ANNUAL REPORT
2019

ARMED FORCES HEALTH SURVEILLANCE DIVISION

FRIENDS AND COLLEAGUES

It is with great pride that I present the Armed Forces Health Surveillance Division's (AFHSD) accomplishments during 2019. We are a division within the Deputy Assistant Director for Public Health under the Assistant Director, Combat Support (AD-CD). AFHSD operates four main areas, the Epidemiology & Analysis (E&A), the Global Emerging Infections Surveillance (GEIS), the Integrated Biosurveillance (IB) and the Data Management & Technical Support (DMTS) branches.

AFHSD continues to be the officially designated central hub for DoD Biosurveillance in accordance with DoDD 6420.02, "DoD Biosurveillance" of 17 September 2020. Our offices consist of a total of 120 persons, 26 of which are assigned at the three Service public health hubs (16-Army, 5-Air Force, 5-Navy) which we call "Service Satellite Cells." Health surveillance team continues

to solidify the Defense Health Agency's role as a Combat Support Agency (CSA).

This year, AFHSD proudly welcomed visits from senior leaders at the Military Health System. Through our efforts and reporting, it has been established that our capabilities provide value to the MHS. We support the military public health transition to the DHA and work tirelessly to refine our role as a CSA. As you read AFHSD's annual report, we hope it will continue to remind you of our recent successes and the future path that we will take to ensure our mission in 2021. We look forward to continuing this effort in support of the Joint Force in order to fulfill the ultimate goal of helping the Combatant Commands (CCMDs) and the Military Services make the best decisions in protecting the health and readiness of DoD's military and beneficiaries. ∎

Douglas A. Badzik, MD, MPH, COL, MC, USA
Chief, Armed Forces Health Surveillance Division

CONTENTS

THE ORIGINS OF HEALTH SURVEILLANCE

AFHSD is the central epidemiologic health resource for the U.S. military. The division operates within DHA's Public Health Directorate under the Assistant Director for Combat Support.

AFHSD was created in February 2008 as the Armed Forces Health Surveillance Center following the merger of the Army Medical Surveillance Activity's Defense Medical Surveillance System (DMSS) with DoD Serum Repository (DoDSR), the DoD Global Emerging Infections Surveillance and Response System (DoD-GEIS), and the Global Health Surveillance Activity from the Office of the Deputy Assistant Secretary of Defense for Force Health Protection and Readiness.

As the central repository of medical surveillance data for the U.S. Armed Forces, AFHSD manages the DMSS and the DoDSR. The DMSS contains current and historical data on diseases and medical events such as hospitalizations, ambulatory visits, reportable medical events (RMEs), laboratory tests, immunizations, periodic health assessments, and casualty data affecting service members throughout their military careers. The DMSS contains billions of data records on service members and other MHS beneficiaries.

The DoDSR was established in 1989 to store blood sera collected during the De-

DEFENSE HEALTH AGENCY

The DHA is a joint, integrated CSA that enables the Army, Navy, and Air Force medical services to provide a medically ready force and ready medical force to CCMDs in both peacetime and wartime. The DHA supports the delivery of integrated, affordable, and high-quality health services to MHS beneficiaries and is responsible for driving greater integration of clinical and business processes across the MHS.

fense Department testing program for human immunodeficiency virus (HIV) infections. Later, the DoDSR was designated to receive serum specimens collected before and after operational deployments. With more than 66 million serial serum specimens from 11 million individuals, the DoDSR is the world's largest storage facility of its kind.
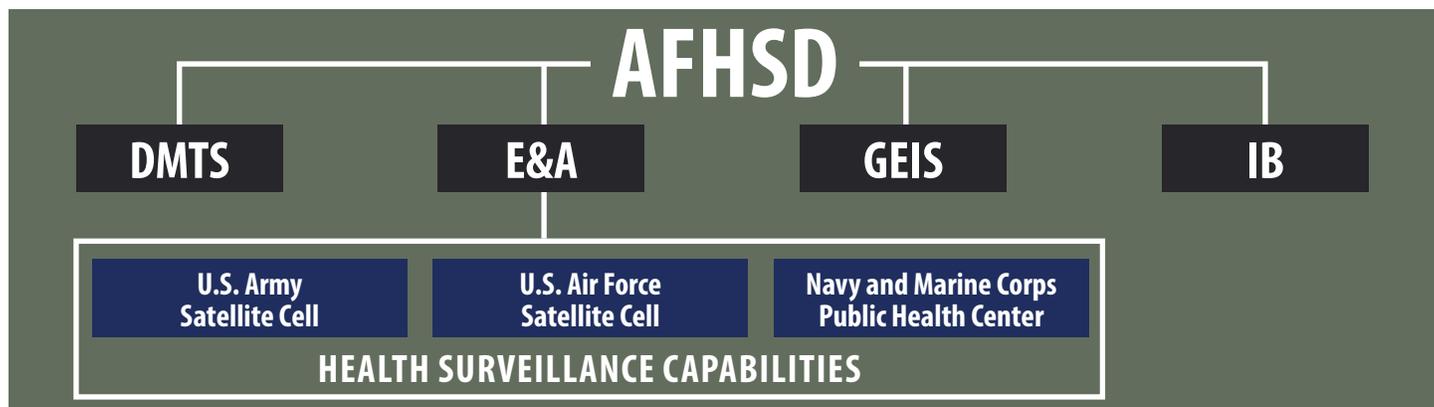
In 1997, the Defense Department established DoD-GEIS in response to a Presidential Decision Directive to expand its mission to include support of global surveillance, training, research, and response to emerging infectious disease (EID) threats. GEIS coordinates AFHSD's global EID surveillance and response initiatives among a network of partner organizations and executes a militarily relevant

surveillance program involving respiratory infections, enteric infections, febrile and vector-borne infections (FVBI), and antimicrobial-resistant organisms. The AFHSD also plays a key role in integrating biosurveillance by collecting data and information in near real-time of the threats from endemic diseases and EIDs relevant to the military worldwide.
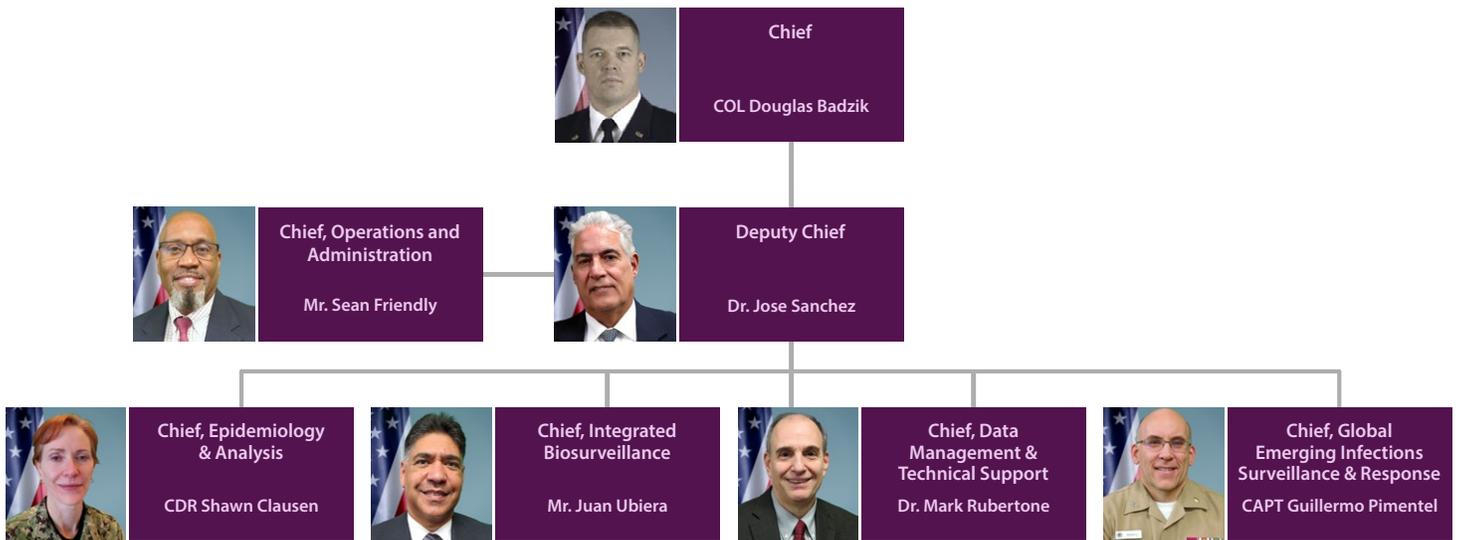
AFHSD publishes summaries of notifiable diseases, trends of illnesses of special interest, and field reports describing outbreaks and case occurrences in its peer-reviewed journal, MSMR. AFHSD also provides up-to-date information on diseases that could affect force health readiness and protection.

