



ENVIRONMENTAL HEALTH PROJECT

*This report was first published by USAID's Office of Policy and Program Coordination,
and the Office of Health and Nutrition, Center for Population, Health and Nutrition
for conference participants and sponsoring organizations*

ACTIVITY REPORT

No. 49

Proceedings Report:

Technical Consultation on
USAID's Infectious Diseases Strategy

December 16-17, 1997
Washington, D.C.

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Rapporteur

First Printing: February 1998 (USAID)
Subsequent Printing: June 1998 (EHP)

Prepared for the Bureau for Global Programs, Field Support and Research
Office of Health and Nutrition
U.S. Agency for International Development
under the Environmental Health Project, Activity No. 432-CC

Environmental Health Project
Contract No. HRN-C-00-93-00036-11, Project No. 936-5994
is sponsored by the Bureau for Global Programs, Field Support and Research
Office of Health and Nutrition
U.S. Agency for International Development
Washington, DC 20523

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Preface

On December 16 and 17, 1997, the United States Agency for International Development (USAID) hosted a two-day conference with many of its key partners as part of a consultative process to help develop a new strategy for USAID in infectious diseases. The conference was widely attended by a broad range of infectious disease and public health experts who lent their technical and field expertise towards refining USAID's draft strategy and further defining areas of focus.

As a result of this conference and subsequent consultations, USAID has developed a comprehensive strategy for infectious diseases. This strategy reflects the substantive and strategic input of USAID's partners and will help guide our efforts to reduce the threat of infectious diseases in the developing world. Just as important, it helps lay the groundwork for how our efforts will coordinate with those of others.

We anticipate that the partnership established at our December meeting will serve as the basis for an expanding collaborative process to maximize our impact on infectious diseases worldwide. I especially want to thank Senator Leahy, Representative Callahan, Representative Pelosi, and Senator McConnell for their leadership, commitment, and efforts to this cause.

I would like to express my appreciation to all of the participants for their time and input. I am sure that we will continue to engage together in the process of building lasting systems to fight disease and promote sustainable development.

J. Brian Atwood
USAID Administrator

Acknowledgments

USAID would like to thank Senator Patrick Leahy; Mr. John Shank, U.S. House of Representatives, Committee on Appropriations staff; Dr. Kazem Behbehani, World Health Organization (WHO); Dr. Stephen B. Blount, Centers for Disease Control and Prevention (CDC); Dr. Joel G. Breman, National Institutes of Health (NIH); Dr. George Curlin, NIH; Ms. Malayah Harper, World Bank; Dr. David L. Heymann, WHO; Dr. James W. LeDuc, CDC; and Dr. Vincent Orinda, UNICEF, for their presentations in plenary. We would also like to express our appreciation to Dr. Stanley O. Foster, Emory University; Dr. Tore Godal, WHO; Dr. Heymann; Dr. Jonathan D. Quick, WHO; Dr. Lee B. Reichman, New Jersey Medical School; Dr. Jonathan Simon, Harvard Institute for International Development; Dr. Jim Tulloch, WHO; and Dr. Ronald Waldman, BASICS, for their presentations in breakout sessions.

USAID would also like to thank Mr. Tim Reiser from the Senate Appropriations Committee staff for his leadership and support of USAID's infectious disease initiative, and Dr. Nelle Temple-Brown from WHO for her help in the planning stages of this meeting.

The success of this conference was the result of extensive efforts on the part of many people within USAID who planned and organized this meeting, including staff from USAID's Global Bureau, Office of Health and Nutrition; Africa, Asia/Near East, Latin America/Caribbean, and Europe and Newly Independent States Bureaus; Bureau for Humanitarian Response; Bureau for Legislative and Public Affairs; and Policy and Program Coordination Bureau.

USAID would like to particularly thank the Environmental Health Project for the invaluable logistical, administrative, organizational, and editorial assistance in preparing for this meeting and for preparing the conference proceedings. Special thanks go to Mr. David Fernandes, Ms. Kathy Alison, Mr. Fred Rosensweig, and Mr. Eduardo Perez, and to Ms. Diane Bendahmane for writing the conference report and Ms. Betsy Reddaway and Ms. Darlene Summers for editorial and production support.

1. Introduction

1.1 Background

In 1997, Congress held a series of hearings on infectious diseases and the role of the U.S. Agency for International Development (USAID). As a result of these discussions, and as an outgrowth of the Administration's increasing attention to emerging and re-emerging diseases, USAID revised its overall health strategy in September 1997 to include an objective on infectious diseases. The new objective was added to USAID's objectives aimed at improving child survival and maternal health, reducing the spread of HIV/AIDS, and preventing unintended pregnancies. Also in 1997, Congress increased USAID's FY 1998 budget by \$50 million for infectious diseases. USAID prepared a draft strategy for the initiative (see Annex A) and shared it with a variety of its partners and global health experts for their review and comment. As part of its consultation process, in December 1997, USAID hosted a two-day meeting with a number of partner organizations. These pages contain the record of that meeting.

The goals of the meeting were to:

- # Review USAID's draft strategy for the prevention and control of infectious diseases
- # Discuss what other partner organizations are doing in the area of infectious diseases, with special attention to identifying gaps, overlaps, and high priority needs
- # Further elaborate specific areas of USAID's draft strategy, including identifying specific objectives and possible activities

- # Agree on important next steps for the coming months.

Participants included representatives from a wide range of USAID's partners working in infectious diseases or colleagues with a particular technical perspective. Approximately 120 persons attended. The participant list is found in Annex B.

1.2 Agenda

The meeting was held December 16-17, 1997, at the Capitol Hill Hyatt Regency in Washington, D.C. The agenda combined plenary and work group sessions in which participants discussed specific topics in detail. (Annex C contains the meeting agenda.)

USAID Assistant Administrator for Legislative and Public Affairs Jill Buckley opened the conference. Following welcoming remarks from Representative Sonny Callahan (R-Alabama) and by Senator Patrick Leahy (D-Vermont), who have been instrumental in raising the issue of infectious diseases in Congress, USAID's Senior Health Advisor, Dr. Nils Daulaire, outlined the draft USAID infectious disease strategy. His presentation was followed by a review of key elements of the strategy by a panel of USAID staff members. Then selected partner organizations—the World Health Organization (WHO), UNICEF, the World Bank, the U.S. Centers for Disease Control and Prevention (CDC), and the U.S. National Institutes of Health (NIH)—made presentations about their organizations' activities in infectious diseases and potential links with the USAID draft strategy. (Chapter 2 contains the welcoming remarks

and Chapter 3 summarizes the opening plenary presentations.)

The first round of work groups considered four key elements of the draft strategy: (1) malaria, (2) tuberculosis, (3) anti-microbial resistance, and (4) surveillance. Each work group session began with a technical presentation and key questions to set the context; the remainder of the time was devoted to discussions involving specific questions and recommendations. After the plenary reports of the first round, the second round of work groups considered the following topics: (1) critical needs of public health systems in addressing infectious diseases, (2) linking infectious disease efforts to ongoing Child Survival and HIV/AIDS prevention efforts, (3) bringing together disease specific surveillance issues, and (4) priority research needs. (Chapter 4 provides summaries of the work groups and their reports to the plenary.)

The closing plenary consisted of two presentations on other infectious disease issues that were not addressed in the draft strategy but might be considered, an overall summary of the meeting's findings by Dr. Daulaire, a general discussion, and closing remarks by USAID Administrator J. Brian Atwood. (Chapter 5 summarizes the closing plenary.)

1.3 Results of the Conference

The conference achieved its goals. In sum, participants strongly endorsed the concept of focusing on the four basic elements of USAID's draft strategy and agreed to continue working consultatively and expeditiously with USAID to provide specific input to those responsible for planning how the strategy will be implemented and how the new resources will be used.

The four proposed key elements of USAID's expanded initiative to prevent and control infectious diseases are:

- # Slowing the emergence and spread of *anti-microbial resistance*, targeted at the principal microbial threats to all countries: pneumonia, diarrhea, sexually transmitted diseases, tuberculosis, and malaria
- # Testing, improving, and implementing options for *tuberculosis* control
- # Implementing new and effective disease prevention and treatment strategies focused on *malaria* and other infectious diseases of major public health importance
- # Strengthening *surveillance* systems by enhancing detection capability, information systems, and data-based decision-making and response capacity in developing countries.

The participants agreed that:

- # Resources should be focused on a limited number of key strategic interventions.
- # The initiative must show results; therefore, specific goals and clear indicators must be set.
- # Most attention should be focused on long-term results, with some attention to short-term needs.
- # Based on considerations of public health threat, the main thrust of the initiative should be on infectious diseases, not on the subset of emerging diseases.
- # Decisions concerning effective interventions will be based on research and established global consensus.

Since all the issues surrounding infectious diseases are global in scope and since solving them is essential for a healthy world and beyond the scope of any one

actor, the initiative will be a collaborative effort; partners will build on each others' activities and resources. When possible, the initiative should tie in with existing programs and systems.

The most important next step is to flesh out the overall strategy, with assistance from USAID partners. Contacts for the general follow-up process are:

- Dr. Duff Gillespie, Deputy Assistant Administrator, Center for Population, Health and Nutrition, Global Bureau (G/PHN)
- Ms. Joy Riggs-Perla, Director, Office of Health and Nutrition (G/PHN/HN)
- Ms. Irene Koek, Bureau for Policy and Program Coordination (PPC)
- Dr. Nils Daulaire, Senior Health Advisor, Office of the Administrator

The following USAID personnel from the Health, Population and Nutrition Center of USAID's Bureau for Global Programs, Field Support and Research (G/PHN/HN) will take the lead in developing specific components of the overall strategy and will be in touch with

conference participants and others for future consultations:

- | | |
|---------------------------|---------------------|
| Malaria | Dr. Dennis Carroll |
| Tuberculosis | Dr. Paul Delay |
| Surveillance | Dr. Victor Barbiero |
| Anti-microbial resistance | Mr. Tony Boni |

The success of the conference, the willingness of a wide range of experts to participate at a busy time of year, and the dedication of participants to common goals demonstrate the importance of this issue and effectiveness of USAID's consultative approach.

2. Welcoming Remarks

Ms. Jill Buckley, USAID's Assistant Administrator for Legislative Affairs welcomed the conference participants and thanked Congress for making resources available for USAID's Infectious Diseases Initiative.

2.1 Letter from Representative Sonny Callahan

Representative Sonny Callahan, Chairman of the House Appropriations Subcommittee on Foreign Operations, Export Financing and Related Programs and co-sponsor of the infectious diseases legislation, was unable to attend the conference. His subcommittee staff director Charlie Flickner and professional staff member John Shank both attended and asked that his letter to USAID Administrator Brian Atwood, given below, be read.

Dear Brian,

I am very pleased that you have acted so quickly to help implement the Congressional initiative to enhance USAID's infectious diseases strategy.

I think the threat of infectious diseases to the economic growth of developing countries is one of the most important challenges facing AID. The globalization of the world economy also increases the threat to us in the United States, therefore it is extremely important that you have assembled the experts in this area to begin the critical work of developing a plan to prevent and contain infectious diseases.

I wish I could be with Senator Leahy today, but I know I join with Chairman McConnell and Congresswoman Pelosi in

expressing our strong bipartisan support for this initiative.

With best regards and my high hopes for success in this endeavor, I am

*Sincerely,
Sonny Callahan
Member of Congress*

2.2 Senator Patrick Leahy's Statement

Senator Patrick Leahy, ranking minority member of the Senate Appropriations Subcommittee on Foreign Operations and Senate sponsor of the infectious diseases legislation, made the following presentation to the plenary:

These consultations are the result of a decision by the Congress this year to provide an additional \$50 million for programs to combat infectious diseases around the world. At the time we included those funds, I said that I wanted to see consultations among the government agencies, international organizations, and other experts on how best to spend this money in support of a global strategy to combat infectious diseases. So I appreciate what USAID has done to organize these meetings, and all of you for being here.

I want to take a minute to explain why the Congress got involved in this, and what I hope comes out of these discussions. Last May when I organized a hearing in the Appropriations Committee on these issues, I spoke of how just 20 years ago we thought we were on the verge of eliminating infectious diseases. Obviously, we were mistaken. It is likely that infectious diseases will be with us for as long as humans inhabit the earth, and the sooner we recognize that, the better

able we will be to protect ourselves and future generations. We need to approach this as if HIV is only the most recent example of what we may face in the future.

To give you an example of the kind of effort I believe is needed, five years ago I sponsored the first law anywhere to ban exports of landmines. At that time, few people even knew what a landmine was, other than the victims and their families. Two weeks ago, 122 nations signed a treaty banning the weapons, and last week the Campaign to Ban Landmines received the Nobel Prize. During the past five years I have spoken to the heads of state of dozens of countries, met many times with two Presidents, Secretaries of State and Defense, made hundreds of speeches, written numerous articles, spoken to countless newspaper and television reporters. What began as a few lone voices became a global movement.

That is what we need here. Landmines are insidious weapons because they strike indiscriminately and cause horrifying injuries and death. The same is true of infectious diseases, but far more people die each year of malaria alone than from landmines.

The day I arrived back home from the landmine treaty signing ceremony I read in the Washington Post not one but two articles on infectious diseases. The first, entitled "Disease Related to Smallpox Breaks Out," describes how the eradication of smallpox and the end of smallpox vaccinations have led to the recent outbreak of monkeypox in Africa. More than 500 cases have been reported and at least ten children have died.

Some Americans might think that a disease outbreak in a remote part of Africa is no threat to us. To them I would point to the second article, entitled "Second Person Identified with Flu Previously Found Only in Birds." If, as that article suggests, the species barrier which traditionally prevents the transfer of infectious agents from animal to man is weakening under the

pressures of population growth, environmental degradation and poverty, imagine the ease with which other diseases—including diseases which may be unknown to us today—could spread.

It makes little difference whether an infected child is in Hong Kong, Congo, or Chicago. To quote Nils Daulaire, who is a fellow Vermonter and one of our government's most effective advocates for international health programs: "In our interconnected world no disease is more than a day away from our shores."

It is remarkable that in this day and age we lack an effective global system for infectious disease surveillance and response. You all know the grim statistics so I will not repeat them. Infectious diseases are by far the world's leading cause of death. Some diseases are new or re-emerging. Some are endemic. Many are preventable, like measles, yet they kill millions of children. Others are curable, like TB, but multi-drug resistance is a frightening and potentially catastrophic problem.

We in Congress recognize the magnitude of what we have to do. The CDC can spend only a tiny fraction of its budget on international programs. It does not have the mandate to build public health systems overseas. USAID, which does have that mandate, has not had sufficient resources directed at these problems. For example, USAID spends only \$2 million annually on TB, a disease which each year kills 3 million people. WHO, which is the mechanism for developing a global framework, provides technical assistance—it is not a funding agency. You are dedicated, talented people. You need to work as partners, and you need the resources to back you up.

I see this additional \$50 million as the first installment in a multi-year effort. I have had the strong support of Senator Mitch McConnell, who was afflicted with polio as a child, and of Congressman Sonny Callahan. Both are Republicans. Both agree with me that this needs to be a priority for the future.

Let me say a few words about what I hope these meetings produce. We need to commit to a global strategy. When I first started looking at this problem it was apparent that not only were there not enough resources, but there was inadequate coordination among governmental agencies and international organizations, and between the public sector and the private commercial sector. We need a collaborative approach in which each partner contributes based on its comparative advantage. Before moving forward, we need to review what we are doing and where we are falling short. Only then can we set priorities and invest additional resources with the most cost-effectiveness and impact. USAID has prepared a draft strategy for the United States to support this effort. It is a work in progress. You have been invited here to help improve it. If it falls short, we want you to tell us.

I share the view that there are diseases like TB and malaria that deserve particular attention. But I also see our goal in far broader terms. I strongly believe that we need a strategy that is designed to build the human capacity and public health infrastructure in the developing countries that are capable of conducting proper surveillance and responding effectively to infectious diseases. We need an integrated, global network. Anything less will not prepare us for the future.

