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Mosquito-Borne Diseases Benchmark Report 2024

UNINFORMED, UNCONCERNED

Ignoring the Global Surge of Mosquito-Borne Diseases at Our Peril

Message From the CEO

Dear Members of the Biotech Community,

As the United Nations General Assembly high-level meetings wrapped up last week in New York City, international leaders grappled with two areas of concern impacting overall global stability: peace and security and climate change, specifically the impact of climate change on human health, a burgeoning field called climate health.

Citing rising sea levels, extreme heat and lack of early warning systems, UN leaders and Climate Week experts focused on the devastation caused by extreme weather and on the aftermath of havoc on human health. Climate change is leading to the reemergence of age-old health threats and the emergence of new, unknown microbial threats, including vector-borne diseases resulting from carriers that thrive and spread with climate change.

Mosquito-borne diseases are a prime example. Recent climate events, like Hurricane Helene, are creating the perfect environment for mosquitos to breed and spread a variety of pathogens. Seasonal changes are leading to a longer mosquito season and spread into new regions. The surge in the United States of West Nile virus and and an increase in Eastern Equine Encephalitis virus have caused widespread concern.

Dr. Tony Fauci, widely regarded as the dean of infectious diseases and pandemic preparedness, himself developed a debilitating case of the West Nile virus infection from a mosquito bite likely in his own backyard, told us, “With climate change, the problem of mosquito-borne diseases will only get much worse. We really do need to increase the public awareness of how the incidence of diseases such as Eastern Equine Encephalitis and West Nile Virus will only increase, and we really need to address this with better attention to mosquito control and investments in vaccines and antivirals.” (see page 7), cautions he also reinforced this week in a *New York Times* opinion article.

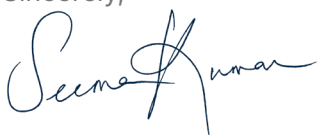
Mosquitoes spread many devastating diseases, including malaria, dengue fever and Chikungunya (see page 10). Growing up in India, I witnessed the devastation these diseases can have on individuals, families, and communities. Once these diseases and conditions take hold, it can be hard for public health authorities to manage the complex trifecta of individual, environmental, and public health factors to mitigate infection and control the spread. An integrated public health effort that includes diagnosis, treatment and prevention strategies will need to be combined with health education campaigns and mosquito control to disrupt the spread.

Engaging the public and educating primary care physicians are crucial elements of a public health effort. Given the recent events, we at Cure surveyed a panel of U.S. primary-care physicians and a representative sample of the public to assess their knowledge and attitudes toward the public health challenge of mosquito-borne diseases. The results of this first-of-a-kind survey are reported for the first time in this *Mosquito-Borne Diseases Benchmark Report 2024, Uninformed, Unconcerned: Ignoring the Global Surge of Mosquito-Borne Diseases at Our Peril*.

We shared the results with leading infectious disease experts, including Drs. Tony Fauci and Peter Hotez, incorporating their perspectives and comments in this report.

The benchmark report highlights the significant gaps between experts' assessment of the threat level posed by these diseases in the face of climate change, makes recommendations to build awareness of the challenges ahead and offers considerations for an action plan to prevent the proliferation of mosquito-borne diseases from becoming a crisis.

Sincerely,



Seema Kumar

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Introduction

The calamitous consequences of global warming are impossible to ignore. Wildfires, floods, and once-in-a-century storms – such as Hurricane Helene, which carved an 800-mile swath of devastation from the Gulf of Mexico through North Carolina – are now common occurrences. Rising temperatures are causing the tropical latitudes to expand toward the poles, with potentially catastrophic effects for global ecosystems, including those densely inhabited by humans. But the intense public focus on the most dramatic and visible aspects of global warning tends to obscure less noticeable, yet equally consequential concerns, such as the growing threat to public health of mosquito-borne diseases.

"With climate change, the problem of mosquito-borne diseases will only get much worse"

Anthony Fauci, MD, former director of the National Institute of Allergy and Infectious Diseases and now Distinguished University Professor at the Georgetown University School of Medicine and McCourt School of Public Policy.

Malaria, dengue, yellow fever, and Zika virus all are transmitted by mosquitoes. Malaria, once endemic in the non-mountainous regions of the U.S. east of the Rocky Mountains, from the border of Canada to Texas and along the East Coast, was eliminated by 1951 by massive spraying campaigns and efforts to eliminate breeding grounds by digging ditches and drains. About 2,500 imported malaria cases are reported in the U.S. each year, but the absence of the malaria vector, the *Anopheles* mosquito, has kept the disease from reestablishing itself, according to the Centers for Disease Control and Prevention (CDC).