AFHSD also assumed responsibility of the health surveillance capabilities of the Service Public Health Hubs, which include personnel from the U.S. Army Public Health Center (APHC), U.S. Air Force School of Aerospace Medicine (USAF-SAM), and the Navy and Marine Corps Public Health Center (NMCPHC). The Service Public Health Hubs' select surveillance personnel and assets are satellites of AFHSD.
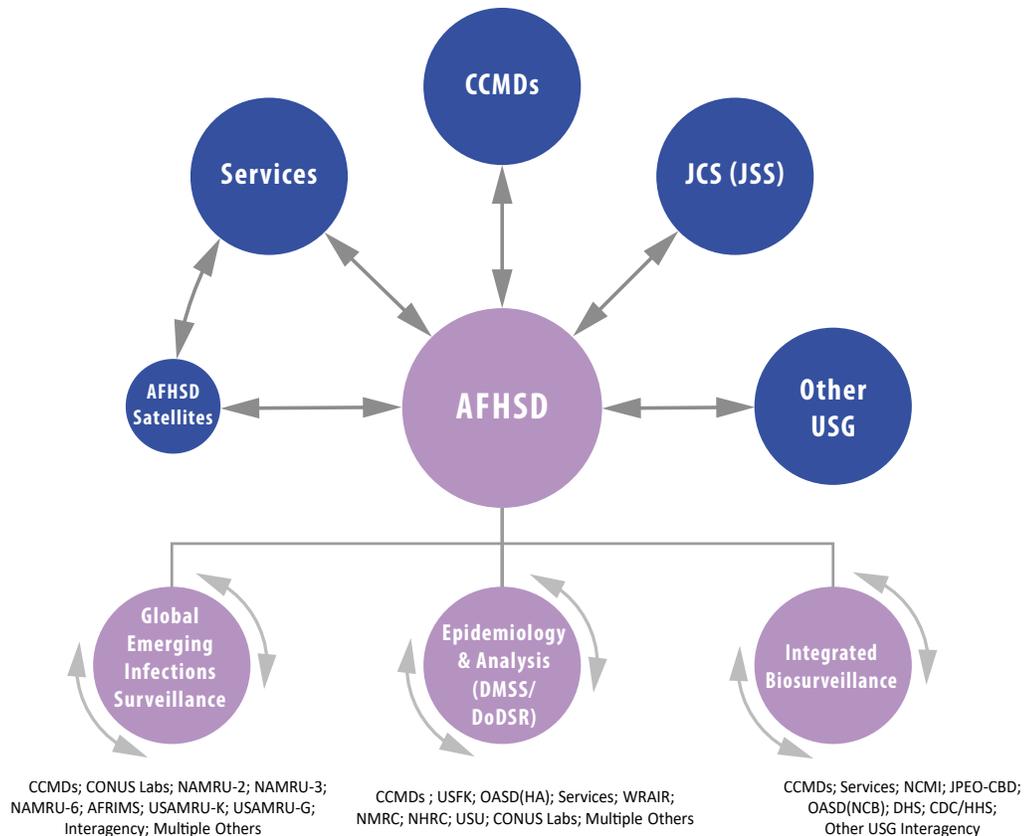
AFHSD is currently organized into four sections: Data Management and Technical Support (DMTS), E&A, GEIS, and IB. ■

AFHSD

DMTS	E&A	GEIS	IB

U.S. Army Satellite Cell	U.S. Air Force Satellite Cell	Navy and Marine Corps Public Health Center

HEALTH SURVEILLANCE CAPABILITIES

ORGANIZATION CHART

Chief

COL Douglas Badzik

Deputy Chief

Dr. Jose Sanchez

Chief, Operations and Administration

Mr. Sean Friendly

Chief, Epidemiology & Analysis

CDR Shawn Clausen

Chief, Integrated Biosurveillance

Mr. Juan Ubiera

Chief, Data Management & Technical Support

Dr. Mark Rubertone

Chief, Global Emerging Infections Surveillance & Response

CAPT Guillermo Pimentel

CUSTOMERS AND STAKEHOLDERS

CCMDs

Services

JCS (JSS)

AFHSD Satellites

AFHSD

Other USG

Global Emerging Infections Surveillance

Epidemiology & Analysis (DMSS/ DoDSR)

Integrated Biosurveillance

CCMDs; CONUS Labs; NAMRU-2; NAMRU-3; NAMRU-6; AFRIMS; USAMRU-K; USAMRU-G; Interagency; Multiple Others

CCMDs ; USFK; OASD(HA); Services; WRAIR; NMRC; NHRC; USU; CONUS Labs; Multiple Others

CCMDs; Services; NCMI; JPEO-CBD; OASD(NCB); DHS; CDC/HHS; Other USG Interagency

AFHSD FINANCES

AFHSD distributed nearly $60M of its funds directly to laboratory partners through the GEIS program following an extensive internal and external proposal review process.

Funding recipients included the Army and Navy overseas laboratories such as the US Army Medical Directorate of the Armed Forces Research Institute of Medical Sciences (USAMD-AFRIMS) U.S. Army Medical Research Directorate-Georgia (USAMRD-G); U.S. Army Medical Research Directorate-Kenya (USAMRD-K), and Naval Medical Research Center Unit No. 2, 3, and 6 (NAMRU-2, NAMRU-3, and NAMRU-6, respectively). Several CONUS-based military and university partners including the Naval Medical Research Center (NMRC), Naval Health Research Center (NHRC); USAFSAM; NMCPHC; Walter Reed Army Institute of Research (WRAIR); and Uniformed Services University of the Health Sciences (USU) among others also received funding in support of their robust programs that benefit the DoD and partners. The remaining funds supported various AFHSD sections and headquarters as well as biosurveillance initiatives, comprehensive health surveillance service and support contract staff, contract personnel working with the MSMR and the DoDSR, and other infrastructure costs. ■

FY19 DISTRIBUTION OF GEIS FUNDING FOR SURVEILLANCE
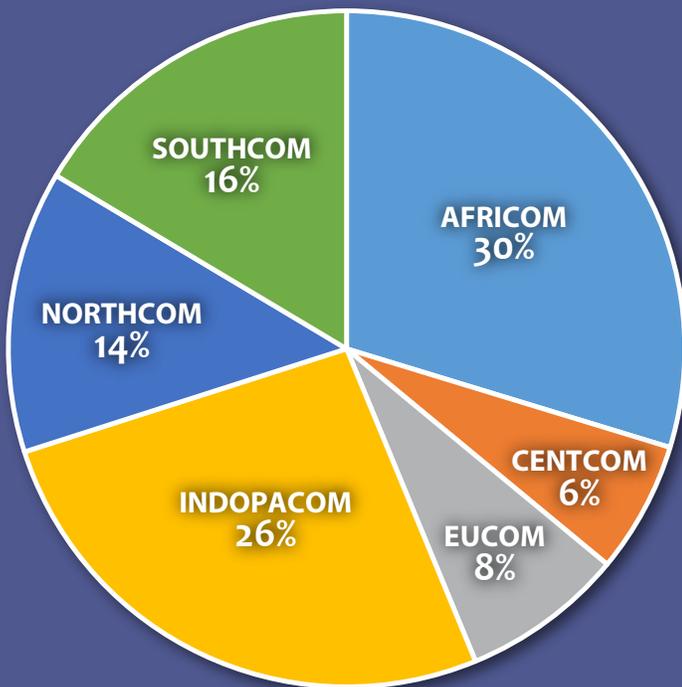
GCC	FY19 Annual Funding	Percent Funding
USAFRICOM	$17,294,465	30%
USCENTCOM	$3,660,174	6%
USEUCOM	$4,522,437	8%
USINDOPACOM	$15,303,094	26%
USNORTHCOM	$7,857,214	14%
USSOUTHCOM	$9,563,955	16%
Total:	$ 58,201,339	100%

NOTE: The GEIS Annual Budget in FY19 was $60,186,000. The remaining funding that does not appear in the total above ($58,201,339) was earmarked for GEIS travel and other reimbursements ($1,984,661).

WE CONDUCT MILITARY MEDICAL SURVEILLANCE, SUPPORT CLINICAL CARE, AND CONDUCT SEROEPIDEMIOLOGIC INVESTIGATIONS
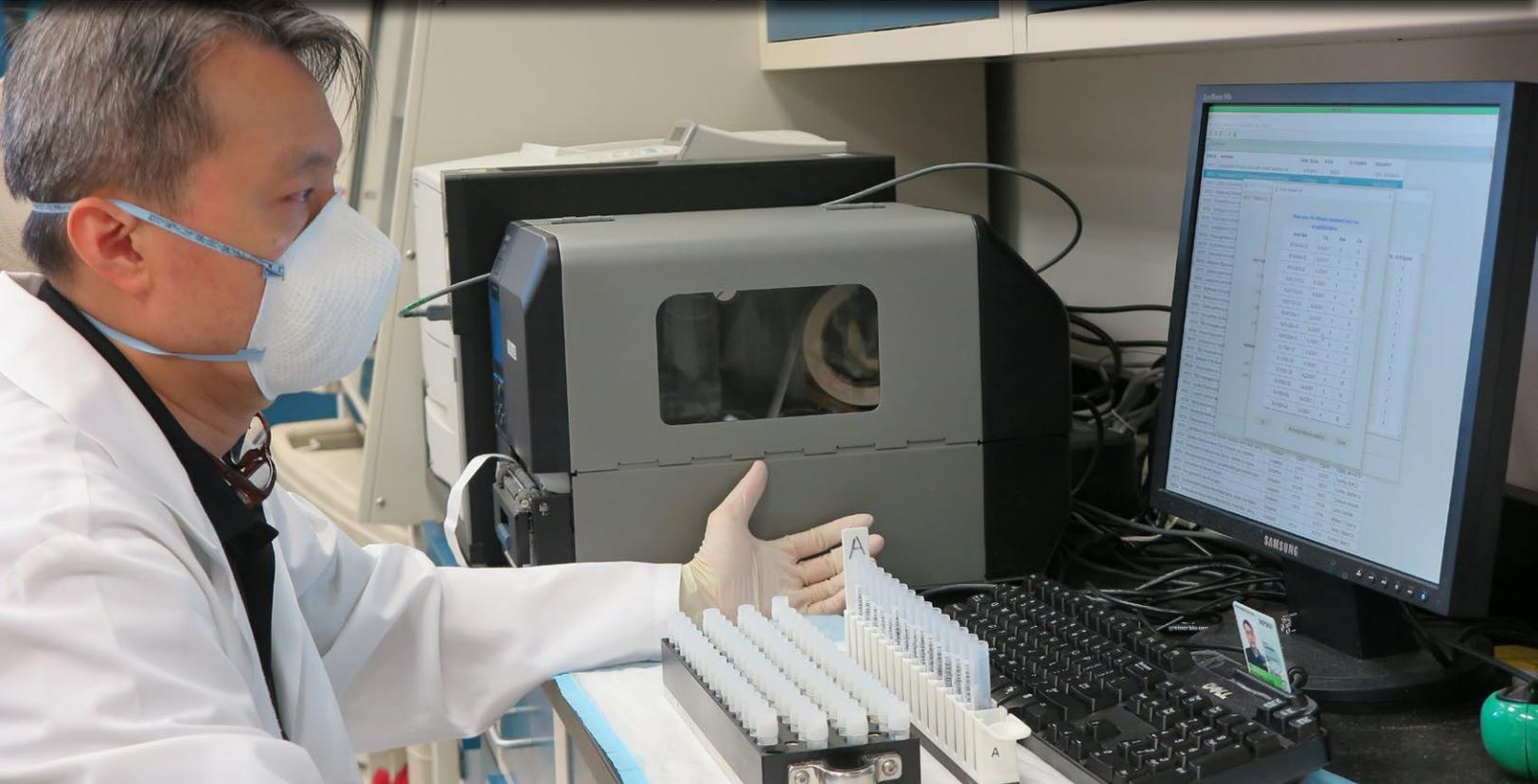
DATA MANAGEMENT AND TECHNICAL SUPPORT

The Data Management and Technical Support (DMTS) section provides the technical infrastructure and database management expertise to support AFHSD's mission to conduct comprehensive surveillance and analysis of health-related information for DoD service members and military-associated populations. DMTS operates two function areas which are detailed below:

The Defense Medical Surveillance System (DMSS) and Department of Defense Serum Repository (DoDSR) are longstanding and vital assets to medical surveillance within the U.S. Armed Forces. The DMSS and DoDSR have their historic roots in routine HIV screening and surveillance. However, their functions were expanded in the early 1990s to encompass all diseases and injuries relevant to the protection of U.S. forces and deployment health.

