UTHealth Houston Response to House Committee on Higher Education Formal Request for Information, COVID-19 Pandemic Questions 1-9

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1. Are institutions of higher education ensuring the health and safety of students, faculty and staff during the 2020 Fall Semester? When applicable, please speak directly to classroom and lab settings, dormitories and dining halls.

UTHealth appointed a COVID-19 response coordinator in March 2020 to help ensure the health and safety of students and faculty. We created new policies and guidelines that cover all aspects of on and off campus life, from travel, to leave policies, to protected population accommodations, to events, to pivoting between in-person and online learning modalities, to room occupancy and event scheduling and formatting. In addition, UTHealth has also created extensive signage on masking, social distancing, and hand hygiene. We provide hand-sanitizer and cleaning supplies throughout throughout the campus. All labs, classrooms, and public spaces have been evaluated and optimized for social distancing. We have extensive policies and robust employee and student health departments for management of potentially sick staff and students, return to work, exposure investigation, contact tracing, and medical management. We created committees to establish guidelines for how to safely bring both clinical and non-clinical students back to campus.

UTHelath has also issued guidance for socially-distant and staggered schedule research laboratories. Our environmental, health, and safety team has evaluated dozens of school spaces and teaching settings optimizing them for CoVID-19 safety. We stood up a command center that met daily at first and is now meeting as needed to address any operational and safety issues. Lastly, we have provided thousands of pieces of PPE, and training sessions to protect our staff and students.

School of Dentistry (SOD) – As many degree requirements include the completion of clinical procedures and passing of clinical competency assessments on live patients, "alternative pathways to graduation" were developed for students and residents in their terminal years in which students were given the opportunity to demonstrate clinical competency via a variety of new virtual clinical curricula and assessments. Of those students who did not completely satisfy requirements for graduation, a remediation plan was developed. For continuing students during the summer session (May 26-July 17) and now fall semester (began August 17), all didactics remain online and remote, with students are coming to the building in a "shift" fashion to attend in-person labs and simulations either missed during the spring semester or scheduled as part of the summer or fall sessions. Clinical education (live patient care) in the summer session was replaced by simulated hands-on activities complemented by virtual/online clinical reasoning and critical thinking teaching and assessment. Students began providing direct patient care on August 24, 2020 as phyicial modifications (e.g., Plexiglas and other barriers) have been made to clinics.

Cizik School of Nursing (CSON) – all Fall 2020 didactic courses are online expect for exams. Students come to campus for exams except if in quarantine. All students are reminded to stay home if they are sick. Rooms are configured to 25% capacity with at least 6 feet for social distancing. Masks are recommended but not required. Exams are spaced so that each group can leave the building before the next group enters allowing time for cleaning between groups. For labs, small groups are in each room and when social distancing is not available, students must have on a mask and if necessary a face shield.

2. What plans are in place for on-campus COVID-19 testing? Do institutions have the capacity to provide testing on campus, both in terms of available supplies and labs to process tests?

UTHealth has created a drive through and stood up on-site testing and a molecular laboratory that offers in-house testing with a same- or next- day turn around time for staff and students. Testing is currently recommend for any symptomatic staff and students and for asymptomatic staff and students after an exposure. We can currently administer up to 500 tests/day and plan to escalate to 1000, pending a stable supply pipeline. Although we did not perform "pre-entry testing" and are not planning for now to do random rapid antigen testing, we are offering antibody testing as part of a point prevalence and longitudinal study.

3. If applicable, what are plans for collegiate athletics this Fall? How will student athletes be kept safe? If fans will be permitted to attend events, how will fans be kept safe?

N/A

4. What do projected enrollment figures and formula funding look like to institutions for this school year?

UTHealth Cizik School of Nursing – summer 2020 enrollment is 11% lower than summer 2019 enrollment. No projections for Fall 2020 are available at this time, but likely lower.

School of Public Health – The School of Public Health has seen an increase in enrollment of approximately 24% in the Summer semester of 2020 compared to Summer 2019. However, the primary concern expressed by the School of Public Health (SPH) is the potential impact of changes being made by the U.S. State Department and Department of Homeland Security related to new rules and proclamations for international students on non-immigrant visas, particularly the F and J visas. For the fall of 2019, international students made up 16% (n=208) of total enrollment at SPH. Because US Consulates and Embassies have only recently reopened, they are months behind in processing student visa applications. Additionally, students on F and J visas are not a priority for visa processing. This, combined with new restrictions from federal agencies, along with continued travel restrictions to the U.S., means that SPH may see a decline in enrollment by as much as 6-7% for the fall term (international students currently in the US on a valid visa will continue to be eligible for enrollment; these students have been discouraged from traveling abroad unless absolutely necessary).

School of Dentistry - No change in enrollment for the incoming dental, dental hygiene and postdoctoral students/residents for 2020-21.

