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COMMITTEE ON INTERNATIONAL SCIENCE, ENGINEERING
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Emerging Infectious Disease Task Force

PDD/NSTC-7 Annual Report
December 19, 1997

CISSET Emerging Infectious Disease Task Force
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Executive Summary

In June 1996, President Clinton directed the Federal agencies to begin a coordinated national response to the growing threat of infectious diseases, both at home and abroad, through policy directive, PDD/NSTC-7. This Directive calls for action in four key areas: developing a global surveillance and response network; enhancing research and training; engaging our international partners; and strengthening public outreach. To implement this policy, the National Science and Technology Council's Committee on International Science, Engineering and Technology (CISSET) formed a Task Force on Emerging Infectious Diseases, which is co-chaired by the Centers for Disease Control and Prevention and the White House Office of Science and Technology Policy. The EID Task Force is composed of nearly two dozen agencies and has become an effective model of interagency coordination. This report summarizes the accomplishments of the Task Force during its first year.

The Task Force members have made significant advances toward achieving the objectives of the President's policy directive. Domestically, we have bolstered disease surveillance at the national, state, and local levels -- our major line of defense against emerging infectious diseases. CDC's recent accomplishments include the establishment of agreements with twenty-two states and localities to strengthen national disease surveillance and outbreak response; the creation of three provider-based electronic networks to study disease syndromes; and the strengthening of cooperative programs with state and local health departments to create real-time, on-line capacity to compare strains of the food-borne pathogens, Salmonella and *Escherichia coli* O157:H7 bacteria. This system, which includes

Colorado, was responsible for catching the recent outbreak of *E. coli* O157:H7 in ground beef.

We have also strengthened research and training through the National Institutes of Health, including the establishment of four new Hepatitis C Cooperative Research Centers and three new Emerging Virus Groups to study hantaviruses and other emerging viral threats. In addition, NIH's National Institute of Allergy and Infectious Diseases (NIAID) has committed \$3 million for a new extramural research program on emerging diseases; and NIH's Fogarty International Center (FIC), in close cooperation with NIAID, has launched a \$1.8 million program to provide training for scientists in developing countries in the field of emerging infectious disease research. Furthermore, NIH has launched a Multilateral Initiative on Malaria and has committed over \$1 million for a program to be established through WHO to strengthen research capacity within Africa for improved malaria control.

Another key accomplishment of the EID Task Force has been the expansion of U.S. agency missions and mandates to more effectively address these challenges. The actions being taken include the creation of a Department of Defense (DoD) Surveillance and Response System for Infectious Diseases; the establishment of a DoD Internet-based Central Communications Hub; and the expansion of DoD's overseas laboratory capabilities and epidemiology training.

Internationally, the Task Force members have engaged our partners through APEC, the G-8, the U.S.-Japan Common Agenda, the U.S.-E.U. New Transatlantic Agenda, the U.S.-Russia Commission on Economic and Technological Cooperation, the U.S.-South Africa Binational Commission, and other bilateral and multilateral fora. At the recent Denver Summit of the Eight, the U.S. presented a major infectious disease initiative, which included a commitment from the Heads of State to develop a global surveillance system; strengthen capacity in developing countries; and coordinate international response to outbreaks.

Our development assistance program has also played a key role in the EID Task Force. USAID continues to take important steps to strengthen basic public health infrastructures and in-country capacity to combat infectious diseases, especially those related to child survival, reproductive health, and HIV/AIDS prevention. The EID Task Force members continue to coordinate with the World Health Organization to make best use of the available resources.

The EID Task Force members have made significant progress toward the implementation of President Clinton's EID policy. Many challenges remain, however. Through the coordinated efforts of the Task Force, the private sector, and the academic, NGO, and international communities, we will continue to work to eliminate the threat of emerging infectious diseases and to protect the health and well-being of our citizens.

Introduction

In June 1996, President Clinton directed the Federal agencies to begin a coordinated national response to the growing threat of infectious diseases, both at home and abroad, through policy directive, PDD/

NSTC-7. This Directive calls for action in four key areas: developing a global surveillance and response network; enhancing research and training; engaging our international partners; and strengthening public outreach. To implement this policy, the National Science and Technology Council's Committee on International Science, Engineering and Technology (CISSET) formed a Task Force on Emerging Infectious Diseases, which is co-chaired by the Centers for Disease Control and Prevention and the White House Office of Science and Technology Policy.

The EID Task Force is composed of nearly two dozen agencies and is comprised of five working groups: 1) Surveillance and Response; 2) Research and Training; 3) Capacity Development; 4) Legislation and Mandates; and 5) Outreach. In addition, an ad hoc Working Group on Bioterrorism has been created to address potential terrorist use of biological agents.

Since the release of PDD/NSTC-7, the EID Task Force members have made significant progress in implementing the President's policy. This report summarizes these accomplishments.

II. Surveillance and Response

● a. Federal and State laboratory and epidemiologic response capabilities

In the United States, the network of state and local health departments is a major line of defense against emerging infectious diseases. The network operates the national notifiable disease system and conducts local disease surveillance and investigations. CDC has established three programs to strengthen this network:

- Epidemiologic and Laboratory Capacity Cooperative Agreements (ELCs). These agreements provide state and large local health departments with technical tools, training, and financial resources to maintain and strengthen national notifiable disease systems, conduct disease surveillance, diagnose diseases, and investigate outbreaks. By the end of FY 1997, CDC will have entered into ELC agreements with twenty-two states and localities. By 2003, CDC plans to involve fifty state health departments, as well as large local health departments and territorial health agencies.
- Emerging Infections Programs (EIPs). The EIPs conduct population-based surveillance and research that goes beyond the routine functions of local health departments to address the most important issues in infectious diseases and public health. EIP projects include establishing active surveillance for invasive bacterial diseases and food borne pathogens (FoodNet) and participating in emergency outbreak responses. FoodNet is a collaborative effort of CDC, USDA, FDA, and the EIP sites. To date, EIPs have been formed with the state health departments of California, Connecticut, Minnesota, Oregon, Georgia, New York, and Maryland.

