

**INFECTIOUS DISEASES: A GROWING THREAT TO
AMERICA'S HEALTH AND SECURITY**

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BEFORE THE
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INFECTIOUS DISEASES: A GROWING THREAT TO AMERICA'S HEALTH AND SECURITY

THURSDAY, JUNE 29, 2000

HOUSE OF REPRESENTATIVES,
COMMITTEE ON INTERNATIONAL RELATIONS,
Washington, DC.

The Committee met, pursuant to notice, at 10 a.m. in room 2172, Rayburn House Office Building, Hon. Benjamin A. Gilman (Chairman of the Committee) presiding.

Chairman GILMAN. The Committee will come to order.

During the summer and fall of last year, the West Nile virus, previously unknown in the Western Hemisphere, reached the New York metropolitan area. The outbreak of the West Nile virus in New York claimed seven lives and resulted in 62 cases of encephalitis. The introduction of this previously unknown deadly virus to the United States vividly illustrates that infectious diseases know no borders.

In addition, despite the valiant efforts of the health care community in our Nation, the outbreak of this lethal virus also demonstrates that we must do much more to handle the spread and unforeseen introduction of new viruses in the United States. In simple terms, the West Nile virus outbreak should serve as a wake-up call for our Nation.

Just this past Sunday, a Rochester, New York, man died of bacterial meningitis on a flight from Tel Aviv to New York. New York health authorities are now concerned that other passengers could have been infected with that disease. Clearly, infectious diseases know no borders. The growing number of infectious diseases and their strengths and mutations is both a domestic and international problem of mounting concern, costing a needless loss of life.

What is most regrettable is that most of the world's deadliest diseases can be eradicated or treated inexpensively. For example, every year our Nation spends over \$300 million immunizing our own citizens against polio, a disease that was eliminated in this hemisphere in 1994. These immunizations are necessary because polio has not been eradicated worldwide and could be reintroduced in the United States at any time.

On June 12, the World Health Organization issued a report citing under use of antibiotics in the developing world and their overuse in the developed world as a major contributing factor to the spread of infectious diseases. Because of the improper use and overuse of antibiotics, viruses have developed stronger strains that are increasingly able to overcome standard antibiotics.

Just a few years ago, a number of inexpensive antibiotics proved effective at treating such diseases as tuberculosis. Today the number of effective antibiotics in our arsenal has dwindled because of overuse and, as noted by the World Health Organization, as a consequence, slowly but surely, most infectious diseases are becoming resistant to existing medicines.

What is clear to me is that infectious diseases today threaten the hard won gains of the past 30 years in both health care and life expectancy. Infectious diseases are now the world's biggest killers of children and young adults and account for more than 13 million deaths annually. In the developing world, a staggering one in two deaths is attributable to infectious diseases. The HIV/AIDS pandemic alone has claimed 34 million victims and millions more will lost their battle with the deadly disease.

An incredible statistic reveals the magnitude of this crisis. Twenty percent of the population of South Africa is now infected with HIV. Alarmingly, some routine vaccines cannot be administered to HIV positive people without fatal consequences. Therefore, in addition to the threat that AIDS singularly posts worldwide, the eradication of other infectious diseases might not be possible because vaccines for those diseases cannot be administered to HIV infected victims.

Yesterday, the UNAIDS program and the United Nations reported that the AIDS epidemic is already measurably eroding economic development, educational opportunities, child survival efforts, and in much of sub-Saharan Africa and the Central African Republic. As many teachers die of AIDS as those who retire each year.

Infectious diseases are not just a developing world problem. Unless the spread of infectious diseases is checked throughout the world, scourges such as tuberculosis will reemerge with a vengeance in the industrialized world. In fact, tuberculosis has already reappeared in Greece and Albania, and polio cases have once again been reported in Southeastern Europe. All of these countries had been free of those diseases for many years.

As our witnesses who are with us today will attest to, the spread of infectious diseases worldwide poses a threat to millions of people, including the citizens of our own Nation.

So we thank our witnesses for joining us today and we look forward to their testimony.

I will now call on our Ranking Minority Member, the gentleman from Connecticut, Mr. Gejdenson.

Mr. GEJDENSON. Thank you, Mr. Chairman. I think all of us are stunned, frankly, by the issue that confronts us, not just in the fact that the magnitude is so significant, but that 160 times more people die each year from infectious diseases than in natural disasters. The natural disasters get our attention because they seem so large at the moment, but, overall, these infectious diseases are far more devastating.

The impact economically to the developing world is also devastating. It takes about 20 years of education to create one doctor. But if that doctor contracts AIDS and can only provide services to his country for one-fifth or one-quarter of the time that a doctor might do if he or she lived to their full life expectancy, it means

that the poorest countries in the world often have to expend four and five times the amount of money and effort in educating their doctors.

As you have pointed out, we have seen the West Nile virus arriving in the United States, and apparently surviving the first winter with birds being found still carrying the virus.

We are not going to be able to put a fence around the country, and when we look at the challenge that we face here, if this was a military invasion, if these were soldiers in uniform coming in airplanes and boats, it would be easy to galvanize public opinion and policy makers. These diseases do arrive almost in the same way.

As you mentioned, on that 747 flight from Israel a disease came to this country endangering hundreds of Americans and individuals had to be contacted in seven different countries as a result of that one individual.

The United States spends hundreds of millions of dollars to deal with illnesses like polio, that if we were able to wipe them out worldwide, could save us between a quarter and a third of a billion dollars annually.

The cost of curing diseases that have become drug resistant grows by 10 times or more. Think about diseases that were virtually disappearing, like tuberculosis, where we virtually had no new cases, it was dropping off the charts as an illness. Now we are finding the cases of TB growing, and what is more dangerous, these new resistant cases of TB, instead of costing several thousands of dollars to treat, can cost tens of thousands of dollars and more.

The good news is if we act and make the proper commitment in resources, we will be able to deal with these issues, and often be able to arrest them overseas before they come to the United States.

The hard part is often to galvanize Americans for something that is as hard to recognize as a slow moving disease is abroad. But AIDS and TB are good examples of why it is not just our humane instincts that we have to respond to, it is an instinct for self-survival. When you look at what has happened with AIDS in countries in Africa and elsewhere, when they reach these kinds of numbers, they become the host for a number of other infectious diseases.

So Americans who might have been sitting here thinking I am not going to be using intravenous drugs, I am not going to be involved in sexual activity that might expose me to AIDS, the fact that AIDS is growing is not a danger to me or my family, have been proven wrong. AIDS in the developing world provides a direct threat to Americans. Those individuals are the host for new and more virulent strains of TB and so many other illnesses.

If we don't participate with our other human beings on this planet to challenge, confront, and beat these diseases where they exist, they will come here and they will ravage our own populations. So both for humanitarian reasons and for self-survival reasons, we need to act.

So I commend you, Mr. Chairman, for holding this hearing today, and my colleagues, who I know are seriously committed to putting forth the resources necessary to fight this challenge as if it was an invading army.

Chairman GILMAN. Mr. Burr.

Mr. BURR. Thank you, Mr. Chairman. Just this morning in the AP story in London, it starts out earthquakes and other natural disasters may have captured donations and headlines, but preventable disease killed far more people, 13 million people in 1999, according to a published report Wednesday by the American Red Cross.

Mr. Chairman, I am here to thank you for holding this hearing. By my count, this is the fifth hearing on world health since I have been a Member of this Committee since 1998. All have been important, but, Mr. Chairman, this one is particularly so. It is focused on the threat posed to stability of countries around the world and our own national security by the spread of infectious disease. Broad advances in fighting the spread of disease after World War II led to hopes that the threats from disease was becoming more manageable.

As this January's national intelligence estimate points out and our witnesses will testify today, those hopes may have been misplaced. The optimism of the post-war era led to complacency in many areas and overlooked the impact of increased trade, travel and the emergence of resistant strains.

For the benefit of those that doubt the threat, I should be very clear. While the situation in developing and former communist countries is troubling, we must not overlook the fact that the trend in infectious disease prevalence at home is up as well. Annual deaths in our country from infectious diseases have almost doubled since 1980, and many of these diseases originated outside of the United States and are introduced by businessmen, travelers, immigrants, and our own military personnel who return home.

Infectious diseases do indeed pose a significant threat to our Nation's interests, both at home and abroad, and will continue to pose a threat in the years to come. The NIE paints a grim picture, but I am hopeful our witnesses can provide us with the ammunition in the form of ideas, proposals and opinions needed to tackle some the problems we currently face.

Mr. Chairman, it is evident that our country must remain vigilant and active in the fight against the spread of infectious disease. The stakes are simply too high for us to become indifferent.

In conclusion, I would like to thank our witnesses. I would like to make a special welcome to Dr. Satcher, and I would also like to make a special welcome to Dr. Heymann, who is in fact a graduate of Wake Forest University School of Medicine, we all know the best ACC team in the conference, also my alma mater, Mr. Chairman, and I welcome Dr. Heymann here today. I yield back.

Chairman GILMAN. Thank you very much, Mr. Burr. Mr. Brown, the gentleman from Ohio.

Mr. BROWN. Thank you, Mr. Chairman. Mr. Burr, while Wake Forest may be the best team in the ACC, I would like to welcome Dr. Satcher, who went to Case Western, which is one of the best medical schools in the country.

Last year TB killed more people than any year in world history. It is the greatest infectious killer of adults worldwide. It is the biggest killer of young women. It kills 2 million people per year, one person every 15 seconds. In 1999 there were 8 million new TB cases around the world, 95 percent of them in developing countries.

The WHO estimates that one-third of the world's population is infected with the bacteria that causes tuberculosis, 8 million people develop active TB each year, and 15 million people in the United States are infected. TB is the biggest killer of people with HIV/AIDS. It accounts for one-third of AIDS deaths worldwide and up to 40 percent of AIDS deaths in Asia and in Africa. Eleven million people are currently infected worldwide with TB and HIV.

The good news is that TB treatment is equally effective in HIV positive and HIV negative people. So if we want to improve the health of people with HIV, we must address tuberculosis. Up to 50 million people worldwide may be infected with multi-drug resistant tuberculosis. MDRTB has been identified on every continent. It is particularly high in certain regions and populations, such as Russian and Latvian prisons, where 5 percent of prisoners have active MDRTB. According to the WHO, multi-drug resistant TB only threatens to return TB control to the pre-antibiotic era where no cure for TB was available.

In the United States treatment, normally about \$2,000 per person, skyrockets to as much as \$250,000, as we found out in the early nineties in New York City, \$250,000 per patient to treat MDRTB, and treatment may not even be successful.

The statistics on access to TB treatment worldwide are pretty grim. Fewer than 1 in 5 of those with TB are receiving directly observed treatment short-course, DOTS. Based on World Bank estimates, DOTS treatment is one of the most cost-effective health interventions available, costing as little as \$20 in developing countries to save a life. It can produce cure rates, as we saw in a couple of states in India, up of up to 95 percent, even in the poorest areas.

An effective DOTS program can prevent the development of MDRTB. A recent WHO study in India found in areas where effective TB treatment was implemented, the TB rate fell by 85 percent.

The threat TB poses for Americans derives from the global spread of tuberculosis. Foreign born people account for almost half of TB cases in our country and from the emergence and spread of strains of TB that are multi-drug resistant. MDRTB kills more than half of those infected in the United States and other wealthy nations. It is a virtual death sentence in the developing world.

As you know, the President recently visited India. Before his trip we talked about TB in that nation. India has more TB cases than any other country in the world. Their situation illustrates the urgency of this issue. More than 1,000 people every day die from tuberculosis in India. It has become a major barrier to social and economic development, costing the Indian economy at least \$2 billion a year. TB attacks the poor and TB causes poverty. 300,000 children are forced to leave school each year because their parents have TB and more than 100,000 women with TB are rejected by their families due to social stigma. India has undertaken an aggressive campaign, but they need our help.

In order to control TB in the United States more effectively, it is also necessary to assure the effectiveness of TB control programs worldwide. TB experts estimate it will cost an additional \$1 billion a year to control this disease. We have a very small window of opportunity during which stopping TB would be very cost-effective. The cost of DOTS can be as little, as I said earlier, as \$20 in devel-

oping countries. If we wait or go too slowly, so much drug resistant TB will emerge that it will cost billions to control, with no guarantee of success.

MDRTB is at least 100 times more expensive to cure than non-drug resistant TB. I have introduced H.R. 4057, the Stop TB Act Now, with Representative Morella in an effort to control TB. The bill authorizes \$100 million to USAID for tuberculosis control in high incidence countries, mostly using DOTS, the directly observed treatment short-course. It calls on USAID to collaborate its efforts with the CDC, with the World Health Organization and with the National Institutes of Health and other organizations with specific knowledge of TB.

Gro Brundtland, the Director General of the World Health Organization, has said that TB isn't a medical issue, it is a political issue. Getting Americans engaged, as Mr. Gejdenson said, in an international medical issue like TB, even when addressing TB serves our own best interests, is still an uphill battle. But we have an opportunity here as a Nation and as a society, especially in the wealthy countries, to work with developing countries to save millions of lives now and prevent millions of deaths in the future.

Mr. Chairman, I thank you.

Chairman GILMAN. Thank you, Mr. Brown. The gentlelady from California, Ms. Lee.

Ms. LEE. Thank you, Mr. Chairman. I want to thank you and our Ranking Member for today's hearing to discuss this very important national security issue, which is the spread of infectious disease around the world. I also want to welcome our witnesses and look forward to their testimony.

Health is definitely a national security issue, but it is also an international security issue that is worthy of our close attention. Beyond today's hearing, however, we must really begin to aggressively support a strategic investment in foreign assistance above and beyond what we are currently spending. In addition, this hearing today really does underscore the importance of the direction of our country's foreign policy, whether it be engagement or isolation. It also highlights the need to provide foreign assistance to countries that are in most dire need.

One issue which we all are talking about today and which we all are working on very diligently is the HIV/AIDS crisis in Africa. We are working on the World Bank AIDS Marshall Plan Trust Fund Act, which was moved out of Congress about a month ago, but we are working on this in a bipartisan fashion with Chairman Leach of the Banking Committee and all of our Members of International Relations, to really begin to craft a major investment in the whole HIV/AIDS crisis in sub-Saharan Africa. But \$100 million a year is what we are currently working for 5 years. It is just a drop in the bucket to address this pandemic in Africa. We have a long way to go.

In Africa right now you have heard the statistics. Currently 70 percent of the AIDS deaths worldwide are in sub-Saharan Africa. But as a result of that, the spread of AIDS in Africa has increased economic instability, food and agricultural destabilization and a severe drop in life expectancy rates. Life expectancy has dropped in some countries in Africa from 65 to 40 years of age. More than 13

million children now have lost one or both parents to AIDS, and as of the year 2010 it is projected that there will be 40 million orphans in Africa as a result of the HIV/AIDS crisis and their parents dying of this disease. That is the equivalent of every child in America's public school system.

This health crisis has repercussions that are reverberating far beyond the sick rooms and the hospitals where its victims lie dying. It threatens to destabilize entire societies. So we must do something before it is too late. Earlier this year the President declared HIV/AIDS a national security issue. I think it is an appropriate declaration. But now we must move aggressively to come up with strategies to deal with this. It is only when the United States commits itself to long-term strategic investment do we have a fighting chance to address the spread of HIV and AIDS as well as other infectious diseases around the world. Diseases do not respect international boundaries.

So I want to thank you, Mr. Chairman, again for holding this hearing today, and thank the Committee for all of its hard work and its commitment to really begin to invest in our country's push to address infectious diseases.

Chairman GILMAN. Thank you, Ms. Lee.

The gentleman from New Jersey, Mr. Payne.

Mr. PAYNE. Thank you very much, Mr. Chairman. Let me commend you for calling this very important hearing today on infectious diseases, a growing threat to America's health and security.

Let me also welcome the panelists, in particular our Surgeon General, Dr. Satcher. Just yesterday I was watching you talk about the new breakthrough in treatment for smoking, and I hope that all the smokers heard that.

We certainly appreciate the outstanding work that you are doing.

I also would like to commend my colleague, the gentlewoman from the great State of California, for her initiative that she has been taking in the question of dealing with HIV/AIDS in Africa. Her Subcommittee, with Congresswoman Christensen, that meets on a regular basis to talk about the whole problem of HIV/AIDS in Africa, has really pushed forward the discussion and the debate, and I certainly would like to commend her publicly again for her diligence and the fine work that she has done in that regard.

Let me say to the audience that I do feel that finally this issue has come out of the Dark Ages and into the light in Africa. Several hundred years ago in this country mental health was considered something that should not be discussed, and people would not acknowledge that there were people who suffered from that problem, and as time went on here in the United States we were able to finally deal with mental health as a real health issue.

It seems the same taboo, not only in Africa, but here in the United States, that no one wanted to talk about. It was denial. There was some feeling even from the church that if you followed the Bible you wouldn't get AIDS, and, therefore, if you have it, it is because you deserve it. Those kinds of illogical thinking. I am glad we finally are bringing this subject out and we are talking about the virus, we are talking about what should be done to attack it.

I think the breakthrough of Vice President Gore at the United Nations in January, Africa Month, under the recommendation of the U.N. Ambassador from the United States, Ambassador Holbrooke, where Vice President Gore talked about the fact that HIV virus and AIDS was a national security issue, and for the first time in the United Nations Security Council this issue was raised.

I think that these are positive signs, I think, that the fact that this hearing is being held, that the Banking Committee with Mr. Leach has joined in with Ms. Lee, that others are talking about the fact that we need to have a quantum leap in the education being brought to bear, but also in the funding. I applaud the pharmaceutical companies several months ago in Geneva announcing that they were going to reduce the cost of some pharmaceuticals that are necessary for treatment of the virus. We think it is a first step in the right direction, but we need much more cooperation from the pharmaceutical industries. We need much more appropriations from the U.S. Congress.

So, with that, I would say that we look forward to your testimony, and once again we appreciate the panel for being here.

Chairman GILMAN. Thank you, Mr. Payne.

The gentleman from New York, Mr. Crowley.

Mr. CROWLEY. Thank you, Mr. Chairman. Thank you for calling this important and timely hearing. As a fellow member from New York, I believe you understand that New Yorkers are concerned about the threat of global infectious diseases.

I want to welcome all the witnesses today, including Dr. Satcher, Dr. Heymann, Dr. Gordon, and I see in the audience Dr. Ostrov from the Center for Disease Control as well, someone I had the opportunity and pleasure of working with most recently on West Nile encephalitis. I would also like to thank Ranking Member Gejdensohn for his leadership on this critical issue as well.

As many of you know, in August 1999 my constituents were shocked to learn that an outbreak of West Nile encephalitis had surfaced for the first time in the Western Hemisphere in the heart of my district in Queens and the Bronx. This outbreak was a wake-up call for every American. It illustrates that the global community has truly become the local community.

As demonstrated by West Nile encephalitis, HIV/AIDS and tuberculosis, a disease respects no borders. An outbreak in Africa, Europe, Asia, or South America can travel to United States shores within days. No longer can diseases occurring in far off lands be ignored. They pose a direct threat to the national security of our great country and must be addressed by the U.S. Government, this Congress and the international community as a whole.

Diseases cannot be seized by Customs and they don't apply at the U.S. embassy for a visa. The only way to halt them is to target them at the source. But today we are losing that battle. Thirteen million people die annually from infectious diseases, most of which are preventable or curable. The 21st century faces an estimated 33.5 million people around the world who are infected with HIV/AIDS. The spread of AIDS can be prevented with an urgent and necessary investment. We must stand at the forefront of tackling this disease in order to secure the health and prosperity of future generations.

In April of this year, I visited Africa with UNFPA to examine family planning clinics and HIV/AIDS control efforts in Malawi, a country where the life expectancy is no more than 36 years of age. In Malawi I witnessed the devastating effects of HIV/AIDS firsthand. Everyone I met in Malawi suffered tragedy due to the HIV/AIDS epidemic. In some instances, whole families had been wiped out.

One gentleman told me that every time he had a position open in his business, he had to hire three people, because he knew that within a year, two would either be dead or caring for a sick or dying family member with AIDS.

In sub-Saharan Africa, the AIDS epidemic is dramatically changing the structure of society. Traditional extended families are falling apart forcing children to leave school in order to provide for their families. Poverty is skyrocketing, and a vicious spiral of decline is setting in that further destabilizes already volatile countries.

Because of this danger, the Clinton administration has designated AIDS as a threat to our U.S. national security. Additionally, the United Nations Security Council has held joint meetings with relevant U.N. councils dealing with health and social issues. I commend these efforts, but much more needs to be done.

As many of you know, I have been joined by over 55 of my House colleagues on legislation that I am sponsoring known as the Global Health Act 2000, H.R. 3826. The Global Health Act authorizes \$1 billion in additional resources to improve children's and women's health and nutrition, provide access to voluntary family planning, and combat the spread of infectious diseases, particularly HIV/AIDS. With the funding authorized in the GHA, the United States would make a giant leap forward in promoting access to health care for millions of people around the world. In today's world, no nation is an island. We are all in this together. Failing to make a commitment to global health now will only cost us more in the long run.

Mr. Chairman, in August I will be holding a forum on the interconnectedness of globalization and the spread of infectious diseases. This event is cosponsored by the Global Health Council and is called Infectious Diseases in Your Own Backyard.

Mr. Chairman, given your interest in this topic as well as the danger to New York and Connecticut, I would like to extend an invitation to you and to Ranking Member Gejdenson to join me for this event which will take place in the near future in New York City.

Once again I would like to thank you and Ranking Member Gejdenson for your work on this critical issue. I ask that my full and complete written statement appear in the record.

[The prepared statement of Mr. Crowley appears in the appendix.]

Chairman GILMAN. Without objection. Thank you, Mr. Crowley. We would welcome hearing more about your proposed meeting.

The gentleman from California, Mr. Sherman. Let me interrupt a moment. We are joined today by way of video conference by Dr. Heymann. Dr. Heymann is the Executive Director of Commu-

nicable Diseases of the World Health Organization. He is meeting with us from his offices in Geneva.

Welcome, Dr. Heymann.

Mr. Sherman.

Mr. SHERMAN. Thank you, Mr. Chairman. I want to commend you for holding these hearings. There was a time when we thought of disease as simply a personal matter, but a look at history shows that disease is also something of great international and historic significance. The Dark Ages were perhaps at their darkest when the plague decimated Europe and really cost that continent over a century of development, and today infectious diseases around the world can pose a major threat to the development, peace and security of our country and countries around the world.

We have talked about AIDS in Africa. Not only does that devastate that continent, but the more AIDS suffering people there are in Africa, the more likelihood of a mutation developing on that continent, producing another strain of AIDS which our medicine may not be able to deal with.

We all, the health of every person on this planet, is dependent upon the health of every other person on this planet, and we in the United States should recognize that infectious diseases are not always just something that comes from some other continent and invades the United States.

The overuse of antibiotics in American agriculture may create in cows and in chickens resistant strains of bacteria where we in our practices could be creating the next plague that will affect other continents.

I think historians in the future may wonder why in our defense budget we spend so much defending ourselves from missiles and so little defending ourselves from diseases. Perhaps NIH is the next or the real Pentagon.

We have billions of people on this planet. The more people we have, the more contact, the more international travel, the more chance there is for diseases to develop and to move quickly around the world; and the more we use drugs to combat these diseases, the more likelihood there is of the development of resistant disease strains.

Mr. Chairman, we have looked at many of the national security threats that face America, our allies and the world in hearings before this Committee, but this may be the biggest threat.

Thank you.

Chairman GILMAN. Thank you, Mr. Sherman.

We are now pleased to welcome the distinguished—I am sorry, I have neglected one our Members, Dr. John Cooksey, the gentleman from Louisiana.

Mr. COOKSEY. Thank you, Mr. Chairman. Since it has been a number of years since I finished medical school, I will wait to hear from the non-elected experts this morning and hear their testimony. Thank you, Mr. Chairman.

Chairman GILMAN. Thank you, Dr. Cooksey.

We now welcome the distinguished Dr. David Satcher, the Surgeon General of our Nation, to testify before our Committee this morning.

Dr. Satcher is the 16th Surgeon General of the United States. He has served in that position since early in 1998. Previous to his appointment as Surgeon General, Dr. Satcher served as Director of the Centers for Disease Control. Prior to serving in government, Dr. Satcher was President of Meharry Medical College in Nashville, Tennessee.

Welcome, Dr. Satcher. Please proceed. You may summarize your testimony and place your full statement in the record if you so desire.

STATEMENT OF DAVID SATCHER, M.D., U.S. SURGEON GENERAL, ASSISTANT SECRETARY FOR HEALTH, U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES

Dr. SATCHER. Thank you very much, Chairman Gilman.

Chairman GILMAN. Would you please press the button in the middle of your mike down on the base.

Dr. SATCHER. Thank you very much, Chairman Gilman, and Members of the Committee. I am very pleased to have this opportunity to join you for this very important hearing and am very pleased to appear with my colleagues, Dr. David Heymann from the World Health Organization, and Dr. Gordon.

We are very concerned about the emergence and reemergence of infectious diseases in this country. I should also say that, as you pointed out, I am joined by colleagues from CDC, Dr. Steven Ostrov; from FDA, Dr. Jesse Goodman; and from NIH, Dr. John LaMontagne. We are all very concerned about infectious diseases, and especially the reemergence and emergence of infectious diseases.

We have come a long way in the last century. At the turn of the century, in 1900, infectious diseases were by far the leading causes of death in this country, and we have made dramatic progress in the eradication of smallpox and now the near eradication of polio. With the new antibiotics and immunizations, we have made dramatic progress.

But as we all know, we also became complacent. In fact it was in 1969 that a former Surgeon General appeared before Congress and the concern was more about too much emphasis on infectious diseases and the need to shift more emphasis to chronic diseases. That was certainly true. But in some ways we may have shifted too much, because by the mid-1970's, we were seeing the emergence of many new infectious diseases.

Between 1980 and the end of this century, indeed death rates from infectious diseases in this country increased dramatically, and only a portion of that, maybe one-third or one-fourth, due to HIV/AIDS. Other infectious diseases played a major role.

So we are concerned. As we speak there are many examples. Last year alone, two Boy Scouts acquired malaria while attending a summer Camp in Suffolk County, New York. Last August and September six people in the northeastern United States and a Canadian visiting New York died from West Nile encephalitis, a viral disease transmitted by mosquitoes. The West Nile fever, which is carried by migratory birds, usually from Asia, Africa, and Europe, had never before been reported in the Western Hemisphere.

