



**USAID**  
FROM THE AMERICAN PEOPLE

## REQUEST FOR INFORMATION

February 7, 2014

**Questions and Comments Due Date:** Wednesday, February 26, 2014, 5:00 pm Washington, DC Time

**Subject:** Request for Information (RFI-EPT-2-OHW) for Emerging Pandemic Threats – One Health Workforce.

Dear Partners:

The United States Government, represented by the Agency for International Development (USAID), Global Health Bureau (GH), Office of Health, Infectious Diseases and Nutrition (HIDN), is seeking comments on a draft program description for a planned new activity, Pandemic Influenza and Other Emerging Threats Program – One Health Workforce. USAID plans to issue a Request for Applications (RFA) within the next few months. The program description presents the current draft objectives and key elements of the activity. The level of funding allocated for this project will not exceed \$50 million over a five-year implementation period.

Issuance of this RFI and posting the draft Program description for comments does not constitute a request for applications, which will come later through a separate process. The RFI does not represent any award commitment on the part of the Government, nor does it obligate the Government to pay for costs incurred in the preparation and submission of any comments or questions.

This RFI can be downloaded from <http://www.grants.gov>. Interested parties who are not able to retrieve the RFI from the Internet can request a copy by contacting the Office of Acquisition and Assistance via email only at [ept-2@usaid.gov](mailto:ept-2@usaid.gov). Comments and questions should be submitted to USAID via email to [ept-2@usaid.gov](mailto:ept-2@usaid.gov) no later than Wednesday, February 26, 2014, 5:00 pm Washington, DC Time. Please use exclusively the [ept-2@usaid.gov](mailto:ept-2@usaid.gov). The contact information below is provided just in case you are experiencing problems with the dedicated program mailbox.

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Thank you for your interest in the Emerging Pandemic Threats -2 initiative. We look forward to receiving your comments.

Sincerely,

A handwritten signature in blue ink, appearing to read "Boryana Boncheva".

Boryana Boncheva  
Agreement Officer

## One Health Workforce

### I. USAID Pandemic Influenza and Other Emerging Threats Program

#### Summary

In 2009 USAID launched the Emerging Pandemic Threats program (EPT-1) – a five year program targeting *the early detection of new disease threats; enhanced “national-level” preparedness and response capacities for their effective control; and a reduction in the risk of disease emergence by minimizing those practices and behaviors that trigger the “spill-over and spread” of new pathogens from animal reservoirs to humans.* EPT-1 complemented an ongoing line of work being supported by USAID since 2005 - to control the threat posed by highly pathogenic H5N1 avian influenza virus (AI).

Both of these efforts grew out of a recognition that we are now in an era of new, re-emerging and recurring global health threats that argue for a longer-term, more strategic approach to global health security. The EPT-1 and AI work have been focused on building those capacities and expanding the evidence base that contribute to mitigating the impact of novel “high consequence pathogens” arising from animals. Using a “risk-based” formula that targeted those places, populations and practices that contribute to the emergence and spread of new microbial threats, our EPT-1 and AI work have laid the foundation for a next generation of investments that seeks to consolidate these efforts into a highly coordinated program spanning pandemic influenza and other emerging threats to further minimize their potential for global impact.

Over the past several decades, many previously unknown human infectious diseases have emerged from animal reservoirs, including agents such as human immunodeficiency virus (HIV), the highly pathogenic avian influenza H5N1, the 2009 H1N1 pandemic virus and more recently the H7N9 virus and the Middle East Respiratory Syndrome (MERS) virus. In fact, more than three-quarters of all new, emerging, or re-emerging human diseases since the beginning of the 21<sup>st</sup> century have been caused by pathogens originating from animals or animal products. As the interactions between people and animals intensify, driven by increasing human populations, the emergence of new, deadly zoonotic disease threats will increase steadily in the coming decades.

Mindful of the looming challenge posed by emerging diseases, a long-term objective of the EPT-1 Program is an “experiment in action” – intended to answer the two-part question: is it possible to anticipate future pandemic threats before they emerge, and can their emergence be stopped? This document speaks to the significant advances made under USAID’s EPT-1 and AI programs in describing the underlying drivers for disease emergence and the opportunities to build upon and extend their accomplishments over the coming five years under a consolidated EPT-2 program that unifies investments in influenza and other emerging viral threats under one strategic umbrella. Importantly, the expected progress to be achieved under EPT-2 will itself lay the foundation for future iterations of EPT and, hopefully, move towards a greater capability to “forecast” and “stop” future threats before they fully emerge. This section also addresses how EPT-2 will contribute to the Global Health Security (GHS) Agenda - a White House led effort to

consolidate US Government (USG) efforts across the health and security sectors to more effectively address threats posed by the natural emergence of new disease threats, as well as the intentional and/or accidental release of dangerous pathogens. Beyond consolidating USG efforts, the GHS agenda is also focused on creating a unified global effort to address these threats.

### **Introduction: A Decade of Learning**

In today's globalized world, the speed with which newly emergent diseases can surface and spread, as illustrated by the H1N1 2009 pandemic virus, raises serious public health, economic, security and development concerns. It also underscores the need for the global community to act pre-emptively and systematically to improve individual countries' abilities to earlier identify and quickly mitigate health threats arising within their borders. Most importantly, the threat posed by new infectious diseases arising from animal reservoirs (zoonotic diseases) argues for a rethinking of standard strategies for the "prevention, detection and response" of diseases and their progenitors to reflect a more inclusive and strategic partnership across the public health, animal health and environmental sectors if we are to be able to address emergent disease threats before they pose an overwhelming global threat.

The emergence of the Severe Acute Respiratory Syndrome (SARS) coronavirus in 2003 and the H1N1-2009 pandemic virus illustrate the consequences of not having in place capacities to detect the early stages of emergence of a new disease threat – that is, while it is still circulating (and evolving) principally in animals and before the potential threat has acquired the ability to efficiently transmit among humans. In both instances the public responses came after the viruses had fully emerged as pandemic threats. On the other hand, the emergence of the H5N1 highly pathogenic avian influenza virus in Hong Kong in 1997 and its re-emergence in Southeast Asia in 2003, and the early detection of H7N9 virus in China and the Middle Eastern Respiratory Syndrome (MERS) coronavirus in Saudi Arabia have provided important opportunities to monitor a threat before it has fully emerged – and enable the world a longer window to prepare for the possibility of a new health threat, including the production of vaccines and the stockpiling of antivirals. The early recognition of a potential threat also allows for a global effort to take preemptive steps to bring the spread of the virus under greater control – and by extension possibly reduce the opportunities for it to emerge as a pandemic threat. Importantly, work, in part supported under USAID's Pandemic Influenza and Other Threats (PIOET) portfolio, has advanced our understanding of disease emergence by highlighting the strong correlation between "high risk" geographic areas, animal hosts, microbial agents, and people. This collective body of work, in turn, has led to the recognition that risk-based intervention strategies enable targeting disease detection to those places, populations, times or situations where risk of disease emergence is greatest and the likelihood of finding it is highest.

### **The "PIOET Portfolio"**

USAID is a major leader in the global response to the dangers posed by emerging pandemic threats. Since 2005, the dual goal of USAID's Pandemic Influenza and Other Emerging Threats (PIOET) program has been to: a) minimize the global impact of existing pandemic influenza threats, particularly from the H5N1 highly pathogenic avian flu, and b) pre-empt the emergence and spread of future pandemic threats. The effectiveness of the three areas of focus by the

PIOET program: 1. H5N1 Avian Influenza; 2. Pandemic Preparedness; and, 3. Emerging Pandemic Threats are described below.

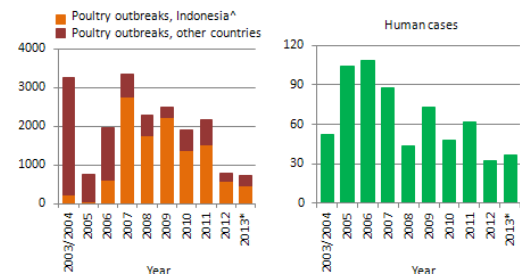
**1. H5N1 Avian Influenza:** Since mid-2005, USAID, in partnership with the U.N. Food and Agricultural Organization (FAO), the World Health Organization (WHO), the U.S. Centers for Disease Control and Prevention (CDC) and national government and non-government counterparts, has strengthened the capacities of more than 50 countries for monitoring the spread of H5N1 avian influenza among wild bird populations, domestic poultry, and humans, to mount a rapid and effective containment of the virus when it is found, and to assist countries prepare operational capacities to mount a comprehensive response in the event a pandemic-capable virus emerges.