- Provider-based Sentinel Networks. Three provider-based networks have been formed to study specific conditions and syndromes.
 - Emergency Department Sentinel Network for Emerging Infections (EMERGENCY ID NET) is a network of academically affiliated emergency medicine departments, which operate emergency departments at eleven hospitals in large U.S. cities. The network monitors a number of syndromes, including bloody diarrhea, illnesses that follow exposure to animals, first-time seizures, prolonged febrile illness in immigrants and travelers, and hemolytic uremic syndrome following infection with *Escherichia coli* O157:H7.
 - Infectious Diseases Society of America (IDSA) Emerging Infections Network (IDSA EIN) is a network of over 150 infectious disease clinicians that: enhances communications and health education among its members; collaborates in research projects; and provides assistance in case-finding during outbreak investigations.
 - The Sentinel Network of Travel Medicine Clinics (GeoSentinel) is composed of eleven travel medicine clinics: nine in the United States, one in Canada, and one in Germany. The network monitors schistosomiasis, dengue, hepatitis, and persistent fever of unknown origin. The data are analyzed by CDC and used to develop travel advisories and recommendations for health-care providers. In the future, it may help track the spread of diseases from place to place when outbreaks occur.

The Department of Veterans Affairs (VA) Infectious Disease Program has developed the Emerging Pathogens Initiative (EPI), an automated national VA surveillance system designed to track emerging pathogens in VA health care facilities worldwide. The monthly report provides data for a number of pathogens and diseases, including vancomycin-resistant enterococcus, penicillin-resistant pneumococcus, *E. coli* O157:H7, and certain diseases of military importance, such as malaria.

- **b. Electronic Network for Surveillance and Response**

The prompt detection of domestic outbreaks depends on the flow of reliable, laboratory-confirmed surveillance data, from doctors and diagnostic laboratories to local and state health departments, and from state health departments to CDC. Many states are beginning to use electronic systems to integrate laboratory and epidemiologic information and transmit state-wide data to county health departments and other reporting sites.

- Standards. CDC, the Council of State and Territorial Epidemiologists, and the Association of

State and Territorial Public Health Laboratory Directors are working with state and local health departments to set standards for laboratory-based reporting of infectious diseases.

- Molecular Fingerprinting. CDC is working with selected state health departments and FDA to develop the online capacity to compare strains of *Salmonella* and *E. coli* O157:H7 bacteria, using the technique called "molecular fingerprinting." Whenever a food borne outbreak of *Salmonella* or *E. coli* occurs in the U.S., the health departments should be able to fingerprint local organisms to determine the extent of the outbreak and implement control measures. FDA is developing fingerprinting for additional foodborne pathogens.

III. Research

The EID Task Force members have committed significant resources to EID research. Examples of major new research programs follow.

- Malaria Research. The NIH is working with partner agencies in France, the UK, the European Community, and with the WHO, the Wellcome Trust, African scientists, and others to develop a strengthened research effort on malaria. NIH has committed over \$1 million for a program to be established through WHO to strengthen research capacity within Africa for improved malaria control. In addition, NIH's National Institute for Allergy and Infectious Diseases (NIAID) has implemented projects in FY 1997 to establish a repository of malaria research reagents and to expand efforts to sequence the genomes of malaria parasites.

USAID has committed approximately \$2 million per year for the development and testing of malaria vaccines. USAID's particular focus is vaccine formulations most suitable for prevention of malaria mortality among children in developing countries.

- Neurocysticercosis Research. NIH and CDC are jointly conducting an epidemiologic survey of neurocysticercosis in the U.S.
- VA Research Program. The VA Research Service has instituted an investigator-instigated research program in emerging pathogens.
- Laboratory Networks. NIH supported a one-time, one-year supplemental award to permit investigators to develop "emerging diseases laboratory networks through travel, reagent exchanges and virtual networks" and to expand existing international programs focusing on emerging diseases.
- Support for Extramural Research. As a follow-up to its Research Agenda for Emerging Infectious Diseases, NIH published a new program announcement on "Expanded Research on Emerging Diseases," which will receive \$3 million in FY 1997.

- International Training and Research. The NIH's Fogarty International Center (FIC), working in partnership with NIH's National Institute for Allergic and Infectious Diseases (NIAID), will make the first awards under its International Training and Research in Emerging Infectious Diseases Program in FY 1997. This 5-year program, with annual funding of more than \$1.8 million, aims to provide training and research opportunities to developing country partners of U. S. scientists in the field of emerging infectious disease research.
- Better Vaccines Against Childhood Bacterial Diseases. In collaboration with the international Childhood Vaccine Initiative, USAID supports the development and testing of vaccines against the major bacterial causes of pneumonia and meningitis in children, as well as the improvement of other important childhood vaccine formulations and the systems and tools for the delivery of the vaccines in developing countries. USAID provided nearly \$1 million in FY 1997 for these activities.

NIAID continues to emphasize vaccine research and development. In FY1997, NIAID committed approximately \$2.7 million to a major effort in streptococcus research and approximately \$2 million for providing tuberculosis research materials to the scientific community.

- Diagnostics. USAID is providing \$300,000 in FY 1997 for the development of new or improved diagnostics suitable for safe and inexpensive use in developing countries, especially in field situations. Some of the specific infectious disease diagnostics being addressed are HIV, malaria, chlamydia, gonorrhea, and syphilis.
- Disease Prevention Research. USAID has committed nearly \$2 million in FY 1997 to the prevention of infectious diseases through behavioral research. Areas of investigation include: the use of safe-water, sanitation, hand washing, and food protection to decrease diarrheal diseases; the use of insecticide-impregnated bednets to decrease malaria transmission; the reduction of domestic smoke pollution to decrease respiratory infections; and the reduction of sexual behaviors that carry high-risk for transmission of HIV and sexually transmitted diseases (STDs).