The DMSS receives data from multiple sources and integrates it in a continuously expanding longitudinal surveillance

> With more than 3 billion data records, including more than 1 billion records on U.S. service members alone, the DMSS remains the DoD's premier epidemiologic health surveillance resource.

database for all individuals who have served in the military since 1990. DMSS records are maintained on person, place, and time of reference. Through traditional epidemiologic practices, users can mine the data for efficient and powerful analyses of morbidity among service members. With more than 3 billion data records, including more than 1 billion records on U.S. service members alone, the DMSS remains the DoD's premier epidemiologic health surveillance resource. The Defense Medical Epidemiology Database (DMED) is derived from the DMSS, providing select data that are de-identified and remotely accessible to online users. The purpose of DMED is to provide standard epidemiologic methodology used to analyze active duty personnel and medical event data. DMED is available to authorized users—including U.S. military medical providers, epidemiologists, medical researchers, safety officers, and medical operations and clinical support staff—who are responsible for surveying health conditions in the U.S. military and conveying this information to commanders for monitoring and enhancing the health of the active duty component. With appropriate documentation, civilian collaborators in military medical research and operations may also access DMED.

The DoDSR was established in 1989 to store sera collected during the DoD's testing program for human immunodeficiency virus (HIV) infections. Later, the DoDSR was designated to receive serum

specimens collected before and after operational deployments.

WITH MORE THAN 68 MILLION SERIAL SERUM SPECIMENS FROM OVER 11.6 MILLION INDIVIDUALS, THE DODSR IS THE WORLD'S LARGEST SERUM REPOSITORY OF ITS KIND.
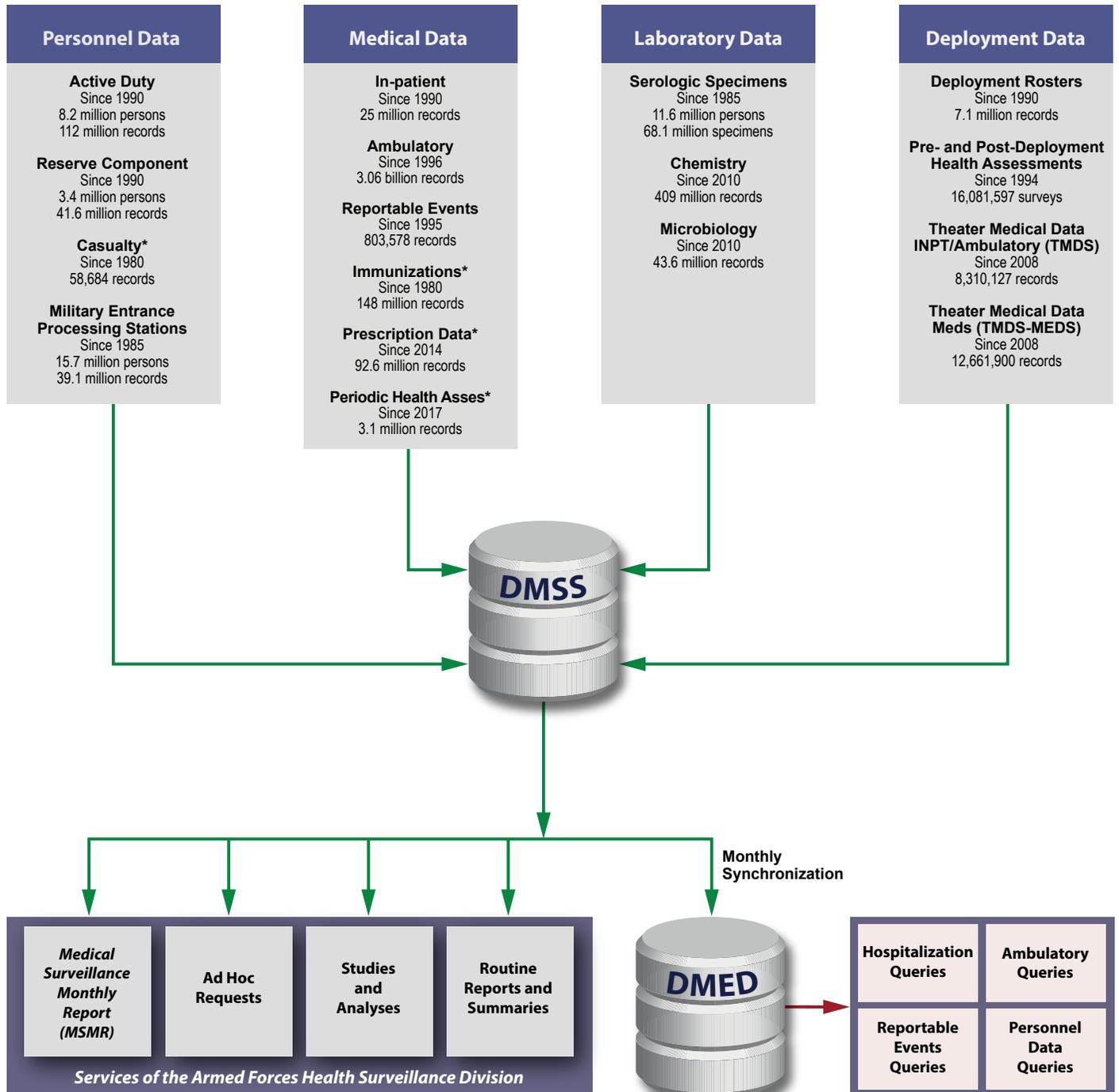
The DoDSR specimens are housed in modern freezers with advanced cooling equipment and technology. The DMSS database stores demographic, occupational, and medical information in longitudinal surveillance and records links to the DoDSR specimens. It is a unique and powerful resource to support the conduct of military medical surveillance, clinical care, and seroepidemiologic investigations.

DURING 2019, AFHSD PROCESSED AND DISPENSED SERUM SPECIMENS IN SUPPORT OF 21 SEROEPIDEMIOLOGIC STUDIES AND ANALYSES.

Of these studies, five were for clinical needs, seven were operational, and the remaining nine were in support of research studies, including a study examining Immune Response to in vivo Expressed Factors (IVEF) in Gonococcal Infection, an analysis regarding Genetic & Environmental Risk Factors for Multiple Sclerosis, a spectrometric serum Analysis of Biomarkers and Biomechanics Associated with Injury-Mediated Osteoarthritis, and an analysis of Leptospirosis and Rickettsial Diseases among Deployers to Afghanistan. ∎

DMSS STRUCTURE AND FUNCTIONAL RELATIONSHIP

Personnel Data

Active Duty
Since 1990
8.2 million persons
112 million records

Reserve Component
Since 1990
3.4 million persons
41.6 million records

Casualty*
Since 1980
58,684 records

Military Entrance Processing Stations
Since 1985
15.7 million persons
39.1 million records

Medical Data

In-patient
Since 1990
25 million records

Ambulatory
Since 1996
3.06 billion records

Reportable Events
Since 1995
803,578 records

Immunizations*
Since 1980
148 million records

Prescription Data*
Since 2014
92.6 million records

Periodic Health Asses*
Since 2017
3.1 million records

Laboratory Data

Serologic Specimens
Since 1985
11.6 million persons
68.1 million specimens

Chemistry
Since 2010
409 million records

Microbiology
Since 2010
43.6 million records

Deployment Data

Deployment Rosters
Since 1990
7.1 million records

Pre- and Post-Deployment Health Assessments
Since 1994
16,081,597 surveys

Theater Medical Data INPT/Ambulatory (TMDS)
Since 2008
8,310,127 records

Theater Medical Data Meds (TMDS-MEDS)
Since 2008
12,661,900 records

DMSS

Monthly Synchronization

Medical Surveillance Monthly Report (MSMR)

Ad Hoc Requests

Studies and Analyses

Routine Reports and Summaries

Services of the Armed Forces Health Surveillance Division

DMED

Hospitalization Queries

Ambulatory Queries

Reportable Events Queries

Personnel Data Queries

Current as of February 2020
DMSS: Defense Medical Surveillance System
DMED: Defense Medical Epidemiology Database
* Service Member Data Only

Version 5.0
Remote access to DMSS data
(non-Privacy Act only)

EPIDEMIOLOGY ANALYSES AND REPORTS

The Epidemiology and Analysis (E&A) section integrates the expertise of epidemiologists, preventive medicine physicians, and data analysts to provide timely analyses and reports of actionable health information. The section uses AFHSD health surveillance tools—the DMSS and DoDSR—and provides surveillance products to DoD policymakers, military commanders, healthcare providers, public health officers, and researchers.

In addition, E&A staff analyze and interpret large data sets, publish the MSMR, develop and disseminate standards for case definitions, and train preventive medicine residents. The section receives and responds to hundreds of health-related inquiries and investigations on the U.S. military with the objective of maintaining the health of the U.S. Armed Forces. Many inquiries are initiated by key leaders throughout the DoD and relate to military operations. Each analysis and report distributed by the section entails numerous hours of epidemiologic expertise and programming by analysts to extract relevant data from the billions of health records stored in the DMSS and blood sera in the DoDSR.