School of Biomedical Informatics: Summer 2020 enrollment was 35% higher than Summer 2019. Fall 2020 enrollment has increased by 10% from 2019 with enrollment ongoing.

McGovern Medical School: Usual enrollment of 240 students for the 2020/2021 class is expected, the sixth largest class in America.

MDACC/UTHealth Graduate School of Biomedical Sciences: Summer 2020 enrollment for the Graduate School of Biomedical Sciences (GSBS) is up slightly (~4%) compared to Summer 2019. GSBS has expressed the same concerns as the School of Public Health with respect to international students (F and J visas). For the Fall 2019 semester, international students made up 39% (n=186) of total enrollment at GSBS. With the delays in international student visa processing, new federal regulations, and restrictions on travel, GSBS could see a drop in Fall 2020 enrollment by 3-4%.

5. Has there been a noticeable impact on staff or faculty retention with regard to concerns about the pandemic?

UTHealth has not experienced an impact on staff retention due to the pandemic, nor applied any RIFs.

6. Health Related Institutions were exempt from the 5% budget cuts earlier this year, due to their important role in resolving the public health crisis. What are some of the programs, research, and responses to the pandemic that our Health Related Institutions have contributed?

Attached as an appendix are the responses from the UTHealth Houston schools and UT Physicians. While this list of about 300 items is long, this is just a sample as there are other programs, research, clinical and hospital care, public health, education and other initiatives that are not included. Please see attached appendix.

7. How have state and federal COVID-related funds already impacted budgets?

In March and April 2020, UT Physicians, the faculty practice of the McGovern Medical School, went from treating well over 5,000 patients per day in our clinics to less than 1,000, equating up to $100,000s per day in lost revenues due to outpatient clinics being shut down to protect critical healthcare workers, patients, and conserve personal protection equipment (PPE). Recall, UTHealth does not own a hospital, so taking away this revenue stream had a tremendous impact on the budgets of all six UTHealth schools that are all supported financially by UT Physicians.

As of August 31, 2020, UTHealth had only received $8.8 million in CARES Act funding from the federal government, plus $2.2 million directly for students. Our clinical revenue losses, additional cost responding to the pandemic, and other costs during the shutdown are expected be in the $10s of millions by the end of the calendar year. Another impact of the shortage of healthcare professionals for COVID-19 care impacted our School of Nursing enrollment with an 11 percent decrease in summer enrollment as nursing staff needs caused nurses to delay advanced degrees to care for patients.

In response to these losses and to prevent as many reductions in force as possible, UTHealth instituted some tremendous cost savings efforts such as all deans and the executive level employees in central administration took a 10 percent salary reduction, every employee in central administration and many in the schools were furloughed for one day a week starting in May, and many department level budgets for FY2021 were reduced from FY2020 levels.

8. How has the pandemic affected the overall financial status of small and rural community colleges?

N/A

9. Does your institution have a public, online dashboard for the reporting of positive COVID-19 cases which is updated daily? If so, what is the link to the dashboard?

UTHealth established a Student COVID Tracking Dashboard in April 2020, and it is still currently updated on a weekly basis. The dashboard is administered through Student Health and Counseling, and tracks total tests/results on a weekly basis. Results as of August 27, 2020, are 224 positive, 56 negative, and 2 pending. UTHealth executive leadership receive regular updates from the dashboard, but it is not publicly available or online.

APPENDIX

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6. Health Related Institutions were exempt from the 5% budget cuts earlier this year, due to their important role in resolving the public health crisis. What are some of the programs, research, and responses to the pandemic that our Health Related Institutions have contributed?

UTHealth School of Public Health (SPH)

SPH has more than 70 faculty members across 6 campuses (Houston, Austin, Brownsville, Dallas, El Paso, and San Antonio) and 15 research centers engaged in COVID-19 related work. SPH has provided expertise to and/or partnered with numerous governmental entities and institutions of higher education, including the Texas Department of State Health Services, Harris County Public Health, City of Houston Public Health, the Texas Legislature, the Governor's COVID-19 Strike Force, Cameron County, City of Brownsville, Northeast Texas Public Health District, Texas Department of Emergency Management, Houston Community College, City of San Antonio, Bexar County, UT Southwestern, Harvard School of Public Health, Kings College, City of Houston, Texas Christian University, and Baylor College of Medicine. SPH has also engaged with numerous businesses, trade associations and community organizations, including Optum, Greater Houston Health connect, Goodyear, Baker-Ripley, United Way/211, Brighter Bites, Texas Association of Community Health Workers, Houston Endowment, YMCA, El Paso Chamber of Commerce, Houston Area Safety Council, Coppell Girl Scouts, Texas Association of Community Health Centers, Texas Medical Center, El Paso Water, Greater Houston Partnership, University Medical Center, and federally-qualified Health and community clinics. Other specific examples from our SPH include:

SPH Research

- Greater Houston Healthconnect Health Information Exchange is following a cohort of over 7,500 COVID-19 patients from Southeast Texas over time to identify sociodemographic factors and co-morbidities that contribute to adverse outcomes (i.e., cardiovascular disease, thrombotic outcomes, lung complications, mortality).
- Impact of COVID-19 on health and social outcomes: Using the Greater Houston Healthconnect Health Information Exchange data we will assess the impact of COVID-19 on health outcomes and related social outcomes.
- UTHealth's Center for Health Care Data has reached an agreement with Optum to make national COVID-19 datasets available to any UT researcher. These data sets are compiled from EHR data integrated from the major EHR vendors, from hospitals, clinics, and physician offices, and thus contain information regarding labs, diagnostics, treatment, patient history, clinical notes, and drugs.
- Assessment and analysis of COVID-19 infection, hospitalizations, deaths and symptom tracking in Austin/Travis County and surrounding areas
- Texas Health and Human Services: evaluating the economic consequences of vaccine-preventable disease outbreaks in Texas, including COVID-19
- VA study of social distancing on mental health of homeless veterans.
- Mental and financial health survey of middle and low-income adults in the U.S. during COVID-19, which has enrolled 4,000 people to-date.

- Coordination of efforts to report a cohort of COVID-19 patients, including actively recruiting patients for compassionate use of different medications
- Conducting stem cell trials with McGovern Medical School to treat COVID-19 patients with Acute Respiratory Distress Syndrome (ARDS).

SPH Contact Tracing

- Working with TX DSHS to track COVID-19 infection, hospitalizations, deaths, and symptoms.
- Working with DSHS to hire up to 500 students and alumni to conduct contact tracing.
- Developed and implemented protocols for COVID-19 contact tracing in the Austin area
- Symptoms and travel/contact tracking on participants in several Cameron County and Brownsville health studies.
- Assisting with contact tracing with the San Antonio Health Department.
- Contact tracing of all pediatric patients/families who test positive for COVID-19 at Children's facilities in North Texas
- Developing a contact tracing and home monitoring smartphone app (partner is Sentinel Health in Seattle) for people who test positive and for contacts with two-way (text) communications between nursing staff and patients/potential cases.
- Student volunteers contributed to local contact tracing efforts across all six campuses.
- Working with Harris County jail to create a contact tracing procedure/asistance for those being released from jail due to COVID-19.

SPH Healthcare provision

- Testing efficacy of PPE decontamination for reuse
- Leading a project which examines telepsychiatry adoption in psychiatric hospitals across Texas. This includes asking patients whether their conditions make it difficult to maintain practices recommended by the CDC such as social distancing and wearing masks.
- Telemedicine delivery of type 2 diabetes and obesity care that incorporates COVID-19 health strategies to patients/families in the Weight Wellness clinic at UT Southwestern
- Coordination of critical care team at Memorial Herman Hospital
- Set up/operationalization of testing facilities

SPH Media

- Served as a resource to more than 100 media outlets, including New York Times, USA Today, CNBC, ESPN, Daily Mail UK, Houston Chronicle, Turkish TV, KPRC Houston, Chinese Daily News, KHOU TV, Dallas Morning News, Texas Tribune, Allure, KVIA TV El Paso, Fox 26 News Houston, Univision, Telemundo, Fort Worth Star Telegram, and Austin American Statesman.

SPH Governmental Resources

- Developed spatial-temporal monitoring, modeling and visualization tools for COVID-19 testing, transmission and epidemics for local county and city governments.
- Supported the Peruvian National Institute of Health (INS) in carrying out the molecular diagnostic tests of the SARS-CoV-2 technical support for biosafety training for general health personnel and health personnel in charge of hospitalized patients.
- Working with the City of Houston Mayor's Office and Greater Houston Partnership to develop effective communication messages related to protecting the health of Houston through prevention and control of COVID-19.
- Prepared recommendations for the Governor's Strike Force to reopen the Texas economy.

SPH Training

- Texas Association of Community Health Centers: Developed questions for implementation on Trauma Informed Care trainer coaching calls
- Establishing protocol with El Paso Water and Baylor College of Medicine Human Genome Sequencing Center to implement wastewater-based epidemiology of COVID-19
- Created business-specific workplace safeguards and "Dos and Don'ts for PPE" for the Paso del Norte Health Foundation's website
- Informing dairy farmers about COVID-19

SPH Guidance/guideline development (e.g., safe reopening)

