Testimony of

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On

Fiscal Year 2022 Appropriations for the National Institutes of Health, Centers for Disease Control and Prevention, and the Institute of Museum and Library Services

Submitted to the

Appropriations Subcommittee on Labor, Health and Human Services, Education, and Related Agencies

United States House of Representatives

May 5, 2021

The Entomological Society of America (ESA) respectfully submits this statement for the official record in support of funding for vector-borne diseases (VBD) research at the U.S. Department of Health and Human Services (HHS). ESA joins the research community by requesting **$46.1 billion in fiscal year (FY) 2022 for the National Institutes of Health (NIH)**, including increased support for vector-borne disease (VBD) research at the National Institute of Allergy and Infectious Diseases (NIAID); **$10 billion for the Centers for Disease Control and Prevention (CDC)**, including investments in the budgets for VBD, global health, and core infectious diseases; and robust funding for the **Institute of Museum and Library Services (IMLS)**, including **$42.7 million for the Office of Museum Services**.
ESA urges the subcommittee to **support VBD research programs that incorporate the entomological sciences as part of a comprehensive approach to addressing infectious diseases.** These efforts can help mitigate the enormous impact that insect carriers of disease have on human health. NIH, the nation’s premier medical research agency, advances human health by supporting research on basic human and pathogen biology and by developing prevention and treatment strategies. Cutting-edge research in the biological sciences, including in the field of entomology, is essential for addressing societal needs related to environmental and human health. Many species of insects and arachnids, including ticks and mites, are carriers or vectors of an array of infectious diseases that threaten the health and well-being of people worldwide. This threat impacts citizens in every U.S. state and territory, as well as military personnel serving at home and abroad. The mosquitoes that carry and transmit diseases are responsible for more human deaths than all other animal species combined, including other humans.¹ VBD can be particularly challenging to manage due to insect and arachnid mobility and their propensity to develop pesticide resistance. Further, effective preventative treatments, including vaccines, are not available for most VBD.

Within NIH, NIAID conducts and supports fundamental and applied research related to understanding, preventing, and treating infectious diseases. The risk of emerging infectious diseases grows as global travel increases in speed and frequency and as environmental conditions conducive to population growth of vectors, like mosquitoes and ticks, continue to expand globally. Entomological research to understand and characterize the relationships between insect vectors and the diseases they transmit is essential to enable scientists to reliably monitor and predict outbreaks, prevent disease transmission, and rapidly diagnose and treat diseases. For example, NIAID-funded researchers are working to understand how common prevention tools

like mosquito repellent work at the molecular level. Although topical mosquito repellents such as DEET are a popular tool for preventing mosquito bites and mosquito-borne diseases like malaria, the mechanism they use to repel mosquitoes is not understood. Using grant funding from NIAID, researchers from Johns Hopkins University have determined that DEET is an effective mosquito repellent because it masks human odors from female mosquitoes.\(^2\)

Researchers can use these findings to develop similar safe, low-cost mosquito repellents to prevent mosquito bites, reducing the burden of mosquito-borne diseases.

ESA requests **robust support for CDC programs addressing VBD and support for the Centers of Excellence on VBD as authorized by the Kay Hagan Tick Act in 2022 and beyond with at least $10 million per year as well as $20 million for the Epidemiology and Laboratory Capacity (ELC) program.** CDC, serving as the nation’s leading health protection agency, conducts research and provides health information to prevent and respond to infectious diseases and other global health threats. Within the core infectious diseases budget of CDC, the Division of Vector-Borne Diseases (DVBD) aims to protect the nation from the threat of viruses, bacteria, and parasites transmitted primarily by mosquitoes, ticks, and fleas. DVBD’s mission is carried out by a staff of experts in several scientific disciplines, including entomology.

CDC plays a key role in tracking new and emerging diseases, as well as in supporting health care professionals in identifying and diagnosing these diseases. From 2016 to 2017, there was a 46% increase in reported cases of a group of tick-borne diseases known as spotted fever rickettsioses (spotted fevers), which includes the notably fatal Rocky Mountain spotted fever (RMSF).\(^3\) Disability and death from RMSF are preventable if the antibiotic doxycycline is administered within the first five days of illness: without treatment, 1 in 5 RMSF cases lead to

\(^2\) [https://www.sciencedirect.com/science/article/abs/pii/S09609822193111674]

\(^3\) [https://www.ncbi.nlm.nih.gov/pubmed/?term=30969821]
Importantly, spotted fevers have non-specific symptoms, and fewer than 1% of the spotted fever cases reported in 2016-2017 had sufficient laboratory evidence for diagnosis. In response to this issue, the CDC has created a first-of-its-kind education module that will help healthcare providers recognize the early symptoms of RMSF and distinguish it from other diseases, enabling affected patients to get the life-saving treatment they need as quickly as possible.

CDC funding is crucial in the development of this and other educational tools that equip health care providers to effectively combat tick-borne diseases.

Using funding appropriated during the 2016 Zika crisis to help respond to that emergency and develop the necessary future workforce, CDC awarded $50 million to five universities to establish regional Centers of Excellence (COE) to address existing and emerging VBD. The five centers, for which current funding expires in 2021, generate research, education, outreach, and capacity to enable appropriate and timely local public health action for VBD throughout the U.S. The COE model requires collaboration between the research institutions and the local and regional departments of health (DOH), important relationships which have not generally arisen organically. This is critical given significant regional differences in vector ecology, disease transmission dynamics, and resources.

The Kay Hagan Tick Act also expands authorized support for the ELC program, critical to supporting state and local departments of health vector surveillance and management. For the last several years, the CDC has only been able to fund a third of the $50 million in requests they receive from states to meet these needs. ESA supports fully funding the $20 million authorized in the Kay Hagan Tick Act to support the ELC grants.

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5 https://www.cdc.gov/rmsf/resources/module.html
ESA requests robust funding for IMLS, including no less than $42.7 million for the Office of Museum Services in FY 2022. The services and funding provided by IMLS are critical in several areas – research infrastructure, workforce development, and economic impact. IMLS provides for the expansion of collections capabilities at American museums, which are key for the identification, documentation of locations, and classification of entomological species. The 21st Century Museum Professionals Program provides opportunities for diverse and underrepresented populations to become museum professionals, expanding participation in an industry with an annual economic contribution of $21 billion. Museums are critical to the public understanding of science through exhibits and programs, and in so doing, support science education as an integral part of the nation’s educational infrastructure. They also make significant long-term contributions to economic development in their local communities.

Thank you for the opportunity to offer the Entomological Society of America’s support for NIH, CDC, and IMLS research programs.

ESA, headquartered in Annapolis, Maryland, is the largest organization in the world serving the professional and scientific needs of entomologists and individuals in related disciplines. Founded in 1889, ESA is a non-partisan professional organization with nearly 7,000 members affiliated with educational institutions, health agencies, private industry, and government. Members are researchers, teachers, extension service personnel, administrators, marketing representatives, research technicians, consultants, students, pest management professionals, and hobbyists. For more information about ESA, please see http://www.entsoc.org/.