USAID's efforts have contributed to dramatic downturns in reported poultry outbreaks and human infections, and a dramatic reduction in the number of countries affected – as illustrated below.

*(1) The overall magnitude of the H5N1 avian pandemic has diminished, with reported numbers of poultry outbreaks and human cases having decreased since their peak in 2006.*

Over the past several years there has been a substantial decrease in reported poultry outbreaks and human infections. Specifically, poultry outbreaks decreased 79% (between 2006 and 2013) and human cases decreased 66% from a peak of 2006. The success in endemic countries has often been due to improvements in the efficacy of poultry vaccination; in epidemic countries success has been more closely linked to improvements in rapid detection and containment. Generally, behavior change communications has had limited impact as people have been reluctant to change the behaviors that put them at risk of infection when the “risk” of infection is recognized as a very rare event.

Number of Reported Poultry Outbreaks and Human Cases Worldwide Decreasing Since 2007



Sources: FAO, OIE, WHO. \* Data from 2013 not yet complete. \* Surveillance in Indonesia expanded in 2006 and not fully operational until 2007

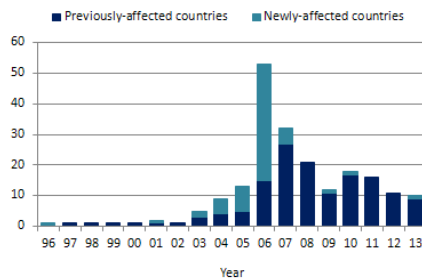
Indonesia is the most recent example of how the introduction of effective measures has led to a dramatic reduction in reported outbreaks in poultry and humans. In 2009 USAID initiated an effort with FAO and the OIE/FAO OFFLU *Network for Animal Influenza* to work with Indonesian authorities to develop and produce a poultry vaccine locally that specifically matched the H5N1 viral strain then circulating in Indonesia. In 2011 a highly effective vaccine was introduced and quickly taken up by the large scale poultry producers. By the end of 2012 there was a greater than a 60

percent reduction in reported H5N1 outbreaks among poultry and a similar reduction in reported human infections (see adjacent figure). Both reductions have been sustained through 2013. Importantly, as part of this activity the capacities for both monitoring for long-term efficacy of the vaccine against circulating H5N1 virus and the development of future poultry vaccines were

institutionalized within Indonesia. USAID is now working to apply this model in Egypt, another persistent “hot spot” for H5N1.

*(2) H5N1 appears to have not only stopped spreading to new countries, but there has also been a dramatic contraction of its geographic range.*

Number of H5N1-Affected Countries\* Worldwide  
Decreasing Since 2006



Sources: FAO, OIE, WHO, GenBank. \* H5N1 detected in wild animals, poultry, or humans.

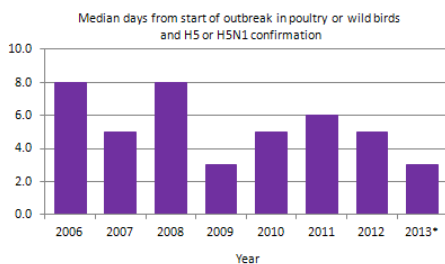
more than 95% of all reported outbreaks.

H5N1 appears largely to have stopped spreading to new countries, at least for now. Between 2003 and mid-2005, nine countries in Southeast Asia reported H5N1 outbreaks. Beginning in late 2005, there was an explosive movement of the virus outside of Southeast Asia to Europe, the Middle East, South Asia, and Africa. At the height of the poultry outbreaks in 2006, a total of 53 countries had reported outbreaks. Since the end of 2010, the number of countries affected has been limited to nine, with five of these countries (Bangladesh, China, Egypt, India, and Vietnam) accounting for

*(3) Affected countries have strengthened their capacities to identify and respond to future poultry outbreaks.*

USAID has focused on strengthening the capacity of affected countries in three key areas: strengthening laboratories for the early identification of H5N1 infections in both poultry and people; promotion of timely and effective response in containment and elimination of the virus;

Detection Times for H5N1 Outbreaks in Birds in  
Developing Countries Decreasing Since 2006



Sources: FAO, OIE, WHO. \* Data from 2013 not yet complete. Due to changes in reporting, poultry outbreaks in Egypt, Indonesia, and Vietnam not included since June 2008, September 2006, and January 2013, respectively.

and education of the general population on the risks associated with avian influenza and steps they can take to protect themselves. These investments have led to improved capacities in early-warning surveillance for AI outbreaks in domestic poultry, wild birds, and humans, have strengthened capacities of veterinary and human health laboratory diagnosis of the H5N1 virus, and have established rapid response teams involving veterinary and public health professionals trained in core principals of field epidemiology. All of these are key capacities that could form the backbone of any effort to address

the larger threats posed by emerging zoonotic diseases. Per the adjacent figure, a comparison of AI outbreaks by year indicates that the average number of days between the start of disease outbreak in poultry or wild birds and H5 or H5N1 confirmation has fallen from eight days (in 2006) to three days (in 2013). This is a strong indicator that the worldwide response to AI outbreaks has dramatically improved.

(4) *Monitoring the spread of H5N1 and its genetic variants across S.E. Asia has led to an unexpected but important understanding of the role of commercial poultry “value chains” in the emergence, spread, and maintenance of influenza viruses*

One consequence of improved laboratory capacities has been the ability to routinely monitor the spread of the H5N1 virus and its genetic variants (clades) across S.E. Asia. This has led to a growing appreciation of the role of commercial poultry trade – from farm to markets - in promoting the evolution of the virus, its spread across the region and its persistence in countries such as Vietnam and Indonesia. As a result, increasingly detailed “value chain” maps have been generated that describe the geographic routes by which poultry are moved from farms to markets, sometimes across thousands of miles. This has led to a better ability to anticipate how new viral variants might spread from an initial point of emergence. This knowledge has proven particularly useful in anticipating how the H7N9 virus, which emerged in eastern China in early 2013 might spread across China and into S.E. Asia. This information has also proven central to recent efforts to better understand the drivers behind the emergence of new influenza threats.

Although these successes against H5N1 are significant, as of 2014 the H5N1 virus remains a serious public health threat and sustained vigilance is required; the virus continues to spread in poultry with a mortality rate among infected humans of nearly 60% - and has an undiminished capacity to re-spread across the world were existing control measures relaxed. As a reminder of the threat it poses, over the past four years several new mutated forms of the H5N1 virus have emerged, principally in China, that have rapidly replaced earlier variants across SE Asia. Most recently a new “recombinant” virus has been detected in Cambodia and is associated with an unprecedented surge in human cases during 2013. Other new variants of the virus have proven to be no longer susceptible to existing poultry vaccines raising concerns that current H5N1



vaccines stockpiled for human use in the event the AI virus becomes an efficient human-to-human transmitter may be no longer efficacious. Mindful of the need for vigilance, USAID, under EPT-2, will continue its efforts to build on its successes while further consolidating our AI programs in the highest risk countries for maximum impact.

**2. Pandemic Preparedness** In response to a growing concern about the possibility of an influenza pandemic and its potential to cause tens of millions of deaths, USAID launched a series of efforts beginning with the *Humanitarian Pandemic Preparedness Initiative* (H2P) in 2007, a partnership with the U.S. Department of Defense’s Pacific and Africa Combatant Commands (PACOM and AFRICOM) in 2008, and in 2009 the *PREPARE* project to support national capacities (civilian and military) to prepare for and respond to the worst consequences of a pandemic. USAID focused its assistance to support national authorities to put in place pandemic preparedness plans that addressed five distinct areas:

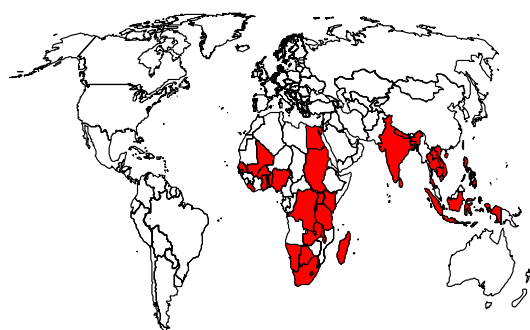
- supportive care and treatment for those with influenza

- limiting transmission from patients with influenza to others in their households and communities
- provision of preventive and/or curative care for those ill with potentially fatal diseases other than influenza, e.g., malaria, diarrhea, bacterial pneumonia, other vaccine-preventable diseases, AIDS, tuberculosis
- ensuring ready access to food
- rapid resumption of income-generating activities following a pandemic.