- Developed predictive models to evaluate the policies for reopening business in Texas.
- Consultation with Houston Community College, Neste Corporation, City of San Antonio, Texas Christian University, El Paso Texas Medical Society, Houston Area Safety Council, Buffalo Bayou Partnership, Texas State Legislature, Texas Dept. of Emergency Management on COVID-19 safety and control.
- Assisted the Greater Houston Partnership with guidelines on screening and notification.
- Consulting for California Association of City Planners; Goodyear; and Coppell Girl Scout Troop to inform about COVID-19, harm reduction, and safety measures.
- Determining phased economic reopening information for UT System.
- Houston Jewish Community Center
- Partnered with several El Paso area hotels to learn their specific business operations and discuss workplace practices
- Met with El Paso retail owners of to discuss Governor Abbott's orders and how they can best be implemented

SPH Data/surveillance

- Analysis of case data from DSHS and creation of reports. Information is used to identify "hotspots" around the state of Texas and to inform the public and government officials
- Analysis of case data and creation of reports for the Texas Medical Center CEOs and Harris Health. Information is used to prepare for possible surges in cases so that the TMC healthcare system is prepared to respond adequately.
- Developed machine learning and AI models for COVID-19 epidemic predictions
- Designed clinical trials for intervention treatments and prevention programs for COVID-19
- Integrating Electronic Health Records (EHR) data with COVID-19 screening and hospitalization data for prediction and risk factor identification of COVID-19 progression, hospitalization and mortality
- Modeling of viral dynamics and immune responses to COVID-19 infections for vaccine and antiviral drug design (ongoing)
- Creating an online GIS dashboard for DSHS Region 6/5s to use in their daily meetings.
- Leading analyses updates for DSHS, particularly by Trauma Service Area, by triangulating confirmed cases, testing, and fatalities in the state of Texas.
- Data surveillance of US adults on behavioral responses and outcomes to/from the coronavirus outbreak and subsequent stay-at-home policies. Such as: coronavirus testing & outcomes (illness), job status/financial changes, stay-at-home/work-from-home practices, intimate partner violence, substance (tobacco, alcohol, drug) use, sleep, physical activity, and depression.
- Conducting a community surveillance of grocery store workers, healthcare workers, first responders, social service providers, homeless populations, sex workers, and others, that are at high risk for

exposure to SARS-CoV-2 infection and may be potential point sources for further community spread in Harris County.

SPH Community outreach/education

- *CATCH Health at Home* Lessons & Resources to include diet, physical activity, vaping, and COVID awareness. 3,000 families are participating to date. Available in English and Spanish.
- Conducted a rapid response survey to identify the social needs (food insecurity, housing insecurity, access to healthcare, access to childcare, unemployment, financial stability), and grocery shopping, dietary habits among low-income households with children across Houston, Austin, Dallas, New York City, and Florida during COVID-19 pandemic.
- Triage of rapid assessment survey participants to deliver basic needs and resources to families
- Weekly fresh produce distributions to 45,000 families in 6 cities
- Develop and implement communication strategies to reach medically underserved populations
- Develop trainings for Community Health Workers and webinars for community-based organizations embedded in and serving medically underserved groups
- Baby Steps for Health: Offering Smoke-free Homes intervention to families of E. TX FQHCs partnering in study to reduce vulnerability of COVID+ individuals and diminish toxicity of household environment especially while homebound.
- PPE distribution at Houston day labor corners
- Consultation to El Paso Water regarding COVID-19 health risks among wastewater treatment plant workers
- Coordinating coronavirus testing of all El Paso Water employees by Baylor College of Medicine Human Genome Sequencing Center (UTHealth SPH is a partner in the center).
- Contributing to the coordination of obtaining PPE for the Region; Facilitated with the Regional Public/Private Partnership and BIO El Paso-Juarez; Providing information on proper PPE sourcing, allocation and decontamination

SPH Prevention/health promotion

- Designed clinical trials for intervention treatments and prevention programs for COVID-19 using the multi-institutional Center for Clinical and Translational Sciences (CCTS) platform.
- Working with community partners to develop a COVID-19 testing sampling plan and contact tracing procedure/assistance for individuals with experiences of homelessness in Houston/Harris County.

SPH Other

- Peer-Reviewed publications in print. Topics include:
  - Birth defect surveillance
  - Effect of COVID-19 on homeless populations.
  - Return to work guidelines
  - Impact of meteorological factors on the COVID-19 transmission
  - Training and Fit Testing of Health Care PPE

UTHealth Cizik School of Nursing (CSON)

CSON has aided in the combat of COVID-19 in many ways. One primary way is by organizing a Grand Rounds with Dr. Luis Ostrosky and other educational offerings to keep faculty, staff, and students apprised of the latest information on COVID-19. Other ways the CSON has contributed:

- We have assisted Harris County Psychiatric Center (HCPC), the only hospital operated by UTHealth, to prepare the workforce and the patient care environment for COVID-19 patients; however, no COVID positive patients have been admitted to date. We supplied webcams so the HCPs could continue to offer video clinic visits.