Cases of other mosquito-borne diseases, however, have begun cropping up with troubling frequency. In Massachusetts, a flurry of cases of Eastern Equine Encephalitis in 2024, caused by a rare but deadly virus, prompted some communities to shut down parks and other outdoor areas when nocturnal mosquitos commonly feed.

Far more widespread in the U.S. is West Nile Virus. More than 880 cases have been reported in 46 states so far this year, 605 of them invading the brain and central nervous system, according to CDC data. Last year, more than 2,500 cases were reported nationwide, nearly double the total for 2022.

According to the World Health Organization (WHO), vector-borne diseases, those carried by mosquitos and ticks, account for more than 700,000 deaths annually.

"With climate change, the problem of mosquito-borne diseases will only get much worse," Anthony Fauci, MD, told Cure. The former Director of the National Institute of Allergy and Infectious Diseases is now Distinguished University Professor at the Georgetown University School of Medicine and McCourt School of Public Policy.

“Nobody understands how destabilizing an epidemic of dengue or yellow fever will be,” he adds. “Yellow fever has a mortality of 30 percent. It would make COVID-19 look like a sideshow.”

Peter J. Hotez, MD, PhD, Dean of the National School of Tropical Medicine at Baylor College of Medicine in Houston.

The states that border the Gulf of Mexico – where the summer water temperature regularly now tops 90F – are particularly vulnerable to mosquito-borne diseases Peter J. Hotez, MD, PhD, told Cure. Hotez is Dean of the National School of Tropical Medicine at Baylor College of Medicine in Houston.

Dengue, yellow fever and other tropical threats are “already spreading out of the Amazon to more populated areas of Brazil, and they’re moving fast,” said Hotez, who also is a Professor of Pediatrics and Molecular Virology & Microbiology at Baylor and the Co-Director of the Texas Children’s Hospital Center for Vaccine Development.

“We could have dengue moving up here at any time.” Hotez noted that the most vulnerable part of the U.S. for such an arrival of dengue is the Gulf Coast.”

“Nobody understands how destabilizing an epidemic of dengue or yellow fever will be,” he adds. “Yellow fever has a mortality of 30 percent. It would make COVID-19 look like a sideshow.”

Mosquito-borne diseases are not just a threat to personal and public health. With their potential to surge and disrupt, they pose economic and security risks to the United States. However, Hotez noted that “For pandemic preparedness, mosquito-borne diseases are still orphan children.”

Almost five years into the COVID-19 pandemic, many Americans – physicians and members of the public alike – are experiencing pandemic fatigue. With the trauma of COVID-19 still lingering and the potential for new outbreaks looming, Cure surveyed a panel of U.S. primary-care physicians and a representative sample of the general public to assess their knowledge and attitudes toward the public health challenge of mosquito-borne diseases. The survey results are reported for the first time in this Cure *Mosquito-Borne Diseases Benchmark Report 2024, Uninformed, Unconcerned: Ignoring the Global Surge of Mosquito-Borne Diseases at Our Peril*.

One issue the survey makes plain, Hotez said, is that many doctors are unaware of the risks mosquito-borne diseases pose. Internists and family physicians, the front line for detecting surges in these vectored diseases “are not even trained” to deal with these illnesses, he said. They’re difficult to diagnose and treat. “Most cases are being missed because we don’t have point-of-care diagnostics.”

10 Mosquito-Borne Diseases to Know

Vector-borne diseases are a threat to more than 80 percent of the worldwide population.[1] Viruses and parasites spread through the bites of infected mosquitoes are the largest contributor to human vector-borne diseases, which can be lethal or cause serious illnesses. These diseases include:

CHIKUNGUNYA

This viral infection causes fever and severe joint pain. It is not usually life-threatening but can lead to chronic pain and long-term joint issues. While a preventative vaccine is available, no medicines are available to specifically treat people with chikungunya infections.

DENGUE FEVER

This viral infection, which causes flu-like symptoms, can lead to severe complications such as dengue hemorrhagic fever. The incidence of dengue viral infections has increased 30-fold globally during the last 50 years, now affecting more than 100 countries. While preventative vaccines are available, no medicine is available to specifically treat dengue.

EASTERN EQUINE ENCEPHALITIS

A rare but life-threatening viral infection, EEE has a mortality rate ranging from 30 percent to 50 percent among symptomatic patients. It can also cause severe neurological damage. No vaccines are available to prevent nor are there medicines to specifically treat eastern equine encephalitis.

LA CROSSE ENCEPHALITIS

This viral infection primarily affects children and can cause serious neurological disease. No vaccines are available to prevent nor medicines to treat La Crosse.

MALARIA

Though not common in the U.S., malaria remains a major global health issue, responsible for more than 400,000 deaths annually, mainly in sub-Saharan Africa. No vaccine to prevent infections with the malaria parasite are currently approved in the U.S., but antimalarial medications to halt infection are available.

