services that aim to address social and structural determinants of health.

When rotating as part of their service-learning session, the clerkship students are assigned to one of six Columbia CSSC projects and are asked to commit about 2-4 h per week on their project, since they are also engaged in their coursework. Each project has clear goals and objectives that demonstrate how the project connects back to the larger service-learning goals outlined above. Students are able to continue their CSSC service-learning work even past their formal clerkship involvement if they choose. These projects range from those that include direct patient contact such as a Colorectal Screening project, to projects that interface with patient families such as the Virtual Neonatal Intensive Care Unit project and finally to community-facing projects such as Learning Together, a virtual tutoring project for students in our community. The six projects, their descriptions, goals, objectives, and current metrics are expanded upon in Table 2.

Over time we expect that the projects available for clerkship students will change as the needs of the community and medical system change and shift. However, the structure of the CSSC—its projects, creating and communicating clear goals and objectives, and operating within a service-learning framework—will remain.

#### 5 | FUTURE DIRECTIONS OF CSSC

Although the Columbia CSSC began as a way to harness the strength and skills of students and faculty on the CUIMC campus during an emerging and continuing pandemic, it

TABLE 2 Clerkship projects and descriptions

Clerkship project	Description	Goals	Objectives
Friendly calls to seniors	Identifies at risk seniors in the community who would benefit from virtual companionship throughout this pandemic	<ol> <li>To support at risk seniors through wellness calls</li> <li>To evaluate the needs of seniors within the Northern Manhattan and Bronx communities</li> <li>To monitor seniors for adverse events and ensure proper follow-up for urgent and acute needs.</li> </ol>	<ol> <li>Students will learn a risk assessment protocol for seniors</li> <li>Students will gain experience interacting with at risk patients.</li> </ol>
Virtual neonatal intensive care unit project	Contacts parents of babies in the NICU to help them setup virtual visits while physical visiting is limited during the COVID-19 pandemic.	To use a telehealth platform to connect parents with their children in the Neonatal Intensive Care Unit during the COVID pandemic	Students will work with an interdisciplinary team in the NICU to learn how to connect parents with a way to see their babies     Students will understand some of the important issues that arise for families with babies who are premature or ill.
Colorectal screening project	Addresses the gap in colorectal cancer screening during the COVID-19 pandemic. This project seeks to create a way for student volunteers to contact patients and connect them with screening options without requiring a visit to the doctor's office, thus, making it more convenient for patients to access care and also decreasing the burden on doctors.	To continue preventative screening for colon cancer via telehealth.	<ol> <li>Students will learn the protocol to reach out to patients in need of colon cancer screening</li> <li>Students will gain experience interacting with patients by telephone and interfacing with their primary care clinic.</li> </ol>
Pediatric psychosocial outreach	Addresses social determinants of health, psychosocial stressors, and mental health disorders within the pediatric population during the COVID-19 pandemic. Using a script, student volunteers make calls to families in order to screen for social determinants of health, psychosocial stressors, and mental health issues. Volunteers are then able to connect patients with resources centered around social service needs, mental health needs, school needs, or COVID-related needs/medical questions.	To support families of children who screen positive on social needs screening     To connect families and children with needed resources	<ol> <li>Students will learn a risk assessment protocol for families of children at risk</li> <li>Students will gain experience interacting with at-risk families; and students will work with an interdisciplinary team to connect families and patients with needed resources.</li> </ol>
ANCHOR project	ANCHOR stands for Addressing the Needs of the Community through Holistic, Organizational Relationships. This project identifies and contacts Medicaid beneficiaries in the community to assess needs and connect them to resources.	<ol> <li>To identify the health-related social needs of Northern Manhattan/South Bronx Medicare and Medicaid beneficiaries</li> <li>To address identified needs through referrals to local community-based social service organizations.</li> </ol>	1. Students will gain experience interacting with patients by telephone and students will learn a risk assessment protocol for Medicaid beneficiaries and will connect families and patients with needed resources.

TABLE 2 (Continued)

Clerkship project	Description	Goals	Objectives
Learning together	Connects children in the community with virtual Columbia tutors/ mentors to help children succeed in this time of uncertainty where they have needed to rapidly adjust to virtual learning without a structured classroom.	<ol> <li>To provide virtual tutoring services to children in the community</li> <li>To ensure that families associated with community-based organizations have access to virtual tutoring</li> </ol>	<ol> <li>Students will be trained in establishing rapport with families and students</li> <li>Students will gain skills in teaching parents and students—an important skill for a future physician</li> </ol>

has transformed into a sustainable interprofessional servicelearning organization embedded within the structure of the medical center. The national CSSC network may also evolve into a longer-term consortium for interprofessional service learning in the health professions. The CSSC is agile enough to adapt to changing circumstances and needs, both in terms of the evolution of the COVID-19 pandemic, as well as other public health and medical crises. For example, the Columbia CSSC was able to adapt existing projects to respond rapidly to recent events highlighting longstanding systemic racism, inequality, and police brutality in our society. The "Mask Check" project, explained further in Table 1, shifted from donating face masks to community organizations to procuring donations and distributing to protesters in NYC. The literature review team within the Information Services branch began compiling and consolidating published literature on systemic racism. Our webinar team brought in a speaker to address the impact and role of race within medicine.

It is the goal of the Columbia CSSC to expand its formal curricular relationships with additional programs on the medical center campus, while continuing to provide interdisciplinary service-learning opportunities as part of the medical school curriculum.

# 6 | IMPLICATIONS AND CONCLUSIONS

According to Lucey & Johnston 2020, COVID-19 can have transformational effects on medical education, and schools can collaborate in order to "establish the educational standard of designing student service learning to respond to urgent community-identified needs for support rather than focusing only on traditional strategies for service learning (eg, free clinics)". The Columbia COVID-19 Student Service Corps demonstrates the power of interprofessional, service-learning models for medical education. In a time of complete upheaval, the medical school was able to adapt and provide fruitful service-learning opportunities to students which allowed them to use their skills, training, and expertise to assist in a time where those skills were greatly needed. The flexible yet sustainable model of the CSSC was shared with

nine additional academic medical centers around the country, demonstrating the adaptability of the model to multiple settings. Not only can the model be applied to other geographic and administrative locations, but it is also versatile enough to respond to future public health and medical emergencies.

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#### CONFLICT OF INTEREST

The authors have no conflicts of interest to report.

#### **AUTHOR CONTRIBUTION**

All authors are members of the Columbia CSSC leadership team, helped to develop the CSSC, and wrote and edited this manuscript.

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