We all recognize that governments cannot do this alone. The private sector plays a central role, and the strategy must reflect that. American pharmaceutical companies have made a great contribution to world health, but there are economic and regulatory barriers which must be addressed so the billions of people who do not have access to essential drugs can get them. Private companies need incentives, and we need the infrastructure in the developing countries to properly distribute the drugs.

I have often called this a humanitarian imperative. It is also in our economic and national

security interests. The latest Institute of Medicine report makes that case persuasively. Prevention costs money, but it is far less costly than responding to an epidemic. We saw that recently with the re-emergence of TB in our own country.

There are other aspects to this. Our recent confrontation with Iraq over United Nations weapons inspections further demonstrates the need for a global strategy to detect and combat deadly microbes. At least nine other countries are suspected of having biological warfare programs.

This is a monumental challenge. We need to approach it that way. Since we cannot do this alone, we need to do what I and others did in the first years of the campaign against landmines—shine a bright light on the problem. Once people understand it, they will want to solve it.

Perhaps more than anything, infectious diseases illustrate that we are a global community, that we are linked to one another in increasingly complex ways, and that we are all in this fight together. It is a fight I welcome, because we are going to make life better for millions and millions of people.

3. Opening Plenary

3.1 Overview of the Meeting and the USAID Strategy

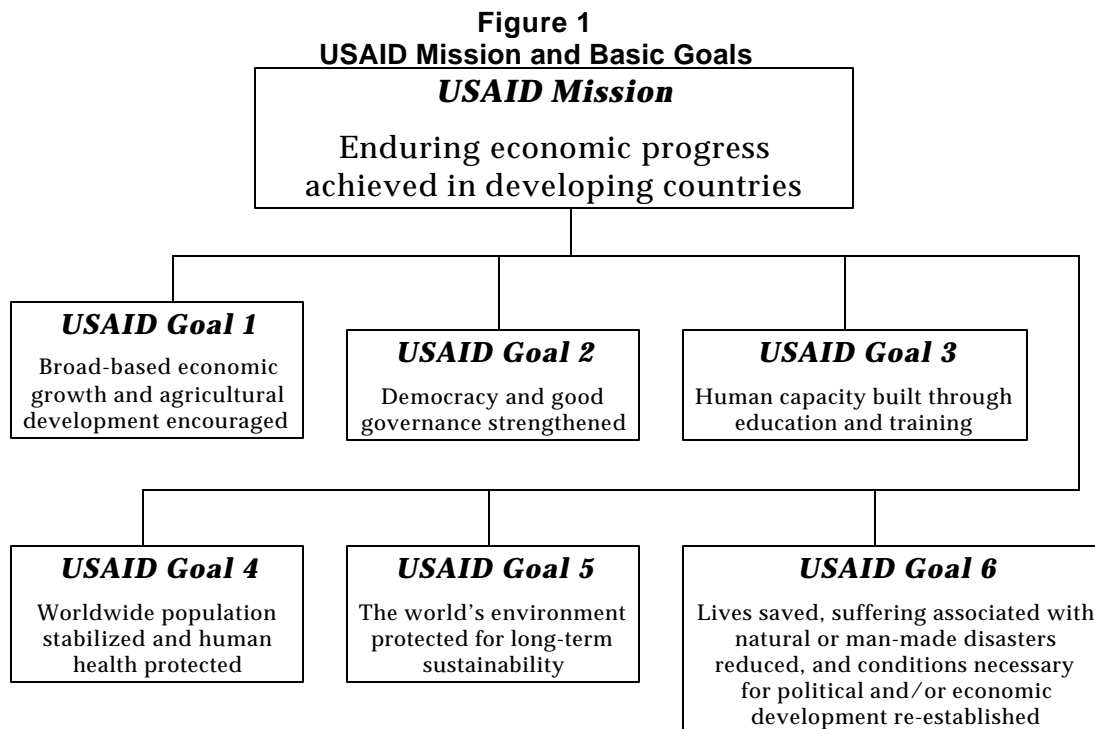
3.1.1 Summary of Dr. Nils Daulaire’s Presentation

USAID’s draft infectious diseases strategy should be discussed in the context of urgent global needs. USAID does not claim to have “discovered” this problem; many partner organizations have been deeply involved for many years. However, now that additional funds have been made available through USAID’s development assistance appropriation, USAID will be able to play a greater role in the fight against infectious diseases—as part of a global effort. The plans that are eventually put into place must and

will take into consideration the resources and the efforts of USAID partners.

Fifty million dollars in the first year of this initiative is a considerable sum and should enable USAID to make a significant contribution to addressing the problem of infectious diseases, but the need is so great that USAID must adopt a highly strategic approach to assure that significant results will be achieved.

The draft strategy fits within USAID’s overall mission and its six basic goals, as shown in Figure 1. The fourth goal— worldwide population stabilized and human health protected— has five strategic objectives. The fifth of these, to reduce the threat of infectious diseases of major public health importance, is new. The proposed



strategy to be discussed falls under this objective (see Figure 2), but there are links to other objectives, notably those aimed at improving infant and child health and reducing HIV/AIDS transmission. The proposed strategy looks for maximization of synergy among Goal 4 objectives.

The pyramid in Figure 3 is a graphic representation of how the new initiative will fit into USAID’s ongoing work. The foundation of the pyramid is primary prevention of infectious diseases through development. Farther up, assistance is focused on improving health systems. Both these levels are already encompassed by USAID’s ongoing development assistance programs. The emphasis of the new initiative will be on targeted activities, which build on the foundation of ongoing activities in primary prevention and improved health systems. USAID’s Population, Health and Nutrition (PHN) portfolio is about \$950 million per year allocated to health activities that support both systems development and targeted interventions.

The principal elements of the draft plan are listed in Box 1; Annex A continues the draft strategy in its entirety.

As the U.S. government’s lead development agency, USAID has extensive

Box 1: Principal Elements of USAID’s Draft Infectious Disease Strategy

<p>Technical Elements</p> <ul style="list-style-type: none"> # Anti-Microbial Resistance # Tuberculosis Control # Expanded Control of Malaria and Other Diseases # Surveillance and Response
<p>Systemic Approach</p> <ul style="list-style-type: none"> # Sustainable Health Systems # Integration with Ongoing Health Assistance Efforts # Cross-Linkage among Targeted Efforts # Research

on-the-ground experience through its country missions. In Washington, a structure has been developed to guide and support efforts in the field, principally through the Bureau for Global Programs, Field Support and Research (G), which handles much of the technical work, the Bureau for Policy and Program Coordination (PPC), which oversees the implementation of USAID’s strategy, and regional bureaus, responsible for planning and management of USAID programs in regions.

The recommendations developed during this conference will assist USAID to develop a multi-year strategy and ideas for allocating the first year of funds. We need to know from the experts assembled at this consultation if the elements of the strategy are the right ones, if the approach is feasible, and where the most important points of linkage are with USAID partners to maximize benefits.

3.1.2 USAID Presentations

A panel of USAID representatives consisting of Ms. Joy Riggs-Perla (Director of the Office of Health and Nutrition), Dr. Frances Carr (Senior Science Advisor in the Bureau for Policy and Program Coordination), and Ms. Dawn Liberi (Deputy Director of the Center for Population, Health and Nutrition) highlighted key elements of the strategy.

- # There must be synergy between USAID’s field-based activities and Global Bureau programming. Also, USAID must work in sync with other organizations and in balance with both public and private institutions. USAID works in 60 countries, many of which will participate in this initiative.
- # The initiative will target worldwide health programs into which infectious disease work can be integrated and will

examine how our most important partners—host country counterparts—can be engaged.

Figure 2
USAID Strategic Objectives in Health, Population and Nutrition

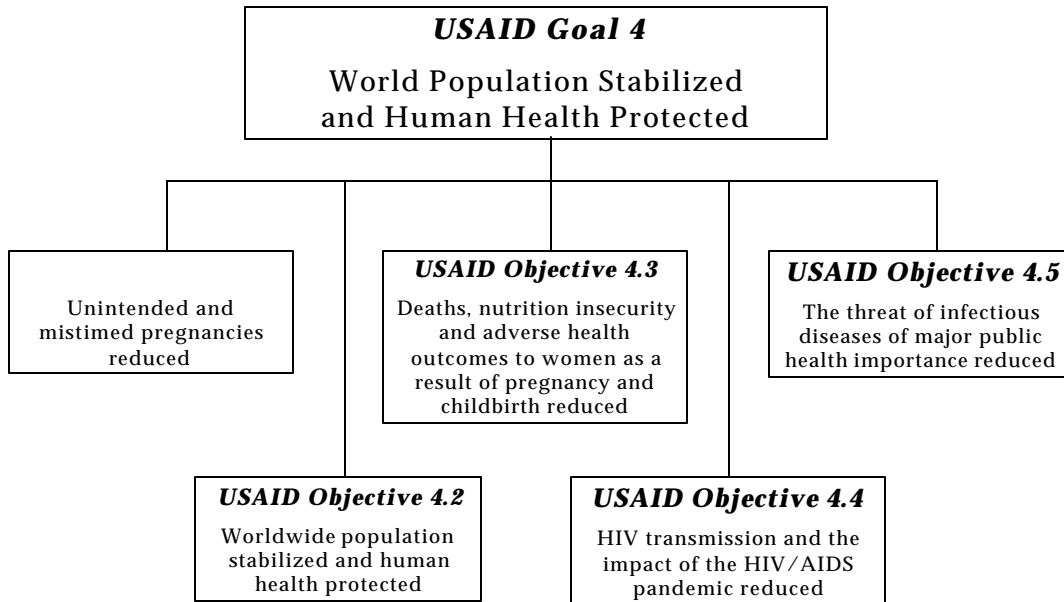
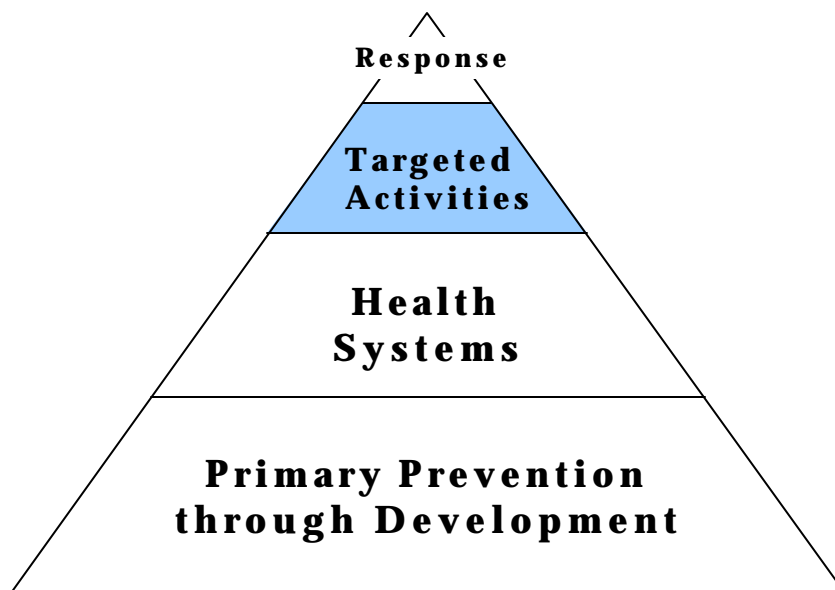


Figure 3
Levels of Response to Infectious Diseases



- # The overarching objective of the new initiative is to build local capacity. Immediate impact cannot be the sole concern; institutional capacity for the future must also be developed and proper indicators of success selected. The draft strategy sets long-term objectives and emphasizes sustainable programs. Along with considering specific technical approaches, conference participants should challenge one another on the issue of sustainability.
- # USAID might make the greatest contribution by filling in the gaps in global infectious disease efforts. The USAID strategy is part of an overall government strategy. “Infectious Disease—A Global Health Threat,” the report of the Task Force on Emerging Infectious Diseases of the Committee on International Science, Engineering and Technology (CISSET), calls for a coordinated effort within the U.S. government. Approximately 17 issues need to be addressed, including research, training, policy dialogue, and capacity strengthening; and a broad array of activities need to be undertaken, including improved laboratory and diagnostic capability, strengthened communications for surveillance activities, and improved research in anti-microbial resistance. USAID can play a unique role in each of these areas.

3.2 Partner Presentations

Representatives from five USAID partner organizations presented summaries of their global infectious disease work.

3.2.1 WHO: Summary of Dr. David L. Heymann's Presentation

Infectious diseases are the cause of one-third of all deaths in the world; the majority are transmitted through person-to-person contact (see Figures 4 and 5). These diseases seek out the poorest and most vulnerable: women and children. Ease and frequency of travel can spread many of these diseases widely.

WHO's infectious diseases mission is to strengthen national and international capacity for surveillance, prevention, and control through:

- # Integrated surveillance (detection and monitoring)
- # Control of specific diseases and/or syndromes to reduce mortality
- # Containment of anti-microbial resistance
- # Basic and operational research (development of new tools).

Box 2 lists the components of each of the four elements of WHO's infectious diseases mission.

WHO's 50 years of experience in surveillance and control of infectious diseases, its international networks of collaborating centers, and its mandate to develop international consensus norms and standards give WHO a distinct comparative advantage in infectious diseases prevention and control. Other advantages include capacity for immediate response to epidemics, liaison with major international nongovernmental organizations (NGOs), direct access to ministers of health, apolitical global information services, panels of international experts, a broad international presence (country representatives and regional offices), and a range of training programs.

The challenge for WHO and its partners is to maintain sufficient resources in the control of infectious diseases, given the presence of new disease priorities related to smoking and the aging process.

Figure 4:
Infectious Diseases: One-Third of World Deaths Annually

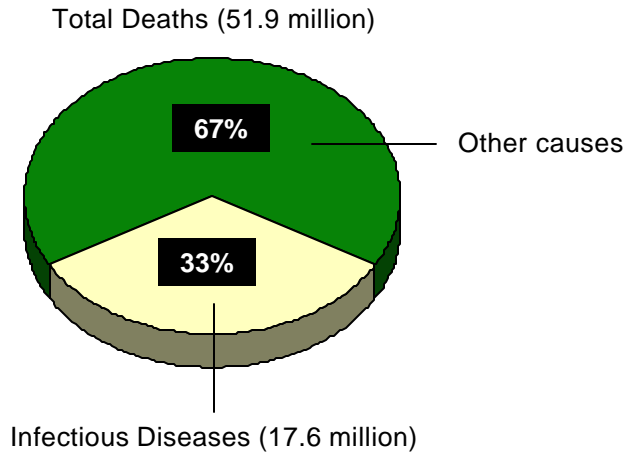
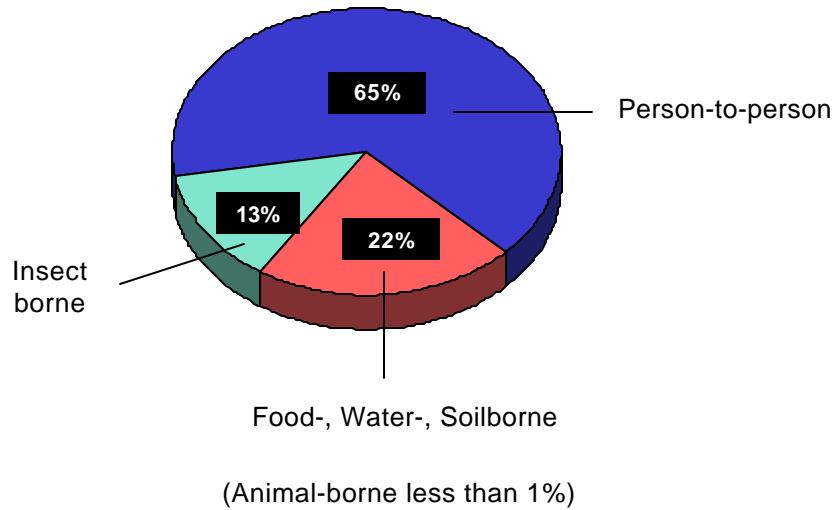


Figure 5
Infectious Diseases: Main Modes of Transmission



Box 2: WHO's Infectious Diseases Approach

Mission	Components
Integrated surveillance	<ul style="list-style-type: none"> # Development of surveillance standards and norms # Provision of global surveillance information and access to global laboratory and disease-detection networks # Assessments of national surveillance systems to assist countries to refocus/prioritize them and ensure their sustainability.
Disease/syndrome control	<ul style="list-style-type: none"> # Tuberculosis prevention and control <ul style="list-style-type: none"> g advocacy/education g disease surveillance/monitoring g basic/operational research (directly observed therapy—DOT—and beyond) g global coordination # Malaria prevention and control <ul style="list-style-type: none"> g early diagnosis and prompt treatment g selective and sustainable preventive measures, including vector control g prevention and control of epidemics g strengthening local capabilities in basic/applied research for regular situation assessment # Integrated Management of Childhood Illness (IMCI) (with UNICEF) <ul style="list-style-type: none"> g interventions in health sector and community to address acute respiratory infections, diarrhea, malaria, measles, and malnutrition g research and program implementation.
Anti-microbial resistance	<ul style="list-style-type: none"> # Situation/public health impact assessment through surveillance, research, and modeling # Identification of the causes of the development and/or spread of anti-microbial resistance # Formulation, application, and evaluation of containment strategies in human, veterinary, and agricultural sectors
Research	

3.2.2 UNICEF: Summary of Dr. Vincent Orinda's Presentation

UNICEF works in collaboration with WHO in the development of strategies for the control of infectious diseases. The UNICEF contribution is made through:

- # Immunization
- # Other programs to improve child survival (control of diarrheal disease and acute respiratory infection)
- # Support to HIV/AIDS programs.