OROPOUCHE VIRUS DISEASE

This illness is frequently mistaken for other arboviruses such as dengue, chikungunya, and Zika viruses. Both infected mosquitos and midges can spread the virus, and it is found in South and Central America, the Caribbean and Cuba. The disease typically features an abrupt onset of fever, severe headache, chills, and muscle and joint pain. No vaccines are available to prevent nor medicines to treat oropouche.

ST. LOUIS ENCEPHALITIS

This viral infection can lead to inflammation of the brain and has been associated with outbreaks in the U.S., particularly in the Midwest and South. No vaccines or medicines are available to prevent St. Louis encephalitis viral infections.

WEST NILE VIRUS

This is the most commonly reported mosquito-borne disease in the U.S. Infections with the West Nile virus can lead to severe neurological diseases, including encephalitis and meningitis. No vaccines are available to prevent nor are there medicines to specifically treat West Nile disease in people.

YELLOW FEVER

This viral infection, which may be asymptomatic, can be devastating in those who become sick. The initial symptoms resemble flu and may escalate to hemorrhagic disease, jaundice, delirium, seizures, coma and death. The disease is fatal in 20 percent to 60 percent of infected people. A vaccine is available to prevent yellow fever, but no medicine is available to specifically treat yellow fever infections.

ZIKA

While a typically mild viral illness, Zika viral infections can lead to severe birth defects in pregnant women. The outbreak in 2015-2016, which began in Brazil and spread through South and Central America, the Caribbean, the Pacific islands and Africa, underscored the rapid spread of mosquito-borne diseases. No medicine is available to specifically treat Zika infections.

KEY:

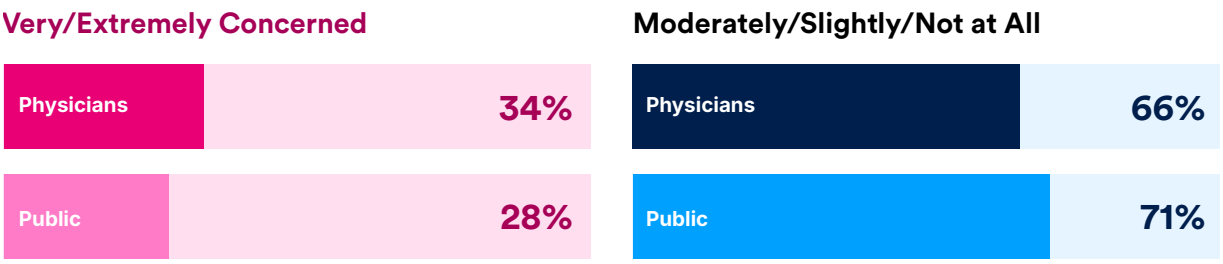
[1] Franklinos LHV, Jones KE, Redding DW, Abubakar I. The effect of global change on mosquito-borne disease. *Lancet Infect Dis.* 2019;19(9):e302-e312. doi:10.1016/S1473-3099(19)30161-6.

Limited Sense of Urgency, Feeling Uniformed Leads to Complacency with Status Quo in Face Rising Threat of Mosquito-Borne Diseases

While infectious disease experts like Fauci and Hotez are alarmed by the rise of mosquito-borne diseases, especially in light of climate change, primary care physicians and the general public surveyed by Cure expressed moderate to no concerns about mosquito-borne diseases.

Specifically, only one in three physicians (34 percent or one-third of those surveyed) expressed being very to extremely concerned about the surge of these threatening diseases, and only about a quarter of the public surveyed (28 percent) expressed being very or extremely concerned.

Figure 1: Levels of concern about the increasing frequency of mosquito-borne diseases.



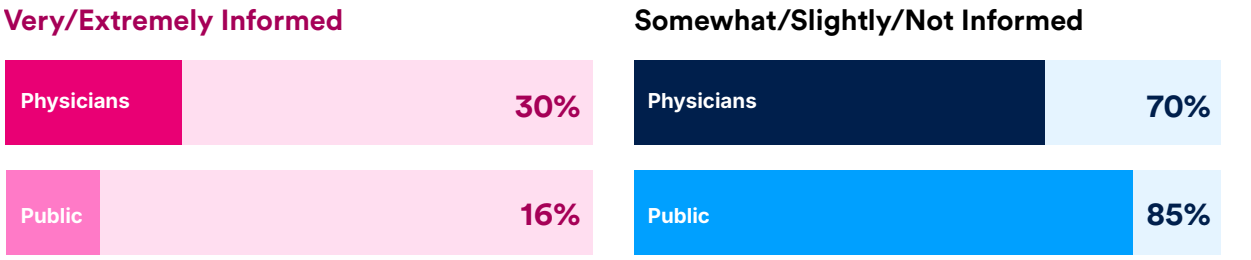
The apparent disconnect between the level of concern amongst infectious disease experts compared to the level of concern expressed by physicians may result from primary care physicians' lack of frontline exposure to clinical engagement with infected patients or their limited role in addressing public health implications of these diseases.

