



ASM GLOBAL REPORT 2019-2020

ADVANCING MICROBIOLOGY IN THE GLOBAL COMMUNITY

Virtual Knowledge Exchange • 11 •

Mentoring Microbial Scientists • 22 •

Advocacy at ASM • 30 •



AMERICAN
SOCIETY FOR
MICROBIOLOGY



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Message from Our CEO

ASM is a global community with members and stakeholders in 154 countries. As always, we are focused on our mission of promoting and advancing the microbial sciences—and never before has this mission come into sharper focus, with the whole world now united in the global fight against COVID-19.

Around the globe, policymakers and the general public alike are realizing how important robust laboratory infrastructure and research operations are to public health. ASM’s Global Public Health Programs team is devoted to strengthening the laboratory networks that comprise the backbone of many health systems, providing critical laboratory training and capacity to detect and respond to infectious disease outbreaks. ASM leverages its cadre of more than 500 subject matter experts and its extensive global membership to provide high-quality training, mentorship, and cost-effective public health solutions in over 20 countries. With its extensive network of laboratory experts, ASM local teams ensure their countries are prepared to face a multitude of public health threats.

The world also needs microbiology advocates, and ASM is working hard to fill that gap. Our print and digital resources are used by researchers, clinicians, educators, and laboratorians around the world. The ASM Ambassador programs, meanwhile, are active in 115 countries, connecting ASM members, building relationships with key institutions, facilitating partnerships and responding to the needs of their local scientific communities. We also have active student chapters in the US and internationally that connect with the next generation of microbial scientists.

Despite the gravity of this crisis, I see rays of optimism and hope. Communities around the world are uniting against this public health emergency. I see great strength in scientists and public health professionals who selflessly donate their time, resources, and expertise to the ASM mission. The need for connection and collaboration within the international scientific community is more critical than ever before.

My hope is that we will emerge from this pandemic acknowledging the need for an overarching research strategy framework where a global approach must play an even more important role than it has in the past. Many of the accomplishments battling this pandemic have foundations in the hard work, collaborations, and commitments of microbiology researchers made over the decades. Our global network of clinical microbiologists is on the front lines, working tirelessly to ramp up COVID-19 testing, accelerating and highlighting critical research, and coordinating amongst federal agencies and the White House Coronavirus Task Force on supply shortages. We are making it our priority to find solutions during these difficult times and remain committed to helping you advance. I am particularly proud of the great work that ASM has done!

So let’s not forget: even after the crisis has faded, we must continue to stress the importance of our field. We have seen what happens when scientists work together, and this report highlights some of the many accomplishments. By sharing data and knowledge, encouraging best practices, and training future scientists, we are strengthening public health capacities, which is saving millions of lives.

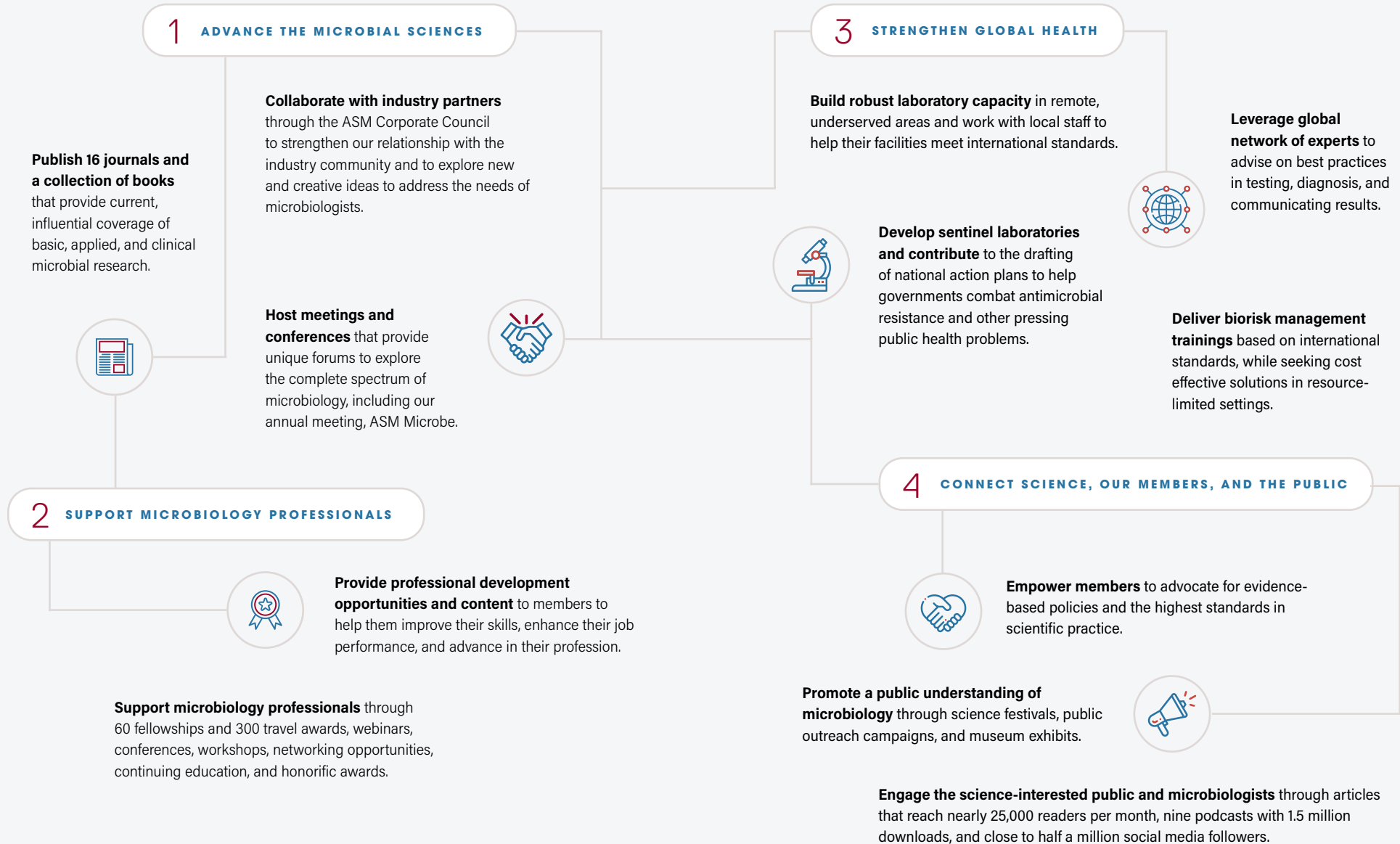
Thank you all for being a part of the ASM global community!



Stefano Bertuzzi, Ph.D., M.P.H.
CEO, American Society for Microbiology

What We Do

With over 30,000 members, including researchers, educators, and health professionals, the American Society for Microbiology, founded in 1899, is one of the largest life science societies in the world.