- The CSON operates the Employee Health Services for UTHealth and provides care for employees, residents and students. To date, 60 employees have tested positive for COVID-19 including seven clinical faculty and nine medical residents. The overall rate of positive for our healthcare workforce is 0.5% which is significantly lower than the 4.4% of healthcare workers reported by Pennsylvania. The early implementation of workplace transmission mitigation practice controls, including double masking, has been extremely effective in keeping the workforce safe from active COVID-19 transmission.
- Faculty are actively involved in research, including two studies related to sero-conversion and validation of antibody testing among UTHealth Employees and employees of a clinical affiliate hospital. Other research is being conducted related to symptom validation and mental health return to work assessment. Two COVID-19 NIH supplements for existing cohort studies are currently under review at NIH.
- CSON has accepted private donations of gloves, gowns, masks, sanitizing wipes, and KN95 respirators (used as masks).

UTHealth School of Dentistry (SOD)

As an oral health care institution, SOD did not treat any known COVID-19 positive patients in our dental clinics. We have also screened all patients, employees, and trainees who have entered our building, utilizing the CDC's most recent symptom list and a temperature check. For the period March 23-May 17, 2020, we saw 737 unique patients totaling 984 visits. This care was limited to emergency needs of patients of record, and was provided primarily by faculty at the main building plus 4 other sites owned and operated by the school.

Additionally, the school developed an informational hotline for any patient or non-patient of record, and has average approximately 125 calls per week.

SOD donated all student PPE to the McGovern Medical School for using on the front lines in clinics and hospitals.

UTHealth School of Biomedical Informatics (SBMI)

During the COVID-19 pandemic, SBMI has been actively contributing to the fight of the pandemic for all of the pandemic phases, including syndromic surveillance and early detection, accurate and effective diagnosis, smart monitoring and tracing of cases, rapid discovery of treatments and therapeutics, and optimization of patient outcomes during recovery. SBMI is conducting these activities in four major areas: Datasets and Tools, Research, Community, and Education.

SBMI COVID-19 Datasets and Related Tools

- **6000+ COVID-19 global datasets**. This is a centralized metadata repository for collecting, indexing, and searching all types of datasets related to COVID-19 to promote efficient data sharing and reuse for timely scientific discoveries, policy making, and pandemic management. (https://www.covid19dataindex.org/). Currently listing more than 6000 datasets across the globe. Featured in Nature (https://www.nature.com/articles/d41586-020-02331-3).
- **COVID-19 Dashboard with Insights and Actionable Knowledge**. Traditional dashboards display raw data and simple statistics. SBMI has developed a non-traditional dashboard providing data layered with analyses that can be rapidly transformed into actionable knowledge for decision makers. This dashboard covers data from local Houston region to all the countries under WHO (https://sbmi.uth.edu/covid-19/data-dashboard).
- **National COVID Cohort Collaborative (N3C)**. SBMI actively participates in this NIH supported national project with contribution of COVID-19 patient data, analytics and expertise.
- **Large Scale National and International Datasets**. We have obtained several large national and international COVID-19 medical record datasets, including Cerner, Optum and UK Biobank. We are actively using them for clinical trials, clinical research, biomedical discovery, and education.

- **SCOR: Secure COllective COVID-19 Research.** This is an international consortium that aims to provide secure and privacy-preserving sharing of COVID-19 related data for research. SBMI is one of the leading partners of the consortium.
- **Houston COVID-19 medical records**. We manage and update a large local EHR (Electronic Health Records) database (up to 10 years of medical history) for patients who are tested (positive and negative) at Memorial Hermann Health System and UT Physicians (100,000 total tested and 16,000 positives, as of 8/19/20). This database is actively supporting COVID-19 clinical trials at UTHealth and nationally as well as supporting research, education, and policy making for UTHealth and the community.
- **Regional Health Information Exchange (HIE)**. We assisted the School of Public Health effort in obtaining and processing the HIE data for COVID-19 patients from the Greater Houston Health Connect that covers the southeast Texas region.
- **Text Retrieval (TREC) COVID 19 Initiative**. With everything coming out about COVID-19, it is a challenge to find correct information and filter out misinformation. To help solve this information overload problem, SBMI, in collaboration with NIH, NIST, and OHSU, has developed a search engine much like Google or PubMed where clinicians and scientists can access evidence-based COVID-19 information they need. This will facilitate both discovery and dissemination of information for decision and policy making
- **NLP Resources for COVID-19**. Much of COVID-19 research data are embedded in narrative texts, such as scientific literature, clinical documents, or social media, which are difficult to be processed and used. SBMI developed this website (http://covid19nlp.org) that is dedicated to collecting and sharing available Natural Language Processing (NLP) resources for COVID-19, including publications, datasets, tools, vocabularies, and events, with the ultimate goal of promoting re-use of existing NLP resources to facilitate COVID-19 research.