Similarly, the public may vastly underestimate the threat of these diseases due to a lack of awareness.

Compounding the limited sense of urgency among physicians and the public is a feeling of being uninformed about the risks associated with these diseases, as reported in the survey. Both groups reported low levels of feeling well-informed about the risks associated with mosquito-borne diseases.

A strikingly 70 percent of physicians felt somewhat to not-at-all informed, as did 85 percent of the public.

Figure 2: Contrasting perceptions of being well-informed about mosquito-borne disease risks.



From a public health perspective, the double-whammy of lack of concern and lack of awareness creates a sense of complacency and a lack of preparedness that is the perfect recipe for disaster in the face of a potential surge of these illnesses in the face of increasing climate change and global warming.

The survey also captured a bit of fatalism. One physician commented, "Everyone is a potential target. Everyone is at risk for a potentially devastating arbovirus infection that can have morbidity and mortality. There's no good and safe way to prevent these issues for now."

Physicians frequently raised three specific issues in their comments about the growing public health issue of mosquito-borne diseases: the serious nature of the diseases that lack effective interventions, climate change and increased spread of mosquitos.

One doctor noted, "With West Nile, Zika and [Eastern Equine] encephalitis, none has curative treatment." And another stated, "They are becoming more common, and with global warming only spreading more disease. The amount of disease is increasing also."

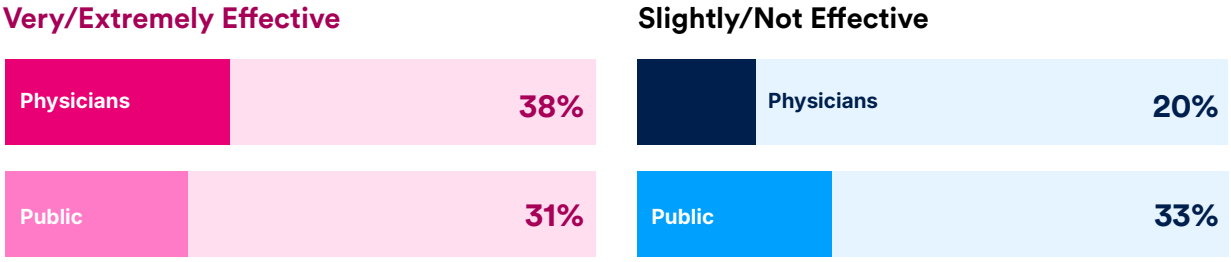
The low levels of concern and the high levels of unawareness spotlight the need for educational initiatives to improve awareness of the risks associated with these diseases, their symptoms, and preventive measures to ensure public health preparedness in the face of a sudden surge or an epidemic. Providing individuals and communities with knowledge can empower them to take actions that reduce the risk of infection.

Skepticism that Public Health Mosquito Prevention Campaigns Matter

Lack of awareness is an opportunity for public health education campaigns.

Indeed, the CDC launched a national collaborative prevention and control strategy in 2024. It involves 17 federal agencies; NGOs; medical, entomological, and vector control professional organizations; state and local health departments; healthcare providers; academics and industry.

Figure 3: Perceptions of the effectiveness of national public education campaigns in reducing the risk of mosquito-borne diseases.



However, the program's priorities include only two mosquito-borne diseases currently, dengue and West Nile, along with the tick-borne Rocky Mountain spotted fever and Lyme Disease.

Many public-facing Fight the Bite campaigns try to raise awareness and prevent spread of West Nile and other mosquito-borne diseases.

However, Cure found that both physicians and the public had low confidence that these efforts would make a difference.

Only about 1 in 3 physicians (38 percent) and public respondents (31 percent) voiced belief in the power of national public education campaigns to be extremely or very effective in reducing infection risks.

These higher rates of skepticism suggests that while education plays a vital role, traditional methods may not suffice.

Public health officials need to implement innovative strategies that engage diverse audiences and drive behavior change.

Information on personal protection, like proper use of repellents or clothing, disease signs and symptoms, and the importance of environmental controls all had nearly equal importance to respondents of both groups, and more so than awareness of geographic spread of mosquito-borne diseases.

Dr. Fauci: “I really felt like I’d been hit by a truck”

The gaps in perception and understanding of mosquito-borne illnesses revealed by the Cure survey come as no surprise, says Anthony Fauci, MD, former director of the National Institute of Allergy and Infectious Diseases and now Distinguished University Professor at the Georgetown University School of Medicine and McCourt School of Public Policy.