In 2019, E&A staff members supported several ad hoc requests for data analyses and distributed hundreds of periodic reports throughout the DoD. These ad hoc requests and periodic reports look for trends over time of diseases and injuries such as communicable diseases, training-related injuries, mental health illnesses, traumatic brain injury (TBI), and deployment health. Ad hoc requests and periodic reports have helped DoD policymakers shape their FHP programs and healthcare professionals develop preventive measures against diseases or injuries affecting U.S. service members and their beneficiaries.

In 2019, E&A completed three analyses in response to congressional inquiries including prostate cancer disparities, warfighter respiratory health, and deployment health assessment compliance. E&A also continued to support important DoD research studies including former Vice President Joe Biden's Cancer Moonshot initiative, which aims to accelerate cancer research and make additional therapies available to patients while also improving the ability to prevent cancer and detect it at an early stage.

Examples of select AFHSD periodic reports in 2019:

- ▶ Deployment Health Compliance Report
- ▶ DoD Consolidated Influenza Surveillance Report
- ▶ Malaria Case-Finding Report
- ▶ DoD Health of the Force Report
- ▶ Army Heat and Cold Weather Injury Report
- ▶ DoD Eye Injury Report
- ▶ TRADOC Training-related Injuries
- ▶ USASOC Reportable Events
- ▶ Health Affairs (HA) Mental Health Report
- ▶ Health Affairs (HA) TBI Report
- ▶ Health Affairs (HA) PTSD Report
- ▶ PHA Tobacco Use Report ■

AFHSD E&A SATELLITES

AFHSD E&A maintains satellite staff at APHC, Navy and Marine Corps Public Health Center (NMCPHC), and US-AFSAM. Satellite staff primarily support Service-specific surveillance at their respective public health centers, but also contribute valuable expertise to the enterprise and regularly participate in joint meetings including the bi-weekly Request Approval Process (RAP), quarterly E&A staff meetings, and the quarterly Health Surveillance Steering Group (HSSG).

THE NAVY SATELLITE staff work within the EpiData Center (EDC) which, along with Health Analysis, and Health Promotion and Wellness, is part of the NMCPHC Population Health Directorate. Navy satellite staff serve as subject matter experts in behavioral and operational health, reportable and emerging infections, and data systems and application development. Staff published a paper in the December 2019 issue of MSMR which discussed an analysis of the incidence of glucose-6-phosphate dehydrogenase (G6PD) among DoD service members over a 14 year period.

THE ARMY SATELLITE staff support several divisions within APHC including the Behavioral and Social Health Outcomes Practice (BSHOP), Injury Prevention, Disease Epidemiology, Army Hearing, and Vision Conservation and Readiness.

THE AIR FORCE SATELLITE staff work closely with the DoD Global Respiratory Surveillance (DoDGRS) program, which performs global sentinel site-based respiratory surveillance analyzing more than 25,000 specimens from 102 sentinel sites around the world annually. Satellite staff also oversee the Air Force Mortality Registry (AFMR). These data are is used to identify mortality trends and patterns, perform targeted studies based on findings, establish preventive programs, and monitor for effectiveness and new findings. The number of records entered into the database monthly range from 300-500. Currently the registry has 464,113 records. ■

SURVEILLANCE METHODS AND STANDARDS

AFHSD's Surveillance Methods and Standards (SMS) working group develops, documents, and publishes standard surveillance case definitions and methodologies for studies that utilize DMSS data. The case definitions primarily use ICD-9 and ICD-10 codes to identify conditions of interest diagnosed in the MHS and serve as guidelines for other DoD health surveillance and research organizations. The working group includes representatives from all services and consults, when needed, with experts from the Defense Department during the case definition development process. These case definitions allow Defense Department public health practitioners to measure disease trends and related biological phenomena in different environments and situations over time.

In 2019, the SMS working group developed and documented 10 new case definitions and updated, among others, all of the published case definitions in the Mental Health and Oncology categories, and continued its efforts to develop ICD-10 code sets for its existing case definitions. Newly documented case definitions include the AFHSD Burden of Illness and Injury (Burden Dictionary) case definition and code set which is now available on the AFHSD website (www.health.mil/AFHSB). To date, there are more than 125 condition-specific case definitions in 18 categories available on AFHSD's website. ∎

MEDICAL SURVEILLANCE MONTHLY REPORT (MSMR)
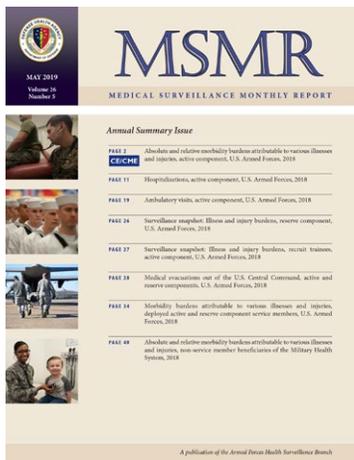
Launched in 1995, the *MSMR* is the flagship publication for AFHSD. Published monthly, the journal provides evidence-based estimates of the incidence, distribution, impact, and trends of illness and injuries among U.S. military service members and associated populations. All content is peer-reviewed.

MSMR's readership includes professionals throughout the MHS, such as public health officials, clinicians, researchers, academicians, healthcare planners, policymakers, and analysts. The Journal is indexed in PubMed and has more than 1,300 online subscribers. During 2019 it received 1,659 total LinkOut hits on PubMed. The average number of page hits per month was 166. Articles published in *MSMR* have generated extensive media coverage. The New York Times, Nature (a British multidisciplinary scientific journal), USA Today, The Standard, The Daily Record, Infection Control Today, Medical Express, the Examiner, The Fayetteville Observer, International Business Times, The Los Angeles Times, The Washington Post, The Times News, Stars and Stripes, and Military Times.

In 2019, the *MSMR* published a total of 58 articles, including 34 original full reports, 7 updates of previously published data

MSMR Articles published in 2019	
Original full reports	34
Updates of previously published data analyses	7
Brief reports	3
Case reports	2
Surveillance snapshots	6
Historical perspectives	2
Editorials	2
Commentary	1
Re-evaluation of a case definition	1
Total	58

analyses, 3 brief reports, 2 case reports, 6 surveillance snapshots, 2 historical perspectives, 2 editorials, 1 commentary, and 1 re-evaluation of a case definition.

Twenty-eight of the articles were submitted by authors not affiliated with the *MSMR* editorial staff. The most frequent topics of original articles and updates in 2019 were healthcare burden of disease and injury, influenza, vector-borne diseases, heat injuries, and sexually transmitted infections (STIs). *MSMR* continues to welcome manuscript submissions for relevant articles on topics in military public health, epidemiology, surveillance, and disease and injury prevention. ∎

RESIDENCY TRAINING

As a key DoD source for health surveillance and epidemiologic training, AFHSD hosts preventive medicine residents from the Uniformed Services University for the Health Sciences (USU) for a five-week practicum rotation under the supervision of senior staff. Residents enhance their understanding of the complexities of health surveillance systems, knowledge and application of epidemiology, and critical analytical skills. They also are exposed to AFHSD daily operations and initiatives. Central to their rotation, residents design and execute a data analysis project using the DMSS.

Since 2008 AFHSD has trained 63 residents with diverse academic backgrounds. In 2019, there were two Air Force residents, two Navy residents, and one Army resident . Resident and student projects have resulted in published articles such

as "Epidemiology of impulse control disorders and association with dopamine agonist exposure, active component, U.S. Armed Forces, 2014–2018," "Testosterone replacement therapy use among active component service men, 2017," and "Polypharmacy involving opioid, psychotropic, and central nervous system depressant medications, period prevalence and association with suicidal ideation, active component, U.S. Armed Forces, 2016." More than one-third of the completed resident projects are published in the *MSMR* or other peer-reviewed journals or presented at the American College of Preventive Medicine or the American Public Health Association meetings. Additionally, the E&A section offers additional rotation and practicum opportunities for occupational and environmental medicine residents and Master of Public Health and Master of Science in Public Health degrees at USU. ∎