NIAID continues to focus on research efforts for the development of effective methods of disease prevention, including the development of new vaccines, therapeutics, and behavioral interventions. In FY 1997, NIAID committed over \$1 million to the establishment of clinical trial units for STDs. In addition, NIAID committed approximately \$1 million to research on the development of new vaccines for fungal diseases and improved vaccines for measles.

USAID supports research into: care-seeking behavior, such as parental recognition of respiratory infection severity and dehydration in their children; health care provider behavior related to quality assurance in health-care delivery, such as following effective diagnostic and treatment protocols for infectious diseases; and inappropriate drug

prescription and sale by providers, and poor patient compliance in the use of antibiotics.

- Social Marketing. USAID supports social marketing research on how market forces can be harnessed to promote healthful behavior change. For example, the social marketing of condoms for HIV and STD prevention is part of extensive, multi-country commitments for which USAID spends several million dollars annually.
- Antibiotic Resistance. Working with Harvard University, Johns Hopkins University, WHO, INCLIN, and other organizations, USAID has supported the development of a 3-5 year international research agenda on issues important to reducing pneumonia mortality among children, with special attention to the increasing problems associated with resistance to the commonly-used antibiotics.

NIAID issued a program announcement soliciting research on the genetics of drug resistance, development of new diagnostic tools, and development of alternative treatments.

- Importance of Micronutrients (Vitamin A and Zinc) in Susceptibility/Resistance to Infectious Diseases. USAID is continuing its role as the leading donor in researching the roles of Vitamin A in dramatic reductions of infectious disease mortality in developing countries, and in implementing national programs to improve Vitamin A nutritional status among all at-risk children. In addition, USAID is providing \$500,000 to support a newly developing body of research on the role(s) of zinc in resistance of children to infectious diseases in developing countries.
- Agriculture and Public Health. In 1996, USDA established an Emerging Pathogens Division to address issues at the interface of agriculture and public health. Activities include coordinating interagency surveillance, response and research needs related to *Salmonella Typhimurium* DT 104, an emerging, multi-drug resistant food borne pathogen of international concern.
- Links between environmental change and infectious diseases. NASA, NIH, CDC, and NOAA are collaborating on the application of changes in the spatial and temporal patterns of infectious diseases. NASA and NOAA are also organizing a series of workshops on applying environmental data to improve human health. NASA is currently in the process of organizing two more workshops – one on the Malaria in Africa Initiative and a second on the evaluation of future remote sensing systems for surveillance of infectious diseases.
- Interagency Research Partnership in Infectious Diseases (IntRePID). NASA is leading an interagency effort to develop a joint resource for the study of arthropod-borne infectious diseases. Participating agencies included the Walter Reed Army Institute of Research (WRAIR), Department of Infectious Diseases; the Naval Medical Research Institute (NMRI), Department of Infectious Diseases; the CDC Division of Vector Borne Infectious Diseases; the USDA

Agricultural Research Service Center for Medical Agricultural and Veterinary Entomology (CMAVE); and the Department of State. University participants include the Johns Hopkins School of Public Health and the University of Michigan School of Public Health. IntRePID activities to date include the following:

- Prototype study on the links between climate change and Dengue Fever. Using a thirty five year dengue data set, research is underway to study dengue in relation to a variety of weather and climatic conditions, including El Niño.
- Survey of international researchers: Working in conjunction with ProMed and the University of Michigan, NASA completed an international survey of researchers in Summer 1997. The purpose of the survey was to identify what tools, technologies, data sets, and resources will enable research into the study of climate change and human health.
- Technology Assessment: NASA is leading an interagency survey of federal resources, specifically intelligent technologies and tools that can enable the study, modeling, and prediction of infectious disease.
- Development of Online Data Distribution Resource and Archive: IntRePID is developing an online resource to archive, maintain, and distribute data sets, tools, and documents for research into climate change and human health. This resource is intended to include some training materials, to have pointers to researchers and leading activities in the field, and to link with other surveillance systems as they come online.
- Cross-Country Investigation of Climate and Encephalitis. NASA has undertaken a study with researchers at four universities to investigate how encephalitis might be affected by climate and weather conditions, and how these impacts may differ regionally throughout the U.S. Participating institutions will include University of California at Davis, Rutgers University, the University of Michigan, and the University of Florida. Additional participants are likely to include the state mosquito control organizations of the associated universities.
- USGCRP Working Group on Climate Change and Human Health. NASA and NIEHS are co-chairing the USGCRP subgroup on climate change and human health. A key element will be meeting with interdisciplinary researchers to identify human health risk areas, as well as to inventory federal resources of the participating organizations.
- NASA, NIH, and CDC Memoranda of Understanding. NASA has signed memoranda of understanding with NIH and CDC to support collaborative research, education, and training, in the application of remote sensing technologies to study the spatial and temporal patterns of infectious disease. To date, NASA has supported studies to apply remote sensing to a number of infectious diseases including malaria, filariasis, schistosomiasis, leishmaniasis, cholera, ebola, encephalitis, hantavirus, Lyme disease, yellow fever, and diarrheal diseases.

IV. Coordination with the Private Sector

The EID Task Force members are working to promote public and private sector cooperation to ensure the availability of the drugs, vaccines, and diagnostic tests needed to combat infectious diseases and infectious disease emergencies. These efforts include:

- Product Availability. FDA is leading an effort to develop a procedures manual on product availability to provide contact information on medical products (drugs, vaccines, diagnostic tests, antisera, etc.) that may be needed during emergencies. The Ciset Product Availability Group is working with domestic companies through U.S. pharmaceutical and device associations and with international industry associations and WHO.
- International Harmonization. FDA is leading international harmonization efforts, such as the International Conference on Harmonization, which includes the pharmaceutical manufacturers and regulatory bodies of the U.S., Japan, and the EU.
- Vaccine Supply. CDC, FDA, and USAID collaborated with drug manufacturers to address the shortage of vaccines for use in controlling meningitis outbreaks in Sub-Saharan Africa during the 1996-97 winter season.
- Pandemic Influenza. A number of Ciset Task Force members are participating in the Interagency Group for Influenza Pandemic Preparedness and Emergency Response (GRIPPE), which is working with state and local health departments, pharmaceutical companies, and health care delivery organizations to further develop the national plan for pandemic influenza.