“The general public usually lags in [its] appreciation of the emergence of public health problems,” Fauci told Cure. “We really do need to increase the public awareness of how the incidence of diseases such as Eastern Equine Encephalitis and West Nile Virus will only increase, and we really need to address this with better attention to mosquito control and investments in vaccines and antivirals.”

“With climate change,” Fauci says, “the problem of mosquito-borne diseases will only get much worse.”

Fauci, 83, is recovering from his own frightening encounter with West Nile – likely from a mosquito-bite in his backyard – that landed him in the hospital in August 2024.

He says he is not ready to offer a personal account of his illness, but he told *STAT* in a brief interview after his release from the hospital, “I’ve never been as sick in my life. Ever. By far, this is the worst I’ve ever been with an illness.”

“I really felt like I’d been hit by a truck.”

Fauci, a leader of the government’s response to COVID-19, AIDS and countless other infectious disease threats, spent six days in the hospital as doctors tried to figure out what was making him so sick.

He assumed at first that he was coming down with a “plain old upper respiratory infection.” He felt “weak and worn out and tired.... But then the weakness got really profound.”

He was hospitalized on August 16. Doctors ordered a flurry of tests that ruled out bacterial infections and tick-borne diseases, *STAT* reported. Finally, a blood test revealed he was “strongly positive” for West Nile Virus.

Fauci said his temperature rose to 103°F and for several nights he suffered “shaking chills.” He was so weak, he said, that he couldn’t stand without help. Finally, the fever broke and his symptoms abated.

West Nile Virus

is the leading cause of mosquito-borne disease in the United States, occurring most frequently in August and September.

It is a flavivirus, a family that includes St. Louis encephalitis virus, Japanese encephalitis virus, and Powassan virus. There is no vaccine and no antiviral treatment. All doctors can do is provide supportive care, including fluids, anti-inflammatories and pain medications.

Fortunately, most cases, about 80 percent, are asymptomatic, the CDC reports. The symptoms, when they occur, can be devastating.

About 1 in 5 patients suffer from fever, vomiting, diarrhea and joint pain. In 1 of 150 cases, people develop a serious, sometimes fatal illness. People older than 60 are at the greatest risk of severe sickness and death.

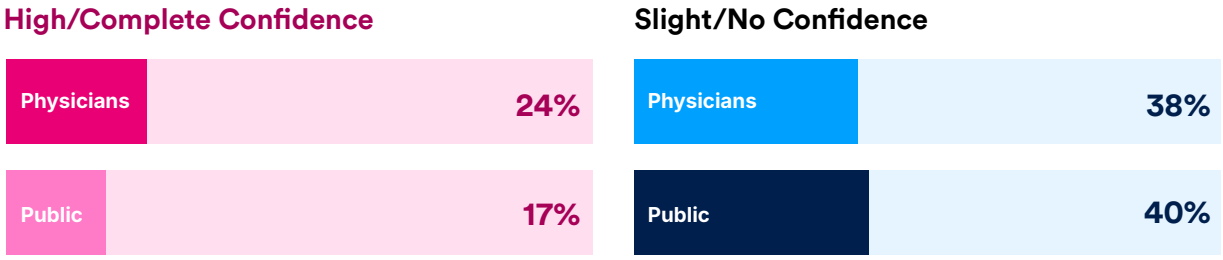
In the most serious cases, the virus attacks the central nervous system, where it can cause encephalitis or meningitis, inflammation of the membrane that enclose the brain and spinal cord. About 10 percent of “neuroinvasive” cases are fatal.

So far this year, as of October 1, 880 cases have been reported in 46 states, and 605 of those patients developed neuroinvasive illness. Each year an average of 130 people infected with West Nile Virus die, CDC reports.

Alarming Lack of Confidence in Local Responses to Manage Mosquito-Borne Disease Outbreaks

Despite recognizing the importance of public health agencies for surveillance and control measures, both groups showed remarkably low confidence in their local public health agencies' ability to handle an outbreak of a mosquito-borne virus.

Figure 4: Confidence levels in local public health agencies' ability to handle an outbreak of a mosquito-borne disease.



Only four in 10 physicians (38 percent) and one in four public respondents (27 percent) expressed confidence that local engagement and education would be extremely or very effective in preventing outbreaks.

This lack of confidence may stem from perceived inadequacies in current public health responses or a general lack of visibility or awareness of the role of local public health efforts in combating these diseases.

Only only one in four physicians (24 percent) and about one in five public respondents (17 percent) expressed high or complete confidence that local public health agencies could manage outbreaks of mosquito-borne diseases..