Where We Are

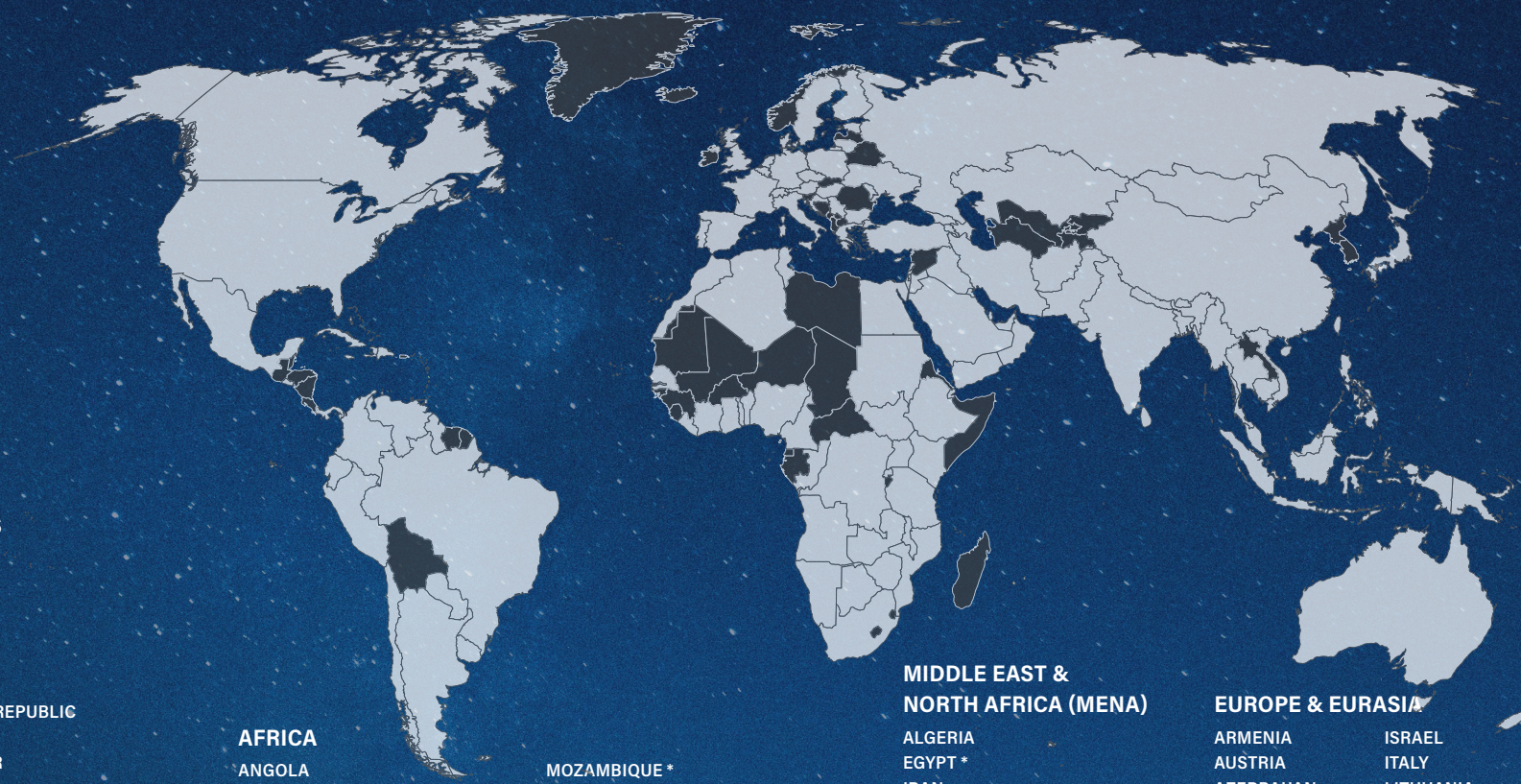
Our mission is to translate microbiology expertise and tools into sustainable global public health solutions. Currently, ASM has a global presence that includes our active laboratory capacity-building programs. We center our approach on workforce development, biorisk management, and disease surveillance.

22 Capacity Building Programs *

90 Country Ambassadors

83 International Young Ambassadors

42 US Young Ambassadors [▶ Check out Ambassador activities on p. 32-41](#)



AMERICAS

- ARGENTINA
- BRAZIL
- CANADA
- CHILE
- COLOMBIA
- CUBA
- DOMINICAN REPUBLIC
- ECUADOR
- EL SALVADOR
- GUYANA
- HAITI *
- JAMAICA
- MEXICO
- PANAMA
- PARAGUAY
- PERU
- SAINT KITTS AND NEVIS
- SAINT LUCIA
- TRINIDAD AND TOBAGO
- UNITED STATES
- URUGUAY
- VENEZUELA

AFRICA

- ANGOLA
- BENIN
- BOTSWANA *
- CAMEROON
- DEMOCRATIC REPUBLIC OF THE CONGO *
- CÔTE D'IVOIRE *
- ETHIOPIA *
- GAMBIA
- GHANA *
- KENYA * 🇰🇪
- LIBERIA *
- MALAWI
- MAURITIUS

- MOZAMBIQUE *
- NAMIBIA
- NIGERIA *
- RWANDA
- SENEGAL
- SOUTH AFRICA
- SOUTH SUDAN
- SUDAN
- TANZANIA *
- TOGO
- UGANDA
- ZAMBIA *
- ZIMBABWE *

MIDDLE EAST & NORTH AFRICA (MENA)

- ALGERIA
- EGYPT *
- IRAN
- IRAQ *
- JORDAN
- KUWAIT
- LEBANON
- MOROCCO
- OMAN
- PALESTINE
- QATAR
- SAUDI ARABIA
- TUNISIA
- UNITED ARAB EMIRATES
- YEMEN *

EUROPE & EURASIA

- ARMENIA
- AUSTRIA
- AZERBAIJAN
- BELGIUM
- CROATIA
- CYPRUS
- CZECH REPUBLIC
- DENMARK
- ESTONIA
- FINLAND
- FRANCE
- GEORGIA *
- GERMANY
- GREECE
- HUNGARY
- ISRAEL
- ITALY
- LITHUANIA
- NETHERLANDS
- POLAND
- PORTUGAL
- RUSSIA
- SCOTLAND
- SERBIA
- SPAIN
- SWEDEN
- SWITZERLAND
- TURKEY
- UKRAINE *
- UNITED KINGDOM

ASIA

- AFGHANISTAN
- BANGLADESH *
- BHUTAN
- CAMBODIA
- CHINA
- HONG KONG
- INDIA 🇮🇳
- INDONESIA
- JAPAN
- KAZAKHSTAN
- MALAYSIA
- MONGOLIA
- MYANMAR
- NEPAL
- PAKISTAN *
- PHILIPPINES
- SINGAPORE
- SRI LANKA
- TAIWAN
- THAILAND
- VIETNAM *

OCEANIA

- AUSTRALIA
- NEW ZEALAND
- PAPUA NEW GUINEA



Virtual Communities

The COVID-19 pandemic has created extraordinary circumstances for the ASM community, sending our Washington, DC, staff into full remote mode and leading to the cancellation of our annual Microbe meeting. But it seems somehow appropriate that the very thing causing us to keep our colleagues and members at a physical distance is also bringing us closer together: around the world, ASM members are hard at work researching the novel coronavirus and ensuring that testing and diagnostic services are available to all who need them.