Also from July 1999 to January 2000, 56 people in south Texas were recognized with Dengue Fever, and at least 17 of those people acquired dengue fever in the United States.

The AIDS epidemic, of course, perhaps needs no further discussion except to say that we are part of this global community where this pandemic is probably the worst that we have seen since the plague of the 14th century or the influenza pandemic of 1918. You have discussed resistant tuberculosis, and we have been very concerned about that in our work at CDC and NIH, as well as FDA. Recently there was an interagency report from these three agencies, a draft report on the management of antimicrobial resistance.

While I want to put this in perspective, I think maybe the best way to do that is to refer back to the Institute of Medicine's report in 1992 in which it was pointed out that there are six major factors involved in the emergence and reemergence of infectious diseases. I think we need to look at them as we think about the future.

One of those factors is changes in human demography and behavior, including growth in population and density, sexual activity, substance abuse, the way we use antibiotics and other drugs, but also advances in technology and industry. The fact that we have the technology, for example, to mass produce foods, such as ground beef, which means that, as somebody pointed out, one patty of hamburger may in fact include beef from 100 different cows. Our technology, which is great, also increases the risk of the spread of infectious diseases in many ways.

Economic development and changes in land use patterns, invasion of the rain forest, all of these things have been factors. Ecological changes, certainly changes in temperature and flooding contributed to the hantavirus outbreak in the Southwest in 1993.

As you pointed out, increases in international travel and commerce are major factors in the spread of infectious diseases. Microbial adaptation and change, as Dr. Josh Lederberg has said many times, we certainly underestimated the intelligence of microorganisms and their ability to mutate and to become resistant to our best drugs.

So the challenge is, of course, for us to change our behavior that often gives advantages to these organisms, but also to continue to produce new and effective drugs.

Finally, the Institute of Medicine pointed out the role of the breakdown in the public health infrastructure. I think we have to be really concerned that we have in fact not maintained a strong public health infrastructure. Many of our State public health laboratories are unable to make some really basic infectious disease diagnosis. We made a lot of progress in the last 4 to 5 years with the leadership of the CDC in strengthening State public health laboratories, working with States, and also the research taking place at NIH and other places, but we still have some major public health challenges.

The other point I want to make relates to the report from the Council on International Science, Engineering and Technology, a Committee which I chaired in 1995 that involved 17 agencies of the government. The charge to that Committee was to look at how we could strengthen our infrastructure to deal with the emerging infectious diseases.

In December 1995, the Committee came out with a report which said that both domestically and globally our infrastructure was inadequate in terms of surveillance, prevention, response to infectious diseases, and recommended a major effort to strengthen this global infrastructure for surveillance and response to emerging infections.

Many things have happened since that report. It led to a Presidential Decision Directive. We now have an interagency task force that is leading an effort in this country to work with our colleagues, following the leadership of the World Health Organization to really develop a global strategy for surveillance and response to emerging infectious diseases. Dr. Heymann certainly will discuss that, and he is playing a very critical leadership role.

Let me say that the challenges continue. There are several models which we have developed, which I will not discuss in detail here except to say that we must continue to invest in these global efforts, whether it relates to the HIV/AIDS initiative, which you have discussed, which certainly requires a global effort. We need to invest heavily. The LIFE program, Leadership and Investment in Fighting an Epidemic, is a great beginning, and we must continue that effort. The malaria initiative, the Roll Back Malaria from WHO, is an initiative that deserves all of our support globally, and we hopefully will continue to support that. The Roll Back TB program, led by WHO, is another one.

So these are some good models. The vaccine initiative, a very strong public-private initiative, the Gates Foundation and others are playing a major role. Many of the pharmaceutical companies are making available drugs needed in other countries at low or no cost. All of these initiatives are critical for us to continue. Partnership, leadership, vigilance is what is needed.

I thank you for the time and will be happy to respond to any questions.

[The prepared statement of Dr. Satcher appears in the appendix.]

Chairman GILMAN. Thank you, Dr. Satcher. I agree that solutions, like problems, have to be global in space and scope. I also agree that international cooperation is vitally necessary to combat and eradicate infectious diseases. To that end, what will our Nation be asking of our allies and our partners at the next G-8 meeting to make certain that a worldwide commitment is going to be made to provide the resources necessary to combat AIDS?

Dr. SATCHER. Mr. Chairman, we will certainly ask that we all continue to support four major efforts: The Roll Back Malaria program, the Stop TB Initiative. TB is responsible for millions of deaths every year in the world, and none of us are safe from it. The HIV/AIDS initiative with the focus on sub-Saharan Africa and increasing in Southeast Asia; the vaccine initiative, which I think is a really critical one. I think all of the nations throughout the world must join in providing resources to make sure that children are immunized all over the world. I think the best way to combat our concern for global emerging infection is to get children immunized against those diseases for which we can immunize. It is also the best way, I believe, to combat the growing antimicrobial resistance of organisms. If children are immunized, then they are not going to get the infections.

Certainly we don't have to worry about the use of antibiotics, but we also have to continue to develop new antibiotics. The Vaccine Initiative is certainly one we are going to ask our global colleagues to support and follow the leadership of the World Health Organization, which is very strong.

Chairman GILMAN. Thank you, Dr. Satcher. The recent outbreak of the West Nile virus in the New York metropolitan region served as a wake-up call for our Nation. The previously unknown viruses can be introduced in our country without too much difficulty but with deadly consequences. What more can we do to prevent that kind of an introduction of virus into our own Nation?

Dr. SATCHER. I think, again, we have got to deal with it from a global perspective. I think we have to make sure that we are part of a global strategy of surveillance and response, that if we detect these viruses early, even before they get to our country, and we control them and contain them there, then we significantly reduce the risk that they will get to this country.

In addition to that, we have to maintain a public health infrastructure in this country that can prevent the spread of viruses, whether they are carried by mosquitoes or in the role of migratory birds, et cetera. We have to have a strong public health infrastructure that detects as early as possible and then a system that allows us to respond in such a way that we stop these viruses in their tracks.

But it has got to be a global response. We have to have laboratories all over the world capable of detecting new infections.

Chairman GILMAN. Dr. Satcher, do we have that kind of response team in our own NIH offices?

Dr. SATCHER. Yes and no. Let me make it very clear. This is an interagency effort. NIH is primarily responsible for research. CDC is responsible for the leadership of the public health system in terms of coordinating the State level response and even making sure that our laboratories at the State and local levels are prepared. Those States and local levels look to the CDC for support whenever there is an issue.

So we have a partnership here among CDC, FDA, and NIH that has to be very strong.

Let me just say I think we have made tremendous progress in developing a public health infrastructure in recent years and strengthening State level laboratories. I think we still have a long ways to go. We have to bring the best technology to bear on this issue, which means very sophisticated communication systems. The DNA fingerprinting, the Pulse Net systems, are making a tremendous difference, but they have to be tied to central systems at CDC and other places.

Chairman GILMAN. Dr. Satcher, how best can our Nation play a leadership role in strengthening our global disease surveillance in response to any outbreak?

Dr. SATCHER. I think we have to make available all our very strong science and technology. I think we ought to be very proud of the leadership that Dr. Heymann is playing and ought to remember that. Not only did he graduate from Wake Forest, but he started at CDC and was sent to WHO from CDC and recently retired from CDC. He has done a tremendous job.

He represents the kind of quality in science we have in this country. I think we have to provide our science and technology as parts of a team and I think we have to make our resources available, whether it is in dealing with the AIDS epidemic in sub-Saharan Africa, I think we have to be able to step up to the plate and do our part, as Vice President Gore said at the United Nations and as Congresswoman Barbara Lee just pointed out. We have to be committed to doing our part in terms of resources, but also making sure we have the partnership. Scientists must come together throughout the world as scientists to fight this battle.

Chairman GILMAN. Thank you, General Satcher.

Mr. Gejdenson.

Mr. GEJDENSON. Thank you, Mr. Chairman.

I was just checking with staff, I was a little confused, all these references to sports, and coming from the State and my district which has the two best basketball teams in all of college at every level, both the UCONN men's and women's, I was confused by discussions of other schools without UCONN being central to the discussion. But I have been informed by my staff that there are other teams at these schools that do play basketball.

Let me just say that your role here is a very critical one. You know, when the warnings on tobacco came out, I think it electrified America and focused us on the challenge, and we are now adding to that cigars beyond cigarettes.

In the national security arena, we have the issue of terrorism, and we have gotten the United States and our global partners to recognize the challenge from international terrorism. Although when you look at the facts, what we confront here, not to diminish any of the others, is far more dangerous to America than terrorism, than tobacco, and I guess I am asking you how you would assess it, is this the major threat to the United States that it appears to be when we look at these facts?

Dr. SATCHER. Let's make sure we agree on the facts. I am not sure I am ready to agree that what we are confronting is more dangerous than tobacco. I won't dwell on that.

Mr. GEJDENSON. Because of the magnitude. Not to diminish tobacco, not to diminish terrorism—but obviously one terrorist attack can kill a lot of people.

Dr. SATCHER. I think this is a very serious problem throughout the world, and I would in no way diminish the significance of infectious diseases. Increasingly, the reason I said what I said, increasingly throughout the world, including developing countries, chronic illnesses are becoming leading causes of death. Four million people died last year in the world due to smoking. We estimate by 2025 it could be up to 10 million, with 70 percent occurring in developing countries. We have to do all of these things at once, unfortunately.

Mr. GEJDENSON. I wasn't trying to defend tobacco.

Dr. SATCHER. I know you weren't. This is a very serious problem and we have to get on top of them. The thing about infectious diseases is, they spread from person to person, either directly or through intermediaries like mosquitoes. That is why we have to be more concerned about them, unlike if you smoke, yourself, or are exposed to environmental tobacco. But many people get infectious diseases because they are spread to other places by other people.

We do have to contain them, and that is what this effort should be.

Mr. GEJDENSON. One of the challenges that faces the Congress and faces the American people worldwide is the issue of intellectual property. Now, the drugs are developed here in the United States, about 45 percent of them, made by American pharmaceutical companies. They need to be profitable, obviously. They need to know when they do the research they are going to make the profits that attract the investors. We in Congress have not given sufficient funding to have the government do the research to create these new drugs. But there is a terrible challenge that occurs here. As we have seen, the drugs are so costly that many in Africa and many in this country can't afford them. We have to deal with that issue. Then it is complicated by oftentimes these illnesses at first appear to be only affecting poor people, and it is very hard to direct private sector funding to do research for illnesses that don't affect people in the developed world. So we have seen for years people dying of things like diarrhea, when we know the cures and we have come up with really inexpensive cures, but it took a very long time to get us to pay attention to that.

I guess my questions would be, one, without undermining the present incredibly productive pharmaceutical industry in this country, how do we make sure we get some of those drugs to people, how do we direct resources to deal with illnesses that don't affect us at first in the West, you know, with good sanitation, with proper medical care available. We seem to think of these as developing world challenges, and it is very hard to attract private sector resources to deal with them.

Dr. SATCHER. Well, these are very critical questions and very difficult. I think the only way that we can deal with the appropriate distribution of drugs throughout the world to protect all of us in this global village, and realizing we are in this village, is that there has to be, I think, a public-private partnership with a commitment to getting drugs to people who need them most.

But we also need a commitment for public health infrastructure. It is one thing to talk about making drugs available. It is another thing to make sure the public health infrastructure is there to appropriately prevent and educate and diagnose early infectious diseases.

I think President Clinton's recent action in terms of making drugs available to people in Africa was very critical, and it recognizes a global crisis. When you have a global crisis, you have to respond in kind. I also believe, however, that we should not underestimate the role that our pharmaceutical companies have played in developing new drugs. Working with the NIH, in many cases building on research at NIH and CDC and other places, our pharmaceutical companies have really done an outstanding job of producing drugs. They have to have an incentive.

At the same time, all together we have to have a public-private partnership that says we have got to recognize that we are part of a global community, a global village, and we have to protect all the people in that village from infectious diseases if we are going to protect the health of the American people. I think that is the attitude that we have to have, and we have to continue to come up

with new strategies. We are, as I speak. I will commend not just the pharmaceutical companies, but foundations, like the Gates Foundation, the Turner Foundation, Robert Wood Johnson, Kaiser, and others that I can name, who are really stepping up to the plate and playing a leadership role in this. The Rockefeller Foundation has been involved in vaccine development. That is what it is going to take.

Mr. GEJDENSON. I thank you. Obviously it will take a lot more discussion than we have time for here, but the issue of the infrastructure, I think the thing that shook me the most in a sense was in many of these countries, if we could get the drugs to the capital city, we still couldn't get them, we still couldn't administer them to the people that need them.

Dr. SATCHER. At the last meeting of the World Health Assembly which I attended, there was a lot of discussion among the African countries about the real challenge of using drugs, if available, in terms of the fact it is so difficult in many cases to make the diagnosis and keep people in systems of care. So our commitment has to be to systems of care, a part of which is making drugs available.

Mr. GEJDENSON. Thank you.

Chairman GILMAN. Thank you.

Mr. Burr.

Mr. BURR. Thank you, Mr. Chairman. I think Mr. Gejdenson hit on the real key in his last statement, and that is the infrastructure is vital. There is no single shot solution, is there, Dr. Satcher?

Dr. SATCHER. No. I think it has to be a public-private solution, and it has to be global in nature.

Mr. BURR. In this country, 2 years ago I think it was, we passed legislation which was the biggest children's health initiative, I think, it was called S-CHIP. We made the resources available, and I am not sure what the percentage were of States who have successfully identified and provided coverage for every child in their State that was available for this program. But it is a very low percentage of States who have actually met the challenge of having the resources and finding in fact—identifying the kids to be covered. So we have our own challenges here, even with the resources, to make sure that those most at risk get the services.

I want to go to the heart of the infrastructure. We learned with the Polio-Plus program that even when governments around the world commit to it, that sometimes it took a private organization to go in, and in this case of Rotary, and to implement the program in a way that could assure us of its effectiveness.

What effect, if any, does what we do here have on overcoming the infrastructure deficiencies that exist in some of these countries?

Dr. SATCHER. I think it has a tremendous effect. I had the opportunity as Director of CDC to work very closely with Rotary International in the polio eradication program. I agree with you, it is one of the best models I have ever seen, and I think it is largely responsible for the progress we have made.

I think we can support the development of public health infrastructures globally. We have our own problems. I would just remind you the report from the World Health Organization last week ranked us number 37 in terms of health system efficiency. So that means that even though we spend more and more per capita, the

efficiency of our health system leaves a lot to be desired. That is why we have got so much trouble on the one hand of implementing CHIP, because as you pointed out, it is probably the most significant advancement in many years in terms of our health system.

We are having a lot of trouble implementing it and getting children enrolled throughout the country. I believe, as you know, we need a universal system of health care, and we ought to move rapidly to that so we can put some of these challenges behind us. So we can help other countries by providing support for public health infrastructures. Again, WHO is providing leadership in terms of that. They just came out with a very important report on health systems and we ought to follow their lead.

Mr. BURR. We are as susceptible as our weakest link in a health care delivery system, and I don't quite hold the optimism that you do that we can have the perfect system that has no flaws. For that reason, we can't continue to, I think, try everything, and I think that is in fact what you have suggested we have to do as it relates to infectious disease globally, we have to do D, all of the above.

Let me ask you specifically as it relates to the HIV/AIDS as a national security threat. I happen to believe that in fact it is. Were you a participant in that process where the President designated HIV/AIDS as that threat?

Dr. SATCHER. Yes, I accompanied Vice President Gore to the United Nations on January 10th where we made our presentation and supported Ambassador Holbrooke and moved toward a declaration of this as a security issue. As you know, this was the first time the Security Council of the U.N. had ever discussed a health issue at the Security Council level.

Mr. BURR. Why limit it to one? You have listed—one disease, HIV/AIDS.

Dr. SATCHER. That is a very good question. I think it is a start, and I think the magnitude of the AIDS pandemic, especially in sub-Saharan Africa, where 24.5 million people have been infected, more than 2 million deaths last year, in places like Zambia we are expecting life expectancy to drop from around 60 to 30-something, and in Zimbabwe from 60 to 40. We haven't seen anything like this in recent years. As I said before, I don't know if we have seen a pandemic of this level ever. Certainly we haven't seen an epidemic since the plague and the pandemic of 1918.

So I do think it stands out and in the magnitude of its impact, especially in sub-Saharan Africa. The same thing could happen in Southeast Asia in a few years if the right measures are not taken. So I think AIDS stands out in the terms of the magnitude of its impacts.

Mr. BURR. I appreciate that answer. I think sometimes our exclusion of others in fact leads us to be complacent on those other diseases and efforts.

One last question as it relates to New York and specifically the outbreak of West Nile.

Could you tell us based upon the infrastructure that we had set up and the process that was in place, and I would think that New York would be one of the better response areas because of the interest there—

Dr. SATCHER. Yes.

Mr. BURR. How did our identification take place and our reaction happen based upon what we had planned if in fact anything like this happened?

Dr. SATCHER. I think it is a mixed picture. I mostly agree with the GAO report. I think there is a lot to be pleased with in terms of the detection, the early detection and communication among members of the Public Health Service, the State, and local, but there were also some major weaknesses in the quality of that response that can be corrected in the future.

So we have a lot to be proud of in terms of the early detection. St. Louis encephalitis, as you know, is very similar in many ways to West Nile fever. That was the first diagnosis. In fact, the response would be about the same in either indication. But I think in terms of what kind of infrastructure does it take to prevent and make sure that that infrastructure is available in communities throughout this country, I still think we have a ways to go.

Mr. BURR. I thank you, Dr. Satcher, and I yield back, Mr. Chairman.

Chairman GILMAN. Thank you, Mr. Burr.

Ms. Lee.

Ms. LEE. Thank you, Mr. Chairman. Dr. Satcher, I believe, and thank you very much for your very clear testimony, and I believe that the Vice President and our U.N. Ambassador and yourself were absolutely correct in sounding the clarion call with regard to the HIV/AIDS crisis in terms of it being a national security threat. It is important that the American people hear you. Now we are beginning to see an understanding as a result of the public awareness that is being raised around the pandemic with regard to HIV/AIDS, and it is important for us in Congress to hear that from the American people.

What is it that you think Congress can do to really move this issue forward so that we can make sure that the resources by the United States are there for combating infectious diseases?

Dr. SATCHER. I think Congress can make sure that our response is consistent with the magnitude of the problem. I don't think it has been yet. I think, as former Congressman Dellums and you and others have pointed out, this is an indication for a major assault on a very dangerous pandemic. Again, I could say more about the security threat, I am sure Dr. Gordon is probably going to talk more about things like that, but when you think about what has happened in sub-Saharan Africa in terms of the impacts on a family, the social systems, the education, the fact that much of the progress made in development over many years is being undermined by this epidemic in sub-Saharan Africa, then it is very clear it is a very real security threat to the world as a whole.

So I believe that Congress should make available the needed resources, and certainly UNAIDS has done a great job of outlining what is needed, with the leadership of Peter Piot. I agree with Dr. Piot in terms of his projection of the need for sub-Saharan Africa. We ought to contribute our share of that.

Ms. LEE. Let me ask you also in terms of the emergence of infectious diseases here in this country that we really haven't seen either before in a long time, such as diphtheria and malaria, the two Boy Scouts which got malaria as a result of a mosquito bite in New

York, is it possible that some of these diseases such as malaria could become a problem here in this country now, or are these very isolated instances and we know how to contain it at that level?

Dr. SATCHER. I think it is possible. I think it is going to require a continuing investment in our public health infrastructure to make sure that it doesn't happen. Dengue fever, would you have thought 5 years ago that we would have 56 cases of dengue fever in Texas, and 17 of them would have been infected within Texas, not people who migrated into Texas? We would have doubted that.

So our failure to participate in a global system, the extent to which we failed, I shouldn't say our failure, because I think in many ways we have provided leadership for developing a global system, but we need to continue to do that, and we also need to continue to invest domestically in strengthening our State and local public health infrastructures. I think that is what is going to prevent this happening.

Ms. LEE. Do you think the public will is here to do that in America?

Dr. SATCHER. I am not sure the public knowledge is there, and that is why this hearing is so important. I think, first of all, the public needs to know the nature of this threat, the fact that this is in fact a global threat and that we are not secure as long as these infectious diseases are moving throughout the world.

So I think the public will probably follow, hopefully, with adequate public education.

Ms. LEE. Thank you.

Mr. BURR [presiding]. The Chair would recognize Dr. Cooksey for purposes of questions.

Mr. COOKSEY. Thank you, Mr. Satcher, Dr. Satcher. It is great to have a physician here. You have very good testimony. It is refreshing to hear from someone other than politicians.

I am going to ask some questions that I—

Dr. SATCHER. Coming from a physician, I am delighted to hear that, a physician-politician.

Mr. COOKSEY. I don't have near the depth of knowledge. You obviously have a great depth of knowledge. Your testimony was very clear and it is very good to have that testimony. There is a little bit, if in fact there is a lot of demagoguery in this body. The other day we had a group of politicians that was going to correct the price of gasoline. I had to leave the meeting, I was afraid I was going to get sick listening to it.

Anyway, question, first, what percentage of the cases of infectious diseases are in sub-Saharan Africa, approximately?

Dr. SATCHER. Between 70 and 80 percent, and certainly I think 83 percent as of December last year were in sub-Saharan Africa.

Mr. COOKSEY. Worldwide you mean?

Dr. SATCHER. Worldwide. We estimate there are probably about 36 million people living today who have been infected, somewhere between 35 and 36 million, and certainly more than 25 million of them are in sub-Saharan Africa. But more than 80 percent of the deaths are occurring in sub-Saharan Africa.

Mr. COOKSEY. What percentage of the world population lives in sub-Saharan Africa, where over 80 percent of the deaths of infectious diseases are?

Dr. SATCHER. It is very small.

Mr. COOKSEY. Is my number 10 percent correct, approximately correct?

Dr. SATCHER. It may even be higher.

Mr. GEJDENSON. I think it is about 400 million. We have a population of about 6 billion. So it is even less than that.

Dr. SATCHER. It is less than 10 percent.

Mr. COOKSEY. So it is a high percentage.

Next question, what medications that are out there to either cure or prevent—incidentally, I took my yellow fever shot yesterday for the first time since 1986, and got a hepatitis shot as well. But what percentage of these medications or specifically what medications for these infectious diseases have been developed in Canada or in Mexico or Europe or Asia or Africa? We had a lot of discussion yesterday on the drug bill for Medicare patients, and I heard a lot of comments by some self-appointed experts. I really consider you a real scholar, so I would like to know from you.

Dr. SATCHER. This scholar is going to have to get back to you, because clearly the United States is the leader in the development of these drugs that we are discussing. Research at NIH of course has been really critical to that, the role of FDA working with industries. FDA regulates the development of drugs by industry and bringing them to market. So I think clearly we are the leaders in that regard. But I won't say what percentage are developed in other places.

Mr. COOKSEY. I don't know that answer either.

Mr. GEJDENSON. If the gentleman will yield, I think it is 45 percent of all new drugs are developed in the United States.

Dr. SATCHER. We are talking specifically about the AIDS drugs. I think it is probably higher.

Mr. COOKSEY. The protease inhibitors, were any of those developed in Europe or Mexico or Africa or Canada?

Dr. SATCHER. Some of the companies are multinational. That is a very good point. We have been talking about global. Some of these companies are now global. We all agree most of them have been developed in the United States, but we also know some of the pharmaceutical companies are not just limited to the United States any more.

Mr. COOKSEY. My concern, and again this should not involve us as physicians, but the economists and the experts here, is that the United States is indeed developing most of these great medications that cure infectious diseases and a lot of other diseases, chronic diseases too, and yet these countries that have socialized health care, like Canada, like Mexico, like Europe, have price controls on their medications, so there is no profit there, and there is no profit made, there is not enough made for them to ever develop, or maybe they just aren't smart enough to develop them in Canada or Mexico or whatever. But I can't think of anything that has been developed. Pasteur, Dr. Pasteur and his wife were instrumental 100 years ago. Who developed smallpox, the British surgeon? Someone here should know that.

Dr. SATCHER. Edward Jenner actually developed the first cow pox used in the vaccine.

Mr. COOKSEY. At times I feel some consideration should be given to telling these countries that if they are going to put price controls on our medications in their countries, they basically are forcing the American people to pay for research and development of all these medications worldwide, and it is unfortunate. Would you agree with that or disagree with that?

Dr. SATCHER. I am going to disagree in part. I want to make it very clear I think some very quality research is being done in many other countries, and I believe the other day when we had the conference on the human genome project, one of the reasons we had the hookup with England, of course, I believe about 30 percent of the people working on that project have been in Great Britain and supported by the Wellcome Trust Fund.

So Canada, there is some outstanding work going on in Canada, some of the recently developed Level 4 laboratories there. So there are some places in the world other than the United States in which really high quality work is going on. The Pasteur Institute is recognized as one of them. It is still a very quality institute.

Mr. COOKSEY. I agree there is important work being done in these countries, but they all have offices and market their products here. They make their profits there and not in the U.K. Thanks you very much. Your testimony has been excellent. I wish we could have you here testifying in front of this Committee every time we have a meeting. It would improve the level of the discussion.

Dr. SATCHER. Thank you very much, Mr. Congressman.

Mr. BURR. The Chair recognizes the gentleman from New Jersey, Mr. Payne, for questions.

Mr. PAYNE. Thank you very much. I have seen a number of the researchers at many of the pharmaceutical companies in New Jersey, and in a lot of instances many of the researchers are not Americans as a matter of fact. They just happen to be here working, just to knock the myth that only Americans can discover things.

Let me just ask a question quickly. The world AIDS organization in Geneva is relatively newly created. What participation does CDC have in it and how do you think they are moving along in their activities?

Dr. SATCHER. UNAIDS is a multi-agency organization that includes WHO, World Bank, UNICEF and several others under the leadership of Dr. Peter Piot.

I think it is moving well. It is a very difficult task they have, and Dr. Heymann is probably going to say more about that, he knows more about it. But we have had a very good working relationship with UNAIDS. We have a lot to do. We know that. But we have a lot of confidence in the leadership of UNAIDS and WHO generally.

By the way, I think the new Director General of WHO, Dr. Brundtland, who we supported, is doing a tremendous job in reorganizing. So I think we are optimistic, but it is a very difficult road ahead.