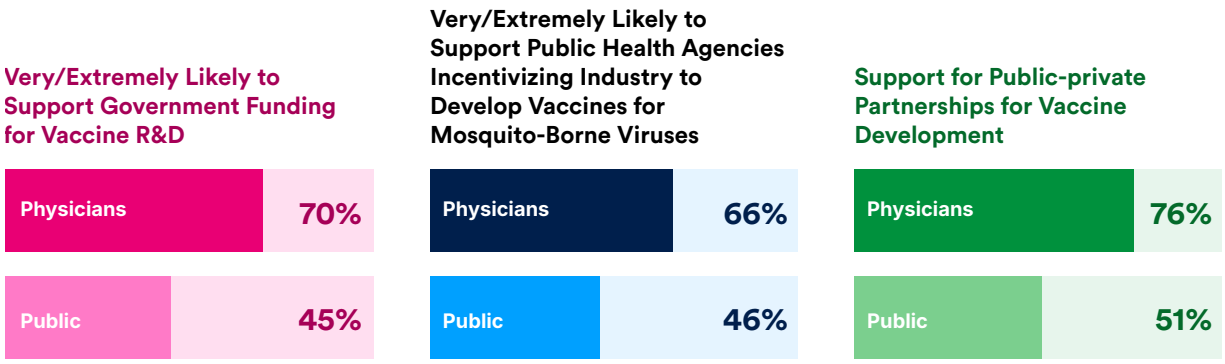
The survey, however, found moderate support for pitching in at local levels. A third of public respondents (33 percent) and nearly half of physicians (46 percent) were extremely or very willing to participate in their communities' initiatives to help reduce risks.

Such activities could include neighborhood clean-up efforts as well as awareness campaigns. Energizing community outreach efforts could help address the concerns respondents raised about increasing surveillance and monitoring of mosquito-borne illnesses. This represents an untapped resource that could be mobilized with effective education and engagement strategies.

Confidence Gap in Vaccine Research and Development for Mosquito-Borne Diseases

Vaccines are among the most powerful tools we have to address significant global health threats, according to public health experts. The survey probed perceptions about interventions like vaccines to prevent infection by the disease-causing viruses that mosquitoes carry.

Figure 5: Willingness to support government funding for vaccine research and community initiatives.



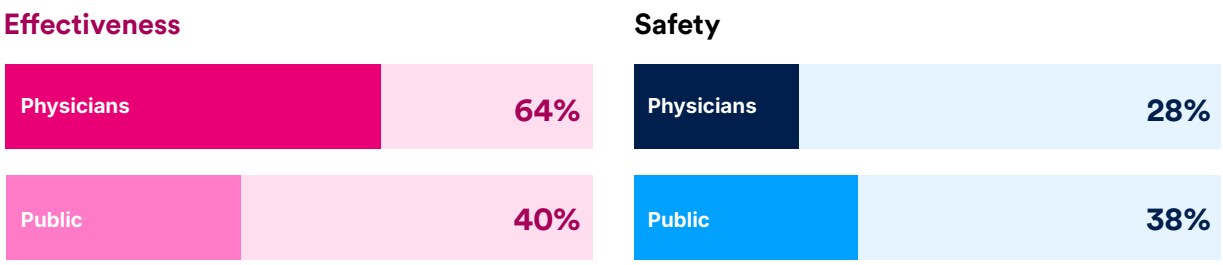
The experience of government-led efforts that accelerated vaccine R&D in the face of the COVID-19 pandemic, pandemic fatigue, vaccine skepticism and misinformation could contribute to the gap. Lagging public support for vaccine R&D could influence health policies at all levels of government, with serious public health consequences.

There was a clear divergence in priorities for vaccine development. Physicians' first priority was effectiveness, while number one for the public was safety.

Affordability and accessibility, two factors in successful immunization strategies, were in a strongly distant third and fourth place, yet still ranked higher than speed of development, all notable factors during the COVID-19 pandemic.

These prioritizations likely reflect a growing public concern about vaccine side effects and long-term health impacts, driven in part by the amplification of medical misinformation on social media channels.

Figure 6: Differences in priorities for vaccine development between physicians and the public.



Public health communication strategies must address these concerns by providing clear and transparent information about vaccine development, efficacy and safety in ways that resonate with the intended audiences.

