The microbial sciences are experiencing a renaissance; new technologies, rapid diagnostics, and the availability of a bounty of data gathered from this microcosm tell us what major impact microbes have on all forms of life on Earth, and indicate paths for harnessing the power of “good microbes” and defeating the “perilous ones” that can wreak havoc in human and animal populations. Today nearly 60 percent of all infectious diseases are zoonotic, transferred from animal to human. Our human world is more interconnected than ever, and so is our microbial world; what happens in the environments in remote areas of the world can often spell the telltale signs of the next major outbreak, wherever we happen to live, because microbes are unimpeded by the construct of human borders.

The American Society for Microbiology (ASM) is deeply committed to bringing scientists together who study microbes in all environments, whether in the soil or in the oceans, in humans or in animals, in the built environment or in processing plants, realizing that these systems are ultimately all interconnected. We provide the know-how for One Health approaches to understanding our world, and the utility toolbox for all microbial scientists around the globe to help them make the world a better place.
ASM is making a difference. We also grapple with the continuous burden placed on human populations around the world by HIV/AIDS, tuberculosis, malaria, fungal infections, antimicrobial resistant organisms, and many other threats. These debilitating, and often deadly diseases are exacerbated by conflicts in places like Syria, Yemen, Myanmar, Sudan, and South Sudan, where vital public health networks are often compromised or non-existent. These dire situations are exacerbated by food shortages—which were estimated to have put 20 million people at risk of starvation in 2017 alone—and water and sanitation issues, like those contributing to the largest-scale cholera outbreak in recorded history in Yemen.

This year we have completed critical baseline assessments of life science laboratories across Yemen, rebuilt a microbiology laboratory in a former Ebola hotspot in Liberia, and installed four new HIV/AIDS diagnostic laboratories in Côte d’Ivoire, to highlight a few ASM accomplishments. While crises can at times seem insurmountable, laboratory technicians, research scientists, clinical microbiologists, biosafety and biosecurity leaders, epidemiologists, veterinarians, staff, and leaders of laboratories and institutions are hopeful, uplifted by the solutions that the microbial sciences can provide—but even more so by the selfless individuals who continue to press onward and advance those scientific and public health solutions. ASM is on the front lines of global health, where laboratory networks provide the backbone of necessary services to train, identify, assess, and respond to infectious disease outbreaks around the world, often in extremely challenging situations.

ASM is fortunate to have the opportunity to count on highly qualified and dedicated members, the true heroes in global public health, who help transform our fragile human world by curbing and harnessing the power of the microbial world. It is my pleasure to present this report to you, which highlights the stories made possible by our ASM heroes.

Stefano Bertuzzi, Ph.D.
CEO, American Society for Microbiology
What We Do

By deploying the expertise of ASM members, we help governments, healthcare systems, educational institutions, and other partners to achieve positive public health outcomes for the populations they serve. We build sustainable scientific capacity and increase capability in the microbial sciences in 109 countries across the globe.

Strengthening Laboratory Capacity

We strengthen laboratory capacity in remote, underserved areas, and work with local staff to help their facilities meet international standards.

- Laboratorians utilize international best practices and can provide quick, accurate diagnoses that help prevent the spread of infectious diseases in their communities. These diagnoses are vital to informing and empowering both healthcare providers and patients on appropriate treatment and management of diseases. [Click here to read more]

Improving Human Resource Capacity

Our global network of experts enables us to deliver trainings on best practices in testing, diagnosis, and communicating results.

- Laboratorians understand international best practices and can provide quick, accurate diagnoses that help prevent the spread of infectious diseases in their communities. Patients are empowered to seek diagnoses through safe, affordable laboratory services in their areas. [Click here to read more]
We deliver biorisk management trainings based on international standards, while seeking cost effective solutions in resource-limited settings.

Local biorisk management leaders are empowered to prevent both the accidental and deliberate release of high risk pathogens. By building individual skills and positive behavioral changes, these leaders are able to make lasting change at their institutions and beyond. ▶️ Click here to read more

Building Strong Surveillance Networks

We develop sentinel laboratories and contribute to the drafting of national action plans to help governments combat antimicrobial resistance and other pressing public health problems.