Mr. PAYNE. Before the AIDS pandemic came about, malaria has always been a big killer in sub-Saharan Africa and Africa in general and Third World countries, but there seemed to have been very little research and move to try to eradicate malaria. Do you

think that the fact that the people that get malaria were in areas where they were impoverished, primarily that there was a lack of an incentive because of the marketplace?

Dr. SATCHER. The issue of eradication of a disease is a difficult one, and I am not sure that I could do it justice here, but let me just say the decision to embark upon the eradication of diseases is based on several factors. When we decided that it was possible, feasible, to eradicate smallpox, it was because of systems that had been developed in many places throughout the world and it was very clear what had to be done, and that some very innovative leadership was needed. I think the same thing is true for polio. Polio affects people all over the world, and it affects people in developing countries disproportionately.

Our attitude in this country in terms of supporting a commitment to eradicating a disease has been if it is feasible to do in the near future working with our colleagues globally, that we should join that effort.

I think there are a lot of issues related to malaria at this point in time in terms of the appropriateness of embarking upon an eradication program. We talk about elimination and eradication. We have eliminated polio in the Western Hemisphere. We haven't had a case now since 1991, the last case in Peru, and not one in this country since 1979. There are a lot of issues here related to malaria, in terms of whether we are ready to embark upon a campaign for eradication. Guinea Worm Disease, which does not even occur in this country—we are all committed to eradicating. We are very close.

So I don't think we have made commitments just because of what happens, whether it happens in this country or in poor countries, because when we have seen the opportunity to eradicate a disease, an infectious disease, for the most part we have historically joined that effort.

Mr. PAYNE. Thank you. I have another two quick questions, and then I will end. One, since we see that malaria is carried by mosquitoes and Lyme disease by ticks, and currently AIDS virus is not transported by mosquitoes, is there any research going on that would determine—of course if indeed mosquitoes could transmit AIDS, then we are in a very serious situation everywhere.

What is the current medical research on that?

Dr. SATCHER. I think there has been research at CDC and perhaps other places too. I think the present position is that there is no evidence that the AIDS virus can be transmitted by mosquitoes. So it is transmitted human to human through sexual intercourse and certainly increasingly IV drug sharing of dirty needles. Those are the major ways, of course, and still mother-to-child is a big factor in sub-Saharan Africa, by the way.

Mr. PAYNE. My second question, and then my last half a statement, the fact that you have mentioned on yesterday about the business of smoking and you also mentioned in your testimony about the impact of smoking and deaths related to that, my concern is that U.S. tobacco companies now are pushing in Third World countries tobacco and smoking, making it glamorous. Is the World Health Organization starting any kind of campaigns to try to educate Third World people about the dangers of smoking?

Dr. SATCHER. Most definitely. That is one of the priorities of WHO, and, again, Dr. Heymann can say more about it. But the leadership of WHO, Dr. Brundtland, has made stopping the spread of tobacco a major part of the WHO. There is a global conference in August that I will participate in Chicago, I believe there is one in China in November that I will join. But we are also moving toward trying to get some kind of world treaty dealing with tobacco that will affect globally this problem and protect people globally. It is not going to be easy and obviously Congress here will play a major role in it.

Mr. PAYNE. Thank you. Let me just conclude by saying that although these statistics on HIV/AIDS are just extraordinary, I do think that finally there is a recognition and that the whole question that it does not exist in many countries now, they are stepping up to the plate. Even in Zimbabwe, President Mugabe and others are saying we have a problem and have to deal with it. So I am optimistic, because I recall my first meetings with President Museveni in Uganda about 10 years ago, he didn't want to discuss it at all, it wasn't a problem, people shouldn't be bothering with it. Then with the conversion that came along 3 or 4 years later, and then with the aggressive education program that Uganda went out with song and dance and everybody getting involved, we have seen the leveling off and probably the decrease in new cases of infection.

So I am optimistic that with this attention being brought, the article in the Washington Post on yesterday, the world focusing on what you are doing, that perhaps the awakening of leaders to protect, particularly in sub-Saharan Africa, to say we really have a problem and we need some help, the education part may come about, and I think we may see a leveling off and perhaps then the decrease.

Dr. SATCHER. I hope you are right. I think there is some basis for optimism. Uganda, Senegal and others have demonstrated that it can be done. So we do have some models. We work very closely with Uganda over the last 10 to 15 years. But this is a very serious pandemic. Nobody should for a minute underestimate the potential of this pandemic. We have got to get very serious globally about stopping it now.

Mr. PAYNE. Thank you.

Mr. BURR. The gentleman's time has expired. Do any other Members seek time?

Dr. Satcher, we once again thank you for not only your willingness to come and testify in front of this Committee, but also your willingness to share with us just how big the challenge is for us, not only internationally, but domestically, and that we can't fall asleep and that there is no single solution. This requires the coordination of many efforts, including that public-private partnership. For that we are grateful for your message today.

Dr. SATCHER. Thank you, Mr. Chairman.

Mr. BURR. You are welcome. The Committee is now joined via video conferencing, by Dr. David Heymann, Executive Director, Communicable Diseases, for the World Health Organization. Dr. Heymann has held this post for a number of years and has served at the World Health Organization since 1989. Prior to joining the World Health Organization, Dr. Heymann spent 13 years working

as a medical researcher in sub-Saharan Africa. Therefore, Dr. Heymann actually is acquainted with the challenges of infectious disease in the developing world.

We welcome you, Dr. Heymann, your testimony today from the Headquarters of the World Health Organization in Geneva, Switzerland. It is also good to have another Demon Deacon here in this hearing.

Dr. Heymann, we now recognize you for the purposes of any opening statement you would like to make.

STATEMENT OF DAVID L. HEYMANN, M.D., EXECUTIVE DIRECTOR, COMMUNICABLE DISEASES, WORLD HEALTH ORGANIZATION (via video-conference)

Dr. HEYMANN. Thank you, Mr. Chairman.

Congressman Gejdenson and Members, as many of you have indicated, infectious diseases are the world's biggest killer of young people in developing countries. In fact, they represent 13 million deaths each year, one of every two deaths in developing countries. You can see on the right of this pie diagram those diseases: AIDS, malaria, TB, diarrhea, measles and acute respiratory diseases or pneumonia. As Dr. Satcher has indicated, sub-Saharan Africa is where the majority of the AIDS deaths occur. The remaining infectious diseases and their deaths are spread throughout the world, so that in Southeast Asia, based on sheer population, one-third of all the infectious diseases deaths are occurring.

These are diseases of the poor in both industrialized and developing countries, and they also interfere with economic growth, globalization and international security.

Infectious diseases impede our development efforts. They keep children away from school and they keep adults from working for a living. This graph shows that adults infected with malaria are incapacitated and unable to work for an average of 2 days in a country such as Nigeria, and an average of 6 days in Sudan. Malaria in children prevents their mothers from working in the fields because they must tend to a sick child, and this often occurs during the rainy season when they should be planting or harvesting.

[Text of the overhead review graphs mentioned appears in the appendix.]

Infectious diseases are one of the major reasons why poor people remain poor.

On the next overhead, as shown in this center box, a recent study from Harvard has indicated that Africa's GDP would be up to \$100 billion greater this year if malaria had been controlled. This extra \$100 billion would be nearly five times greater than all development aid provided to Africa last year.

Other infections, such as cholera and plague, also cost countries money, often because of trade barriers and decreased tourism. Periodic food recalls because of infection can cost millions of dollars, as in the case of mad cow disease in the U.K., or the recall of hamburger and fruits that has often occurred in the United States.

The global spread of diseases occurs quickly. As shown in this map, international travel has increased from 27 percent in Europe to 44 percent in Africa. In 1 year's time, drug resistant TB has

been imported to Germany and Denmark and there has been an increase of 50 percent in resistant tuberculosis in these countries.

Disease, as has been said by many of the Members and by Dr. Satcher, does not respect national boundaries. In 1991 in Peru, a ship carrying contaminated water from Asia in its ballast tanks sparked off a cholera epidemic that spread throughout South America and was responsible for 11,000 deaths. Recently, as we have heard, mosquitoes imported to the United States in water that had collected in tires spread infection to the unsuspecting.

CDC is one of WHO's major partners in the global surveillance and response activities and infectious disease control activities worldwide that are greatly supported by the United States, and we thank the U.S. Congress for assuring that this support continues to occur.

The security threat of AIDS and other infectious diseases is great. As you can see on this graph, since 1945, infectious disease has killed approximately 150 million people, while war has killed 23 million, mainly military and some civilians. Yet the investment for public defense in 1995 was only U.S. \$15 million for infectious diseases, as compared to \$864 billion for military defense.

Immunization campaigns have eradicated smallpox, are on the verge of eradicating polio, and are rapidly decreasing deaths caused by measles. Vaccines have greatly reduced illness and death during the last 30 years, and today deaths occurring from infectious diseases are occurring in those diseases which have no vaccines such as tuberculosis, malaria and HIV. Fortunately, other low cost treatments and preventive measures are available for fighting these diseases.

We are the first generation ever to have the means of protecting the world from infectious diseases. Today we possess the knowledge and the drugs, vaccines and commodities, to prevent or cure the high mortality infections, tuberculosis, malaria, HIV, diarrhea diseases, pneumonia and measles. These tools have become available because of successful research in the United States and other countries and the development of research-based pharmaceutical companies, who have, as shown in its second column on this table, developed many, many different tools. They have given us such tools as the ingredients for DOTS therapy for TB, which is shown in the third column, and other treatment strategies which have been developed with support from international organizations and also with heavy support from USAID.

These medicines and preventive tools are inexpensive and they are cost-effective. The cheapest of these can be bought for less than 5 cents and even the most expensive for tuberculosis costs no more than \$20 for a full course of treatment. As shown in the last column of this table, these strategies are highly effective in curing infection and in preventing death.

Examples of the effectiveness of these strategies is shown in these two graphs. Malaria deaths are no longer common in Vietnam because of advances in the use of anti-malarial drugs and insecticide-treated bed nets. Oral rehydration therapy developed by USAID has dramatically reduced death from diarrhea in Mexico. TB deaths have decreased sevenfold in parts of India through the effective use of antibiotics, and increased condom use and health

education have enabled Thailand and Uganda to reduce the spread of HIV.

If we fail to make wider and wiser use of these medicines, they will likely slip through our grasp because the microbes are becoming resistant to their effect. We are in a race against time to bring down levels of infectious diseases worldwide before these diseases wear the drugs down first or before new diseases arrive and collaborate to render our interventions today ineffective.

This map shows a small sample of the infectious diseases that have emerged or reemerged during the past 4 years. They occur worldwide and regularly they travel with those infected. During this month alone, we could add eight more diseases to this map. In 1980, AIDS was just identified and would have appeared on the map. This was the same year that smallpox was declared eradicated. If smallpox had not been eradicated, the world might still have its 2 million deaths each year. Immunization with the smallpox vaccine is now known to be fatal for people whose immune system is impaired by HIV. Just a few years delay in eradicating smallpox might have made it impossible to eradicate because of the arrival of HIV.

We took advantage of a window of opportunity without knowing it. Had smallpox not been eradicated, it would be among the top 6 infectious killers in the world today.

Antimicrobial resistance is eroding the strength of medicines, eventually leaving them ineffective. Antimicrobial resistance is a natural biological phenomenon amplified many fold from overuse of medicines in developed countries and paradoxically from under use of medicines in developing countries.

As seen in this figure on the left, penicillin was introduced in 1942, and already 14 percent of hospital staph infections had developed resistance by 1946. Today penicillin is virtually ineffective against staphylococcus, as are the second line drugs which replaced penicillin.

The graph on the left of this next overhead shows how rapidly resistance to salmonella, a bacterium that commonly taints food products, has developed resistance in Germany. The graph on the right shows how rapidly malaria has developed resistance to all drugs used in its treatment. Likewise, Streptomycin was once the most effective drug we had in treating tuberculosis. Today it is virtually useless in Europe. In the United States, a variety of medicines used to treat patients in hospitals, such as Vancomycin, are less effective, leading to thousands of deaths each year.

Drug resistance threatens to put simple medical treatments out of the reach of poor people, even out of the reach of those who are wealthy. We heard about tuberculosis in the United States. The emergence of multi-drug resistant bacteria means that infections in the United States which once cost \$2,000 to completely cure must now be replaced with treatments that cost well over \$200,000, and there are no known TB medicines to cure a recently detected strain of TB in New York.

Since 1970, no new classes of antibacterial drugs have been placed on the market to combat infectious diseases in humans. On the average research and development of anti-infective drugs takes 10 to 20 years, as shown in this table. Currently there are no new

antibiotics or vaccines ready to emerge from the research and development pipeline. This is why it is urgent that we make wider and wider use of the effective medicines and tools we now have, before resistance makes them ineffective.

We may only have the next decade or two in which to make optimal use of these medicines before our window of opportunity to fight these infectious diseases closes. We must remember, as many of the Members have said, today's world of globalization causes a resistant organism anywhere to be a problem for us all.

At the same time, infectious diseases are no longer seen exclusively as a health issue. They concern finance ministers and the IMF as they discuss modalities for debt relief. They concern the U.N. Security Council as it discusses HIV/AIDS in Africa, and they concern 22 ministers of health and finance in the Netherlands who recently conducted a summit on tuberculosis. They concern leaders of G-8 countries meeting this July 21 to 23 in Okinawa, as we have heard, and we understand that the G-8 countries will consider calling for a powerful health initiative as a contribution to reducing world poverty.

Mr. Chairman, Committee Members, it is time to go to scale with the knowledge we have about controlling major diseases of poverty as a means of ensuring international public health security for us all.

The next overhead shows us what is required. A massive effort is required to reduce the infectious diseases of poverty. This massive effort must broaden our thinking from vaccines as a means of preventing mortality and alleviating poverty to also emphasize drugs and other commodities such as bed nets and condoms. We must aim such a massive effort against the high mortality causes of poverty, those 6 diseases which we have talked about, and unsafe pregnancy.

At the same time, we must implement this massive effort through weakened health systems, but we must also count on non-governmental organizations and communities and other proven means to get the goods to the patients.

With a massive effort, deaths and disability caused by the high burden diseases in low income countries could be reduced by as much as 50 percent, as shown in the next overhead. This could be before the year 2010. Then we could also have security from these infectious diseases worldwide.

Two futures are equally conceivable as we enter the 21st century. Infectious diseases can continue to burden human development, while diseases emerge and drug resistance reverses the scientific progress of the past century and threatens human security; or we can make a massive effort to provide the medical advances of recent decades to all people, dramatically cutting the impact of infectious diseases and preventing health, economic and security problems tomorrow.

Thank you, Mr. Chairman.

[The prepared statement of Dr. Heymann appears in the appendix.]

Chairman GILMAN. Thank you, Dr. Heymann, for your informative statement on the situation on infectious diseases worldwide. We appreciate your cooperation in testifying from your head-

quarters in Geneva. We have a few questions, if you would be pleased to entertain them.

Dr. Heymann, I understand the World Health Organization has launched this massive effort to take advantage of our narrow window of opportunity to eradicate these deadly infectious diseases. Can you please explain what is different about this effort and how the international community can better coordinate its efforts to combat and defeat these infectious diseases?

Dr. HEYMANN. This effort is occurring because we are seeing a decrease in the effectiveness of those tools which we already have available, of the antibiotics used to treat these infections and the various other interventions. Therefore, what is new is we have a very short window of opportunity in which to use these tools which U.S. industry has provided to the world.

We need to use them rapidly. We need to get them more widely used throughout the world.

Chairman GILMAN. Dr. Heymann, I would be interested in knowing whether the recently announced efforts by the World Health Organization to focus on the principal killer diseases, AIDS, tuberculosis, and malaria, will distract in any way from our efforts to build the health infrastructure of the developing nations?

Dr. HEYMANN. We think that by concentrating an effort on these infectious diseases and by getting the drugs and the goods that are necessary to weakened health systems, we can strengthen this by depending on nongovernmental organizations, community structures and others to help the governments themselves spread these goods throughout the country.

Chairman GILMAN. Dr. Heymann, when the leaders of the G-8 countries meet next month to discuss, among other things, the threat of infectious diseases, how will the World Health Organization focus international attention on the need to build the overall health care capabilities of the developing world?

Dr. HEYMANN. The World Health Organization has started two major initiatives: The Stop TB Initiative and the Roll Back Malaria Initiative. As we heard earlier, the UNAIDS program is coordinating a massive effort against AIDS.

By working together with these three initiatives, and our partners who are from both the public and the private sector, including industry, including groups who are working on these diseases in developing countries, we anticipate that this massive effort that will be called for by the G-8 will be successful.

Chairman GILMAN. Thank you, Doctor. I will now recognize the gentleman from Connecticut, Mr. Gejdenson.

Mr. GEJDENSON. Thank you, Doctor. It was a pleasure meeting with you at breakfast, I guess a week or two ago. The more we look at this, the things you have laid out for us, obviously are critical issues.

I guess several areas, one is we really need to get direction on the kinds of assistance we need to provide or guidance to develop the infrastructure, because it seems clear that is one place that is really lacking in a lot of the particularly sub-Saharan Africa countries, but elsewhere in the world, where even if you have the medicine, the needles and everything, you can't get the job done.

The second is getting the G-7 to direct some resources to the illnesses of the poor, something Mr. Payne was pointing out. We tend to put all of our resources or most of our resources where it affects developed nations, and that is a short-term obvious response, but long-term it does endanger us, and it is just good humanitarian policy to find cures for those illnesses that affect the developing world.

I guess the last thing is, when we looked at this 747 flight coming in from Israel with one man with, I guess, meningitis, I mean, how concerned should we be about bioterrorism in the sense that, here is an easy way to spread disease very rapidly, and are we in the developed world prepared to respond to this challenge?

Senator Schumer, our former colleague now in the Senate, argued that the basic infrastructure systems that we have, even in major metropolitan areas like New York City, would very rapidly be overcome.

Dr. HEYMANN. Thank you. Regarding infrastructure, I think any of us who have been in developing countries know that we can get a Coca-Cola, a cold Coca-Cola anywhere, or a cold beer anywhere. We can also get drugs and bed nets and condoms anywhere. But it takes a massive effort, not just of governments in those countries, but of the private sector, of nongovernmental organizations, of everyone working together to get these goods out. We are convinced these goods can be made available, as are Coca-Colas, beer and cigarettes.

Regarding the 747 and the case of meningitis, this was one of many cases of meningitis this year that have circulated around the world. After the Haj in the Mecca this year, there were over 500 pilgrims that returned to their countries in North America, Asia and Latin America and in Africa, with bacterial meningitis. Many of these people died and spread this disease elsewhere.

Now, this was not bioterrorism, but bioterrorism will appear the same way. It will be an epidemic of disease occurring somewhere, and therefore we are working closely with CDC and with our other partners throughout the world to develop a network which will help us identify any infectious disease when it occurs and respond to that infectious disease on a global basis.

So we are very concerned about not only naturally occurring infectious diseases, but about diseases which 1 day might be caused intentionally.

Mr. GEJDENSON. Thank you.

Mr. BURR [presiding]. The gentleman's time has expired. The Chair will recognize himself.

Once again, welcome, Dr. Heymann. You have been asked and you have addressed the issue of the infrastructure challenges that we have that vary greatly from country to country. Let me ask you to address the cultural hurdles that exist throughout the world, given the fact that we can get drugs, we can get condoms, we can get prevention there. What cultural hurdles exist that would make us optimistic that we can overcome them and meet this challenge?

Dr. HEYMANN. The cultural hurdles are many. In the early days of HIV infection, countries throughout the world refused to admit that they had this disease because they felt it was stigmatizing. The same occurs with diseases such as Ébola. People don't want to

admit this disease occurs in their country because they fear that they will be blamed if it spreads out of their country, or they fear they are being blamed for the disease. So culturally, countries are not willing to accept these diseases.

Only by working with them, through activities such as CDC will soon have in the Life initiative project, which is working throughout Africa on HIV/AIDS, and this project will also be supplemented by USAID activities, can we begin to change cultural norms and cultural behavior.

Taxes are also a very important reason why goods don't get into countries. We have just completed working with Uganda and having them decrease, actually eliminate, all their import taxes on bed nets and anti-malaria drugs for treating malaria, so that these will not be an obstacle to infection treatment.

So what you are seeing is, working together as a global community we can change cultural habits so that countries do accept recommendations to drop taxes or to admit that they have infectious diseases.

Mr. BURR. Dr. Heymann, in your estimation, can we ever hope to actually control infectious disease, or is the best we can do to have a better understanding of what our risk is and where that risk may be coming from?

Dr. HEYMANN. We must control infectious diseases where they are occurring, and presently they are occurring among the poorest of the poor. Our hope is that we can decrease mortality, decrease deaths from these infectious diseases enough so that people do survive, do produce economically, and pull themselves also out of poverty. We can't push people out of poverty, we can help them pull themselves out of poverty. If we can do that, and we can change the balance of people who are out of poverty to those who are in poverty, there is a good chance that we can continue the momentum to get rid of infectious diseases, at least as major public health problems. But they will still be with us, and there will still be the chance of new infections jumping the barrier from animals to humans and causing major epidemics in humans, as did HIV 20 years ago.

Mr. BURR. Thank you, Dr. Heymann. Once again I appreciate your patience during this hearing, but I am sure it was much easier than the flight over would be.

The Chair recognizes the gentleman from New Jersey.

Mr. PAYNE. Thank you very much. It is according to what time it is over there. Let me ask about the World Health Organization. In your Report 2000, you refer to a new paradigm to combat infectious diseases. We have had great success in the past with the eradication of smallpox and other diseases such as polio. Would you please explain what is new about the new efforts to combat microbial resistance to infectious diseases and whether the program sponsored by the United States needs to be altered in light of the new threats?

Dr. HEYMANN. What has happened, and this has been through major support from industrialized countries, including the United States, is that we have been able to get vaccines to the populations that needed them and we have decreased deaths occurring from

vaccine preventable diseases. Now what remains is the diseases for which there are no vaccines.

We must continue our efforts to develop new vaccines, and we must intensify this effort, because a vaccine is the only way to prevent an infection and to prevent the complications of an infection, and also to prevent the effects of drug resistance.

What we see today is that we have the drugs to treat these major infections, but we are losing them because of resistance. The organisms we use to treat them are rapidly becoming resistant to these drugs.

As a result, we need to get the drugs available rapidly while there is still time. We need to get them to all people with infections so we can decrease infections while the majority of these infections are still not resistant, and get them to a level at which they will not interfere with economic development or spread to other countries.

Mr. PAYNE. Thank you very much. It is sometimes suggested that we have an overuse of antibiotics in the United States and other industrialized countries. In terms of educational efforts, what should we be doing here to discourage overuse and what can we do to prevent the misuse in developing countries? Are there any ongoing programs that you are addressing this problem with?

Dr. HEYMANN. Education is the answer to overcoming antimicrobial resistance. Health workers, physicians, must not over prescribe, and, at the same time the public should not demand antibiotics, which many times happens. We have all gone to a doctor and requested an antibiotic when we didn't know we really needed one, and because the doctor wanted to make us happy, he or she provided an antibiotic, and, if not, we went to another doctor who did.

Education of the public decreases demand for antibiotics. This has been shown in Canada, just next door, where they decreased antibiotic use by over 4 percent through an education campaign of the general public indicating that the public should not demand antibiotics.

In developing countries, the issue is different. It is under use which causes resistance. There we have to make sure that the drugs are available in sufficient quantities so that there is no under use, so that infections are properly treated.

Mr. PAYNE. Finally, I have heard you talk about the private sector. How are you there at the World Health Organization involving the private sector to meet some of these challenges?

Dr. HEYMANN. The original program with private segment input was with Merck & Company from the United States, which provided all the drugs necessary to eliminate river blindness in sub-Saharan Africa. Since then there have been many, many more programs. SmithKline Beecham from the United States has provided the drug that is necessary to get rid of elephantiasis throughout the world, and, in partnership with Merck, which is providing Ivermectin, another drug also useful in this disease, we will eliminate this disease from the world.

At the same time, the Novartis Company has given all the drugs necessary to get rid of leprosy. Pfizer has given drugs to eliminate trachoma as a public health problem. So companies have joined

with WHO in providing the goods necessary. When this occurs, other partners come in very rapidly, from the private sector, from the nongovernmental organizations and from governments such as the United States

So what we are seeing is the private sector is catalyzing the possibility of eradicating and eliminating many infectious diseases, but this is a short-term solution. We need also to have industry at the same time producing the new vaccines and the new drugs that are necessary for the future.

Mr. PAYNE. Thank you very much. I am very aware of the Merck project, since it is in New Jersey, and I visited them while they were working on the river blindness, and Du Pont providing some of the nylon to be used in the process, and, of course, former President Carter taking this on as a main issue. So we do know that that cooperation between private and public is very important.

Thank you very much for your testimony.

Chairman GILMAN [presiding]. Thank you, Mr. Payne. Mr. Meeks.

Mr. MEEKS. Thank you, Mr. Chairman. Doctor, thank you. Your testimony has been very informative.

Let me ask a question in that in developing nations, they have a whole host of problems and issues, and the statistics you utilized to show this, talking about the economic impact of infectious diseases in developing nations, is astounding. But one of the things that I think happens, and I ask you do you agree, that a large part of the problem is the willingness of developing countries to acknowledge that they in fact have these kinds of health problems and as a result the economic problems.

So my question to you is how does the World Health Organization work with governments to help them understand that they have that problem so they can address their health care needs?

Dr. HEYMANN. It is true that governments many times want to close their eyes to problems and commitment to health is very low in most developing countries.

The way that the World Health Organization works to increase the importance of this is through global meetings or summits. For example, we worked with the president of Nigeria in April of this year in which we had a summit of African heads of State who discussed malaria, who committed by signing a declaration to work to eliminate malaria as a public health problem in Africa.

They signed an agreement that they would commit resources and the WHO and other partners agreed that they would provide additional resources.

The same thing happened in tuberculosis. The government of Netherlands hosted a tuberculosis summit where ministers of health and ministers of finance from the 22 tuberculosis burdened countries, those countries with the most tuberculosis, met. Secretary Shalala was present at this meeting in the Netherlands in March.

At this meeting, ministers of health and finance both signed a declaration on the willingness of these countries to commit funds to the elimination of tuberculosis while the window of opportunity is still open.

Mr. MEEKS. We talked and I know that a significant amount of resources, although the resources that are going toward health care in the chart that you showed was a drastic difference, \$15 billion for research in dealing with vaccines, et cetera, as opposed to 400 and some odd billion we invest in defense, but a significant amount of those resources have been made available to develop vaccines for a whole host of infectious diseases. I understand the importance of them. But what are the specific health care tools that the World Health Organization considers of vital importance to immediately combat diseases that can be prevented or treated, such as tuberculosis, malaria and the measles?

