ANNUAL REPORT

2024

HARVARD MEDICAL SCHOOL

BLAVATNIK INSTITUTE
GLOBAL HEALTH &
SOCIAL MEDICINE

PROGRAM IN GLOBAL SURGERY
AND SOCIAL CHANGE

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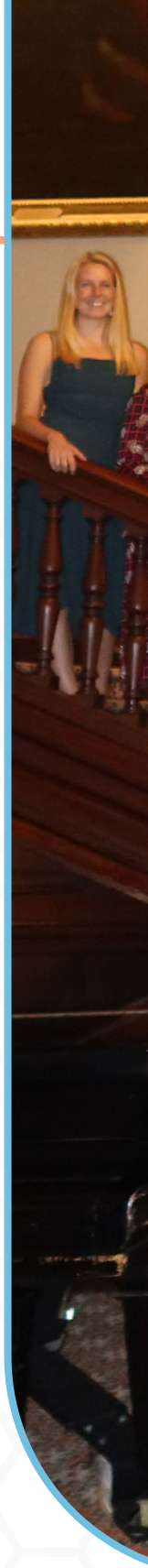


Dear Friends and Colleagues,

It is with great pride and gratitude that I address you in this year's annual report of the Harvard Medical School Program in Global Surgery and Social Change. As we reflect on the past year's accomplishments and challenges, I am continually inspired by the dedication and resilience of our community.

This year has been a transformative journey, marked by our collective transition from pandemic isolation to renewed in-person connections. Amidst this transition, we have persevered in advancing research, shaping policy, and deepening our understanding of public health and global surgery. These pursuits are vital, yet I believe our most profound achievements lie in the relationships we have nurtured – friendships forged, mentorships cultivated, and partnerships strengthened.

I urge you to view these relationships not merely as personal connections but as essential skills in our pursuit of global health equity. Dr. Paul Farmer often emphasized that our impact in the world is magnified through deliberate kindness and effective partnerships. In a landscape where systemic inequities persist, our ability to empathize, communicate thoughtfully, and collaborate across diverse backgrounds is as crucial as our technical expertise.

Throughout the year, I have witnessed countless acts of kindness within our community—moments of compassion during global crises, supportive gestures in times of personal loss, and courageous conversations around equity and justice. These acts are not incidental; they are deliberate choices that strengthen our bonds and enhance our collective ability to effect meaningful change.

As we move forward, let us continue to prioritize kindness and empathy in all that we do. Maya Angelou once said, "People will never forget how you made them feel." This observation resonates deeply in our work, where the impact of our actions extends far beyond policies influenced or research findings published. It lies in the lasting impressions we leave on individuals and communities through our genuine concern and collaborative spirit.

I encourage each of us to embrace the challenge of fostering deliberate kindness in our interactions. Whether in advocating for global health equity, conducting groundbreaking research, or simply extending a helping hand, let us strive to build relationships grounded in mutual respect and understanding.

Together, we can create a future where health equity is not just an ideal but a reality for all. Thank you for your unwavering commitment and partnership in this shared journey.

With sincere appreciation,

Robert Riviello

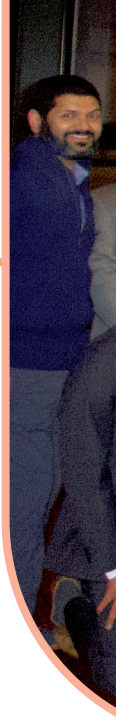
Director, Harvard Medical School Program in Global Surgery and Social Change

▲ *PGSSC Class of 2023*

Whether in advocating or global health equity, conducting groundbreaking research, or simply extending a helping hand, let us strive to

build relationships grounded in mutual respect and understanding.

06 MESSAGE FROM CHIEF STRATEGIST



The concept of a global surgery

program and fellowship at Harvard Medical School began with a conversation I had with Paul Farmer on the trip from Port-au-Prince back to Miami in 2007. Paul was passionate about including "social change" in the name and thus began the "Program in Global Surgery and Social Change" (PGSSC). Paul knew that for surgery to be integrated into health system strengthening, we needed to address not only the biological but also the social, commercial, and political factors that conspire against the poor—something Paul called "structural violence".

Since then, we have focused our PGSSC efforts largely on the social change necessary for equitable surgical care. Over the years, the program has worked to highlight and address the disparities in surgical care across the globe, emphasizing that surgery is not just a medical issue but a social justice issue. Paul Farmer's vision was that surgery should be accessible to all, regardless of their socioeconomic status, and that the barriers preventing this accessibility must be dismantled.

Looking ahead, the next decade will require us to redouble our efforts. Social and behavioral change on a planetary scale will be necessary to address the forces conspiring to threaten surgical care if not our existence. In this context, we must concentrate on what I call the Three Scourges of Our Time - Climate Change, Pandemics, and Forced Human Migration. These scourges, each causing widespread pain and suffering, are either primarily caused by or spectacularly exacerbated by human maleficence.

The notion of a scourge implies an affliction that causes great suffering. Tragically, we are inflicting these sufferings upon ourselves. We are not good stewards of our only planet, and as has been said, "There is no planet B." Our actions have led to a climate crisis that is making natural disasters more frequent and severe, pandemics that spread rapidly and devastatingly, and the social and political factors that lead to forced migration that displaces millions of people. However, amid these challenges, there is a glimmer of hope. Surgery and anesthesia can be an antidote of sorts for all three of these scourges, and the solutions related to surgical care are at the nexus of addressing these global issues.

Building surgical capacity fortifies the health system and makes it more resilient in the face of all three scourges. For instance, during a pandemic, a robust surgical infrastructure can ensure that essential surgeries continue despite the strained health system. In the wake of natural disasters exacerbated by climate change, surgical teams can provide critical care to injured individuals. Moreover, in regions experiencing forced human migration, surgical care can be a lifeline for displaced populations who often face significant health challenges with no access to the formal health sector.

To be more specific, the epicenter of this capacity growth and maturation must be the district-level hospital. This is the clearinghouse for surgical care, linking rural community health workers with the downstream referral centers. However, for decades, the rural or district-level hospital has been considered an expense and a consumer of much-needed power that is often spotty and unreliable. To make matters worse, communication to and from these hospitals is often nearly impossible.

What if this could be entirely changed? What if district-level hospitals could be the source of power and economic development for rural communities? What if district hospitals had reliable 24/7 high-speed internet connections to make patient data management seamless and make the district-level hospital the most reliable link to rural communities, large cities, and the rest of the world?

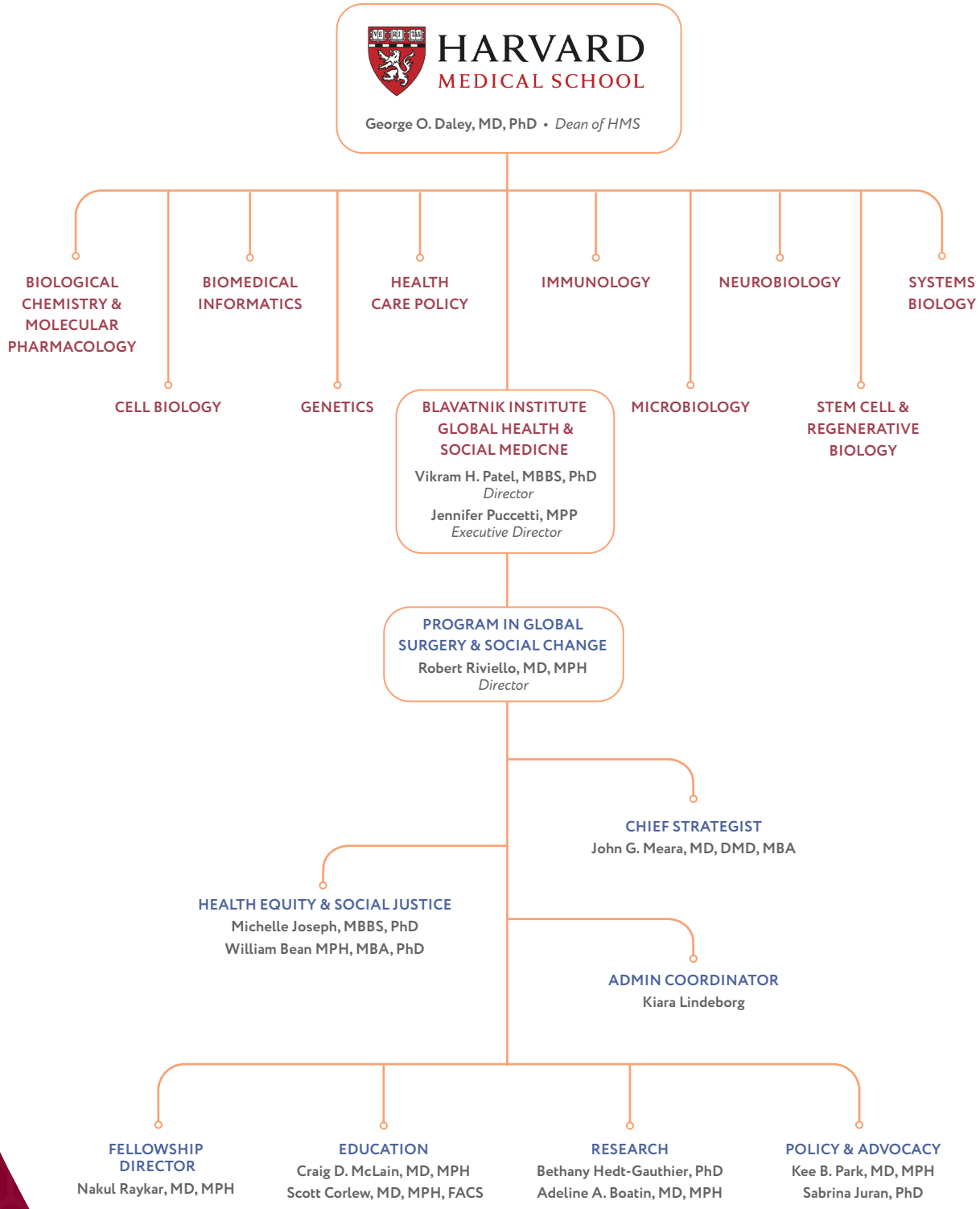
So, what needs to happen now? We need to fund NSOAP (National Surgical Obstetric and Anesthesia Plans) creation and implementation. As a result of the Lancet Commission on Global Surgery's recommendation for national surgical strategic planning, dozens of countries have embarked on the journey to create these plans. The world knows how to build surgical capacity. This process of surgical strategic planning must be funded as part of holistic health system strengthening. It is that simple conceptually—fund all six domains of NSOAPs. To be clear, the financial mechanisms will look much different country by country, but the end result must be the same—**building surgical capacity that is inextricably linked and integrated into the overall health ecosystem.**

Furthermore, district-level hospitals should be energy-independent and not reliant on the national grid. They should be net energy producers instead of energy consumers, giving them a revenue source. Solar power can be a game-changer in this regard. By harnessing solar energy, hospitals can ensure a reliable power supply, which is critical for surgeries and other medical procedures. This energy independence would also empower hospitals to serve as economic development hubs in rural areas.