Clinicians and governments are better able to understand, track, and stop the spread of dangerous pathogens with well-defined strategies and plans.

▶️ Click here to read more

Applying Biorisk Management Best Practices

We deliver biorisk management trainings based on international standards, while seeking cost effective solutions in resource-limited settings.

Local biorisk management leaders are empowered to prevent both the accidental and deliberate release of high risk pathogens. By building individual skills and positive behavioral changes, these leaders are able to make lasting change at their institutions and beyond. ▶️ Click here to read more
Where We Are

In 2017-2018, ASM implemented programs in 109 countries, focusing on health systems strengthening through workforce development and the establishment of quality management and biorisk management systems.

| **89** countries with ASM Country Ambassadors |
|------------------|------------------|
| **80** countries with ASM Young Ambassadors of Science |
| **24** countries with active capacity-building programs |
| **17** International Student Chapters |

**ASM’S GLOBAL PRESENCE**

**AMERICAS**
- Argentina
- Brazil
- Canada
- Chile
- Colombia
- Cuba
- Dominican Republic
- Ecuador
- El Salvador
- French Guiana
- Guyana
- Haiti
- Jamaica
- Mexico

- Panama
- Paraguay
- Peru
- Saint Kitts and Nevis
- Saint Lucia
- Uruguay
- Venezuela

**AFRICA**
- Angola
- Benin
- Botswana
- Cameroon
- Côte d’Ivoire
- Democratic Rep of Congo
- Ethiopia
- Ghana
- Guinea
- Kenya
- Liberia
- Malawi
- Mauritius
- Mozambique
- Namibia
- Nigeria
- Rwanda
- Senegal
- South Africa
- Sudan
- Tanzania
- Togo
- Uganda
- Zambia
- Zimbabwe

**MIDDLE EAST & NORTH AFRICA (MENA)**
- Egypt
- Iran
- Iraq
- Jordan
- Kuwait
- Lebanon
- Morocco
- Palestine
- Oman
- Qatar
- Saudi Arabia
- United Arab Emirates
- Yemen
EUROPE & EURASIA
- Austria
- Armenia
- Belgium
- Croatia
- Cyprus
- Czech Republic
- Estonia
- Finland
- France
- Georgia
- Germany
- Greece
- Hungary
- Italy
- Lithuania
- Netherlands
- Poland
- Portugal
- Russia
- Scotland
- Serbia
- Spain
- Sweden
- Switzerland
- Turkey
- Ukraine
- United Kingdom

MENA
- Afghanistan
- Bangladesh
- Cambodia
- China
- Hong Kong
- India
- Indonesia
- Japan
- Kazakhstan
- Malaysia
- Myanmar
- Nepal
- Pakistan
- Philippines

ASIA
- Singapore
- Sri Lanka
- Taiwan
- Thailand
- Vietnam

AFRICA
- Australia
- New Zealand
2017–2018 Highlights

91 Country Ambassadors
- Female: 38%
- Male: 62%

80 Young Ambassadors
- Female: 41%
- Male: 59%

21 US Young Ambassadors
- Female: 48%
- Male: 52%

Additional Country Ambassadors since 2016

Additional Young Ambassadors since 2016

US Young Ambassadors*
* = launched in 2018

ASM Ambassadors

Our Ambassadors are local leaders who work with ASM to foster collaboration and engagement with local institutions, and assist ASM in responding to the needs of their scientific communities.
41 laboratories benefitted from improved biosafety measures as a result of the 52 Weeks of Biosafety program.

49 workshops conducted

944 people trained

- President’s Emergency Plan for AIDS Relief (PEPFAR): 51%
- Global Health Security Agenda (GHSA): 33%
- Biosecurity Engagement Program (BEP): 16%

Africa: 54%
Asia: 42%
Europe: 4%

Examples of Training Topics
- Light-Emitting Diode (LED) Microscopy
- Antimicrobial Susceptibility Testing (AST)
- Biorisk Management
- Blinded Rechecking External Quality Assurance (EQA)
- Quality Management Essentials
- Writing and Publishing Articles
- Laboratory-based Surveillance of Zoonoses
Local Changes for Global Results

STRENGTHENING LABORATORY CAPACITY

We strengthen laboratory capacity in remote, underserved areas, and work with local staff to help their facilities meet international standards.