Dr. HEYMANN. The tools that we have today are a vaccine for measles. This must be expanded, because measles kills many children. It still kills about 1 million children in the world. So we need to get this vaccine out. It is available, we need to get it out.

For tuberculosis, we have antibiotics. For diarrheal diseases, which kill the majority of children in developing countries, we have oral rehydration therapy, which was developed with support from USAID. We now need to get these goods out to the people, through a massive effort, making use of any delivery system we can.

Mr. MEEKS. I am listening and you are telling me that we have these vaccines that are readily available, we need to get them out. What can we in the United States, what can we do to help get them out, because as indicated throughout the testimony, this may be happening or occurring in the developing nations now, but tomorrow someone can take a plane ride and they are here in the United States of America. So it is in our national defense to get these vaccines out. What in addition to what we are doing can we in the United States and the G-7 nations do to get them out and distribute them in a more timely fashion?

Dr. HEYMANN. The United States, as you already said, is doing a lot. But what we need to think now is in much greater terms. We know that the G-7 this year will be promoting a fight against the diseases of poverty. What we need to do is think not in millions, but in billions of dollars.

We estimate that by an investment of \$15 billion in getting the goods available, the drugs and the bed nets and the condoms available to countries, to NGO's, that we could halve infectious disease mortality from the major infectious diseases in the next 10 years.

That takes much bigger thinking than we have done before. It takes dependence on many, many types of distribution systems in countries. But we feel it can be done, and we are very pleased that the G-7 is taking this up as an issue in the meetings coming up in Japan.

Mr. MEEKS. Thank you.

Chairman GILMAN. Thank you, Mr. Meeks.

Any other questions? Mr. Burr?

Mr. BURR. No.

Chairman GILMAN. Mr. Payne, any additional questions?

Mr. PAYNE. No, Mr. Chairman.

Chairman GILMAN. If not, Dr. Heymann, we thank you very much for taking your time to be with us by way of video conferring. We thank you for your recent visit to Washington. We hope we will see you again soon. Keep up your good work.

Dr. HEYMANN. Thank you, Mr. Chairman.

Chairman GILMAN. We will now proceed with our next witness, Dr. David Gordon, National Intelligence Officer of the National Intelligence Council.

The Committee is pleased to welcome the testimony of Dr. David Gordon of the Economics and Global Issues Section of the National Intelligence Council. Prior to joining the NIC, Dr. Gordon was U.S. Policy Program Director of the Overseas Development Council, and in early 1990's, Dr. Gordon served as a professional staff member of the House International Relations Committee.

Welcome back, Dr. Gordon.

STATEMENT OF DAVID F. GORDON, PH.D., NATIONAL INTELLIGENCE OFFICER OF ECONOMICS AND GLOBAL ISSUES, NATIONAL INTELLIGENCE COUNCIL

Mr. GORDON. Thank you very much, Mr. Chairman.

Chairman GILMAN. Please proceed. You may put your full statement in the record and summarize, whichever you deem appropriate.

Mr. GORDON. Thank you very much, Mr. Chairman. I want to thank you and the Distinguished Members of the Committee for providing me the opportunity to participate in this very important hearing.

It certainly is an honor for me to share the podium with Dr. Satcher and Dr. Heymann, both of whom I greatly respect and admire. My testimony this morning will be drawn from a declassified national intelligence estimate recently produced under my direction entitled "The Global Infectious Disease Threat and Its Implications for the United States".

As you know, Mr. Chairman, NIE's are prepared for the President and other senior policy makers on issues that have strategic implications for the United States, and they represent the most authoritative assessments of the Intelligence Community because they reflect the coordinated judgments of the senior officers of all of the relevant agencies.

The Infectious Disease Estimate represents an important initiative on the part of the Intelligence Community to consider the broad national security implications of a nontraditional but highly lethal threat. My remarks today will focus on the social, economic, political and security implications of the infectious disease threat. We have heard a lot about the science and the epidemiology from our distinguished panelists this morning.

The Estimate's most significant judgment is that new and re-emerging diseases will pose a rising and in the worst case a catastrophic global health threat that will complicate U.S. and global security over the next 20 years. These diseases will endanger U.S. citizens at home and abroad, threaten U.S. Armed Forces deployed overseas, and exacerbate social and political instability in key countries and regions where the United States has significant interests.

In national security terms, the global infectious disease threat manifests itself in a number of ways. First is the link between infectious diseases and the increasing possibility of a biological warfare or biological terrorism attack against the United States or U.S.

equities overseas as hostile states and terrorist groups exploit the ease of global travel and communications in pursuit of their goals.

Today, at least a dozen states are pursuing offensive BW programs, as are a growing number of terrorist organizations. The West Nile virus scare in the New York-Connecticut area last year indicates the confusion and fear that even the possibility of a BW attack can sow, and it highlights the importance of effective collaboration among public health authorities, law enforcement agencies, and the Intelligence Community in monitoring global BW threats.

Second is the direct risk posed to U.S. health by the importation of infectious diseases which, as we have all discussed this morning, do not respect national borders.

The next major infectious disease threat to the United States may be like AIDS, a previously unrecognized pathogen, or it may be a new strain of influenza developing in Asia. Flu now kills some 30,000 Americans annually. Epidemiologists generally agree it is not a question of whether, but when the next killer flu pandemic will occur.

Or it may be, as several people emphasized this morning, drug resistant TB, which we thought we had under control but is now being brought back into the United States by travelers and immigrants.

The third national security dimension is the potential impact on the military, both U.S. troops abroad and on the readiness of foreign militaries and their ability to engage in international peacekeeping operations. U.S. military personnel deployed in support of peacekeeping and humanitarian operations in developing and former communist countries will be of highest risk.

Fourth, the worst infectious diseases, TB, malaria, and especially AIDS, are slowing economic development in and undermining the social structures of countries and regions of specific interest to the United States. As the most recent UNAIDS report that was highlighted in the media yesterday underscores, this will challenge democratic development and transitions and possibly contribute to humanitarian emergencies and to military conflicts to which the United States may be expected to respond.

Fifth, in the economic realm, infectious disease-related embargoes and restrictions on travel and immigration will be a source of friction among and with key U.S. trading partners and other states and the issue of intellectual property rights with respect to new and existing drugs promises to become a major source of controversy between developed and developing countries.

The outlook for infectious diseases shows extreme geographic variation, both between and within regions. Developing and former communist countries will continue to experience the greatest impact, but developed countries will also be affected. Although global health care capacity has improved substantially in recent decades, the gap between rich and poor countries and the availability and quality of health care is widening and the revolution in medical technology may reinforce this trend.

Almost all research and development funds allocated by rich country governments and the pharmaceutical industries are focused on advancing therapies and drugs relevant to rich country

maladies. In general, our study highlights a very close linkage between persistent poverty, malnutrition, poor levels of health care, and social and political insecurity on the one hand, and high levels of infectious diseases prevalence on the other.

Let me speak to the social, economic and political impacts. The persistent infectious disease burden is likely to aggravate and may even provoke social fragmentation, economic decay and political polarization in the hardest hit countries in the developing and former communist worlds. At least some of the hardest hit countries, initially in sub-Saharan Africa and later in other regions, face a demographic catastrophe as AIDS and associated diseases reduces human life span dramatically and kills up to one-quarter or more of their populations over the next 15 years, including up to one-half of their youth.

Last year, 10 times as many people in sub-Saharan Africa died of AIDS than died of civil conflicts.

Life expectancy is likely to be reduced by 30 years in Botswana and Zimbabwe, 20 years in South Africa, 13 years in Honduras, 8 years in Brazil, and 3 years in Thailand.

AIDS, particularly in Africa, has hit very hard the professional classes of teachers, civil servants, engineers and skilled workers who have formed the social backbone of recent advances in both political and economic liberalization. The degradation of nuclear and extended families from all across the social structure will produce severe social and economic dislocations with likely political consequences as well.

With as many as a third of the children under 15 years of age in the hardest hit countries, some 42 million by 2010, expected to comprise a lost orphan generation, these countries will be at risk of further economic decay, increased crime and political instability as these young people become radicalized or are exploited by various political groups for their own ends.

The economic impact of infectious diseases is already significant and is likely to grow. They will take an even higher toll on productivity, profitability and foreign investment, again especially in those most affected countries. World Bank President James Wolfensohn has recently declared AIDS to be the single greatest threat to economic development in sub-Saharan Africa, and a growing number of studies suggest that AIDS and malaria will reduce GDP growth in Africa by 20 percent over the next decade.

The impact of infectious diseases at the sector and firm level is already substantial and growing, and will be reflected in higher GDP loss as well, particularly in the more advanced developing countries with specialized work force needs, such as South Africa.

Several firms have undertaken surveys recently of the costs of AIDS on profitability and productivity, and these tell a story that has the potential of having a truly devastating impact as costs escalate and the investment climate deteriorates.

Infectious diseases also will add substantially to national health bills, setting the stage for cruel budgetary dilemmas and conflicts. For instance, treating one AIDS patient even modestly in sub-Saharan Africa costs as much as educating 10 primary school students for a year. In Zimbabwe, already half the meager health budget is spent on treating AIDS, while in Kenya AIDS treatment

costs will rise to 50 percent of health spending over the next several years.

Few countries will be able to afford the high cost of multi-drug treatments for AIDS, ensuring that this disease will continue to be highly prevalent.

The political impact of infectious diseases will be indirect and it will be difficult to assess with any precision, but it is our view that the infectious disease burden threatens to add to political instability and slow democratic development in social security in Africa, parts of Asia, and the former Soviet Union, and may become a growing source of political tensions in and among some developed countries as well.

The severe economic impact of AIDS and other diseases and the infiltration of these diseases into ruling political and military elites is likely to intensify the struggle for political power to control scarce resources. Mounting infectious diseases cause deaths among the officer corps and may also continue to contribute to deprivation, insecurity and political machinations that incline some to launch coups and countercoups aimed as often as not at plundering state coffers. The human losses from infectious diseases is already hampering the development of civil society and will increase the pressure on democratic transitions in sub-Saharan Africa and the former Soviet Union.

A CIA-sponsored study on the causes of instability suggests that infant mortality, highly correlated with infectious diseases, is a powerful predictor of political instability, especially in those states that have started along a democratic path but have not yet fully consolidated a transition to democracy.

Infectious diseases also will affect international security and peacekeeping efforts as militaries and military recruitment pools experience increased deaths and disabilities. The greatest impact will be among hard to replace officers, NCO's and enlisted soldiers with specialized skills among militaries with advanced weapons and weapons platforms of all kinds.

HIV/AIDS prevalence in the militaries of heavily infected countries is considerably higher, often twice as high as the rates among civilian populations, owing to risky lifestyles and deployments away from home. Militaries in several former Soviet Union states are increasingly experiencing the impact of negative health developments within their countries and one in three Russian draftees is currently rejected for health reasons as compared to only one in 20 back in 1985.

While it is difficult to make a direct connection between high rates of HIV/AIDS prevalence and other infectious diseases on overall military performance and readiness, it is likely, given a large number of officers and other key personnel are dying or becoming disabled, that combat readiness and capability of such military forces is bound to deteriorate.

Over the longer term, the consequences of the continuing spread of deadly diseases such as HIV/AIDS on the more modernized militaries in the former Soviet Union and possibly China, India and some other states in Africa, may be increasingly severe and have an impact similar to what we are seeing in sub-Saharan Africa.

The negative impact of high infectious disease prevalence on national militaries will be felt in international and regional peacekeeping operations as well, limiting their effective necessary and making them vectors for further spread of diseases among coalition peacekeepers and local populations.

Healthy peacekeeping forces will remain at risk of being infected by disease carrying forces and local populations as well as by high risk behavior and inadequate medical care.

Chairman Gilman, thank you very much for your attention. I will be happy to answer any questions that you or other Members of the Committee have.

[The prepared statement of Dr. Gordon appears in the appendix.]

Chairman GILMAN. Thank you, Dr. Gordon. We thank you for your review of this problem. How capable is U.S. Intelligence Community in the field of bioterrorism? To your knowledge, has our Intelligence Community been successful in thwarting any bioterrorist attacks in the form of infectious diseases?

Mr. GORDON. The Intelligence Community is increasing its focus on biological warfare and has an increasing capability to monitor the efforts of both hostile regimes and other groups.

That said, that said, we are concerned both about the groups we know about and the groups that we don't know about. While the risk of biological warfare is still a small one in percentage terms, the impact is potentially very, very, very great. We are working very hard, both with people in the public health communities, with people in the law enforcement communities, both nationally and internationally, to increase our capability to monitor the efforts of those who would do us harm.

Chairman GILMAN. Dr. Gordon, you noted in your testimony despite your collaboration with the World Health Organization progress has been slow to be able to strengthen your surveillance programs. In your opinion, what additional specific measures should be undertaken to enhance the surveillance of infectious diseases? Also, are there any additional early warning systems that should be developed to enhance our capabilities to detect any bioterrorist threats to our country?

Mr. GORDON. I think that the answer lies in enhancing international collaboration, enhancing the U.S. role, already a very strong leadership role in international efforts on surveillance, working with the world health organizations.

We have been quite impressed by the improvements made in the world health organizations by Dr. Heymann and his colleagues that currently undertake a highly sophisticated epidemiological intelligence operation to ensure that new pathogens, as soon as they are noticed, can be quickly identified and linked up into broader intelligence and law enforcement operations to judge whether or not they pose a political threat as well as a health threat.

I think that a good deal of diplomacy will be needed, both at the bilateral and multilateral level, to increase collaboration, particularly by developing country governments with these efforts internationally.

Chairman GILMAN. Dr. Gordon, one last question. In addition to the danger posed to American Armed Service personnel who serve overseas, is there an increased danger to the American public of

diseases unwittingly brought to our shores by soldiers returning from overseas duty? Does the military have adequate measures in place to both safeguard the health of military personnel and to prevent their becoming unwitting carriers of infectious diseases?

Mr. GORDON. The military is constantly monitoring these issues. In fact, within the Intelligence Community, our main component that works on these issues is in Armed Forces intelligence. We at this point are satisfied that we do have the capabilities to ensure that returning U.S. military personnel will be effectively screened so as to ensure that an infectious disease that might have been acquired while overseas, either in a normal deployment or in a peacekeeping operation, does not get transmitted to the United States.

These, however, are not foolproof and depend upon the existence of a robust overall surveillance program internationally.

Chairman GILMAN. Thank you, Dr. Gordon.

Mr. Payne.

Mr. PAYNE. Thank you very much for your very clear paper and your comments. I was also concerned about what steps the military, and maybe the question wasn't asked, what steps are we taking with our military as they are overseas? I know we don't have—we have virtually no U.S. peacekeepers in sub-Saharan Africa, but we do have them in Eastern Europe and Asia where I am sure, the disease is not as prevalent, but it is there.

What do we do when they are in the regions outside of the country to ensure that their health and safety is provided for?

Mr. GORDON. There are basically three elements to the efforts of U.S. military to ensure the health of U.S. forces overseas.

First, are that U.S. forces have as comprehensive and up-to-date immunization package as exists in the world. We work very, very hard to ensure that happens, and, again, that is partially facilitated by the international collaboration that I have been talking about.

Second, is education, to ensure that our soldiers know what the risks are and know how to protect themselves against those risks and are constantly being reeducated about those issues.

Third, is monitoring, and there is a very aggressive program of monitoring the status, the health status, of U.S. forces deployed overseas.

Mr. PAYNE. Thank you. Perhaps you could explain a little bit to us about the general overview of the contingency plans that exist should the worst case scenario develop with regard to the spread of infectious diseases in developing countries. Specifically, what measures would the United States have to undertake in the event that the spread of infectious diseases were to be unchecked as set forth in part of your statement?

Mr. GORDON. Mr. Payne, I think that our main efforts have gone into working to ensure that the worst case scenario is not going to take place, so part of the whole aim of international efforts here at both surveillance and response to infectious diseases is to try to minimize the likelihood of the worst case scenarios coming into play.

That being said, we are already in sub-Saharan Africa and in several of the sub-Saharan African countries, in a situation that is, if not a worst case, close to a worst case scenario, and we are trying

to work collaboratively both with those governments, with the international community, institutions like the World Health Organization, the international financial institutions, particularly the World Bank, to ensure that there is as effective as possible a response to these issues.

There is no grand plan for a worst case scenario developing which would occur over a longer term. Certainly if we see ourselves moving into that scenario, I think planning for those contingencies would take on a more prominent role.

Mr. PAYNE. Thank you. In your opinion though, is there an effective coordination between the military intelligence and science and health communities in addressing the infectious disease threat? Do you all kind of stay in touch with each other?

Mr. GORDON. We are certainly pleased by the increasing degree of collaboration on biological terrorism and biological warfare. There is increasingly close collaboration between the Department of Defense, the Centers for Disease Control and the Intelligence Community in monitoring and working together to plan contingencies to address these issues. I think that is one of the large advances that we have made in recent years.

Mr. PAYNE. Just finally, do you feel that Congress is providing enough assistance to deal with these infectious diseases, for security and surveillance programs and all the rest? I know it is a real concern, and our goal is to provide assistance overseas as needed, but also to safeguard the health of American people. What is your feeling on that question?

Mr. GORDON. Congress has been responsive to the requests for support from the Intelligence Community, and I believe that as we stand now, we are in an adequate situation. I think as several of the other speakers mentioned, in the larger view of the infectious disease threat, I think that the international community as a whole is just beginning to come to grips with the resource mobilization that will be needed.

Mr. PAYNE. Finally, it has been mentioned that it has been declared that this whole question of infectious disease is a national security issue or threat. Do you concur with that finding?

Mr. GORDON. Yes, I think that as several speakers today have highlighted, both among the Members and the panelists, that taken together, I think the range of effects that the rising global infectious disease trends provides to the United States raises some very, very serious national security implications.

I would not want to get into an academic exercise of trying to define precisely whether and when something becomes a national security issue or a national security threat, nor would I suggest that all health issues are national security issues. I think many, if not most health issues, are not national security issues, they are public health issues.

But in general for the reasons I laid out in my testimony, we see a whole series of national security concerns attached to the infectious disease threat, which in sum I do believe raise it to a national security interest of the United States.

Mr. PAYNE. Thank you very much.

Mr. BURR [presiding]. I thank the gentleman from New Jersey. The Chair would recognize himself. Welcome, Dr. Gordon. You and

I have had an opportunity to spend some time together to talk in depth, so I will be very brief today.

Let me followup on Mr. Payne's comments as it relates to the cooperation, collaboration, between intelligence, the science community, the health community.

I sensed just a little bit of hesitancy in the answer from the standpoint of the way the question was posed, so let me try to restate it and hopefully solicit an answer that covers everybody in that loop.

From the standpoint of the military, the Intelligence Community, the science community, the health community, is there the level of cooperation between all of those that makes you feel confident that we are on top of this challenge of infectious disease and its threat?

Mr. GORDON. I believe, as I said earlier, that we are still at a place where we have work to do, both as a national government and internationally as a global community, in effectively addressing the global infectious disease threat.

I do believe that as a government we have taken very significant steps to enhance collaboration among the scientific community, the national security establishment, and the Intelligence Community, particularly on issues relating to the biological weapons threat per se.

We also now have an interagency working group at the White House level on AIDS that is working to bring together all of the various elements in government who have a stake in the AIDS issue.

I think the fact of the matter is that as both of our previous speakers emphasized, that coming to grips with the global infectious disease threat is not something that is going to happen overnight, and that there is still a need to mobilize support, both publicly and privately, so that a sufficiently robust effort is made that will enable us to turn the corner on this issue.

Mr. BURR. You are, and I think it is safe to say the Congress is, aware of the challenges that exists between agencies to communicate, and when we bring health and the science community into it, it is naturally a challenge. But in fact that level of communication has to exist if in fact we want to be ahead of a problem that we can't stick our finger out today and say "this is it," because it is a range of scenarios that could pop up is the problem.

I trust that you, from the standpoint of the intelligence agencies, like I would the health community who was here earlier, will share with us when you think that there is help that is needed from this body to make sure that that cooperation and collaboration, not only to address an existing problem, but to anticipate where our greatest needs might be in the future and when we can help.

Let me ask one question, and that deals with HIV as the only designation from the infectious disease as a national security threat. I personally agree with that designation. I am not sure that I would limit it to one infectious disease, and I would ask you from the standpoint of the Intelligence Community, was that your recommendation as well, or would you include additional infectious diseases at the same level that you would AIDS/HIV?

Mr. GORDON. We have done a lot of work on the issue of HIV/AIDS, on the impact of HIV/AIDS on militaries. Certainly the work

that was undertaken on this issue by the Intelligence Community was a major input into this designation.

In our study of infectious diseases and their implications for the United States, we did take a broader look at the global infectious disease environment, and I do think that while I agree with you that while HIV/AIDS in and of itself is a security issue globally and to the United States, there is a larger context.

I don't believe that there is necessarily a tradeoff between dealing with HIV/AIDS on the one hand as a security threat and dealing larger—with infectious diseases more generally as a security threat, but I do think it is something we have to pay attention to, that HIV/AIDS is not the only disease out there.

Mr. BURR. Is there a reason that the national security threat was not infectious disease versus one specific infectious disease?

Mr. GORDON. We were asked by the State Department, the Secretary of State, to look at infectious diseases more generally when this paper was tasked to us.

Mr. PAYNE. Would the gentleman yield? I listened to the question regarding—and there is no question about the fact that malaria really is a real killer and tuberculosis is increasing. But when I read that Washington Post article on yesterday, I mean, we have got a lot of diseases, and we have bad diseases and tough diseases and diseases that have been around, but we have never had a disease that has reduced the life expectancy by one-third in 3 or 4 years. I mean, this is magnitude that the Black Plague in Europe didn't even experience. The life expectancies of 20 years and 25 years in some countries at this point, I mean, I concur that there are a number of serious problems that we have around, even more being discovered in food products.

We once thought if you just ate chicken, you were fine, leave the pork alone. Then you find, there was salmonella or whatever comes up, and beef was always definitely OK, but now you find you got to be careful, we can't leave the beef out when you do your backyard cooking. So we are discovering a lot more in food products, shellfish, you got to watch that, you know. I am on carrots right now.

But there has been nothing that I can remember, reading history or at the present, that is anywhere near, in my opinion, as devastating as this pandemic. I think this AIDS and HIV virus is really standing in a class all by itself, is the way I see it. But that is not to—you know—

Mr. BURR. The gentleman's point is a very important one, and one I would agree with. My question stems more from the fact that we do know the means of transmission for AIDS, we do see and can follow its progress from sub-Saharan Africa to Asia, and we have a history which gives us a good gauge for what the threat is to the new areas that HIV/AIDS is emerging in.

But from a standpoint of the other infectious diseases that we might not yet know the scope of transmission, that we might be faced with resistant strains without the tools to treat it today, in fact there is a bigger question mark and an unknown as it relates to its impact 10 years down the road, and I raise the issue more to make sure we are not focused on one area of the water balloon while there is a squeeze somewhere else and a bulge that is in fact

created. I think it goes hand in hand with my original question to Dr. Gordon.

Mr. GORDON. Congressman, I think you are absolutely right, that the issue of global surveillance and having the ability to monitor infectious disease outbreaks and understand the epidemiology and likely epidemiology of those outbreaks is crucially important.

So I think that it is not a question of focusing on HIV/AIDS, but not focusing on other particular diseases, but especially not losing track of the ability of the international community to build a very, very robust surveillance system.

Mr. BURR. My hope is that not only the communications within our branches of not only government, the health community and the science community, are in fact strong, but that the world health organizations can compel other countries to bring their similar communities together to make sure that the review of this threat worldwide is one that we all take seriously and all share the information.

Mr. PAYNE. If the gentleman would yield, I am in concert with the fact that we are looking at drug resistant strains of tuberculosis and so forth. As a matter of fact, when tuberculosis reappeared, there was no streptomycin around, because no one had it around because there was no tuberculosis around, so they had to run around to find some streptomycin, and they found a little place in France that still had some around.

So we do have to really remain focused.

But, for example, are we doing anything, Dr. Gordon, say with the problem of the tough strains of tuberculosis in the Russian prison system, where I understand that infection is almost at epidemic proportions and the strains are tough?

Mr. GORDON. Yes, it is. The issue of drug resistant tuberculosis, particularly in Russia and some of the other areas of the former Soviet Union, is one of the major infectious disease issues as we see it evolving over the next several years. It is something that a great deal of attention is being paid to.

Again, none of these issues, and I want to emphasize what Dr. Heymann and Dr. Satcher said, none of these issues is amenable to an easy or quick resolution. Even on AIDS, on which we know the elements of a strategy that works, combining political leadership, education and destigmatization of the disease, and partnerships between the private sector and nongovernmental organizations and both local governments and the international community, we know a strategy that works. But that doesn't mean that you can easily turn the problem around.

The issue of TB and drug resistant TB, I think it is going to be one of the very large challenges we face over the next several years.

Mr. BURR. I thank the gentleman from New Jersey. I also thank you, Dr. Gordon, for your patience and willingness to compile the report that you did, and to share with this Committee in a number of fashions the findings of your investigation.

The unfortunate conclusion of this hearing is that we will continue to meet on this issue well into the future, and my hopes are today that we are able to narrow the threats down and to talk

about successes, not only here at home, but abroad in some of the many countries we have talked about.

At this time this hearing is adjourned.

[Whereupon, at 2:50 p.m., the Committee was adjourned to reconvene subject to the call of the Chair.]

A P P E N D I X

JUNE 29, 2000

Statement by Benjamin A. Gilman, Chairman
Committee on International Relations
Hearing on Infectious Diseases
June 29, 2000

During the summer and fall of last year, the West Nile Virus, previously unknown in the Western Hemisphere, reached the New York metropolitan area. The outbreak of the West Nile Virus in New York claimed seven lives and resulted in 62 cases of encephalitis. The introduction of this previously unknown deadly virus to the United States vividly illustrates that infectious diseases know no borders. In addition, despite the valiant efforts of the health care community in the United States, the outbreak of this lethal virus also demonstrates that we must do more to handle the sporadic and unforeseen introduction of new viruses in the United States. In simple terms, the West Nile Virus outbreak should serve as a wake-up call for America.