Underlying USAID's approach to pandemic preparedness was the recognition that while all nations could be affected by an influenza pandemic, developing countries will likely have limited access to lifesaving vaccines and pharmaceuticals and as a result will be among the most vulnerable. Unlike the aftermath in more common large-scale disasters, access to aid (supplies and manpower) from traditional donor countries could be very limited or even non-existent while the 'industrialised world' struggled against the pandemic within its own borders. In countries where health systems are often not available in poor or remote areas, stockpiling supplies is either extremely complex or simply impossible for people at, or below, subsistence levels. When faced with more immediate threats to daily existence, inevitably, preparing for an influenza pandemic too often takes a low priority.

At the core of USAID's pandemic preparedness agenda was ensuring that local populations can access and benefit from realistic and sustainable 'off-the-shelf' pandemic preparedness plans which district and community leaders have the capability to implement. To assure pandemic preparedness plan sustainability, individual projects were designed to integrate into existing programmes – either health or disaster preparedness – at the community level in the target countries.

USAID's pandemic preparedness work has been critical in enabling more than 25 countries (principally in Africa and Asia) that are at disproportionate risk of the consequences of a global influenza pandemic. USAID also strengthened the capacities of regional bodies such as ASEAN



for the purpose of supporting the development of detailed "whole of society" national pandemic preparedness plans that emphasis the role of non-pharmaceutical strategies in protecting vulnerable populations. These plans, tested under simulation exercises highlighted the roles and responsibilities of key stakeholders from government (civilian and military), civil society and non-governmental organizations, and the private sector in responding to a pandemic. In 2009, in the face of the H1N1

pandemic virus, the national Pandemic Preparedness Plans proved extremely valuable in mobilizing an early and effective response to the anticipated threat of this novel virus in many of these countries. In 2011, the lessons learned from USAID's pandemic preparedness work was captured at the *Towards a Safer World Conference* and set the stage for harmonizing this work with the UN's International Strategy for Disaster Reduction and its Hyogo Framework for Action (2005-2015).

**3. The Emerging Pandemic Threats Program** In 2009, recognizing the threat of new infectious diseases extended beyond the risks posed by avian influenza, USAID launched the Emerging Pandemic Threats program. EPT-1 was designed to give earlier insight into the emergence of new public health threats (in addition to influenzas) and enhance country-level capacities to mitigate their potential impact. The EPT-1 portfolio initially drew heavily from the experiences and lessons acquired from efforts to address the threats posed by H5N1 – and as such reflects a strategic approach that (1) builds on the understanding that the future well-being of humans, animals and the environment are inextricably linked, (2) promotes a One Health approach that spans the animal health, public health, conservations communities and the environment, (3) targets promotion of those policies and the strengthening of those skills and capacities critical for both minimizing the risk of new disease emergence and the ability to limit their social, economic and public health impact, (4) uses a “risk”-based approach to target investments where the likelihood of disease emergence and spread is greatest.

EPT-1’s Strategic Approach provided a framework for USAID investments intended to reduce the risk of emergence of new diseases of animal origin and their potential economic and human toll. At the heart of EPT-1’s approach has been the recognition that to be effective USAID cannot be successful on its own and must partner with a range of other US government agencies, multi-lateral, bi-lateral, national, non-governmental, and private sector players. EPT-1’s strategic approach has been guided by the following assumptions:

- All populations are vulnerable to new diseases emerging in other countries; it is in our collective interest to strengthen the capacity of all high-risk countries to prevent the emergence and spread of these new disease threats.
- Deadly zoonotic disease threats will increase steadily in the coming decades driven by population growth and expanded interactions between people, animals and the environment.
- Measures are currently available that if properly deployed could greatly reduce the risk of new disease emergence and their impact.
- It is possible, in the event of new disease emergence, to minimize its potential economic and public health impact through enhanced surveillance and early deployment of control measures.
- Enhanced coordination across animal, human, and environmental sectors will contribute to reduced risk of new disease emergence and lead to early and effective control minimizing their impact should they emerge.

At the country level, the EPT-1 partners have been working with governments and other key in-country, regional and international partners to enhance the understanding of distribution of specific “high consequence” viral families across “high risk” animal populations and key drivers of disease emergence—from deforestation and land use change to wildlife trade and livestock product demands. This information, along with other EPT-1 investments to strengthen country-level capacities for routine infectious disease detection and outbreak response, have been used to

improve surveillance and response as well as risk-mitigation strategies. Over its life, EPT-1 has significantly refined our understanding of the “drivers” that underlie disease emergence and established important new partnerships and platforms for even more timely and effective prevention, detection, and control of future threats.

**The “Legacy” of EPT-1** EPT-1 is a suite of four capacity building projects (PREDICT, PREVENT, RESPOND and IDENTIFY) that individually and collectively have made significant contributions to national, regional and global capacities to “detect, prevent and respond to” emergent threats. Below are the “End of Project” deliverables expected by the end of EPT-1 for each of the major lines of work supported:

- Viral Discovery
- Risk Characterization
- Risk Mitigation
- Early Detection
- One Health Capacities
- Outbreak Response

Viral Discovery: To address the need for early discovery of new, emergent disease threats the EPT-1 program, through its PREDICT component, has brought together a coalition of experts from wildlife ecology, genetics, virology, informatics and veterinary medicine focused on building a global early warning system for emerging diseases. Advances in genomics and informatics have allowed for investing in collecting genetic and epidemiologic data that tracks changes in select viruses for the purpose of developing a first generation “predictive model” for pathogen emergence. With its focus on detection and discovery of zoonotic diseases at the wildlife-human interface PREDICT has made significant contributions to: strengthening surveillance and laboratory capacities for monitoring wildlife and people in contact with wildlife for novel viral agents that may pose a significant public health threat; characterizing human and ecological drivers of disease spill-over from animals to people; and, strengthening and optimizing models for predicting disease emergence. By the end of EPT-1 the following deliverables will have been achieved:

- 100 percent of the target countries<sup>1</sup> will be capable of conducting appropriate animal sampling in key interfaces
- 100 percent of target countries will have the capacity and/or access to diagnostics for the target (20) high consequence viral families.
- Surveillance data for all countries will be incorporated into the global predictive model.
- Initial characterization of viral and wildlife species diversity in target countries.

Risk Characterization: A key part of USAID’s EPT-1 program has been the characterizing the biologic profile of specific high consequence viral families circulating in animal populations and human behaviors and practices that are associated with their potential “spill-over, amplification

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<sup>1</sup> EPT-1/PREDICT “target” countries: Africa: Cameroun, DR Congo, Republic of Congo, Gabon, Rwanda, Tanzania, Uganda; Asia: Bangladesh, Cambodia, China, Indonesia, Laos, Malaysia, Nepal, Thailand, Vietnam; Americas (PREDICT only): Brazil, Bolivia, Peru.

and spread”. These investments have allowed for a better appreciation that the “risk of emergence” is ultimately determined by the interplay between the “biological risk” and the “behavioral risk”. As a consequence, if a new and potentially deadly virus emerges in animal populations that may never interact with human populations then it will ultimately prove to be of little to no consequence to humans. It is in the understanding of “how, where and when” a potential viral threat circulating in animals will interact with human populations (or their domestic animals) that is key to determining what constitutes a genuine risk to public health. By the end of EPT-1 the following deliverables characterizing risk will have been achieved:

- First iteration of a global model linking land use change, agricultural intensification, livestock production, extractive industries, and climate change to disease emergence in place
- Initial quantification of risks associated with different interfaces completed, including transmission pathways associated with historical and current outbreaks,
- A working model with CDC for monitoring “spill-over” of novel pathogens into humans in a limited number of sites,
- Longitudinal profiling of wildlife trade in a limited number of urban/peri-urban African markets
- Initial monitoring of viruses on wildlife farms in at least one country
- A completed “Africa Livestock Futures” assessment focused on likely livestock production scenarios through 2030 and potential for increase in zoonotic disease “spill-over, amplification and spread”, along with policy and regulatory options for risk mitigation