In addition, linking all district-level hospitals to satellite internet connections can ensure a constant high-speed link with the internet powered by a consistent solar source. This connectivity can revolutionize patient data management, telemedicine, and overall hospital operations. It would make district-level hospitals the most reliable link to rural communities and larger cities, facilitating better healthcare delivery and coordination.

The future of global surgery lies in addressing the social determinants of health and the broader structural issues that impact surgical care through structured national surgical and anesthesia strategic planning processes that are fully integrated into national health plans. By focusing on climate change, pandemics, and forced human migration, we can build resilient and equitable surgical care systems by strengthening district-level hospitals through sustainable energy and connectivity solutions. The journey that began with a conversation on a flight from Port-au-Prince continues to inspire and drive the efforts to make surgery accessible to all, ensuring we do not leave anyone behind in our quest for health equity and social justice.

08 ORGANIZATION STRUCTURE




HARVARD MEDICAL SCHOOL
ANNO DOMINI
MDCCCCIIII
THE WORLD IS WAITING
THE CAMPAIGN FOR
HARVARD MEDICINE
ELLEN AND MELVIN GORDON

10 GET TO KNOW THE TEAM

DIRECTOR: DEVELOPMENT/ FUNDRAISING

Robert Riviello, MD, MPH
Associate Professor of Surgery, Global Health, and Social Medicine, Harvard Medical School.Director of Global Surgery Programs, Center of Surgery and Public Health, Brigham and Women's Hospital

CHIEF STRATEGIST

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Chief, Department of Plastic and Oral Surgery, Boston Children's Hospital

STRATEGY: HEALTH EQUITY / SOCIAL JUSTICE

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Michelle Joseph, MBBS, MSc, PhD
Instructor, Department of Global Health and Social Medicine, Harvard Medicine School

FELLOWSHIP DIRECTOR

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Assistant Professor of Surgery, Division of Trauma, Burn, and Surgical Critical Care Brigham and Women's Hospital

ASSISTANT FELLOWSHIP DIRECTORS

Geoffrey Anderson, MD, MPH
Assistant Professor of Surgery, Division of Trauma, Burn, and Surgical Critical Care Brigham and Women's Hospital

Kavitha Ranganathan, MD
Assistant Professor of Surgery, Division of Trauma, Burn, and Surgical Critical Care Brigham and Women's Hospital

Salim Afshar, MD, DMD, FACS
Attending Surgeon Department of Plastic and Oral Surgery Boston Children's Hospital

EDUCATION

Craig D. McClain, MD, MPH
Co-director - Pediatric Neuroanesthesia, Department of Anesthesiology, Critical Care and Pain Medicine Director - Global Pediatric Anesthesiology Fellowship, Boston Children's Hospital Associate Professor of Anesthesia, Harvard Medical School

Scott Corlew, MD, MPH, FACS
Lecturer, Department of Global Health and Social Medicine, Harvard Medical School

RESEARCH

Bethany Hedt-Gauthier, PhD
Associate Professor of Global Health and Social Medicine, Harvard Medical School
Associate Professor in the Department of Biostatistics, Harvard T.H. Chan School of Public Health.

Adeline A. Boatin, MD, MPH
Assistant Professor of Obstetrics, Gynecology and Reproductive Biology, Massachusetts General Hospital, Harvard Medical School.

POLICY & ADVOCACY

Kee B. Park, MD, MPH
Lecturer, Department of Global Health and Social Medicine, Harvard Medical School.

FACULTY

Sabrina Juran, PhD
Sr. Technical Specialist Population Census and Geospatial Data, United Nations Population Fund (UNFPA); Lecturer, Department of Global Health and Social Medicine, Harvard Medical School; Associated Researchers Epidemiology and Global Health, Technical University Munich, Germany

Blake Alkire, MD, MPH
Otolaryngologist, Massachusetts Eye and Ear Infirmary Instructor in Otolaryngology, Harvard Medical School.

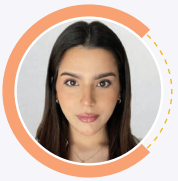
Pablo Tarsicio Uribe Leitz, MD, MP
Investigator I Instructor in Surgery, Center for Surgery and Public Health, Brigham and Women's Hospital; Affiliated Faculty, Department of Global Health and Social Medicine, Harvard Medical School; Senior Staff Scientist, Department of Plastic and Oral Surgery, Boston Children's Hospital.

Mark G. Shrime, MD, MPH, PhD
International Chief Medical Officer, Mercy Ships; Lecturer, Global Health and Social Medicine at Harvard Medical School.

Lauri Romanzi, MD, MScPH, FACOG, FPMR
Obstetrics, Gynecology, and Urogynecology Previously Director of the Fistula Care Plus project at EngenderHealth, Washington D.C. Lecturer, Department of Global Health and Social Medicine, Harvard Medical School.

Benjamin C. Warf, MD
Director, Neonatal and Congenital Anomaly Neurosurgery Associate Professor of Neurosurgery, Harvard Medical School

ADMINISTRATIVE COORDINATOR



Kiara Lindeborg

RESEARCH FELLOWS

Callum Forbes, MBChB
Callum is a British Anesthesia trainee. Born and raised a proud Scouser, he completed his medical degree from the University of Edinburgh, Scotland in 2013. After completing a junior clinical fellowship in Critical Care Medicine, he commenced his anesthesia training in Edinburgh in 2016 before moving to New Zealand in 2019. His research interests include the role of safe anesthesia in surgery provision and the interplay between Global Surgery and climate change.

Radzi Hamzah, MBBS, MPH
Radzi is an aspiring academic global neurosurgeon. He received his medical degree from Manipal University, India, in 2014 before starting his residency training in neurosurgery in Malaysia. In 2020, he earned his MPH from Harvard University. His interests include surgical system strengthening, climate and social justice, policy advocacy, and migrant/refugee health.

Mehreen Zaigham, MBBS, PhD
Mehreen is a Swedish Obstetrics and Gynecology specialist of Pakistan origin. She works at Skåne University Hospital in Malmö, Sweden, and completed her PhD from Lund University studying the role of umbilical cord blood sampling in predicting neurodevelopmental handicaps in infants later on in life. Her research interests include maternal-fetal medicine, COVID-19 in pregnancy, health equity, maternal health advocacy, and strengthening of Ob/Gyn healthcare systems in low-resource settings.

Anabelle Jones, MD
Annabelle was born and raised in Homer, New York, on a working horse and cattle farm, and is currently a general surgery resident at Brigham and Women's Hospital. She received her B.A. from Middlebury College, where she completed a degree in Molecular Biology and Biochemistry, as well as a minor in Global Health. Her MD was obtained from Stony Brook University School of Medicine, during which she performed research focused on global health disparities.

Madeleine Carroll, MD
Madeleine Carroll grew up in Washington, DC, and Narberth, PA, and received her undergraduate degree from Wesleyan University. She went on to receive her MD from the Lewis Katz School of Medicine at Temple University and is now a surgical resident at Yale New Haven Hospital. Her interests include trauma systems development, violence and injury prevention, and pediatric surgery capacity building.

Saksham Gupta, MD
Saksham was born in Karlsruhe, Germany, and raised in New Delhi, India, and Acton, Massachusetts. He is a neurosurgery resident at the Brigham and Women's Hospital. He earned his MD from Harvard Medical School and is currently enrolled in the MPH program at the Harvard School of Public Health. He is passionate about resident/trainee education in neurosurgery worldwide and quality monitoring in growing surgical systems.

Kate Obayagbona, MD, MPH, MWACS

Kate is a specialist Obstetrician and Gynaecologist with the West African College of Surgeons, before this she obtained a Masters in Public Health from Leeds University UK and spent several years working within various capacities and several projects for different development organizations. She is very passionate about health systems strengthening, research development and management, capacity building, disease prevention, and control, and improving the quality of women's and child health.

Joseph Aryankalayil, MD

Joseph is a fourth-year general surgery resident at Walter Reed National Military Medical Center in Bethesda, Maryland. Born in India and raised in Maryland, he completed his undergraduate studies at New York University before obtaining his medical degree from the University of Maryland. Joseph's research interests include military-civilian trauma system partnerships and trauma/burn surgery education and implementation.

Gabriella Y. Hyman, MBBCh, Dip Obst, MPH

Gabriella was born in South Africa where she grew up on a farm. She received her MBBCh, and is a PhD student in surgery and public health, at the University of the Witwatersrand Department of Surgery. She is an inaugural recipient of the South African Medical Research Council's (SAMRC) Institutional Clinician Researcher Program scholarship. Gabriella is a fellow in the Wits SADC Regional Collaboration Centre for Surgical Healthcare (WitsSurg). She completed her MPH at the Harvard T.H Chan School of Public health this year.

Taylor Wurdeman, MD.

Taylor Wurdeman is a General Surgery Resident at Loma Linda University. He graduated from the University of Miami Miller School of Medicine with a combined MD/MPH degree. During his medical school, he spent a research year with the PGSSC and confirmed his dedication to both surgery and global health. He has clinical interests in trauma/critical care and research interests in large database work, the intersection of technology and global health, and surgical education.

Simon Fabry, MD

Simon was born and raised in Dusseldorf, Germany. He received his M.D. from Innsbruck, Austria, and went on to complete a full training in General Surgery in Germany, earning Board Certification in 2021. Simon is passionate about global health and surgery, exemplified by his one-year appointment with a German INGO in South Kordofan, Sudan. He is committed to education and addressing Human Resources gaps through partnerships.

Afra Jiwa, MD

Afra is a General Surgery Trainee in Edinburgh, Scotland. She gained her MBBS from King's College London and a Masters degree from the London School of Hygiene and Tropical Medicine before completing her Foundation Training in Jersey. She is continuing her postgraduate study with a PhD in Medical Informatics, at the University of Edinburgh. She has an interest in big data and global surgery research.