Box 3 lists the components of UNICEF's contributions to infectious disease prevention and control.

Box 3: UNICEF's Infectious Diseases Approach

Strategy	Components
Immunization	<ul style="list-style-type: none"> # Polio eradication # Measles control # Neonatal tetanus elimination # World Summit for Children: mobilizing countries for action
Specific disease control initiatives	<ul style="list-style-type: none"> # Measles in urban areas # Guinea worm eradication # Hemophilus influenza b vaccines
Integrated Management of Childhood Illness (IMCI) # Acute respiratory infections # Control of diarrheal diseases # Measles # Malaria # Malnutrition	<ul style="list-style-type: none"> # Improving case management skills of health workers <ul style="list-style-type: none"> g standard guidelines g pre- and in-service training g follow up # Improving health systems' capacity to deliver IMCI # Improving family and community practices.

Box 4: UNICEF's Links to USAID Strategy

Element of USAID's Infectious Diseases Strategy	Potential UNICEF Contribution
Malaria prevention and control	<ul style="list-style-type: none"> # Scaling up bednet programs # Redipping of bednets # Improved malaria case management in health facilities and at home # Improved access to anti-malarial drugs as part of IMCI # Rational use of drugs/anti-malarials
Anti-microbial resistance	<ul style="list-style-type: none"> # Rational use of drugs through IMCI # Collaboration with WHO in addressing anti-malarial drug resistance/policies
Tuberculosis	<i>[UNICEF has no specific program for tuberculosis, but a few field officers are interested.]</i>
Surveillance	<ul style="list-style-type: none"> # At the country level, support for surveillance focused on polio, guinea worm, malaria, measles # Through IMCI, improvement of community-based monitoring # Nutrition interventions focused on the Triple A approach at the community level (assessment, analysis, action).

In terms of the four elements of USAID’s draft infectious diseases strategy, the potential UNICEF contribution is shown in Box 4.

UNICEF’s comparative advantage in the area of infectious diseases lies in its:

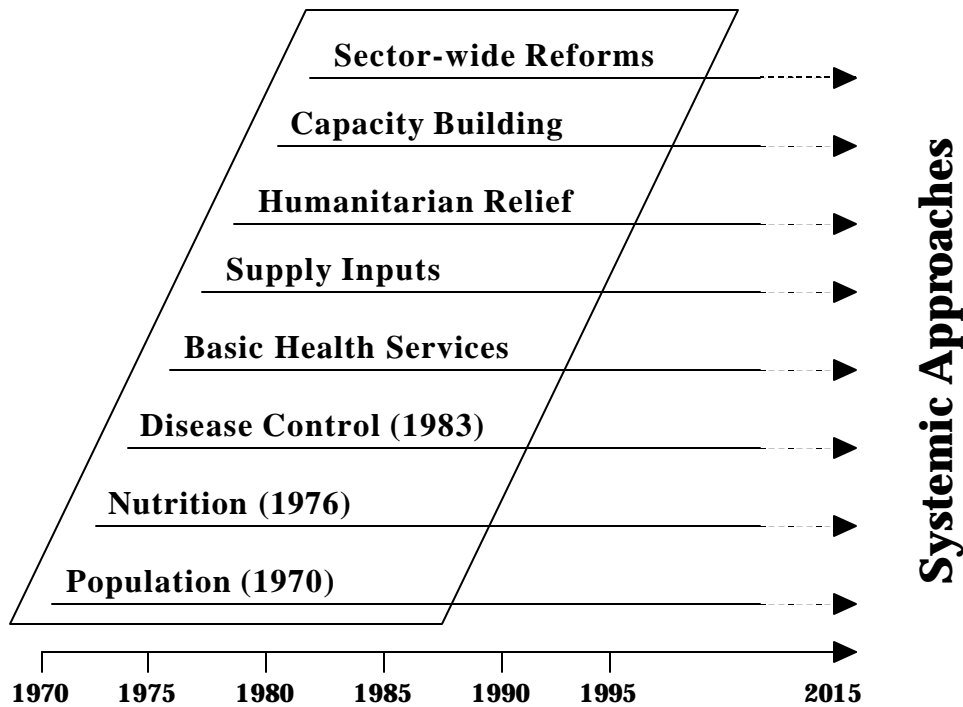
- # Adoption of the “rights” approach (health as a human right)
- # Ability to work with many different sectors
- # Decentralized management
- # Experience in scaling up interventions
- # Experience in situation analysis and strategy development
- # Relatively rapid response, especially in emergency situations
- # Advocacy and social mobilization.

UNICEF’s challenges are to ensure that targeted approaches complement on-going integrated/horizontal approaches, that partnerships and communication/social mobilization essential for scaling up are maintained, and the most vulnerable and difficult to reach are reached.

3.2.3 World Bank: Summary of Ms. Malayah Harper’s Presentation

World Bank lending for health/nutrition/population projects has grown from nothing in 1970 to \$13.5 billion in 1996, with most of the increase in the last few years. Currently 225 health-related projects in 89 countries are funded, with an average of 27 new projects initiated yearly. Figure 6 shows how the major activities of health/nutrition/

Figure 6
World Bank: Main Product Lines
of Health, Nutrition, and Population Projects
Main Product Lines



population projects have changed over the years. The overall World Bank strategy in health has been to link up with global initiatives.

The World Bank is currently the largest financier of tuberculosis control programs, with cumulative commitments of more than \$275 million since 1989. There are Bank-financed projects with a tuberculosis control component in 19 countries: Bangladesh, Cambodia, China, Cote d'Ivoire, Egypt (planned), Haiti, India, Kazakhstan (planned), Kenya, Kyrgyzstan, Madagascar, Morocco, Niger (planned), Romania (planned), Turkmenistan (planned), Uganda, Venezuela (research), Vietnam, and Zimbabwe. There is expanding use of directly observed therapy, short course (DOTS) in various project models. The following agencies provide technical assistance to Bank-financed tuberculosis programs:

- # WHO
- # Royal Netherlands Tuberculosis Association (KNCV)
- # International Union against Tuberculosis and Lung Disease (IUATLD)
- # Pan American Health Organization (PAHO)
- # CDC.

The Bank is interested in developing a program emphasizing malaria and other major diseases. At present, there are only six freestanding malaria projects with total funding of \$200 million. The vast majority are in India. There is only one freestanding program in Africa, with total funding of \$25 million. Given that record, the Bank has decided to put more resources in malaria control. The Bank's malaria "work in progress" has three basic goals: to increase

the number of projects in Africa, to conduct additional research (a two-year research project on the economics of malaria is ongoing), and to launch an African-led and -based malaria program in the year 2000.

3.2.4 CDC: Summary of Dr. Stephen B. Blount's Presentation

CDC has three priorities for international programs:

- # Strengthen surveillance and response capacity—with the focus on priority diseases and anti-microbial resistance. This includes development of national and regional institutions to act as surveillance focal points, distribution of computer programs, electronic postings and updates, and national and regional programs to monitor vector populations.
- # Strengthen prevention and control operations for priority emerging infectious diseases. This includes judicious use of anti-microbials, a strong emphasis on human resources development (also in water supply and sanitation), development of public health leadership and sound public health policy, and development of rapid assessment tools. Program activities are decentralized and brought as close as possible to the community level.
- # Support applied research. This includes refinement of tools and technologies currently in use, the development of novel techniques in laboratory analysis, and the study of immune protection systems in both community and hospital settings.

Box 5 lists the various components of CDC's priorities.

3.2.5 NIH: Summary of Dr. George Curlin's Presentation

Addressing emerging infectious diseases is a national priority for the United States. This responsibility is shared among CISET, a joint effort of 24 discrete U.S. government administrative units, U.S. links to the European Union, and the Asia-Pacific

Box 5: CDC's Infectious Diseases Approach

Priority	Component
Surveillance and response capacity	<ul style="list-style-type: none"> # Enhance or establish national surveillance systems # Establish national and regional training in epidemiology, laboratory, management, and other public health functions # Provide training and support for routine public health laboratory functions # Coordinate with WHO to support national and regional reference laboratories # Facilitate development of national and regional outbreak preparedness and response plans # Help develop national communications capacity # Facilitate international surveillance communications # Support other priority surveillance and response activities.
Prevention and control of emerging infectious diseases	<ul style="list-style-type: none"> # Provide technical and financial assistance to implement prevention and control strategies # Develop human resources for prevention and control of emerging infectious diseases # Strengthen national systems for prevention and control of emerging infectious diseases.
Applied research	<ul style="list-style-type: none"> # Develop and transfer improved diagnostic technologies # Determine the most effective ways to prevent anti-microbial resistance # Investigate protective immunity and develop novel interventions.

Economic Cooperation (APEC) organization's Telecommunications Network for Emerging Infections. NIH's work in emerging infectious diseases is conducted by the National Institute on Allergy and Infectious Diseases (NIAID). This institute conducts research in four areas:

- # Ecologic and environmental factors that influence disease emergence
- # Microbial changes and adaptations that influence disease emergence
- # Human susceptibility to new microbes
- # New and improved control strategies.

NIH is a fundamental research partner in emerging infectious diseases.

Surveillance is the tripwire that identifies the problems, and research seeks to solve them.

Box 6 lists some examples of each of NIAID’s research areas.

From the point of view of NIH, the four areas of concentration in the USAID infectious diseases strategy are very well chosen. Three are linked to NIH priorities: (1) tuberculosis control, (2) malaria, and (3) anti-microbial resistance. NIH plays an active role in a multinational initiative in malaria, with most work in the area of vaccines for control in concert with other interventions. NIH is active in anti-microbial resistance research but not in surveillance. Whatever strategy is finally adopted by USAID should be a mosaic, with many organizations contributing what they do best.

NIH’s International Training and Research Programs to Combat Global Health Threats are carried out by the Fogarty International Center. In 1997, the center began

Box 6: NIH’s Infectious Diseases Approach

Research Area	Examples
Ecology and environment	<ul style="list-style-type: none"> # Lyme borreliosis # Cholera pandemics # Hantavirus pulmonary syndrome.
Microbial changes	<ul style="list-style-type: none"> # <i>E. coli</i> O157.H7 # <i>V. cholerae</i> O139 # Influenza viruses H7N1 (avian) strain # Anti-microbial resistance.
Host susceptibility	<ul style="list-style-type: none"> # Immune suppression # Boost immunity with vaccines # Pathogen orchestration of host immune response to ensure pathogen survival.
New control strategies	<ul style="list-style-type: none"> # New and improved vaccines # New diagnostics # Elimination of reservoir hosts # Block transmission in vectors # Control other infections that boost transmission.

offering courses in emerging infectious diseases. So far there have been 13 programs with participants from 20 countries. The center offers other courses also: environmental and occupational health, population and health, AIDS, and biodiversity and drug discovery.

3.2.6 Discussion of Partner Presentations

Issues raised by participants during the open discussion session following the partner presentations are summarized in Box 7.

Box 7: Discussion Highlights

Absence of acute respiratory infections (ARI) and pneumonia from USAID's strategy. ARI is already an area of focus in USAID's ongoing Child Survival programs. Through this new initiative, however, resistance to drugs used to treat ARI/pneumonia will be an important element of the anti-microbial resistance components.

Relevance of oral rehydration therapy (ORT) model to new strategy. USAID hopes to follow the successful model of ORT, which comprised sound research, broad political consensus, adequate funding, and collaboration of partners.

Unpredictable diseases. USAID's infectious diseases strategy is targeted toward control and prevention of known diseases, not to predicting what the next big disease might be. Predicting the next pandemic is an important issue but is beyond the scope of USAID.

Making an impact. The new funds should be strategically focused to have maximum impact, not spread too widely among ongoing programs. Impact can also be increased with collaboration and integration of efforts.

4. Work Group Discussions and Reports

4.1 Organization of Work Groups

There were two rounds of small work group discussions: four the first day, four the second. The groups summarized their discussions in reports to plenary sessions immediately afterward on both days. Conference organizers had assigned participants beforehand to one of the first-day groups; on the second day, participants chose which group to attend. Each group was assigned a moderator to keep the group on task, a technical presenter who made a brief state-of-the-art presentation, a rapporteur who made the group's report to the plenary sessions, and a recorder who observed and recorded the group's discussion.

This chapter summarizes the groups' technical presentations, discussions, and reports to the plenary.

4.2 First Round of Work Groups: Topics for Discussion

During the first round, the four groups addressed the following topics:

- # Work Group 1: Malaria
- # Work Group 2: Tuberculosis
- # Work Group 3: Anti-Microbial Resistance
- # Work Group 4: Surveillance

All four groups had a common set of tasks or questions:

1. Based on the introductory overview, discuss the overall approach (there may be consensus on this approach from other meetings) for the topic area (i.e.,

global approach to the topic, *not USAID's* or any other organization's specific strategy) for the next 3-5 years, including:

- # Technical focus
 - # Highest priority issues
 - # Geographic focus (i.e., areas where the problem is biggest)
 - # Key intermediaries and partners (i.e., NGOs, central government institutions, local government, communities).
2. Determine which parts of the overall approach are already being adequately addressed by others and where the major gaps or opportunities for synergy are.
 3. Identify outstanding issues/ questions that are fundamental to the achievement of the goals, or to addressing the problem.
 4. Make recommendations on the most important issues for USAID's strategy to focus on within this area.
 5. Agree on the next steps needed to move forward.

4.3 Work Group 1: Malaria

4.3.1 Summary of Technical Presentation by Dr. Tore Godal, WHO

An estimated 300-500 million cases of malaria are reported each year throughout the world. Malaria is ranked seventh in life-years lost. Eighty percent of malarial morbidity and 90% of mortality occurs in Africa. One in four childhood deaths in

Africa is caused by malaria. Death rates due to malaria have remained relatively stable over the past few decades: in 1969, when the world's population was about 3.6 billion, more than 1 million people died each year; in 1993, the world's population was about 5.5 billion, and reported deaths were about 1.5-2.7 million yearly.