Risk Mitigation: As the “risk mitigation” arm of EPT-1, PREVENT has focused on developing strategies for mitigating the risk of disease “spillover”. PREVENT has contributed to a significant increase in our understanding of options for mitigating the risk associated with those practices and behaviors (e.g. habitat change associated with “extractive industry”, bush meat hunting and butchering, raising wildlife for trade and consumption, and the marketing of animals) that expose people to zoonotic diseases. End-of-project deliverables include:

- A “risk assessment/mitigation tool” for the Extractive Industry will have been tested in multiple mining sites
- Fora for routine policy-level dialogue with the extractive industry (mining and petroleum) will be established
- Policy framework for minimizing the risks associated with “wildlife farming” in SE Asia will be formulated in at least one Asian country, and
- Through FAO, strategies and practices for mitigating the risk of disease emergence in poultry “value chains” in Asia will be validated

Early Detection: As part of EPT-1’s overall strategy to be able to detect early new threats, IDENTIFY, a partnership between WHO, FAO and OIE, has focused on strengthening laboratory capacities to safely diagnose and report common animal and human pathogens. IDENTIFY has been instrumental in improving laboratory assessment tools that allow for better

targeting of technical support and training; developing and rolling out training modules on diagnosing highly-infectious diseases; improving laboratory management practices related to biosafety and biosecurity; "twinning" labs with developed country labs; and expanding monitoring of antimicrobial resistance rates among priority pathogens. Additional support was provided to WHO's Global Influenza Surveillance and Response System (GISRS), with support from CDC, to expand their efforts to strengthen laboratory influenza diagnostic and reporting capacities in the Africa region. Through PREDICT significant effort was made to upgrade laboratory capacities in viral characterization. Among expected deliverables by the end of EPT-1 are:

- 31 human health labs and 39 animal health labs in 20 EPT-1-countries in Africa and Asia have enhanced capacities in safe handling, diagnosis and reporting of major endemic human and animal diseases.
- 25 laboratories in 20 EPT-1-focus countries have enhanced capacities in handling, diagnosing and characterization of known high consequence and novel viruses in wildlife
- Seven labs in the African region have enhanced capacities in influenza diagnosis and reporting as part of the Global Influenza Surveillance and Response network
- National and local public health workers and laboratory staff trained in detecting, reporting, diagnosing and responding to disease threats of zoonotic origin (Uganda, DRC, and Indonesia)
- Strengthened Viral Hemorrhagic Fever surveillance in Uganda

One Health Capacities: Through a strategy that focuses on the central role of local Universities to train professional cadres of leaders responsible for supporting, promoting, and implementing the One Health approach, RESPOND has enabled the networking of 28 schools of public health, veterinary medicine, medicine and environment in both Africa (Uganda, Tanzania, Rwanda, Kenya, Ethiopia and D.R. Congo) and Southeast Asia (Thailand, Vietnam, Malaysia, and Indonesia). In addition, the Southeast Asia One Health University Network (SEAOHUN) partners have established national-level One Health networks involving an additional 45 schools. Working closely with their government counterparts, the university networks ensure not only that the skills they teach will meet the workforce needs of the nations' ministries, but also that these skills are empowered in the workplace. Our One Health capacities strategies also included support for the Field Epidemiological Training Programs of CDC and FAO – with particular focus on targeting animal health specialists.

Expected deliverables by the end of EPT-1 include:

- OH University networks in SE Asia and Central/East Africa spanning 28 schools of public health, veterinary medicine, medicine and environment are in place.
- An additional 45 schools in Vietnam, Malaysia, Thailand and Indonesia are actively engaged in national-level One Health networks that draw from the lessons and materials of the regional network
- Among the topics targeted are:

- using an agreed-upon set of core professional competencies to develop course content and learning experiences to help students understand how animal-based diseases are evolving and spreading,
- applied, field-based training programs, and
- teaching and learning methodologies to improve collaboration across disciplines so that professionals are equipped with the skills needed to respond to outbreaks, and to build and manage cross-disciplinary teams.
- Functional Field Epidemiology Training Programs (FETPs) that strengthen in-service capacity for human and animal health and laboratory professionals in DRC, Uganda, Indonesia, Thailand, Cambodia, Laos and Vietnam

Outbreak Response: One of the major lessons learned under EPT-1 is that timely and effective response “to events of public health significance” is frequently undermined by the absence of clear guidance on how to determine the underlying etiology of the event when it is unknown. While agent-specific guidelines are available for the response to public health events of known etiology, such as yellow fever and cholera, there has been a significant gap in written guidance for the early phases of recognition, reporting, investigation and response when the agent is initially unknown and the cause may be due to an infectious agent, environmental toxin or other factor. The absence of guidance has led to initial responses that are often chaotic and ineffective; it also means any “after-action” review is compromised by the absence of clear performance standards. To address this “gap” RESPOND supported an intensive process led by the WHO and included the participation of the Global Outbreak and Response Network (GOARN) network and CDC to develop and field validate a “tool” to be used by national authorities for identifying, investigating and responding to public health events of initially unknown etiology. More than a half dozen countries in Africa and S.E. Asia, by the end of EPT-1, will have been able to adapt this tool and develop National Outbreak Preparedness Plans – which describe the steps and the roles and responsibilities of national and international partners in responding to the initial signal of an event of public health significance. Importantly, this experience has laid the foundation for elevating outbreak preparedness planning as a major effort under EPT-2. Among the deliverables expected by the end of EPT-1 are:

- Comprehensive Public Health Event (PHE) Preparedness tool developed and field-validated with WHO and the GOARN network.
- The PHE Preparedness tool is incorporated as a core element of WHO outbreak preparedness strategy
- Up to seven countries in Africa have developed national preparedness plans using this tool
- WHO regional offices in Asia have adapted this tool for use in the region and piloted in at least one country

**EPT-plus** The emergence in 2009 of the novel H1N1 pandemic virus in Mexico, after circulating and evolving undetected for over a decade in swine populations underscored a serious gap in global surveillance operations – the monitoring of swine livestock for future influenza threats. It is well established that influenza viruses circulating in swine, poultry and migratory waterfowl act as “mixing vessels” for different influenza viruses. Where animal production systems allow for the “free-flow” of viruses between the different species the genetic

enrichment of the swine gene pool is thought to play a critical step in the emergence of new influenza viruses with human-to-human transmissibility. Monitoring of sub-clinical viral evolution in swine, however, has long been inhibited by international regulations which require notification of viral infection only when there is evidence that a viral infection causes severe illness or death among swine.

While not originally envisioned during the design of EPT-1, what became known as EPT-*plus* came online in 2011 as a *proof-of-principle* to demonstrate that it is possible to routinely monitor swine and other livestock populations under production settings that have characteristically diverse influenza profiles. Implemented by FAO with initial support from CDC, EPT-*plus* is actively working in China and Vietnam to: 1) conduct influenza surveillance in farmed animal systems where virus diversity is considered to be highest (e.g. swine, aquatic waterfowl, backyard poultry); 2) implement surveys to assess biosecurity, epidemiology, animal production characteristics and animal movements in the sectors sampled; and 3) gather detailed information on virus identification and sequence data to better understand the “progenitor” influenza viruses present in swine and the dynamics of evolution.

## **EPT-2: Building on AI and EPT-1’s Operational Platforms, Institutional Partnerships and Expanded Knowledge-Base**

EPT-2 – as with its predecessors – AI and EPT-1 – is focused on *mitigating the impact of novel “high consequence pathogens” arising from animals through a suite of One Health investments with the goal of enabling: early detection of new disease threats; effective control of new threats through enhanced “national-level” preparedness; and, a reduction in the risk of disease emergence by minimizing those practices and behaviors that trigger the “spill-over and spread” of new pathogens.* EPT-2 has the distinct advantage of being able to build on those operational platforms built under Avian Influenza, Pandemic Preparedness, EPT-*plus* and EPT-1, as well as the partnerships and knowledge generated by these efforts to more effectively “prevent, detect and respond” to emerging disease threats.