THE CHALLENGE

- Under-developed infrastructure
- Lack of sustainable management planning
- Global shortage of trained laboratory personnel

Patients lack access to accurate diagnoses—and treatment—for potentially deadly diseases, which may contribute to the unchecked spread of epidemic-prone diseases like HIV/AIDS, TB, or Ebola.
Empowering laboratorians to provide diagnoses that equip healthcare providers with critical information to improve quality of patient care and health outcomes.

A laboratory technician performs a rapid diagnostic test (RDT) for the detection of HIV in Mozambique. Credit: American Society for Microbiology
Côte d’Ivoire has the second-highest HIV prevalence rate of any West African country. As one of the leading causes of death, HIV/AIDS weighs heavily on the nation’s health system. However, the disease remains under-diagnosed, with only an estimated 58% of infected people knowing their status.

ASM, in partnership with the Centers for Disease Control and Prevention (CDC), is expanding access to HIV viral load (VL) testing and early infant diagnosis (EID) throughout Côte d’Ivoire. In 2017, ASM added eight new testing sites across the country. Combined with the four modular molecular laboratories established in 2016, the addition of these regional testing sites has helped Côte d’Ivoire exceed its 2017 HIV testing target by 141%—and increase testing coverage from 10% to 62% across the country in less than two years.

The expansion of testing services throughout the country makes it easier for patients to learn their HIV status. While many patients previously had to travel a full day’s journey to the capital to get tested, they can now access testing services closer to home. These gains are a major step toward controlling the spread of the disease. Around 76% of known HIV patients in the country are already on antiretroviral (ARV) treatment regimens and demonstrating VL suppression; the addition of new testing services will bring Côte d’Ivoire closer to meeting the UNAIDS 90-90-90 targets.

In 2018, ASM expects to deliver and help establish four more containerized medical laboratories, bringing the total number of regional testing hubs to 12. Coupled with 50 new pre-analytic sample collection sites, these hubs will provide the capacity and reach necessary to increase testing coverage and empower patients with accurate information about their health.

HIV testing coverage has been increased from 10% to 62% nationwide in just two years.
Since 2015, Tanzania has been battling a cholera outbreak, with more than 30,000 reported cases resulting in over 500 deaths. Cholera is an acute and deadly diarrheal disease that can be contracted via unsanitary food or water. Many people across the country use unsafe drinking water from contaminated sources and lack access to basic sanitation and hygiene. If detected early, however, cholera—like many other infectious diseases—is easily treatable. A strong laboratory network is critical to early diagnosis and containment.

To ensure that the areas with the highest disease burden have access to quick and accurate diagnostics, ASM has trained 16 local mentors who are working with 19 regional laboratories to advance their microbiology capacity. ASM’s objective is to train up to two mentors per site across all regions of Tanzania, with the ultimate goal of implementing sufficient laboratory capacity to support data-based decision-making for positive health outcomes.

Thus far, ASM has achieved success at all 19 locations, with mentors stationed at each site to train their fellow colleagues on proper microbiology techniques. With the introduction of trained microbiologists at sites that did not previously have employees with these skill sets, the implementation of proper diagnostic capabilities are now becoming a reality. Patients are able to receive quick and accurate diagnoses, which in turn, leads to recovery. By engaging these laboratories, ASM has been able to collect data from each site to track and identify cases of cholera and other priority diseases.

**30,000 reported cases of cholera with more than 500 deaths since 2015.**
In Georgia, antimicrobial resistance (AMR)—and in particular multidrug-resistant tuberculosis (MDR-TB)—is an increasingly serious public health threat. As bacteria become less responsive to common treatment options, people in resource-limited countries are faced with a lack of access to effective medicines, which may not be available or are prohibitively expensive.

