6

CHAPTER

The renovated and upgraded AFRIMS animal facility included the addition of many props for social and recreational stimulation for the monkeys living communally in large cages. Here monkeys of a similar age can be seen living and interacting together. (MFN#003811, AFRIMS photograph archives)

Lieutenant Colonel Terrell Blanchard (left) of the Department of Veterinary Medicine provides instruction in the preparation of preserved animal tissues for histopathologic examination (2002). (MFN#000006, AFRIMS photograph archives)

2000 *to* 2010

THE FIRST DECADE OF THE NEW CENTURY brought growth in the AFRIMS mission, staff, and facilities. Major General Suebpong Sangkharomya's 5 years as director general was the longest tour since leadership shifted to the Royal Thai Army (RTA) Medical Department in the 1980s. His prior experience as a leader of the RTA's HIV control and prevention programs was utilized widely as he became an advisor regionally and within the United Nations AIDS program, UNAIDS. During the decade, the size of the RTA component was stable, as was the number of US military. In contrast, the number of civilians employed by the US component increased greatly. The 22 to 26 members of the US military were supported by a civilian staff that grew from 264 to 453. New to this workforce was the inclusion of small numbers of employees in Nepal, Cambodia, and the Philippines. A cooperative agreement was established in 2001 (and renegotiated every 5 years thereafter) to provide a new management tool for staffing the institute and paying the costs of utilities and maintenance.

In 2003 a satellite unit in northern Thailand moved into its own building when the Department of Virology opened the Kamphaeng Phet–AFRIMS Virology Research Unit (KAVRU) on the grounds of the Kamphaeng Phet provincial hospital (AFRIMS's relationship with the hospital had started in the 1980s with the Japanese encephalitis vaccine trial). In Bangkok, facilities were augmented by a major renovation of the Department of Veterinary Medicine's offices and laboratories, as well as the renovation and use of two floors borrowed from the Phramongkutklao Army Medical Center for the new Department of Epidemiology and Disease Surveillance and several support units.

AFRIMS HIV research, begun in the 1990s, became the most successful and visible part of the mission after 2000. Based on a series of phase I/II

[Left] Major General Suebpong Sangkha-romya, Director General, 2001–2006. (Royal Thai Army official photograph)

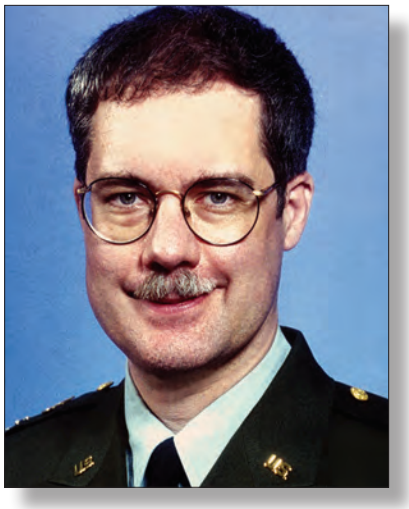
[Right] Major General Anont Nobthai, Director General, 2006–2007. (Royal Thai Army official photograph)

vaccine trials and cohort studies of new HIV infections, the world's largest HIV vaccine trial was started in 2003. This collaboration was led by the Thai Ministry of Public Health, with Mahidol University, the RTA Medical Department, the US Army Medical Research and Materiel Command, and two vaccine manufacturers (Sanofi Pasteur and VaxGen). The US National Institutes of Health became the major funder. Results of the 16,000-person trial were released in 2009, revealing that the vaccine combination had provided moderate protection (31% efficacy) from HIV infection. This was the first HIV vaccine to show any protective benefit, and the study reinvigorated the demoralized discipline of HIV vaccinology.

Other important vaccine developments also occurred during the decade. A collaboration between the Walter Reed–AFRIMS Research Unit, Nepal, and the Nepalese Army in a 2,000-person efficacy trial found that a GlaxoSmithKline (GSK) vaccine was very effective (95% efficacy) in protecting against hepatitis E viral infections. Phase I/II trials of dengue vaccines were carried out in a collaboration among AFRIMS, GSK, and pediatricians at Phramongkutklao Army Hospital. Shigella vaccines were studied for down-selection in the AFRIMS monkey colony, and tested for safety and immunogenicity in humans at the Vaccine Trial Centre of Mahidol University.