WHO's current control strategy focuses on prevention (vector control, administering prophylaxis during pregnancy, promoting use of insecticide-treated bednets, and selective use of insecticides); case management (promoting early effective treatment, integrating malaria treatments in management of childhood illnesses); forecasting, detecting, and controlling epidemics; promoting research and training opportunities for community health workers; and improving surveillance and monitoring of malaria outbreaks.

Numerous problems are encountered in the implementation of control measures:

- # Malaria is common where health systems are weak, particularly in war-torn societies
- # In diagnosis and treatment:
 - g symptoms of malaria and other febrile illnesses overlap
 - g 60-90% of treatments for malaria take place outside the formal health system
 - g less than 50% of people who die sought care at a health facility during their illness
 - g compliance with treatment at health facilities is less than 50%
 - g less than 10% of over-the-counter prescriptions are appropriate.
- # Drug and insecticide resistance is increasing.

Both short- and long-term measures can be recommended.

Short-term:

- # Strengthen national control programs (e.g., improve case management, implement use of insecticide-impregnated bednets, survey drug resistance)
- # Integrate the management of childhood illness
- # Improve fever management strategies at the household level
- # Improve treatment strategies for women in pregnancy and children with severe anemia
- # Exploit health sector reforms to enhance the integrated control of malaria.

Long-term:

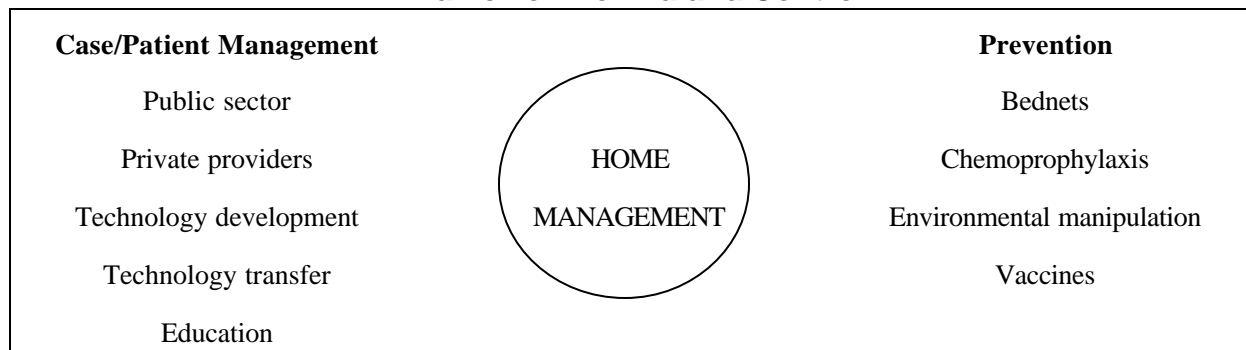
- # Improvement of drugs (including combinations) and drug policies to slow the spread of drug resistance
- # New drugs
- # Malaria vaccines
- # New tools for vector control
- # Methods for rapid mapping of drug resistance and epidemiological types.

Controlling malaria would promote equity between rich and poor people (the economic burden of the disease is much greater on poor people), increase national economic growth (in Rwanda, for example, malaria drains at least 2.5% of the country's gross domestic product), and promote lower birth rates. Priorities for controlling the disease include focusing on children in Africa, improving case management, tackling the issue of drug resistance, and strengthening national control programs. Resistance needs to be mapped, alternative first-line drugs identified, and criteria identified for promoting a switch to alternative drugs. Epidemics are relatively recent phenomena and can be traced to drug resistance and changing living patterns. It has become easier to predict epidemics

through the use of geographic information systems, remote sensing, and other, less-sophisticated prediction methods.

Ensuring optimal use of resources calls for increased collaboration between malaria-related and health-sector-related programs, between public and private sectors, and between bilateral and multinational agencies.

Figure 7
Framework for Malaria Control



4.3.2 Work Group Report

The overall strategy for malaria control consists of five elements:

- # Early diagnosis and treatment
- # Prevention, including vector control
- # Epidemic forecasting and management
- # Local capacity-building and education
- # Research and training.

The framework for understanding the approach is shown in Figure 7.

Issues in malaria control and prevention are listed in Box 8 and discussed below.

IMCI. Malaria control is part of the Integrated Management of Childhood Illnesses (IMCI), an approach which combines treatment and preventive strategies for major diseases in a single

functional package, including nutrition, immunization, vitamin A supplementation, breastfeeding, and hygiene information. Important issues are the sensitivity of diagnosis and the appropriate use of drugs. Management of the patient involves more than administration of drugs; it involves the family, its awareness of the disease, treatment-seeking behavior, and compliance with treatment. Managing malaria within the IMCI framework works in locations where malaria is endemic, particularly in Africa. In

Box 8: Issues: Malaria

- # Incorporation of malaria into IMCI
- # Drug resistance
- # Controversy over use of *in vitro* or *in vivo* parasite resistance mapping
- # Need for new technologies, vaccines, and drugs
- # Prevention
- # Urban malaria.

theory, health workers will prescribe a standard, first-line drug and, if necessary, then prescribe a second-line drug. Malaria control is also part of antenatal care.

In addition to Africa, programs should expand to the Amazon basin and Southeast Asia.

Drug Resistance. Drug resistance must be tackled, alternate first-line drugs must be identified, and criteria for switching to alternative first-line drugs must be identified. *Plasmodium falciparum* resistance to chloro-quine is a major worry on a global scale, but recently, two strains have been found that are also resistant to primaquine. A drug-resistance database would help nations establish national anti-malaria policies. Such a database would also help scientists correlate *in vivo* and *in vitro* research. Health scientists must be encouraged to continue measuring sensitivities of malaria strains to current drugs.

In Vivo vs. In Vitro Resistance Mapping. USAID should support individual countries in their attempts to conduct *in vivo* and *in vitro* research. In addition, polymerase chain reaction (PCR) tests should be a top priority area in resistance research. It is unknown, however, if *in vivo* tests correlate with *in vitro* results.

New Technologies, Drugs, and Vaccines. Research should include *P. vivax* resistance.

Many national governments are not concerned about *P. vivax* resistance: they see their challenge as the control of *P. falciparum*. A critical need exists for solid diagnostic capabilities in clinics and in homes.

Scientists must focus on developing a sensitive, specific, reliable, and inexpensive diagnostic tool for both *P. falciparum* and *P. vivax*. The cost of such a tool is still a barrier, however. USAID is currently working on developing a diagnostic “dipstick” and a strategy for its use in promoting a national drug management plan. USAID could push the development of such tools and devote more resources to train more epidemiologists, laboratory technicians, and clinicians.

In the next five years, USAID will double or triple the amount of money it devotes to research in vaccine development and will develop closer working relationships with research being conducted in the United Kingdom and with UNICEF’s malaria consortium.

Prevention through Bednets.

Information on preventing malaria is mostly based on trials with the use of insecticide-treated bednets in Africa. The number of countries and the scope of bednet use has not yet been determined. USAID sponsored a conference in October 1997 on bednets; participants discussed issues of demand, access, affordability, and monitoring and evaluation of correct use of bednets. WHO has invested a lot of money in bednet research. Efficacy trials are nearly completed, but participants agreed that more research needs to be done and agreed that, in general, large-scale malaria control programs have not provided very good monitoring and evaluation information. Ideally, every family would have bednets, but participants wondered if large-scale programs were sustainable. Trials of bednet use have shown that some questions remain

unanswered; in particular, no one really knows how to implement a large-scale program.

USAID has an advantage in promotion of prevention because of its experience in social marketing, health-care financing, behavior change, and communication.

Urban Malaria. Urban malaria-control programs are generally unfocused. By 2020, more than 50% of Africa's population will reside in urban areas. Malaria control in urban and peri-urban areas needs to be examined.

Research efforts should not be limited to Africa; much research should focus on malaria control in the Amazon basin, drug resistance in Southeast Asia, multi-drug resistance, selective vector control, and emergence of *P. vivax* resistance.

Surveillance. Surveillance methodology should focus on the following issues:

- # Developing standard approaches and procedures
- # Promoting better surveillance methods at national and subnational levels
- # Creating surveillance information that is valuable to data users
- # Building international and national capacities to perform surveillance and data-capturing
- # Fostering networks of information gatherers and users

It is clear that there are good and bad surveillance systems. Unfortunately, malaria surveillance data is very little used. USAID can help build capacity, foster a political commitment for the importance of surveillance work, train data collectors, provide training in logistics, and promote continuing education for workers in malaria surveillance and control.

4.4 Work Group 2: Tuberculosis

4.4.1 Summary of Technical Presentation by Dr. Lee Reichman, New Jersey Medical School

For most diseases, the responsibility for prevention, treatment, and cure rests with the patient; for tuberculosis, however, that responsibility primarily rests with the health care worker and society. Experts have recognized the impending disaster of tuberculosis—both domestically and internationally—for some time. The United States saw a resurgence of tuberculosis during the 1980s, for several reasons:

- # Many national welfare and health programs were dismantled and block grants were set up so that states could administer their own programs. There was a simultaneous decline in public health surveillance in the United States.
- # The growth in the number of cases of human immunodeficiency virus/acquired immune deficiency syndrome (HIV/AIDS) in the 1980s created an enormous increase in tuberculosis prevalence.
- # Homelessness and poverty increased.
- # Increased immigration brought new populations to the United States—many from areas where tuberculosis was and is common.

Addressing tuberculosis overseas is an important factor in controlling tuberculosis in the United States; it is in the U.S. national interest, in the narrowest terms, to tackle tuberculosis worldwide. Key issues in tuberculosis control are listed in Box 9.

Box 9: Tuberculosis: Key Issues

- # Weakened health service delivery systems further weakened by health sector reform
- # Nonadherence to standardized therapy
- # Weak laboratory networks
- # Lack of well-trained personnel
- # HIV/AIDS
- # Multi-drug resistance
- # Need for training and education of personnel and policymakers.

The core elements of traditional tuberculosis programs include:

- # Planning and policy development
- # Identification of clinically active tuberculosis
- # Management of patients with active and suspected tuberculosis and delivery of effective treatment
- # Laboratory and diagnostic services
- # Data collection and analysis
- # Training and education.

The International Union Against Tuberculosis and Lung Disease (IUATLD) “credo” of a good national tuberculosis program includes:

- # Existence of political will to support the program
- # Detection of cases by clinical symptoms and microscopy
- # Initiation of short-course chemotherapy and directly observed treatment for at least the first few months of therapy
- # Ensuring a regular supply of essential anti-tuberculosis drugs
- # Establishment of a registry and reporting system as well as monitoring and evaluating the program.

Directly observed therapy, short course (DOTS) offers many advantages, but

it is not a panacea; it is labor intensive (and thereby costly); requires administrative, management, and case-finding systems that are rarely sustainable over extended periods of time in the places where they are needed most.

WHO has identified tuberculosis as both the most serious and most manageable disease in the world today. It is a global health emergency, but there appears to be little political will to do anything about it. Although new tools are needed, cost-effective strategies are currently capable of controlling and preventing further spread of the epidemic.

The problem is not how to introduce or re-introduce effective and appropriate interventions to diagnose, treat, and control tuberculosis. Rather is it how to ensure appropriate “buy in” and sustained commitment to the areas that need the assistance. Thus, USAID’s involvement in tuberculosis control programs should be an incentive for institutional change rather than a handout. Sustained local support for the control programs must be a high priority.

USAID needs to recognize tuberculosis as a priority:

- # To use and promote the use of the best available tools to control tuberculosis in the developing world
- # To recognize and promote the concept that our tools, although state-of-the-art, are not as effective as they might be
- # To promote strategies to find and validate new tools (such as improved directly observed treatment strategies) and ensure that these strategies and technologies are transferred to the field.

4.4.2 Work Group Report

Tuberculosis is a serious disease with a 50% case fatality rate if untreated. It is unusual in that a good program has a

positive effect on public health, while a bad one is worse than no program at all because it can lead to potentially untreatable drug-resistant strains of tuberculosis. By contrast, a bad ORT (oral rehydration therapy) program, while it does not effectively address the problem, does not make diarrhea worse.

The criteria for effective tuberculosis control programs are given below. These are supported by WHO and IUATLD.

- # They must have adequate political support.
- # Case detection must be a priority.
- # Short-course chemotherapy should be given for all smear-positive pulmonary cases, with direct supervision at least in the initial phase.
- # A regular, uninterrupted supply of drugs must be ensured.
- # A surveillance monitoring and registration system must be established.

Box 10 presents the essential elements of the DOTS strategy.

There are three key strategic options for USAID in tuberculosis control:

- # Focus on the 22 highly endemic countries in which 80% of the tuberculosis cases occur
- # Choose a few countries that (1) have the internal political support to strengthen their tuberculosis control efforts but which lack the resources to train caseworkers and improve laboratory capabilities, or (2) that could become centers of excellence for their control efforts (such strengthening efforts might take 15-20 years).
- # Invest in countries where infrastructure strengthening (better laboratories and surveillance activities) would lead to real, sustainable decreases in tuberculosis case loads.

Ideally, a tuberculosis control strategy and plan should be global in scope; it should be based on an analysis of what works and what does not, and on adequate surveillance that focuses attention on the disease burden

Box 10: Essential Elements of DOTS

Technical elements	<ul style="list-style-type: none"> # Standardized diagnosis # Standardized treatment (DOTS at least for the first two months) # Information management system consisting of a case registry and cohort analysis of treatment outcomes
Logistical elements	<ul style="list-style-type: none"> # Regular supply of anti-tuberculosis drugs # Functioning microscopy network
Operational elements	<ul style="list-style-type: none"> # Availability of trained health workers, volunteers, and other personnel
Political elements	<ul style="list-style-type: none"> # Access to adequate financial and human resources # Political support for the program

(epidemiology being the first step in case management). The intervention of choice is DOTS—done well. Research should be concentrated in centers of excellence and should be aimed at improving interventions and evaluating new tools and techniques.

A global program is currently being developed, and USAID should join in its design process. This meeting, and further programmatic discussions within USAID, can move the global strategy along and may prod USAID to serve as a catalyst or leader of other organizations. Participants noted that recommendations for tuberculosis programs should include 5-10 years of continuous funding.

One participant suggested that USAID work toward a global tuberculosis strategy in conjunction with the European Union, WHO, and other donors. A meeting scheduled for January 1998 in Paris should review what is needed, which donor will provide what resources, and which donors should take responsibility in particular categories.

A WHO representative noted that it would take most countries 70 or 80 years to reach the same levels of tuberculosis treatment and control that are found in the United States and Japan. “Are we talking now about plan-ning for only 10-15 years?”

The representative noted that in one year, WHO spends about \$20 million on tuberculosis treatment, whereas other donors spend \$70-\$100 million. WHO also spends about \$100 million on tuberculosis research; all countries together spend about \$3.5 billion on national tuberculosis programs.

The group did not reach consensus on which existing country programs need strengthening. They suggested a task force to identify topics and countries to work in.

The following ideas were put forth as next steps for USAID (listed in no particular order):

- # Support improved surveillance and emergency response efforts to ensure proper case management
- # Support case management systems which include collection of data, follow up, good laboratory skills and training, and public education
- # Set up three sites that could become centers of excellence.

4.5 Work Group 3: Anti-Microbial Resistance

4.5.1 Summary of Technical Presentation by Dr. Jonathan

Quick, WHO, and Dr. Jonathan Simon, Harvard Institute for International Development

Anti-microbial resistance to drug treatment protocols occurs in the following afflictions, with varying prevalence:

- # Acute respiratory infections (ARI) and bacterial meningitis, where, for example, penicillin resistance is found in 12-55% of all *Streptococcus pneumoniae* infections
- # Diarrhea, where *shigellosis* cases are 10-90+% resistant to ampicillin and 5-95% resistant to trimethoprim/sulfamethoxazole
- # Malaria, where chloroquine resistance is found in 81 of 92 countries
- # Sexually transmitted infections, where *Neisseria gonorrhoeae* is resistant to penicillin in 5-98% of cases
- # Tuberculosis, which shows a 2-40% rate of primary drug resistance.