## **EPT-2: Strategic Areas of Focus**

Like its predecessors, EPT-2 has three overarching purposes: the prevention of new zoonotic disease emergence, the early detection of new threats when they do emerge, and their timely and effective control. Under EPT-2 previous AI/EPT-1 work will be refined and/or expanded. EPT-2 will build on the lessons and knowledge from its predecessors and bring heightened focus to those “places and practices” that enable not just “spill-over” of new microbial threats, but potentiate its “amplification and spread”, and invest in the One Health policies and capacities needed for their prevention and control. At the core of EPT-2 are seven new areas of strategic focus:

### **1. Developing longitudinal data sets for understanding the biological drivers of disease emergence**

Under EPT-1 significant progress was made in identifying the primary wildlife reservoirs involved in “spill-over” of new viral agents and in the profiling of those viral families and some of their genetic variants most commonly circulating in these animal populations. Under EPT-*plus* important progress was made in describing how the

interplay between genetics and ecosystems contributes to the emergence of new influenza variants. Under EPT-2 heightened focus will be brought to expanding these efforts by developing longitudinal datasets spanning select high consequence viral families and their ecologies for the development of models describing the drivers and dynamics that underlie the emergence of new viral variants. Under EPT-2 *EPT-plus* will further refine its scope to address the emergence of new influenza variants. Collectively, this information will be critical to better forecast future threats and further target resources to where the risk of emergence is greatest.

## **2. Understanding the human behaviors and practices that underlie the risk of “spill-over, amplification and spread” of new viral threats**

EPT-1 and AI were important windows for appreciating the central importance of “amplification” and “spread” for a new viral pathogen to pose a significant public health threat. When “spill-overs” involve human populations living in remote, poorly connected geographic areas the end result is frequently an “epidemiologic dead-end”. For a new viral agent to pose a significant public health risk the “spill-over” event must be closely linked to conditions which favor the further “amplification and spread” of the virus broadly among human populations. Under EPT-2 particular focus will be brought to identifying those geographic areas where the risks of “spill-over, amplification and spread” are greatest and characterizing those behaviors and practices that underlie disease emergence.

## **3. Promoting policies and practices that reduce the risk of disease emergence**

Under AI and EPT-1 it became increasingly clear that efforts to promote individual behaviors that were intended to lower infection to “rare” disease threats were highly ineffective. At the core of the dilemma was the common and accurate perception that the risks posed by potentially new infectious diseases were very unlikely to affect any one individual. As such, there was little to no motivation for individuals to adopt new behaviors. On the other hand, it became increasingly clear that mitigating the risk posed by new infectious diseases could be more effectively addressed by focusing on policies and regulations that can affect the population-based behaviors and practices that contribute to “spill-over, amplification and spread”.

Under EPT-2 there will be particular focus on promoting policies and regulations that can impact on industrial and/or community scale practices that directly or indirectly contribute to “spill-over, amplification and spread” of new infectious diseases. EPT-2 will not focus on individual behavioral change and/or communications work. Under EPT-1 four areas were identified that can directly contribute to such risk, and these will be specifically targeted under EPT-2:

- The Extractive Industry (mining, petroleum, logging, and agri-business) is closely associated with dynamics and practices that contribute to habitat change, changes in population settlements, and increased population mobility – three factors critical to triggering the “spill-over” of a new infectious disease in remote “hot spot” areas and its “amplification and spread” into highly connected population settlements.

- Urban/peri-urban markets in Africa and Asia that actively market wildlife and wildlife products from remote “hot spot” areas to populations living in high density, globally connected locations
- Livestock “value chains” in Asia: A major driver in the emergence “amplification and spread” of new diseases, particularly influenzas, in Asia over the past several decades has been the unabated co-circulation and mixing of novel viral strains among wildlife, poultry and swine, largely potentiated by livestock value chains.
- Africa Livestock Futures: In Africa, the absence of large scale animal production has limited the role of livestock value chains in potentiating viral intermingling of the kind documented in Asia. Dramatic changes in household wealth, exemplified by increasing GDP across Africa, are likely to lead to rapid increase in the demand for animal products and, as a result, increased livestock production. An unmanaged increase in production, as occurred in Asia in the 1960s -90s, could bring adverse consequences. The risk of disease-causing pathogens moving from wildlife into domestic animal populations is significant given the reservoirs of pathogens in African wildlife. This “risk”, however, is preventable if increases in livestock production incorporate well-established biosecurity measures. Under EPT-2 (Preparedness and Response) the promotion of policies and regulatory practices consistent with known animal husbandry “best practices” will be a major focus.

#### **4. Supporting national One Health platforms**

Under AI and EPT-1 it became clear that sustained and successful One Health practice requires that a broad range of government and non-government stakeholders come together and stay engaged in the collaboration as part of a normative practice, not just during the period when responding to an immediate infectious disease threat. By way of example, USAID has supported national governments in Africa to establish One Health plans or “road maps” to introduce and/or strengthen cross-sectoral collaboration. A number of countries had initiated cross-sectoral One Health collaboration when AI spread to the region. However, when it became apparent that the virus was not taking hold in the region the incentive for cross-sectoral collaboration faded. Under EPT-1 USAID expanded the scope of its support to address the broader threat posed by zoonotic diseases. This in turn has contributed to the ongoing One Health dialog among stakeholders in focus countries and has supported the university network to engage directly with government partners.

The experience from existing One Health Platforms is that they are most effective when they are country-owned and have been officially recognized or sanctioned by the national leadership (e.g. President, Prime Minister, or coordinating Ministry). The role of the One Health Platform is generally one of strategic planning, promoting a positive policy environment, information sharing, assessing national capacity for One Health engagement, and harmonizing systems. More specifically, the One Health Platforms serve as a focal point for assessing One Health capacities and a clearinghouse for new

information, technologies, and opportunities. One Health Platforms are also well-placed to facilitate cross-sectoral dialogue related to One Health policies and or human resource issues; coordinate disease outbreak response; harmonize disease surveillance systems; share data on priority pathogens; identify and fill gaps in One Health workforce capacity; develop and implement a One Health strategy and/or zoonosis prevention and control plan; and plan or coordinate One Health-related research.

Under EPT-2 focused effort will be made to facilitate and support the formation and/or strengthening of One Health Platforms in the EPT-2 focus countries. Particular emphasis will be to support those efforts that play a catalytic role of advancing cross-sectoral collaboration, promoting measures and/or practices that mitigate the risk of disease emergence, sharing of data and best practices, enhancing country preparedness for outbreaks of new or emerging infectious diseases and zoonoses, harmonizing cross-sectoral surveillance, honing cross-sectoral response skills, and/or leading to new opportunities to assess and strengthen related capacities.

## **5. Investing in the One Health workforce**

Under EPT-1 our experiences with the “prevention, detection and response” of disease outbreaks reveal that the traditional skills, approaches, and relationships are inadequate to address the risks the world faces. Recognizing that most emerging diseases evolve through a complex interplay between animals, humans, and the environment, professional skill sets and practices must reflect that complexity, enabling collaboration across disciplines to stop diseases from becoming significant crises – an approach to disease prevention called “One Health”. However, since professionals are often educated and work in discipline “silos”, they are often less likely to engage one another in problem solving, even during disease outbreaks.

Under EPT-1 we have come to appreciate that universities play a critical role in creating long-term changes to workforce skills. As the primary educators of all health and science professionals, universities are a key catalyst in this transformation. They are working on the cutting edge of their fields, educating students who will comprise tomorrow’s workforce. Universities are also testing sites for education, where innovative and trans-disciplinary approaches to training professionals are constantly introduced and refined, including One Health approaches. By investing in universities in developing countries, we are creating a long-term capability for improved human resource capacity.

Under EPT-2 we will build on the One Health University Networks of Africa and Asia to target the long-term workforce needs for an effective implementation of One Health preventive, detection and response capacities. Under EPT-2 we will work closely with university partners and national governments to define national One Health workforce needs and strategies for their realization.

## **6. Strengthening national preparedness to respond to events of public health significance**

Under the International Health Regulations all member states of the World Health Organization (WHO) are required to achieve core capacities for preventing, responding to, and reporting on Public Health Events of International Concern (PHEIC). A key activity under EPT-1 has been to support WHO, particularly its regional offices in Africa and in the Western Pacific, to develop and test the guidance document for preparing for and responding to Public Health Events of Unknown Etiology. Under EPT-2 expanded support will be provided to assist EPT-2 target countries in the Africa and Asia regions to apply this guidance in the development and implementation of National Preparedness Plans for responding to PHEIC. This work will be done in concert with CDC efforts to develop national-level Emergency Operation Centers and the Defense Threats Reduction Agency (DTRA).