The Kamphaeng Phet–AFRIMS Virology Research Unit (KAVRU) moved from borrowed space to its own building in 2003 on the grounds of the Kamphaeng Phet provincial hospital. Dignitaries attending the inauguration on July 9 included US ambassador to Thailand Darryl Johnson (front center), Ministry of Public Health permanent secretary Dr. Vallop Thaineua (front, second from right), and AFRIMS director general Major General Suebpong Sangkharomya (behind ambassador). Lieutenant Colonel Anza Mammen (rear, second from left), chief of the Department of Virology, led the initiative to create this facility. (MFN#003800, AFRIMS photograph archives)

[Inset] In 2000 the Thai National Commission for Prevention and Control of AIDS presented an award of appreciation to AFRIMS for strengthening the capacity of Thailand to conduct HIV vaccine trials and development. The subcommittee making this award was chaired by Professor Natth Bhamarapravati, former president of Mahidol University. (MFN#003799, AFRIMS photograph archives)



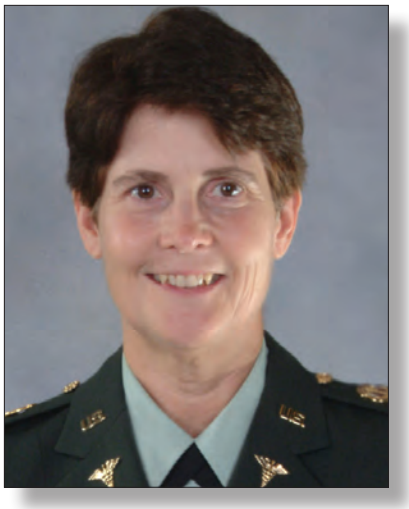
[Left] Major General Krisada Duangurai, Director General, 2007–2009. (Royal Thai Army official photograph)

[Center] Major General Boonyarak Poonchai, Director General, 2009–2013. (Royal Thai Army official photograph)

[Right] Colonel Dennis Shanks, USAMC Commander, 2000–2002. (US Army official photograph)

Malaria researchers conducted regulated clinical trials of two important drugs in the US Army development portfolio: tafenoquine for treatment of relapsing malaria in collaboration with Mahidol University (2003) and intravenous artesunate for severe malaria at the Kwai River Christian Hospital (2007) in parallel with AFRIMS's sister laboratory in Kenya. Toward the end of the decade, new collaborations in malaria prophylaxis and drug resistance were established in Cambodia: the US component worked with the Ministry of Health and the Royal Cambodian Armed Forces, and the RTA component and the Cambodian Department of Defense conducted active malaria surveillance as part of a border malaria control program. Resistance of falciparum malaria against artemisinin was described, raising concern that one of the few remaining effective antimalarial drugs may be lost. Dr. Rampa Rattanarithikul and Khun Prachong Panthusiri provided means to identify the mosquito vectors of malaria in their six-part taxonomic key to the mosquitoes found in Thailand and much of Southeast Asia. This tool has great utility for vector control teams throughout the region.

AFRIMS increased biosafety measures during the decade. A biosafety committee was established in 2001, a biosurety program began in 2006, an animal biosafety level III (BSL3) laboratory opened in 2006, and a full BSL3 laboratory followed in 2009. Despite these measures, the US Department



[Top Left] Colonel Carl Mason, USAMC Commander, 2002–2005. (US Army official photograph)

[Top Right] Colonel Bonnie Smoak, USAMC Commander, 2005–2007. (US Army official photograph)

[Bottom Left] Colonel James Boles, USAMC Commander, 2007–2010. (US Army official photograph)

[Bottom Right] Colonel Robert Bowden, USAMC Commander, 2010–2012. (US Army official photograph)

of Defense did not give AFRIMS approval for a biosurety program, and all archival specimens of Japanese encephalitis virus were transferred to Fort Detrick, Maryland, for temporary storage in a secure and approved facility.