V. Training of Health Care Providers

- Expanding training. NIH and CDC sent a letter in August 1997 to medical and microbiology associations and other professional organizations urging them to focus training and certification programs on emerging infectious diseases. In March 1998, NIH, FDA and CDC will sponsor a satellite meeting focused on training needs at the CDC's International Conference on Emerging Infectious Diseases.
- Judicious use of Antibiotics. In collaboration with the American Association of Pediatrics Committee on Infectious Diseases and the American Association of Family Physicians, CDC has prepared material for physicians on the judicious use of antibiotics in treating common pediatric respiratory infections. CDC has also developed a complementary set of materials aimed at consumers.
- Laboratory Fellowship Program. CDC and the Association of State and Territorial Public Health Laboratory Directors have developed a laboratory fellowship program for students at the BA,

MS, and PhD levels.

VI. Screening and Quarantine

Approximately one million legal immigrants and refugees are admitted to the U.S. each year, many from high-risk countries. At the same time, international travel by U.S. citizens has increased substantially, rising from 20 million to 40 million in the past decade. Half of these travelers visit tropical locations, putting them at risk for diseases they would not normally encounter. In response to this trend, the EID Task Force Working Group on Quarantine and Containment is developing a plan to improve the detection and containment of emerging infectious diseases imported into the United States, which will be completed by early 1998.

- Detection and Control at U.S. Ports of Entry. A CDC-led implementation working group, which includes representation from federal, state, and local health departments, held its first meeting in August 1997, to develop strategies for disease detection and control at U.S. ports of entry. Next, regional meetings will be held around the country to develop protocols for managing disease threats at particular ports of entry.
- Review of Regulations. CDC's Division of Quarantine has begun to review and prioritize regulations, focusing initially on imported disease risk from animals and other vectors.
- Refugee and Migrant Groups. The Division of Quarantine is currently developing a protocol for managing infectious diseases in refugee and migrant groups entering the United States and is evaluating the relevance and adequacy of the immigrant and refugee medical screening requirements.

The Division of Quarantine is also developing standardized recommendations and guidelines for the selection of panel physicians and laboratories responsible for conducting immigrant/refugee medical examinations.

- Communicating Health Information. Representatives from universities, travel clinics, and the International Society of Travel Medicine met with CDC in June 1997 to begin drafting a plan to improve communication of health information related to international travel. The plan will include involvement by airlines and cruise ship companies, as well as by state and local public health groups.

CDC's Division of Quarantine is developing a system for communicating with local health departments about the health risks associated with immigrants and refugees.

- GeoSentinel. GeoSentinel—a surveillance network of travel medicine clinics—is now in place. Representatives of the clinics met in June 1997 to review progress made to date and to work on further improvements. See paragraph on page 5.

VII. Updated Agency Missions and Mandates

Nearly two dozen agencies participate in the EID Task Force and contribute to the government-wide effort to combat the threat of emerging infectious diseases. Several of these agencies have changed or are in the process of changing their missions or mandates in order to make best use of their resources and expertise. A brief description of new or expanded missions and mandates follows.

a. CDC

- Over the past year, the EID Task Force has sought to expand CDC's mandate to allow surveillance and response activities to epidemics overseas. The two principal agencies involved in this issue, HHS and USAID, have been engaged in a discussion of two possible approaches: a narrow mechanism to give CDC authority under the Foreign Assistance Act, and a broader approach to build greater ability to respond to EID outbreaks. The EID Task Force continues to pursue these two approaches.

b. NIH

- NIH, the lead U.S. agency for biomedical and behavioral research, will expand its resources in research and research training in emerging infectious diseases. NIH activities are aimed at improving the understanding of the biology of infectious agents, developing diagnostics to detect them, and developing and testing drugs, vaccines, and other interventions to treat and prevent infections. NIH supports research capacity strengthening through its programs that link U.S. laboratories with those in developing countries for training or research purposes.

c. USAID

- In FY 1998, USAID established emerging infectious diseases as a strategic objective in health and will develop new programs to address malaria, tuberculosis, antimicrobial resistance and EID surveillance needs. USAID will continue to work bilaterally and regionally with more than 50 countries to develop in-country capacity to combat infectious diseases, especially those related to child survival, reproductive health, and HIV/AIDS prevention.

d. DOD

- Surveillance and Response System. DOD's Surveillance and Response System for Infectious Diseases was created to give senior leadership a system wide view of emerging infections. It will incorporate large surveillance databases that contain detailed information on infectious illnesses in U.S. troops, including data on demographics, hospitalization, reportable diseases, and deployment screening. The mission of DOD's overseas laboratories has been expanded to include a surveillance role, and the corps of epidemiologists has been expanded. Communication with

other federal agencies on emerging infectious diseases is provided through public and private web servers.