We know well enough by now that physical distance does not have to mean communication breakdown—and our virtual communities are playing a major role in keeping ASM members informed and connected. With rapid advancements in telecommunications technologies over the last few decades, knowledge sharing and communication between our staff, ambassadors, and members has reached new heights.

INTERESTED IN JOINING ONE OF THESE COMMUNITIES?

CLINMICRONET

If you are an ASM member and a Ph.D.-level clinical microbiology laboratory director or manager, consider joining the conversation.

DIVCNET

If you are a clinical microbiologist, but not (yet!) at the director level, then this community is for you. Applications to join must be approved by a moderator.

OTHER CONNECTIONS

ASM has more than 20 listservs available to the microbiology community at

🔗 www.asm.org/forms/subscriptions

Oceans Apart, Working Together: The Online ClinMicro Knowledge Exchange

When Dr. Michael Miller created a small consultation group for laboratory directors in the early 1990s, he never expected it to turn into the world's premiere virtual network for microbiology discussions and advancements. At the time, Dr. Miller was working as an associate director at the CDC in Atlanta—but though he had a Ph.D. in microbiology, he was feeling increasingly disconnected from the clinical world.

"I didn't feel confident in my knowledge of the day-to-day work of hospitals," Dr. Michael Miller, Director, Microbiology Technical Services, LLC told ASM. "So I decided to ask the people who know the field best."

And thus, a small advisory group of microbiologists, lovingly nicknamed the "Very Intelligent People (VIP) Group," was born. The group was originally made up of six laboratory directors who asked each other questions and exchanged knowledge. But it did not stay small for long.

"Somehow the word started spreading," Dr. Miller said—so much so that in 1995, he asked ASM if they would be willing to host the group in the form of a listserv. Thus began ClinMicroNet, and later, DivCNet.

Today, ClinMicroNet is home to discussions amongst more than 900 laboratory directors and managers from over 50 countries. As the listserv has grown, it has become a key resource for the world's top clinical microbiologists, allowing them to connect with each other, discuss new research, and address some of the field's greatest challenges. During global events like the current COVID-19 crisis, the need for ClinMicroNet is more apparent than ever.

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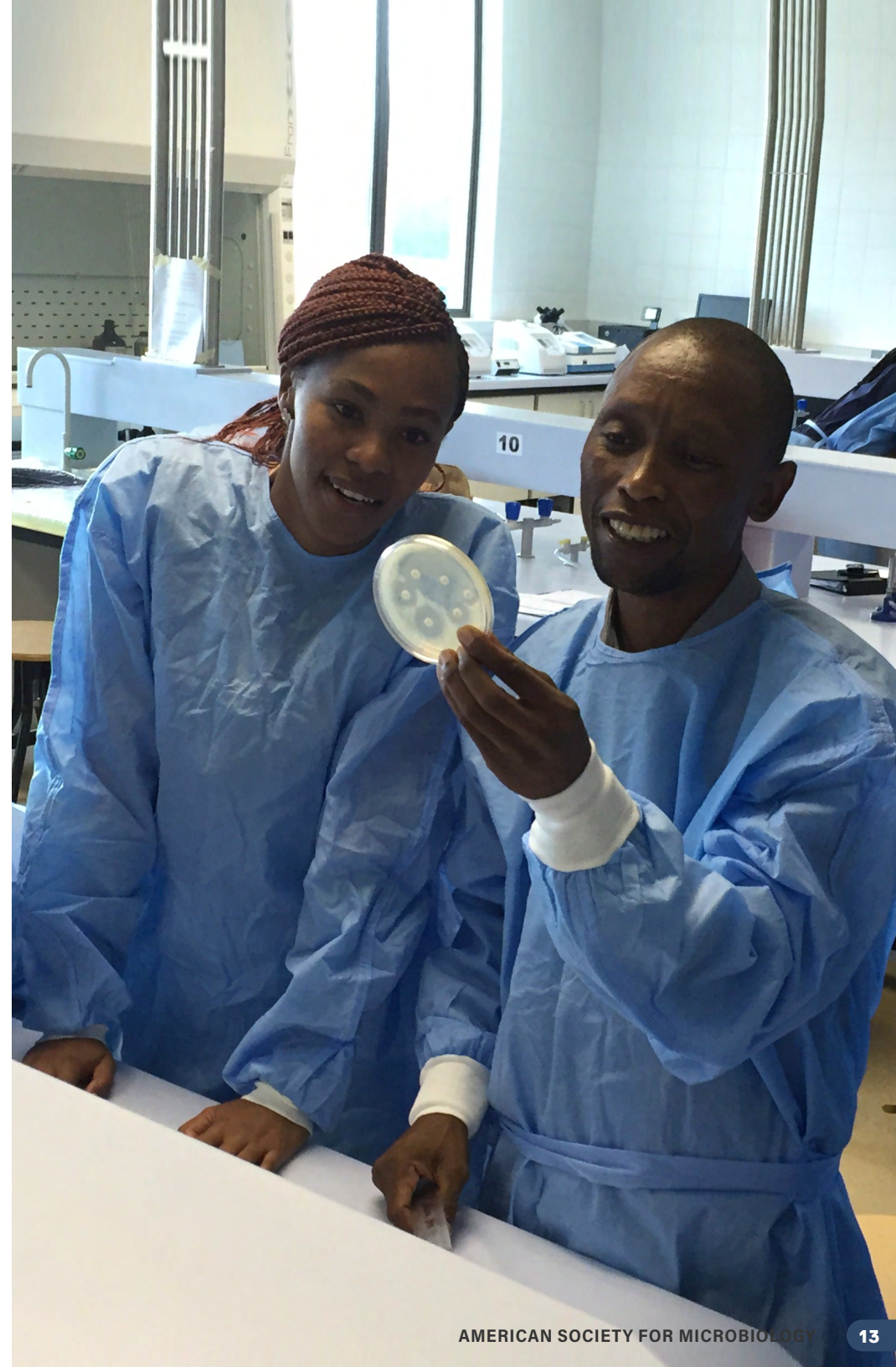
“DivCNet members are located across the globe and share the joy of clinical microbiology,” said Brent Barrett, a microbiologist who retired from the Indiana State Department of Health in 2018 and is the primary moderator of DivCNet. “I’m glad to see so many microbiologists share their expertise with other listserv members.”

With clinical microbiologists on the frontlines of fighting emerging diseases, virtual communities like ClinMicroNet and DivCNet play an important role in facilitating information exchange. These platforms will continue to help policymakers, medical professionals, and the general public better understand dangerous pathogens and improve biosafety and biosecurity around the globe.



LABORATORIANS

The COVID-19 crisis has shown the world what ASM has always known: laboratorians are essential to protecting public health. Clinical microbiologists are the first to identify and begin understanding new threats. They play a critical role in raising awareness, both among the microbiology community and the public. ASM seeks to empower microbiologists around the world through practical knowledge of new techniques and developments in the field.