In 2005 AFRIMS was designated as a World Health Organization (WHO) collaborating center for "reference, training and investigation of emerging infectious diseases." A prime example of a reemerging infectious disease was

Khun Apichai Srijan (in blue shirt) works with a team at the National Pediatric Hospital in Phnom Penh, Cambodia, to study the etiology of diarrhea in young children and patterns of antibiotic resistance (2004–2006). (MFN#003802, AFRIMS photograph archives)

the outbreak of chikungunya virus infections in southern Thailand in 2008. SEATO MRL investigators had studied this virus in the 1960s and 1970s, but it had largely disappeared, while dengue continued to increase in prevalence. In the 2008 event, the chikungunya virus had mutated and was now easily transmitted by *Aedes albopictus*. Dr. Ananda Nisalak was called upon for her historical knowledge of the disease, and the Department of Virology established molecular assays and provided diagnostic support to the RTA and the Ministry of Public Health as they responded to the outbreak. Surveillance for influenza virus increased in mid-decade as part of global efforts to prepare against a new pandemic. The AFRIMS surveillance team notably found a strain in a Bhutanese person living in Nepal, which was unique and selected by the WHO in its annual modification of the globally recommended vaccine. The RTA component established a rapid laboratory response team to investigate outbreaks of infectious diseases. As the decade ended, a new pandemic form of influenza struck Thailand, and both components of AFRIMS were extensively involved in supporting military and civilian public health teams responding to this major challenge.

[Top] In 2004 Major General Suebpong Sangkharomya officially opened the Clinical Research Center of the Thai component. This center, located in the former AFRIMS cafeteria (as space became increasingly precious), provided secure and private space for visits by participants in clinical trials. Colonel Sorachai Nitayaphan (front left) was the center's principal investigator. (MFN#003803, AFRIMS photograph archives)

[Bottom] Dr. Ananda Nisalak (standing) speaks at a workshop for the Bhutan Ministry of Health (MoH) on Japanese encephalitis in 2004. Subsequently, AFRIMS helped the Bhutan MoH establish assays for arbovirus infections. AFRIMS was also represented on an advisory committee for an agreement of mutual assistance between the Thai Ministry of Public Health and the Bhutanese MoH. (Photograph courtesy of Dr. Ananda Nisalak)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[Opposite] Khun Umaporn Suksawad talks to the mother of a child at Srisangwan Hospital in Mae Hong Son Province as part of a 2004–2006 study of the prevalence and drug resistance of Campylobacter and other enteric pathogens in Thailand. (MFN#003804, AFRIMS photograph archives)

[Top] Khun Eakkapob Srichamnan (sitting), vivarium quality control engineer of the Department of Veterinary Medicine, briefs the Pacific Command surgeon, Rear Admiral Robert Hufstader, on the state-of-the-art system for environment control and monitoring of the AFRIMS animal facility (2005). (MFN#003801, AFRIMS photograph archives)

[Bottom] Major Santi Hemsri of the Division of Analysis assays water samples from a surveillance project of all hospitals under the Royal Thai Army for purity and specific contaminants (2007). Through the more than 10 years of the project, no significant problems have been identified. (MFN#000394, AFRIMS photograph archives)

[Left] In 2007 Her Royal Highness Princess Sirindhorn (in hat) visits the Cambodia–Thailand Collaboration on Malaria Control, which was one of her initiatives. Here Lieutenant Colonel Pradit Kaewsatien of RTA-AFRIMS briefs the princess on the progress of the project. (MFN#003805, AFRIMS photograph archives)

[Right] Middle school students from the International School in Bangkok learn about raising mosquitoes from Khun Prasan Karnkaew as part of a visit to AFRIMS in 2006. (MFN#001389, AFRIMS photograph archives)