## **7. Strengthening global networks for real-time bio-surveillance**

Under EPT-1 and AI we invested in several distinct streams of laboratory strengthening. Through IDENTIFY we strengthened 31 human health labs and 39 animal health labs in 20 EPT-countries in Africa and Asia capacities in safe handling, diagnosis and reporting of major endemic human and animal diseases; through PREDICT we targeted 25 laboratories in 20 EPT-focus countries for enhanced capacities in handling, diagnosing and characterization of known high consequence and novel viruses in wildlife; and, through WHO's Global Influenza Surveillance and Response System (GISRS) we targeted seven labs in the Africa region for enhanced capacities in influenza diagnosis and reporting. Under EPT-2 we have the opportunity to expand the potential impact of these capacities by aligning our laboratory investments against the following strategic priorities:

- A global database of respiratory pathogens
- Enhanced biosafety
- Linking bio-surveillance data to response

A global database of respiratory pathogens: Over the past half-decade WHO's GISRS has made significant gains in expanding the global reach of its influenza surveillance network, particularly in the Africa region. Further, by strengthening its linkages to clinic-based Influenza-Like Illnesses/Severe and Acute Respiratory Influenza (ILI/SARI) sites they have begun collecting important data sets that will enable better real-time monitoring of the evolution of influenza viruses. Importantly, influenza viruses are implicated in a minority of samples tested. In 2013 only 14% of all influenza-like samples tested by GISRS laboratory network in Africa were influenza positive. As such, the ILI/SARI samples provide an important window into understanding what "non-influenza agents" might be implicated in causing ILI/SARI. Under EPT-1 coronaviruses, which have been implicated in two respiratory-like illnesses, SARS and MERS, were shown to be much more virally diverse and geographically distributed than previously thought - the question remains as to whether they are playing a much larger role in routine respiratory illness. Under EPT-2 we will look to more strategically align our "viral discovery" and "influenza monitoring" activities to build a more longitudinal profiling of respiratory illness and underlying etiologies.

Enhanced biosafety and biosecurity: An important objective of the laboratory work supported under EPT-1 has been in the promotion and adoption of practices and capacities that ensure the safe handling of dangerous pathogens. Under EPT-2 we will build on this work and include the active promotion of multi-sectoral approaches for managing biological materials to support diagnostic, research and bio-surveillance activities. This effort will target the promotion of biosafety/biosecurity through our training and laboratory partnerships.

Linking bio-surveillance data to response: The emergence of automated electronic information systems for monitoring, organizing, and visualizing reports of global disease outbreaks according to geography, time, and infectious disease agent has greatly enhanced the early identification of events of public health significance, even in areas relatively outside the reach of traditional global health efforts. With the rapid uptake of mobile information technologies, even in communities once considered beyond the reach of the modern information grid, these "IT portals" have the potential to play an increasingly important role in redefining the relationship between "providers and users of information" and in linking bio-surveillance data to response. Under EPT-2 we will explore options for how the One Health University networks can better prepare their graduates to be active "providers and users" of these IT platforms, how our support for national "event preparedness planning" can incorporate these information nodes into their "early warning triggers", as well as explore how One Health policy reforms can better harmonize the flow of information from these portals with those of more traditional health surveillance systems.

## **EPT-2 Implementation Partners**

As with EPT-1, EPT-2 will be composed of a suite of technical assistance projects (described in the attached documents) that draws from across the private sector, universities and non-governmental organizations. In addition, EPT-2 will enter into direct agreements with the U.N. technical agencies - the World Health Organization (WHO) and the Food and Agricultural Organization (FAO), as well as the U.S. Centers for Disease Control and Prevention (CDC). These partnerships will share an overarching strategic vision for achieving the seven "Strategic Areas of Focus" (SAF). Importantly, no one project or partner will be exclusively responsible for achieving any one of the SAFs. As was the case under EPT-1, the work of the projects and partners will be highly interconnected and interdependent. USAID will manage the relationships across EPT-2 to maximize the synergies and the shared effectiveness of the entire EPT program.

## **EPT-2 Geographic Focus**



Under EPT-1 the geographic focus was broadly around demonstrated geographic "hot spots" for new disease emergence in the America's, Central and East Africa, South and Southeast Asia. EPT-2 will consolidate the PIOET portfolio around "hot spots" in Central and East Africa, and South and Southeast Asia, with heightened focus on the following EPT-2 priority countries (spanning

AI and other emerging threats): Africa: Cameroun, DR Congo, Republic of Congo, Egypt, Ethiopia, Gabon, Kenya, Rwanda, Tanzania, Uganda. Asia: Bangladesh, Cambodia, China, Indonesia, Laos, Malaysia, Myanmar, Nepal, Thailand and Vietnam. Much greater effort will be made to further consolidate around those specific geographic areas within countries and “epidemiologic zones” where the risks of “spill-over, amplification and spread” are greatest.

## **EPT-2 and the Global Health Security Agenda**

In early 2014 the United States joined in an international effort in the launch the Global Health Security Agenda. At its core the GHS Agenda recognizes infectious diseases, whether naturally caused, intentionally produced, or accidentally released, are among the foremost dangers to human health and the global security. Limited capacity in many countries to prevent, detect, and rapidly respond to these threats, and the added danger of terrorists using biological material and expertise for their own ends, are among the key reasons for a concerted international effort at a senior leadership level to accelerate progress toward GHS. The GHS agenda elevates nine objectives (see attached file), aimed at preventing, detecting, and responding to biological threats - of which eight are closely aligned with those of EPT-2

At the core of both EPT-2 and the GHS Agenda is a strategic approach that fosters developing multi-sectoral collaboration with partners across health, science, agriculture/veterinary, interior (security), border and trade, and defense agencies. As EPT-2 is implemented every effort will be made to ensure it is maximally synched with other US government agencies, national governments and international partners towards achieving the GHS Agenda objectives.

## **EPT-2 Program Partnerships**

The EPT-2 program, like its predecessor EPT-1, will be implemented through suite of highly integrated technical and operation assistance partnerships that collectively span the seven Areas of Strategic Focus. EPT-2 partnerships will include international and USG partners WHO, FAO, the U.S. CDC, and local platforms and institutions in target countries that will be determined after awards are made and in conjunction with USAID missions and the successful bidders:

WHO: WHO will be active in four of the strategic areas of focus: strengthening real-time bio-surveillance (WHO/GISRS), particularly in supporting a global database of respiratory pathogens; strengthening the national preparedness to respond to events of public health significance (WHO/AFRO, WHO/Hqs and GOARN; supporting One Health national platforms (WHO Hqts and regional offices); and, investing in One Health workforce (WHO Hqts and regional offices).

FAO: FAO will be actively involved in five of the strategic areas of focus: developing longitudinal datasets for understanding biological drives of disease emergence (FAO/EPTplus); promoting policies and practices that reduce the risk of disease emergence (FAO Hqts and FAO/Asia); supporting national One Health platforms (FAO Hqts and regional offices); strengthening national preparedness to respond to events of public health significance (FAO Hqts and regional offices); and strengthening global networks for real-time bio-surveillance (FAO Hqts and regional offices)

CDC: CDC will be actively involved in four of the strategic areas of focus: developing longitudinal data sets for understanding the biological drivers of disease emergence; strengthening national preparedness to respond to events of public health significance; investing in One Health workforce (FETP) ; and, strengthening global networks for real-time bio-surveillance.

EPT-2, also, will be comprised of three technical assistance agreements that will be competitively awarded:

ONE HEALTH WORKFORCE: OH Workforce will build on the partnerships forged through the One Health University Networks (OHUNs) to address the workforce needs of national ministries and the private sector, as well as focus on strengthening the operational capacities of the university networks.

PREDICT-2: This project will assist focus countries in identifying and monitoring "hot spots" for emergence, amplification and spread of pandemic threats. PREDICT-2 consolidates the research scopes of PREDICT-1 and PREVENT-1 to more precisely identify and characterize the zoonotic viruses in animals and people, as well as behaviors associated with zoonotic virus spillover, amplification and spread.

PREPAREDNESS AND RESPONSE (P&R): The P&R Project will assist focus countries to establish One Health Platforms through which they will develop and maintain highly functioning multi-sectoral collaboration. The Project will facilitate and support countries to develop and maintain exemplary cross-sectoral capacity and skills for responding to "public health events" at the regional, national, and subnational levels.