As Georgia works to control MDR-TB and AMR among its population, bacteriologists at the Lugar Center, the Georgian National Reference Laboratory, have been working towards international accreditation. Accreditation demonstrates a laboratory’s ability to properly test specimens and provide timely and accurate results to patients and doctors. This new focus on accreditation is positioning the Lugar Center on the frontlines of the efforts to curb the effects of MDR-TB in Georgia.

ASM, in partnership with the Lugar Center, has succeeded in its efforts to improve the standard of diagnostics by implementing the ASM Microbiology Mentoring training program. In the past, a lack of quality control for testing services has led to widespread inaccurate diagnoses among patients. By promoting standards of excellence in foundational microbiology techniques and antibiotic susceptibility testing through comprehensive trainings, ASM has been able to establish quality-controlled testing of all relevant specimens, provide more accurate diagnoses, and position the laboratory for international accreditation.

64% of Georgian TB patients tested were resistant to first-line TB medicines in 2008.
India faces unique challenges in fighting two zoonotic diseases: leptospirosis, caused by the *Leptospira* spp., and anthrax, which is caused by *Bacillus anthracis*. The spread of these diseases is perpetuated by the free movement of cattle, which enjoy both cultural and religious reverence in Hindu culture. However, since cows are liable to carry both of these deadly zoonoses, accurate diagnosis and disease reporting is necessary to control the spread of disease to the human population.

In partnership with the Ranchi Institute of Medicine, the U.S. Centers for Disease Control and Prevention (CDC), the National Institute of Veterinary Epidemiology and Disease Informatics (NIVEDI), and Manipal University, ASM supported capacity building for molecular diagnostics of anthrax. Thirty-five scientists from 13 endemic districts participated in the three-day training, which provided continuing education for attendees on basic and complex microbiology skills, including sample collection, packaging and safe transport, processing, and biosafety and biosecurity practices. The curriculum will help to build the country’s ability to surveil zoonotic diseases.

In partnership with the State of Gujarat and NCDC, ASM also targeted laboratory capacity building efforts on public health laboratories in Gujarat, with a focus on medical colleges and district hospitals. ASM hired three local consultants with backgrounds in medical microbiology and pathology to train 55 faculty members and 50 laboratory technicians and epidemiologists. Individualized support was also provided to 10 laboratories during weekly mentoring visits, which included gap analyses and the development of improvement plans.

140 laboratorians and health care professionals benefitted from ASM–supported training in 2017.
For decades, Liberia’s health system has struggled under the weight of political crises—including two civil wars—and the widespread infectious disease outbreaks. The most recent of these was the 2014-15 Ebola outbreak, which caused 10,000 cases in the country. The outbreak crippled public health infrastructure, created food shortage issues, and devastated the economy. These catastrophic events have decimated Liberia’s laboratory system, resulting in major gaps in the country’s ability to provide timely and accurate diagnoses to patients.

Since 2017, ASM has been working closely with the newly established laboratory team at Phebe Hospital and School of Nursing in Bong County to implement basic microbiology services. Located in a former Ebola hot zone, the hospital serves about 450,000 people (around 10% of the country’s population), and suffered devastating losses when most of its laboratory staff died during the Ebola outbreak.

Working with the Henry F. Jackson Foundation and the Austere Environments Consortium for Enhanced Sepsis Outcomes (ACESO) group, ASM has fully trained four new laboratory mentors on basic microbiology testing and blood culture techniques. These mentors are now able to independently carry out a pre-set menu of laboratory tests, manage supplies and equipment to ensure quality diagnostics are provided, and oversee reporting of results via proper documentation methods.

In just one year, ASM and the local staff brought this laboratory from nonexistent to operational. In addition to the trainings, ASM has made recommendations on laboratory space, equipment usage, and staff communications, all of which are intended to promote better patient care outcomes.

More than 4,800 Liberians died as a result of the 2014-15 Ebola outbreak.
With more than 73,000 tuberculosis (TB) cases diagnosed in 2016, Mozambique has one of the highest rates of TB in the world. In 2017, ASM worked with local laboratories to deliver a step-down training initiative that bolsters TB diagnostic capacities and testing access.