Just this past Sunday, a Rochester, New York man died of bacterial meningitis on a flight from Tel Aviv to New York. New York area health authorities are now concerned that other passengers might have been infected with the disease. Clearly, infectious diseases know no borders.

The growing number of infectious diseases and their strengthened mutations is both a domestic and international problem of mounting concern costing a needless loss of life. What is most regrettable is that most of the world's deadliest diseases can be eradicated or treated inexpensively. As an example, every year the United States spends over \$300 million immunizing our own citizens against polio, a disease that was eliminated in this hemisphere in 1994. These immunizations are necessary because polio has not been eradicated worldwide and could be re-introduced in the United States.

On June 12th, the World Health Organization issued a report citing under-use of antibiotics in the developing world and their over-use in developed world as major contributing factors to the spread of infectious diseases. Because of the improper use and overuse of antibiotics, viruses develop stronger strains that are increasingly able to overcome standard antibiotics. Just a few years ago, a number of inexpensive antibiotics proved effective in treating diseases such as tuberculosis. Today, the number of effective antibiotics in our arsenal has dwindled because of overuse and, as noted by the World Health Organization, as a consequence, slowly but surely, most infectious diseases are becoming resistant to existing medicines.

What is clear to me is that an infectious disease crisis of global proportions is today threatening the hard-won gains of the past 30 years in both health care and life expectancy. Infectious diseases are now the world's biggest killers of children and young adults and account for more than 13 million deaths annually. In the developing world, a staggering one in two deaths is attributable to infectious diseases.

The HIV/AIDS pandemic alone has claimed 34 million victims and millions have lost their battle with the deadly disease. An incredible statistic reveals the magnitude of this crisis-- 20% of the population of South Africa is infected with HIV.

Alarmingly, some routine vaccines cannot be administered to HIV positive people without fatal consequences. Therefore, in addition to the threat that AIDS singularly poses worldwide, the eradication of other infectious diseases might not be possible because vaccines for these diseases cannot be administered to HIV-infected people.

Yesterday, the UNAIDS program of the United Nations reported that the AIDS epidemic is already measurably eroding economic development, educational opportunities, and child survival efforts in much of Sub-Saharan Africa. In the Central African Republic, as many teachers die of AIDS as retire each year.

Infectious diseases are not just a developing world problem. Unless the spread of infectious disease is checked throughout the world, scourges such tuberculosis will re-emerge with a vengeance in the industrialized world. In fact, tuberculosis has already reappeared in Greece and Albania and polio cases have once again been reported in Southeastern Europe. All of these countries had been free of these diseases for many years.

As our witnesses will attest to in their testimony today, the spread of infectious diseases worldwide pose a threat to millions of people, including the citizens of our own country. We thank our witnesses for joining us today and look forward to their testimony.

**Statement of Congressman Joseph Crowley
Hearing on Infectious Diseases: A Growing Threat to America's Health and
Security
June 28, 2000**

Mr. Chairman, thank you for calling this important and timely hearing. As a fellow Member from New York, you understand that New Yorkers are concerned about the threat of global infectious diseases.

I would also like Ranking Member Gejdenson for his leadership on this critical issue as well.

As many of you know, in August of 1999, my constituents were shocked to learn that an outbreak of West Nile Encephalitis had surfaced for the first time in the Western Hemisphere in the heart of my district in Queens and the Bronx.

This outbreak was a wake up call for every American. It illustrates that the global community has truly become the local community. As demonstrated by West Nile Encephalitis, HIV/AIDS and tuberculosis, a disease respects no borders. An outbreak in Africa, Europe, Asia or South America can travel to U.S. shores within days.

No longer can diseases occurring in far off lands be ignored. They pose a direct threat to the national security of our great country and must be addressed by the U.S. government, this Congress and the international community as a whole. Diseases can not be seized by Customs and they do not apply at the U.S. Embassy for a visa. The only way to halt them is to target them at the source.

But today, we are losing this battle.

Over 10 million children under the age of five die each year in developing nations from preventable causes.

13 million people die annually from infectious diseases, most of which are preventable or curable.

HIV/AIDS has become the world's leading infectious disease threat with over 16,000 new infections daily, of which, 7,000 of these are young people between the ages 10-24.

The 21st century faces an estimated 33.5 million people around the world who are infected with HIV/AIDS. The spread of HIV/AIDS can be prevented with an urgent and necessary investment. We must stand at the forefront of tackling this disease, in order to secure the health and prosperity of our future generations.

In April, I visited Africa with UNFPA to examine family planning clinics and HIV/AIDS control efforts in Malawi. In Malawi, I witnessed the devastating effects of HIV/AIDS

first hand. Everyone I met in Malawi suffered tragedy due to the HIV/AIDS epidemic. In some instances, whole families have been lost. One gentleman told me that every time he had a position open in his business, he had to hire three people because he knew that within the year, two would either be dead or caring for a sick or dying family member with AIDS.

In sub-Saharan Africa, the AIDS epidemic is dramatically changing the structure of society. Traditional extended families are falling apart, forcing children and adolescents to leave school in order to provide for their families. Poverty is skyrocketing and a vicious spiral of decline is setting in that further destabilizes already volatile countries.

In Latin America, the 1980's are known as the "lost decade" because of the economic devastation suffered in the region.

If the trends in Africa are not reversed, the 21st century will become known as the century that we lost Africa. And now, the National Intelligence Council reports that Asia may be next.

But AIDS isn't our only concern.

The World Health Organization just published a report titled "Overcoming anti-microbial resistance."

The main message of the report is, and I quote: *The underuse and misuse of recent health breakthroughs has been catastrophic for people living and working in developing countries. [...] We are now beginning to pay for our neglect – a price over and above the tragedy and suffering infectious diseases inflict on millions of people annually. Our failure to make full use of recently discovered medicines and products means that many will slip through our grasp.*

The WHO is talking about a "window of opportunity" for us to control the most dangerous infectious diseases – but this window will soon be closing!

Wealthy countries like the US have focused almost exclusively on fighting disease within their own borders, while failing to help eliminate them globally. Proliferating elsewhere, many bacteria, viruses and parasites mutate, become drug resistant and venture back to wealthy countries via modern transportation.

Although multi-drug therapies have cut HIV/AIDS deaths in the US by two-thirds to 17,000 annually since 1995, emerging microbial resistance to such drugs and continued new infections will sustain the threat.

Because of this danger, the Clinton Administration has formally designated AIDS as a threat to U.S. national security. Additionally, the United Nations Security Council has held joint meetings with relevant UN Councils dealing with health and social issues. I

commend these efforts, but more must be done.

As many of you know, I have been joined by over 55 of my House colleagues on my legislation, H.R. 3826, the Global Health Act of 2000. The GHA authorizes \$1 billion in additional resources to improve children's and women's health and nutrition; provide access to voluntary family planning; and combat the spread of infectious diseases, particularly HIV/AIDS.

With the funding authorized in the GHA, the United States would make a giant leap forward in promoting access to healthcare for millions of people around the world.

In today's world, no nation is an island. We are all in this together. Failing to make a commitment to global health now will only cost us more in the long run.

Mr. Chairman, in August, I will be holding a forum on the interconnectedness of globalization and the spread of infectious diseases. This event is cosponsored by the Global Health Council and called: Infectious Diseases in Your Own Back Yard.

Mr. Chairman, given your interest in the topic, as well as the danger to New York and Connecticut, I would like to extend an invitation to you and Ranking Member Gejdenson to join me for this event (date and location in New York to be determined).

Once again, I would like to thank you and Ranking Member Gejdenson for your work on this critical issue.

STATEMENT OF

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U. S. SURGEON GENERAL

ASSISTANT SECRETARY FOR HEALTH

DEPARTMENT OF HEALTH AND HUMAN SERVICES

BEFORE THE

COMMITTEE ON INTERNATIONAL RELATIONS

U.S. HOUSE OF REPRESENTATIVES

June 29, 2000

Good morning. I am Dr. David Satcher, U.S. Surgeon General and Assistant Secretary of Health, Department of Health and Human Services. I am pleased to be here to discuss an important issue: the threat that infectious diseases like malaria, HIV/AIDS, and tuberculosis pose to global stability and what this means for the United States, in terms of health, economics, and foreign policy. I will also review recently launched global initiatives and partnerships that aim to address specific disease problems.

Emerging Infectious Diseases as a Global Issue

From a public health point of view—no less than an economic one—the world has become a global village. Modern factors that connect us culturally, commercially, and physically, such as air travel and the food supply, put us at risk of exposure to microbes with epidemic potential, whether we live in large cities or small rural hamlets. Last year, two Boy Scouts acquired malaria, which is not usually contracted in the United States, from mosquitos at a summer camp in a rural part of Suffolk County, New York. In August and September, 6 people in the northeastern United States and a Canadian who visited New York died from West Nile encephalitis, a viral disease transmitted by mosquitoes. The West Nile virus, which is carried by migratory birds in Asia, Africa, and Europe, had never before been reported in the Western Hemisphere. Also from July 1999 to January 2000, 56 persons in South Texas were recognized with dengue fever, 17 of whom acquired their illness in the United States.

The HIV/AIDS pandemic continues to cause the death of children and young adults all over the world, and age-old diseases like malaria and tuberculosis are resurging, often in drug-resistant forms. For instance, a new strain of tuberculosis (strain W), which is multidrug resistant and occurs more frequently in HIV-infected people, has now been reported in twelve states. Additionally, 45 states have reported other strains of multidrug-resistant TB. Moreover, a long list of unforeseen infectious disease problems with global impact have emerged in recent years. To give a few examples: in 1997, an avian strain of influenza that had never before been found in humans caused the death of previously healthy people in Hong Kong. This crisis raised the specter of an influenza pandemic similar to the one that killed more than 20 million people worldwide in 1918-1919. In 1997, we learned that vancomycin—an antibiotic of last resort—has begun to lose its power to cure infections caused by *Staphylococcus aureus*, a common bacterium that can cause life-threatening illness. And in 1998, a new encephalitic disease of pigs and humans was discovered in Malaysia and found to be caused by a previously unknown virus, which has recently been named Nipah virus.

Disease Outbreaks Affect Global Prosperity and Security

The impact of infectious diseases goes far beyond devastating effects on individuals and families. The cumulative burden of morbidity and mortality caused by infectious diseases like malaria, HIV/AIDS, and multidrug-resistant tuberculosis affects economic growth in many countries and decreases global prosperity and security.

Many countries in Africa, especially those in Sub-Saharan Africa, are experiencing explosive HIV epidemics that are taking an enormous toll in human life and having a profound economic

and social impact. It is estimated that 22 million adults and 1 million children are currently living with HIV/AIDS in the Sub-Saharan region of Africa and an estimated four million new infections occur in that area each year. The AIDS death toll is rapidly rising, with an estimated 5,500 funerals occurring each day in the region. The epidemic is wiping out gains in life expectancy. By the year 2010, demographers project that life expectancy will fall from 66 to 33 years in Zambia and from 70 to 40 years in Zimbabwe. By 2005, 61 of every 1,000 infants born in South Africa are expected to die from AIDS before the age of one year.

Outbreaks of infectious disease can interfere with trade, agriculture, tourism, and foreign investment, and epidemic-related trade embargoes and restrictions on travel and immigration can cause friction with trading partners. The 1997-98 Rift Valley Fever (RVF) outbreak in eastern Africa, which killed both humans and livestock, harmed the Kenyan dairy industry, as well as trade in sheep, goats, cows, and camels. In Somalia, where 96% of export income is generated by the sale of sheep, camels, and goats to the nations of the Persian Gulf, the economy was devastated by trade embargoes intended to prevent the spread of RVF via imported animals. The agricultural costs of controlling outbreaks can also be considerable when large numbers of disease-carrying food animals must be slaughtered, such as cows during the "mad cow disease" outbreak in the United Kingdom; chickens during the avian influenza outbreak in Hong Kong; and pigs during the Nipah virus outbreak in Malaysia.

Organizations concerned with economic development, including the World Bank and the World Trade Organization, have concluded that disease reduction efforts are a necessary part of global development strategies. Infectious diseases can sap the strength of a nation's workforce and deplete its medical resources, making it more difficult to compete in the global economy. Each year, for example, loss of productivity due to malaria has decreased economic growth in Sub-Saharan African countries by as much as 1.3 percent. Had malaria been eliminated 35 years ago, Africa's current annual gross domestic product would be \$400 billion, rather than \$300 billion—a loss that is nearly five times greater than all development aid provided to Africa last year.

Security experts, including members of the National Intelligence Council, are concerned that large outbreaks like the HIV/AIDS pandemic may devastate poorer nations. In January 2000, a special session of the U.N. Security Council addressed the HIV/AIDS epidemic in Africa as a global security threat. Social and political strains exacerbated by infectious disease problems in developing and former communist countries may challenge democratic development and political transitions and possibly contribute to humanitarian emergencies and military conflicts. The security community is also concerned that an infectious outbreak might be caused intentionally by a terrorist group or as a weapon of war.

U.S. Investment in International Health

Public health programs are wise investments, both domestically and globally. Successful disease eradication programs save significant amounts of money. The eradication of smallpox in 1977, with support from CDC and USAID, proved to be a remarkably good economic investment. A total of \$32 million was spent by the United States over a 10-year period in the global campaign

to eradicate smallpox. The entire \$32 million has been recouped every 2½ months since 1971 by saving the costs due to smallpox infection including medical care, quarantine, and other costs, and the cost of smallpox prevention including costs of the vaccine and its administration, and other costs. Achievement of global polio eradication will offer similar benefits: More than \$230 million will be saved annually in the United States alone in polio vaccine and administration when polio eradication is achieved. Globally, more than \$1.5 billion will be saved annually.

In the coming years, the impact of global infectious diseases on the United States is likely to increase. Infectious disease problems may endanger U.S. citizens at home and abroad, threaten U.S. armed forces deployed overseas, and exacerbate social and political instability in countries in which the United States has significant economic and foreign policy interests. U.S. investment in global health may therefore yield multiple benefits, including:

Preserving domestic health. The United States cannot protect the health of its citizens without addressing infectious disease problems that are occurring elsewhere in the world. Helping other countries to control disease outbreaks—Ebola in the Democratic Republic of the Congo, avian influenza in Hong Kong, or dengue fever in Mexico, for example—prevents those diseases from spreading to the United States, saving lives and dollars. It also reinforces our diplomatic efforts in this area by demonstrating U.S. commitment to global health. In addition, U.S. participation in international outbreak investigations provides U.S. scientists with opportunities to focus on new or drug-resistant pathogens and consider how best to control, prevent, and treat them, before they arrive on our shores.

Outbreaks in other countries may affect Americans who travel overseas, as well as U.S. military forces stationed abroad, who have historically experienced higher rates of hospitalization from infectious diseases than from battlefield combat and noncombat injuries.

Enhancing the U.S. Economy. Improvements in global health can enhance the U.S. economy in direct and indirect ways. Domestic health care costs may be reduced by decreasing the number of cases of imported diseases and by eradicating diseases currently included in childhood vaccination programs. Moreover, as noted by Treasury Secretary Lawrence Summers, the United States has an enormous economic stake in the successful human and economic development of the poorest countries. As poor countries grow richer, they tend to become the fastest growing markets for U.S. goods and services. At the present time, developing countries account for 42% of all U.S. exports.

Advancing U.S. foreign policy interests. Health is an area of concern for all nations, and international projects that address infectious disease issues can build bridges and ease tensions between the United States and other nations. Protecting human health and reducing the spread of infectious diseases is one of the Secretary of State's strategic goals for international affairs, recognizing the importance of global health issues to the national interests of the United States. Investments in global health clearly benefit the American people by reducing the threat to public

health in the United States, but such investments also pay dividends through improved bilateral relationships, conditions for economic development and trade, and regional stability. Benefits provided by health investments can also accrue to our national security through activities such as redirecting the work of biological weapons scientists in the Russian Federation and Newly Independent States of the former Soviet Union to fight global diseases.

Investing in global health is an area in which global humanitarian needs and U.S. national interests coincide. As the Institute of Medicine stated in its 1997 report, *America's Vital Interest in Global Health*, "the direct interests of the American people are best served when the U.S. acts decisively to promote health around the world." In the area of emerging infectious diseases, the United States can lead with its strengths in science and technology to protect American and global health while projecting U.S. influence internationally. While we must continue to respond to other countries' requests for outbreak assistance, we must also support international efforts to build global public health infrastructure to detect, control, and prevent infectious diseases.

Partnerships and Initiatives

The challenge ahead outstrips the means available to any one agency, organization, or country. To quote Dr. Gro Bruntland, Director-General of the World Health Organization (WHO), when it comes to public health, "solutions, like problems, have to be global in scope." If we pool our talents and resources, a great deal may be accomplished.

Many U.S. agencies are involved in interagency efforts to combat infectious diseases. For example, earlier this month an Interagency Task Force on Antimicrobial Resistance, that is co-chaired by CDC, the Food and Drug Administration (FDA), and the National Institutes of Health (NIH), and includes seven other agencies, published a draft *Public Health Action Plan to Combat Antimicrobial Resistance*. The Action Plan provides a blueprint for coordinated federal actions and will be used by agencies to develop programs to effectively combat the emergence and spread of antimicrobial resistance through better surveillance, prevention, research, and new products for treatment and diagnosis. The growing threat of resistance is also the topic of a newly released WHO report, *Overcoming Antimicrobial Resistance*, which outlines WHO's recommendations for addressing the worldwide problem.

As another example of collaborative efforts, in 1995, I had the honor of chairing a working group on emerging infectious diseases for a committee of the National Science and Technology Council—the Committee on International Science, Engineering, and Technology (CISSET)—which was charged with conducting a government-wide review of our ability to protect our citizens from emerging infectious diseases. In September 1995, the Committee issued a report which concluded that existing mechanisms for surveillance, response to, and prevention of outbreaks of new and reemerging infectious diseases were inadequate, both at home and abroad. The report described the seriousness of infectious diseases and problems of antimicrobial resistance in the United States and made specific recommendations that became the basis of a 1996 Presidential Decision Directive (PDD) that established a new national policy. The Directive called for a

coordinated U.S. government response to address the growing health threats posed by infectious diseases.

The PDD called for the establishment of an interagency Emerging Infectious Diseases (EID) Task Force, which I co-chaired with Dr. Kerri-Ann Jones, the former Associate Director for National Security and International Affairs of the White House Office of Science and Technology Policy (OSTP). The President charged the EID Task Force with implementing the PDD. U.S. agencies are working through diplomatic channels to make the issue of emerging infectious diseases a priority with other nations, in accord with the PDD and with the State Department's Strategic Plan for International Affairs. Emerging infectious disease issues are also on the agenda of the Group of Eight Nations and the Asian Pacific Economic Cooperation (APEC). In addition, they are under consideration in bilateral talks with Japan, South Africa, Mexico, the European Union, and the Russian Federation.

U.S. agencies are also providing advice and technical support to global health initiatives that involve foreign governments, WHO, development banks, foundations, non-governmental organizations (NGOs), and private companies. The aim of these initiatives is to use the combined expertise, experience, and resources of many partners to identify and implement the most efficient and effective methods for detecting, controlling, and preventing infectious diseases. Global collaborations include:

- ***HIV/AIDS Initiatives.*** The U.S. Government has joined the International Partnership Against HIV/AIDS in Africa to mitigate the effects of the growing HIV/AIDS pandemic. The Partnership, coordinated by UNAIDS, includes African governments, NGOs, USAID, CDC, and other U.S. Federal agencies, aid agencies representing major donor governments, and the private sector. In July 1999, as part of this effort, the Clinton Administration launched the Leadership and Investment in Fighting an Epidemic (LIFE) initiative, which provides support to fourteen countries in Africa and India for reducing HIV transmission, improving treatment of HIV/AIDS and opportunistic infections, and strengthening national capacities to collect disease surveillance data and manage national HIV/AIDS programs.
- ***Malaria Initiatives.*** WHO's **Roll Back Malaria** program aims to reduce deaths from malaria by 50% by 2010. This will be accomplished by increasing access to treatment, promoting bednet protection against malaria-carrying mosquitoes, and developing new products for the prevention and treatment of malaria. Specific U.S.-backed initiatives that contribute to the Roll Back Malaria partnership include:
 - ▶ **Malaria Vaccine Initiative**, which accelerates the development and field-testing of promising malaria vaccine candidates. This initiative was created through a grant from the Bill and Melinda Gates Foundation to the Program for Appropriate Technology in Health.
 - ▶ **Medicines for Malaria Venture**, a public-private sector initiative that develops antimalarial drugs and drug combinations for distribution in poor countries.

- ▶ **Multilateral Initiative on Malaria**, currently led by NIH's Fogarty International Center, is a multi-partner effort which fosters global collaboration and coordination to maximize the impact of scientific research against malaria in Africa.
- ▶ **The African Integrated Malaria Initiative**, a USAID-sponsored initiative that enhances integrated malaria treatment and prevention in Kenya, Malawi, Zambia, and Benin.
- ▶ **Vaccine Research Plan**, the NIAID has developed a research plan for malaria vaccine development.

- **Tuberculosis Initiatives.** The goal of the *STOP TB Initiative* is to accelerate social and political action to stop the spread of tuberculosis around the world. One of its objectives is to promote the implementation of the Directly Observed Treatment Short-course strategy (DOTS). The effective implementation of DOT in NYC, in response to the epidemic in the late 1980s - early 1990s, has served as a model nationally and internationally. The *STOP TB Initiative* includes research institutions, private companies, donor organizations, government agencies, and NGOs.

- **Vaccine Initiatives.** The elimination of malaria, HIV/AIDS, and tuberculosis will ultimately depend on the development of effective and inexpensive vaccines. Research on the development of vaccines against these three important infectious diseases is a priority of the NIH. In his State of the Union message, President Clinton announced the Millennium Initiative, a public-private sector collaboration to overcome technical and economic barriers to the development and delivery of such vaccines for use in developing countries. This Initiative involves new partnerships among the world's major pharmaceutical and vaccine companies, foundations, and international organizations.

A global effort is also underway to strengthen childhood immunization programs and to bring a new generation of recently licensed vaccines into use in developing countries. These include vaccines against hepatitis B and childhood meningitis and against respiratory infections, which are the leading cause of death in children under five. Substantial resources for this purpose have been pledged by the Bill and Melinda Gates Foundation and by the Global Alliance for Vaccines and Immunization (GAVI).

- **Polio Initiatives.** The Global Polio Eradication Initiative, spearheaded by WHO, Rotary International, CDC, and UNICEF, is a good example of protecting the Nation's health by addressing infectious disease problems elsewhere in the world. Widely endemic in 125 countries on 5 continents in 1988, polio is now concentrated only in parts of sub-Saharan Africa and South Asia. At the end of 1999, there were 30 remaining polio-infected countries. However, no country can be free of the fear of polio until all are free.
- **Measles Initiatives.** The United States, through CDC and USAID, is also participating as a partner with the Pan American Health Organization in the elimination of measles from the Western Hemisphere by the end of 2000. Measles is at record low levels in the Americas, with approximately 300 cases reported from only 8 countries so far in 2000.

Through this effort, in combination with ongoing success in increasing measles immunization levels in the United States to their highest levels ever, interruption of measles transmission has been achieved in the United States and the health of U.S. citizens protected.

- **APEC Initiative.** On July 16, CDC and DOD will host a meeting of APEC representatives from developed and developing countries to consider the establishment of a regional system that integrates capacities for disease surveillance, laboratory diagnosis, outbreak response, research and training, and disease prevention. This initiative was proposed by the interagency CISET Task Force on Emerging Infections.

The West Nile Encephalitis Outbreak

Before I conclude, I would like to touch again on last year's West Nile virus (WNV) outbreak as an example of the domestic health benefits that accrue when U.S. scientists focus on diseases that occur in other countries. Because several agencies had done work on WNV or closely related viruses, diagnostic tools and information on disease prevention were readily available when the outbreak occurred.

CDC and its partners on the WNV interagency coordination committee have issued guidelines to help local health departments address WNV this summer and in the future. In the short run, the guidelines recommend intensified monitoring to determine when and where WNV is circulating in local birds and mosquitoes. Over the short and long run, they recommend the development of emergency mosquito control plans and implementation of integrated pest management techniques. In addition, NIH will continue to explore the potential public health use of new vaccines or antiviral drugs to prevent or treat WNV infections in humans and animals.

The 1999 outbreak epicenter was in the New York City area with infected birds or mosquitoes also identified in Long Island, upstate New York, Connecticut, New Jersey, and Maryland. As the major bird migration routes from this area run south along the Atlantic and Gulf Coasts, this virus poses a threat to humans, wildlife, and domestic animals in coastal states that are either adjacent to or south of the New York City/Connecticut/New Jersey area. Ultimately the virus could appear in other parts of the country as well.

CDC, in coordination with U.S. Department of Agriculture, the Department of Interior, and the Environmental Protection Agency continue to monitor for WNV activity and seek ways to prevent future outbreaks. CDC is working with State and local health departments in this geographic area of risk to develop and implement surveillance for West Nile and other arboviruses so that they can identify and rapidly respond to outbreaks of WNV should they occur. CDC is providing \$4.1 million to 19 state and local health departments on the eastern seaboard and Gulf of Mexico to assist in planning and implementing a program for WNV surveillance and laboratory diagnosis. An additional \$3.1 million will be awarded to enable other parts of the country to diagnose WNV infection if needed.

As with many emerging infectious disease problems, addressing the WNV outbreak requires a strong partnership between public health and veterinary agencies and the public. There are things that individuals can do to reduce their risk of exposure to WNV. These include eliminating any areas of standing water around the house; minimizing outdoor activities at dawn, dusk, and in the early evening; wearing long-sleeved shirts and pants when outdoors; applying insect repellent sparingly to exposed skin and clothing; and reporting sightings of dead birds to the local health department.

Conclusion

Addressing the threat of emerging infectious diseases depends on international cooperation. Our confidence that nations can come together to improve global health is reinforced by the success of the effort to eradicate smallpox, and the substantial progress made toward the worldwide eradication of polio and guinea worm disease.

We do not underestimate the difficulty of this work, especially when it involves countries that cope with civil unrest, refugee camps, internal migrations, troop movements, or malnutrition. Helping these countries participate in global efforts to combat infectious diseases is a challenging task—one that requires a sustained effort over many years and a willingness to persist in the face of repeated setbacks. It requires strategic investments that build on host countries' strengths and encourage multi-national assistance.