WE SUPPORT INFECTIOUS DISEASE
SURVEILLANCE AND OUTBREAK RESPONSE
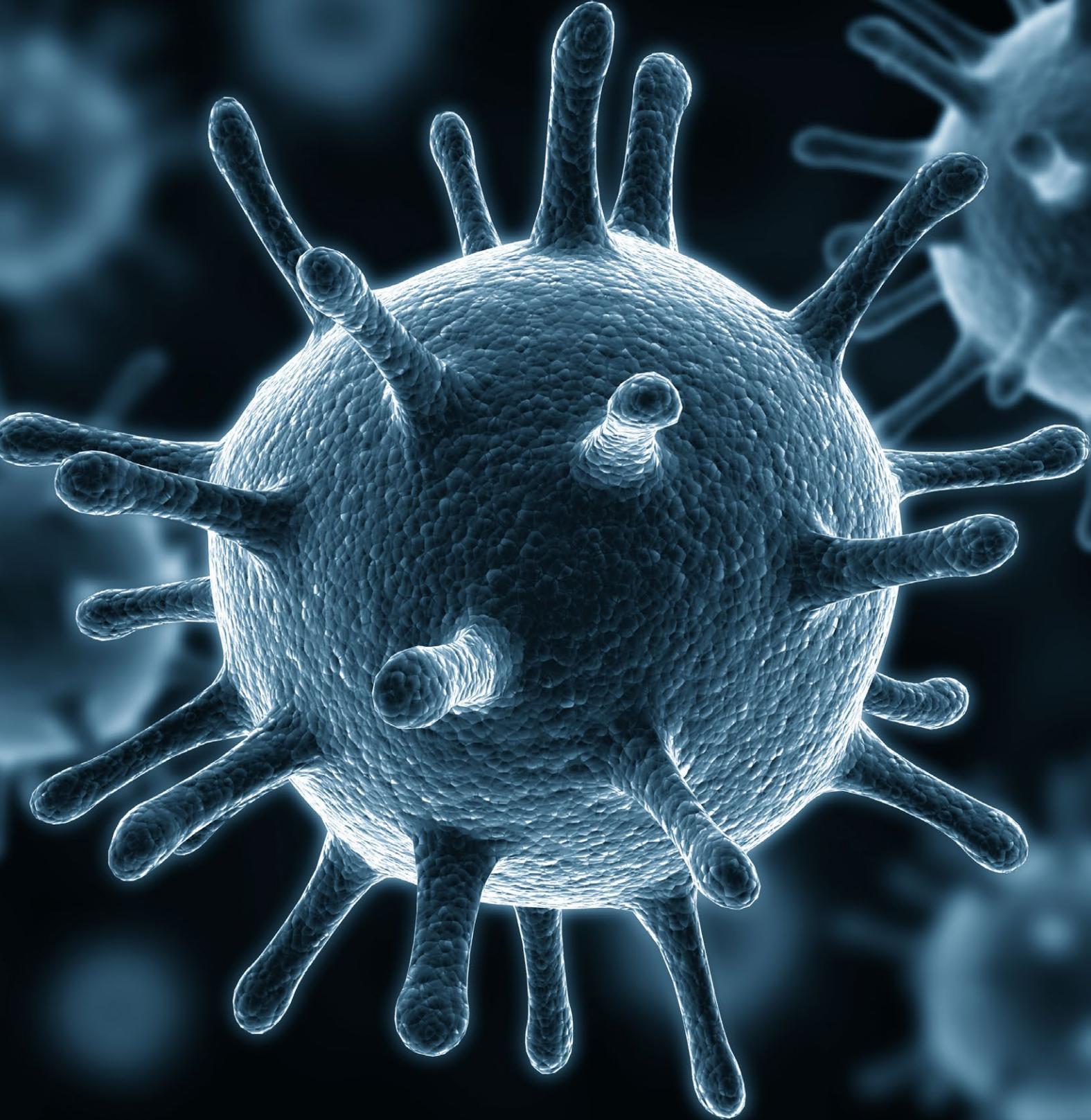
GLOBAL EMERGING INFECTIONS SURVEILLANCE

The Global Emerging Infections Surveillance (GEIS) oversees and manages infectious disease surveillance activities executed through a global network of highly-qualified DoD Service medical research laboratories and partners positioned in strategic locations. This extensive capability and infrastructure provides on-the-ground infectious disease surveillance and outbreak response in support of the Geographic Combatant Commands (GCCs), leading to early and accurate detection of emerging infections to inform Force Health Protection (FHP) decision-making and enhance national and global health security. Providing timely communication about operational public health threats is critical to enabling GCC FHP decision-making and mission success. As such, GEIS routinely coordinates directly with the GCC Surgeons to capture their infectious disease and Theater Campaign priorities and uses this information to direct funding decisions in support of surveillance efforts in four primary areas of focus:

► Antimicrobial resistant and sexually-transmitted infections

► Enteric infections

► Febrile and vector-borne infections

► Respiratory infections

In fiscal year (FY) 2019, the GEIS section provided approximately $60 million in funding to 27 DoD laboratories, USG agencies, and academic partners.

Since 2016, GEIS has worked to implement a more comprehensive strategy process that aligns with national and DoD guidance and defines specific objectives with greater focus on supporting the Joint Force and the DHA Combat Support mission. The purpose of this strategy is to clearly communicate the vision and mission of the GEIS Network to partners and other stakeholders while providing the strategic context in which GEIS operates. The strategy guides and synchronizes all efforts within the GEIS Network, from laboratory-level project execution to program-level oversight and management, to ensure they lead to a common purpose that ultimately drives the program toward mission accomplishment.

GEIS continued to optimize and refine the Data-to-Decision initiative launched

> In fiscal year (FY) 2019, the GEIS section provided approximately $60 million in funding to 27 DoD laboratories, USG agencies, and academic partners.

in late 2017. The goal of this initiative is to provide timely, actionable and meaningful information from GEIS-funded projects to the GCCs to inform FHP decision making. Over the course of 2019, GEIS laboratory partners provided surveillance findings to the GEIS Program Office on a monthly basis, and GEIS subsequently provided reports summarizing the findings and their potential FHP implications and recommendations to the GCCs.

Moving into 2020, the Data-to-Decision initiative will be targeting two primary objectives:

► Improving effective communication of impactful infectious disease surveillance findings and information from the partner network to the GCCs and

► Harmonizing data practices throughout the GEIS laboratory network allowing the labs and the GEIS Program Office to collaborate on data management and analysis.

In 2017, GEIS established the Next-Generation Sequencing and Bioinformatics (NGS-BI) Consortium, bringing DoD partners together to collaborate on NGS-BI implementation, capabilities, and standard operating procedures. Ultimately, the Consortium aims to achieve a harmonized approach to NGS-BI within the network. The next phase of NGS-BI Consortium strategic development will focus on establishing laboratory-level objectives and milestones to advance or maintain NGS-BI capabilities for infectious disease surveillance, with a special focus on OCONUS laboratories.

New priorities for the NGS-BI Consortium over the next year are:

► Cloud-based solutions for IT challenges such as data sharing and analysis,

► Harmonization and reach back support for NGS-BI for OCONUS laboratories and

► Development of metrics and milestones for successful NGS-based surveillance programs.

The NGS-BI Consortium has also been tracking developments in sequencing technology and use within the GEIS partner network and a MinION Users Group has been created to facilitate information sharing and connect investigators across DoD and USG.

Through Data-to-Decision initiative, the NGS-BI Consortium and other initiatives, the GEIS network informs FHP, provides support to regional security

objectives, and increases lethality through improved survivability in austere environments. Additionally, GEIS network engagements with regional partners allows for longstanding relationships with host nations and allies, collaboration between partner countries and the laboratories, as well as partnerships with host nation militaries. Lastly, the GEIS network indirectly supports multiple DoD medical product development efforts by identifying potential geographic locations and clinical sites to conduct clinical trials of new medical products to protect US military personnel. The GEIS network is able to establish enduring, reliable partnerships that have a shared stake in the security and prosperity of each region. The GEIS program is a vital funding source and support mechanism for the DoD Service laboratories and continues to support a global network of irreplaceable military capabilities.

ANTIMICROBIAL RESISTANT INFECTIONS (AMR)

FOCUS: The AMR Focus Area surveillance projects address antimicrobial resistant pathogens causing healthcare-associated infections (HAI), wound infections, drug-resistant sexually-transmitted infections (STIs) and emerging resistance patterns, providing information for upstream initiatives such as improved antibiotic stewardship and medical countermeasures development.

WHAT'S NEW IN FY19: The AMR portfolio supported 7 competed projects and 19 workplan projects, funded at approximately $9.14 million, in FY19. AMR surveillance expansion included, surveillance of high-risk populations (i.e. commercial sex workers and men who have sex with men) for STI studies; enhanced surveillance of wound infections associated with blast injuries; and enhanced surveillance of AMR patterns in *Mycoplasma genitalium*.

WHERE WE ARE GOING: The Multidrug-Resistant Organism Repository and Surveillance Network (MRSN) and the Uniformed Services University Gonococcal Reference Laboratory & Repository, both released handbooks outlining submission and laboratory procedures in early FY20. This will allow the AMR Focus Area to improve harmonization and standardization of laboratory procedures for OCONUS labs submitting isolates. In addition to improving laboratory workflows, the AMR Focus Area is working to improve standardization of minimal data elements, harmo-

nization of data with external partners, implementation of molecular characterization of antimicrobial resistant genes and optimal visualization of AMR data in order to better communicate FHP information.

DOD SERVICE LABORATORIES AND OTHER ORGANIZATIONS SUPPORTED IN FY19: AFRIMS, Georgetown University, NAMRU-2, NAMRU-3, NAMRU-6, NMCPHC-EDC, NMRC, OTSG-PVC, USAMRD-G, USAMRD-A, USUHS, WRAIR

FY19 ACCOMPLISHMENTS:

▶ WRAIR MRSN launched TnFinder, the first and only database categorically classifying and storing information on transposons. This public facing resource has already contributed to FHP by allowing researchers at the MRSN to identify new transposons from the Tn3 family that carry genes conferring colistin resistance from bacteria in Afghanistan and Thailand. Providing the first fully curated, expansive and accurate resource for identifying transposons, the primary vehicle for the acquisition and sequestration of AMR genes, this resource is envisaged to become the de facto resource for the scientific community for tracking transposons that carry AMR genes, and this information can be used to inform antibiotic usage that will better protect FHP. For more information see: https://tn-central.proteininformationresource.org/TnFinder.html

▶ Georgetown University received GEIS funding to conduct broad literature search-based surveillance for antimicrobial resistances, particularly those to last line antibiotics: carbapenems and colistin. In FY19, Georgetown conducted over 600 unique data report searches. The analyzed data suggest an increasing spread and intensity of carbapenem resistance among *Enterobacteriaceae*, with reported detections of carbapenemase genes not previously observed in some geographic locations. Additionally, the analyzed data exposed significant surveillance gaps in 21 nations without carbapenem susceptibility data for *Escherichia coli* or *Klebsiella pneumoniae*, with five of these nations identified as being of high strategic priority by USAFRICOM.

▶ NMCPHC enrolled and reported a total of 42 military treatment facilities' antibiotic resistance data into the CDC National Healthcare Safety Network (NHSN) Antimicrobial Use and Resistance (AUR) module. A total of 116,070 bacterial/fungal infections were reported, representing an infection rate of 31.8 per 1,000 admission and 9.08 infection rate per patient days. A total of 499 carbapenem-resistant

Enterobacteriaceae (CRE) and carbapenem non-susceptible *Acinetobacter* spp. and *Pseudomonas* spp. were identified. Advanced characterization performed by the MRSN revealed 26.8% of these positive for carbapenemases with 40% of these identifying as oxacillinase-23 (OXA-23). NMCPHC addresses a gap in comprehensive AMR surveillance within the Department of Defense (DoD).