- Central Communications Hub. DOD has established an Internet-based Central Communications Hub at Walter Reed Army Institute of Research for emerging infectious diseases. It will include a private web server for an intranet chat line to link the overseas laboratories in Cairo, Nairobi, Jakarta, Bangkok, Lima, and Rio de Janeiro with Service hubs that perform surveillance of reportable diseases among U.S. troops. By Summer 1997, the Communications Hub will include a public web site that allows users to search for information in several DOD databases, which will lay the groundwork for automatic reporting of bacterial resistance patterns and certain reportable diseases. Fifteen new billets are being created to train military epidemiologists at DOD's overseas laboratories and the Central Communications Hub.
- Guideline for Surveillance and Response. DOD held a Joint Health Service Support Vision 2010 Conference in Washington, DC, in June 1997, to create guidelines for surveillance and response for infectious disease outbreaks affecting deployed troops around the world.
- Overseas Laboratories. The overseas laboratories have received funding to encourage collaborations with research colleagues from other U.S. agencies or other nations. The funding covers the costs of providing desks, laboratory space, and secretarial assistance to visiting scientists
- Ensuring Availability of Diagnostic Capabilities. Operational funding has been given to DOD's overseas labs to purchase equipment and reagents for laboratory support of host nations to assist them in diagnosing the causes of outbreaks.
- Scientific Exchanges. DOD is supporting exchanges of scientists, including two CDC epidemiologists, at several overseas labs.

e. NASA

- Since the mid-1980s, NASA has sponsored studies directed at using remote sensing technologies to monitor and predict the patterns of infectious disease in time and space. The approach is based on the identification and monitoring of environmental, entomological, and epidemiological factors that affect the patterns of disease transmission risk. The results of several studies indicate that remote sensing data can be used to predict the spatial and temporal patterns of infectious disease and that this information can be used to map disease transmission risk and direct control measures.
- Currently, the Office of Mission to Planet Earth supports basic research and education; and training is supported through the Center for Health Applications of Aerospace-Related Technologies. These programs support basic research and provide education, training, and technology transfer in the application of remote sensing technologies to studies of infectious

disease. This is accomplished through: interagency agreements with the NIH and CDC; joint research activities with U.S. and foreign university and agency investigators; and training of foreign investigators through the Third World Foundation fellowship program.

- NASA is dedicated to significantly improving the use of its diverse observing systems, data, and information about the Earth to support research on the environment, climate change, and human health. NASA is working with scientists to determine how the best products from NASA's 1997 Earth Observing System missions, and its future missions, can be applied to provide value-added services and to develop joint products with other organizations to facilitate the study, understanding, and predictions of vector-borne and infectious disease and other human health issues.

VIII. Bioterrorism

The EID Task Force is working in coordination with the National Security Council to respond to Section 1443 of the FY 1997 Defense Authorization bill. The EID Task Force formed an Ad Hoc Working Group comprised of the intelligence, security, public health, and law enforcement communities to focus on surveillance for terrorist use of biological agents. The Ad Hoc Working Group met in September 1997 and has initiated a report on the costs and benefits of national and international surveillance and response to incidences of criminal or terrorist uses of biological agents.

IX. International Activities

The challenges presented by EIDs far outstrip the means of any one country or international organization. Therefore, the U.S. has developed a sustained effort to enlist support from other nations and international bodies, as follows:

a. International Outreach

- The Department of State has established an Emerging Infectious Diseases and HIV/AIDS Program under the Bureau of Oceans and International Environmental and Scientific Affairs.
- In 1996, the Department of State cabled all ambassadors requesting that they raise awareness of emerging infectious diseases in each country.

b. Multilateral Initiatives

- Denver Summit (G-8). As a result of a U.S. proposal, the Eight (G-7 + Russia) pledged to work together to reduce the threat of EIDs by cooperating in three areas: 1) coordinating international response to outbreaks; 2) developing a global surveillance network; and 3) building capacity for surveillance, response, and research in developing countries.

- New Transatlantic Agenda (U.S.-European Union). Principal activities under the New Transatlantic Agenda include:
 - Exchanging *Salmonella* surveillance data among EU countries and the U. S.
 - Feasibility study on establishing a global *Salmonella* database.
 - Training exchanges and joint investigations between the EU's EPIET and the U.S. Epidemiology Intelligence Service (EIS).
 - Meeting hosted by EU in May 1997, in collaboration with WHO, to set standards for global surveillance of antimicrobial resistance. This includes common case definitions, reporting formats, and reporting intervals to facilitate the exchange of information.
 - Developing a resource inventory of EU domestic and international activities in cooperation with the U.S. This inventory includes organizations, institutions, and available technical experts responsible for monitoring and controlling communicable diseases. The focus is also on coordinating and evaluating results of assessments for local and national capacity of infectious disease surveillance in developing African countries.
 - Developing a "white paper" on clinical research training in emerging infectious diseases. This was discussed at a U.S.-E.U. meeting in Luxembourg, September 22-23, 1997.
 - Colloquium on Ebola virus research held September 4-7, 1996 in Antwerp. (See Appendix I).
 - International conference on malaria held in Dakar in January 1997.
- Asian-Pacific Economic Cooperation (APEC). The U.S. introduced the first-ever health initiative, one related to EIDs, into APEC through the Science and Technology Ministerial in 1995. The first project involved the development and application of a self-assessment survey to evaluate each economy's capabilities to address EIDs and identify strengths and areas that need improvement. Support for this area of cooperation was echoed at the Science and Technology Ministerial in 1996, and a workshop was held in the autumn of 1997 to draft a framework for cooperation and self-action.

c. Bilateral Initiatives

U.S.-South Africa Binational Commission.

- CDC is in the early stages of providing in-country training in surveillance and applied epidemiology within the new government structure, expanding the public health infrastructure to include the entire country.
- Representatives from South Africa participated in CDC's annual Distance Learning Conference, which focuses on technology aspects of distance learning, such as computer- and satellite-based technologies.
- NIAID organized with partners in South Africa a consultation consisting of seminars, site visits, and a grantsmanship workshop in key areas identified by South African investigators, including HIV/AIDS, TB, malaria, arboviruses, and antimicrobial drug resistance. As a result, Secretary Shalala announced that NIAID will develop a special relationship with South Africa on EIDs and HIV/AIDS.
- HHS will collaborate with the South African Department of Health to establish a new school of public health in South Africa.