A New Partnership to Strengthen Liberian Laboratories

Under a new five-year agreement, ASM continuing its lifesaving work in Liberia through health systems strengthening initiatives. Funded by the US CDC, ASM is partnering with MRIGlobal, X-Cell System International, and the Government of Liberia to improve laboratory capacity. While this work focuses on two of ASM's specialty areas— infection prevention and control (IPC) practices and laboratory quality assurance—it also provides an opportunity to expand into another critical area of need: safe blood transfusion practices.

"We are excited to continue working with our partners to fortify Liberia's health security and lessen the spread of infectious diseases across the country," said Dr. Mark Lim, the director of ASM's Global Public Health Programs (GPHP) team. "Unique from any work GPHP has done before, we are delving into infection prevention and control in an entirely new capacity, and we are venturing into the blood space for the first time."

GPHP has been working in Liberia since 2016 to strengthen laboratory capacity at Phebe Hospital and School of Nursing in Bong County a former Ebola hot zone. With the new project, work will expand to other areas of the country. Among other goals, the partnership will facilitate the transition of Liberia's National Public Health Reference Laboratory (NPHRL) to a new site, assist with site-targeted implementation of national IPC protocols, and provide training and tools for the National Blood Safety Program.



*Phlebotomy chair,
National Blood
Safety Program site,
Monrovia, Liberia.
Photo courtesy
Linda Barnes.*

Interview with Celso Carrera, Laboratory Quality Assurance Coordinator



CELSO CARRERA
*LABORATORY QUALITY
ASSURANCE COORDINATOR*

Celso Carrera is the Acting Quality Assurance Coordinator at the Central Medical Laboratory in Belize City, Belize, where he has been working for more than 12 years.

What inspired you to become a laboratorian?

Working in science has always been of interest to me. My love for biology inspired me to venture into the field of Medical Laboratory Technology. At the time I enrolled [at the University of Belize], the number of medical laboratory scientists in our country was limited. I knew that I could make a difference and that we urgently needed professionals in this field at the time.

Now fast-forward to 2020: laboratorians in our country are making a big difference when it comes to the COVID-19 pandemic. We are at the frontlines, providing timely, reliable, and high-quality information for the Belizean public. Our work is crucial for the surveillance of the disease.

What accomplishment are you most proud of?

I coordinated the training of the Medical Laboratory Service network. With the assistance of stakeholders, we were able to carry out national trainings on biosafety, biosecurity, and quality management. This event is unprecedented in Belize, and we were able to bring together staff from every region of the country. At the end of the day, we raised the bar of knowledge for all medical laboratory technologists in the country.

How has ASM supported your work?

I participated in a three-week fellowship program at the Indiana State Department of Health Laboratory, facilitated by ASM. It was a first-time experience for me being exposed to a state laboratory in the US. The most important takeaway for me was seeing how incidents are being managed. The laboratory has a clearly defined process for reporting, which records and manages incidents in real time. This system is crucial to keeping upper-level management informed and keeping everyone in the process on board. This kind of system ultimately raises the bar of quality within the whole medical laboratory.

LABORATORIANS

Fighting AMR, One Sample at a Time

Antimicrobial resistance (AMR) is a global challenge, with resistant pathogens present in every country in the world. As microbes mutate into superbugs, health professionals are less and less able to treat their patients. In 2016, an estimated 490,000 people worldwide suffered from multidrug-resistant tuberculosis (MDR-TB), a form of the disease that does not respond to the two most powerful anti-TB drugs. And even previously "minor" ailments like urinary tract infections and gonorrhea are showing high levels of resistance to common treatments—and, increasingly, to last-line antibiotics.

While resistant pathogens are increasing in number, the pipeline for new antimicrobials is underwhelming at best. The World Health Organization (WHO) reported in January 2020 that the 60 antibiotic agents currently in development show few benefits over existing treatments, and very few target the most critical resistant pathogens: Gram-negative bacteria.

With cases increasing faster than treatments can be developed, health policymakers are turning to laboratorians for support in identifying and containing resistant microbes. ASM works with laboratories and national health systems around the world to implement national AMR surveillance plans and laboratory reporting procedures as well as to improve diagnostic techniques and sample management.



ETHIOPIA: CONNECTING SCIENTISTS THROUGH VIRTUAL TRAINING

In July 2017, the Ethiopian Public Health Institute (EPHI) launched the Ethiopia AMR Surveillance Network at four sentinel laboratories. While the establishment of the new network was a great achievement, it was clear that additional capacity building would be necessary to ensure the accurate reporting of quality data in the new system. To this end, ASM, along with the US CDC and EPHI, established a completely virtual surveillance training program for laboratorians: Project ECHO (Extension for Community Healthcare Outcomes).

Over the course of 10 months, 17 laboratorians from all four sentinel sites took part in the Project ECHO online trainings. Through their virtual connections to subject matter experts in the US, the trainees improved their understanding of the identification of priority pathogens as well as antibiotic susceptibility testing, proper reporting protocols, and laboratory quality control.



Participants of the Best Practices and the Best Quality of Clinical Microbiology Laboratory seminar, Mongolia



MONGOLIA: IMPROVING ACCURACY AND EFFICIENCY

Mongolian laboratories struggle to consistently produce accurate test results, often due to a lack of quality assurance and training. Many laboratory workers do not have access to high-quality training in modern techniques for diagnostics and laboratory management. This means that health professionals often treat patients with antibiotics without accurate antibiotic susceptibility data to guide their therapeutic choices.

Recognizing this problem, ASM delivered a training for 156 clinicians, laboratory doctors, biomedical scientists, and technicians at the First General Hospital in Ulaanbaatar in November 2019. Organized in collaboration with the National Center for Communicable Diseases, the Mongolian National University of Medical Sciences, and the Ulaanbaatar City Health Department, the training covered topics like sample collection and transport, sputum cultures and pneumoniae diagnosis, and the identification of antibiotic resistance in a variety of common infections. Participants also learned about laboratory quality control and gained practical experience in antibiotic susceptibility testing.



UGANDA: STUDENTS HELPING STUDENTS

Early-career training is crucial to building a comprehensive understanding of AMR and the role laboratorians play in fighting it. That is why ASM helped to organize the second-ever student-led scientific conference on the Global Health Security Agenda (GHS) in Kampala, Uganda, in October 2019.

The one-day symposium attracted 360 delegates from the Ugandan government, universities, NGOs, and the private sector to discuss strategies for promoting antimicrobial stewardship. The aim of the event was to raise awareness of AMR and encourage the development of evidence-based solutions—particularly with regard to food safety and security.

TB Testing in Zimbabwe: Sustained Progress Through Mentoring

Though Zimbabwe is one of the world's highest TB-burden countries, it has made significant progress in fighting the disease over the last decade. By increasing access to testing and treatment, the per capita TB incidence rate was halved between 2008 and 2018, and WHO reported both TB treatment coverage and treatment success rates at 83%—just seven percentage points away from the 2022 country targets.