We must not stop now. The potential for saving human lives by preventing infectious diseases overseas is tremendous. Although U.S. agencies participate in international health projects in many parts of the world, much more could be done, at relatively low cost, if we have the political will, the national leadership, and the support of the American people. Promoting the international effort to combat emerging diseases is a natural role for the United States, and one that benefits both the United States and the global community. We do not know where the next emergency will arise or what its cause will be, but we can be assured that global health emergencies will continue, and we must have the flexibility to be prepared to respond accordingly.

Thank you for the opportunity to testify before the Committee. I will be happy to answer any questions you may have.

Statement by

**Dr. David L. Heymann
Executive Director for Communicable Diseases
World Health Organization**

Before the

**Committee on International Relations
U.S. House of Representatives**

29 June 2000

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Against Infectious Diseases”**

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Summary

Infectious diseases are the world's biggest killer of children and young adults. They account for more than 13 million deaths a year – one in two deaths in developing countries. The majority of these deaths are caused by just a handful of illnesses – TB, malaria, AIDS, pneumonia, diarrhoeal diseases and measles.

The impact of these diseases extends far beyond the suffering of those afflicted. Nor are infectious diseases just a problem of developing countries. New information shows that infectious diseases are also threatening economic growth, globalization and international security. In the last three months, groundbreaking reports by Harvard, WHO and the Central Intelligence Agency have documented that:

- ◆ The *economic costs* of malaria are much higher than previously estimated. Africa's GDP would be up to \$100 billion greater this year if malaria had been eliminated years ago.
- ◆ The *global spread* of drug resistant TB is occurring much more quickly than anticipated. In one year's time, drug resistant TB in Germany and Denmark recently increased by 50%.
- ◆ The *security threat* of AIDS and other infectious diseases is much greater than expected. The National Intelligence Council has issued a report stating its concern over the implications infectious diseases have for U.S. national security and destabilization of foreign governments.

A Preventable Social Burden

This suffering -- and its social consequences -- should not be happening. We are the first generation ever to have the means of protecting the world from the most deadly and common infectious diseases. Today, we possess the knowledge -- and the drugs, vaccines and commodities -- to prevent or cure tuberculosis, malaria, HIV, diarrhoeal diseases, pneumonia and measles practically anywhere on our planet.

Immunization campaigns have eradicated smallpox, are on the verge of eradicating polio, and are rapidly decreasing deaths caused by measles. Vaccines have greatly reduced illness and death during the last 30 years, but the highest burden diseases still remaining among the poor -- such as TB, malaria and HIV -- cannot currently be prevented with vaccines. Fortunately, other low-cost treatments and preventive measures are available now for fighting these diseases.

TB, malaria and HIV can be prevented or treated with medicines and prevention tools that usually cost a few dollars -- often only a few cents. Thanks to health care strategies developed in the past two decades, TB, malaria and HIV can now be affordably controlled even in the poorest communities. For example, TB deaths have decreased seven-fold in parts of India through the effective use of antibiotics. Malaria deaths are no longer common in Viet Nam because of advances in the use of anti-malarials and insecticide-treated bednets. Increased condom use and health education have enabled Thailand and Uganda to reduce the spread of HIV.

Our Window of Opportunity is Closing

If we fail to make *wide* and *wise* use of these medicines we have available today, they will likely slip through our grasp due to antimicrobial resistance. Antimicrobial resistance is a natural biological phenomenon amplified many-fold owing to human misuse and neglect. Drug resistance is the most telling sign that we have failed to take the threat of infectious diseases seriously. It suggests that we have mishandled our precious arsenal of disease-fighting drugs, both by overusing them in developed nations

and, paradoxically, both misusing and underusing them in developing nations. In all cases, half-hearted use of powerful antibiotics now eventually results in less effective drugs later.

We may only have the next decade or two in which to make optimal use of these medicines, control the spread of the most dangerous infectious diseases, and reduce the threat of drug resistance. We are literally in a race against time to bring down levels of infectious diseases worldwide, before the diseases wear the drugs down first.

While many exciting research efforts are currently underway, there is no guarantee that they will yield new drugs or vaccines in the near future. Since 1970, no new classes of antibacterials have been developed to combat infectious diseases in humans. On average, research and development of anti-infective drugs takes 10 to 20 years. Currently, there are no new drugs or vaccines ready to emerge from the research and development pipeline. Industry must be empowered to do its job better, producing products to address the market failure.

Our grandparents lived during an age without antibiotics. We don't want our grandchildren to face the same situation. We have the means to ensure antibiotics remain effective, but we are running out of time. Our window of opportunity to help those impoverished by infectious diseases is closing.

A Massive Effort is Required

This year – at the onset of a new millennium – the international community is beginning to show its intent to turn back these microbes through massive efforts against diseases of poverty – diseases which must be defeated now, before they become resistant. When diseases are fought wisely and widely, we can contain drug resistance, facilitate sustainable development, stimulate economic growth, ensure greater global public health security, and most importantly, save human lives.

1. THE PROBLEM

“Infectious diseases are the leading killer of young people in developing countries.”

SYNOPSIS *Infectious diseases are now the world's biggest killer of children and young adults. They account for more than 13 million deaths a year - one in two deaths in developing countries. Over the next hour alone, 1 500 people will die from an infectious disease - over half of them children under five. Of the rest, most will be working-age adults - many of them breadwinners and parents.*

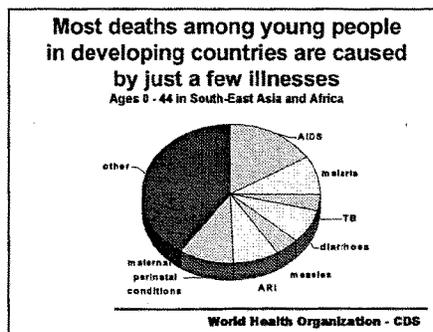
But infectious diseases are not just a developing country problem. Unless checked, they threaten the industrialized countries as well. Old scourges such as tuberculosis and diphtheria have occurred in explosive epidemics in Europe and other industrialized countries. In our global economy, the \$1.7 billion in lost tourism resulting from a 1994 plague outbreak in India not only affected hotels in New Delhi, but also travel agents in New Jersey. Even today, no country is safe from the threat of infectious diseases.

A. Six diseases cause 90% of infectious disease deaths

A physician's reference book lists many infectious diseases, yet just six -- tuberculosis, malaria, diarrhoeal diseases, pneumonia, measles and more recently HIV/AIDS - account for almost 90% of infectious disease deaths.

Every three seconds a young child dies - in most cases from an infectious disease. In some countries, one in five children dies before turning five. Every day 3 000 people die from malaria - three out of four of them children. Every year 1.5 million people die from tuberculosis and another eight million are newly infected.

But the most staggering number is “one,” as behind each and every death lies an unexpected human tragedy. Because these diseases affect mainly young children and adult breadwinners, their impact on



families can be catastrophic. Children may lose one or both parents to an infectious disease. The AIDS epidemic alone has left over eleven million children orphaned.

Tuberculosis (TB) Tuberculosis, a disease once thought to be under control, has returned with a vengeance to kill 1.5 million people a year – and .5 million more in combination with HIV/AIDS. Nearly two billion people - one-third of the world's population - have latent TB infection. Together they constitute a huge potential reservoir for the disease. TB is one of the biggest infectious killers of adolescents and adults. It is also a leading cause of death among women.

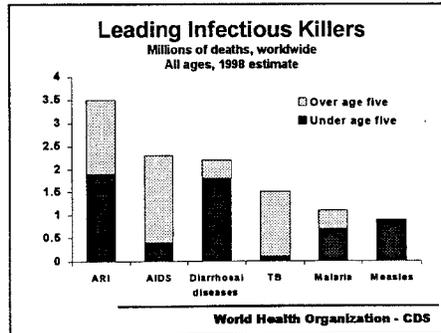
To make matters worse, infection with HIV weakens the immune system and can activate latent TB infection. It is also believed to multiply the risk of initial infection with TB. About one-third of all AIDS deaths today are caused by TB.

Malaria Malaria kills over one million people a year - most of them young children. Most malaria deaths occur in sub-Saharan Africa, where malaria accounts for one in five of all childhood deaths. Women are especially vulnerable during pregnancy. They are more likely to die from the disease, suffer miscarriages or give birth to premature, low-weight babies.

An estimated 300 to 400 million people are infected by this mosquito-borne parasite globally each year. Malaria can rapidly overwhelm a young child causing high fever, convulsions and breathing difficulties. With the onset of cerebral malaria - an acute form of the disease - the child lapses into a coma and may die within 24 hours.

Pneumonia Acute respiratory infections (ARIs) are responsible for 3.5 million deaths each year. Pneumonia, the deadliest ARI, kills more children than any other infectious disease. Most of these deaths (99%) occur in developing countries. Yet in industrialized countries childhood deaths from pneumonia are rare.

Pneumonia often affects children with low birth weight or those whose immune systems are weakened by malnutrition or other diseases. Without treatment, pneumonia kills quickly. The influenza virus is another cause of lung infection that can lead to pneumonia. There is very little information available on the number of influenza deaths in developing countries. However, in the United States alone, the disease kills 10 000-40 000 people in an average influenza season.

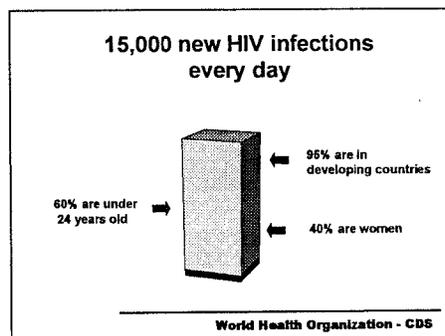


HIV/AIDS At the end of 1999, an estimated 33.6 million individuals were living with HIV worldwide. There is still no cure on the horizon. Worst affected is sub-Saharan Africa. In some countries, up to one in four of the adult population are now living with HIV/AIDS. In Zimbabwe, 20%-50% of pregnant women in some areas are infected with HIV and risk infecting their newborn children. An increasing number of maternal deaths are now due to infections contracted by HIV-positive women during delivery. In many countries, life expectancy and child survival rates have plummeted. In Botswana life expectancy at birth has fallen from 70 to around 50 years.

Diarrhea Diarrhoeal diseases claim nearly two million lives a year among children under five. They are so widespread in developing countries that parents often fail to recognize the danger signs. Children die simply because their bodies are undernourished through lack of food and then are weakened through rapid loss of fluids.

Diarrhoeal diseases impose a heavy burden on developing countries - accounting for 1.5 billion bouts of illness a year in children under five. The burden is highest in deprived areas where there is poor sanitation, inadequate hygiene and unsafe drinking water. In certain developing countries, epidemics of diarrhoeal diseases such as cholera and dysentery strike down adults and children alike. Other major diarrhoeal diseases include typhoid fever and rotavirus which is the main cause of severe dehydrating diarrhea among children.

Measles Measles is the most contagious disease known to man. It is a major childhood killer in developing countries - accounting for about 900 000 deaths a year. The measles virus may ultimately be responsible for more child deaths than any other single microbe - due to complications from pneumonia, diarrhea and malnutrition.



B. Impact on sustainable development

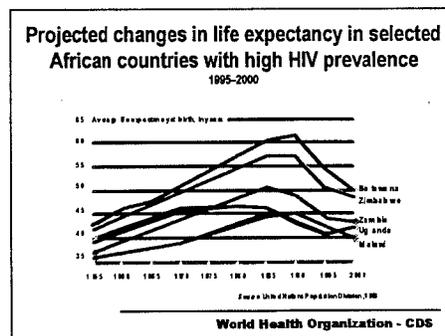
The high death toll from infectious diseases is only part of the story. Many infectious diseases cause sudden repeated bouts of debilitating illness throughout the year - keeping children away from school and preventing adults from working or caring for their children. Serious illness is one of the major reasons why poor people remain poor. It is a major cause of underdevelopment in many countries today. The interrelationships between health and development are so intertwined, that it is impossible to address one without the other. Poverty breeds infections; infections breed poverty.

The road out of this vicious cycle begins with efforts that contribute to a person's ability to meet basic needs. Health is a minimum requirement for development. People cannot contribute to the economic progress of their families and communities when they are rendered helpless or die from infectious diseases. By fighting infectious diseases, major obstacles to development are removed.

In the past two decades, the AIDS epidemic has made this interdependence obvious. One example is the relationship between AIDS and education. Prevention strategies are much more difficult where basic literacy skills are absent. At the same time, efforts to increase literacy have become an uphill struggle in many countries where the workforce has been devastated by HIV. In the United Republic of Tanzania, the investments in education required to yield expected standards have been increased substantially because HIV/AIDS is affecting an increasing number of teachers. Additionally, 20% fewer children attend school because parents are ill or dying as a result of HIV/AIDS.

In the past 25 years, we have witnessed significant progress in sustainable development. On average, life expectancy has increased by nine years. Since 1975, child death rates in developing countries have been cut nearly in half. But this progress must be tempered with the sobering reality that one out of two people in developing countries will still die from an infectious disease and by the fact that HIV/AIDS is changing their national demography.

Poverty and underdevelopment cannot be made to disappear by magic. To make progress, concrete and measurable contributions must be made in a coordinated way to remove the obstacles that prevent people from reaching their full human, economic and social potential.



C. Economic impact

The economic burden of malaria alone has taken a staggering bite out of Africa's economy. Africa's GDP would be up to \$100 billion greater this year if malaria had been eliminated years ago, according to new research by Harvard economist Jeffery Sachs, the London School of Hygiene and Tropical Medicine, and WHO. This extra \$100 billion would be, by comparison, nearly five times greater than all development aid provided to Africa last year.

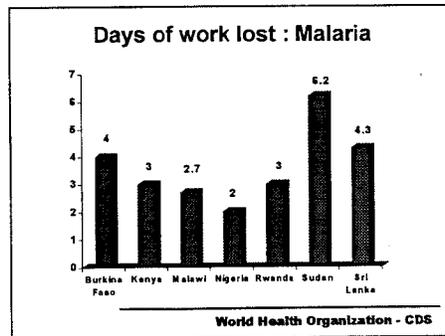
Malaria is hurting the living standards of Africans today and is also preventing the improvement of living standards for future generations. In addition to the cost of lost working days, the cost of treatment for repeated bouts of malaria can also be a huge burden for the poorest families. In Nigeria, it has been estimated that subsistence farmers spend as much as 13% of total household expenditure on malaria treatment.

Tuberculosis also inflicts an unnecessary handicap on the economic development of low-income countries. Because of these and other costs, tuberculosis may cost the Thai economy up to \$7 billion by the year 2015. In India, the estimated loss of economic output due to TB deaths reaches nearly \$400 million every year.

TB takes its toll primarily among people in their most productive wage-earning years, frequently sending once self-sufficient families into destitution. First, cash income is lost when the wage earner is too ill to work. In Zambia, for example, an average of five dependants are supported in the household by the main income earner, making the loss of these wages an often insurmountable hardship for the entire family.

Next, capital is lost when a family sells animals, land and investments to pay for healers, medicines and hospital bills, where low-cost health care is not available from NGOs or government health services. It is common in developing countries for the direct costs of seeking diagnosis and undergoing treatment from private practitioners to surpass the average annual income of a family. Because of these costs, a patient may not be able to afford to complete treatment.

On a larger scale, the output of factories and corporations suffers when their employees miss months of work. Often, benefits must be paid and new employees must be trained. TB also causes disruption in the



workplace when contagious employees transmit the infection to their co-workers. One study has shown that 68 percent of all health professionals in Thai hospitals are infected with the TB bacilli.

Companies in the United States are also affected. In a shipyard in Maine, a labourer infected 417 co-workers with TB bacteria. On an American airline, a flight attendant infected two other members of the cabin crew. And in Phoenix, Arizona, 125 firefighters who voluntarily tested for TB tested positive, representing a dramatic increase over previous years.

D. Impact of globalization

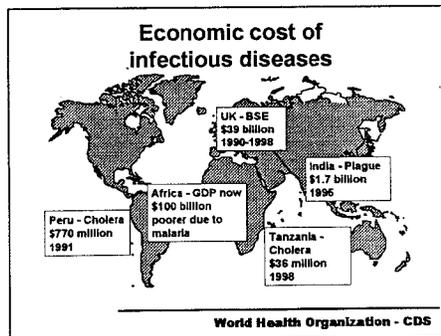
In the Middle Ages deadly plagues were shipped from one continent to another - carried by flea-infested rats on board ships. Today they travel by plane - carried by airline passengers from one corner of the earth to another. And all in a matter of hours.

As the number of international airline passengers has soared from two million a year in 1950 to over 1.4 billion today, the world has been slow to recognize the implications for public health.

Deadly airborne diseases such as pneumonic plague, influenza and TB can easily spread in crowded airport lounges, on a jumbo jet or by passengers after their return home. And infectious diseases can also be carried across borders by their animal or insect hosts. Disease does not respect national boundaries.

In the United States in 1977, over 70% of the passengers on board an airliner grounded for several hours were infected with influenza by a fellow passenger. In 1994, a person with active TB is believed to have infected six fellow passengers on a flight from Chicago to Honolulu.

Published reports show that the majority of multi drug-resistant typhoid cases in the United States originated in six developing countries. In 1978 and again in 1992, poliovirus was imported into Canada by people travelling from western Europe. Eleven people were affected by polio paralysis in the first outbreak - all of them people who had refused immunization. Also in Canada, health care authorities traced two outbreaks of MRSA to a small village in North India.



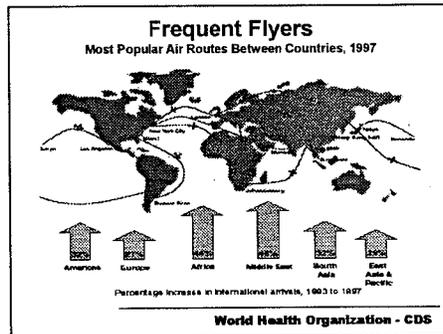
While outbreaks of drug-resistant tuberculosis in western Europe have been shown to originate in countries further east, drug resistance is not merely an issue of immigration. Drug-resistant tuberculosis in eastern Europe is due primarily to lack of implementation of an effective TB control strategy, DOTS (Directly Observed Treatment, Short-course), lack of political will by some governments, and little enforcement of effective guidelines within health care institutions.

In 1996, travelers returning to the United States and Switzerland developed yellow fever. They had not been vaccinated against the disease. This was repeated a few years later when a German photographer returned to Germany and died from a disease shown to be yellow fever.

In the United Kingdom, 1 000 new cases of malaria are imported each year from malaria-endemic countries. There have also been reports of a surprising number of malaria deaths in northern countries following unrecognized infection through a blood transfusion or a once-off mosquito bite near an international airport. Brussels, Geneva and Oslo have all had recent cases of airport malaria. Malaria deaths are not uncommon among travelers who develop unexpected fever after returning to their home country. In northern countries where the disease is rarely seen, doctors may fail to diagnose malaria in time. And in countries where mosquitoes that can carry malaria exist, such as the U.S., the risk of locally transmitted malaria is real.

Infectious diseases can cross borders in other ways too. In 1985, the aggressive tiger mosquito - normally found in Asia - slipped unnoticed into the United States inside a shipment of water-logged used tires from Asia. Within two years the mosquitoes - capable of transmitting yellow fever, dengue and other diseases - had established themselves in 17 States.

In Sub-Saharan Africa, HIV was spread among migrant workers, who later carried the disease back to their homes, and by lorry drivers, who bought sex at truck stops on their way across the continent. Tourism, international travel and migration are all helping to spread disease. The number of refugees and displaced people has increased nine-fold over the past two decades. In 1996, as many as 50 million people worldwide had been uprooted from their homes - 1% of the world's population. Refugees and displaced persons living in overcrowded, unsanitary conditions are at risk of outbreaks of cholera and other waterborne diseases.



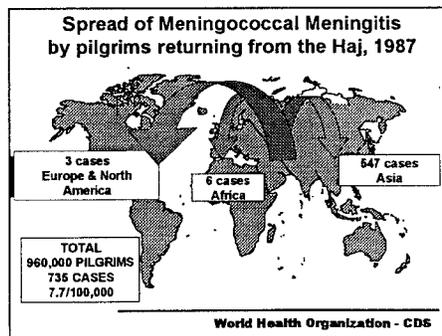
In 1991 in Peru, a ship carrying contaminated water from Asia in its ballast tanks sparked off a cholera epidemic that spread rapidly throughout South and Central America. About 11 000 people died. The International Health Regulations require governments to report all cases of three diseases - cholera, plague and yellow fever. The aim is to provide a rapid international alert system for diseases of international public health importance. The system is designed to steer a course between maximum protection against these diseases and minimum interference with world traffic and trade. But many countries fail to report outbreaks - deterred by the threat of potential economic losses. And the rules are difficult to enforce. Today these regulations are being revised and broadened to provide an early warning about outbreaks of any deadly diseases.

An outbreak anywhere in the world must now be treated as a threat to virtually all countries - especially those that serve as major hubs for international travel. Without an active global disease surveillance system in place to provide an early warning of outbreaks, the export of infectious diseases could become a growth industry.

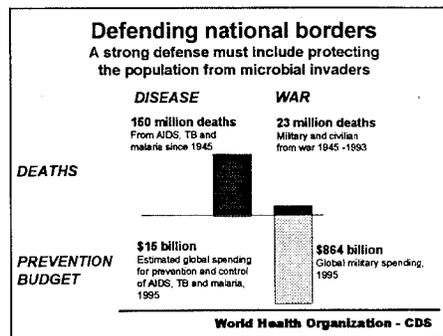
E. Implications for global security

In January of this year, the UN Security convened an unprecedented session devoted exclusively to the threat HIV/AIDS is posing to Africa. The same month, the U.S. National Intelligence Council released a report concerning the potential national security threat infectious diseases pose to the United States. The report found that the United States faces the following security risks (to quote):

- Infectious diseases are likely to continue to account for more military admissions than battlefield injuries. U.S. military personnel deployed at NATO and U.S. bases overseas, will be at low-to moderate risk. At the highest risk will be U.S. military forces deployed in support of humanitarian and peacekeeping operations in developing countries
- The infectious disease burden will weaken the military capabilities of some countries – as well as international peacekeeping efforts – as their armies and recruitment pools experience HIV infection rates ranging from 10 to 60 percent. The cost will be highest among officers and the more modernized militaries in Sub-Saharan Africa and increasingly among FSU states and possibly some rogue states.



- Infectious diseases are likely to slow socioeconomic development in the hardest-hit developing and former communist countries and regions. This will challenge democratic development and transitions and possibly contribute to humanitarian emergencies and civil conflicts.
- Infectious disease-related embargoes and restrictions on travel and immigration will cause frictions among and between developed and developing countries.
- The probability of a bioterrorist attack against U.S. civilian and military personnel overseas or in the United States also is likely to grow as more states and groups develop a biological warfare capability. Although there is no evidence that the recent West Nile virus outbreak in New York City was caused by foreign state or nonstate actors, the scare and several earlier instances of suspected bioterrorism showed the confusion and fear they can sow regardless of whether or not they are validated.



2. THE SOLUTION

“We now have the means to stop infectious diseases with affordable and highly effective solutions.”

SYNOPSIS *Most of the 13 million deaths each year from infectious diseases can be prevented. Effective tools have been developed to fight each of the infectious diseases which take the greatest toll on human lives. The cheapest of these interventions can be bought for less than one U.S. nickel. The most expensive of these lifesavers costs a little more than the price of a few bottles of aspirin. In every case, low-cost health delivery strategies have developed to provide these interventions in the poorest parts of the world.*

* * * * *

Science undermines any excuses for complacency toward infectious diseases. Public health advances in the past decade mean that health professionals cannot stand by while tuberculosis, malaria, AIDS, diarrhoeal diseases, pneumonia and measles kill over 13 million people each year.

Known interventions and delivery systems of existing drugs, vaccines and commodities have been extensively tested and proven to be successful in helping communities in poorer countries to control each of these diseases. It is now technically and operationally possible to halve mortality from six of the world's predominant causes of illness. These efforts can succeed if life-saving medicines and vaccines and other commodities can be accessed by low income people, at an affordable price.

A. Effective, low-cost interventions are available

DOTS Millions of TB deaths could be averted through the use of DOTS (Directly Observed Treatment, Short-course) - an inexpensive strategy for the detection and treatment of TB. This highly-effective health care package involves detection of TB cases through low-cost sputum smear tests, followed by 6-8 months of treatment with a combination of inexpensive drugs. A key component is regular ongoing

Significant Breakthroughs in our Lifetime		
Disease	Effective prevention/ treatment developed	Effective strategy developed
TB	1946 - Streptomycin 1952 - Isoniazid 1970 - Rifampicin	1980s - Directly Observed Treatment, Short-course (DOTS)
Malaria	1946 - Chloroquine	1980s - IMCI, rapid treatment of childhood illness
AIDS	1930s - Latex condom	1980s - Social marketing of condoms
Diarrhoeal disease	1980s - Oral rehydration	1980s - IMCI
ARI - Pneumonia	1928 - Penicillin	1980s - IMCI
Measles	1943 - Vaccine	1970s - Expanded Programme on Immunisation (EPI)
World Health Organization - CDS		

support to the patient. This includes observation to ensure that patients follow the treatment correctly and follow-up sputum tests to determine whether it has been successful. The strategy can detect and cure disease in up to 95% of infectious patients, even in the poorest countries.

Impregnated bednets One in four child deaths from malaria could be prevented if children at risk slept under bednets at night to avoid mosquito bites. Bednets dipped in an insecticide cost about \$4 each and \$0.50 to \$1 a year for a supply of insecticide to re-treat the net. Dip-it-yourself kits are now available for re-treating the nets at home. The cost of a net and one year's supply of insecticide is less than one hour's parking in New York, Paris or Tokyo.

Prevention strategies for HIV/AIDS While expensive antiretroviral drug therapy for HIV/AIDS is still way beyond the means of most developing countries, well-targeted, low-cost HIV prevention and care strategies can have a major impact on the spread of HIV. Millions of new infections could be prevented through low-cost interventions including:

- ◆ use of essential drugs to treat other sexually transmitted infections (which amplify the risk of subsequent infection with HIV)
- ◆ HIV testing and counseling (which can lead to safer sex)
- ◆ access to cheap condoms and, where necessary, safe drug injecting equipment
- ◆ counseling and support for HIV-positive mothers along with antiretroviral drugs and counseling on safe alternatives to breastfeeding
- ◆ promotion of safe injection practices
- ◆ sex education at school and beyond.