Isaac Alty, MD
Isaac was born and raised in Lynchburg, Virginia, and is currently a general surgery resident at Brigham and Women's Hospital in Boston. He received his B.S. in Chemistry at the College of William & Mary where he also completed a double major in Ancient Greek. He received his MD from Harvard Medical School, where his research focused on access to surgical care in rural Burundi. His interests include surgical capacity building, trauma systems development, and surgical education.

Nikathan Kumar, MD, MS
Nikathan grew up in Nashville, TN, and Connecticut and is currently a general surgery resident at UCSF East Bay in Oakland, CA. He received his B.A. in Spanish and Music from Vanderbilt University, an M.S. in developmental biology from New York University, and received his medical degree from New York Medical College. His interests include surgical infrastructure development, the financial burden of surgery, and global health disparity.

VISITING SCHOLAR

Shehnaz Alidina, SD, MPH
Shehnaz is the senior global health systems researcher in the Program for Global Surgery and Social Change. She received her MPH and her SD in health policy & management from the Harvard Chan School of Public Health.

RESEARCH COLLABORATORS

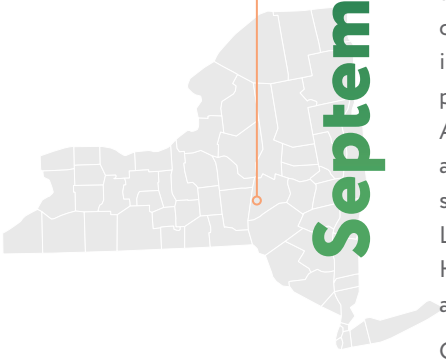
Betel Fenta
Betel Fenta is a Medical Doctor from Ethiopia who aspires to become a surgeon and is currently a Global Health Research Fellow at KidsOR, an NGO working to ensure access to safe surgery for children worldwide. She received her MD degree from Mekelle University College of Health Science, Ethiopia, and earned her Master's in Global Health Delivery, Gender, Sexual, and Reproductive Health Track from the University of Global Health Equity in Rwanda.

Kiana Winslow
Kiana is from Hanover, NH, and is an MD/MPH candidate at the University of Miami Miller School of Medicine. She received her undergraduate degree from the University of Miami, double majoring in Geography and Religion and Healthcare with a minor in Chemistry. Before medical school, she was a health volunteer with the Peace Corps in Botswana where she worked with community members and stakeholders to support the HIV/AIDS response.

Ayla Gerk
Ayla Gerk completed her Medical Degree in Argentina and is currently a Master's candidate in the Department of Experimental Surgery at McGill University. She was the local student lead of Team Brazil in PGSSC and Co-Chair of the Gender Equity Initiative in Global Surgery (GEIGS) from 2022-2023.


SIMON

16 EVENTS



September 2023

UNGA / CLIMATE WEEK • NYC

In September 2023, our team attended the UN General Assembly (UNGA) in New York, engaging in various side events, and participating in strategic side events. Our team attended events focused on women's health, primary health care, and innovation in healthcare and participated in Climate Action Week, enhancing our social media influence to generate funding and discourse on critical global surgery issues.

Our team worked closely with the Women's Health and Empowerment Network and the Centre for Global Health and Development (CGHD) to host a roundtable and Women's Breakfast, providing networking opportunities and facilitating discussions on advancing women's health initiatives through sustainable innovative finance solutions. Of note, we participated in a strategic meeting hosted by Smile Train and the G4 Alliance. Additionally, we conducted a Morning Report feedback session, allowing for the exchange of insights and continuous improvement of our strategies. Ahead of the UNGA, our team published a commentary in The Lancet, emphasizing the importance of global surgery in the Universal Health Coverage (UHC) 2030 Action Agenda- setting the stage for our advocacy efforts at the event.

Our participation in the UNGA and its side events highlighted the indispensable role of surgical care in achieving UHC. Our efforts were instrumental in advocating for improved funding and fostering sustainable cross-sectoral collaboration to address global health challenges.

> *"Our participation in the UNGA and its side events highlighted the indispensable role of surgical care in achieving UHC.*

> *We actively participated in sessions and advocated for global surgery using our social media platforms, including a PGSSC WHS selfie frame that provided an opportunity to engage the wider global health community.*

WHS • BERLIN

In October 2023, our team attended the annual World Health Summit (WHS) in Berlin. We actively participated in sessions and advocated for global surgery using our social media platforms, including a PGSSC WHS selfie frame that provided an opportunity to engage the wider global health community.

A highlight of the WHS was our co-hosted panel "Private-Public Partnerships for Equitable Surgical Care Delivery". This panel convened experts who represented diverse stakeholders in the global health ecosystem to discuss the potential of private-public partnerships to overcome bottlenecks in surgical systems strengthening. Our esteemed speakers spanned governmental, private, and public sectors and included leaders such as Atul Gawande of the USAID and Bente Mikkelson of the WHO. This event highlighted current barriers and future opportunities for innovative financing to realize the sustainable and equitable delivery of surgical care.

May 2023

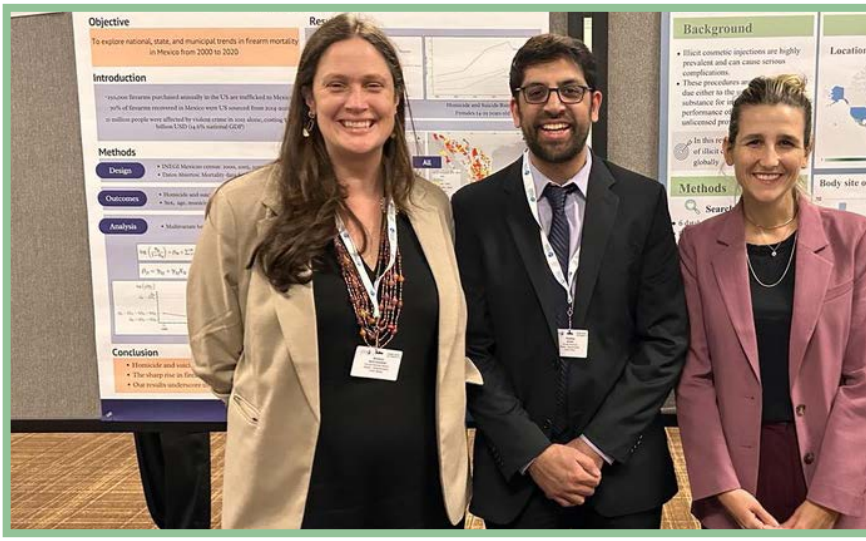
WHA • GENEVA

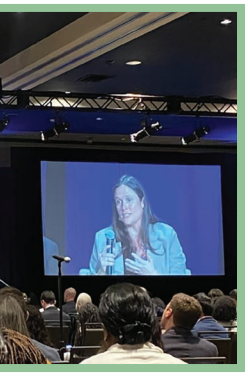
In May 2023, our team attended the 76th World Health Assembly (WHA) in Geneva. We played a pivotal role alongside the global surgery community, participating in key events and establishing a strong presence both on the ground and on social media.

Our strategic involvement included attending several high-profile events hosted by esteemed collaborating partners. These included PGSSC faculty, Mercy Ships, CGHD, Smile Train, G4 Alliance, the National Institute for Health Research Global Surgery Unit (NIHR-GSU), and the Global Surgery Foundation and UNITAR were instrumental in coordinating events focused on advancing the global surgery research, policy and advocacy agenda. These events facilitated crucial discussions on surgical system strengthening and innovative solutions to healthcare challenges, particularly in low- and middle-income countries.

Participation at the WHA provided invaluable exposure to the value of diplomacy and global advocacy efforts, highlighting the role of engagement around high level policy and advocacy for a for advancing Global Surgery. Through these engagements, we were able to advocate for increased funding and policy-level support, while emphasizing the need for sustainable cross-sectoral collaboration. These efforts were crucial in advancing our mission to improve global health outcomes and elevate the profile of surgical care on the international stage.

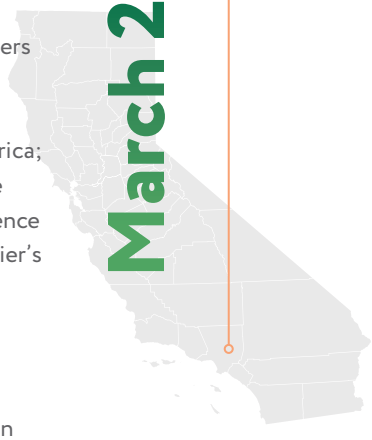
> *In March 2023, our team attended the Consortium of Universities for Global Health in Los Angeles, USA participating in numerous panels and presenting research findings through poster presentations.*





CUGH • LOS ANGELES

March 2023



In March 2023, our team attended the Consortium of Universities for Global Health in Los Angeles, USA participating in numerous panels and presenting research findings through poster presentations.

Highlights include a panels led by Bethany Hedt-Gauthier and Adeline Boatin, on " Digital Technology to Improve Quality of Care for Maternal Health: Fostering the Innovation-Impact Loop" featuring guest speakers from Partners In Health (Fredrick Kateera), Emory University/Babson College (Dheera Ananthakrishnan) and Intron Health (Tobi Olatunji), a healthtech startup focusing on developing and implementing electronic medical records in Africa; contributed to a panel on "Overcoming Key Structural Barriers to Equitable Global Health Clinical Education Exchanges", where work from the Conference Equity Project was presented by Michell Joseph; and Bethany Hedt-Gauthier's contribution in a keynote panel exploring larger themes of equity in collaborations in Global Health. Furthermore, our fellows showcased two poster presentations at the conference: Nikathan Kumar represented Team Brazil with a scoping review of illicit silicon injections, while Ayla Gerk presented on mentorship in surgery as part of the Gender Equity Initiative in Global Surgery (GEIGS), an initiative under the PGSSC program.