The ASM Mentor4TB curriculum has supported Zimbabwe by improving laboratory workflows and specimen management. When ASM began collaborating with the National Microbiology Reference Laboratory (NMRL) in Harare to pilot the program in 2017, a number of challenges were identified: a lack of quality control procedures, supply chain management issues, and outdated standard operating procedures (SOPs). The most pressing issue, though, was the loss of functionality of the NMRL's Biosafety Level 3 (BSL3) containment laboratory.

With support from ASM, the NMRL approved renovation plans and identified solutions for specimen management, operationalized new procedures for registering and handling specimens to ensure timely processing through a new laboratory information management system, trained NMRL staff in processes to improve workflow and quality control, and established new SOPs.

A technical expert from CDC visited the NMRL in early 2020 as part of a TB network assessment and reported that the laboratory has sustained the improvement activities introduced in 2017. "It was an impressive accomplishment despite the short [mentoring] visit (7 weeks)," the expert stated. All staff trained under the program were still working at the NMRL and report a smoother sample collection and testing process, a systematized laboratory workflow, and an ongoing collaboration with the University of Zimbabwe's BSL3 suite.



CDC Atlanta technical subject matter expert Dr. Josie San Pedro mentors microbiologists at the NMRL during ASM's Mentor4TB pilot in Harare.

Interview with Dr. Afreenish Amir, Clinical Microbiologist



DR. AFREENISH AMIR
CLINICAL MICROBIOLOGIST

Dr. Afreenish Amir has been working as a clinical microbiologist for more than 12 years. She is currently the coordinator for the CDC Global Health Security Agenda activities at the Pakistan National Institute of Health (NIH) in Islamabad, Pakistan, where she focuses on implementing surveillance systems for antimicrobial resistance (AMR).

What inspired you to become a laboratorian?

During my undergraduate training, I had an interest in pathology, especially in microbiology and infectious diseases. This made me opt for a microbiology specialization and start entering laboratory work.

What accomplishment are you most proud of?

For the last three years, I've been engaged in the Global Antimicrobial Resistance Surveillance System (GLASS) with WHO and the NIH. I developed the AMR surveillance plans for human health for Pakistan with support from the CDC and WHO, making Pakistan the first country to finalize its plans in WHO's Regional Office for the Eastern Mediterranean (EMRO). I have also worked on the development of the Pakistan AMR Surveillance System (PASS).

Can you tell us more about the AMR work you are doing?

Every year, I organize activities on World Antibiotic Awareness Week in Pakistan in collaboration with WHO. I am also engaged as a project manager for ECHO for AMR surveillance and mycotic disease surveillance (specifically *C. auris*). In my Ph.D. work, I have developed a novel nanoantibiotic based on antimicrobial peptides for treatment against multidrug-resistant *A. baumannii* infections.





CONSULTANTS

ASM's consultants help to maintain the quality and continuity of our services throughout the world. With the help of consultants, we were able to deliver more than 50 trainings and workshops in 2019, covering a diverse range of topics, including antimicrobial resistance, quality assurance and management, biosecurity, and laboratory safety.

Consultants also play a key role in helping laboratory directors and managers gain crucial management skills. These directors go on to lead their laboratories in adhering to best practices towards gaining international accreditation—and often end up becoming trainers themselves.



CONSULTANTS • • • •

Mentoring Programs Keep Microbiologists at the Forefront of the Field

The field of microbiology is continually advancing, which means that keeping pace with new developments can be challenging. With the help of trained and qualified consultants around the world, ASM's Microbiology Mentorship Package translates knowledge into practice, giving microbiologists the tools they need to apply complex decision-making techniques and technical skills in their laboratory practice.

ASM has customized its Microbiology Mentorship Package for more than a dozen countries. Generally, it is delivered by an ASM consultant or a local ASM-trained mentor (usually senior laboratory staff). These mentors provide on-site training and guidance to mentees in working with diagnostic tools and enhancing problem-solving and decision-making skills. Mentors also focus on strengthening laboratory quality assurance systems and standard operating procedures to ensure the safe delivery of quality services.

Recently, ASM Consultant Abdul Chagla leveraged the Microbiology Mentorship Package to train a cohort of laboratorians in Pakistan. Over the course of the five-day workshop, participants strengthened their skills in identifying bacteria, implementing quality control mechanisms, and laboratory knowledge management. They also learned about laboratory safety, equipment maintenance, process implementation, and compliance with international best practices. As a health security expert, Dr. Chagla was able to place special focus on pathogen classification and antibiotic sensitivity testing—crucial to identifying and controlling antibiotic-resistant bacteria.



Dr. Chagla works with two mentees in Pakistan.

52 Weeks of Biosafety

Fostering awareness of behavioral and technical best practices is a critical component of promoting biosafety in laboratory facilities around the world. In laboratories where equipment and infrastructure are limited, staff must focus on the factors they can control. Often this translates into ensuring all staff are trained in microbiological techniques, the use of appropriate personal protective equipment (PPE), and behavioral safety in laboratories. As the number of individuals requiring training on safe practices in high biocontainment laboratories increases, comprehensive biosafety training, including behavioral components, is critical to reducing the potential for human error. The *52 Weeks of Biosafety* program is designed with exactly these components in mind.

Delivered through a combination of practical, in-person sessions and online workshops facilitated by an ASM biosecurity consultant, the *52 Weeks* program seeks to address the biggest risk factor for biosafety: human behavior. Scientist participants learn critical behavioral skills for the control and accountability of biological agents, as well as the knowledge and processes to protect themselves and their communities from preventable exposure to infectious disease. Participants include leaders from various public health-related fields, as engagement of all aspects of the laboratory workforce is essential to improving biosafety and biorisk management practices of their hospitals, universities, and laboratories.

52 WEEKS PROGRAM IN 2019



Participants in Egypt practice donning and doffing PPE. Photo credit Bethany Bandera.

In 2019, the *52 Weeks* program was delivered to:

132 participants
from Egypt and
Pakistan

Expert Interview with Dr. Douglas Abbott, ASM Consultant



DR. DOUGLAS ABBOTT
ASM Consultant

Dr. Douglas Abbott has been an ASM member for over 50 years. He began his career as a microbiology professor in Kentucky before becoming a state laboratory director in Montana and eventually moving on to the USDA, where he directed the Food Safety Inspection Service's Food Emergency Response Network. In his 11 years as an ASM consultant, he has trained more than 100 laboratorians in Ethiopia, Rwanda, and Tanzania using the ASM Microbiology Mentorship Package.

What is the basis for the Microbiology Mentorship Program? Who are you working with and what skills are covered?

We work with microbiologists and hospital laboratories to do training, teaching, and laboratory improvement programs with them in their own laboratories. A great deal of it is assisting with management processes, quality assurance, and establishing standard operating procedures. We give laboratorians the practical training they may be missing—many of them have very good academic backgrounds, but little to no experience working in a well-functioning microbiology laboratory.

The quality of the work coming out has vastly improved. Routine culture and sensitivity tests can now be run in virtually all the laboratories we have worked in—and that wasn't the case before. Now you have established a real tool for clinicians to move toward a more evidence-based therapy for patients.