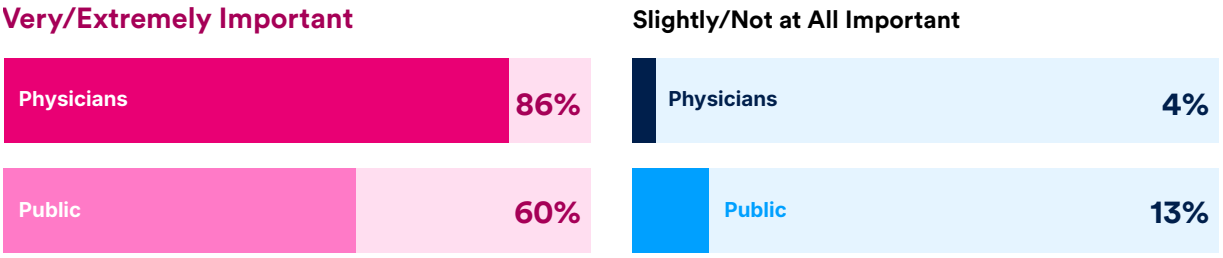
Hotez noted that the public's safety concerns are likely to be exacerbated by the known painful side effects of vaccines for diseases such as Yellow Fever. "If you think COVID-19 vaccine has side effects, wait till you try a Yellow Fever vaccine," he said. "Nobody's going to want to take it."

There are enormous costs involved in vaccine development and distribution, disease surveillance and public education. Despite the threat of disease and the potential public health benefits, only half of doctors (50 percent) and four in 10 (40 percent) of the public surveyed would consider paying a small tax (less than 1 percent) to support programs designed to combat mosquito-borne viruses.

Differences in How to Monitor and Control Mosquitos

A considerable majority of physicians (86 percent) and more than half (60 percent) of the public respondents reported that increased public health surveillance and environmental monitoring are extremely or very important.

Figure 7: The importance of increased disease surveillance and environmental monitoring as rated by the general public and physicians.



Enhanced surveillance plays a crucial role in early detection of outbreaks, monitoring the spread of viruses, and identifying high-risk areas. Effective surveillance allows for timely interventions, reducing the impact and spread of these diseases.

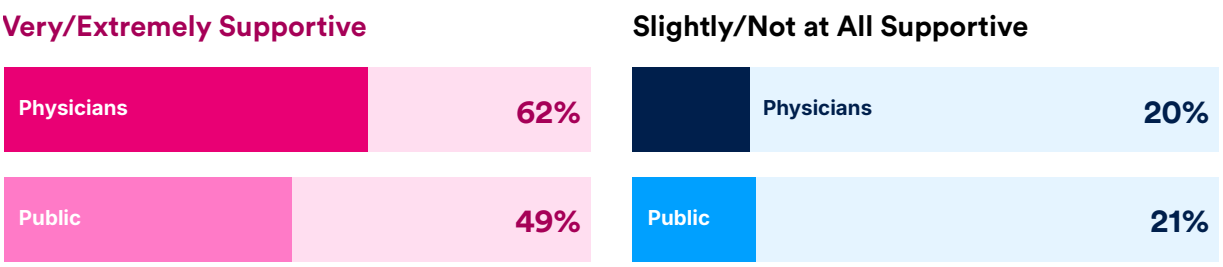
Some specific reasons cited by physicians for increasing surveillance and monitoring include the seriousness of the diseases and that being well-informed helps in prevention efforts.

One physician noted, "We have to monitor it closely, or we can have another pandemic."

Another physician commented that it is "important to know which mosquito-borne viruses are prevalent in our area to teach patients what to look out for."

About a third of both groups noted that the most important goals of heightened disease surveillance should be early detection of outbreaks and identification of high-risk areas.

Figure 8: Support levels for aggressive mosquito control programs such as increased spraying.



Programs like The National Emerging Special Pathogens Training and Education Center (NETEC) and ArboNET complement established CDC to local health department surveillance programs.

NETEC is designed to help healthcare professionals stay informed, know how to diagnose, treat and educate patients, and reporting cases to health authorities to help minimize the impact of mosquito-borne diseases.

ArboNET Surveillance

ArboNET is the national surveillance system managed by the CDC and state health departments. Begun in 2000 to track West Nile virus infections, ArboNET now maintains data on nine arboviral infections among humans, presumptive viremic blood donors, veterinary disease cases, mosquitoes, dead birds, and sentinel animals. CDC notes that ArboNET is a passive surveillance system that relies on physicians who use appropriate diagnostic tests and report laboratory-confirmed cases to public health authorities. Because diagnosis and reporting are considered incomplete, the CDC notes that incidence of arboviral diseases is underestimated.

What Next?

Mosquito-borne diseases pose an escalating public health challenge, requiring a comprehensive approach that includes education, surveillance, and vector control. The Cure *Mosquito-Borne Diseases Benchmark Report 2024* reveals significant gaps between experts' assessment of the level of threat posed by these illnesses in the face of climate change and the lack of concern and knowledge among primary-care physicians and the public and support for measures to respond to the rising threat of mosquito-borne illnesses.

The report's recommendations are intended to build awareness of the challenges ahead and offer considerations for an action plan to prevent the proliferation of mosquito-borne diseases from becoming a crisis.

By developing and rapidly implementing targeted strategies to bridge these gaps, healthcare professionals and public health officials can enhance community awareness, improve disease prevention efforts and reduce the burden of these illnesses in communities.