TEAM PROJECTS
& FACULTY LABS PROJECT UPDATE

STAB LAB

The **S**ystems for **T**rauma **A**nd **B**lood and Global Surgery (STAB) Lab, led by Dr. Nakul Raykar, led a series of initiatives and reached key milestones this year including:

1. Leading a collaborative system approach to trauma systems in India consensus conference, culminating in the Trauma Research Action Implementation Network (TRAIN) meeting in New Delhi in October 2023
2. Launched the Blood Delivery via Emerging Strategies for Emergency Remote Transfusion (Blood DESERT Coalition) in March 2024 (www.blooddesertcoalition.org)
3. Secured an additional $250,000 from the Gillian Reny Stepping Strong Center for Trauma Innovation with a 2023 Breakthrough Award for the STAB Lab's **L**ocal **I**nitiative **F**or **E**mergency **Blood** (LIFE-Blood) study in Turkana Kenya
4. Continued its leadership in equitable exchanges through its work with the American College of Surgeons Operation HOPE Advocacy Committee and the Advocacy Committee for the Association for Academic Global Surgery Advocacy Committee (chaired by Dr. Raykar and led at the trainee level by incoming '24-25 PGSCC Research Collaborator, Dr. Riya Sawhney)
5. Collaborated with the Dr. Nobhojit Roy and Dr. Anita Gadgil of The George Institute New Delhi/Center for Global Surgery and Trauma to launch a Phase I "community-of-practice" demonstration project aimed at frontline nurses in India

TRAIN

The Transdisciplinary Research, Action, and Implementation Network for Trauma in India (TRAIN-Trauma India) Symposium, held from September 30 to October 1 at the All India Institute for Medical Sciences in New Delhi, was a pivotal event in the Harvard Program in Global Surgery and Social Change's calendar. This symposium convened experts to address the critical impact of injuries on global health, particularly in low- and middle-income countries. Through a structured Delphi approach, five working groups conducted comprehensive literature reviews and developed consensus statements and recommendations focused on pre-hospital trauma care, in-hospital trauma resuscitation and training, trauma systems, trauma registries, and India's TITCO registry. The symposium resulted in 24 consensus statements and prioritized 27 interventions aimed at enhancing trauma care systems and reducing preventable trauma mortality in India. These recommendations highlighted the need for integrated, efficient trauma care systems and underscored the importance of community engagement and comprehensive care pathways from pre-hospital to post-discharge. The organization of the symposium and the production of the research output were led by faculty member and fellowship director Dr. Nakul Raykar, along with research fellows Dr. Radzi Hamzah and Dr. Isaac Alty.

The Systems for Trauma and Blood and Global Surgery (STAB) Lab, led by Dr. Nakul Raykar, led a series of initiatives and reached

key milestones this year.

BLOOD DESERT COALITION

There is a 102 million unit global blood shortage but, worse than shortage, rural settings across the world often have no access to blood. We call these areas "blood deserts" and if you suffer from traumatic or obstetric hemorrhage, anemia, or need surgery in a blood desert, you are out of luck.

In April of 2023, the STAB Lab convened frontline providers, researchers, policymakers, and patient advocates for a two-day seminar at the Harvard Radcliffe Institute in Cambridge, MA, with the goal of addressing the on-going and often invisible crisis of blood unavailability in the world's blood deserts. innovative solutions to improving blood access in the most resource-limited areas, coined blood deserts. This launched the Blood DESERT (Delivery via Emerging Strategies for Emergency Remote Transfusion) Coalition, whose modus operandi is that no person should die from lack of blood transfusion. The BDC has targeted three innovative strategies–walking blood banks, intraoperative autotransfusion, and drone delivery–that target different areas of transfusion workflows and can provide access to blood today. The consensus statement from group was published in the March 2024 issue of The Lancet Global Health and was featured in NPR and The Guardian.

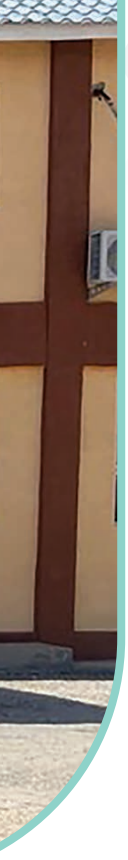
LIFE-BLOOD PHASE 2

The Local Initiative For Emergency Blood (LIFE-Blood) Project explores the use of a walking blood bank (WBB) to provide emergency blood transfusions in rural Turkana, Kenya. The LIFE-Blood project was able to secure two grants from the Stepping Strong Foundation. The first, Innovator Award in 2021, for $100,000, allowed the team to explore the need, feasibility, and safety of a WBB in this setting. The second in 2023, Breakthrough Award for $250,000, has funded the next phase of the project to understand the implementability of a CWBB, establish a template for a CWBB protocol in low resource contexts, and understand its adaptability in a variety of contexts.

The LIFE-Blood study represents the world's first structured implementation of a walking blood bank in a low-resource setting.

STAB LAB WITH ACS HOPE ADVOCACY COMMITTEE/CUGH WORKING GROUP ON EQUITABLE OPPORTUNITIES IN CLINICAL EDUCATION/AAGS ADVOCACY COMMITTEE

The STAB Lab at PGSSC led by Dr. Nakul Raykar and Dr. Riya Sawhney spearheaded the AAGS Advocacy Committee's work on state-level medical licensure barriers to equitable clinical exchange programs in global health. This work was conducted in collaboration with partners at the ACS HOPE



Advocacy Committee and CUGH Working Group on Equitable Opportunities in Clinical Education to outline state-specific medical licensure provisions that could facilitate the clinical involvement of physicians and surgeons visiting the US for short term exchange programs. This prize-winning project has been presented at two major international conferences, receiving wide acclaim, and catalyzed the creation of three formal working groups within CUGH (aimed at addressing federal, state and institutional level barriers), where Dr. Sawhney continues to play an active role. The overarching aim is to expand advocacy efforts into policy change up to the level of the US senate, including more flexible licensure types and exchange visas for physicians.

GLOBAL SURGERY CONNECT

The Global Surgery Community of Nurses, Novices, Experts, Clinicians, and Technicians (CONNECT) platform, launched in late March 2024 by the WHO Collaborating Centre for Research in Surgical Care Delivery in LMICs - India, The George Institute for Global Health - India, and the Harvard Program for Global Surgery and Social Change, is a WhatsApp-based community of practice for surgical nurses and technicians in rural primary hospitals in India. With the motto "Never Practice Alone Again," it connects about 120 members across rural and urban settings and various medical centers spanning multiple regions of India. As the first phase of a WHO-backed effort to create a global community of practice for frontline surgical providers, it functions to facilitate knowledge sharing and professional networking through discussions on topics like surgical sterilization, blood transfusion safety, and referral systems. It also serves as a forum for exchange of clinical advice on difficult cases experienced in rural hospitals, while ensuring patient privacy by omitting identifying information. Webinars, shared resources, collaboration opportunities, and asynchronous learning support surgical care in resource-limited settings. The first phase of this WhatsApp-base platform is expected to conclude in August 2024, and will be succeeded by a robust, custom-developed online community platform tailored to support rural surgeons in their practice. The project is led by a team that includes PGSSC faculty member Dr. Nakul Raykar, in collaboration with Dr. Nobhojit Roy and Dr. Anita Gadgil's team at the George Institute Center for Global Surgery and Trauma, and PGSSC research fellows Dr. Radzi Hamzah, Dr. Gabriella Hyman, and Dr. Isaac Alty.

> ***Webinars, shared resources, collaboration opportunities, and asynchronous learning support surgical care in resource-limited settings.***

TIGER LAB

The TIGER (Trauma, Implementation Science, Global Surgery, Equity & Research) Lab, led by Dr. Geoffrey Anderson hosted 3 fellows and 1 research collaborator from PGSSC this year: Radzi Hamzah, Madeline Carroll, Isaac Alty, and Kiana Winslow. In addition, the lab welcomed medical students and other research collaborators on an interim or project basis.

The lab aims to enhance surgical education and improve trauma care in low-resource settings in the US and internationally. This is achieved by analyzing social factors affecting trauma patients, determining long-term outcomes of trauma, particularly firearm violence, assessing factors influencing access to trauma care, and building capacity for surgical training using low-resource models. This year, the TIGER Lab is working on multiple projects, including:

SURGICAL EDUCATION AND CAPACITY BUILDING:

The University of Global Health Equity (UGHE) Simulation Center

The TIGER Lab collaborated with the Riviello Lab and UGHE to implement an intensive, sustainable, and contextually relevant simulation-based surgical curriculum for junior surgical clerkship medical students. This initiative aims to establish the UGHE Simulation Center as a regional hub for surgical education and training in East Africa.

This year, the team spent a week in person at UGHE to lead and coordinate the surgical simulation week for junior surgical clerkship students. During this week, the team demonstrated and taught multiple surgical skills to the medical students, including basic surgical suturing, trauma resuscitation, hand tying, and wound management using low-cost models. Each student had the opportunity to learn and practice these skills under the guidance of the team.

The sessions were well received, and the team is currently in the process of collating data to demonstrate the longitudinal effectiveness of the surgical simulation week and the training provided to the medical students.

Capacity building of trauma care - Surgical Techniques and Resuscitation in Trauma for Low-resource Environments (STARTLE) Course

Collaboration with the University of Rwanda to design and implement an intensive cadaver-based trauma course to teach trauma surgical techniques. The STARTLE course utilizes a training of trainers (ToT) model to equip general surgeons to teach the course to their own residents, ensuring the sustainability and long-term impact of the project. This year, the team, led by Dr. Anderson, organized the inaugural trauma care training in Rwanda. The second course is planned for Sept 2024.

Bringing Advanced Trauma Life Support (ATLS) to Ukraine

This is a partnership between Brigham and Women's Hospital (BWH), Harvard Humanitarian Initiative (HHI), International Medical Corps (IMC), the Ministry of Health of Ukraine and the American College of Surgeons (ACS). To date this team has conducted 20 provider courses and 5 instructor courses in Ukraine. This is the first time in history that ATLS has been taught in an active war zone.

3 fellows hosted

1 research collaborator hosted

20 provider courses conducted in Ukraine

5 instructor courses conducted in Ukraine

1ST time ATLS has been taught in an active war zone

Webinars, shared resources, collaboration opportunities, and asynchronous learning support surgical care in resource-limited settings.

JOSEPH LAB

The Conference Equity project aims to provide an effective framework and index for global health conferences that can be readily adapted to measure and inform equity-based implementation strategies. This year the team conducted a number of activities in support of this goal:

The Conference for Public Health in Africa (CPHIA) Side Event – "Global Health Conference Equity: The African Paradigm": The event convened global health practitioners and experts from across the continent to discuss their first-hand experiences of barriers and facilitators to attending global health conferences. The consensus exercise conducted during the event included 54 in-person and virtual CPHIA participants. The facilitated discussions contributed to the development of a consensus statement with 62 recommendations across 5 main themes: visas and passport power, conference organization and structure, funding, conference equity index equity metrics, and governmental influence.

Mixed methods study:
The team conducted focus group discussions with LMIC participants and interviews with conference organizers to qualitatively analyze barriers and facilitators to LMIC attendance and participation at global health conferences. The findings will be combined with survey and consensus statement results to inform the development of the conference equity framework and index, which we hope will serve as a valuable tool to measure and track gaps in equitable practices.