Changing to second-, third-, and fourth-line drugs is costly; evidence and criteria for switching are critical.

A conceptual framework for anti-microbial resistance should consider four elements: magnitude and trends, causes, containment practices, and interventions. Box 11 provides details about what is necessary under the four headings to contain anti-microbial resistance.

Some factors contributing to anti-microbial resistance are well known:

- # Twenty-five to seventy-five percent of antibiotic use in teaching hospitals is inappropriate, as in multi-microbial treatment for ARIs and diarrhea.
- # Antibiotic injections are still popular.
- # Weekend “prophylaxis” for sexually transmitted diseases is used in some areas.

- # Misuse and overuse of drugs are major contributing factors in the development of resistance, including physician prescribing practices, consumer demand, and patients’ non-compliance.
- # Antibiotics are easy to buy without a prescription in many parts of the world, although studies have shown that implementation of standard treatment guidelines can slow the development of multi-drug resistance (see Figure 8).
- # Global movement of people, food, and other goods brings about the spread of microbial resistance. Resistance patterns vary within and among countries, as evidenced by increased penicillin resistance in *N. gonorrhoeae* in Australia, Japan, Malaysia, Philippines, Singapore, and Vietnam between 1992 and 1995.
- # Use of anti-microbials in food production may be a factor in the development of resistance (see Figure 9). Preventive, clinical, laboratory, and agricultural best practices need to be defined.
- # Optimal treatment regimens that minimize the use of antibiotics but maintain efficacy need to be developed, and rotating use of drugs needs to be explored.
- # Socioeconomic factors must be considered.

Figure 10 shows a pattern of resistance over time in several countries. It illustrates how anti-microbial resistance spreads in uncontrolled environments and points to the urgency of country action sooner than later.

Figure 8
Implementation of Standard Treatment Guidelines
for Tuberculosis (SCC) Slows Development of Resistance

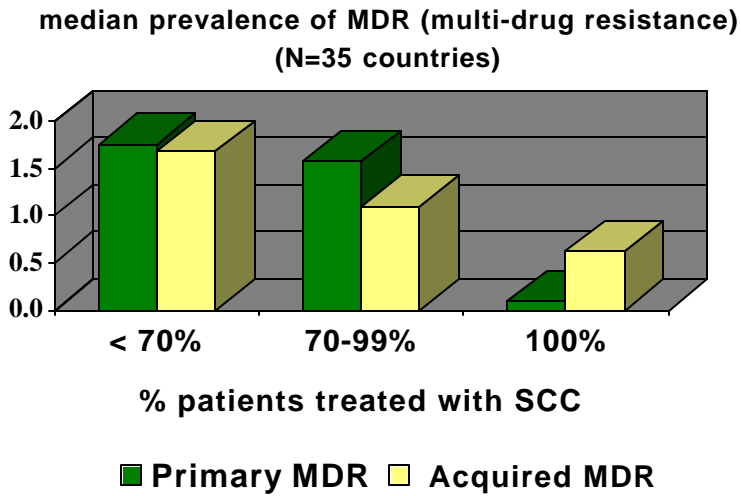


Figure 9
Anti-Microbial Use in Food Production
Is a Growing Threat to Human Health

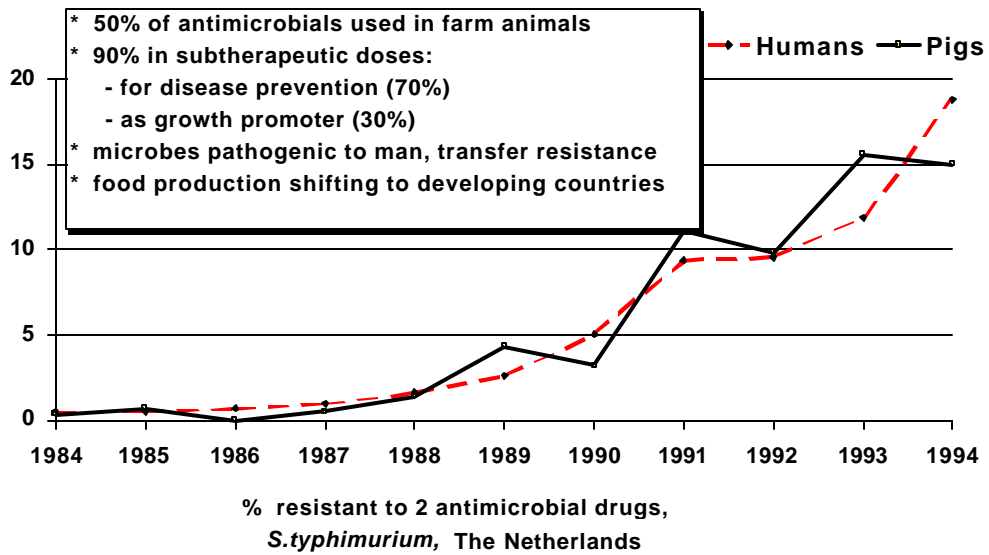
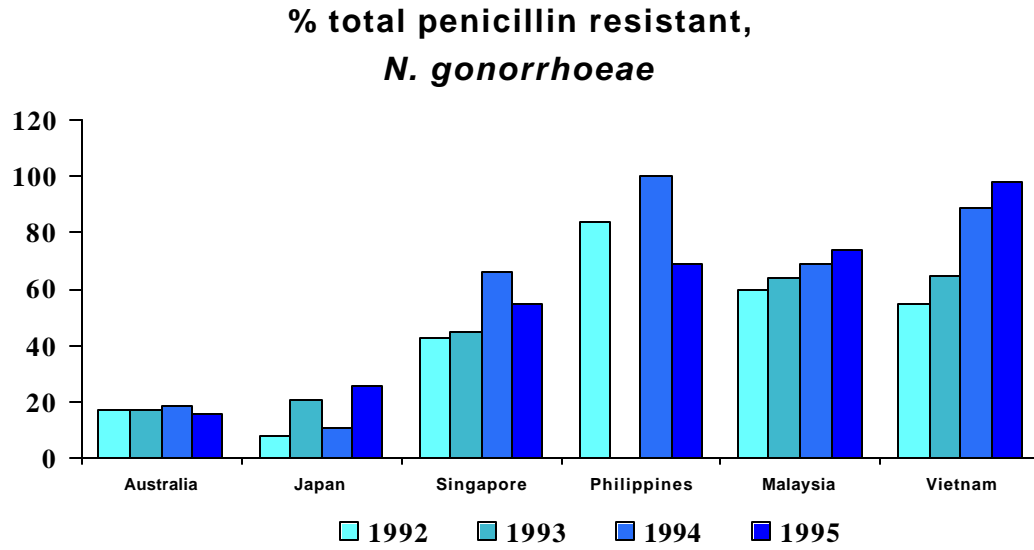


Figure 10
Anti-Microbial Resistance Variations
(Within Countries, Among Countries, and in Rate of Change)



Box 11: A Conceptual Framework for Containment of Anti-Microbial Resistance

Determining magnitude and trends	<ul style="list-style-type: none"> # Surveillance of populations at risk # Levels, rates of change, and spread of resistance # Rural-urban, hospital-community variations # Country-to-country, region-to-region variations # Excess mortality and morbidity attributable to anti-microbial resistance # Economic impact.
Assessing the causes	<ul style="list-style-type: none"> # Therapeutic and biological factors (diagnosis, drug, dose, duration of use, drug quality) # Behavioral factors of health professionals and consumers # Economic and commercial factors (drug costs, market pressures, informal sector) # Health system factors (selection, access, regulation, quality control) # Veterinary, agricultural, aquacultural use/misuse # Contributing factors (population mobility, malnutrition, environmental).
Containment practices	<ul style="list-style-type: none"> # Disease prevention <ul style="list-style-type: none"> g vaccines g infection control # Clinical and laboratory best practices <ul style="list-style-type: none"> g diagnostics—role of laboratories g standard treatment guidelines for anti-microbials g optimal dosing, short-course prescriptions g criteria for switching (laboratory versus clinical) g reservation/rotation of anti-microbials # Veterinary, agricultural, aquacultural practices <ul style="list-style-type: none"> g growth promotion, prophylaxis g agricultural spraying, other uses g aquacultural use in fishing.
Interventions	<ul style="list-style-type: none"> # Global guidelines # National policies, guidelines, programs # Disease prevention to reduce anti-microbial need # Selection, supply, regulation, quality assurance of anti-microbials # Industry policies, practices, monitoring # Training for health professionals in standard treatment guidelines # Community and consumer education # Hospital policies and practices # Programs for veterinary, agricultural control.

Following the technical presentation, work group members outlined key activities of their organizations or partners in anti-microbial resistance (see Box 12). Not all relevant organizations or partners were represented in the group, including the

private for-profit sector, pharmaceutical companies, foundations; developing country researchers, policymakers, program managers, and consumers; other donors; non-health technical specialists from agriculture and veterinary science; and other NGOs.

Box 12: Partner Activities in Anti-Microbial Resistance

Centers for Disease Control and Prevention. CDC works with WHO in developing surveillance methodologies and has written a manual on epidemiological and laboratory methods. Research focuses on the mechanism of resistance—how antibiotics interact with human flora. CDC will publish principles of good antibiotic use in early 1998. CDC maintains more than 30 WHO collaborating centers and has a network of overseas laboratories, including a large one in Kenya that conducts resistance research on malaria, sexually transmitted infections, diarrhea, and other diseases.

National Institutes of Health. NIH carries out basic microbiological research and is working to diagnose resistance in resource-poor areas and in specific locations. NIH does not promote the development of more anti-microbials because it does not want to add to the problem of anti-microbial resistance.

World Health Organization. WHO's Office for the Americas works with governments on legislative issues, regulation, quality control, public-sector supply systems, hospital-level drugs, the role of pharmacists and pharmacies, and education and information. WHO's Drug Action Program focuses on malaria, counterfeit drugs, rational drug use, basic anti-microbial use, and tuberculosis; it has a laboratory technology program with an external quality assessment scheme. WHO's Division of Child Health Development focuses on improving case management guidelines for pneumonia, diarrhea, malaria, and meningitis. CHD's focus is on optimizing anti-microbial use. WHO also focuses on improving laboratory facilities.

United States Pharmacopeia Convention. USP examines drug products, packaging and storage, distribution, and other issues. USP emphasizes information dissemination and creation of nonbiased sources of information for professionals and consumers. It would like to use the internet more effectively and promote a standardized way to present current information. USP also examines rational use of drugs by veterinarians and animal owners. Education is key, training people on how to deal with patients and training students in vet schools. The issue of children and medications is important—young children can be taught the proper use of medicines.

Harvard Institute for International Development. The Applied Research and Child Health (ARCH) project funds activities to reduce microbial overuse in children—to reduce household use of medicines by targeting mothers and caretakers.

International Clinical Epidemiology Network. INCLEN works with interdisciplinary teams from throughout the world to enhance research activity and quality.

Johns Hopkins University. JHU focuses on the magnitude and trends of anti-microbial resistance. It is expanding its work to some INCLEN schools in Egypt, Ethiopia, Tanzania, Kenya, and Zimbabwe on the issue of anti-microbial resistance and is working on vaccine development issues, currently in Bangladesh and perhaps later in India. Another JHU project is a prospective look at resistance in *Haemophilus* species among 3.5 million people where a vaccine may be tested on half of them.

International Network for Rational Use of Drugs. INRUD has four foundations working on anti-microbial resistance. The network works with the IUATLD, military representatives from the United States and other nations, the mass media, and relevant sectors, such as agriculture and the food industry.

4.5.2 Work Group Report

The development of a comprehensive anti-microbial resistance approach is

important in order to coordinate and mobilize global action. Such a global framework or strategy exists for tuberculosis and malaria but does not exist for anti-

microbial resistance. Some guidelines for developing an approach are the following:

- # Gather relevant information for defining a broad approach for research and implementation. Find out:
 - g who is doing what and
 - g what is known and what is unknown in each area of anti-microbial resistance
- # Develop a global anti-microbial resistance strategy and action plan
- # Systematically define priorities: some will be generic, but many will be specific to
 - g a particular organism/drug combination or
 - g an economic/health system type (not geographic)
- # Enable developing country partners to participate fully; this implies development of their infrastructure and capacity.

Other global needs and gaps include the following:

- # Lack of attention to economic and commercial issues at the macro level (for example, the United States exports drugs but does not make a connection between that commercial activity and the development of anti-microbial resistance)
- # Consideration of veterinary, agricultural, and aquacultural use and its contribution to the development of anti-microbial resistance
- # Cost-benefit analyses of drug treatment, e.g., comparison of treatment in settings using second- and third-line drugs with settings in which first-line drugs continue to be used, with second- and third-line drugs reserved only for clinical failures
- # Improved methods for detecting resistance; an assessment of the balance

between lab-based and clinical-based surveillance; definition and role of each

- # Capacity-building to generate quality data and to make the data-collection efforts sustainable, building on infrastructure and human resources already in place
- # Examination and analysis of the attributable causes for emergence of resistance to assist in priority setting
- # Assessment of the effectiveness of regulatory measures in addressing resistance
- # Increased advocacy for and awareness of anti-microbial resistance
- # Use of stratification (typologies) rather than geography to identify targets for different strategies
- # Effective ways to link research to policy and implementation and to bring current knowledge into practice
- # Effective partner collaboration.

New resources should focus on the following diseases (along with malaria and tuberculosis which are covered in the strategy):

- # Pneumonia
- # Diarrhea (*shigellosis, salmonella*)
- # Meningitis
- # Gonorrhoea
- # Nosocomial infections.

For some of these diseases (e.g., gonorrhoea) there are data on resistance and fairly well developed assays for surveillance, while for others (e.g., pneumonia) tool/methodology development is required in order to provide countries with the data they need to make drug policy decisions. USAID should deal with a cluster of diseases when appropriate to promote integration.

Efforts should include activities related to resistance in hospitals and private-sector providers of anti-microbials and

should take into consideration the economic and regulatory aspects of containing anti-microbial resistance. A start should be made in countries that have some basic infrastructure in laboratories and research capacity. Where possible, disease-specific approaches should be integrated.

It is preferable to focus not on “surveillance,” but on “data for decision making.” This approach includes finding effective ways to link research to policy and implementation, to bring current knowledge into practice, and to generate data from surveillance targeted for use at different levels and by various decision makers.

In collecting data, the focus should be on improving the quality of data. Rapid, cheap, and reliable data collection methods are needed, with adequate quality control.

Possible interventions include:

- # Developing unbiased sources of information, using a common language, at all levels, not just within the pharmaceutical industry
- # Reinforcing ongoing activities that contribute to standard case management, education policies, lists, appropriate use of drugs, and preventive interventions
- # Taking action based on what is already known—for example, limiting unnecessary use of antibiotics for common colds and diarrhea
- # Setting research priorities based on what we don’t know—for example, optimal regimens for various anti-microbials.

For USAID, the new resources offer a real opportunity to stimulate a coordinated global effort to contain anti-microbial resistance. However, such an effort will not be achieved simply by distributing the resources among already ongoing activities.

Actions so far have been piecemeal; a more comprehensive approach is needed.

The current USAID strategy is defined in terms of rational (or appropriate) use of drugs; this may need to be further broadened. Also, it must be kept in mind that results are not solutions; too great an emphasis on short-term results will not achieve much for such a deeply complex issue.

USAID and other partners should not operate “linearly” but should implement what is known to work while research is being conducted to provide solutions to what is not known.

USAID has a unique role in capacity-building. Activities selected for the infectious diseases strategy will dictate the type of capacity-building necessary; however, it is certain that capacity-building for detecting resistance, especially at the laboratory level, will be required.