▶ NAMRU-6 conduced AMR surveillance through the collection of bacterial isolates (specimens include: wounds, blood, urine, lower respiratory tract, cerebrospinal fluid and other sterile body fluids) from civilian and military hospitals in Lima, Peru, Iquitos, Peru, Tegucigalpa, Honduras, from the Health Reference Laboratory in Panama, and from Peruvian Military Amazon Riverboats. In FY19, findings from five civilian and military hospitals in Lima, Peru revealed resistance to at least one carbapenem in 460 isolates, with the carbapenemases KPC and NDM detected in *Enterobacter cloacae* complex and *K. pneumoniae*, and carbapenemases IMP and VIM detected in *Pseudomonas aeruginosa*.

▶ AFRIMS collected a total of 96 samples primarily from military personnel with clinically suspicious gonorrhea of which 93 were confirmed positive for *Neisseria gonorrhoeae*. Antimicrobial Susceptibility testing (AST) was performed and revealed isolates with demonstrated resistance to ceftriaxone, ciprofloxacin, penicillin, and tetracycline, which is cause for concern as ceftriaxone is one of the CDC-recommended drugs for *N. gonorrhoeae* dual therapy.

ENTERIC INFECTIONS (EI)

FOCUS: The EI surveillance projects address militarily relevant enteric pathogens that degrade readiness through: 1) surveillance for acute diarrhea (AD) and acute gastroenteritis (AGE) in the U.S. military (including recruit, shipboard, and forward-deployed populations) and in foreign military and civilian populations; 2) characterization of travelers' diarrhea (TD) in immune-naïve travelers; 3) advanced characterization and antimicrobial susceptibility testing of enteric pathogens; and 4) detecting emerging pathogens in previously tested "pathogen negative" stool samples.

WHAT'S NEW IN FY19: The EI Focus Area supported 10 competed projects and 12 workplan projects, funded at approximately $6.4 million. The multi-site Global Travelers' Diarrhea (GTD) study continued prospective surveillance efforts in Cambodia, Honduras, Kenya, Nepal, Peru, the Republic of Georgia, and Thailand, with a successful reinvigoration of surveillance activities among forward deployed Service members (SMs) at Camp Lemonnier, Djibouti. Additionally, the EI Focus Area supported five new competed projects incorporating a One Health approach, or comprehensive surveillance that includes animal-source or environmental pathogens that could impact human gastrointestinal illness. We look forward to seeing projects such as the surveillance work conducted by the 65th MED BDE, examining AMR in food-source pathogens utilizing MinION technology, continue to progress and inform FHP in militarily strategic locations.

WHERE WE ARE GOING: The EI Focus Area continues to expand AMR surveillance of enteric pathogens to better understand resistance trends and support treatment recommendations for SMs. Further, increasing standardization and harmonization, when relevant, across the portfolio will increase data utility as infection, case severity, and treatment are examined across sites in five continents. Finally, the EI Focus Area will expand use of advanced diagnostics to detect resistance in enteric pathogens, with a particular emphasis on forward-deployed locations.

DOD SERVICE LABORATORIES SUPPORTED IN FY19: 65TH MED BDE, AFRIMS, LRMC, NAMRU-2, NAMRU-3, NAMRU-6, NEPMU-5, NHRC, USAFSAM, USAMRD-G, USAMRD-A, USUHS, and WRAIR

▶ NAMRU-3 enrolled and tested a total of 101 diarrheal cases at Camp Lemonnier, Djibouti of which 75 tested positive for at least 1 pathogen and underwent molecular testing. Enterotoxigenic *E. coli* (ETEC) (51%, 38/75) was the most common pathogen identified, followed by enteroaggregative *E. coli* (EAEC) (31%, 23/75). Additionally, 31% of cases reported a partial reduction in job performance and 30% reported being unable to conduct work. These reports highlight the impact diarrheal illness can have on an operational unit in the completion of duties.

▶ Cumulative data from the GTD study analyzed in FY19 revealed that 33% of individuals reporting severe AD and 80% reporting severe AGE were hospitalized, and 37% of those reporting severe AD and 86% of those reporting severe AGE reported a full reduction in performance, indicating the potential

significant operational impact of enteric illness.

▶ LRMC established a sentinel site at Nigerien Air Base 201 (AB201) in Agadez, Niger in collaboration with U.S. Air Forces in Europe-Air Forces Africa (USAFE-AFAFRICA). The AB201 team identified an ETEC cluster of nine cases where epidemiologic investigation revealed consumption of a particular meal in Agadez as the potential source.

▶ NAMRU-6 enrolled a total of 109 U.S SMs and beneficiaries into their AGE surveillance in Honduras at Joint Task Force-Bravo (JTF-Bravo). Samples collected and tested for enteric pathogens revealed the most frequently detected pathogens were EAEC followed by enteropathogenic *E. coli* (EPEC). AGE Surveillance at a Spanish school in Cusco, Peru, reported 44 diarrhea events among 138 students enrolled in the study. Testing revealed all *Campylobacter* spp. as resistant to ciprofloxacin and

tetracycline and all susceptible to azithromycin.

▶ NEPMU-5 supported the deployment of the first operational shipboard BioFire FilmArray PCR system for gastrointestinal PCR detection during the Theater Amphibious Combat Rehearsal operations in the Indian Ocean. Shipboard testing for stool samples found diarrheagenic *E. coli* (EAEC/EPEC/ETEC) to be the most frequently detected enteric pathogens.

FEBRILE AND VECTOR BORNE INFECTIONS (FVBI)

FOCUS: FVBI surveillance projects address vector-borne and zoonotic pathogens that threaten the health of U.S. SMs, with the goal of better characterizing risk to U.S. personnel, guiding FHP decision making, and informing countermeasure development. To accomplish these objectives, FVBI surveillance projects fall into three general areas: identifying causes of acute febrile illness, including drug-resistant malaria, documenting the presence of vectors, reservoirs, and associated pathogens, and understanding environmental drivers of exposure and infection.

WHAT'S NEW IN FY19: The FVBI Focus Area supported 27 competed projects and 39 workplan projects at 19 DoD partner laboratories, funded at approximately $22.5 million. FVBI continued to support acute febrile illness surveillance across OCONUS partner labs, expanding to sites in Cameroon, Jordan, Panama, and Somalia. FY19 brought continued emphasis on vector surveillance support for Soto Cano Air Base in Honduras (NAMRU-6) and Camp Lemonnier in Djibouti (NAMRU-3). FVBI collaborated with the CDC through leptospirosis surveillance in Bangladesh and anthrax surveillance in Ethiopia.

Vector surveillance activities expanded in support of the GCC priority countries and pathogens: AFRIMS and NAMRU-2 initiated surveillance for tick and tick-borne pathogens in Mongolia, NECE leveraged existing partnerships to extend mosquito surveillance in Cameroon, WRAIR and the SI established a network to characterize vectors and pathogens in East and Central Africa, and USAMRD-G led tick surveillance in the Baltics to better understand the risk of tick-borne encephalitis to U.S. SMs.

WHERE WE ARE GOING: The FVBI Focus Area will continue to increase coordination and collaboration on vector-borne diseases across the GEIS network, particularly as related to improving acute febrile illness surveillance, coordinating antimalarial drug resistance testing, and detecting malaria rapid test failure. Currently, the FVBI team is working with the AFHSD Integrated Biosurveillance section to introduce a Health Surveillance Explorer layer that illustrates vector surveillance data to enable pre-deployment SMs to determine vector disease risks in a selected area, link to relevant resources, and guide GEIS surveillance activities. Additionally, FVBI is working to harmonize acute febrile illness surveillance protocols and *Plasmodium*

falciparum histidine-rich protein 2 /3 (*pfhrp2/3*) gene deletion surveillance. FVBI activities will continue to leverage the NGS-BI Consortium for validating pathogen detection, identification, and characterization activities. Additionally, FVBI is exploring the utility of predictive modeling to inform risk assessments for pathogens such as chikungunya virus. These activities will enhance the capability to identify known and/or emerging FVBI vectors and pathogens for expanded FHP decision-making capabilities globally.

DOD SERVICE LABORATORIES AND OTHER ORGANIZATIONS SUPPORTED IN FY19: 18-AMDS, 65th MED BDE, ADF-MIDI, AFRIMS, CDC, NAMRU-2, NAMRU-3, NAMRU-6, NASA, NECE, NHRC, NMRC, SI, STRATCOM, USAMRD-G, USAMRD-A, USAMRIID, USUHS, and WRAIR

FY19 ACCOMPLISHMENTS:

▶ NAMRU-6 supported JTF-Bravo in response to the dengue outbreak in Honduras by establishing capability to test samples from U.S. SMs and collaborated with local partners to identify circulating serotypes. NAMRU-6 also documented the

- re-introduction of dengue virus serotype 1 into northeastern Peru.

▶ Vector surveillance by 65th MED BDE and 18-AMDS provided key updates to Japanese encephalitis virus (JEV) ecology in Okinawa, Guam, and South Korea, including documenting JEV in a vector on a U.S. installation. These results provided a better understanding of vector species and reservoirs and drove improved mitigation strategies to reduce risk to U.S. personnel.

▶ WRAIR used next generation sequencing to expand available mosquito genome data, which will enable rapid vector identification methods. This addresses a critical gap needed to enable accurate identification of mosquito vectors for preventative measures and risk assessments.

▶ WRAIR provided regularly-updated *Aedes* distribution maps based on current climate conditions along the U.S. Southwest border, to inform risk assessments on installations and for deployers supporting the border control mission.

▶ NAMRU-3 identified polymorphisms in the *P. falciparum* kelch propeller domain, the region of the genome associated with artemisinin resistance, in Ghana. These data will provide context for continued surveillance in AFRICOM for potential resistance to drugs that may be used for treating infected personnel.

▶ USAMRD-A and WRAIR genetically characterized dengue and chikungunya viruses circulating in Kenya, providing a better understanding of arbovirus transmission in a region

where these pathogens have been poorly documented.

▶ ADF-MIDI detected *pfhrp2* and *pfhrp3*-deleted parasites in countries in East and West Africa, expanding our knowledge of these circulating variants. Presence of parasites with these genetic deletions may impact the performance of rapid diagnostic tests used by the U.S. military to detect *P. falciparum* infections originating in those countries.