SBMI COVID-19 Research Projects

- **REACT**. Funded by National Science Foundation, REAl-time Contact Tracing and Risk Monitoring (REACT) is a multi-institution project among Emory University, USC, and UTHealth that aims to develop techniques and a mobile application, REACT, for Real-time Contact Tracing and risk monitoring via privacy-enhanced tracking of users' locations and symptoms.
- **Rapid Response Data for Discoveries (R2D2)**. This project aims to speed up the process of going from COVID-19 clinical data collection to promote better outcomes. R2D2 leverages existing pSCANNER (patient-centered SCAlable National Network for Effectiveness Research) infrastructure to collect and normalize COVID-19 related data elements into OMOP CDM and to support cross-institution studies on COVID-19.
- **Combinational Drug Discovery for COVID-19**. This is a supplement grant on the existing NIH funded "Finding Combinatorial Drug Repositioning Therapy for Alzheimer's Disease and Related Dementias" project. The goal is to facilitate the discovery and development of novel drugs, as well as repurposing and repositioning existing drugs, for preventing and treating COVID-19.
- **Characterization of Misinformation Dynamics in COVID-19 in Social Media**. This is a supplement grant from NIH to explore social media misinformation about health during COVID-19 and makes recommendation on how to manage misinformation.
- **Who Should Be on Ventilators?** SBMI researchers are collaborating with UTHealth ICU physicians to develop an Artificial Intelligence system that can potentially identify and predict which patients are at higher risk and thus should be placed on ventilator as soon as possible through machine learning processing of the medical records of the patients.
- **Cerebrovascular Outcomes of COVID-19 Survivors.** SBMI researchers are working with UTHealth neurologists and stroke experts to understand the short- and long-term impacts on the brain due to COVID-19 infections.
- **Detecting COVID-19 through Retina Images.** SBMI researchers are exploring the possibility of making non-intrusive detection and diagnosis of COVID-19 through AI-based processing of retina

images. This is leverages a NASA funded project for the early detection of strokes among astronauts during space flight.

- **COVID-19 Vaccine Clinical Trial.** SBMI is involved in a COVID-19 vaccine trial with a major US pharmatheutical company, providing support of clinical data analytics.
- **Other COVID-19 Research Projects (ongoing pilot studies in progress and/or proposals submitted).**
  - Meeting Information Needs and Retrieval System Readiness for Pandemics
  - An Assessment of Resource Utilization and Patient Safety of Critically Ill Patients Before and During the COVID-19 Pandemic via Informatics Approaches
  - Telehealth Emergency Response Interaction for COVID-19 – "TERI-C19"
  - NYU RADx-UP Coordination and Data Collection Center Project
  - Evidence-Based Operations with Predictive Analytics: Tools for Managing Regional Healthcare Capacity During the COVID-19 Pandemic
  - High-throughput computational sub-phenotyping for assessing personal and population risk from COVID-19
  - Using Plasma Cytokine for Early Detection and Identify Possible Treatment Targets for COVID-19 patients
  - Understanding the impact of COVID-19 on medication adherence
  - Pandemic IR: Methods for rapid biomedical search engine development
  - Health impact of therapeutic substitution of essential medications due to drug shortages during the COVID19 pandemic
  - Standardized and formal representation of eligibility criteria to enable data FAIR and COVID-19 related clinical studies
  - High throughput knowledge mining to understand risk factors and identify potential pharmaceutical interventions to COVID-19 using advanced AI approaches
  - American Heart Association COVID-19 Coordinating Center Heart CORD: a knowledge graph to capture and visualize biological data and clinical information for studying COVID-19 impacts on cardiovascular diseases
  - Development of an AI-based algorithm using nanosensor-based salivary analytics to predict clinical outcomes in symptomatic COVID-19 patients

SBMI COVID-19 Community Projects

- **Houston Emergency Opioid Engagement System (HEROES)**. Funded by HHS, the State of Texas, and the City of Houston, HEROES is a clinical trial that uses first responder and emergency department surveillance data to identify, engage, and treat patients with opioid use disorder. Building on the first three successful years, this program has been renewed an additional two years. A subcomponent focuses on managing the opioid crisis during COVID-19 pandemic.
- **COVID-19 Houston Datathon**. Jointly organized by UTHealth SBMI and Rice University, the goal of this online data hackathon is to develop a Machine-Learning prediction model using local county-level COVID-19 data to estimate the changes in hospitalization and mortality rates in the greater Houston area encompassing 9 counties (Harris, Fort Bend, Montgomery, Brazoria, Galveston, Liberty, Waller, Chambers, and Austin). Undergraduate and graduate students in the Greater Houston Metro Area and the Gulf Coast Region are eligible to participate. (https://sbmi.uth.edu/datathon/index.htm)