U.S.-Russia Commission on Economic and Technological Cooperation

- CDC, FDA, and USAID are collaborating on preventing HIV/AIDS and assisting in outbreak response and vaccine quality control to diphtheria in the Russian Federation.
- Complementary to activities formally addressed under this agreement, CDC and FDA have provided U.S.-based and in-country training in applied epidemiology and regulatory quality control to approximately 90 Russians since 1993.
- NIH co-sponsored and co-organized a U.S.-Russia Workshop on EIDs held in St. Petersburg, Russia on December 8-11, 1996, on HIV/AIDS, hemorrhagic fevers, insect borne viruses, and vaccine-preventable viral conditions. At least twelve applications on EIDs were submitted for Civilian Research and Development Foundation funding as a result of the workshop, of which five were funded. In addition, the Ministry of Science subsequently announced the establishment and funding of an EIDS Vaccine Initiative ("Vaccines for Future Generations").

U.S.-Japan Common Agenda.

- The U.S. and Japan agreed to collaborate in four key areas: (1) dengue and dengue hemorrhagic fever (DHF); (2) antimicrobial resistance; (3) acute respiratory infections (ARIs); and (4) *E. coli* O157:H7 and related foodborne pathogens.
- International conferences on EID research and science policy were held in Tokyo in July 1996,

Bangkok in March 1997, and Baltimore in June 1997.

- A team from CDC and FDA participated in a cooperative investigation of an outbreak of *E. coli* O157:H7 in Tokyo during the summer of 1996.
- The Japanese Ministry of Health assigned a staff member to serve as an EIS officer at CDC in 1997.
- NIH continues to co-organize and participate in the U.S.-Japan Cooperative Medical Sciences Program, which sponsors annual scientific conferences in the areas of acute respiratory diseases, tuberculosis, diarrheal diseases, hepatitis, parasitic diseases, and others.

Central Asia Initiatives.

- USAID has provided assistance to all 5 republics within Central Asia to strengthen national immunization and disease control programs. Specific activities and results to date in Kyrgyzstan include the reduced incidence of diphtheria by 40% (from 545 cases in 1995 to 328 cases in 1996) and no new polio cases reported in 1996. Future efforts focus on increasing capacity for infectious disease surveillance information, control, and management, with particular emphasis on TB, hepatitis, and STDs.
- In Ukraine, USAID provided 32 million doses of diphtheria vaccine in 1994 and is continuing to assist the Ministry of Health to control the diphtheria epidemic. As a result, in part, of these efforts, diphtheria incidence nationwide in 1996 was dramatically below 1995 levels.

Other Overseas Capacity Strengthening Activities.

- Training in the NIS. In the Newly Independent States (NIS), USAID and CDC have improved national surveillance capacity through training and technical assistance. Accomplishments to date include the publishing of epidemiological surveillance bulletins in eight republics and training of 180 public health officials, representing eleven republics, in applied epidemiology and scientific communications.
- Controlling Hospital-based Infections in the NIS. In the NIS, the USAID/American International Health Alliance's medical partnerships program is improving hospital-based infection control policies and procedures, which will result in decreased nosocomial infections. AIHA is also assisting the NIS Ministries of Health to develop national infection control programs, basic infection controls courses for health professionals, training of trainers models, and standardized protocols for infection control surveys.
- EID Conference in Bangkok, Thailand. NIAID co-sponsored and co-organized with the International Medical Center of Japan an international conference on Emerging Infectious

Diseases held in Bangkok, Thailand in March 1997, which focused on dengue, antibiotic resistance, and enterohemorrhagic *E. coli* in the Asia-Pacific basin. See previous page.

- Malaria Conference in Dakar, Senegal. The FIC and NIAID, co-organized and co-sponsored with European partners and African scientists an International Conference on Malaria in Africa, held in Dakar, Senegal on January 6-9, 1997. The conference resulted in a set of recommendations aimed at stimulating collaborative malaria research efforts between Northern and Southern scientists. A follow-on meeting of representatives from science agencies, development agencies, pharmaceutical companies, the African scientific community and others was held in July 1997 in the Hague. See page 16.
- International Conference on Improving Use of Medicines (ICIUM). USAID supported the first ICIUM conference in April 1997 in Malaysia, in collaboration with INCLIN and other organizations. Some 272 attendees from forty-six different countries deliberated on points of common interest for making more effective use of pharmaceutical resources, especially related to antimicrobials, in developing countries.
- Country self-assessments. EID Task Force members developed a standardized questionnaire for countries to use to assess their own current priorities, capacity and needs, and thus as a basis for planning their own focused capacity strengthening activities. This tool was distributed on a pilot basis to all countries/economies within APEC plus South Africa and Vietnam. Specific progress includes: collaboration with the Philippines and Vietnam in epidemiology training and laboratory based surveillance; the establishment by CDC-Rockefeller of a Public Health School Without Walls in Vietnam; and collaborations with Bangladesh related to *E. coli* and cholera.
- Internet resources. Based on EID self-assessments completed by eight countries, CDC developed a notebook of Internet resources related to the six highest priority diseases (TB, HIV/AIDS, dengue, malaria, hepatitis, STDs), in key capacity development categories for each: clinical, laboratory, treatment/therapy, epidemiology/surveillance, control/prevention. More than fifty notebooks have been distributed to overseas collaborators. An APEC Emerging Infections Network was also established in 1997.
- Field Epidemiology Training Programs. In late June 1997, CDC and WHO convened a meeting of worldwide FETP directors to begin to strengthen networking of these national epidemiology training programs in support of EREID activities. An FETP Secretariat will be established to institutionalize this important network.
- Ebola Diagnosis. The FIC, through an administrative supplement to Yale University and to U.C. Berkeley, has provided training in Ebola virus diagnosis and research for scientists from Central African Republic, Cote d'Ivoire, and Gabon.
- Regional Capacity Building. A collaborative effort began at U.S. Naval Medical Research Unit

No. 3 (NAMRU-3) in Cairo to conduct special research projects and to help build regional capacity to monitor and respond to emerging infectious diseases. CDC has placed an expert at NAMRU-3 to collaborate on these activities. NIAID provided grant supplements to several projects, including its International Collaborations for Infectious Diseases Research, to expand collaborative research on emerging diseases in developing countries.