Integrated Management of Childhood Illnesses (IMCI) This low-cost strategy can dramatically reduce the 70% of deaths from pneumonia, diarrhea, malaria, measles, malnutrition and other infectious diseases such as meningitis. Seriously ill children are often suffering from more than one condition at the same time - making exact diagnosis difficult. For these children combined therapy can be life-saving. Treatment may include oral rehydration salts to treat diarrhea, low-cost antibiotics to treat pneumonia, antimalarial drugs, and vitamin and mineral supplements. Another key focus is prevention through promoting immunization, breastfeeding and better feeding practices. Millions of lives could be saved every year through the IMCI approach. Correct management of pneumonia and diarrhoeal diseases alone could prevent up to three million deaths a year.

Effective Interventions at Low Cost		
Intervention	Prevention or treatment cost (US\$)	Effectiveness when used consistently and correctly
Six months of chemotherapy to treat TB	\$20	95%
Antimalarials	\$0.05	99%
Years supply of condoms to prevent HIV	\$14	95%
Rehydration salts to treat diarrhoeal diseases	\$0.33	Highly effective
Five days of antibiotics to treat pneumonia	\$0.27	90%
Measles	\$0.25	98%
World Health Organization - CDS		

Childhood vaccinations More widespread use of low-cost vaccines could prevent 1.6 million deaths a year among children under the age of five. Yet today, one in five children are still not fully immunized with the whole package of six basic childhood vaccines: diphtheria, whooping cough, tetanus, polio, measles and BCG.

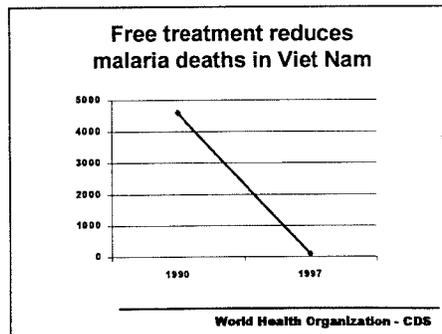
B: Controllable in any country

Wherever a low-cost strategy is available to prevent or treat infectious diseases, individual countries - even low-income countries - can make dramatic progress in getting them under control. But few countries have succeeded without strong political commitment at the highest level, a health care system or coordinated use of NGOs and private practitioners that can deliver services to the entire population, and public demand for action.

In Viet Nam, a four-year onslaught on malaria between 1992 and 1996 succeeded in reducing malaria deaths by over 90% and malaria cases by 40%. A decade earlier the situation was dire. An economic recession had greatly damaged health services, donations of insecticide had been stopped, resistance to antimalarial drugs was rising fast and migrant workers were carrying malaria into areas where it had once been eliminated. In 1991 alone, there were 144 epidemics of malaria in Viet Nam.

Through government commitment, increased funding, and the widespread use of locally produced low-cost tools, health workers have today succeeded in turning the situation around. Locally produced high-quality drugs are now being used to treat cases of severe and multidrug-resistant malaria. Throughout Viet Nam, about 12 million people are protected by house spraying and insecticide-impregnated bednets. In areas where malaria is endemic, insecticide impregnation is provided as a public service - free of charge. The success of the program has attracted international funding - allowing the government to give greater attention to the control of other diseases such as dengue.

In West Africa, a small low-income country - Guinea - has shown what can be done to control TB through government commitment to use the DOTS treatment strategy. Within four years of launching its TB control program, the case detection rate had doubled and almost 80% of patients were being cured. The number of patients who failed to complete the treatment was halved as home visits were used to motivate patients to complete the course.



With three out of four people living in rural areas, the TB program operates through primary health care clinics. It has grown from small beginnings, steadily increasing its reach every year. Today every prefecture is covered. Guinea has also established a network of laboratories for diagnosis and research. When the TB program was launched in 1990 there were only 15 laboratories. Today there are 67.

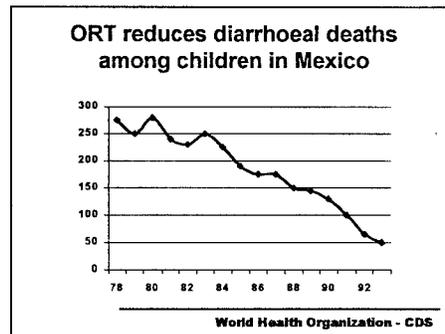
In Mexico the success of efforts to reduce child deaths from diarrhoeal diseases has served as a model for other national programs. Strong political commitment and leadership were key factors in achieving a 60% reduction in death rates within a decade. Even more impressive, the dramatic reduction in death rates was achieved in the face of a nationwide epidemic of cholera during 1990-92. The strategy involved efforts to ensure correct home case management and the availability and use of oral rehydration solutions at home and in health centers.

Meanwhile in Senegal, a rapid broad-based response to the HIV/AIDS epidemic has succeeded in holding the spread of HIV at much lower levels than in many other African countries. The government acted swiftly - putting sex education on the timetable in primary and secondary schools, providing treatment for sexually transmitted infections, and actively promoting the use of condoms.

The results so far have been impressive. As HIV infection rates have risen steadily in other urban centers, the rate in the capital city, Dakar, has stayed below 2%. Over 60% of men and 40% of women aged 15-24 are now reported to be routinely using condoms with casual partners. And, as a result of active condom promotion in Senegal, the condom distribution rate has soared - from 800 000 a year in 1987 to over seven million by 1998.

C. Controllable globally

There is a tendency for some to be fatalistic about our ability to fight infectious diseases in developing countries. But there are plenty of reasons to be optimistic. Efforts to prevent and control diseases in the poorest communities have, and will continue to succeed. These initiatives have been among the most practical and achievable ways of alleviating poverty and furthering social and economic development.



Throughout history only one infectious disease - smallpox - has ever been eradicated. Today efforts are being stepped up to ensure that worldwide polio eradication is completed and certified by the year 2005. Prospects are good. Over the past decade the number of reported cases fell from 35 000 cases to about 5 000. The disease has been eliminated throughout the Americas and transmission now appears to have been halted in the European Region and the Western Pacific Region, including China.

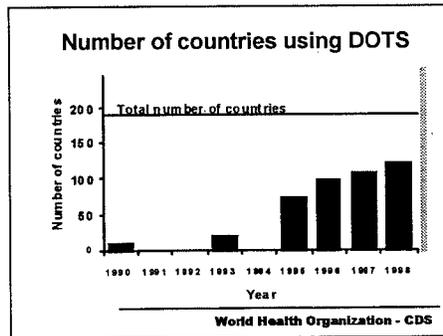
Guinea-worm disease is also on the way toward eradication. Over the past decade the number of cases has been reduced by 90%. The strategy used involves health education, case containment and provision of safe drinking water. Guinea-worm disease is now restricted to 14 countries in Africa.

Efforts are also under way to control or eliminate a range of other diseases. Neonatal tetanus has been eliminated in over 100 countries but the disease continues to kill almost 300 000 newborn babies every year, and tetanus kills about 40 000 mothers as well. The disease could be eliminated through immunizing women with tetanus toxoid during pregnancy and ensuring they have access to a safe delivery. But in 1997, only 64% of pregnant women were immunized and, of the almost 50 countries where the disease is still a public health problem, only 17 had national plans to eliminate the disease.

Almost ten million people have been cured of leprosy over the past 15 years in an effort to eliminate the disease by the year 2000. Today virtually every registered patient is receiving multi-drug therapy. The number of countries where the disease is a public health problem has been reduced from 122 in 1985 to only 28. But leprosy remains a problem in 16 countries which together account for over 90% of all cases.

Global efforts to control measles are being hampered by continuing low immunization coverage rates in some countries. In Africa, fewer than two in three children today are immunized against measles. And in ten countries fewer than half of all children are protected. Mass vaccination campaigns are now being carried out in the highest-risk areas in some regions - especially densely populated deprived urban areas. In the Americas, where the disease is targeted for elimination by the year 2000, over 90% of children are now immunized against measles.

Efforts are also under way to eliminate lymphatic filariasis as a global public health problem. The elimination initiative has been made possible by greatly improved diagnostic techniques and dramatic advances in treatment methods - both for controlling the spread of the disease and for alleviating the



suffering involved. In addition, partnerships with pharmaceutical manufacturers SmithKline Beecham and Merck are ensuring that drugs are available wherever they are needed.

In Latin America, countries have made a political commitment to eliminate Chagas disease. The first initiative was launched in 1991 by Argentina, Brazil, Bolivia, Chile, Paraguay and Uruguay. So far Uruguay has been successful. The strategy used involves screening blood donations and vector control. More recently, the Andean and Central American group of countries have launched similar elimination efforts. One of the key tools being used is a low-cost colorless latex-based insecticide paint developed within this region.

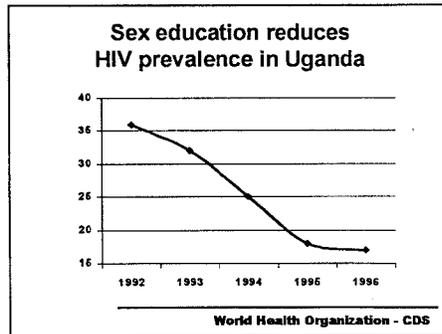
Onchocerciasis (river blindness) has been virtually eliminated in 11 countries in West Africa through a 20-year Programme initially involving vector spraying and now providing once-yearly community-based treatment with the drug ivermectin - supplied free by the manufacturer Merck. In 1994, with partners including the World Bank, the African Programme for Onchocerciasis Control was established to ensure that the disease is eliminated in the remaining 19 African countries where it is a serious health problem.

D. Multisectoral efforts make the difference

The key determinants of health - as well as the solutions - often lie outside the direct control of the health sector. They are rooted in areas such as sanitation and water supply, environmental and climate change, education, agriculture, trade, tourism, transport, industrial development and housing.

The link between environmental quality and health, for example, is critical. Over 10% of all preventable ill-health today is due to poor environmental quality - conditions such as bad housing, overcrowding, indoor air pollution, poor sanitation and unsafe water.

The critical need for collaboration between health and other sectors has been highlighted most recently by efforts to prevent HIV/AIDS. A few governments have attempted to reduce individual vulnerability to HIV/AIDS through a cross-sectoral approach. The aim is to influence infrastructure development plans, laws, education, labor policies and the exercise of human rights, for example, in an effort to create an environment that makes it easier for people to avoid HIV/AIDS. This can involve providing incentives to



enable girls to finish secondary education, boosting job and educational opportunities for women to break the cycle of economic and sexual dependency, and ending the criminalization of marginalized groups such as sex workers and injecting drug users. It can also involve carrying out impact assessments for development projects to foresee ways in which schemes could fuel the epidemic - through accelerating the pace of urbanization, for example, or splitting up families through creating the need for a migrant labor force.

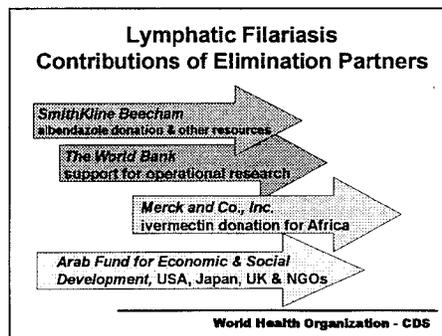
In Thailand, where prostitution remains illegal, the government's pragmatic approach to slowing down the epidemic has brought a significant decline in infections - especially among the young. The multisectoral approach included work with brothel owners to urge 100% condom use in brothels, the launch of mass media campaigns to encourage respect for women and discourage men from visiting sex workers, improved educational and vocational opportunities for women to keep them out of the sex industry and improved access to care, as well as economic and social support for people living with HIV/AIDS.

E. Public/private partnerships also make the difference

In addition to the need for increased collaboration between the different public sectors which impact on health, there is a need to build partnerships with the private sector. WHO's efforts to control diseases are a collaborative effort by global partnerships. WHO has forged strategic alliances with governments, ministries of health in developing countries, international development banks, foundations, the private sector, civil society, non-governmental and international organizations and other UN agencies. The guiding principles of WHO are:

- ◆ "We can't do it alone, so we work in partnership with others."
- ◆ "We can't do it all at once so we set priorities. Priority setting helps focus the world's attention, resources and actions on innovative and cost-effective public health action with specific goals and measurable results."
- ◆ WHO is the health conscience of the world.

Global efforts to eradicate polio, for example, have demonstrated what can be achieved through private sector collaboration. Rotary International, a private sector service organization, has raised \$500 million to fund vast quantities of vaccine for mass immunization campaigns and to help equip a refrigerated cold

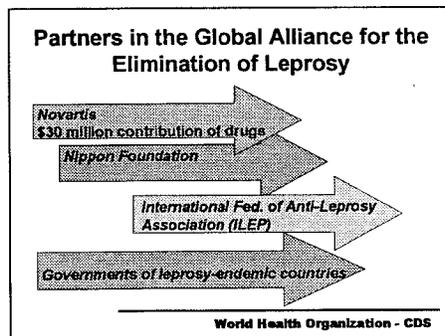


chain for vaccine transport. Rotary has used its global network of over 28 000 clubs in 155 countries to enlist volunteers to carry out social mobilization campaigns, provide organizational skills for immunization campaigns, and administer polio vaccine drops to children.

The recent launch of the New Medicines for Malaria Venture - a joint initiative by the public and private sectors to develop new antimalarial drugs - is an example of efforts to harness greater public and private sector collaboration in developing new products for use in developing countries. Another example is the donation of drugs by industry free-of-charge to help eliminate infectious diseases with a high disease burden in developing countries. These include donations of drugs by pharmaceutical manufacturers. SmithKline Beecham and Merck for the treatment of lymphatic filariasis, Merck for the treatment of river blindness, Novartis for leprosy and Pfizer for trachoma. In addition vaccine manufacturers have occasionally donated vaccines during outbreaks of disease, such as meningitis, for polio eradication, and for vaccine trials in developing countries.

STOP TB, based at WHO, is a partnership of countries with serious TB problems, UN and other international organizations, bilateral donors, scientific and public health institutions and NGOs. The STOP TB Initiative is mounting a political and social movement against TB throughout the world by promoting the use of cost-effective Directly Observed Treatment, Short-course (DOTS). Despite the DOTS policy, there are obstacles to countries adopting its use. These include lack of political will and commitment to support TB control programs, inadequate financing and human resources, poor organization of and **management** capacity for programs, and interrupted supplies of high-quality anti-TB drugs.

Roll Back Malaria is one of WHO's best examples of how global partnerships help control infectious diseases. Through a global coalition involving UNDP, UNICEF, WHO and the World Bank, Roll Back Malaria is helping health systems deliver cost-effective interventions including: better health care, insecticide-treated bednets and improved environmental management. At the same time Roll Back Malaria is harnessing the support of both the public and private sector in developing new malaria drugs and vaccines. The Roll Back Malaria partnership is working in all countries where malaria is a health problem, and focusing its greatest efforts in Africa where most malaria deaths occur.



3. URGENCY

“We may only have a decade or two to make optimal use of the medicines presently available”

Synopsis *Slowly, but surely, medicines once effective in curing infectious illnesses are becoming ineffective due to anti-microbial resistance. Anti-microbial resistance erodes the strength of once life-saving prescriptions, eventually leaving them with the negligible effect of placebos.*

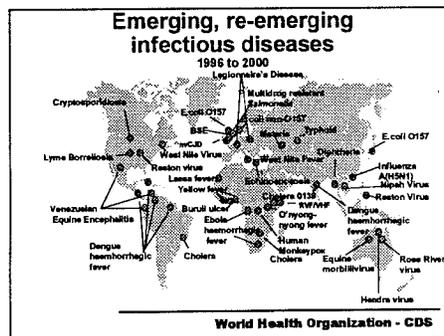
Antimicrobial resistance develops when medicines are not widely accessible for the poorest segments of society, and when they are not wisely prescribed throughout the world. We must undertake a massive effort to make better use of these powerful medicines, before our window of opportunity to do so closes and we move even further toward a post-antibiotic age

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We are wise not to delay in controlling infectious diseases. Over thirty new diseases have emerged within just the past twenty years, and no one knows what other unforeseen microbial threats await us in the future. All the more reason to defeat our microbial foes now before the battlegrounds are potentially redrawn later.

Smallpox provides a very striking example. If smallpox had not been eradicated in a few remaining countries in 1977, the world might still be paying a heavy price today. Unforeseen was the imminent emergence of HIV/AIDS. Immunization with the smallpox vaccine - made from a live weakened cowpox virus similar to the smallpox virus - is now known to be fatal for people whose immune system is impaired by HIV. Just a few years delay and global eradication of smallpox might have become impossible without the discovery of a new vaccine.

Had smallpox not been eradicated - at a cost then totaling \$300 million - it would be among the top six infectious killers in the world today. Without past concerted efforts to fight the disease, smallpox could still be causing over a million deaths a year and costing governments billions of dollars in health costs.



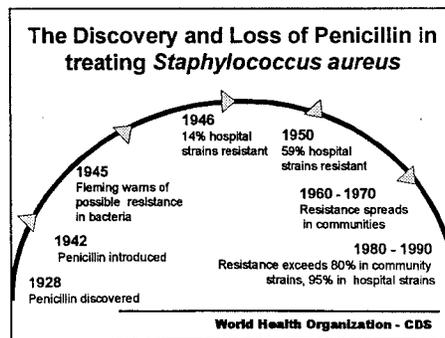
A. The increasing threat of antimicrobial resistance

As early as half a century ago – just a few years after penicillin was put on the market – scientists began noticing the emergence of a penicillin-resistant strain of *Staphylococcus aureus*, a common bacterium among the human body's normal bacterial flora. Resistant strains of gonorrhea, dysentery-causing shigella (a major cause of premature death in developing countries) and salmonella rapidly followed in the wake of staphylococcus 20 to 25 years later.

From that first case of resistant staphylococcus, the problem of antimicrobial resistance has snowballed into a serious public health concern with economic, social and political implications that are global in scope and cross all environmental and ethnic boundaries.

- Penicillin was once 100 percent successful for curing gonorrhea. Now it is virtually useless against gonorrhea in South East Asia and other parts of the world.
- Streptomycin was once the most effective drug we had to cure TB. Now, it is no longer effective in many European countries.
- Chloroquine and sulfadoxine-pyrimethamine could once stop malaria in Thailand. Now they cannot.
- Mefloquine was once one of our best backup weapons against malaria. Now it can no longer cure most malaria cases in Thailand.
- Lamivudine -- only recently developed to treat hepatitis B -- has quickly become ineffective in 30 percent of patients treated.
- In the United States, a variety of medicines used to treat patients in hospitals – such as vancomycin – are less effective, leading to thousands of deaths each year.
- In India, chloramphenicol once saved people from typhoid. Now these drugs are largely ineffective in protecting people from this life-threatening disease.
- Cotrimoxazole once controlled outbreaks of shigella dysentery. Today, nearly all shigella are non-responsive to this drug.

In many cases, these drugs have become ineffective in some countries only within a span of 10 years or less. Although most drugs are still active in other parts of the world, the lengthening shadow of resistance means that many of them may not be for long. In the case of tuberculosis, the emergence of



multi drug-resistant bacteria means that medications that once cost as little as US\$ 20 must now be replaced with drugs a hundred times more expensive. Other diseases are likewise becoming increasingly impervious as currently effective drugs continue to be underused by patients who do not complete courses, and misused through indiscriminate and over-prescribing.

Fortunately, we still have other effective medicines to cure most of these and other infectious diseases. However, our options are increasingly limited.

- Rifampicin, isoniazid and ethambutol are – so far -- 95 percent effective in curing tuberculosis.
- Combinations of anti-malarials are – so far -- 95 percent effective in curing malaria in most parts of the world.
- Five days of antibiotics are – so far -- 90 percent effective in treating pneumonia.
- Ciprofloxacin is – so far – still very effective in curing most cases of gonorrhea.

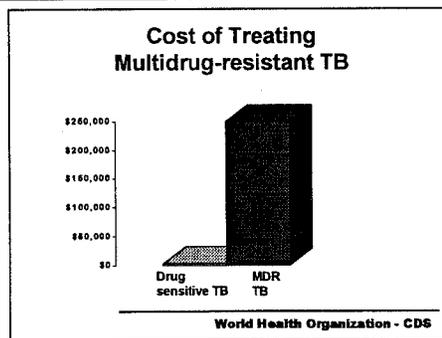
But we could lose these medicines as well if the world does not take urgent measures to turn back the threat of infectious diseases.

B. How resistance develops and spreads

The causes of anti-microbial resistance are paradoxical. It can be caused by the under-use of medicines. It can also be caused by the over-use of medicines.

The under-use of medicines is particularly a problem in developing countries. For example, where patients are unable to afford the full course of medication, or where some medicines are sporadically unavailable, patients often take insufficient dosages that kill off the weakest microbes in the body, but provide the more resistant microbes an opportunity to survive and multiply.

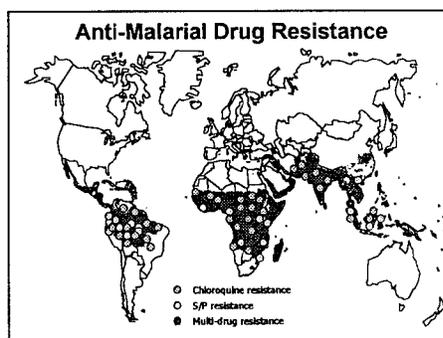
But resistance also emerges for the opposite reason: from the overuse of antibiotics. Especially in wealthy countries, patients often demand anti-microbials for every minor illness, and health services are often prone to over-prescribe them. Similarly, overuse of anti-microbials in food production in wealthy countries is also contributing to increased drug resistance.



Microbiology. Researchers soon discovered that microbes develop resistance to antimicrobials through a process known as natural selection. When a microbial population is exposed to an antibiotic, more susceptible organisms will succumb, leaving behind only those resistant to the antimicrobials that can still be transmitted to others. These organisms can also pass on their resistance genes to their offspring by replication, or to other related bacteria through "conjugation" whereby plasmids carrying the genes "jump" from one organism to another. This process is a natural, unstoppable phenomenon exacerbated by the abuse, overuse and misuse of antimicrobials in the treatment of human illness and in animal husbandry, aquaculture and agriculture.

The Poverty Paradigm: Drug Access and Resistance More than any other issue, poverty and inadequate access to drugs continue to be a major force in the development of resistance. In many developing nations drugs are freely available – but only to those who can afford them. This means that many patients are forced to resort to poor quality, counterfeit, or truncated treatment courses that invariably lead to more rapid selection of resistant organisms. A patient infected with a resistant strain endures prolonged illness (often resulting in death) and hospital stays which in turn result in lost wages, productivity, family hardship and infectiousness with resistant strains.

Misdiagnosis and Resistance Misdiagnosis is just another symptom of weak public health systems in industrialized and developing nations. Overworked and under-informed physicians and healthcare workers are ill-equipped to deal with the large number of patients coming through clinic and office doors. Increased pressure inevitably leads to "defensive" and unnecessary prescribing as a means of forestalling potential complications. A dearth of proper diagnostic facilities and laboratories in poorer nations means physicians and healthcare workers are forced to engage in the kind of symptom-based guesswork that often leads to misdiagnosis and the increased likelihood of prescribing the wrong medication. In many developing countries poverty and a lack of information forces patients to purchase single doses of drugs taken only until the patient feels better. Health workers may also be responsible. In a study undertaken in Vietnam in 1997, researchers discovered that more than 70% of patients were prescribed inadequate amounts of antimicrobials for serious infections, while another 25% were given unnecessary antibiotics. In China, researchers found that 63% of antimicrobials selected to treat proven bacterial infections were simply the wrong choice, while in Bangladesh 50% of drugs dispensed in one hospital unit were inappropriate. The same is true in North America where it is estimated that physicians in both Canada and the United States over-prescribe antibiotics by 50%.



Counterfeit Drugs Counterfeit drugs are also a problem that directly contributes to antimicrobial resistance. A US\$ 21 billion industry – which comprises an estimated 5% of all antibiotics sold worldwide, bogus drugs claim the lives of victims whose health, families and livelihood could have been spared with proper medication and the necessary government controls.

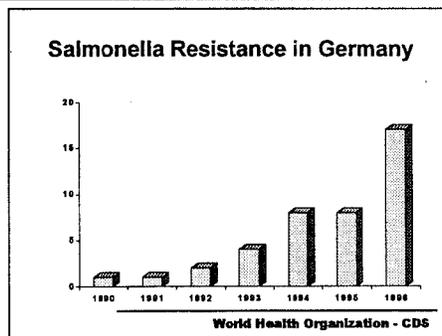
Resistance flourishes wherever antibiotics are abused, misused and dispensed at levels lower than treatment guidelines dictate. This means that instead of curing the infection, medications kill only non-resistant organisms – leaving their tougher counterparts to replicate and spread resistance genes.

Between 1992 and 1994, as many as 51% of counterfeiting cases uncovered by WHO (70% of which were discovered in developing countries) revealed that forged drugs carried no active ingredient whatsoever. Among the counterfeits, yet another 17% contained the wrong ingredient, while an additional 11% contained weaker than recommended concentrations of active medication. Indeed, some of these, so-called “medications” contained poisons capable of causing severe disability or death. Overall, only 4% of counterfeits contained the same quantity and quality of medication as their authentic counterparts.

Today, no one knows to what extent drug counterfeiting has spread. What is clear, however, is that in the wake of globalization and the increasing power of organized crime, the problem of counterfeiting grows ever more acute.

Dubious Pay-offs and High-priced Prescriptions Owing to fears of resistance, many health workers are avoiding narrow-spectrum drugs that treat specific complaints in favor of broader-spectrum antibiotics that have wider applications. In countries where health care providers earn only subsistence wages, unethical pharmaceutical companies sometimes pay a commission for recommending more expensive broader-spectrum medications when cheaper narrow-spectrum alternatives would suffice. The end result is a smaller, more highly-priced pool of antimicrobials combating a larger number of infectious diseases. This troubling development accelerates the natural process of resistance, and results in only a small percentage of the world’s population benefiting from new research.