▶ USAMRIID and NAMRU-3 collaborated with partners in Liberia to genetically characterize Lassa virus circulating in-country. The high level of observed genomic diversity underscores the need to evaluate diagnostic and countermeasure development against locally circulating strains.

RESPIRATORY INFECTIONS (RI)

FOCUS: The RI Focus Area's goal is to inform FHP decisions across the GCCs through coordination of global respiratory surveillance networks, rapid detection and reporting of respiratory infections, particularly those with pandemic potential, and enabling actions to limit disease spread and maintain readiness of military members. Priority populations include U.S. SMs in deployed/shipboard settings, during exercises in regions highly endemic for respiratory diseases, and in recruit populations. The RI Focus Area also uses data from global influenza surveillance to inform seasonal influenza vaccine formulation.

WHAT'S NEW IN FY19: The RI Focus Area supported 7 competed and 21 work plan projects at 14 DoD partner laboratories, funded at approximately $18.1 million. The RI Focus Area supported respiratory work in 10 tier-1 countries identified as priorities by the GCCs, including several countries bordering mainland China.

Additionally, the DoD Global Respiratory Pathogen Surveillance Program (DoDGRS) added 5 new sentinel sites during the 2018-2019 influenza season.

WHERE WE ARE GOING: The RI Focus Area will continue to support the DoDGRS to provide broad surveillance of respiratory infections. Harmonization of data collection and reporting efforts will continue, with the goal of a central location to view respiratory data and utilize it to make actionable decisions for FHP. Additional efforts to expand and harmonize animal surveillance, particularly in locations where spillover to humans is likely, is being initiated in FY20. The RI Focus Area will continue to support labs as they stand up new capabilities, such as evaluating influenza antigenic reactivity at NMRC, enterovirus sequencing at USAFSAM and coronavirus and respiratory syncytial virus (RSV) sequencing at NHRC. The focus area will also work with labs as they use existing sites

to coordinate expansion to new sites in areas of strategic importance, such as establishing new sites at the US-Mexico border and leveraging relationships in Georgia to coordinate sites in Azerbaijan and Romania.

DOD SERVICE LABORATORIES AND OTHER ORGANIZATIONS SUPPORTED IN FY19: 65th MED BDE, AFRIMS, FDA, LRMC, NAMRU-2, NAMRU-3, NAMRU-6, NEPMU-5, NHRC, NMRC, USAFSAM, USAMRD-G, USAMRD-A, and WRAIR

FY19 ACCOMPLISHMENTS:

▶ USAFSAM provided support to the DoDGRS which finalized results on over 12,000 samples which included 2,711 that were sequenced in FY19. They also conducted phylogenetic analysis on a portion of influenza samples to determine the geographic distribution and predominance of

circulating clades. These data, along with vaccine effectiveness estimations were presented to the CDC and FDA to inform selection of the seasonal vaccine formulation.

► NAMRU-6, in collaboration with NMRC Genomics & Bioinformatics Department, performed taxonomic profiling and virus discovery on a sample collected from a Ruddy Turnstone bird. Sequencing data suggests the discovery of a novel virus belonging to the family Parvoviridae (47.1% identical with Sea star-associated densovirus).

► WRAIR reported ongoing advanced characterization of pathogen negative, RSV, and adenovirus (AdV) samples from across the network. The group at WRAIR has done phylogenetic analysis of circulating AdV in SE Asia, and they are also currently working to develop a pathogen negative testing algorithm and training for harmonized influenza protocol.

► NEPMU-5 provided surveillance in shipboard populations which allowed for the testing of 122 samples from 6 ships, and identified 15 influenza positive specimens. Total pathogen-positive rate was 62%.

► LRMC, in collaboration with US-AFSAM and USAMRIID, started advanced genetic characterization of Influenza A by NGS.

► NHRC provided critical insight into circulating respiratory infections within multiple high-priority populations through testing of 1,117 recruit samples, 54 shipboard samples, and 1,304 samples from the US-Mexico border population.

► NMRC continued work on antigenic characterization of circulating influenza viruses. In addition, NMRC performed additional characterization of MERS-CoV samples from the Middle East and demonstrated a potential false-negative issue with the current detection assay.

The following are GEIS partner laboratories, programs, and agencies executing GEIS-funded work or regularly sharing data or information with the GEIS network:

► **Naval Medical Research Center (NMRC)**, including
  • Naval Medical Research Unit (NAMRU)-2, NAMRU-3, NAMRU-6, and Naval Health Research Center (NHRC)

► **Walter Reed Army Institute of Research (WRAIR)**, including
  • US Army Medical Directorate-Armed Forces Research Institute of Medical Sciences (US-AMD-AFRIMS), US Army Medical Research Directorate (USAMRD)-Georgia, and US-AMRD-Africa

► **US Air Force School of Aerospace Medicine (USAFSAM)**

► **Uniformed Services University of the Health Sciences (USUHS)**

► **Additional DoD Partners:**
  • 18th Aerospace Medicine Squadron (18-AMDS),
  • Theater Preventive Medicine Flight, 65th Medical Brigade (65th MED BDE),
  • Navy Entomology Center of Excellence,
  • Office of the Surgeon General Pharmacovigilance Center (OTSG-PVC),
  • US Army Corps of Engineers,
  • US Army Medical Research Institute of Infectious Diseases, and
  • US Military Academy West Point.

► **DoD Organizations:**
  • USU/Center for Global Health Engagement,
  • Defense Threat Reduction Agency Biological Threat Reduction Program (DTRA), Military Infec-

tious Disease Research Program (MIDRP),
  • Naval Research Laboratory, (DC)

► **Military Treatment Facility Laboratories:**
  • Brian Allgood Army Community Hospital, S. Korea;
  • Landstuhl Regional Medical Center, Germany;
  • Naval Hospital Guam;
  • San Antonio Military Medical Center, TX; and
  • Tripler Army Medical Center, HI.

► **Public Health Commands:**
  • Navy and Marine Corps Public Health Center-EpiData Center (NMCPHC-EDC),
  • Navy Environmental Preventive Medicine Unit-2 (NEPMU-2),
  • Navy Environmental Preventive Medicine Unit-5 (NEPMU-5), and
  • Public Health Command Europe (PHC-E).

► **US Government (USG) Interagency:**
  • Department of State,
  • Centers for Disease Control and Prevention (CDC),
  • Food and Drug Administration (FDA),
  • National Aeronautics and Space Administration (NASA), and
  • Smithsonian Institute (SI)

► **International Organizations:**
  • Australian Defence Force Malaria and Infectious Disease Institute (ADF-MIDI),
  • North Atlantic Treaty Organization (NATO) and the
  • World Health Organization (WHO)

► **Universities: Georgetown University**

WE ADDRESS THE GLOBAL BIOSURVEILLANCE SITUATIONAL AWARENESS NEEDS WITHIN THE DOD
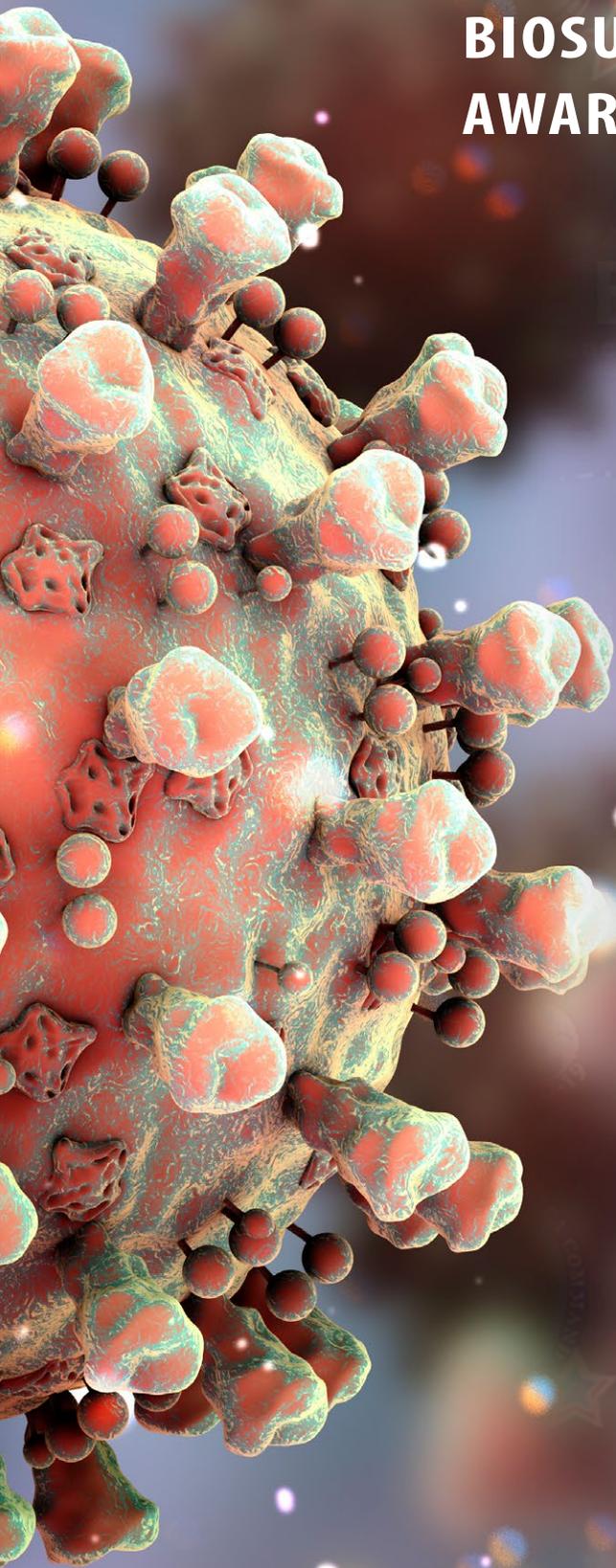
INTEGRATED BIOSURVEILLANCE

Integrated Biosurveillance (IB) provides near real-time communication of infectious disease and health threats to military populations within DoD. This section is part of a global network that maintains key partnerships with inter-agency counterparts that include the National Center for Medical Intelligence, Department of Homeland Security/National Biosurveillance Integration Center, CDC, Department of State, and Defense Threat Reduction Agency (DTRA). IB provides critical information for CCMD development of FHP Guidance and serves as a "One-Stop Shop" that distributes analysis and information from reliable resources (NCMI, CDC, WHO, etc.).