The increasing threat of mosquito-borne illness also represents an historic opportunity for innovation.

"There will be a whole slew of opportunities, depending on which pathogens emerge," said Ginger Metcalf, Executive Director of Strategy and Project Development at the Human Genome Sequencing Center at Baylor College of Medicine.

As cases accelerate, and with increasing climate change introducing new pathogens, demand for newer, safer and more effective control and treatment measures will escalate, including point-of-care diagnostic tests, improved and new vaccines, and pathogen-specific targeted therapies.

Laboratories and pharma companies will need reagents, she said. Medtech innovators will be called upon to create contact tracing apps. Data companies will develop platforms for collecting, analyzing and consuming a flood of data aggregated from government, researchers, health workers and public sources.

Hotez and Metcalf and their teams at Baylor have begun crafting and are seeking funding for an unprecedented mosquito-borne disease surveillance program.

This novel interdisciplinary initiative will couple genetic sequencing with detailed location-based data of detected pathogens present in the mosquito populations at a county level.

The resulting geo maps will be actionable tools that public health officials can use in real time to implement prevention and response efforts.

"It's exciting and quite novel," Metcalf said, "bringing together different disciplines and genomic technology to look at potential public health concerns around climate change, infectious diseases and diseases caused by vectors such as mosquitoes."

There will be setbacks, too. The pharmaceutical firm Johnson & Johnson recently announced it is scaling back its infectious disease pipeline and, as a result, has dropped its candidate dengue virus vaccine mosnodenvir despite positive phase 2 results. If dengue were to emerge in the U.S., however, Johnson & Johnson could potentially revive mosnodenvir and fast track its development.

The astonishing technological achievements of the last half century offer new tools for tackling these ancient ailments in ways that were unimaginable even a few years ago.

COVID-19 has tragically demonstrated that we let down our guard at our peril. But the lightning-fast development of mRNA COVID-19 vaccines and effective antivirals demonstrates that brilliant minds equipped with transformative technology can meet the challenges ahead.

Source: Centers for Disease Control and Prevention

Resources

BARDA Influenza and Emerging Infectious Diseases Medical Countermeasures.

Centers for Disease Control and Prevention Vector-borne diseases

Centers for Disease Control and Prevention Geographic Information Systems.

Centers for Disease Control and Prevention National Public Health Strategy to Prevent and Control Vector-Borne Diseases in People.

Environmental Protection Agency Insecticide Safety.

National Institute of Allergy and Infectious Diseases Vector Biology Information for Researchers.

World Health Organization Vector-borne diseases.

Research Methodology

Cure, a premier healthcare innovation campus and hub for entrepreneurs in New York City, conducted the Cure Mosquito-Borne Diseases Survey 2024 in collaboration with the Deerfield Institute, a division of Deerfield Management Company, an affiliate of Cure.

Cure surveyed conducted the survey in September 2024. The survey received responses from 50 primary-care physicians: 16 internists, 25 family practitioners, 9 pediatricians and 281 members of the US adult general population. An industry-standard honorarium was provided to encourage thoughtful participation.

Among the Physicians, 64 percent were male, 36 percent female, and 32 percent had practiced for 15 or fewer years, 40 percent had practiced for 16 to 25 years, and 28 percent for more than 25 years. Among the public respondents, 46 percent were male, 54 percent female, and ranged in age from 18 to 79. Among the public respondents, 65 percent were white, 10 percent Hispanic or Latino, 13 percent black or African American, 7 percent Asian or Pacific Islanders and 2 percent Native Americans or American Indian.

A large proportion of the respondents hailed from the South (40 percent of physicians and 38 percent of the public), while the West is home to 22 percent of each group. Another 24 percent of physicians are based in the Northeast, and 14 percent in the Northwest. The public respondents included 18 percent from the Northeast and 22 percent from the Northwest.

Education levels for the public respondents included 17 percent high school graduates (or equivalent), 21 percent with some college but no degree, 10 percent with an associate degree, 31 percent with a bachelor's degree, 1 percent with a doctorate and 17 percent with graduate or professional degrees.

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Citation

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About Cure

Cure is a healthcare innovation campus in the heart of New York City that features laboratory and business facilities, a collaboration residency, office space and premium event venues, including an education center, conference center, and iconic rooftop facility, as well as tools, mentoring, networking, and other assistance to members of its ecosystem. Cure houses on-campus startups and established companies. Residents regularly create synergies and collaborative partnerships with peer organizations across the spectrum of healthcare, from academic or private to non-profit or government, and focus on diagnostic, device, drug or vaccine discovery, development and production as well as care delivery and public health. Cure also offers industry-leading event programming focused on critical health topics. Cure's mission is to foster and accelerate advances in health. For more information, please visit wewillcure.com.

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