RESEARCH PROJECTS:

Mapping social determinants, investigating causes, and assessing the capacity of trauma care
Multiple projects involving the analysis of large databases, geospatial mapping, and scoping reviews to deepen our understanding of where and how trauma care is experienced by the most vulnerable in US society. The projects evaluate the social and political determinants of trauma with a specific interest in firearm violence in the United States.

Surgical capacity in LMICs
Conduct several scoping reviews to understand the capacity to provide surgical care in conflict settings as well as the impact of healthcare provider directed violence on the surgical workforce in low- and middle-income countries.

Non-English Speaking Trauma Survivor (NESTS) Pathway
Developement of a multifaceted pathway to help trauma survivors at tMGH and BWH navigate their post discharge course. NESTS is designed to mitigate disparities in long-term outcomes between English speaking patients and those with limited English proficiency. The pathway is in its third year and has connected scores of patients with much needed services.

Transforming Recovery after Injury for the Long-term (TRAIL) Clinic
This is a longitudinal, multidisciplinary trauma survivorship clinic aimed to improved the long-term health of socially vulnerable trauma survivors. It focuses on victims of violence, patients with limited English proficiency, low socioeconomic status and low social support. Patients are followed longitudinally and see a variety of providers (social work, patient navigators, PT/OT, mental health, trauma NP, violence intervention, community health worker) all in one place.

RIVIELLO LAB / UGHE

The Riviello Lab is centered around strengthening a bi-directional partnership between the Center for Equity in Global Surgery (CEGS) at the University of Global Health Equity (UGHE) in Rwanda and the PGSSC . Primarily based in Butaro, Rwanda, fellows within the Riviello Lab are dedicated to strengthening education and research effortsof the CEGS. These include: developing and delivering undergraduate educational curriculum for medical students, post-graduate education for Master of Science in Global Health Delivery (MGHD) students, and engaging in research and global convenings to improve surgical care across sub-Saharan Africa. Through these efforts, the Riviello Lab aims to enhance surgical education and practice, ultimately strengthening surgical systems across the continent of Africa.

UGHE-CENTER FOR EQUITY IN GLOBAL SURGERY (CEGS)

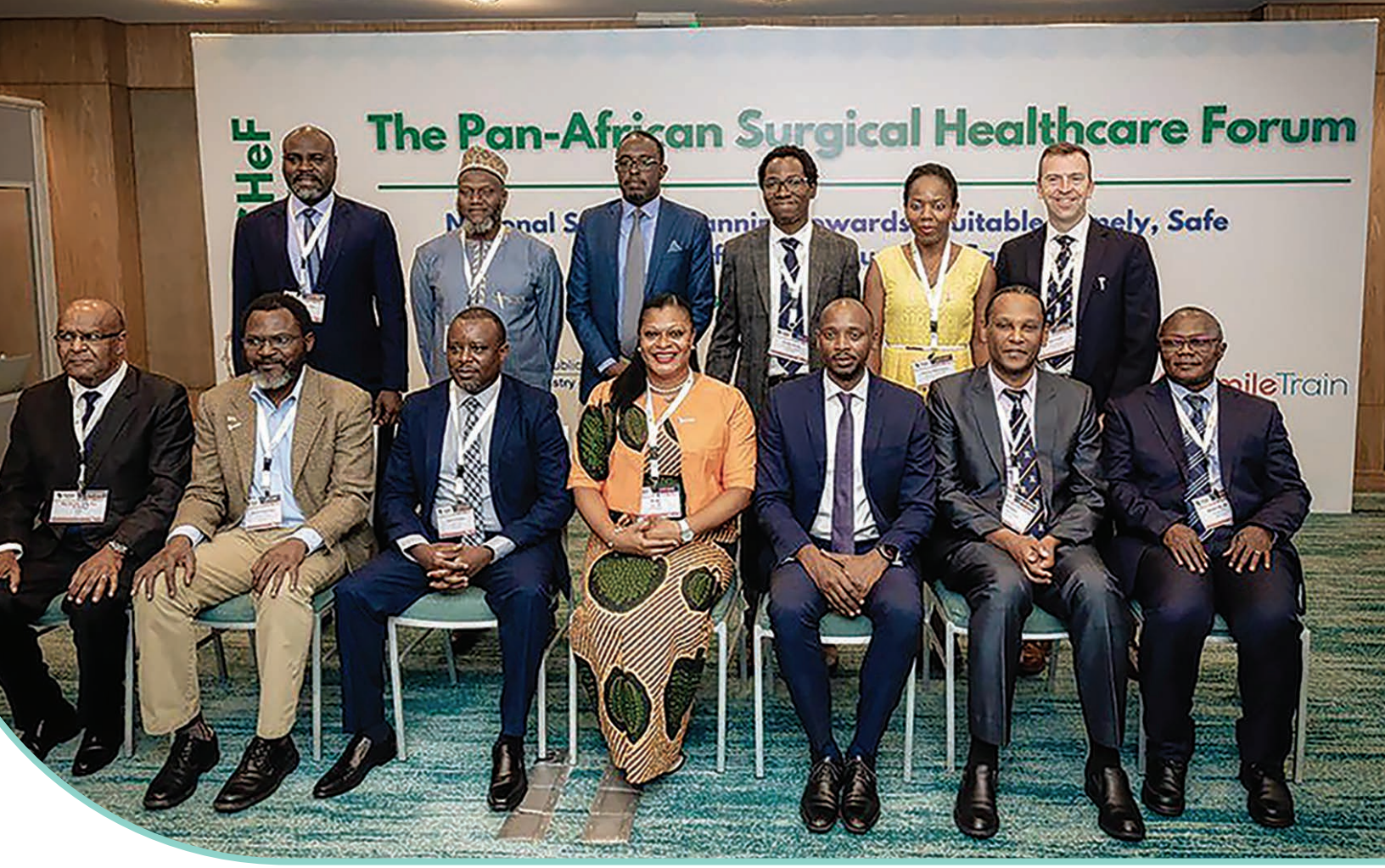
The First Cohort: MGHD-Global Surgery Program

As part of the Master of Science in Global Health Delivery (MGHD) program at UGHE, the CEGS launched its one-year Global Surgery program for the first cohort of nine students from various countries across Africa, including Rwanda, Ethiopia, Kenya, Sierra Leone, and South Sudan. The master's program provides comprehensive training on global surgery leadership, burden of disease, planning, indicators, capacity building, research, advocacy, and financing. It aims to equip the next generation of healthcare professionals, researchers, and advocates with interdisciplinary and leadership skills to improve surgical care delivery in Rwanda, the continent, and beyond. Students first study the core MGHD curriculum, followed by a specialized global surgery curriculum. Additionally, they engage in a longitudinal practicum experience with mentorship from faculty and affiliates, allowing them to apply the skills developed in the classroom to real-world settings

PAN-AFRICAN SURGICAL HEALTHCARE FORUM (PASHEF)

The Pan-African Surgical Healthcare Forum (PASHeF) was established in July 2023, as an African platform to devise solutions tailored to the needs and challenges facing the continent in improving surgical healthcare. This initiative aims to bring together policymakers, clinicians, researchers, development partners, and

▼ *In class lectures by faculty and visiting faculty at UGHE, Butaro Campus*



▲ *Delegates and PASHeF core committee at the inaugural PASHeF conference in Kigali, Rwanda*

advocates in a unified effort toward achieving equitable and sustainable surgical healthcare systems across the continent. The forum hopes to address all issues around surgical healthcare in Africa which include but are not limited to political commitment and global health diplomacy, health service delivery and accountability, and national surgical healthcare policies and plans. The PASHeF secretariat currently sits at UGHE.

Hosted in Kigali, Rwanda on July 13 and 14, the inaugural PASHeF forum was a consensus conference of technocrats from African Ministries of Health to discuss challenges, share experiences, and collectively chart the path forward for Africa with the theme focusing on **"National Surgical Healthcare Policies and Plans."** The meeting yielded actionable strategies toward enhancing surgical care across Africa, including the development of a consensus statement consolidated by delegates present at the meeting representing 32 African MoHs.

This year, the 2nd PASHeF gathering is being organized in Kigali, Rwanda, with the theme "Roadmap to Equitable Surgical Healthcare for Africa," with a focus on operationalizing and implementing the PASHeF 2023

> ***"The Pan-African Surgical Healthcare Forum was established in July 2023, as an African platform to devise solutions tailored to the needs and challenges facing the continent in improving surgical healthcare.***

▶ *Multidisciplinary NOTSS instructors training kick off in Rwanda*

Consensus Statement. It aims to gather State Ministers, Surgical Technical Officers, and other key stakeholders to discuss and work towards strengthening our collective commitment to improving surgical healthcare across Africa.

A Comprehensive Evaluation of Breast Cancer Surgery Care and Patient-Centered Outcomes in Rwanda
This project is a three-year collaboration between the Butaro Cancer Center of Excellence (BCCOE), the University of Global Health Equity, the Global Surgery Foundation (GSF), and the United Nations Institute for Training and Research (UNITAR). We aim to conduct a baseline assessment to better understand breast cancer care in Rwanda and based on the results design and implement targeted interventions including piloting a PROMs system at BCCOE. We hope to partner with with the Rwanda Minister of Health (RMOH) and other stakeholders with the intention to adapt, and scale to other cancer centers throughout Rwanda, untimitately to improve patient-centered care and work towards increasingthe quality of healthcare services and patient outcome measurements.

The baseline needs assessment is comprised of three concurrent studies to evaluate

1. Clinical and surgical breast cancer outcomes at BCCOE
2. Gaps in general surgeon training, knowledge, and management of breast cancer throughout Rwanda
3. Qualitative analysis of stigma behind breast cancer diagnosis and surgical management at Butaro Hospital.

MULTI-PROFESSIONAL NON-TECHNICAL SKILLS FOR SURGICAL TEAMS IN SUB-SAHARAN AFRICA (NOTSS)

For the year 2024, the Riviello Lab and the Global NOTSS team have worked to refine, scale, and integrate their multi-professional human factors surgical safety program (Non-Technical Skills for Surgery in the Variable Resource Context - NOTSS-VRC) into existing surgical workforce training. In addition to ongoing programs developing in Nigeria and Malawi, the team is also partnering with the Rwanda Ministry of Health and Rwanda Surgical Society to introduce NOTSS-VRC as a regular feature of onboarding training for new surgical teams at district hospitals in Rwanda.