USAID also has a comparative advantage in dealing with the private sector and should articulate a strategy regarding the role of private firms and health delivery systems in drug use and policies. Private-sector employers are concerned about absenteeism due to disease. Pharmaceutical companies are concerned about the impact of shortened drug life on their markets. In many developing countries, much of the prescribing and dispensing is done by the private sector.

Next steps were identified at the end of the discussions:

- # An inventory of activities of partners attending the conference should be compiled.
- # Partners not present at this meeting should be consulted for their input; they include the private for-profit sector, foundations, developing country researchers, policymakers, implementers, and consumers, multilateral donors such as the European Union, the military, mass media, non-health technical and program specialists from agriculture, veterinary science, and

aquaculture, professional organizations, and NGOs.

- # State-of-the-art information should be gathered in an effort to determine what we know and don't know.
- # The USAID strategy and WHO framework should be harmonized.

4.6 Work Group 4: Surveillance

4.6.1 Summary of Technical Presentation by Dr. David Heymann, WHO

Surveillance can be defined as information for action. The “action” may be a change in drugs or it may be a change in the priority that a country gives to a specific disease. In surveillance, data are used to develop information, which in turn is used to make decisions and take action; then further data collection is fed back into the system (see Figure 11).

The WHO six-step framework for surveillance is given in Box 13.

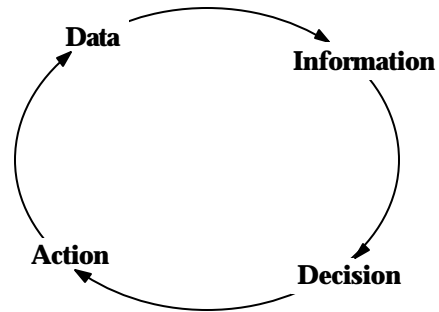
Surveillance *priorities* can be determined by cataloguing (1) the major disease burdens of the country for which there are feasible interventions, (2) diseases with epidemic potential, and (3) diseases of international importance. A fourth consideration could be the emerging diseases. Figure 12 uses three overlapping circles to represent these components and, as an example, lists the diseases that would be considered for sub-Saharan Africa.

Surveillance *objectives* depend on which of the three phases the country is in with regard to the disease: the control phase, the outbreak prevention phase, or the elimination phase. Figure 13 gives possible actions in each phase, using measles as an example.

Box 13: Framework for Surveillance

- # Determine surveillance priorities and objectives
- # Develop standards, methods, and materials
- # Evaluate current system
- # Develop plan of action
- # Implement plan
- # Evaluate progress and performance.

Figure 11: Surveillance Is Information for Action



The second step is to develop surveillance standards, materials, and methods for:

- # Case definition
- # Reporting sites
- # Reporting procedures
- # Specimen collection procedures
- # Investigation/response procedures
- # Performance indicators.

Evaluating the current surveillance system, the third step, consists of reviewing the priorities, objectives, standards, implementation, and performance of field surveillance, data management, and laboratories, as shown in Figure 14. The plan of action uses the information from the evaluation and should focus on remedying weaknesses. The plan might include the following elements:

- # Situation analysis
- # Objectives
- # Strategies
- # Work plan (activities)
- # Measurable outcomes
- # Budget.

Figure 12: Determining Surveillance Priorities
Example: Sub-Saharan Africa

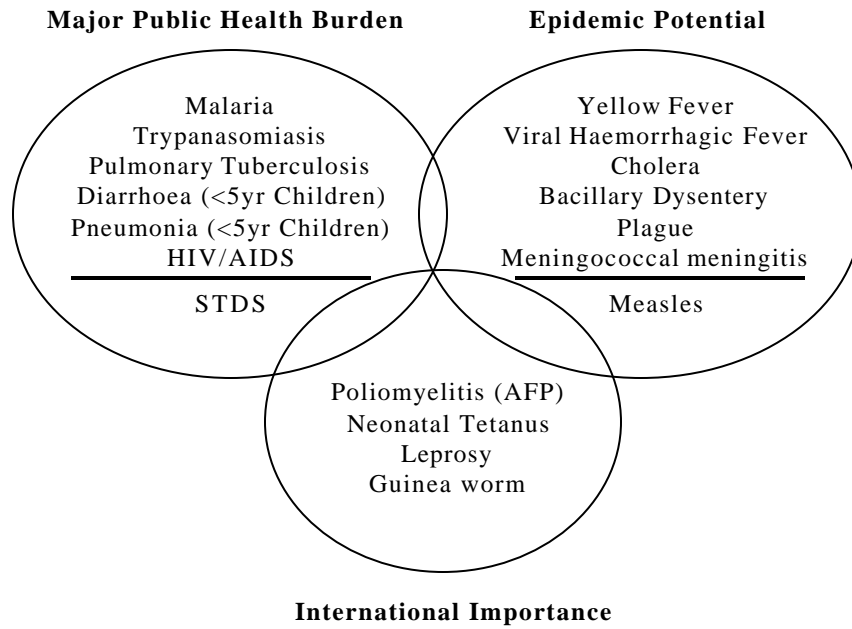


Figure 13: Determining Surveillance Objectives
Example: Measles

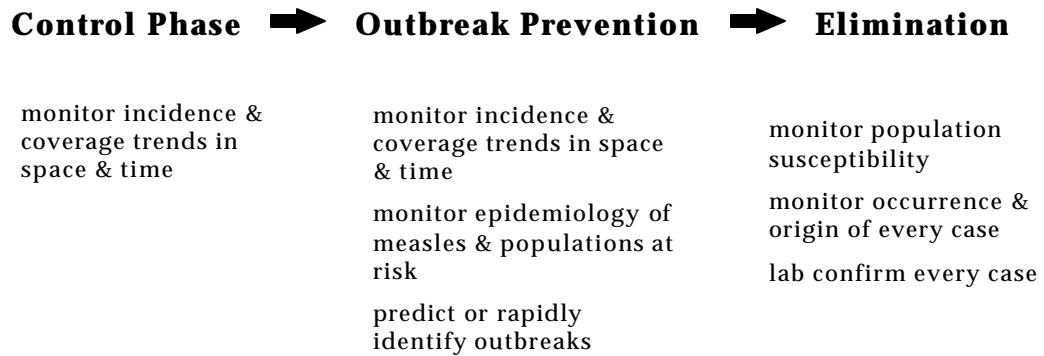
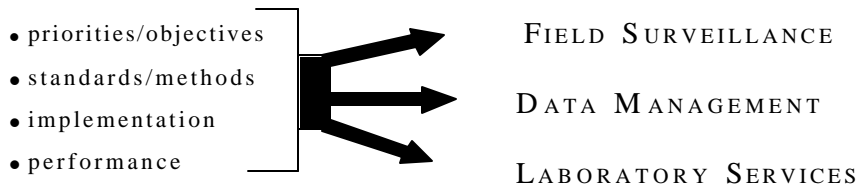


Figure 14: Evaluation of a Surveillance System



The final steps are implementation and evaluation. Implementation requires networking, unified standards, availability of materials and methods, and technical assistance.

4.6.2 Work Group Report

Overall Approach

There are several frameworks for surveillance, with variations from one disease focus to another. However, standard principles and procedures for collecting and analyzing data do exist. WHO has developed a standard tool for assessing country-level surveillance systems. On the basis of such an assessment a country can adjust or refocus its surveillance system to give it what it really needs in terms of information for action.

Good surveillance systems follow several basic principles. They should be simple, flexible, acceptable to the public, sensitive, and predictive; they should collect representative data in a timely manner; and they should follow uniform procedures.

In designing a surveillance system, the first step is to determine what decisions need to be made and who will make them. In other words, the system should be built to meet the needs of decision makers and

national users. One of the key issues in surveillance is that data are often divorced from decision making. Decision makers should be involved in identifying the purpose of the system and decisions about what data are to be collected; to do that they must understand the importance of data and be able to use it. It is important to meet international needs, but if national needs are not met, data will be of poor quality, and the surveillance systems will not be sustainable.

Building capacity at the country level is critical, including training in analyzing and using data, improving laboratory capacity, creating effective feedback loops throughout the system, and developing political and managerial support for surveillance systems. It is at the national and subnational level that USAID should focus its efforts.

Much can be accomplished through networking at the community, national, and international level and between the public and private sectors.

Gaps/USAID Recommendations

USAID should focus primarily on building capacity for surveillance at the local level (national, subnational, and regional). USAID can help with capacity-building at all levels (including the political level for building political

commitment), involving managers in the design of systems and training and monitoring, building feed-back loops throughout the system, educating policymakers on the importance of good data, and providing training on methods of data collection.

- # The most outstanding gap is that there is often limited connection between decision makers and data collection, and data collected in surveillance systems are often not used. Strengthening systems to use data for action should be a priority for USAID.
- # There is often a lack of coordination among donors. Sometimes several different surveillance systems are operating in one country to respond to requests for data from donors. USAID can encourage coordination at the country level to try to reduce different requests for data and consolidate needs.
- # There is a lack of simple, easy to use diagnostics appropriate for field use. USAID could make those that exist available and could support the development of new diagnostics. USAID could also support the development and use of policy dialogue tools to help increase policymaker commitment to appropriate collection and use of data for decision making.
- # Laboratory support is often very weak. USAID can build technical and managerial capacity for labs.
- # There is a shortage of trained epidemiologists and a lack of appreciation for epidemiology among policymakers and program managers. USAID can develop in-country capacity for training epidemiologists as well as for giving policymakers and program managers an introduction to epidemiology.
- # Epidemiologists, laboratory workers, and clinicians do not always work as a

team within countries. USAID can help by involving all groups in the design of

systems and encouraging linkages and partnerships among the different groups.

Next Steps

- # Develop more of a long-term approach, which will eventually lead to the ability to predict when problems will occur.
- # Identify better indicators. This is difficult because donors like to look for population-based results. The goal should be to document incremental improvements.
- # Review what assessment tools and capacity already exist to address gaps.

Conference participants should consult with others in their home institutions on the topics discussed to enrich subsequent meetings, and plans should be made to meet again—perhaps by e-mail or at a meeting piggy-backed onto a WHO consultation or regional meeting.

4.7 Second Round of Work Groups: Topics for Discussion

The topics for the second round of work groups were as follows:

- # Work Group 5: Critical Needs of Public Health Systems in Addressing Infectious Diseases
- # Work Group 6: Linking Infectious Diseases to Child Survival and HIV/AIDS Efforts
- # Work Group 7: Disease-Specific Surveillance Issues
- # Work Group 8: Priority Research Needs

The discussion topics assigned to each group are given at the beginning of the work group report sections below (e.g., Section 4.8.2, “Goal of Discussion”).

4.8 Work Group 5: Critical Needs of Public Health Systems in Addressing Infectious Diseases

4.8.1 Summary of Technical Presentation by Dr. Nils Daulaire, USAID

Figure 15 presents two cycles, the vicious cycle of disease and the virtuous health cycle. In the vicious disease cycle of vector, infectious agent, and host, the latter two reinforce each other. In the virtuous health cycle of provider, client/customer, and intervention, there is continual interaction between the latter two.

A number of key issues must be considered for each component of the health cycle, as shown in Box 14.

Work group members mentioned other topics necessary to create a good public health system:

- # Involvement of both the public and the private sectors (including NGOs)
- # Pluralism
- # Insurance systems (these may be of equal or greater importance than public policy).

4.8.2 Work Group Report

Goal of discussion: Identify explicit, key needs of public health systems based on Day 1 recommendations and identify steps that need to be taken to address the needs.

Health sector reform issues fall into three categories: organization of the health sector, roles of the public versus the private sector, and financing. There are also a number of crosscutting issues: information and behavior change, drug management, laboratory services, and capacity-building.

All must be considered in the context of individual countries; there is no one formula for all places.

The key issues for health sector *organization* are how decentralization of the sector and integration of programs will affect infectious disease programs.

- # Some good tuberculosis programs are being destroyed through integration and decentralization.
- # It is not good to integrate a program that works into one that does not.
- # There are several levels of integration and decentralization: (1) knowledge generation and application, (2) system development and training, (3) monitoring, and (4) service delivery.
- # An integrated system keeps all components intact; for example, in a tuberculosis program, these components would be in place: drugs, a treatment plan, logistics, personnel, information systems, and the like.
- # Integrating programs for multiple infectious diseases is more complicated than working on one disease.

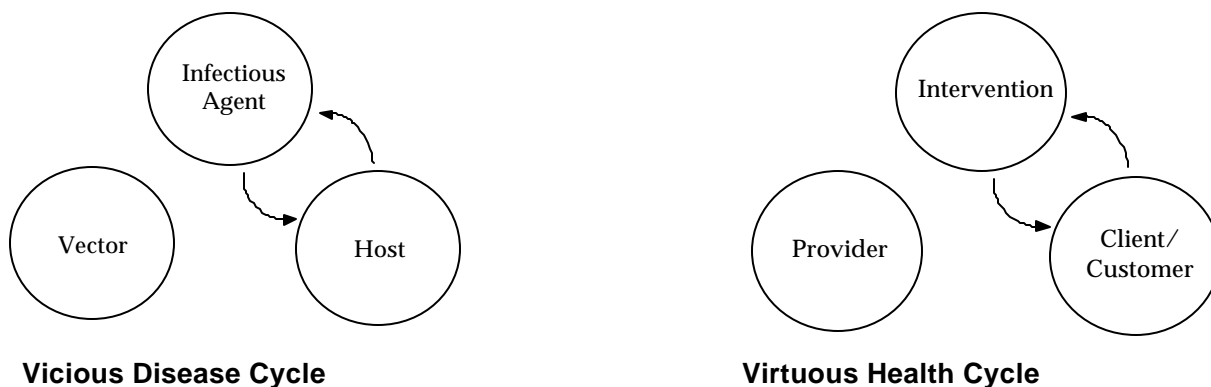
Issues for *public/private roles* are concerned with an evolving situation in which the government role is changing and public health provision is becoming more pluralistic.

- # The mix varies, but the following groups are involved in the provision of public health: governments (public services), insurance companies, NGOs, and the open market.
- # In many places, the government's role is changing from managing and providing to
 - g standard-setting
 - g training and information

g monitoring, enforcement, regulation (in some areas deregulation has led to inappropriate use of drugs).

- # The government must play a dynamic leadership role.
- # The central question is who can do what best in providing both curative and preventive services.
- # A "third sector" might be said to have emerged, alongside the public and private

Figure 15: Vicious and Virtuous Cycles



Box 14: Key Issues in Public Health

Component	Issues
Provider	<p><i>All issues relate to personnel:</i></p> <ul style="list-style-type: none"> # Recruitment and selection of health workers # Initial training # Supportive supervision # Continuous skills improvement # Compensation and recognition.
Client/ customer	<ul style="list-style-type: none"> # Community involvement, i.e., household knowledge and treatment-seeking behavior # Problem recognition: diagnostic techniques # Broad IEC/BCC (information, education and communication and behavior change and communication) # Counseling for individual patients.
Intervention	<ul style="list-style-type: none"> # Research and development # Selection of most appropriate drug or treatment # Procurement system # Logistics, including information systems, inventory, handling bioactive products correctly, etc. # Laboratories # Vector control.
Systemwide	<ul style="list-style-type: none"> # National policies and priorities # A process for planning # Appropriate use of information <ul style="list-style-type: none"> g for monitoring and evaluation g for continuous quality improvement # Financing (a critical issue) # Community and political will (essential for sustainability).

sectors; it consists of NGOs that are providing health services, universities, advocacy groups, and professional associations.

- # There are several different kinds of health environments
 - g public-sector dominant (national health services)
 - g insurance-sector dominant
 - g open market/private sector
 - g NGO-sector dominant.
- # Public commitment to health does not always match the level of development or economic status of a country.

Financing issues include the following:

- # Cost-recovery for provision of health services
- # The need for public financing for infectious disease control (public commitment varies greatly)
 - g the needs must be defined
 - g an effective case must be made
- # The current mix of public/donor/lender financing
- # Management of public resources
 - g best uses versus political uses
 - g accountability
 - g priority-setting
- # Making a sustained impact.