This section operates three areas that generates EXSUM, SPOT reports and surveillance summaries in addition to the weekly AFHSD Health Surveillance Update. As the integrators of biosurveillance information, IB analysts scan open source surveillance data, collaborate with partners and post the health surveillance information in easy-to-access locations.

More than 1,850 subscribers receive the Health Surveillance Update (HSU). Subscriptions to the HSU have consistently increased for the past two years. It is anticipated that additional customers will engage and use this product as its utility and timeliness continues to enhance the Combatant Command and Military Service customers' health surveillance information needs.

ALERT AND RESPONSE OPERATIONS (ARO) FY19 ACCOMPLISHMENTS INCLUDE:

► Improved Force Health Protection and minimized risk to mission/risk to force for Joint Staff, Services and Combatant Commands with timely response to requests for disease surveillance.

► Routinely provided information products focused on informing

> **Produces and distributes 53 AFHSD Health Surveillance Updates (AHSU) reporting on more than 255 new public health events of interest to the Global CCMDs and 950 updates for those events.**

commander FHP posture decisions to lower the risk of disease and non-battle injury (DNBI) and illness and eliminate preventable DNBI evacuations from Geographic Combatant Command Areas of Responsibility.

► Produces and distributes 53 AFHSD Health Surveillance Updates (AHSU) reporting on more than 255 new public health events of interest to the Global CCMDs and 950 updates for those events.

► Developed fully unclassified (NATO) versions of the AHSU and shared with non-governmental organizations and foreign nations.

► Responding to Requests for Information from the CCMDs on topics including dengue situation in southeast Asia.

IE'S FY19 ACCOMPLISHMENTS INCLUDE:

► Initiated the systematic and methodical approach for the daily evaluation of thousands of ESSENCE alerts. Multiple disease outbreaks and other health issues are identified and reported on a daily basis. Resulting documents and reports are archived to track and for further reference.

► Collaborated with the services to improve the functionality of ESSENCE, which brings advanced visualization capability on par with

the civilian sector. Upgrading to same code as civilian ESSENCE provides an opportunity to share future system enhancements and allow for easier data sharing across agencies.

► Assisted in the development of new data streams allowing for NMCPHC laboratory positive results data to be visualized for inclusion as a new function of ESSENCE.

► Established the 2019-2020 DoD Influenza Forecasting Challenge with five academic and government participants, analyzing ILI medical encounter and laboratory data and applying internal forecasting models at MTF locations. Forecast results are displayed on a dashboard.

GEOSPATIAL INFORMATION SYSTEM (GIS) FY19 ACCOMPLISHMENTS INCLUDE:

► More than 4,700 HSE views from January to November 2019

► Created a community on All Partners Access Network (APAN) to effectively collaborate and connect with NATO partners.

► Created and linked SOCOM Medical Facility Assessments on the SIPR HSE

► Created and published the SIPR and NATO version of the HSE.

► Assessed the implementation of ArcGIS Enterprise at AFHSD

► Created and reviewed the standard operating procedures on HSE, AHSU and Influenza data loading.

► Created and reviewed the back-up and restore procedures on HSE application.

Implemented new directory structure and file naming for storing the GIS software development and GEO database. ∎

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DIGITAL STRATEGY

AFHSD maintains a strategic social media presence on Facebook and Twitter. Below are the top 5 most popular surveillance-related messages posted on AFHSD's Facebook page during 2019.

1

JULY 29, 2019, AFHSB FUNDS DOD LABORATORIES
5,275 People Reached
617 Engagements

2

MAY 24, 2019, AFHSB HOSTED BIOSURVEILLANCE INDICATIONS AND WARNINGS ANALYTICS COMMUNITY
948 People Reached
78 Engagements

3

NOVEMBER 18, 2019, COL BADZIK WELCOME GEIS MEETING ATTENDEES
786 People Reached
157 Engagements

4

MARCH 28, 2019, INCIDENCE OF CHLAMYDIA INFECTIONS INFOGRAPHIC
653 People Reached
51 Engagements

5

DECEMBER 31, 2019, HIV INFECTION RATES IN AUGUST 2019 MSMR
585 People Reached
34 Engagements

ACRONYMS

AD-CS	Assistant Director for Combat Support
AFHSD	Armed Forces Health Surveillance Division
AFMR	Air Force Mortality Registry
AFRICOM	U.S. Africa Command
AFRIMS	U.S. Armed Forces Research Institute of Medical Sciences
AGE	acute gastroenteritis
AMD	Aerospace Medicine Squadron
AMR	antimicrobial resistance
APHC	U.S. Army Public Health Center
AOR	Areas of Responsibility
ARO	Office of Alert and Response Operations
BAACH	Brian Allgood Army Community Hospital
BIWAC	Biosurveillance Indications and Warnings Analytic Community
CAC	Common Access Card
CARB	Combating Antibiotic Resistant Bacteria
CSART	CSA Review Team
CCMD	Combatant Command
CDC	Centers for Disease Control and Prevention
CENTCOM	U.S. Central Command
CONUS	Contiguous United States
CSA	Combat Support Agency
DHA	Defense Health Agency
DMED	Defense Medical Epidemiology Database
DMSS	Defense Medical Surveillance System
DMTS	Data Management and Technical Support
DoD	Department of Defense
DoD-GEIS	DoD Global Emerging Infections Surveillance and Response System
DoDGRS	DoD Global Respiratory Pathogen Surveillance Program
DoDSR	Department of Defense Serum Repository
DRSi	Disease Reporting System internet
DTRA	Defense Threat Reduction Agency
E&A	Epidemiology and Analysis
EDC	EpiData Center
EI	enteric infection
EID	emerging infectious disease
EPEC	enteropathogenic E. coli
ESSENCE	Electronic Surveillance System for the Early Notification of Community-based Epidemics
EUCOM	U.S. European Command
FDA	U.S. Food and Drug Administration
FHP	force health protection
FY	fiscal year
FORSCOM	United States Army Forces Command
FVBI	febrile and vector-borne infection
GAO	Government Accountability Office
GCC	Geographic Combatant Command
GEIS	Global Emerging Infections Surveillance
GHE	Global Health Engagement
GHSA	Global Health Security Agenda
GIS	Geographic Information Systems
GTD	Global Travelers' Diarrhea
H7N9	avian influenza A (subtype H7N9)
HAI	healthcare-associated infection
HAdV-B55	human adenovirus type 55
HAdV-11a	human adenovirus 11a
HIV	human immunodeficiency virus
HPV	human papilloma virus
IB	Integrated Biosurveillance

ICD-10-CM	International Classification of Diseases, 10th Revision, Clinical Modification
ICD-9-CM	International Classification of Diseases, Ninth Revision, Clinical Modification
ID	identification
IE	Office of Innovation and Evaluation
IHR	International Health Regulations
ILI	influenza-like illness
IPL	Institut Pasteur du Laos
LOE	line of effort
LRMC	Landstuhl Regional Medical Center
MAT	medical air transports
MDR-TB	multidrug-resistant tuberculosis
MDO	Multidrug resistant
MDRO	multidrug-resistant organisms
MERS-CoV	Middle East Respiratory Syndrome Coronavirus
MHS	Military Health System
MRSN	Multidrug-Resistant Organism Repository and Surveillance Network
MSMR	*Medical Surveillance Monthly Report*
MTF	military treatment facility
NAMRU-2	Naval Medical Research Unit No. 2
NAMRU-3	Naval Medical Research Unit No. 3
NAMRU-6	Naval Medical Research Unit No. 6
NATO	North Atlantic Treaty Organization
NCMI	National Center for Medical Intelligence
NDM-1	New Delhi metallo-beta-lactamase-1
NECE	Navy Entomology Center of Excellence
NEPMU-2	Navy Environmental Preventive Medicine Unit 2
NHRC	Naval Health Research Center
NIH	National Institutes of Health
NMCPHC	Navy and Marine Corps Public Health Center
NMCPHC-EDC	Navy and Marine Corps Public Health Center-EpiData Center
NMRC	Naval Medical Research Center
OCONUS	outside the contiguous United States
OTSG-PVC	Office of the Surgeon General Pharmacovigilance Center
PCR	polymerase chain reaction
PHC-E	Public Health Command Europe
RI	Respiratory infections
RME	reportable medical event
SMS	Surveillance Methods and Standards
SOUTHCOM	U.S. Southern Command
SSBP	Surveillance of Suicidal Behavior Publication
STI	sexually transmitted infections
TAMC	Tripler Army Medical Center
TBI	traumatic brain injury
USG	United States Government
USAFSAM	U.S. Air Force School of Aerospace Medicine
USACE	U.S. Army Corps of Engineers
USAMC	U.S. Army Medical Command
USAMRD-G	U.S. Army Medical Research Directorate–Georgia
USAMRD-K	U.S. Army Medical Research Directorate–Kenya
USAMRIID	U.S. Army Medical Research Institute for Infectious Diseases
USINDOPA-COM	U. S. Indo-Pacific Command
USU	Uniformed Services University of the Health Sciences
VE	vaccine effectiveness
WHO	World Health Organization
WRAIR	Walter Reed Army Institute of Research
WRIR	Weather-Related Injury Repository

VISION

To be the *central, integrated, customer-focused* epidemiologic and global health surveillance resource for the U.S. Armed Forces.

MISSION

To provide timely, relevant, and actionable, comprehensive health surveillance support to the Joint Staff, Combatant Commands and military Services in order to promote health and enhance Force Health Protection, Readiness and Lethality.

CRITICAL FUNCTIONS:

» Acquire, analyze/interpret, and disseminate health surveillance information and recommend evidence-based policy.

» Develop, refine, and improve standardized surveillance methods.

» Serve as a focal point for sharing health surveillance products, expertise, and information.

» Coordinate a global program of militarily relevant infectious disease surveillance.

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