AGASAKE LAB

The AGASEKE lab (Advancing Global Access to Surgery through Education, Knowledge, and Equity), led by Dr. Bethany Hedt-Gauthier and including PGSSC Fellow Afra Jiwa, conducts research to improve access to high-quality surgical care in rural district hospitals. The team works in partnership with Partners In Health/Inshuti Mu Buzima in Rwanda. Research areas include image-based diagnostics and Community Health Worker (CHW) upskilling within the context of cesarean sections. Some 2023/2024 highlights are below:

MHEALTH TOOLS FOR HOME-BASED POSTOPERATIVE FOLLOW-UP.

Through an NIH-funded mHealth study, the lab developed a phone-based application integrating clinical decision support and AI image algorithms to screen women for surgical site infections at home following c-section. The tool passed usability and acceptability testing and has started prospective validation with a cohort study. Future work includes an RCT.

RESEARCH TRAINING AND CAPACITY BUILDING.

In addition to within-team research strengthening and skills transfer, the AGASEKE lab participated in the 2024 Intermediate Operational Research Training (IORT), which was launched in March 2023 and includes three in-person training weeks. One of the training teams is leading a paper on financial assistance to support rural patients completing surgical referrals in urban settings.

MCCLAIN LAB

Over the past 12 months, the McClain lab has continued to focus their efforts on anesthesia education and training for all cadres of providers. Having helped lead the development and delivery of the inaugural anesthesia and critical care clerkship for UGHE medical students in 2023, the McClain lab continued to strengthen their links with UGHE in leading the iterative adaptation and subsequent delivery of the second cohort of MBBS students from January through April of 2024. The lab helped to run both an intensive bootcamp week for all students at the start of the clerkship and a multimodal week of examinations and assessments at the end of the clerkship, as well as supporting the Rwanda-based UGHE team during the students' clinical placements across 4 sites and over a 9 week period.

In addition to undergraduate education, the team also fostered closer ties with the simulation department at UGHE in supporting the development and delivery of simulation-based continuing medical education for non-physician anesthesia providers and affiliate operating room staff. Three multi-day training courses were provided throughout the year for almost 40 providers from hospitals across Rwanda, covering topics such as emergency management in the operating room, human factors, and post-operative pain assessment and management. The team hopes to expand this training over the coming year to include additional topics, reaching more providers from across Rwanda and East Africa.

The McClain lab has also worked to finalize the content for a handbook of spinal anesthesia, designed to help guide non-specialists practicing in rural settings to provide safe anesthesia care for surgery. The handbook is due to be published by the end of the 2024 calendar year.

GLOBAL REPRODUCTIVE SURGERY LAB

Led by Adeline A. Boatin, the Global reproductive surgery laboratory continues to engage in research endeavors geared towards enhancing the quality of perioperative care for expectant mothers undergoing surgical procedures in resource-limited environments. This year, the lab has focused on three main projects all aiming to improve quality of care provision around cesarean delivery: CRADLING, mTUSA and WIMS. In collaboration with Dr. Henry Lugobe from Mbarara University of Science and Technology, and Kwame Adu-Bonsoaffoh from University of Ghana, CRADLING is a mixed methods study with sites in Uganda and Ghana. The study aims to describe cesarean delivery usage and decision making around mode of delivery among regional and referral hospitals to gain insights that can be used to optimize cesarean delivery rates and safety.. The project uses several methodologies including as secondary analysis of DHIS2 data, surveys, geospatial mapping, as well as qualitative and primary quantitative data collection from 30 facilities across Uganda and Ghana to comprehend the utilization of cesarean deliveries, variations in rates, and metrics related to the quality of care in this context. Significant insights from the data has included "Assessing tranexamic acid utilization for management of postpartum hemorrhage at referral facilities in Ghana" and findings recently published in the American Journal of Obstetrics and Gynecology in January 2024.

In collaboration with Dr. Henry Lugobe, mTUSA - mHealth for Timely and Safe Birth, is a project driven by a quality improvement quality improvement initiative at the Mbarara Regional Referral Hospital with the goal of interrupting the emergency cesarean cycle by creating a platform for scheduling timely cesarean for women with a pre-labor indication for cesarean delivery. By implementing a quality improvement initiative, this project seeks to break the cycle of emergency cesareans and establish a framework for scheduled timely cesarean sections targeting individuals with suitable pre-labor indications for the procedure. It has expanded into an MHealth tool aiming to improve delivery planning for women with a high- risk pregnancy. The tool will provide education to women with high-risk pregnancies and their spouses using automated voice messages and SMS, enable triage for delivery planning and schedules women for delivery at the appropriate level facility. This year, with input form a former PGSSC research collaborator (Rohini Dutta), we have piloted the use of text messages and automated voice response

▲ *Team training with midwives for data collection at referral hospitals in Ghana (right) and Uganda (left)*

> *This year, with input form a former PGSSC research collaborator (Rohini Dutta), we have piloted the use of text messages and automated voice response to provide reminders and education to women with high risk pregnancies and prior cesarean sections.*

▲ *Rohini Dutta (former PGSSC research collaborator) and Joseph Rwebazibwa (recent MRRH OB/GYN residency graduate) presenting mTUSA study plan at a OB/GYN departmental meeting at MRRH, Mbarara, Uganda)*

to provide reminders and education to women with high risk pregnancies and prior cesarean sections.

In collaboration with Dr. Joseph Ngonzi, the WIMS (Wireless Monitoring Study) aims to explore the effectiveness and feasibility of using wearable technology for post operative monitoring with the goal of improving the detection of post-cesarean delivery complications and enabling healthcare providers to promptly administer life-saving interventions when necessary. The study has completed data collection, enrolling 1500 women post-cesarean and their responding clinicians. Currently data analysis is ongoing, including a new collaboration with Professor Milind Tambe from the Harvard School of Engineering and Applied Sciences to investigate machine learning approaches to develop risk prediction models that leverage signals in continuous vital sign data to improve accuracy and lead time for detecting postoperative complications compared to traditional intermittent-based vital sign checks and to build resource allocation models that optimize use of wearable technology in resource limited settings.

▲ *Research assistant collecting data on postpartum ward at Mbarara Regional Referral Hospital, Mbarara, Uganda.*

SURGICAL EPIDEMIOLOGY, TRAUMA SYSTEMS & GEOGRAPHIC INEQUALITIES LAB

Over the past year, the Surgical Epidemiology, Trauma Systems, and Geographic Inequalities lab has been focused on multiple research and advocacy efforts across multiple contexts. While the lab focuses geographically on Latin America, its members have collaborated on numerous projects across PGSSC to contribute skills related to epidemiology and geospatial mapping.

In November, the lab's multi-year work culminated in the writing and publication of the National Surgical Plan for Ecuador. As the first national surgical plan in the PAHO region, this work has been key in sparking interest in surgical planning in the region, and has brought surgery to the table of regional policy discussions. Multiple high level diplomacy meetings were held, including a round table discussion with key PAHO members held in Washington DC. The plan itself involved serial stakeholder meetings, national assessment of surgical capacity in Ecuador, and priority setting. While the plan is written, much work remains in Ecuador and the region, as other countries consider their commitment to improving surgical care and as Ecuador works on implementation of the plan itself. The plan has led to the creation of a regional policy group focused on surgical systems strengthening, led by Former Vice President of Ecuador. It also has multiple pending research outputs, including viewpoints, commentaries on climate change and surgery, and qualitative/quantitative analysis of the outputs of the national surgical assessment. The plan acts as the starting point for multiple future research and implementation endeavors.

In addition, the lab has a special focus on epidemiology and geospatial research, leading to many completed and ongoing projects in the region. Through work with large national datasets such as Cubos Dinamicos in Mexico, multiple questions are being answered about the epidemiology of surgical disease and care in the region. Beyond simple descriptions of surgical disease, the lab works to answer the question "Why does location matter in surgical care?" through use of geospatial analysis of disease patterns and care trends. It has adopted methods to evaluate the supply and demand of surgical care, novel to global surgery, as an adjunct to policy decision-making about allocation of surgical

services. These methods are being implemented in multiple contexts, including Mexico, Ecuador, and beyond Latin America to provide empirical evidence to policymakers.

Throughout the years, the lab has fostered collaboration in the region that has led to exciting new projects. One such collaborative project, which was awarded a supportive grant, will be focused on improving the trauma system in Ecuador through implementation of a trauma registry at 4 hospitals. Another collaboration is being developed with the Emergency medical services (EMS) system in Buenos Aires, and will focus on describing patterns of traumatic disease, improving efficiency of care, and geospatially mapping EMS response.

SHRIME LAB

The Shrime Lab is dedicated to evaluating the impact of surgical disease and surgical care, focusing on the intersection between policy, patient choice, and outcomes. Global surgery interventions aim to increase access for patients. The mitigation of barriers to effective surgical care access and provision requires an understanding of the cost-effectiveness of interventions and the economic impact of interventions on patients. Ongoing projects include assessing the financial risk patients incur for surgery worldwide and a patient-centered impact analysis of the health, financial, and equity impacts of surgical care. Current projects include:

- **Climate Impact Project:** Evaluating the effect of decentralizing surgical care on climate impact for elective ophthalmologic surgeries in rural USA.
- **Cost-Effectiveness Analysis (CEA) for the BREATHE Trial:** Conducting a CEA for a clinical randomized controlled trial (RCT) across Kenya, Malawi, and Rwanda (BREATHE trial), comparing high-flow oxygen to standard flow oxygen in adults.
- **Catastrophic Health Expenditure (CHE) for emergency general surgery:** Investigating CHE for emergency bowel obstruction patients in Burundi, using patient-level insurance information.

We hosted didactic sessions on cost-effectiveness analysis and summary measures of population health for the PGSSC team. Through these projects, the Shrime Lab contributes to global surgery by evaluating and promoting effective and sustainable healthcare solutions.

SADC LAB

The primary focus of the SADC Lab continues to revolve around the enhancement of surgical systems within the sixteen constituent states of the Southern African Development Community (SADC). The SADC Lab's dedication to assisting SADC member states in advancing their National Surgical Obstetric & Anaesthesia Plans (NSOAPs) underscores its commitment to improving healthcare infrastructure and services in the region. Integral to this work is a working relationship with the SADC Technical Experts Working Group, which meets monthly, and with WitSSurg, the global surgery institute at the University of Witwatersrand.

Our initiatives span across country, regional, and global levels. At the country level, we have actively engaged in offering technical support to the DRC in their data transformation, exploration, and analysis endeavors. The insights derived from the country's Health facilities assessments were shared at the October 2023 American College of Surgeons meeting,and at the 2nd Harvard African Health Conference in February 2024. Additionally, we collaborated with the Namibian team by providing technical assistance for their NSOAP writing process, leading to its successful completion and launch in April 2024. A qualitative case study that describes this process has been drafted and presents a possible model for a pragmatic NSOAP development process that other SADC countries can learn from.