How does ASM's work through the mentorship program help to build a sense of community?

This is in many ways a patient-centered activity. And the patients benefit because we're communicating all of this information with the clinicians. So we have built that sense of community between clinicians and the patients. I hope that in the future we'll be placing more emphasis on building bridges between the clinicians and the public health experts in these countries—the ones who go out and gather data to investigate and identify outbreaks.

What is the most important aspect of ASM Global Public Health Programs?

When the division was established, I thought it was a great idea. There has been a tremendous change in the level of outreach that ASM does in a lot of areas—and that's improved not only ASM's work, but also raised the bar for other organizations as well. This kind of global outreach is something that professional organizations didn't do 50 years ago.



HEADQUARTERS

Our work may stretch to more than 100 countries, but none of it would be possible without the work being carried out at ASM's headquarters.

Our Washington, DC-based colleagues are responsible for hiring great talent, managing program budgets, designing and implementing sustainable programs, and communicating ASM's successes to our members and stakeholders alike. The proximity to US lawmakers in the capital city also puts our HQ team in the ideal location to advocate for initiatives that advance the microbial sciences.



HEADQUARTERS

ASM Press: Making Critical Information Accessible to All

ASM's book publishing arm, ASM Press, manages the acquisition and review of all of ASM's books that are now co-published with Wiley. Based at our headquarters in Washington, DC, ASM Press staff find the best ways to make vetted microbiology content accessible for students and laboratorians around the world—and one of the best ways to ensure access is to publish digitally.

That's why ASM and Wiley are partnering to launch ClinMicroNow.org, an online subscription-only service that integrates some of ASM's most trusted resources for clinical microbiologists and infectious disease clinicians. Built on Atypon's Literatum platform, ClinMicroNow is designed to meet the specific needs of the community with a granular search mechanism that provides quick answers to microbiology questions.

“ASM, in partnership with Wiley, is moving its globally utilized clinical microbiology references into a unique digital resource, one that is positioned to react to events such as outbreaks better than content that is 'locked' into book pages. Our goal is to support laboratorians and clinicians by providing well-organized, actionable, and timely content as scientific knowledge increases and the practice of clinical microbiology advances,” said Christine B. Charlip, Director of ASM Press.

To provide this information, ClinMicroNow combines three of ASM's best-known reference books: the *Manual of Clinical Microbiology* (12th ed.); *Cases in Medical Microbiology and Infectious Diseases* (4th ed.); and the *Clinical Microbiology Procedures Handbook* (4th ed.). In addition to offering thorough searching of these resources, ClinMicroNow will provide updates to each contribution as the science advances, before the next print edition goes to press. Each of the core texts of ClinMicroNow will continue to be vetted thoroughly by respected microbiologists, making it a dynamic, current, and easily accessed tool.

➤ ClinMicroNow is coming soon! Visit www.asm.org to sign up for launch updates.

American Society for Microbiology Agar Art 2019 Professional. "Gain immunization by illumination," Elifnaz Ilgar.



HEADQUARTERS

Beauty in Science: The 5th Annual Agar Art Contest

Agar art uses living, growing microorganisms to create colorful masterpieces within the borders of a petri dish. Creators use either naturally colorful microbes, like the red bacteria *Serratia marcescens*, or genetically modified microbes, like the yeast *Saccharomyces cerevisiae* transformed with violacein genes, as 'paint' and various types, shapes, and sizes of agar as a canvas.

ASM launched its Agar Art Contest in 2015 with the aim of sharing the beautiful and diverse world of microbes beyond the microbiology community. Submissions are accepted in three categories (Kids, Professional, and Maker) and have been featured in more than 200 media outlets, including *National Geographic*. In 2019, the contest received 347 submissions, with winners including a depiction of a koi fish, an artist's self-portrait, and a rendition of Hungarian folk art.

➤ See more submissions at www.asm.org/Events/2019-ASM-Agar-Art-Contest/Home



DID YOU KNOW?

The original agar artist was Alexander Fleming himself! A self-taught painter, Fleming began using his artistic energies to create scenes in petri dishes with fungi and bacteria.

US PUBLIC POLICY ENGAGEMENT

ASM's Public Policy and Advocacy team helps to ensure that science has a place in policymaking. By engaging with lawmakers, government bodies, think tanks, and other organizations, we give the microbiology community a voice on the national policy stage. The COVID-19 pandemic has highlighted the importance of our work in promoting evidence-based approaches to handling national (and international) public health crises.

➤ Read more about ASM's advocacy and public policy programs at www.asm.org/advocacy.

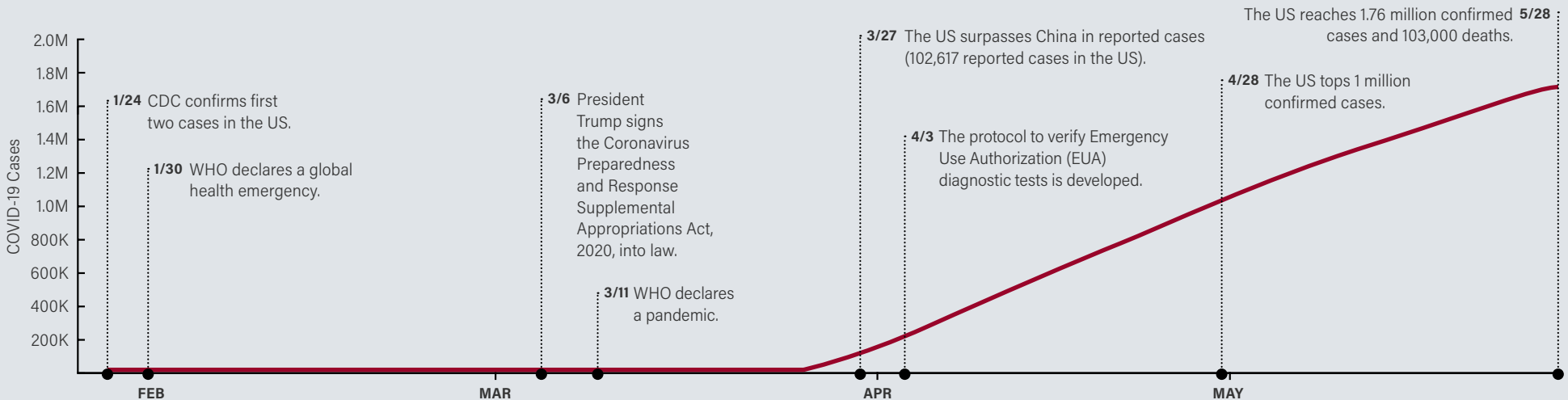
- 2/5** ASM issues a response to the House hearing on the novel coronavirus, urging Congress to continue funding for the GHSA.
- 2/28** ASM submits a letter to the FDA voicing concerns about clinical access to tests and asking the FDA to adjust its regulations for faster response times and diagnosis.
- 3/2** FDA consults with ASM leaders before hosting a public webinar on new steps to enhance and expand access to clinical testing services. Chief among these steps is expanding use of laboratory-developed tests.
- 3/3** ASM urges Senate support for coordinated efforts to combat COVID-19.