An overarching issue is developing the skills of health leaders. Effective leadership is the key to sustainability and should be a crucial element in USAID's infectious diseases strategy. To be successful advocates for infectious disease programs and to provide the necessary technical leadership, health leaders need the following skills:

- # Advocacy and communications (plus political savvy) for dealing with the government, professionals, and the public—working with the media and

learning how to tell the “story” persuasively

- # Technical leadership in an environment of health sector reform and changes in the roles of ministries of health—networking and process skills
- # Planning for decision making—a basic understanding of epidemiology and an ability to create and use relevant indicators to measure progress
- # Ability to talk finance
- # An appreciation for the roles of values, vision, and equity in public health.

4.9 Work Group 6: Linking Infectious Diseases to Child Survival and HIV/AIDS Efforts

4.9.1 Technical Presentation by Dr. Ronald Waldman, BASICS Project

Since the initiation of USAID's Child Survival program in 1985, there has been a decrease in the number of children dying from infectious diseases, from about 14 million yearly to about 10 or 11 million, representing an absolute reduction in child mortality of about 15%. This is evidence of the success of the “twin engine” approach: promoting the value of early immunization against childhood diseases and the use of oral rehydration therapy for treating diarrheal diseases.

However, childhood infectious diseases are still a major threat; they cause the deaths of 15,000-20,000 children each day and are responsible for 70% of childhood deaths annually. Even though it is important to be aware of the new, or emerging, infections, it is the older, “classic” diseases that kill children: pneumonia (and other upper respiratory infections), malaria, diarrhea, and measles.

Child Survival is still an unfinished agenda. This agenda should not be replaced, but it can be improved upon. Linking together treatment of the major childhood illnesses (malaria, measles, and pneumonia) in caring for children, as is done in IMCI programs, can decrease childhood mortality. Box 15 summarizes the current status of IMCI.

Box 15: Current Status of the Integrated Management of Childhood Illness Approach

Implementation

- # 46 countries have started working on IMCI
- # 24 have initiated adaptation of IMCI guidelines for first-level health workers
- # 11 have completed national guidelines
- # 7 have started training at the district level.

Research and Development

- # Improving health worker skills—ongoing activities
 - g clinical research to refine case management guidelines
 - g preparation of an adaptation guide including case management options and their technical basis
 - g review of guidelines for case management at the referral level by 50 pediatricians
 - g field testing of guidelines on triage and emergency care at the referral level
 - g development of training materials on management of severe malnutrition
 - g trials of preservice training
 - g exploration of options for training community health workers in IMCI.
- # Improving the health system to deliver IMCI—ongoing activities
 - g review of essential drug lists and policies to ensure compatibility with IMCI
 - g design of operational research on the effectiveness and costs of IMCI and other issues, e.g., drug availability, organization of work in health facilities.
- # Improving family and community practices—ongoing activities
 - g development of IMCI messages adapted to local conditions by at least 10 countries
 - g research on community-based interventions to improve care-seeking behavior and child nutrition.

Global Collaboration

- # Collaboration with other WHO programs continues.
- # UNICEF has expressed strong commitment to IMCI, and joint strategy meetings have been held.
- # IMCI is included in a number of World Bank health sector projects.

The HIV/AIDS problem is of a similar magnitude as major childhood illnesses. HIV is the emerging disease in the latter part of the 20th century. There are currently 5.8 million new cases of HIV/AIDS

yearly, with 2.6 million deaths, 95% in developing countries. Estimates are that, by the year 2002 or 2003, the toll from HIV/AIDS will be 4-6 million deaths annually.

Tuberculosis is the cause of 50-60% of HIV-related deaths. Even though the triple-drug combination therapy for tuberculosis is widely accepted and appreciated, it cannot be practically applied in many developing countries. Because drug resistance is expected to increase, increasing case loads of tuberculosis-infected individuals will affect treatment of HIV.

There is growing support for conducting widespread HIV serosurveys and linking such surveys with behavior surveillance and mortality. There is also improved capacity for laboratories to identify HIV subtypes.

Research is being conducted on immune-system response in HIV-infected individuals and those with chronic susceptibility to malaria; that is, chronic infection with malaria seems to predispose one to HIV infection. Widespread use of antibiotics does not seem to be an issue in the HIV-infected population; nor is pneumocystis a common problem in developing countries.

Box 16: Linkages: Infectious Diseases Strategy—Child Survival and HIV/AIDS

Infectious Diseases Strategy	Links to Child Survival and HIV/AIDS
<i>Anti-microbial resistance</i>	# Improved case management of malaria, pneumonia, and tuberculosis in both CS and HIV/AIDS.
<i>Tuberculosis</i>	# Diagnosis of dual infections in HIV/AIDS # Integration of client services: TB and HIV/AIDS.
<i>Health system strengthening</i>	# Laboratories # Logistics/procurement # Surveillance.

<i>Programmatic elements</i>	<ul style="list-style-type: none"> # USAID experience can be tapped with demand creation, planning, training, information/education/communication, behavior change, building community-based structures, strengthening health systems, working with NGOs (with TB, USAID will be starting from scratch) # Research links with CS # Networks/organizations developed by CS at national, district, and community level # Donor coordination.
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4.9.2 Work Group Report

Goal of discussion: Identify programs that can most directly be built on for components of infectious disease strategies and identify any particular issues that need to be addressed.

There are many linkages between ongoing large health programs to promote child survival and control HIV/AIDS and USAID's draft infectious diseases strategy (see Box 16).

In addition to the linkages, there are potential areas of programmatic conflicts. A major question is whether or not USAID's structure will support all the linkages identified. Other potential conflict areas are as follows:

- # Lack of capacity at the local level
- # Poor use of research and poor implementation of research programs
- # Possible diversion of CS programs
- # Demand for decentralization and integration of services: health sector reform.

To minimize these potential conflicts, programs in Child Survival, HIV/AIDS, and infectious diseases should identify common areas where their actions can be mutually reinforcing and synergistic:

- # Epidemic preparedness and response
- # Local capacity-building
- # Seeking out the vulnerable and hard-to-reach
- # Networking and coordination in the field
- # Surveillance.

The last area, surveillance, offers an ideal area for common action, including local-level planning and meetings of surveillance experts in different programs.

Other ways to minimize potential conflicts are to:

- # Operate separate programs but try to improve coordination in the field
- # Find out what partners are doing so that duplication can be avoided
- # Involve local people in planning.

The working group recommended that USAID Health, Population and Nutrition officers be given the opportunity to participate in state-of-the-art courses in infectious diseases control.

4.10 Work Group 7: Bringing Together Disease-Specific Surveillance Issues

4.10.1 Summary of Technical Presentation by Dr. Stanley Foster, Emory University

Some prefer the expression “data for decision-making,” rather than surveillance, but the real goal should be to provide “data for *action*.”

Surveillance systems have been set up in many developing countries, but the data they produce often are no good. To paraphrase Sir Josiah Stamps, government is keen on amassing statistics. Government officials collect them. They raise them to the nth power. They take the cube root and prepare wonderful diagrams. But never forget that every number came in the first place from the village watchman who put down just what he pleased. Today, computers can make unreliable data look legitimate.

What are the rules for data?

- # Each component of a health system has its own unique need for data.
- # Data have to be understood and used, at least to some extent, at the level of collection.
- # Data transmission should be limited to what is needed, used, and fed back into the system.
- # The use of data should justify the time and effort spent in data collection.

What data are needed for action?

- # Household level: recognition of disease, care-seeking, compliance with treatment
- # Community level: availability, accessibility, quality of drugs
- # Health center level: availability of services (for example, vitamin A, immunizations), counseling, treatment
- # District level: standards, guidelines
- # National level: capacity-building
- # Regional level: centers of excellence (tuberculosis, malaria)
- # Global level: basic science, antibiotic resistance, malaria prevention/treatment

Building national capacity to collect and use information is of prime importance.

4.10.2 Work Group Report

Goal of discussion: Ensure that surveillance efforts adequately address surveillance needs for malaria, tuberculosis, and anti-microbial resistance and that separate and duplicative surveillance plans are not part of other components of the USAID strategy.

Surveillance needs can best be met by building a horizontal surveillance system and then inserting disease-specific vertical pieces. For each vertical piece, information needs and users must be defined and methods for collecting data must be identified. Various approaches may be used; there is not one approach but different approaches depending on needs and the stage of development of the system.

Building a system is a staged, long-term process, one that will take 10 to 15 years to complete. A start should be made in areas where the burden of disease is greatest— where the need to take action is more urgent. Some of the first activities are the following:

- # Begin by setting up a sentinel surveillance system
- # Help labs to become reliable and responsive
- # Strengthen what already exists; build on what is there.

The priority investment should be in building capacity through ensuring quality data are available and used by decision makers, developing tools and methods, training, and establishing quality assurance standards.

Clinical and diagnostic tools and methods are needed in both the laboratory and the field. The need is great for simple tests and reagents. USAID is supporting the development of diagnostics for sexually transmitted diseases. That effort could be melded with the infectious diseases strategy. By and large, U.S. businesses are not interested in developing these tools because the technologies are not needed in the United States. Tools should be oriented for use in the field. One result that could be achieved in five years is simple rapid diagnostics for tuberculosis and malaria and anti-microbial resistance profiles.

Training should focus first on basic surveillance functions (detection, collection, analysis-use loop) and later on disease-specific methods. Quality assurance standards should be set for methods, tools, data management, and indicators.

Meaningful data on anti-microbial resistance are lacking, especially for pneumonia. People don't know what the data mean. However, there are interventions aside from changing drugs that can be used against anti-microbial resistance even in the absence of data: education, lowering amounts of drugs given, decreasing drug use, washing hands, etc. Prescribing patterns could be changed; pharmacists could be educated in the problem of anti-microbial

resistance. Education could start even before data are collected.

To assure sustainability, the government must be engaged from the beginning; the surveillance system must be nurtured through continuous training, performance-based supervision, and monitoring; and funds must be allocated to pay for the system—this is especially important for laboratories.

Given the keen interest in this program among members of Congress and others, it is important to think ahead to what senior USAID representatives will have to show to Congress after a year or two of this program. USAID will have to answer for how it has used the money. Has the U.S. public benefited? Have we contributed to the global efforts? To answer these questions, good indicators for what we are trying to do must be developed.

4.11 Work Group 8: Research Priorities

4.11.1 Summary of Technical Presentation by Dr. James Tulloch, WHO

Setting research priorities should be a highly systematic process, although not necessarily a long one. This conference has produced some good ideas which can feed into the process. However, development of good ideas shouldn't be the end of the process.

From a review of the literature, a five-step process of determining research priorities can be derived. These are summarized in Box 17 and discussed below.

- # *Step One:* Calculate the burden of the disease or condition or quantify the

Box 17: Five Steps to Inform Resource Allocation for Health R & D

1. Calculate the burden of the disease or condition
2. Identify the reasons why the disease burden persists
3. Judge the adequacy of the current knowledge base
4. Assess the promise of the R & D effort
5. Assess the adequacy of the current level of effort.

magnitude of the health problem. International health has some clear-cut topics to focus on, such as issues surrounding anti-microbial resistance.

- # *Step Two:* Identify reasons why the disease burden persists. Types of information needed about existing interventions include:
- g efficacy
 - g population currently covered
 - g maximum realistic coverage within a defined cost-effectiveness ratio limit.

Determine what types of research and development are most needed.

- # *Step Three:* Judge the adequacy of the current knowledge base. If step two suggests that new interventions should be developed and evaluated, then an assessment is needed to find out if there is a sufficient knowledge base or if more strategic research is required.

- # *Step Four:* Assess the promise of the proposed R & D effort. Assess the expected cost-effectiveness of the potential intervention compared with existing interventions and the probability of success of the developmental effort: How long will it take? How much will it cost? (Both answers are typically underestimations.) The more solid the information base, the higher the probability of success.

- # *Step Five:* Assess the adequacy of the current level of effort. Given the assessments of steps one to four, is the

current level of funding and activity appropriate?

By going through these five steps for a range of health problems of interest, resources can be allocated based on need and opportunity.

The five steps can be applied for any disease problem or for comparing disease problems to make decisions about investments. While the system has been criticized because the five steps seem prescriptive, it is meant to guide efforts in a systematic fashion, not to dictate a single approach.

4.11.2 Work Group Report

Goal of discussion: Identify priority research needs in tuberculosis, malaria, surveillance, anti-microbial resistance, and other infectious diseases. Identify where other partners support research. Where are the gaps? Make recommendations on the most important research issues to be considered in USAID's strategy.

The consensus of the group was that it was not possible for this conference to identify research priorities for the focus areas of the draft USAID infectious diseases strategy. Experts in each of the strategy's focus areas must provide input, and a systematic process of identifying needs and priorities must be followed. Also, the institutional locus for each area should be

identified. For example, while WHO may be clearly the locus for anti-microbial resistance, identifying a locus for surveillance may be more difficult because it cuts across many organizations' activities.

Given that caveat, a number of specific ideas for research and related activities were discussed:

- # USAID is involved in a large amount of research and has a tremendous track record in such areas as family planning. However, it takes a long time for these research findings to be disseminated. Also, there is a dynamic tension between the desire for short-term results and the need for longer-term or less visible work. With more funds going to the field, there are fewer resources for research in USAID Washington, where most research is funded. An effort might be made to make the field more aware of the need for research.
- # There is a disconnect between effective techniques for research and getting them put in place. It is necessary to get people at the policy level to believe in research, support its application, and advocate on its behalf. It is at the policy level that support for research is lacking, not in the scientific or development community.
- # Whatever USAID does in research within the new infectious diseases initiative must undergo scrutiny on Capitol Hill. Congress will be asking what results have been achieved with the \$50 million. Tangible results from research might be achieved with operational research aimed at solving a particular problem: e.g., how can Botswana solve its tuberculosis problem? USAID was highly successful with oral rehydration therapy and was able to present tangible results on the Hill. The accountability issue is crucial but difficult to resolve for research efforts, which require a heavy

investment in terms of money and time, with slow returns.

- # One possibility would be for USAID to implement a pilot research program in anti-microbial resistance. However, more

than one model is needed. USAID has a project quite similar to the pilot concept: the African Integrated Malaria Initiative, but it must be applied more rigorously. A possible approach would be for USAID to select two diseases—tuberculosis and malaria or pneumonia and diarrhea—and examine how they intersect with anti-microbial resistance and surveillance.

- # A possible approach would be for USAID to establish centers of excellence with quality research activities while also building local capacity.
- # Because the research agenda is fairly well set for malaria and tuberculosis, USAID might focus on anti-microbial resistance.

The process USAID will use to identify which of these, or other ideas, should be implemented must begin with an assessment of what has been done and by whom. Answers should be found for these questions:

- # What is the magnitude of the problem, and why does the disease burden exist?
- # What has been done?
- # What gaps may be identified through a review of the professional literature?
- # What demonstration models exist? How effective are they?
- # Where are partners supporting research (analysis and collection of data)?
- # How can results be disseminated?

The work group put forth the following recommendations for USAID:

- # Define research in the context of the strategy: make it an integral part of USAID operations.
- # Build local capacity for translating research results into policy and practice. Because USAID's focus is operations, it

could stimulate a higher level of productive links between research and policy.

5. Closing Plenary

5.1 Other Infectious Disease Issues

5.1.1 Summary of Technical Presentation by Dr. James Leduc, CDC

Several infectious diseases, aside from tuberculosis and malaria, might be considered for inclusion in the USAID strategy. These are listed below with a few words of explanation.

Dengue and Dengue Hemorrhagic Fever. These are serious diseases, especially in urban areas. Rates of occurrence are increasing dramatically in parts of Latin America and the Horn of Africa. Teaching clinicians to recognize and treat the two diseases could save many lives. There has been a shortfall in the development of a vaccine against both forms of the disease. [Sidenote: a vaccine is readily available for yellow fever, but it is not well distributed.]