On a regional and global scale, we have developed a Global Status reporting tool and are currently working with the Pan-African Surgical Healthcare Forum (PASHef). This work aims to explore how a surgical healthcare policy development and implementation assessment model from a SADC country can be adapted to form a continental road map for global status reporting.

In our ongoing efforts to enhance global health metrics, we are focused on updating the World Bank's critical development indicator, the Specialist Surgical Workforce. This indicator, which encompasses Surgeons (including general surgeons as well as specialties - orthopedics, neurosurgery, plastic surgery, ENT, Urology, and Ophthalmology specialists), Obstetricians, Gynecologists, and Anesthetists, is measured per 100,000 population. Initially introduced in the 2015 Lancet Commission on Global Surgery Report, it has not seen significant updates since 2018.

As we approach the 10th anniversary of this indicator, our goal is to provide a comprehensive and timely update to the database. In our methods, we aim to achieve a greater degree of accuracy than previous efforts and to collect data from diverse sources in order to minimize outlier data points.

To this end, we have developed a survey dissemination approach that emphasizes broader stakeholder involvement. By building collaborations with organizations and associations that share similar objectives, we strive for a more inclusive and equitable data collection effort. We have a number of key collaborators including specialty and regional societies.

Our objective is also to gather more granular data by involving stakeholders from each cadre—Surgery, Anesthesia, and OBGYN. Engaging stakeholders from grassroots to governmental levels will help us identify geographical variations and differences in data estimates, thus providing a solid foundation for future qualitative and mixed-methods research, as well as geospatial analyses.

A successful trial run in the SADC region has demonstrated that collaboration, local leadership, and comprehensive stakeholder inclusion are essential for achieving robust results. We plan to launch the global survey between August and September 2024 and aim to gather preliminary results by the end of the year.

Additionally, we intend to transition our data collection to a digital platform, facilitating continuous updates from stakeholders and providing easy access. Data will be visually represented on a world map in collaboration with the WFSA, offering differentiated views for each specialty.

> ***A successful trial run in the SADC region has demonstrated that collaboration, local leadership, and comprehensive stakeholder inclusion are essential for achieving robust result***

Furthermore, we have made significant progress in collecting data on non-specialist personnel performing Surgery, Obstetrics/Gynecology, and Anesthesia, such as General Practitioners and nurses. If the data proves sufficient, it will be integrated into our collective effort, providing a valuable foundation for further research, especially when correlated with surgical volume.

This comprehensive approach underscores our commitment to improving global health metrics through rigorous data collection and collaboration.

The strategic plan for the SADC Lab's future directions reflects a comprehensive and ambitious approach to advancing both the vision and goals at the PGSSC and also healthcare in Southern Africa through collaborative research, policy development, and implementation initiatives.

Our vision encompasses two primary areas of focus, each designed to leverage our strengths while fostering partnerships that amplify our impact across the region.

1. **Collaboration with Other Labs**
   At the forefront of our collaborative efforts is the implementation of the WHO Clinical Registry (RTEC) Trial in Zambia. This initiative underscores our commitment to contributing to global health research standards and improving clinical data management in resource-limited settings. By participating in this trial, we aim to enhance the quality and accessibility of clinical data, ultimately leading to more informed decision-making in healthcare delivery and policy formulation

   Complementing this endeavor is the "Blood DESERT" project hosted with the STAB lab. This project could potentially revolutionize blood collection, storage, or distribution methods in challenging environments within the SADC, thereby improving access to life-saving blood products across the region.

2. **Furthering Existing Research**
   Our commitment to building upon established foundations is evident in the continuation and expansion of the NSP (National Strategic Plan) Roadmap. Drawing inspiration from our experiences in Namibia, this initiative aims to refine and adapt national health strategies to address the unique challenges faced by different countries in the region. By leveraging lessons learned and best practices identified in Namibia, we can provide valuable insights and guidance to other nations seeking to strengthen their healthcare systems and improve health outcomes for their populations.

Our future directions reflect a holistic and forward-thinking approach to advancing healthcare in Southern Africa and as we move forward, the SADC Lab remains committed to innovation, collaboration, and evidence-based practice in our pursuit of better health for all.

BRAZIL LAB

The four central aims of Team Brazil are to:

1. **Analyze** gaps in surgical education at all levels of training in Brazil
2. **Develop** sustainable improvements in surgical care in Brazil
3. **Correlate** surgical indicators with national indices on economics, policy, and expenditure in Brazil
4. **Evaluate** disparities in surgical fields in Brazil and worldwide.

Our PGSSC faculty mentor is Dr. David Mooney, Associate Professor of Surgery at Harvard Medical School, pediatric surgeon, and Director of the Trauma Center at Boston Children's Hospital. Our Brazilian faculty mentors continue to include Dr. Cristina Camargo (plastic surgeon), Dr. Joaquim Bustorff (pediatric surgeon) Dr. Fabio Botelho (pediatric surgeon), and Dr. Julia Loyola (pediatric surgeon), Dr. Nivaldo Alonso (plastic surgeon), Dr. Roseanne Ferreira, and Dr. Rodrigo Vaz (trauma surgeon). This year we have been fortunate to recruit Dr Gabriel Schnitman (general surgeon) as an additional Brazilian faculty mentor. Our research team is composed of Brazilian medical students and medical graduates with a strong interest in global surgery research. Team members are selected through an annual application process, and this year we had a record number of applicants totaling 110, of which 10 students were invited to join Team Brazil. Team Brazil was present in 8 surgical events over the year, such as the American College of Surgeons Clinical Congress, the Association of Women's Surgeons Congress, the Brazilian College of Surgeons Congress, the Pediatric Trauma Conference, the Global Initiative for Children's Surgery Congress, Consortium of Universities for Global Health and Canadian Association of Paediatric Surgeons Annual Meeting, presenting a total of 22 abstracts. We had 9 published articles and 7 submitted manuscripts on Global Surgery, Pediatric Global Surgery, Surgical Education, and Plastic Surgery. Dr. Nivaldo and Dr. Cristina organized a collaboration between Team Brazil and ACTA Cirurgica Journal, a Brazilian surgical journal, to elaborate a Global Surgery Series and spread awareness over the country.

In addition, Dr. Nivaldo, Dr. Meara, Dr. Proctor and Dr. Tonello organized a collaboration between Boston Children's Hospital (BCH) and São Paulo University, Bauru Campus (USP-Bauru), and patients' families, represented by Natália Jereissati, Igor Cunha and Craniosynostosis Association, to hold the first national Craniosynostosis Symposium, focusing on Apert Syndrome and how we can foster adequate treatment on the public health system for those children in Brazil. The Symposium was a two-day event, held in March, that gathered reference centers from different regions of Brazil and the Ministry of Health Representative. Listed are some of our ongoing and recently completed projects.

10 students invited to join Team Brazil

8 surgical events attended

22 abstracts presented

9 published articles

7 submitted manuscripts

ADULT AND PEDIATRIC TRAUMA CARE IN BRAZIL AND OTHER LMICS

Management of Pediatric Blunt Splenic Injury in Brazil:

- Comparing overall rates of operative vs non-operative management in Brazil vs high-income countries.
- Comparing rates of operative vs non-operative management in Brazil when patients are managed by pediatric surgeons vs non-pediatric surgeons.

Research Trends in Pediatric Spleen Trauma: Brazil vs USA:

- Overview of the research trends on pediatric spleen trauma, aiming to identify the gap between LMIC and HIC and call for action on the disparities of pediatric trauma outcomes in Brazil.

Traffic Accident in Brazil by Region

- Overview of the impact of traffic accidents in Brazil. In the first study, we aimed to assess the cost of traffic accidents in Brazil and the impact of age and location. In a second instance, we are evaluating more specifically the impact of motorcycle accidents by age and location.

PEDIATRIC SURGICAL CARE IN BRAZIL

Determinants of Surgical Approach to Pediatric Appendicitis in Brazil

- Analyze pediatric appendicitis care in Brazil, exploring the association between hospital resources, surgical techniques, and their impact on clinical and financial outcomes.

Appendicitis Approach and Outcomes by Staff Profile in Brazil

- This study explores the social and clinical determinants affecting the surgical decision-making process in Brazil.

Congenital Disease Mortality in Brazil

- Investigating regional disparities regarding outcomes for patients with gastrointestinal congenital malformations and the associations between surgical workforce, socioeconomic inequity, and mortality.

Surgical Workforce and Under Five Mortality Rate: A Focused Look at Piaui, Brazil

- Evaluating how pediatric surgical workforce and socioeconomic indicators impact infant mortality in Piaui
- Utilizing geospatial mapping to gauge the accessibility of pediatric surgical care.

GENDER DISPARITIES IMPACTING SURGEONS IN BRAZIL & GLOBALLY

Gender Disparities in Female Authorship: A Worldwide Megadata Analysis

- Assessing women's representation in surgical authorship worldwide from 2018 to 2021

Family Planning and Fertility Among Brazilian Surgeons: A National Survey

- The aim is to compare experiences and attitudes toward family planning and fertility among surgeons of different gender identities and different surgical subspecialties.

Trends in Author Gender Among Diversity Studies in Surgery in Brazil

- Assessing women's representation in surgical authorship in different specialties in Brazil

PLASTIC SURGERY

Venomous Animal Accidents

- Aim to correlate climate change with the increasing incidence, and related morbidity and mortality, of venomous animal accidents in Brazil and compare death and disability between Brazil and Africa

Surgical Treatment of Craniosynostosis in Brazil: Insights from National Data

- Aims to retrospectively analyze craniosynostosis cases managed across Brazil, focusing on regional differences in the profile of these cases. This analysis is crucial for identifying disparities in healthcare access and outcomes, and informing policy and healthcare resource allocation to effectively address these gaps.

Craniosynostosis Management in Brazil: A Systematic Review

- Evaluate the research trends regarding craniosynostosis to provide insights on the current national dissemination of knowledge in this field.

OTHER ONGOING PROJECTS

Surgical Outcomes in Patients with Sickle Cell Trait/Disease

- Aim to evaluate the national trends in Adult and Pediatric SCD, assessing Brazil's incidence, mortality, and public health system costs from 2008 to 2022. Also, explore the association between the patterns of patients with and without crises.

Global Surgery Education

- Assess the current status of the Global Surgery field in Brazil, aiming to create educational strategies for local leaders.