- Meningitis Epidemiology. Provision of instructors and educational materials for WHO/AFRO-sponsored training courses in meningitis epidemiology, in Nigeria, Niger, Chad, Burkina Faso, and Mali, in December 1996. (NIH, CDC, USAID)
- Laboratory Training on Diagnosis of Meningitis. Provision of instructors and educational materials for WHO/EMRO-sponsored laboratory training courses on diagnosis of meningitis, in seven of the most populated EMRO countries, in early 1997. (NIH, CDC, USAID)
- USAID provides support to several WHO programs related to infectious diseases. This includes support for global programs on acute respiratory infections, children's vaccine development, diarrheal diseases, TB, malaria, and onchocerciasis.
- USAID also collaborates with and supports UNICEF on many fronts for the prevention and control of childhood infectious diseases, and USAID provides a substantial portion of the financing and other support for UNAIDS and the WHO GPA for the prevention of HIV transmission.

d. Coordination with WHO

- International Health Regulations. In 1996, U.S. health experts met with their international counterparts at WHO to draft a plan of action for revising the International Health Guidelines (IHR), basing them on disease syndromes rather than on specific diseases.
- Networking the WHO Collaborating Centers. The EID Task Force members collaborated with WHO, PAHO, and the National Council for International Health (NCIH) to help strengthen networking among similar WHO Collaborating Centres worldwide (e.g., network of polio reference laboratories, network of applied epidemiology training programs).
- Regional Inventories of resources. Inventories of resources for combating infectious diseases were completed by the Pan American Health Organization (WHO/PAHO), the Southeast Asia Regional Office (WHO/SEARO), the Eastern Mediterranean Regional Office (WHO/EMRO) and the Western Pacific Regional Office (WHO/WPRO) in 1996.

Other joint activities with WHO:

(CDC support for specific WHO Collaborating Centres is attached as Appendix II.)

- Through the Gorgas Institute at the Univ. of Alabama, USAID will support WHO/PAHO's program for the surveillance and study of pneumococcal pathogens in Latin America. The information will greatly enhance knowledge about increasing antibiotic resistance, as well as options for the development of effective vaccines for controlling pneumococcal pneumonia, meningitis, and other illnesses.
- Strengthening of twenty-two U.S.-based WHO Collaborating Centers (WHOCCs), which help diagnose diseases and control outbreaks around the world (see appendix). A new WHOCC on Control of Epidemic Meningitis was established at CDC in 1996, and a Center on Clostridium botulinum has been proposed.
- Demonstration project on meningococcal disease in Sub-Saharan Africa. This project was initiated in Summer 1996, to improve detection and control of meningitis epidemics, and as of June 1997, significant progress has been reported.
- Procedures manual on the availability of emergency medical products (see above).
- Setting of standards for global surveillance of antimicrobial resistance. WHO is revising its program to monitor antimicrobial resistance [now called Antimicrobial Resistance Monitoring (ARM)]. In addition, CDC is working with WHO/EMC to assess the diagnostic proficiency of the laboratories that use WHONET to track the spread of drug-resistant microbes. WHO/EMRO has also established an industry working group on antimicrobial resistance. At the group's request, WHO/EMC is planning to set up a strain bank to provide bacterial strains and laboratory reagents that are not commercially available.
- FDA provided technical leadership and expertise in setting standards for vaccines and other biological products.
- Planning of projects on global communications and regional S&R centers. The Ciset agencies are providing support and assistance to WHO/EMC in its current efforts to improve global health communications (see above) and build regional centers for surveillance and control of infectious diseases. WHO/EMC is sponsoring the development of sub-regional teams, or "hubs", for disease surveillance, outbreak control, training in laboratory diagnostics, and epidemiological and operational research.
- CDC has assigned an expert on Arboviruses and Hemorrhagic Fever to WHO to help develop capacity to respond to outbreaks in these disease areas.
- The Abidjan-based WHO/AFRO-USAID-EU program's mission is to improve responses to epidemic outbreaks in western Africa, including the control of yellow fever, cholera, meningitis, and measles.

- The Harare-based WHO/AFRO-USAID-CDC project involves surveillance for cholera, dysentery, and other diarrheal diseases in southern Africa.
- FDA collaborates with FAO in giving training on detection and control of foodborne pathogens in several countries.

Appendix I

Selected Workshops and Conferences.

- In the Fall of 1996, NIH sponsored a workshop on human ehrlichiosis.
- In September 1996, NIH, CDC, OIRH/DHHS, USAMRIID, WHO, and the Institute of Tropical Medicine in Antwerp sponsored a major scientific meeting in Antwerp on the Ebola virus, filoviruses, and lessons learned from Kikwit.
- CDC, along with its French counterparts, sponsored the 2nd annual workshop on "Molecular Epidemiology and Evolutionary Genetics of Pathogenic Microorganisms" in Montpellier, France, May 26-28, 1997.
- NIH, State, and international partners co-sponsored a U.S.-Mexico-Canada Research Development Workshop on Emerging Infectious Diseases in September, 1997. The workshop focused on improving research cooperation on this topic among the NAFTA partners.
- NIAID, in cooperation with the Embassy of Italy and visiting Italian scientists at NIH, held a conference in May 1997 to consider critical areas for research cooperation on emerging infectious diseases.
- NIAID convened a workshop on drug resistance in *Staphylococcus aureus* in response to recent isolation of strains with reduced vancomycin susceptibility; experts from CDC and FDA participated in discussions about research needs in this area.
- NASA, CDC, DOD, and NIH participated in the American Society of Microbiologists meeting to define a research agenda on climate variability and human health.
- In September 1997, NASA participated in an international workshop on disease surveillance and monitoring in Rostock, Germany. As an outcome of this meeting, NASA is now working with WHO's Paris-based FluNet, providing climate data sets to assist in modeling relationships between weather parameters and the migration of influenza across Europe.
- Working with the Liverpool School of Tropical Medicine and Hygiene, NASA is developing data

sets for a conference-long training session at the European Congress on Tropical Medicine planned for September 1998 in Liverpool. NASA plans to maximize the use of remote sensing products from its 1997 and 1998 missions for the study of climate change and human health.