- 3/10** ASM expresses concern about test reagent shortages, calls for accelerated production of the necessary reagents.
- 3/17** ASM commends new guidance to increase COVID-19 testing capacity.
- 3/26** ASM supports CARES Act provisions to combat COVID-19.
- 3/30** ASM leads stakeholder letter urging a review of COVID-19 response to prepare for future pandemics.
- 4/14** ASM submits letter to FDA calling for stronger oversight of COVID-19 serology tests.
- 4/15** ASM provides recommendations to Congress for supporting scientific research in future stimulus packages.

- 4/17** White House Coronavirus Task Force looks to ASM for assistance mapping testing capacity and equipment in each state.
 - 4/24** Congress passes the Paycheck Protection Program and Health Care Enhancement Act. The Act includes \$25 billion for a "testing fund" to support the research, development, validation, manufacturing, purchasing, administering and expanding capacity for COVID-19 tests.
- ASM worked with key Senate offices to ensure that bill language specified "academic and hospital laboratories" so that all clinical laboratories, not just commercial ones, will have access to this critical assistance.

“ Robust and predictable federal investments are essential to our understanding of neglected and emerging diseases.
 - ASM recommendations to Congress, April 15, 2020

COVID-19 TIMELINE: KEY US EVENTS





AMBASSADORS

ASM Country Ambassadors and Young Ambassadors are scientists who connect ASM members across the globe, building relationships with key institutions, facilitating partnerships, and responding to the needs of the local scientific community. As representatives of ASM within their countries, Country Ambassadors play a major role in promoting and advancing the microbial sciences in their countries and regions. Young Ambassadors advocate for the needs of early-career scientists in their home countries, organizing workshops and trainings, and helping to secure necessary resources. There are currently 90 Country Ambassadors and 125 Young Ambassadors across 115 countries.



“Being a member of ASM allowed me to challenge myself as a scientist and participate in a network I would never have been able to access otherwise.”
- María José González, ASM Young Ambassador to Uruguay

Man, Microbes, Machine: Finding Solutions Together

The exchange of information is one of the keys to advancement in any field—and for microbiologists, creating platforms to learn and discuss regional and international challenges is particularly crucial.

In this spirit of knowledge-sharing, the Nepalese Association of Clinical Microbiologists (NACM), in collaboration with ASM, organized its first international conference in September 2019. The three-day event brought together 162 clinicians, laboratorians, students, and other microbiology professionals to network and share their experiences under the theme “Man, Microbes, Machine: Finding Solutions Together.”

“Microbiology isn’t so developed in Nepal,” said Dr. Shishir Gokhale, ASM Country Ambassador to Nepal. “We started NACM about six years ago, but this was the first year we held an international conference.”

Organized in large part by Dr. Gokhale, the conference featured experts from 13 different institutions in India, Lebanon, Nepal, Thailand, and the UK. The conference included diagnostic capacity-building sessions, a webinar on antibiotic stewardship and sepsis organized by the Indian Association of Medical Microbiologists, and a pop-up display of the Smithsonian’s *Outbreak* exhibit.

“

“The primary focus was on clinical microbiology,” Dr. Gokhale said. “It was a two-and-a-half-day program with presentations, papers, and keynote addresses.”

Dr. Rama Chaudhry, ASM Country Ambassador to India, also hosted a pre-conference workshop on human mycoplasma infections. Workshop participants performed staining and microscopic examinations of mycoplasma and carried out immunology diagnostic tests—a first-time experience for many of the 36 young delegates in attendance.

PARTICIPATING INSTITUTIONS

BP Koirala Institute of Health Sciences (BPKHS), Dharan
Institute of Medicine, Kathmandu
Jaypee Hospital NOIDA, India
King’s College Hospital, UK
Mahidol University, Thailand
Manipal College of Medical Sciences (MCOMS), Pokhara
Nepalese Association of Clinical Microbiologists (NACM)
Nepal Medical College (NMC), Kathmandu

North Bengal Medical College, Siliguri, India
Post-Graduate Institute of Medical Education and Research, Chandigarh, India
Post-Graduate Institute of Medical Sciences, Pondicherry, India
Tribhuvan University (TU), Kathmandu
University of Balamand, Lebanon
World Health Organization, Nepal



The Nepalese Association of Clinical Microbiologist (NACM) honors Dr. Ziad Daoud, ASM Country Ambassador to Lebanon, at the 1st International Conference (Man, Microbes, Machine), Kathmandu, September 2019.

OUTBREAK: EPIDEMICS IN A CONNECTED WORLD

In 2018, ASM partnered with the Smithsonian Institution’s National Museum of Natural History to launch the exhibit *Outbreak: Epidemics in a Connected World*. Launched to mark the 100th anniversary of the 1918 flu pandemic, the exhibit encourages visitors to consider how epidemics emerge and spread, as well as One Health approaches to fighting them. In 2019, ASM Ambassadors organized pop-up *Outbreak* exhibits in nine locations: Democratic Republic of the Congo, India, Israel, Kenya, Mongolia, Nepal, Puerto Rico, Spain, and Uganda.



Pop-up exhibit September 2019 at the Nepalese Association of Clinical Microbiologists meeting.

Bringing Global Research to the Local Context

When it comes to controlling the spread of deadly infectious diseases, the ASM community is on the frontlines. Our programs help ensure that microbiologists around the world have the knowledge and resources they need to identify and diagnose dangerous pathogens. While sharing knowledge is one thing, applying it in a meaningful way is another. ASM Ambassadors help to build this practical knowledge in their home countries by forging ties with research institutions and laboratories. These relationships help ASM apply its expertise in local contexts, allocating resources where they are most needed.

Again and again, ASM Ambassadors have been at the forefront of action on disease control and prevention in their home countries. This applies not only to global emergencies like COVID-19 but also to initiatives that fight emerging and re-emerging threats.

In Yemen, infectious diseases that were previously eradicated, are emerging and surging at an alarming rate. Further exacerbating the country's public health crisis is the fact that the healthcare system has been devastated by the ongoing civil war. Yemen is currently host to the largest cholera outbreak ever recorded, which has resulted in an estimated 3,900 deaths since 2016.

In April 2019, ASM Country Ambassador Dr. Habib Thabet organized a workshop to address this public health crisis. In partnership with Ibb University and Médecins Sans Frontières, Dr. Thabet brought together 120 participants to discuss the state of the cholera outbreak as well as additional re-emerging infectious diseases. The workshop not only raised awareness among participants about the severity of these outbreaks, but also urged them to consider new strategies for containing the spread of the diseases.



Dr. Habib Thabet welcomes university vice rectors, the head of the Medical Microbiology Department, staff, and specialists from Ibb University, Yemen.



Main event of the WAAW 2019 activities with the attendance of influential and decision makers from various sectors (health, education, agriculture, WHO, NGOs, universities and professional syndicates).