## **II. Program Description of One Health Workforce (OHW)**

Developing countries face tremendous challenges with disease outbreaks and other events of public health importance. Not only do these events result in illness and loss of lives, but they have large social and economic impacts on communities and their livelihoods.

Chiefly among the gaps in national capabilities are the lack of adequately trained personnel and workforce policies and structures at all levels of government that allow for a cohesive system to prevent disease and to quickly detect diseases when they occur and provide swift response actions that stop transmission and mitigate further damage to communities. There is also a great under-utilization of traditional data collection systems and the harnessing of the rapidly growing non-traditional data sources for early detection of disease (e.g. news, social media, linkages with non-disease reporting systems).

As noted earlier, the current and future workforce needs new skills, approaches, and relationships for understanding, preventing, detecting, and responding to zoonotic diseases – especially since these diseases arise in very complex and dynamic physical, social and economic environments. While disciplinary “silos” are important for developing specific technical knowledge and expertise, they often hinder the ability of professionals of any one discipline to engage other

disciplines in problem solving, even during disease outbreaks. Therefore, this collaborative and trans-disciplinary “One Health” approach must be integrated into the already rigorous training of these disciplines.

USAID supports the partnering of U.S. universities with those in developing countries as a key strategy for long-term changes in the One Health workforce. The U.S. universities bring a wealth of expertise both in the technical areas (.e.g, public health, veterinary medicine, nursing, wildlife, environment) as well as new, effective methods for teaching and learning. They come to the table with the universities in developing countries to help solve problems and jointly work toward improving education and student outcomes. This work together is the basis for long-term, productive relationships among the universities that should live beyond USAID’s project. Additionally, the U.S. universities learn a tremendous amount about development by working along-side with the developing country universities, and this experience makes them, overall, stronger development partners.

Over the last five years, USAID has invested in the development of two university networks that share the vision of shaping the future “One Health” workforce.

- The One Health Central and Eastern Africa (OHCEA) network brings together Schools of Public Health and Schools of Veterinary Medicine from universities in Central and Eastern Africa which are collaborating to build One Health capacity and academic partnerships, including government, local and regional stakeholders, and the overall community. Six countries (Ethiopia, Democratic Republic of Congo, Kenya, Rwanda, Tanzania and Uganda) and 14 schools of Veterinary Medicine and Public Health are part of OHCEA. Since its inception in 2011, OHCEA schools have worked closely together and with U.S. university partners to initiate many one health activities. These include curricula and short course development, field learning experiences that include students from human and animal health disciplines, faculty exchanges within Africa and with the U.S., formation of one health student clubs, development of country-level coordinating committees that include government and other stakeholders to plan one health activities, and holding their first international one health conference. More information on OHCEA can be found at <http://ohcea.org/>.
- The Southeast Asia One Health University Network (SEAOHUN) builds on the existing framework of linkages between government and universities throughout the region to identify and respond to areas of One Health capacity-building need. Ten universities from Thailand, Vietnam, Indonesia and Malaysia—each recognized leaders in their respective fields—established the core network. They comprise 14 faculties and schools including Veterinary Medicine, Tropical Medicine, Nursing, Allied Health Sciences, Public Health, and Medicine. SEAOHUN is currently working through administrative procedures to be registered as a foundation in Thailand. In the meantime, each country has created a national coordinating office that also serves as a country-level, one health network. These country-level networks (named THOHUN, VOHUN, INDOHUN, and MYOHUN) have further extended their reach by including additional universities in their respective countries to join their national networks. This branching adds an additional 45 faculties and schools in Southeast Asia. Immediately after the SEAOHUN members first met to discuss the idea of

forming a network, they and their national level networks, in partnership with the U.S. universities, have also completed many one health activities. These include the development of regional and national-level one health “core competencies”, mapping of curricula to competencies to identify gaps and strengths, convening several regional and national workshops on one health and specific zoonotic diseases, development of one health short courses and curricula, infusion of one health core competencies into existing curricula, and faculty exchanges. More information on SEAOHUN and the National Coordinating Offices can be found at the following links: <http://www.indo-oh-university.net/background/?lang=en> ; <http://myohun.blogspot.com/> ; <https://www.facebook.com/NCOTHOHUN> .

USAID intends to build upon these investments by requesting applications for the OHW project. The goal of this project is to employ the strengths of universities to prepare the “One Health” workforce in core competencies and skills for preventing, controlling, detecting and responding to zoonotic diseases. The intent of the project is to expand the knowledge of human, animal and environmental health disciplines to understand how animal and human diseases are related and to provide them with competencies, knowledge, and tools to work together to solve and prevent these complex disease problems. The geographic scope of this expanded effort will be directed to those zoonotic “hotspots” of wildlife and domestic animal origins.

OHW is envisioned to empower universities to work with government ministries and other “future employers” of their graduates to define and plan for a capable “One Health” workforce. Through this project, African and Southeast Asian university networks will be supported in a joint process, along with government and private sector stakeholders (e.g., the One Health platforms supported in the EPT2 Prepare and Respond project), to determine the skills, knowledge and competencies that are required for a one health workforce as well as the number of skilled professionals from the central to local levels of government. After identifying these needs, university networks, paired with U.S. universities under OHW, should be supported to develop and implement the curricula, learning experiences and other tools that will prepare students to meet the expressed needs of the government and other future employers. OHW will facilitate these processes in several ways to include:

- Financial Support to the networks to strengthen their capacity to carry out these functions
- Foster partnerships in which U.S. universities and foreign university teams from the one health university networks work together to strengthen faculty, develop curricula, apply innovative and effective teaching and learning methods and to enhance a one health learning environment
- Organizational development assistance to the university networks in areas such as financial, human resource and administration to help assure long-term sustainability of these organizations

Expected Results:

- African and Southeast Asian university networks will work with government ministries and other key stakeholders in their respective countries and regions to develop plans that describe the competencies, skills and numbers of trained workers required for a “One Health” workforce in select countries.
- African and Southeast Asian universities will participate in an ongoing dialogue with relevant ministries in their respective countries to provide input and receive feedback on “One Health” workforce education issues.
- U.S. universities and the University Networks will work together to design curricula and other tools that will be used to train the workforce outlined in the one health workforce plans.
- Universities within the networks will create cadres of animal and human health and environmental health professionals from a wide range of disciplines who share common training, degrees, common approaches, vocabulary, and techniques regarding the detection, response, prevention and control of zoonotic diseases;
- University Networks in Africa and Southeast Asia will develop robust organization infrastructures (e.g., personnel, policies, procedures, systems) that allow them to manage network business, operate efficiently and comply with standard practices and donor reporting and accountability requirements

## Goals and objectives

Although the following goals and objectives are provided to help further describe the project, it is important for applicants to understand that several aspects of this EPT2 project and other EPT2 projects and partners are interdependent. Therefore, achieving success depends highly upon the success of the project leadership to create substantial, productive working relationships across the full range of EPT2 partners and projects to share knowledge and work towards mutual goals.

Objective 1: Support One Health University Networks to participate with government, academia, and other key partners in defining one health workforce needs. (This objective contributes to EPT2 Strategic Areas of Focus 4 and 5, and it is linked to the EPT2 “Prepare and Respond” project)

In most countries, the current health and animal workforce structures are not well-designed to handle the current one health challenges – particularly those challenges concerning zoonotic diseases. While many countries have a health care system of hospitals, clinics, health centers and other points of care, many of the workers most likely to first detect the transmission of a zoonotic disease are not prepared to take appropriate action. The animal health system is comparatively much less robust with very limited capacity at the most local levels. Under the USAID “Preparedness and Response” project, USAID plans to support countries in the strengthening or establishment of One Health “platforms” – that is, regularly convening bodies of senior technical personnel from Ministries of Health, Animal Health and Environment as well as university faculty and potentially other stakeholders to address and provide direction on critical one health issues such as workforce. USAID envisions the universities (particularly those that are part of one health university networks) will actively participate in the platform for

their respective country. A key activity will be to explore the country's one health workforce structure to determine the competencies and skills as well as the number and distribution of skilled workers at the various levels of the human and animal health systems from central to local.