- The Electric Power Research Institute commissioned a workshop on "Climate Change and Vector Borne and Infectious Diseases" in September 1997, cosponsored by NASA, NIAID, NIEHS, and DOE, to identify major research gaps and to outline a major research agenda to provide a sound scientific basis for public policy debates and decisions.
- FDA conducted workshops and a public meeting on *Cyclospora cayetanensis* foodborne outbreaks and research.

Appendix II

Enhancement of the Surveillance and Response Capacities at WHO Collaborating Centers

In 1996, CDC conducted a review of the thirty WHO Collaborating Centers located within the National Center for Infectious Diseases. Based on this evaluation, a total of \$800,000 was provided to strengthen fourteen of the Centers. The program was expanded in 1997, with

\$2,000,000 allocated to strengthen eight additional Centres, to expand high-priority activities, and to foster collaboration with other Centres around the world.

Projects funded in 1996-1997 include:

WHO Collaborating Center for Arthropod-Borne Viruses, Western Hemisphere. Partial support for expanded production and distribution of reagents for arthropod-borne viruses; re-development of laboratory surveillance for Venezuelan equine encephalitis (VEE) in sentinel laboratories in Central America; re-establish expertise in arbovirology in the areas of diagnosis, surveillance, epidemiology and entomology with the Uganda Virus Research Institute.

WHO Collaborating Center for Leptospirosis. Provide basic terms of reference for surveillance and diagnosis of Leptospirosis, diagnostic development, reagent production and technical transfer

WHO Collaborating Center for Malaria Control in Africa. Study of multi-drug resistant malaria and testing newly-developed drugs and new drug combinations; production and distribution of the sporozoite ELISA reagents.

WHO Collaborating Center for Research and Reagents for Human Immunoglobulin Subclasses. implement a tracking and monitoring system for reagents and other collaborating center services.

WHO Collaborating Center for Mycoses in North America. Provide basic terms of reference for

diagnostics and specimen tracking systems for mycoses.

WHO Collaborating Center for Surveillance, Epidemiology and Control of Influenza. Update influenza reagent kit with Influenza A subtyping monoclonal antibodies and ensure worldwide availability.

WHO Collaborating Center for Reference and Research on Plague Control. Develop capacity to provide rapid sample analyses for plague surveillance and outbreak investigations and support molecular epidemiology and training activities. Conduct collaborative research and training on plague prevention in China.

WHO Collaborating Center for Reference and Research on Rabies. Update and maintain lyssavirus collection; produce and distribute reagents including monoclonal antibodies.

WHO Collaborating Center for Evaluating and Testing New Insecticides. Provide technical support for chemical and biological assays used in evaluating compounds in current and new delivery modes for use in malaria strategies. Investigate discriminating dosages for five pyrethroid insecticides using laboratory maintained vectors to establish a base line for pyrethroid resistance.

WHO Collaborating Center for Antimicrobial Resistance. Provide quality control and proficiency testing strains to participants in the global WHONET surveillance system.

WHO Collaborating Center for Research, Training, and Eradication of Dracunculiasis. Stop dracunculiasis transmission in Chad, Senegal, Cameroon, and Yemen by the end of 1997 and reduce to less than 100 cases in Mauritania and Ethiopia.

WHO Collaborating Center for Rickettsia and Rickettsial Diseases. Update rickettsial culture collection, produce and distribute reagents and form a network of collaborators through training of international investigators for rickettsial diagnosis.

WHO Collaborating Center for Shigella. Transfer sustainable technology and expertise for Shigella to southern Africa region.

WHO Collaborating Center for Respiratory Viruses Other than Influenza. Provide support for antigenic characterization of group A and B RSV and sequencing studies of para-influenza type 3.

WHO Collaborating Center for Viral Hemorrhagic Fevers. Produce viral hemorrhagic fever reagent and further develop and distribute immunological and molecular approaches to identify viral causes of fatal illness.

WHO Collaborating Center for Dengue and Dengue Hemorrhagic Fever (in development). Meet the basic terms of reference for reagent production and distribution and diagnostic test evaluation. Develop an international training center for Dengue and Dengue Hemorrhagic Fever.

WHO Collaborating Center for Measles Virus Diagnostics. Transfer the capability to perform the capture IgM EIA virus isolation to at least those African laboratories involved in Polio eradication.

WHO Collaborating Center for Foodborne Disease Surveillance. Develop, produce and distribute reagents for a new food-borne disease laboratory network. Establish a national network and database for molecular subtyping of E. coli 0157:H7 isolates.

WHO Collaborating Center for Prevention and Control of Epidemic Meningitis. Develop a sustainable, national and sub-regional laboratory capacity for neisseria meningitides in Sub-Saharan Africa.

Collaborating Center for Vibrio cholerae 01 and 0139. Meet basic terms of reference for diagnostics, susceptibility testing and molecular and subtyping assays for Vibrio cholerae 01 and 0139.

WHO Collaborating Center for Clostridium botulinum (Proposed). Meet basic terms of reference for diagnostics, toxicity testing, reagents and antitoxin testing for Clostridium botulinum.

WHO Collaborating Center for Control and Elimination of Lymphatic Filariasis. Study distribution and magnitude of Lymphatic Filariasis problem in Americas and establish and coordinate rapid assessment, control and laboratory training activities.

WHO Collaborating Center for Cysticercosis. Meet basic terms of reference for WHO Collaborating Center for Cysticercosis by providing reference sera from humans and pigs infected with different stages of the disease and provide reference diagnostic tests including standardized conjugates and antigen.

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