ASM Ambassadors have played a similar role in raising awareness about antimicrobial resistance (AMR). Our members help to diagnose resistant cases in patients, strengthen surveillance protocols, and develop new ways to combat resistant bacteria—and Ambassadors play a crucial role in bringing new information and best practices to institutions in their home countries.

In November 2019, ASM Country Ambassador to Palestine, Dr. Abdelraouf A. Elmanama, helped to organize a series of events for World Antibiotic Awareness Week at the Islamic University of Gaza. In line with the theme “the future of antibiotics depends on us all,” the activities included keynotes by experts from the university, government offices, and the WHO.

A press conference on November 18th focused on the need to coordinate efforts among the general public, health workers, and policy makers to avoid the spread of AMR. Several government offices in Palestine area already showing this kind of collaboration: the Ministry of Health and the Ministry of Agriculture are putting increased controls on the use and sale of antibiotics, while the Ministry of Education has included AMR education in its curriculum for medical students.

Dr. Elmanama and his colleagues inaugurated an exhibition on antibiotic awareness, which included information on proper hygiene practices and alternatives to antibiotic use, as well as an interactive component for visitors to test their knowledge. The event also featured the launch of an educational mobile app to help spread public awareness about AMR and the proper use of antibiotics.

Promoting Equal Opportunities for Female Scientists in Latin America

Latin America leads the world in terms of the number of women working in the sciences, with females representing 45.4% of the regional workforce in the field—significantly higher than the worldwide average of 28.8%, according to UNESCO’s 2018 Women in Science report. However, working in the traditionally male-dominated field of microbiology remains challenging for women, particularly in terms of career advancement.

“I have observed in my country that we have made some progress in bringing down the installed belief that science, technology, engineering, and math (STEM) careers are ‘manly’ careers,” said Maria Laura Ferreira, ASM Young Ambassador to Argentina. “But on the other hand, despite the high ratio of women working in STEM fields, there is an invisible problem: few women reach high-level positions at universities or non-academic (managerial) positions.”

To address this gap, she and two other ASM Young Ambassadors from the region set out to give young women in the sciences a clearer path to success. In conjunction with the Women in Microbiology Network—LATAM, Ferreira, María José González (Uruguay) and Estefania Ochoa (Ecuador) worked together to organize a series of events for women in microbiology in their respective home countries.

“In lower-level microbiology education programs [at the Bachelor’s degree level] in Uruguay, we have a high number of women—this may even exceed the number of men,” González told us. “But when we look at the level of principal professor or laboratory director, the number of women is much lower.”



Scientists and social actors speak on the importance to and impact of women in the field of microbiology. Quito, Ecuador, March 2019.

The three events featured prominent women working in microbiology, who raised awareness and gave advice on the specific obstacles and adversity women in the field face. Keynote topics included overcoming barriers for women in STEM; advancing into managerial-level roles; motivating young girls and women to pursue a career in the microbial sciences; and balancing an innovative scientific career with a family.

According to Ferreira, work-family balance remains one of the biggest challenges for women in Argentina.

“There is a lack of support for women when they become pregnant, and this problem carries over to when they re-enter the workforce after maternity leave,” she said. “Workplaces don’t generally offer adequate infrastructure for mothers with young infants (even with something as basic as a baby-changing facility). On top of that, mothers may fall behind when they are unable to adhere to strict working hours or attend conferences due to family obligations.”

This is why it was important to the Young Ambassadors that the Women in Microbiology events focus not only on new research but also on personal sacrifices and challenges that female microbiologists face. In total, more than 120 women attended the three events.

“I believe that most of the young people who attended realized that the microbiology path is a wide one—many contributions can be made,” Ochoa told us. “And those contributions have an impact, no matter if you’re in a small village or a large hospital in the capital!”

INTERESTED IN BECOMING AN ASM YOUNG AMBASSADOR OF SCIENCE?

QUALIFICATIONS:

➤ **CURRENT ASM MEMBERSHIP**

Join or renew at www.asm.org

➤ **CURRENT ENROLLMENT**

as a student or Ph.D. candidate, or have earned a Ph.D. within the past 5 years.

➤ **DEMONSTRATED LEADERSHIP** in your scientific or academic community.

Contact: international@asmusa.org
Visit: www.asm.org/articles/international/become-a-young-ambassador



Dr. Visnapuu, standing, chats with a WiSci Estonia camper.

AMBASSADORS • • •

Training Future Scientists

ASM Ambassadors are committed to advancing the field of microbiology—and engaging young people is a major part of ensuring that future research is in good hands. Karen Trchounian, ASM Country Ambassador to Armenia, partnered with the Microbial Technologies and Biofuel Innovation Center at the University of Yerevan to bring together high school students for a microbiology workshop in October 2019.

Of the more than 200 students who applied, 45 were selected to attend the four-day workshop, titled *Microbes in Everyday Life: Theory and Practice from School to University*. Participants spent each day learning about foundational concepts of microbiology and were given the chance to apply their knowledge in practical assignments. The students formed small groups to take on individual challenges, including identifying antimicrobial resistance in Gram-positive and Gram-negative bacteria and determining the antibacterial effects of garlic.

Following positive feedback from the students, schools throughout the country announced their intention to have “microbiology open days,” with ASM members and student chapter representatives in attendance. A number of teachers also requested the development of a similar training for science educators in order to raise awareness of the field among schools and society alike.

YOUNG AMBASSADORS • • •

WiSci: Young Women Explore STEAM Careers in Estonia

Gender disparities are an unfortunate reality of the science, technology, engineering, arts and design, and mathematics (STEAM) fields. But the Women in Science (WiSci) Girls' STEAM camp, a program of the United Nations Foundation's *Girl Up* initiative, aims to change that fact.

WiSci, a two-week-long, all-expenses-paid camp for young women, brings together female-identifying secondary school students from around the world to learn from scientists at ASM, Google, NASA, Intel, and more. One of the 2019 WiSci camps took place in Tallinn, Estonia, and ASM Program Coordinator Alexis Rose co-facilitated a microbiology-focused workshop with 100 students from Eastern Europe and the US. Together with ASM Young Ambassador to Estonia Dr. Triinu Visnapuu (pictured left), they explored the invisible world of organisms that live in us, on us, and around us through hands-on educational activities.

In one activity, the students assembled a Foldscope—an innovative and affordable paper microscope that can be built in less than an hour and can magnify samples up to 140x. Students collected and cut samples and examined them with their Foldscoopes. In another activity, Dr. Visnapuu showed the students how to create agar art (see pg. 29) using petri dishes as canvases and bacteria such as *Serratia marcescens* and *Bacillus mycoides* as paint.

Science is an important component of girls' education at every age, but it is imperative that STEAM training is a major focus at the middle and high school levels in order to put girls on a science trajectory. Workshops like WiSci aim to engage girls when they are forming opinions about their abilities and making decisions about their futures. By enhancing girls' STEAM skills through hands-on experimentation, we can inspire young women to become leaders in science.

“

What image comes to mind when I think of a scientist? I see myself.
- WiSci Participant



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