[Left] Dr. Krisada Jongsakul (left) observes preparation of malaria blood films, part of the microscopy training provided in Cambodia (2004) for a malaria baseline survey. This survey led to a larger collaboration between AFRIMS and the Cambodian Ministry of Health, and subsequently joined by the Royal Cambodian Armed Forces. An important early finding (2007) was evidence that falciparum malaria parasites were developing resistance to the artemisinin drugs. (MFN#000433, AFRIMS photograph archives)

[Right] Department of Veterinary Medicine staff work with Thai government teams to survey livestock for serologic evidence of infections with microbes that could jump species and cause human disease (2007). (MFN#003806, AFRIMS photograph archives)

[Left] Studies of dengue transmission in over 3,000 children in Kamphaeng Phet Province were established to provide baseline information for future vaccine trials. Here Khun Songdej Sangsri (standing), Dr. Chusak Pimgate (right) and a KAVRU–AFRIMS team collect serum samples from school children after their community and parents had been informed of the study and given permission. (MFN#00380, AFRIMS photograph archives)

[Top Right] Disease surveillance was strengthened among border units of the Royal Thai Army by a joint AFRIMS team from the two components. Here, Colonel Narongrid Sirisopana (near right) leads a meeting with staff of a border unit in 2007. To his right is Lieutenant Colonel Rodney Coldren. (MFN#000436, AFRIMS photograph archives)

[Bottom Right] Dr. Alongkot Ponlawat moved studies of mosquito repellents out from the laboratory in 2009 to a 50-meter tunnel that he designed and had built in Chanthaburi Province. This semi-field condition utilized ambient temperature and humidity while measuring the flight of mosquitoes after exposure to commercial repellents. The success of this model led to its replacement by a less temporary semi-field facility in Kamphaeng Phet, which is used for studies such as examining new insect control agents that combine both push and pull effects. (MFN#002486, AFRIMS photograph archives)

[Inset] Disease surveillance in border areas also included capture and examination of potential animal reservoirs of infection. Here rodents are examined for evidence of *Rickettsia* and *Leptospira* carriage (2007) by Major Wuttikon Rodkvamtook, Sergeant Yudthapong Sudsawas, and Sergeant Suthep Youngrod (left to right). (MFN#000392, AFRIMS photograph archives)

[Inset] AFRIMS coordinated a 16,000-person HIV vaccine trial from 2003 to 2009. The trial was led by the Ministry of Public Health (MoPH), with in-country support from both components of AFRIMS and Mahidol University. The photograph shows the announcement of trial results at the MoPH, a meeting chaired by the Minister of Public Health, Wittaya Kaewbharadai (right), US Ambassador Eric G. John (center), and MoPH Permanent Secretary Dr. Paichit Warachit (left). The vaccine combination was shown to provide protection, though moderate, against HIV infection. This was the first study worldwide showing that an HIV vaccine could provide protection. (Photograph courtesy of Dr. Supachai Rergs-Ngarm)

[Left] Lieutenant Colonel Yvonne van Gessel (left) uses a model of the veterinary medicine facility to brief Lieutenant General Sahachat Pipithkul, director general of Phramongkutklao Army Medical Center, in a 2008 visit. This photograph includes Lieutenant Colonel Fernando Guerena, Colonel Chaiyaphruk Pilakasiri (second and third from left), and Colonel Sorachai Nitayaphan (second from right). (MFN#003809, AFRIMS photograph archives)

[Right] US ambassador to Thailand Eric John joins Major General Krisada Duangurai and Colonel James Boles in the ribbon-cutting ceremony for a BSL3 laboratory in 2009. The lab is located within the Yothi Annex and was promptly utilized for studies of chikungunya virus and its mosquito infectivity following the outbreak in southern Thailand. (MFN#003810, AFRIMS photograph archives)

Research programs are ongoing, utilizing multiple collaborations both within Thailand and, more than ever before, with other partners in the region. Currently highlighting the Institute's product development mission is its participation in the multinational phase III testing of a dengue vaccine in study sites in Kamphaeng Phet, Thailand, and Cebu, Philippines.

[Opposite] Colonel William Geesey, USAMC Commander, July 2012–present (US Army official photograph)