Only three laboratories—the National Reference Laboratory (NRL) and two regional laboratories in Nampula and Biera—are currently capable of performing TB cultures. Working with these designated “champion” laboratories, ASM helped establish best practices for important practices like drug susceptibility testing on first-line TB drugs and line probe assay. Each of these three laboratories then helped to train additional facilities to increase diagnostic accuracy and accessibility. This step-down training technique develops cadres of trained technologists who pass their knowledge, expertise, and skills to smaller more rural laboratories, enabling them to run more advanced tests more accurately.

To ensure all laboratory work is performed with workers, community, and environmental safety in mind, ASM is working closely with the Ministry of Health to develop national biosafety guidelines and standardized TB and microbiology training packages. These will eventually be distributed throughout the country’s 11 provinces—an essential first step toward standardizing laboratory safety.

ASM will continue creating laboratory “champions” to reduce the burden of TB in Mozambique in the year to come, working with the Ministry of Health to disseminate the 2017 biosafety guidelines to improve the specimen referral system and promote standards of excellence nationwide.

ASM trained 375 laboratorians in Mozambique in 2017.
Resource-limited countries, which are often the hardest hit by infectious disease outbreaks, suffer the most from this lack of human resources.

Ensuring that laboratory workers have the tools they need to accurately diagnose infectious diseases

Implementing surveillance protocols to stop epidemics before they begin
Empowering microbiologists to implement the changes needed to meet global norms and targets for disease control
In El Salvador, many of the doctors who run rural public health clinics are also actively engaged in epidemiological research. A recent research study in the northern municipality of Chalatenango, for example, discovered that urinary tract infections, bacterial vaginosis, and periodontal disease were driving factors of premature births. These findings served as the evidence base for national guidelines for clinical management of pregnant women.

While the work of these clinicians provides invaluable insight into patient care and outcomes, it is generally not well distributed. Very few of these studies are published or peer-reviewed on an international level.

ASM is engaging local experts to help bring important research findings from El Salvador into national and global health policymaking. This began in March 2017, when ASM Country Ambassador, Dr. Leonor Linares, and ASM Young Ambassador of Science, Dr. Tatiana Ascencio, hosted a scientific writing and publishing workshop. The virtual course trained 15 clinicians working in the department of Chalatenango on effective writing techniques and strategies for publishing research results.

Dr. Ascencio knows the benefits of the workshop have been significant, saying, “It has been possible to establish alliances between the government and private institutions, which have allowed for new research studies.”

These new alliances have created opportunities for studies on HPV in women, leading to greater awareness by clinicians to diagnose the disease, and greater publicity for the issue. With plans to conduct more workshops in the future, El Salvador’s doctors and researchers will be able to build its culture of scientific publishing to further enhance patient treatment outcomes.

**15 clinicians** were trained in effective strategies for publishing research.
A country of some 17,000 islands—around 8,000 of which are inhabited—Indonesia is not only host to some of the greatest biodiversity on the planet, but also to vastly different cultures and some 700 spoken languages or dialects. This diversity poses great challenges in establishing standards and protocols for the country’s health system, including the Indonesian national clinical microbiologist residency training program. While the program is intended to standardize microbiologist competencies throughout the country, its delivery and results vary greatly.

In December 2016, ASM partnered with the Indonesia Society for Clinical Microbiology (PAMKI) to revise and standardize the curriculum framework across universities throughout the country. The project set forth a year-long process between PAMKI and ASM subject matter experts who provided expertise on the curriculum framework and teaching methodologies, as well as biosafety and biorisk management. Some of the main changes included standardization and integration of biosafety instruction into the curriculum and a shift in teaching styles to mirror practices implemented at the Mayo Clinic. This includes replacing traditional didactic lectures with reading and preparation by students before class, leaving time during class for more interactive, practical explorations of content.

After a year, the groups reconvened in Surabaya for an implementers’ workshop, where they finalized the curriculum book that PAMKI is rolling out for use in resident trainings at universities across the country. In addition to the finalization of the curriculum book, the implementers discussed ideas for continued improvements in the safety and security of clinical microbiologists across the country.