SBMI COVID-19 Publications (selected)

- **JBI Special Issue**. SBMI researchers organized a Special Issue of the Journal of Biomedical Informatics (JBI), "Novel Informatics Approaches to COVID-19 Research", to timely disseminate the research findings by researchers across the world on the application of Artificial Intelligence and Data Science to COVID-19 research.
- Ohno-Machado L, Xu H. Coronavirus: indexed data speed up solutions. Nature. 2020 Aug;584(7820):192.
- Sittig DF, Singh H. COVID-19 and the Need for a National Health Information Technology Infrastructure [published online ahead of print, 2020 May 18]. *JAMA*. 2020;10.1001/jama.2020.7239. doi:10.1001/jama.2020.7239
- Singh H, Sittig DF, Gandhi TK. Fighting a common enemy: a catalyst to close intractable safety gap. *BMJ Quality & Safety* Published Online First: 16 July 2020. doi: 10.1136/bmjqs-2020-011390
- Stanfill, M.H., Giannangelo, K., & Fenton, S.H. (2020). *Health Information Management Best Practices for Quality Health Data During the COVID-19 Global Pandemic.* Perspectives in Health Information Management**,** 2020 Winter.
- Stanfill, M.H., Giannangelo, K., & Fenton, S.H., HIM *Best Practices for Quality Health Data During the COVID-19 Global Pandemic.* Webinar. Texas Health Information Management Association May 6, 2020.
- *Patient Safety Primer: Covid 19 and Dentistry Challenges and Opportunities for Providing Safe Care.* Content last reviewed August 2020. Agency for Healthcare Research and Quality, Rockville, MD. https://psnet.ahrq.gov/primer/covid-19-and-dentistry-challenges-and-opportunities-providing-safe-care
- Patel SA, Halpin RM, Olson GW, Franklin A. *Global pandemic and the rise of teledentistry.* Journal of Dental Education. DOI: 10.1002/jdd.12355
- Tongtong Huang , Yan Chu , Shayan Shams , Yejin Kim, Genevera Allen, Ananth V Annapragada, Devika Subramanian, Ioannis Kakadiaris, Assaf Gottlieb, Xiaoqian Jiang. *Population stratification enables modeling effects of reopening policies on mortality and hospitalization rates, A case study in Houston, Texas, USA.* (under review).

SBMI COVID-19 Educational Offerings

- Application of Academic Integrity Policies in an Online Environment. Amazon Web Services, 4/27/20.
- Teledentistry Curriculum Simulation: The new normal, UTHealth SOD. Summer 2020.

McGovern Medical School and UT Physicians (UTP)

McGovern Medical School and UT Physicians, the physician practice plan of UTHealth, are helping to lead the regional response and collaborating with state and local departments of health, regional emergency management systems, our hospital partners, and all other major players in emergency response. Specific details of services provided include the following:

- UT Physicians: 11,830 patients tested. 1,890 diagnosed with COVID-19 to date.
- UT Physicians stood up four convenient drive-thru COVID-19 testing locations across the Greater Houston area to serve the community (Victory, Rosenberg, Sienna, and Cinco Ranch).
- UT Physicians offers COVID-19 consulting services to provide corporate guidance for testing as well as company-wide testing on location to get the Houston area back to work safely.
- UTP has maintained access to primary care during the pandemic, providing more than 85,000 telemedicine visits to patients for primary and specialty care since March 2020.
- Memorial Herman Texas Medical Center: 6,213 patients tested and 342 CoVID-19 diagnosed, hospitalized, and treated to date.

- Lyndon B. Johnson General Hospital: 1,088 patients tested and 192 CoVID-19 diagnosed, hospitalized, and treated to date.
- UTHealth McGovern Medical School Pathology molecular diagnostics laboratory (converted part of it to COVID-19 test lab): Processed 948 tests since May 11th. Our average case daily load is around 100 patients and growing. The lab expects to reach 250-300 daily next week. Current capacity is 500 tests a day and can expand to 1000 easily. Max theoretical is 2000 per day but that would require some staffing changes.

McGovern/UTP Other hospital and patient care contributions through McGovern Medical School faculty and residents:

- **Frontline care:** McGovern Medical School residents volunteered to work caring for patients requiring the most intense care, rather than spending time on their normal residency rotation. In addition, other residents who graduated from McGovern Medical School May 1, 2020, started their residencies a month early to contribution to the pandemic's needs.