- The recipient of this award will provide support to the academic networks to be part of regional and/or national working groups that explore one health workforce needs. This exploration may include: determining what competencies, skills and functions are needed at critical levels of government system, developing target numbers of trained personnel at different levels of the human and animal health system. (via participation in the established government one health platforms and in conjunction with the government).
- The university networks will contribute to national workforce plans to reach and sustain the targeted numbers of trained persons. University networks and the implementing partner will not be responsible for independently creating one health workforce plans.

#### Illustrative Activities:

- Provide financial support and limited administrative and technical assistance to the academic networks to enable them to be part of these regional and/or national working groups
- Pair U.S. Universities with the academic networks to provide consultation and technical assistance as needed

Objective 2: Support OHCEA and SEAOHUN to assist government ministries to train the future “One Health” workforce. (This objective contributes to EPT2 Strategic Area of Focus 5, and it is linked to the EPT2 “PREDICT 2” and “Prepare and Respond” projects)

OHCEA and SEAOHUN were founded based on the idea that there is more strength within the academic environment if several universities with common interests work together. Each university, and indeed each school, has strengths and challenges in teaching “One Health”. A benefit to belonging to a network is that strengths can be shared across network partners to address gaps and challenges in other schools and universities. Another benefit is that “One Health” curricula and other materials and teaching and learning activities can be developed at the network level (engaging the participation of several schools plus the U.S. university partners) and then used and even modified by individual schools.

These networks present an excellent opportunity to dramatically change pre-service training to reflect a one health, trans-disciplinary approach across regions in which this approach is most critically needed. Through this project, the academic network members and the U.S. university partners under OHW will work together to reshape training so that the competencies, skills and knowledge of future graduates reflect one health thinking for the purposes of detecting, responding to, controlling and preventing the transmission and spread of zoonotic diseases. Such training will be based on the needs identified through university participation in regional and

country-level “platforms” where government and other stakeholders determine workforce requirements (linked to the USAID “Prepare and Respond” project).

Illustrative activities:

- U.S. and network universities learn together about the expressed needs of governments for creating a one health workforce.
- U.S. and network universities translate workforce needs into curricula and other materials that provide students with the competencies, skills, and knowledge required to meet those needs.
- U.S. and network universities together develop learning and teaching opportunities that enhance the One Health educational experience (to include real-world, hands-on field experience).
- U.S. and network universities apply innovative teaching and learning methods to improve the achievement of One Health competencies and skills.
- U.S. universities will strengthen their relationships with SE Asian and African network universities through joint projects, long-term faculty visits to these regions, and the sharing of ideas and experiences.
- OHW supports OHCEA and SEAOHUN schools in helping each other with One Health teaching and learning challenges through faculty exchange, student exchange, joint projects, and other activities.

Objective 3: Support OHCEA and SEAOHUN to assist government ministries to train the current “One Health” workforce (This objective contributes to Strategic Areas of Focus 4 and 5, and it is linked to the EPT2 “Prepare and Respond” project)

In addition to preparing the “One Health workforce of tomorrow”, there is great need to strengthen the One Health competencies, skills and knowledge of today’s workforce. Universities can also play an important role in this area, though the details of that role may vary among countries and ministries. For example, some ministries have their own systems and programs to strengthen the competencies, skills, and knowledge of their current staff. In other countries, ministries may rely on various internal and external resources (e.g., universities, non-governmental organizations, private companies, donors) to ensure the ongoing training of their workforce. In this project, OHW will support the university networks to explore the opportunities for universities to provide added value to existing university training - specifically in competencies, skills and knowledge for detecting, responding to, controlling and preventing transmission and spread of diseases using a One Health approach. U.S. universities under OHW can further support this “value added” training through joint technical assistance in design and development.

Illustrative Activities

- OHW will support OHCEA and SEAOHUN in having dialogue with ministries regarding their one health training needs

- U.S. universities under OHW will work with OHCEA and SEAOHUN to translate those in-service training needs into potential activities that optimally support government ministries in developing their one health workforce
- OHCEA, SEAOHUN with technical support from the OHUN U.S. universities will develop training materials and/or design and implement teaching and learning opportunities to deliver training content using a One Health approach

Objective 4: Support U.S. universities in strengthening faculty capacities for One Health teaching, research, and community outreach. (This objective contributes to EPT2 Strategic Area of Focus 5, and it is linked to the EPT2 “PREDICT2 and “Prepare and Respond” projects)

If universities are to prepare the One Health workforce of tomorrow, then they themselves also need to be adequately prepared to handle this challenge. This means investment in faculty development - targeted at those faculty members that will be most directly involved in educating students. In EPT1, some important areas of faculty development were identified in joint exploration between the academic networks and the U.S. university partners. They focused these development activities around three key areas of importance to virtually all universities: Teaching, Research, and Community Outreach. In EPT1, the participating schools were able to identify specific needs of faculty in each of these areas and then to design activities to meet those needs. USAID sees this as an ongoing need and a natural fit between U.S. universities and the University network members in Africa and Southeast Asia. In EPT2, the focus of faculty development will be specifically to help faculty be better prepared to teach students the competencies, skills and knowledge to detect, respond to, control and prevent the transmission and spread of zoonotic diseases.

#### Illustrative Activities

- U.S. universities work jointly with OHCEA and SEAOHUN faculty to reassess faculty development needs within the scope of this project and develop faculty development plans
- U.S. universities train OHCEA and SEAOHUN faculty in innovative teaching and learning methods.
- U.S. universities assist OHCEA and SEAOHUN faculty in improving their research and publication skills with a focus on detection, response to, control and prevention of the transmission and spread of zoonotic diseases.
- U.S. universities assist OHCEA and SEAOHUN faculty in developing innovative ways to engage communities, government and students to identify and solve real-world one health problems

Objective 5: Provide organizational development support to One Health networks (This objective contributes to EPT2 Strategic Area of Focus 5)

USAID views OHCEA, SEAOHUN, and the four Southeast Asian national coordinating offices (INDOHUN, VOHUN, MAYOHUN, THOHUN) as the pivotal organizations for leading change in academic approaches to creating the one health workforce. So, in addition to the range of academic and faculty development listed in previous objectives, USAID will invest in the

organizational development of these networks and NCOs such that they will be capable of operational and programmatic function independent of USAID. OHCEA is legally registered in Uganda as a private, not for profit, non-governmental organization. The network is organized under an agreement among the participating universities. It operates under a board of directors composed of member universities, and day to day operations are coordinated through a small secretariat based in Kampala, Uganda. Each participating country has a designated country coordinating office located at one of the member schools. That coordinating office is responsible for the administration of funding received from the secretariat (e.g., funds received by the secretariat from a USAID implementing partner), coordinating country-level activities and reporting to the secretariat. Each participating also has organized a country coordinating committee (CCC) that is composed of government ministry representatives, university representatives and other key stakeholders. This body helps to advise OHCEA on the development of one health education, training and activities that are most relevant and needed within the country.

SEAOHUN is in the process of registering in Bangkok, Thailand as a foundation. This process is projected to be completed in the Spring of 2014. In the meantime, the Deans of all participating schools meet regularly as an executive board, and one Dean from each country serves on the SEAOHUN foundation board. The four founding countries of SEAOHUN (Thailand, Vietnam, Malaysia, and Indonesia) have also each have organized an National Coordinating Office (NCO) at one of the member schools as mentioned earlier. These NCOs are responsible for the planning, implementation and reporting of country-level one-health activities under EPT1. They administer the associated funds, but they have a more direct relationship of accountability and reporting to the USAID implementing partner.

#### Illustrative Activities:

- Conduct an organizational assessment/audit and/or build off of previously conducted audits to determine the networks' current managerial, financial, and operational functionality
- Work with the individual networks to determine short, medium, and long-term (10 year) vision of organizational framework recognizing a tapered/diminished level of funding each year of EPT2
- Develop a sustainability plan with the network that articulates the niche role and organizational structure required to independently sustain the network (via external funding streams)
- Prepare networks to pass an internationally recognized audit

### **Project Leadership Framework**

Given the diverse activities of this project, USAID envisions that the recipient of this cooperative agreement will assemble a coalition of partners (e.g., U.S. universities, foreign universities, business management/organizational development experts) with specific skill sets that can contribute to the accomplishment of the project goal and its supporting objectives and activities. Additionally, the leadership of this project must foster a productive working relationship with other projects under EPT2 such that interlinking objectives and activities can be successfully supported.