There are 1.02 million TB cases in Indonesia each year, according to World Health Organization estimates.
Stopping Epidemics Before They Start

BUILDING STRONG SURVEILLANCE NETWORKS

We develop sentinel laboratories and contribute to the drafting of national action plans to help governments combat antimicrobial resistance and other pressing public health problems.

THE CHALLENGE

High rates of antimicrobial resistance have been observed in all regions of the world, with the World Health Organization warning that we are on the verge of a “post-antibiotic era”.

OUR STRATEGY

Strengthening surveillance mechanisms around the globe to ensure that cases of resistant pathogens are recorded, tracked, and treated.
Refine diagnostic practices
Establish standard operating procedures
Implement national strategies

Laboratorians and governments gain a better understanding of surveillance practices that can stop epidemics in their tracks.

An infant with HIV is treated in a hospital in Côte d’Ivoire.
Credit: American Society for Microbiology
In Vietnam, widespread misuse of antibiotics—including overprescription and over-the-counter sales—has led to a rapid increase in rates of antimicrobial resistance (AMR) in recent years. To protect against this threat to public health, ASM is collaborating with the Vietnam Ministry of Health to establish AMR surveillance mechanisms for eight WHO-designated priority pathogens.

Laboratory leaders have identified the need for quality standard operating procedures for bacterial identification and antimicrobial susceptibility testing (AST). They have also noted that many laboratory technicians need to gain a better understanding of susceptibility testing and quality control practices. ASM is working directly with laboratory teams from 16 designated sentinel surveillance laboratories in Ho Chi Minh City and Hanoi to implement these new practices.

ASM is working with these sentinel laboratories to implement quality AST and other AMR surveillance and recording techniques, in line with goals laid out in Vietnam’s AMR National Action Plan. Since mid-2017, ASM has trained 16 laboratorians, from senior scientists to technicians, on foundational microbiology techniques to provide accurate diagnoses of various priority pathogens that are prevalent across Vietnam. This core team of Vietnamese microbiologists is now capable of serving as subject matter experts, trainers, and educators around AST and data management.

Within the next few years, ASM plans to expand AST trainings to sites across Vietnam, including many in remote areas. Many of these workshops will be led by this first cadre of ASM-trained microbiologists, who will now be able to spread their knowledge and serve as mentors to staff in other laboratories.

80% of antibiotics used in Vietnam are sold without prescription.
Lower respiratory infections, diarrheal diseases, and tuberculosis (TB) are among the top causes of death in Ethiopia. As these illnesses are also commonly complicated by antibiotic-resistant bacteria, effective diagnostics and close monitoring of patients is necessary to identify and prevent the spread of AMR.

To improve laboratory services across the country, ASM began a partnership with the CDC-Ethiopia and the Ethiopian Public Health Institute (EPHI) in 2016. A key component of this partnership has been the development of the 2016–2020 Ethiopia AMR Surveillance Plan to control the spread of AMR, as well as the provision of technical assistance to laboratories functioning as surveillance sites. In 2017, ASM began training staff at 16 pilot surveillance laboratories in accordance with the national plan. ASM worked to establish national specimen referral guidelines across Ethiopian laboratories, engaging technicians at four of these sites to increase AMR surveillance through a standardized mentoring program.

Through the ASM Microbiology Mentoring program, ASM has also been working with the National Reference Laboratory (NRL) and two regional laboratories in Adama and Bahir-Dar to improve quality management. In 2017, all three laboratories achieved 5-star status—the highest level—in the Stepwise Laboratory Quality Improvement Process Towards Accreditation (SLIPTA), showing that they can produce timely, reliable, and accurate diagnosis of resistant pathogens.

In 2017, 36% of urine and wound specimens collected at the Ethiopian NRL showed resistance to traditional antibiotics.
A Roadmap for Reducing Risk

APPLYING BIORISK MANAGEMENT BEST PRACTICES

We deliver biorisk management trainings based on international standards, while seeking cost effective solutions in resource-limited settings.