Cerebrospinal Meningitis. Epidemiologists are at a watershed in predicting outbreaks of the disease and treating it. Within 10 years, response may be possible before an outbreak occurs instead of reacting afterward.

Influenza. Most laboratories are not able to recognize and identify new influenza strains immediately. The world is currently unprepared to respond to new epidemics.

Acute Respiratory Infections. Many of these infections are now proving to be resistant to traditional antibiotic therapy. As more advances are made in laboratories, scientists may be able to develop strategies to combat these infections.

Diarrheal Diseases. Epidemiologists and laboratory researchers must focus their thinking beyond traditional treatments. Vaccines are under review for application against rotaviruses.

Schistosomiasis. This disease poses a significant threat to health in many parts of the world. If efforts were coordinated, the world could manage the disease.

Other Diseases. CDC maintains ongoing, albeit limited, global research on:

- # Sexually transmitted infections (all forms)
- # Hepatitis (all forms)
- # Plague
- # Leptospirosis
- # Other vector-borne diseases, including Japanese encephalitis, Lyme disease, and Erlichiosis.

Six diseases have the potential for eradication. A strategy for eradicating these diseases is to be discussed at a meeting in February 1998 at the Carter Presidential Center in Atlanta:

- # Polio
- # Lymphatic filariasis
- # Measles
- # Guinea worm
- # Leprosy (Hansen's disease)
- # Hepatitis B.

5.1.2 Summary of Presentation by Dr. Kazem Behbehani, WHO

Lymphatic filariasis is found widely: 120 million people are infected in 73 endemic countries (49% of cases occur in Southeast

Asia, 16% in Western Pacific nations, 34% in Africa).

The strategy for control of this disease is to treat human populations, instead of traditional vector control. Communitywide treatment is recommended, instead of selective treatment of microfilaria.

Several drugs are available for treatment: ivermectin alone or in combination with diethylcarbamazine (DEC) and albendazole. Both ivermectin and albendazole have the added advantage of broad anti-parasite effectiveness.

The disease has the potential for eradication through treatment once a year for four years throughout affected communities.

5.2 General Discussion

Box 18 lists some of the topics raised in the final plenary.

5.3 Summary, Synthesis, and Next Steps: Summary of Presentation by Dr. Nils Daulaire, USAID

Thanks to the work of this meeting, we have achieved broad consensus on the basic thrust of USAID's draft strategy. Moving to flesh out and implement the plan will be a highly intensive process. The first goal is to decide expeditiously where the resources should go this fiscal year. While this meeting was not intended to serve the function of deciding details on how the resources should be allocated, these discussions will be extremely valuable to USAID in making those decisions. While USAID is under time constraints to design a program and to program resources quickly, a hurried plan could be wasteful.

This meeting also reached consensus on some other basic questions. Our

discussions did touch on issues of *emerging diseases*; nevertheless, the broad agenda of *infectious diseases* will remain the focus of the strategy.

If this effort is to be sustainable, the goals, both long-term and short-term, and the indicators must be very clear. The plan should devote most attention to long-term efforts, with some attention to short-term needs.

The initiative will continue to be a collaborative effort among USAID and its partners. Congress will want to know that the partners are building on each others' activities and resources. This meeting confirmed that USAID and its partners can work together.

In general terms, conference participants concluded that

- # All the issues are global in scope and essential for a healthy world.
- # Resources should be focused on a limited number of key strategic efforts.
- # Investments should be a mixture of short-term and long-term efforts.
- # Decisions should be based on research and an established global consensus.
- # The new initiative should tie into existing programs, but only those that are known to work.
- # The successful partnerships demonstrated at the conference should be the foundation for future action.

The summary conclusions for each of the four components of the strategy are given below. These will guide the development of more detailed plans.

Antimicrobial resistance

- # Anti-microbial resistance is a critical issue in which USAID can play a unique role. No organization has taken a leadership role in this area.

- # Pneumonia, infectious diarrheas, tuberculosis, and malaria are the key areas that need attention.
- # A key first step is to determine the extent of the problem and identify which organizations are involved in anti-microbial resistance activities.
- # USAID, along with partners, should determine a research agenda and define operational needs.
- # Programs must assure that drug use is appropriate and should focus on behavior change.

Tuberculosis

- # USAID should support the development of a global strategic plan to control tuberculosis. The disease kills 3 million a year and is clearly a global health emergency.

Box 18: Discussion Highlights: Final Plenary

Eradication Programs

- # Much interest in disease eradication is seen within Congress. Looking at other potentially eradicable diseases is an intellectual exercise at the moment. There is a difference between how politicians (who have to talk to constituents) and technical people look at this topic.
- # USAID has stood firm for development of sustainable health systems. However, there are linkages that can be made between eradication and sustainable development of health systems. Reaching zero incidence should not be the only goal of eradication programs; they should also contribute to strengthening health systems.
- # If we have an opportunity to eradicate a disease, we should take advantage of it to reduce human suffering. For example, the training developed and used in dracunculiasis eradication efforts could be used for other campaigns.
- # The Carter Center meeting scheduled for February 1998 is likely to be attended primarily by those who advocate eradication of diseases. The decision to eradicate a particular disease is too important to be made by a few people. Undertaking a campaign for eradication of a particular disease can siphon money and attention away from controlling viral, parasitic, and communicable diseases and improving nutrition.
- # Only one disease has been eradicated by a vaccine; none through drug therapy. Is it realistic to target six diseases for eradication?

Disruptive Potential of Vaccination/Eradication Programs

- # Vaccination campaigns can be very disruptive of regular health and child survival activities. For example, a special measles immunization campaign would disrupt the process of building health systems: there are opportunity costs to such campaigns.
- # It is impossible to assess benefits and side effects of the polio eradication campaign at this time. We need a serious analysis of this campaign. USAID is looking at the positives and negatives of the polio campaign in conjunction with its partners.
- # Eradication campaigns are disruptive, but they can offer an opportunity for rapid training and improvements in health systems and mobilization of communities.

Education vs. Elimination

The terms “eradication” and “elimination” are being used interchangeably. Eradication is completely wiping out a disease; elimination is reducing the incidence to one case per million. We don’t seem to be able to agree on whether or not eradication is feasible or logical from an economic point of view, but we can agree on acceptable, minimal levels of disease control. In the United States, for example, we haven’t eradicated tuberculosis, but we do agree that an “acceptable” level of control, i.e., elimination, is when no more than one case of TB is reported per million people.

Adding Diseases to the Strategy

- # Senator Leahy said the \$50 million was just the first of what he expects to be yearly allocations. If the strategy addresses anti-microbial resistance and surveillance capacity, over time it will also address other diseases.
- # The discussion has focused solely on high-burden diseases. What about emerging diseases? We must be able to recognize what is “normal” before we discuss what is “abnormal.”
- # A “laundry list” of new diseases should not be added to the discussion.

- # The best treatment is prevention.
- # DOTS is an effective control strategy but not the sole one.
- # Laboratories, trained staff, and an assured supply of drugs are essential.
- # USAID should focus on a few countries where potential for high impact exists.
- # Centers of excellence should be established as a basis for vaccine and other research.
- # USAID should support broad surveillance efforts.

Malaria

- # USAID's malaria strategy should expand linkages to other international efforts.
- # Programs should focus on management of cases in the home and in the community.
- # Prevention efforts should emphasize insecticide-impregnated bednets, environmental management, and vaccine trials.
- # The geographic focus should be broadened from what is now primarily an Africa focus to include the Amazon basin and areas of Southeast Asia.
- # USAID should support the development of low-cost, rapid-diagnostic tools.
- # Behavioral issues, especially as they relate to the development of drug resistance, need particular attention.

Surveillance

- # The strategy should focus on building local capacity to apply internationally accepted principles.
- # Data systems that are designed and used by decision makers and health providers should be supported.
- # The strategy should support efforts to ensure that decisions are based on data and promote the concept of data for action.
- # USAID could support the development of simple diagnostic tools.

- # USAID should work with CDC and WHO to strengthen laboratory capabilities.

The clear consensus of the meeting was that infectious diseases do matter and that USAID's approach is appropriate and its increased involvement welcome.

5.4 Closing Presentation, Administrator J. Brian Atwood, USAID

Administrator Atwood's presentation is given in its entirety.

I want to thank you all for coming—many of you from thousands of miles away—to what I believe is a very important discussion. Thirty years ago, we often used to hear, “If you're not part of the solution, you're part of the problem.” While the circumstances have changed a bit since the sixties, everyone in this room is here because you can be part of the solution and because you are making unique contributions to combating the scourge of infectious diseases.

Certainly we are offered almost daily reminders of the depth of the problems we face. While the leading experts on disease outbreaks gathered for this conference, a new and deadly avian flu appeared in Hong Kong. This underscores the fact that we can't predict when these issues will arise, but we can confidently predict that they will arise. Safety can only come through preparedness. This highlights the importance of your advice in shaping our strategy.

When we look at the numbers affected by infectious diseases in the developing world, and when we consider the suffering and the immense social costs spurred by disease, we know that more has to be done—and soon. On World AIDS Day, I had the dubious pleasure of releasing the findings of a USAID study on AIDS that found that more

than 40 million children—in just the 23 developing nations we looked at—will likely have lost one or both their parents by 2010.

Most of these deaths will be the result of the AIDS epidemic and complicating illnesses. The human and social costs of these numbers are absolutely staggering. But what is even more troubling: this is but one disease of many, and the burdens of any given disease will be exacerbated by all the others.

Pestilence has been with us since the Four Horsemen of the Apocalypse. For as long as we have existed as a species, our closest companions from cradle to grave have been microbes. Some of the most compelling moments of human history turn on our battle against disease. It is small wonder that Typhoid Mary, the Black Death, and scarlet fever have worked their way into the collective consciousness.

In our age-old battle against disease, complacency has always been the greatest threat. As microbes evolve right along beside us, they patiently bide their time, ready to strike down vast numbers when our ability, or willingness, to respond as a society has wavered.

In its seminal 1992 report, the Institute of Medicine issued a wake-up call to the American people about the re-emerging risk of infectious disease. As the report described in detail, the developing world provides an all too fertile breeding ground for disease. The Institute of Medicine highlighted the following dynamics driving this new era in disease:

- # The combination of rapid population growth and equally rapid urbanization is creating more and more areas dense with the critical human mass capable of triggering and sustaining epidemics;
- # Changing patterns of economics and land use are leading to increasing encroachment on rain forest “hot zones” around the world and exposure to new and variant microbes;

- # Booming international travel and commerce now mean any organism on earth is now less than one day away from our own cities;

- # The ability of these same microorganisms to evolve and adapt to the drugs we have developed to fight them over the last half century;

- # And, of course, the breakdown of public health measures needed to fight diseases at their source in the developing world—the kind of trench warfare that had been so very effective in reducing this threat until the last decade.

Fortunately, this report did not fall on deaf ears. Recognizing that the new threats to national security after the end of the Cold War went well beyond traditional military issues, the Clinton Administration tasked its Committee on International Science, Engineering and Technology to study this problem and come up with concrete recommendations. The resulting Presidential Decision Directive on Emerging Infectious Diseases, issued in 1996, has served as the basis for my agency’s development of a draft plan, which you have been discussing—and improving—for the past two days.

Our efforts to combat infectious disease are very much a team effort. Congress deserves praise for its role in this expanded initiative. Senator Leahy, whom we were fortunate to have help open this conference, well understands the growing importance of nontraditional threats to our national security, and it was his vision and leadership that saw to it that there would be resources to back up the words. Similarly, Congressman Sonny Callahan, long a supporter of Child Survival programs, led the House in increasing USAID’s budget in order to address this critical issue. This \$50 million for this fiscal year will give us all some critically needed tools in our common cause.

I want to note that it was largely because of the efforts of these two Congressional leaders that USAID’s appropriated budget this year

reversed its precipitous decline. I congratulate them on their foresight and prudence on behalf of the American people.

Let me turn to the critical work that you have all been carrying out over the past two days. An expanded budget has little value without a thoughtful and meaningful plan based on solid technical analysis and an understanding of the real world. The draft of USAID's Infectious Disease Strategy, which has served as the basis for these discussions, was never envisioned to be the end point, but rather the starting point for discussions with you, our partners in this effort. Your presence here and your active dialogue shows that it has served that purpose admirably.

Your intense efforts over the past two days, which my Senior Health Advisor, Dr. Nils Daulaire, has kept me abreast of, has done a great deal to clarify the path that we should take in incorporating an infectious disease strategy into the core of our development strategy. And just as important, it has identified many of the steps that we must take together, among all of our various institutions with their individual capacities, in order to have the greatest possible impact on infectious diseases worldwide.

With these new insights, we are prepared to work with you to address the issue of microbes that are increasingly resistant to drug treatment, to expand common efforts to control tuberculosis, to fight the expansion of malaria around the globe, and to help set in place a system of disease surveillance that builds the lasting capacities of the countries themselves.

Together we will see to it that outbreaks like the one in Hong Kong today do not go unrecognized. Fortunately, Hong Kong already has a first rate surveillance system. USAID's new infectious disease program will help extend surveillance systems—our critical tripwire in combating disease—throughout the developing world.

USAID staff will begin tomorrow reviewing your recommendations, incorporating your advice, and working with you to enlarge the partnership you have helped establish.

I know that you are all keenly interested in the budget that will come out of this process over the next few months—this has been far from an academic exercise, and \$50 million has a wonderful way to concentrate the mind. But I would be careful in reminding you that we cannot save the world with \$50 million. We will not be able to fully fund every deserving program or research initiative. But this money will make a real difference, and we are committed to using it to maximize its effect.

Your solid judgment and expertise have led you to focus first on what it is we all need to do, where critical gaps exist in programs, and how we need to address those gaps. This is the best basis for deciding how resources can be wisely and well spent, and is consistent with the charge we were given by Senator Leahy at the opening of this meeting.

We all bring to this discussion the strength of our specific perspectives. Represented among you are a broad variety of personal and institutional missions, and each of us would probably describe our challenge somewhat differently.

At USAID, our mission of course is, and will continue to be, sustainable development. We view all our programs and funds through the lens of what they will do to strengthen societies' ability to address their own problems over the long term. Our job is to build America's partners of tomorrow, not to preserve dependency on our largesse, or our expertise. Triage can only be effective in the short term.

We must build the capacity of societies to deal with these issues over the long term, with their own resources and with their own expertise. This is at times a different vantage point from those of you whose mission is to deal with disease,

often one particular disease, and whose first priority is to get the job done as quickly and efficiently as possible. I believe the discussion that has unfolded over the past two days has brought these two vantage points together, so that we are all much closer to being able to envision our battle as it really is: not just an issue of microbes, but one of human societies. Not just of cure, but of fundamental prevention.

As we move over the next months from a strategy to a definite plan, we intend to build on the collaboration that has been established here. I have asked our Office of Health and Nutrition, together with our Policy Bureau and regional geographic bureaus, to continue their consultations with you as the plan for this year's budget is developed. And I have asked Dr. Daulaire to make sure that the process continues to be open and collegial, and to assure that the end product will both fight disease and promote sustainable development.

Let me end with a clear understanding of what all of us have to offer. We at USAID believe that our development expertise provides a critical element to this common effort, but so too does the disease control expertise of the Centers for Disease Control and Prevention, the research expertise of the National Institutes of Health, the global technical expertise of the World Health Organization, and the unique contributions of the other institutions we have invited here. Each of us has resources, both human and financial, that we can mobilize for this important goal. This is an effort far greater than the \$50 million that the Congress has put on the table, and one that will need to be carried on for many years.

The eternal enemies of human health will never rest in their continued efforts to find the chinks in our common armor. We are fortunate to

have the opportunity to strengthen that armor through our joint efforts. Your work here has done a great deal toward this end. I look forward to working closely with all of you and thank you for your insight and dedication.

**Annexes A, B and C
are not available electronically.
Please contact EHP for a copy.**