CROSS-CUTTING
CONTENT TOPIC UNITS

POLICY AND ADVOCACY

The Policy and Advocacy Cluster is dedicated to fostering a policy and advocacy community within PGSSC and beyond. Our mission is to build skills and create opportunities to further the goal of safe, timely, and affordable surgical care for all. In addition to monthly PAC cluster meetings and morning report sessions, we launched a policy and advocacy bulletin highlighting ongoing P&A events and activities.

PAC POLICY & ADVOCACY CLUSTER
PROGRAM IN GLOBAL SURGERY AND SOCIAL CHANGE

PROJECTS AND INITIATIVES INCLUDED:

- **MMH Student Internship:**
  Hosted a graduate student from the MSc in Media, Medicine, and Health for hands-on policy and advocacy experience.
- **WHO NCD Collaboration and Cancer Control Policy Review:**
  Conducted a strategic policy review with the WHO NCD Division, submitted a policy memorandum, an abstract for ACS, and are finalizing a manuscript.
- **Sustainable Financing Initiatives:**
  Collaborated with CGHD to develop long-term financial strategies, including a structured review with a University of Michigan medical student.

EVENTS COVERED BY PGSSC RC/RFS AND FACULTY:

- **UNGA • New York, NY, USA - September 2023**
  Participated in various side events, hosted a CGHD dinner and women's breakfast, and conducted a Morning Report feedback session.
- **Washington DC Ecuador Embassy PAHO Regional Approach to Surgical Systems Strengthening**
  Engaged in discussions on regional surgical system strengthening.
- **World Health Summit (WHS) • Berlin, Germany - October 2023**
  Co-hosted and participated in a public-private partnership (PPP) side event and Morning Report feedback session.
- **Ecuador NSSP Launch • Quito, Ecuador - November 2023**
  Covered the event on social media, engaged with MHSP members, and hosted a dinner with VP Borero.
- **CUGH • Los Angeles, CA, USA - February 2024**
  Presented on equity in global health and showcased research through poster presentations.
- **77th World Health Assembly (WHA) • Geneva - May-June 2024**
  attended and participated in global policy and advocacy work for global surgical care.

Through these initiatives and events, the Policy and Advocacy Cluster continues to advance our mission, creating a robust policy and advocacy community and driving progress in global health.

Policy and advocacy remains a core component of our work at PGSSC. PUr team strives to incorporate several workflows, including "research as advocacy" into our P&A agenda. Involvement in P&A contributes to meaningful dialogue, strategic collaborations, and impactful actions that promote equitable access to surgical care worldwide. Together, we can shape policies that make a real difference.

COAST

Welcoming a second faculty lead, Dr Josh Ng-Kamtra, to the team, COAST has continued to work across its two core pillars of advocacy and research in the field of climate change and surgical care. At the beginning of the year, the team consolidated a large breadth of surgical sustainability research into easy-to-use guides entitled 'COAST Hot Topics' which are accessible through the COAST section of the PGSSC website. These were officially launched at the 2023 American College of Surgeons Clinical Congress in October, during a panel on surgery and climate change.

COAST
Climate in Obstetrics, Anesthesia & Surgery Team

> ***"The team has also continued to collaborate on a number of fronts to generate relevant primary research, with real-world application in health policy for the regions most impacted by the climate crisis.***

The team has also continued to collaborate on a number of fronts to generate relevant primary research, with real-world application in health policy for the regions most impacted by the climate crisis. This includes an ongoing project with Public Health practitioners from the Pacific Community (SPC) and climate scientists based out of the University of Auckland to model and map the impacts of climate change on healthcare infrastructure in the Pacific region.

Finally, COAST has also spearheaded the development of an international team of clinicians and researchers from 7 different sites, with the aim to measure the carbon footprint of surgical care across LMIC and HIC contexts. The first project undertaken by this research collaborative will compare the footprint of planned Cesarean section surgeries in Australia, New Zealand, Papua New Guinea, Uganda, Rwanda, Brazil, and the US, and is currently in the data collection phase of the study following the completion of this project, the team hope to evaluate other common Bellwether surgeries including appendectomies and hip fracture fixations.

IMPACT

The **I**ntegrated **M**ilitary **P**artnerships and **C**ivilian **T**rauma Systems (IMPACT) Study is an innovative project designed to understand the functions and capabilities of military trauma systems and their integration with civilian trauma systems. This multi-year project has already helped to address a critical knowledge gap in the literature through a comprehensive scoping review, case series, and international survey analysis. By examining the global landscape of military-civilian trauma system integration, the study explores the potential of such integration as a "leapfrog strategy" to advance trauma systems development.

Throughout the year, we have been invited to numerous international conferences, including the Indo-Pacific Military Health Exchange, the Philippine College of Surgeons Meeting, the American College of Surgeons Meeting, the Civilian-Military Humanitarian Coordination Workshop, and the International College of Military Medicine Meeting. These events provided platforms to share our findings with a global audience and to identify local partners who can apply our recommendations for trauma system integration within their respective contexts.

The project received $100,000 in funding from the Stepping Strong Foundation to conduct initial mixed-methods research aimed at understanding integration worldwide. Additionally, the IMPACT study has been approved to apply for Department of Defense funding through the Global Health Engagement Research Initiative Grant. This grant will support our efforts to develop data-driven recommendations for integrating military and civilian health systems resources in Poland and the Baltics to improve trauma care. Other key geographic areas of interest include the Philippines and Uganda, where initiatives are underway to incorporate civilian-military trauma system integration into national surgical planning.

The next phase of the IMPACT Study presents an exciting opportunity to build upon the key information gathered from our prior research. We aim to identify the indicators required to create an integrated trauma system. Moving forward, we will utilize several modified Delphi consensus processes to develop regional and country-level frameworks for civilian-military trauma system integration.

WHO-CC

This year, the Program in Global Surgery and Social Change (PGSSC) was redesignated as a WHO Collaborating Centre, highlighting our ongoing commitment to advancing global health. The Centre is organized around four key activities:

1. **National Surgical Plans (NSP) and Indicator Tracking:** We evaluate and track the progress of national surgical plans worldwide, providing actionable recommendations to foster global collaboration and achieve surgical capacity goals by 2030.
2. **Universal Health Coverage (UHC) Compendium & Service Package Delivery and Implementation (SPDI):** We assist WHO in identifying the building blocks for surgical services, and mapping the necessary resources for specific health services.
3. **Trauma Systems:** We support WHO in reducing mortality from injuries in resource-limited settings through the development and implementation of trauma registries and systems. The WHO developed the WHO Clinical Registry, a platform designed to reduce data collection burden. PGSSC is working to evaluate barriers and facilitators to WHO-CR implementation.
4. **Community of Practice (CoP):** We coordinate with WHO to develop context-specific, frontline-informed technical inputs, and facilitate collaboration through a community of practice. See the STAB Lab section on Global Surgery CONNECT.

We host weekly quorum calls (QCs) fostering collaboration, task-sharing, and information exchange across our projects. These efforts position our Centre as a leader in global health research and policy development, contributing to improved health outcomes worldwide.

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DIGITAL HEALTH FOR IMPROVING SURGICAL CARE

RADCLIFFE ACCELERATOR WORKSHOP: DIGITAL INNOVATIONS TO IMPROVE MATERNAL AND CHILD HEALTH IN AFRICA.

With funding from the Harvard Radcliffe Institute and the Harvard Global Health Institute, this workshop, led by Adeline Boatin (Global Reproductive Surgery Lab) and Bethany Hedt-Gauthier (AGASAKE lab) and including fellows Afra Jiwa and Kate Obayagbona, brought together experts and leaders from academia, government, funding agencies, implementing NGOs, entrepreneurs and the private sector to explore the potential for digital innovations to address the needs of mothers and their children in sub-Saharan Africa and to outline a strategy for long-term collaboration to deliver a process, in essence, a translational science, for moving past the pilot stage of digital innovation and bringing these innovations to scale. Over the 1.5-day workshop, held in October 2023, the group co-developed a framework for pathways that take digital innovation ideation to full-scale implementation elucidating common pitfalls and highlighting opportunities for success. Current outputs have included collaborative efforts between participants and a viewpoint piece titled, "Africa's Digital Health Revolution: Leapfrogging Challenges to Deliver Healthcare for All", to be published in the JMIR theme Issue: 25 Years of Digital Health Excellence: Reflecting on Transformative Technologies, Interventions, Methods, and Policy Issues.

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42 INAUGURAL ALUMNI EVENT

LAUNCH OF THE ALUMNI SOCIETY

The Alumni Society was officially launched this year, marking a significant milestone in our PGSSC community's journey toward fostering lifelong connections and collaborations. As part of the launch, we hosted a hybrid event and proudly presented the first-ever Alumni Achievement Awards, recognizing outstanding contributions and impact in global health and surgery.

The inaugural recipients, celebrated for their leadership, innovation, and dedication to advancing healthcare access and equity, set a high standard of excellence for future generations to aspire to. Their accomplishments serve as an inspiration, reinforcing our commitment to cultivating a vibrant and engaged alumni network.

We invite all our alumni to join this vibrant and dynamic community, where you can connect with like-minded professionals, share experiences, and contribute to advancing global surgery together. By becoming a part of the PGSSC Alumni Society, you will help shape the future of equitable surgical care worldwide and inspire the next generation of leaders in global health. Join us today and be a part of this transformative journey!

▸ **Email PGSSCBoston@hms.harvard.edu to join!**

We would like to extend our heartfelt congratulations to the inaugural recipients of the PGSSC Alumni Association Awards:

- **PGSSC Global Surgery Leadership Award:**
  John G. Meara

- **John G. Meara Global Surgery Leadership Award:**
  Nobhojit Roy
  Recognizes individuals who have led global surgery efforts and fostered pathways for others to engage in this work.

- **PGSSC Alumni Award:**
  Barnabas Tobi Alayande
  Recognizing alumni that, post-PGSSC training, continue to exemplify the values of the PGSSC.

- **PGSSC Global Surgery Frontline Award:**
  Faith Mugoha Odwaro Orinda
  Recognizes an individual who directly supports individuals' access to equitable, high-quality surgical care.

> *"The inaugural recipients, celebrated for their leadership, innovation, and dedication to advancing healthcare access and equity, set a high standard of excellence for future generations to aspire to.*

OUTPUT TO DATE

78 FELLOWS TRAINED TO DATE

90 RESEARCH COLLABORATORS TRAINED TO DATE

63 2023 PUBLICATIONS

10 CONFERENCES ATTENDED

COUNTRIES VISITED:

Canada
Ecuador
Ghana
India
Kenya
Malaysia
Mexico
Philippines
Rwanda
Sierra Leone
South Africa
Switzerland
Uganda
UK
USA

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