THE CHALLENGE

Failure to adhere to biosafety management best practices can lead to the accidental spread of dangerous pathogens through occupational exposure, into the community and the environment.
Conduct in-country workshops and trainings, and virtual engagements to help laboratorians understand and implement internationally recognized best practices.

**OUR STRATEGY**

A culture of world-class biosafety and biosecurity strategy in even the most resource-limited countries.

**THE RESULT**

EDTA tubes in a HIV sample receiving area in Côte d’Ivoire.
Credit: American Society for Microbiology
More than 1 million people in Yemen have been infected during the cholera outbreak.

Yemen has been ravaged by war since March 2015, with estimated casualties standing at more than 10,000 deaths and more than 40,000 injuries by the end of 2017. The war has leveled the country’s public health system, allowing infectious diseases to run rampant through the population and leading to one of the worst cholera outbreaks in history. In late 2017, the United Nations estimated that more than 1 million people had contracted the disease. Ensuring that proper biosafety measures are established and followed is vital to preventing the spread of cholera and other pathogens.

To better understand the constraints and challenges local laboratories are facing, ASM conducted a country-wide laboratory infrastructure and security survey, to which 260 employees at 30 public and private laboratories responded. The survey results described capacity gaps, waste management practices, infrastructure challenges, and other pressing problems.

Eighty survey respondents were selected to participate in biorisk management workshops, which took place in Aden, Ibb, Sana’a, and Taiz. From this group, ASM has selected 20 participants for further training intended to develop them as biorisk management leaders. ASM anticipates that these leaders will be able to rebuild the health systems that have collapsed during the war.

ASM’s former Ambassador Dr. Nagi Al-Haj (second term ended December 2017) and Young Ambassador Ms. Sumia Abbas played critical roles in coordinating activities on the ground. Their efforts illustrate the great resolve of scientists dedicated to providing the necessary services for health and veterinary systems, even in the face of great danger.
Middle East & North Africa (MENA) Biosecurity Fellowship

In 2018, ASM is engaging 10 early career scientists in the MENA region with a biosecurity fellowship. Fellows applied to the program by submitting a project proposal designed to improve an aspect of biosecurity at their institution or more broadly throughout the country. Fellows will meet for a kick-off workshop, in which they will work with an ASM biosecurity expert and be paired with mentors. Mentors are mid-to-senior-level scientists at their institutions or in their country who will serve to guide the Fellows through their projects. In addition, the Fellows will participate in four webinars with the ASM biosecurity expert throughout the year, to reinforce their learning and understanding of biosecurity best practices.
230 scientists in Pakistan and Egypt have been trained using the 52 Weeks of Biosafety program.

Improving local understanding and implementation of biosafety practices is critical to controlling high-consequence pathogens that affect both humans and animals in Pakistan. In 2017, ASM trained a fourth cohort of Pakistani life scientists through its 52 Weeks of Biosafety program, a year-long course that provides scientists with applicable knowledge and skills. The program promotes positive behavioral shifts that they apply to their work to improve the biorisk management best practices in their home institutions.

The course aims to build a One Safe laboratory culture in which safety and security is integrated into standard operating procedures for laboratorians and institutions as a whole. Over three intensive in-person workshops, participants engage with biosafety expert and course facilitator Mr. Sean Kaufman.

The workshops provide opportunities to gain practical experience in biorisk management, with topics including the donning and doffing of personal protective equipment; emergency preparedness and response for a variety of situations, including injuries in the laboratory and the evacuation of laboratories during emergency events or attacks; designing mock standard operating procedures; and biological waste management.

In addition to the in-person workshop, the course includes 10 monthly webinars and individual courses on topics relating to laboratory safety and security. Each month, participants are expected to complete assignments that relate to that month’s webinar. Some of these include posting proper signage at locations in the laboratory, assembling spill kits, and fridge and freezer clean-outs. With a better understanding of biosafety best practices, these local laboratorians are now better equipped to diagnose and control the spread of high-risk pathogens in Pakistan.
52 Weeks of Biosafety was really an amazing program. It was very beneficial both on a personal and professional level, with contents covering all the basic concepts of biosafety and biosecurity.