- **Vaccines:** McGovern Medical School students are leading a Vaccine Task Force – contacting community members (UT Physicians patients) who have missed getting their children scheduled vaccines during the pandemic. Vaccination rates have been dropping during the pandemic, but are essential to ensure herd immunity and prevent against the outbreak of other diseases.
- **Serving Houston:** Anjail Sharrief, MD, MPH, associate professor of neurology and director of stroke prevention for the Institute of Stroke and Cerebrovascular Disease, was appointed to a citywide COVID-19 response task force. Established by Houston Mayor **Sylvester Turner**, the Health Equity Response Initiative and Task Force was launched in April 2020 as an intervention for vulnerable and at-risk populations to the health and economic impacts of COVID-19. Dr. Sharrief also was appointed co-chair of the group's Medical Care Subcommittee.
- **Starting at the end:** Autopsy research published in *Cardiovascular Pathology* by the McGovern Medical School Department of Pathology with collaboration of other McGovern faculty helps to elucidate COVID-19's pathogenesis and pathophysiology to create individualized treatment plans. **Dr. Maximilian Buja**, professor of pathology, and his team will continue to work with clinical colleagues across the nation as part of a national autopsy consortium on this topic.
- **Essential supplies:** McGovern Medical School faculty and staff collaborated to create a new protective face shield for frontline providers in March when PPE was scare. Thousands were produced and distributed to frontline workers.
- **Education resources:** Documenting educational challenges and changes, McGovern Medical School's Department of Neurosurgery published "Challenges of Neurosurgery Education During the Coronavirus Disease 2019 (COVID-19) Pandemic: A U.S. Perspective" in *World Neurosurgery*. Authored by **Yoshua Esquenazi, MD,** assistant professor of neurosurgery, and neurosurgery residents **Cole Lewis, MD**, and **Hussein Zeineddine, MD**, the paper offers resources that can help residency education and clinical applications during pandemics.
- Why the difference: Differences in lung physiology and immune function in children are detailed in a paper, "Understanding the age divide in COVID-19: why are children overwhelmingly spared?" published in *The American Journal of Physiology- Lung Cellular and Molecular Physiology* and co-authored by Harry Karmouty-Quintana, PhD, assistant professor of biochemistry and molecular biology; with senior author Matthew Harting, MD, MS, assistant professor of pediatric surgery; and study co-author Bindu Akkanti, MD, associate professor of critical care medicine. The research was done in collaboration with Baylor College of Medicine.

- Treatment of high risk patients: The recovery of a severe case of COVID-19 was published April 22 in the *New England Journal of Medicine*. In one of the first reported cases of its kind, a 3-week-old infant in critical condition recovered from COVID-19 due to rapid recognition and treatment by physicians from McGovern Medical School.

McGovern/UTP Research Collaborations

National Center for Advancing Translational Sciences. As part of the Center for Clinical and Translational Sciences, UTHealth and The University of Texas Health Science Center at Tyler are joining a study established by New York University and Montefiore Medical Center/Albert Einstein College of Medicine to evaluate the safety and efficacy of convalescent plasma in hospitalized coronavirus patients. The trial, which will enroll patients locally at Memorial Hermann-Texas Medical Center, is funded with an $8 million grant from the National Center for Advancing Translational Sciences, part of the NIH.

New England Journal of Medicine

(Alvaro Coronado Munoz, MD) "Uncommon complication": Houston children affected by Multisystem inflammatory syndrome in children (MIS-C), recognized as an "uncommon complication" of COVID-19, were included in a network study published by the *New England Journal of Medicine*. The Division of Pediatric Critical Care was invited to participate in this study with Alvaro Coronado Munoz, MD, assistant professor of pediatrics, as the site investigator. The study of children affected by MIS-C is ongoing by Dr. Coronado Munoz.

Cardiovascular Pathology.

(Dr. Maximilian Buja) Autopsy research published in *Cardiovascular Pathology* by the McGovern Medical School Department of Pathology with collaboration of other McGovern faculty helps to elucidate COVID-19's pathogenesis and pathophysiology to create individualized treatment plans. Dr. Maximilian Buja, professor of pathology, and his team will continue to work with clinical colleagues across the nation as part of a national autopsy consortium on this topic.

McGovern/UTP Other notable contributions:

- 137 research protocols dealing with epidemiology, diagnosis, management, and prognosis have been launched and are ongoing (list is available upon request).
    - Recent example is UTHealth McGovern Medical School is one of the leading sites with New York and Miami for a NIH-sponored double-blinded clnical trial on convalescent plasma to determine its true impacts on COVID-19 (Article).
- Media and social media contributions by faculty and staff to help educate regional, national, and international public about CoVID-19.
- A large scale study to examine the prevalence of antibodies in healthcare workers was launched, aiming to recruit 2000 UTHealth employees.
- Together with our hospital partners have launched a large scale PPE reprocessing system that has stabilized N95 and face shield availability throughout our clinical footprint.
- Children's Learning Institute translated much of their vast library of activities, online materials, and other early childhood education opportunities to the CIRCLE Family Activity Collection that is free of charge for any family. It is available in both English and Spanish.