Dr. Saba Rafique, National Reference Laboratory for Poultry Diseases

Focus on: Crimean Congo Hemorrhagic Fever

Crimean Congo Hemorrhagic Fever (CCHF), a virus affecting large livestock, is transferred from animal to humans through ticks or through close contact to tissue, especially after slaughter. This pathogen is endemic to Pakistan and of particular concern due to the high rate of the disease in livestock and the corresponding religious holiday of Eid al-Adha, at which time some 8 million animals are slaughtered around the country. Now, and for the majority of the next decade, the holiday falls in the warmer summer and spring seasons when prevalence rates are highest for the virus. CCHF presents as an issue at slaughter, in hospitals with infection control practices, and in the lab during diagnostic tests.
In 2018, ASM is taking an exciting new direction by applying its full scope of biosecurity expertise to communities outside of life science laboratories and hospital settings. In Egypt, ASM will work with farmers and families to increase biosecurity practices at the local level, which will help limit human exposure to avian influenza.

Over the past 10 years, there have been several outbreaks of highly pathogenic avian influenza (H5N1) in Egypt. These outbreaks have been hard to contain due to the widespread practice of household poultry production, with nearly 5 million Egyptian families raising poultry. A lack of awareness of household biosecurity measures exacerbates the problem when the birds are slaughtered, putting the slaughterer—often the women and children of the house—at risk of contracting the virus and then spreading it throughout the community.

To address this challenge, ASM will partner with the Animal Health Research Institute, a department in the Egyptian Ministry of Agriculture and Land Reclamation, and other key stakeholders to develop biosecurity protocols to mitigate the risk of avian influenza transmission. ASM will conduct a four-month assessment of existing field data to evaluate cost-neutral biosecurity measures that can be taken advantage of. Following the data collection, ASM will lead a stakeholder meeting to help guide the development of the biosecurity guidelines.

Working closely with local and regional NGOs, ASM will help create an awareness campaign and educational initiative to inform Egyptian households on the proper care, slaughter, and cleaning of poultry. This approach will help establish a sustainable method for families and small-scale farmers to prevent the spread of avian influenza.
Over the next year, ASM will be taking critical steps to create effective surveillance systems for antimicrobial resistance (AMR) across Bangladesh. Following capacity-building efforts over the past year, ASM will work with local and international stakeholders to help the country become a full participant in the worldwide AMR surveillance network.

In 2017, ASM reviewed newly developed standard operating procedures (SOPs) in support of a strong AMR surveillance network. In collaboration with key stakeholders at the Institute of Epidemiology Disease Control and Research (IEDCR) in Dhaka, the SOPs were modified to be compliant with best practices in microbiology and international accreditation requirements. ASM has supported IEDCR in the development of components of their national strategic plan for AMR including their monitoring and evaluation (M&E) plan.

In 2018 and beyond, the SOPs will be used to prepare the 10 designated sentinel laboratories for full AMR surveillance participation. To begin, ASM will lead a workshop in Dhaka to introduce the new SOPs to a broader audience of microbiologists from designated surveillance laboratories across the country.

By preparing local laboratory personnel to adhere to a proper AMR surveillance routines, ASM is helping to both increase awareness of AMR and decrease the long-term threat of AMR to the treatment of patients.
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Content for ASM’s 52 Weeks of Biosafety program was developed by Mr. Sean Kaufman of Safe Behaviors.
REPORT PREPARED BY
Peter Geoghan
Nisha Puntambekar
Katy Stewart

EDITED & DESIGNED BY
Elyse Franko-Filipasic
Yoonji Jung

INTERNATIONAL TEAM STAFF
Sean Conaton, Senior Director
Mark Lim, Assistant Director
Kirsten Bartlett
Kaye Cruz
Laetitia Diatezua
Lynée Galley
Peter Geoghan
Koss Mensah
Emma Muir
Amanda MacDonald
Ade Olarewaju
Arthur Ostrega
Nisha Puntambekar
Kristopher Palensky
Andrea Rosales
Ann Sangthong
Dominique Stokes
Katy Stewart
Maritza Urrego

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