Advertising for Resistance At the other end of the spectrum, patient demand for antimicrobials – sometimes the result of TV, internet, magazine or newspaper advertising – also spurs the development of resistance. In a 1997 study undertaken in Europe, physicians cited patient pressure as the number one reason why they prescribed the wrong antibiotics. In the United States, 95% of physicians surveyed had

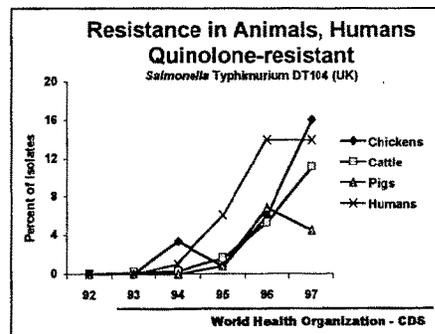


seen an average of seven patients in the previous six months who had requested specific drugs as a result of advertising. Of physicians questioned, 70% admitted that patient pressure forced them to prescribe drugs they might otherwise have avoided. In a 1995 study undertaken in Peru, two-thirds of those health workers surveyed claimed that their primary source of information came from medical journals. Researchers concluded otherwise, and wrote that advertising appeared to be a key information source. The authors went on to say that this factor “tended to promote irrational drug use”.

Lack of Education Even in industrialized nations, antimicrobial resistance is often given only cursory coverage in medical schools or is confined to specialist training. In developing nations, an acute shortage of qualified health care workers means that patients must rely on their own judgement, or that of underqualified doctors, paramedics and other health care workers.

Many drug dispensers are likewise under-educated and under-informed. In a study of 40 randomly selected healthcare facilities in Ghana, only 8% of drug dispensers had received formal training. At most clinics surveyed, trained dispensers were notable only by their absence. These factors are particularly significant when one considers that in many countries the majority of patients purchase antimicrobials and other drugs without visiting a health worker first. Another study found that drug retailers in seven sub-Saharan African nations often advised consumers to purchase non-essential drugs without adequate explanation – and without any suggestion that individuals consult a health worker prior to their purchase. This combination of poverty and ignorance is the perfect spawning ground for antimicrobial resistance.

Resistance and Hospitals Most health workers are trained in the hospital setting. Unfortunately, when it comes to prescribing practices, teaching hospitals sometimes unwittingly promote the type of irrational dispensing that contributes to drug resistance. In an analysis of 10 studies undertaken at teaching hospitals worldwide, researchers determined that between 40% and 91% of antibiotics prescribed were inappropriate. The survey also revealed that health care workers often disregarded basic hygiene practices – such as hand-washing and/or changing gloves – before and after patient visits. Inadequately cleaned equipment is also a major determinant in the spread of infectious disease. In one study, researchers surveying health clinics in United Republic of Tanzania discovered that some 40% of presumed sterile reusable needles and syringes were contaminated with bacteria. Inadequate training, monitoring and education on basic hygiene has serious implications, not only for the hospital population itself, but also for the community at large.



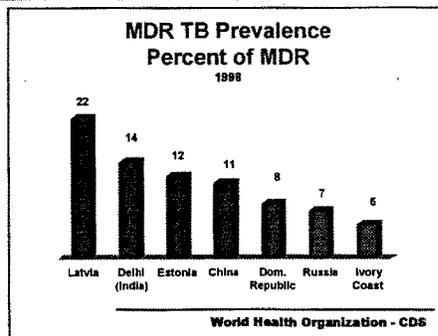
Antimicrobial Resistance and Food Another source of resistance lies in our food supply and is related to infectious agents that live in what we eat and drink. Since the discovery of the growth-promoting and disease-fighting capabilities of antibiotics, farmers, fish-farmers and livestock producers have used antimicrobials in animal husbandry, aquaculture and horticulture. Currently, only half of all antibiotics produced are slated for human consumption. The other 50% are used to treat sick animals, as growth promoters in livestock, and to rid cultivated foodstuffs of various destructive organisms. This ongoing and often low-level dosing for growth and prophylaxis inevitably results in the development of resistance in bacteria in or near livestock, and also heightens fears of new resistant strains “jumping” between species. Vancomycin-resistant *Enterococcus faecium* (VRE) is one particularly ominous example of a resistant bacterium appearing in animals that may have “jumped” into more vulnerable segments of the human population.

The emergence of VRE in food can be traced to the widespread use of avoparcin (the animal equivalent of the human antibiotic vancomycin) in livestock. Moreover, with livestock production increasing in developing countries, reliance on antimicrobials is likewise expanding – often without guidelines in those nations where antibiotics are sold without prescription. With the trends toward globalization and the relaxing of trade barriers, inadequate standards and enforcement in one nation means all others are vulnerable.

Often bacteria that are harmless to livestock are fatal to humans. This is true of a number of outbreaks that have taken the medical community by surprise. One example occurred in Denmark in 1998, when strains of multi drug-resistant *Salmonella typhimurium* struck 25 people, killing two. Cultures confirmed that the organisms were resistant to seven different antibiotics. Epidemiologists eventually traced the micro-organism to pork and to the pig herd where it originated. In 1998, 5 000 people in the United States learned about antimicrobial resistance when they fell ill with multi drug-resistant campylobacteriosis caused by contaminated chicken. The same drugs that eventually failed them had also been used in the poultry that turned up on their plates.

C. The world's biggest killers plan their escape

Tuberculosis Tuberculosis is becoming increasingly resistant to anti-TB drugs. Researchers assess the approximate number of multi drug-resistant TB cases at between 1% and 2% of current global tuberculosis figures. But in some parts of the world, the rates of MDR TB are much higher. China



(Henan and Zhejiang), India (Tamil Nadu), Iran, Mozambique and Russia (Tomsk) each reported high levels of MDR TB of over 3% in new cases. Israel, Italy, Mexico (Baja California, Oaxaca and Sinaloa) reported MDR TB in over 6% of both new and previously treated cases combined.

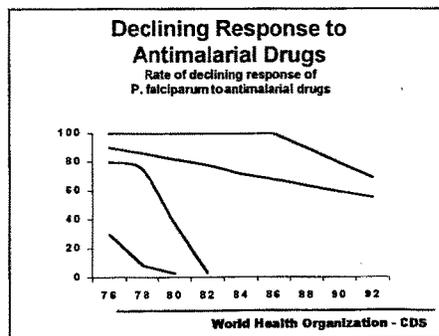
In Estonia, the percentage of MDR TB strains -- those resistant to the two most powerful anti-TB drugs -- isoniazid and rifampicin -- has increased from 13.5% in 1997 to 18.1% one year later. When drug resistance is permitted to flourish in developing countries, the consequences are inevitably felt by wealthy countries. Resistance to at least one drug has increased by 50% in both Denmark and Germany since 1996, and it has doubled in New Zealand. In all three countries, foreign-born TB patients are nearly twice as likely as native-born patients to be harboring a drug resistant strain.

In 1991, New York City experienced an outbreak of MDR TB that eventually claimed 500 lives. Recently, an MDR TB outbreak in Russia has killed many more. North America and Europe may have the billions of dollars required to contain this emergency. The worst affected countries in Asia, Africa and Latin America do not.

Malaria Resistance to chloroquine -- the former treatment of choice -- is now widespread in 80% of the 92 countries where malaria continues to be a major killer, while resistance to newer second and third-line drugs continues to grow. Unfortunately, many of these new drugs are not only expensive and have serious side effects, but most will be eventually rendered ineffective by the malaria organism's complex epidemiology and facility for rapid mutation. Mefloquine resistance emerged in South-East Asia almost as soon as the drug became a treatment option.

The challenge is to use already existing antimalarials more effectively to better control the disease. This means improving access to appropriate drugs and providing combinations of medications at lower cost. Increasing surveillance to guide the proper use of drugs, and more attention to alternative prevention strategies such as insecticide-treated bednets is also vital.

AIDS and STIs A small but growing number of patients are showing primary resistance to zidovudine (AZT) -- as opposed to "secondary" resistance where viruses grow increasingly insensitive to antivirals over the course of the patient's illness. This is also true for protease inhibitors that became available a mere 10 years ago. A growing body of evidence indicates that when HIV develops resistance to one



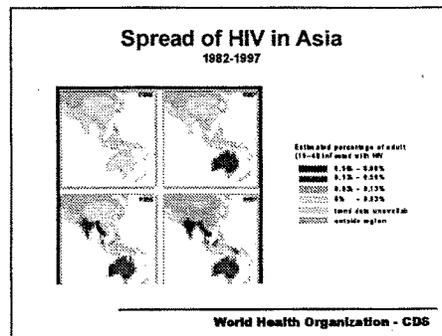
protease inhibitor it quickly becomes insensitive to the entire family of drugs, thus outwitting antiretrovirals that took years to develop at huge cost.

Gonorrhoea and other sexually transmitted infections (STIs) are important co-factors in the transmission and spread of HIV. This is because HIV bonds to white blood cells collecting at inflamed sites around the urogenital tract. Studies show that those co-infected with gonorrhoea and HIV shed HIV at nine times the rate of individuals affected with HIV alone.

Of the STIs – including chancroid and chlamydial infection – gonorrhoea is the most resilient with a resistance rate that continues to outstrip new treatment strategies. Gonorrhoea resistance first showed up in GIs during the Viet Nam war and is now entrenched around the globe with MDR strains appearing in 60% of those infected each year. In most of South-East Asia, resistance to penicillin has been reported in nearly all strains at a rate of 98% overall. Newer, more expensive drugs – notably ciprofloxacin – are likewise showing an increasing failure rate. Owing to resistance, chronic gonorrhoea has become a driving force in the HIV epidemic.

Pneumonia In lab samples as many as 70% of chest infections are resistant to one of the first-line antimicrobials. Formerly, first-line medications were both effective and affordable. With the onset of resistance however, newer treatments are proving too costly to the vast majority of the poor living in developing nations. This alarming situation is due, in part, to widespread confusion over the difference between viral and bacterial respiratory infections. Both forms present the same clinical symptoms that can often only be distinguished by laboratory tests – expensive and therefore unavailable in many parts of the world. While bacterial infections can kill, treating viral illness with antibiotics is not only ineffective but contributes to the development of resistance. This is particularly true when it comes to treating children. Recent studies undertaken by WHO indicate that for every 100 respiratory infections, only 20% require antibiotic treatment. This means that 80% of patients are treated with unnecessary medications thereby leading drugs directly into the conditions for drug resistance to emerge.

Diarrhoeal Diseases Multi drug-resistance is also occurring in microbes that cause diarrhoeal diseases. One such agent, the bacterium *Shigella dysenteriae*, is a highly virulent microbe that is resistant to almost every available drug. The results of this growing crisis were illustrated most notably in the wake of the 1994 civil war in Rwanda when the bacterium spread through vulnerable refugee populations already traumatized by war and loss. Left untreated, death can follow within days of infection. Ten years ago a



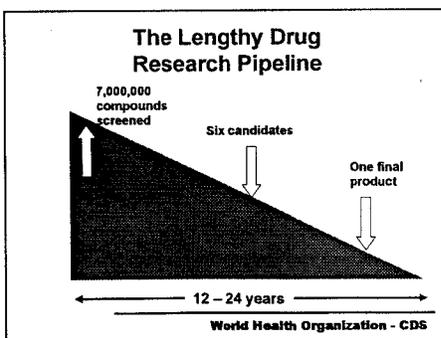
shigella epidemic could easily be controlled with co-trimoxazole – a drug cheaply available in generic form. Today, nearly all shigella are non-responsive to the drug, while resistance to ciprofloxacin – the only viable medication left – appears to be just around the corner.

The bacteria that cause cholera and typhoid are also revealing the ease with which they acquire resistance. In treating people with cholera, fluid replacement is paramount, but antibiotics (especially tetracycline) play an important public health role in limiting the spread of epidemics. *Salmonella typhi* – like shigella, – is adept at accumulating cassettes of resistance genes, producing strains that withstand first-line, second-line and now, third-line drugs. Up until 1972, chloramphenicol was the treatment of choice for typhoid fever throughout much of the Indian subcontinent. By 1992 two-thirds of reported cases were chloramphenicol-resistant, thereby necessitating treatment with expensive quinolones that are themselves losing effectiveness. Without proper treatment, typhoid is a serious and frequently relapsing disease that kills up to 10% of those infected.

D. Myth of an endless supply of new drugs

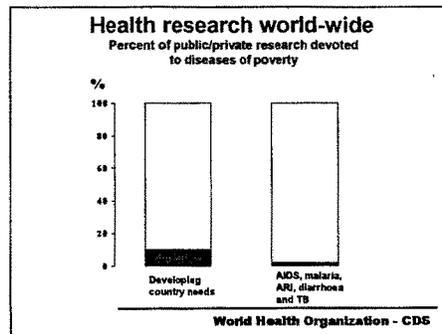
It is easy to live under the illusion that science is continually supplying us with an endless array of anti-microbials; that the pharmaceutical industry is frequently making new drug discoveries to replace those drugs that become ineffective in fighting the major infectious diseases. In reality, this is not the case. While new versions of older drugs continue to be developed, no new classes of antibacterials have been discovered in the past 30 years to fight the major infectious diseases in humans. On average, research and development of anti-infective drugs takes 15 to 20 years. And the reality is, there are no new replacements ready to roll off the research pipeline.

Twenty years ago physicians in industrialized nations believed that infectious disease were a scourge of the past. With industrialization came improved sanitation, housing and nutrition, as well as the revolutionary development of disease-fighting antimicrobials. Populations living in those nations were not only enjoying an unprecedented decrease in mortality and morbidity, but a corresponding increase in life expectancy. In the developing world – where poverty and ongoing civil disturbance offset often modest health care gains – people could nevertheless look forward to a time when an increased quality of life might one day lead to a relatively disease-free future. The tools were there.



Confident in this pharmacopoeia, major drug manufacturers turned away from intensive antibacterial research, and concentrated their energies on seeking cures for heart disease, Alzheimer's and other chronic diseases – thus effectively closing the door on further research into new drugs designed to combat infections. Indeed, since the early 1980s, significant breakthroughs have been largely confined to the development of antiviral agents targeting the ever-widening HIV epidemic

While there is renewed interest from some companies in developing new vaccines and medicines to cure infectious diseases, research and development funding continues to be woefully inadequate. A very small percentage of all global health research and development funding is currently devoted to finding new drugs or vaccines to stop AIDS, acute respiratory infections (ARI), diarrhoeal diseases, malaria and TB. The pharmaceutical industry reports that it costs them a minimum of US\$ 500 million just to develop and bring one drug to market. Combined funding for research and development into ARI, diarrhoeal diseases, malaria and TB last year was under that amount.



4. Action

“We need a massive effort to use existing tools more widely and wisely.”

SYNOPSIS *After concluding the last millennium with a flurry of scientific discoveries and medical advances, world leaders have the option to begin the new millennium by extending these medical riches to historically unreached populations. After spending hundreds of billions to stop a millenium bug that lasted but a second, world leaders can also afford to begin conquering those microbes that have routinely killed millions, generation after generation.*

It is time to go to scale with the knowledge we have about controlling major diseases of poverty. This would be a millenium gift of inestimable value to the world's poorest people – at a time when strong leadership and a profound, and lasting, transformation are sorely needed. The immediate benefits resulting from a massive effort against diseases of poverty would be the most lasting and historic millenium gift world leaders could conceivably hope to present to humanity.

Infectious diseases are no longer seen exclusively as a health issue. They concern finance ministers and the IMF as they discuss modalities for debt relief. They concern the UN Security Council as it discusses HIV/AIDS in Africa. They are a key component of a human security as the basis of foreign policy in a growing number of states. They concern leaders of G8 countries who – when they meet this July 21-23 in Okinawa -- will consider calling for a powerful health initiative as a contribution to reducing world poverty.

There is now opportunity to make a significant leap towards reducing poverty and ill-health. Deaths and disability caused by highest burden diseases in low-income countries could be reduced by as much as 50% before the year 2010.

A Massive Effort Against Diseases of Poverty

- Broaden the paradigm from vaccines as a means of preventing mortality and alleviating poverty, to also emphasize drugs and other products.
- Aimed at high mortality causes of poverty: tuberculosis, malaria, AIDS, diarrhoeal diseases, acute respiratory infections, unsafe pregnancy
- Implementation wisely and widely through health sector, NGOs, communities and other proven means.

World Health Organization - CDS

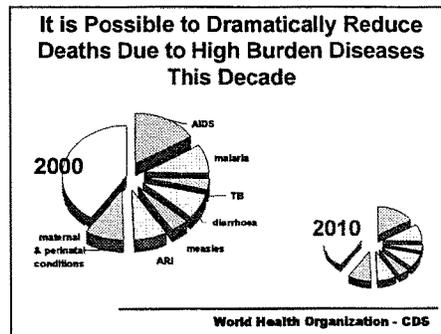
What is required is an over-arching, highly focused, and intensive initiative to reduce illness and early mortality experienced by poor people, concentrating initially on a small group of conditions (tuberculosis, malaria, HIV/AIDS and other treatable or preventable infectious diseases) that disproportionately affect the poor in large numbers. Such an initiative would enable poor people to invest more time and energy in education, child care, production and/or earning. It would also result in their having increased security, and contribute to their peace of mind. Health systems will be improved in ways that will contribute to addressing the health needs of poor and vulnerable populations more systematically.

A. Opportunity for a massive effort against illnesses of poverty

The window of opportunity is there for a focused and intense effort to reduce the impact of illness on poor people – perhaps linked to debt relief. Without a massive effort, countries with diseased workforces will continue to lose a sizable share of their potential GNP. Without a massive effort on the big infectious killers, nearly 100 million people will die from the targeted diseases while the world awaits the arrival of vaccines which could take 10 to 20 years or more to emerge from the research pipeline. Without a massive effort, the effective medicines we have now to cure the world's most devastating diseases will be eroded and rendered ineffective with increasing drug resistance. If we do not act now, we will have lost the window of opportunity to reduce major disease burdens while these medicines were still highly effective.

This massive effort would require funds for the purchase of medicines and consumables necessary to tackle the principle diseases of poverty. These would be routed through health care delivery systems -- including those of governments, the private sector and NGOs -- that demonstrate that their over-riding priorities are to deliver effective health services to those who need them, and to maximize the resulting benefits. In this way, incentive is provided for expanding the effectiveness of existing health systems and stimulating the emergence of new health care services.

International organizations, such as WHO, UNICEF, international foundations and others, have a key role to play. Their work with national governments, non-governmental organizations and private entities establishes effective mechanisms for channeling resources and stimulating concerted action - at global and local levels - to yield measurable health benefits for poor people. International organizations have assessed the additional cost of effective implementation – approximately US\$15 billion over five years - and the potential impact that would result:



- **Bednets** With \$1.5 billion for insecticide-treated nets, every African child could be protected from malaria by the year 2005. Potential: 600,000 child deaths prevented per year.
- **Anti-Malarials** With \$4 billion, a blister packet of effective antimalarial drugs could be quickly available to 100 million children in malaria endemic areas by the year 2005. Potential: 25% reduction in mortality due to malaria.
- **Anti-TB Drugs** With \$1 billion for anti-TB drugs provided to NGOs and governments using the DOTS strategy, 70% of all new TB cases could be provided with effective treatment by the year 2005. Potential: 50% reduction in deaths due to TB.
- **Treatment for Sexually Transmitted Infections** With \$1 billion for antibiotics, an additional 70 million STI cases could be treated. Potential: Up to 30% reduction in HIV transmission in high risk countries.
- **Oral Rehydration Therapy and Antibiotics for Pneumonia** With \$1 billion for antibiotics, oral rehydration salts and training materials, access to IMCI care for diarrhoeal diseases and acute respiratory illness could be increased 10-fold. Potential: 50% reduction in mortality due to diarrhoeal disease and ARI.
- **Measles Vaccines** With \$2.9 billion, measles vaccination coverage could be increased to 95% in low income countries. Potential: 579,000 child deaths averted per year.
- **Obstetric Treatment** With \$3.2 billion invested in equipment, drugs, supplies, and training materials for skilled birth attendants, safe deliveries could be extended to 80% of women in low income countries. Potential: 75% reduction in maternal mortality by 2015.

These interventions need to be made available through a range of public, private and voluntary channels, through health and other sectors.

The recent attention given to debt relief provides an opportunity to focus the attention of governments in Highly Indebted Poor Countries on the potential gains from increasing expenditures on health and education. Many countries will be starting to prepare Poverty Reduction Strategy Papers as part of the requirements for World Bank and IMF financial support. Ensuring that health has a prominent place as a poverty reduction strategy, and as an indicator of progress, is essential. There are increasing opportunities for collaboration with the private sector on the development and production of international public goods such as drugs and vaccines. Several promising models exist. Work is being done (as part of the soon-to-report Commission for Macro-economics and Health, called into being by WHO Director-General Gro Harlem Brundtland) to explore new mechanisms for improving incentives.

ACTION

"We need a massive effort to use existing tools more widely and wisely."

World Health Organization - CDS

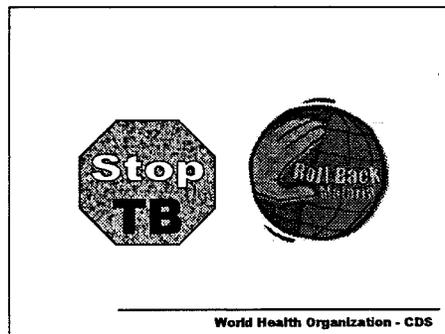
B. A massive effort to provide proper treatment

In peoples who enjoy wide access to antimicrobials and wise dispensing in approved treatment strategies health can be improved and the evolution of resistance contained. Without *wiser* and *wider* use, effective antimicrobials now taken for granted, will be rendered increasingly impotent against a burgeoning population of resistant microbes.

The beneficial effects of wise and wide use have been clearly demonstrated. In some regions of China anti-TB drugs are widely available to all patients diagnosed with TB. At the same time, these drugs are provided wisely through the WHO-recommended DOTS strategy – an effective case-management system that helps ensure that patients take quality anti-TB drugs in the right dosage for the appropriate length of time. A recent study has shown that TB resistance in those areas of China implementing DOTS, is one-third lower than in regions that have not followed DOTS. The Stop TB Initiative – an alliance of concerned governments, non-governmental organizations, international organizations, and financial institutions – is mobilizing resources and promoting DOTS expansion worldwide.

Roll Back Malaria is another “wisely and widely” initiative, based on the principle that antimalarials must be made widely available in order to prevent the 1.1 million deaths the infection causes every year while, at the same time, promoting rational use of quality antimalarials. Currently, Roll Back Malaria is developing surveillance strategies designed to detect increased drug resistance to further enable countries to respond wisely to the threat of resistance before it reaches a critical level.

We need not stand by helplessly watching antimicrobial resistance increase and drug effectiveness decrease. When an infection is addressed in a comprehensive and timely manner, resistance rarely becomes a public health problem. The most effective strategy against antimicrobial resistance is to get the job done right the first time – to unequivocally destroy microbes – thereby defeating resistance before it starts.



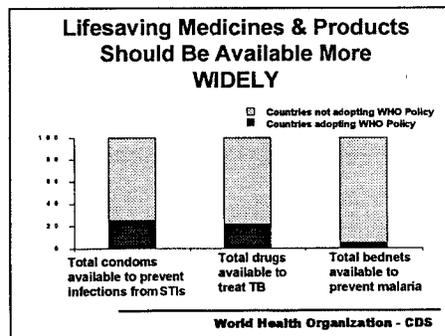
C. Wider availability of lifesaving medicines and supplies

Make Essential Drugs Available to Poor People In 1977 WHO developed the Model List of Essential Drugs to encourage rational drug use. The intent is to provide a blueprint on essential drugs required for national governments to treat specific complaints. Over the years, this document has been revised regularly and now serves as a guide for more than 120 countries. Essential drug policies – when adopted by countries in conjunction with educational programs, effective follow-up, development of national standard treatment guidelines and mechanisms to ensure the supply of high-quality drugs – significantly increase wider availability of quality drugs as well as encourage their wiser use.

Analysis has shown that individuals living in nations that have adopted essential drug policies enjoy greater drug access yet resort to significantly fewer injections and antimicrobial prescriptions when confronted with possible infections. A retrospective survey of prescribing practices in Ethiopia determined that health care providers who relied on the essential drugs list discouraged the unnecessary dispensing of non-essential drugs. To further bolster national efforts, WHO has recently released an Internet guide to assist Member States in accessing reliable information on pharmaceutical products.

Build Alliances and Partnerships to Increase Access to Antimicrobials Inadequate access to essential antimicrobials results in inappropriate treatment which in turn hastens the development of resistance. Successful attempts to increase access to existing antimicrobials in a coordinated manner are dependant on creative private and public sector collaboration. Implementation can only be assured through alliances that involve governments, international organizations and non-governmental organizations (NGOs) and the private sector.

For example, WHO has recently partnered the Eli Lilly Company, several generic manufacturers and Médecins sans Frontières to form a Green Light Committee aimed at reviewing research proposals designed to evaluate the most cost-effective treatment of multi drug-resistant TB. Applicants will be offered concessionally-priced second-line anti-TB drugs for approved projects. A unique partnership between WHO's Programme for Research and Training in Tropical Diseases (TDR) and Aventis, the company that developed eflornithine, could spell relief for thousands suffering the effects of African Trypanosomiasis, also known as sleeping sickness.



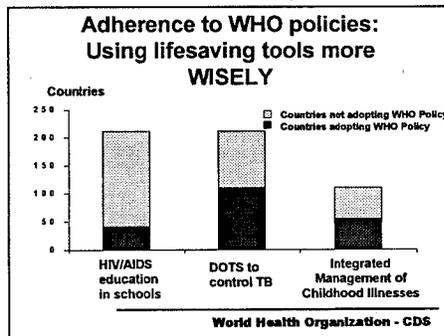
D. Wiser use of lifesaving medicines and supplies

The World Health Organization and its technical partners have redeveloped low-cost strategies based on clinical best practice in Member States, operational efficiency, scientific breakthroughs, cost-effectiveness and, above all, on what works best. For ARIs, diarrhoeal diseases and malaria in children, WHO has developed the Integrated Management of Childhood Illness (IMCI). For the treatment of TB, WHO recommends use of the DOTS strategy.

The problem is that many countries are still not using these strategies - or not deploying them widely enough to make a difference. For example, Integrated Management of Childhood Illnesses, a strategy with the potential to save millions of children's lives every year, has only been adopted in 57 countries so far and, to date, the strategy has not been implemented throughout any one country. Expansion of IMCI and other effective strategies is often slowed due to weaknesses in a country's health system, such as the lack of available medical supplies or difficulties in retaining qualified - but extremely overburdened - medical staff.

The DOTS strategy for TB is highly cost-effective. It can detect the disease and cure up to 95% of TB patients - even in the poorest countries - and is effective in preventing the spread of drug-resistant forms of the disease. But it is still a strategy waiting to be used. In 1999, only half of WHO's Member States have adopted DOTS so far. And of those that have, one in three have not yet made the treatment available nationwide.

A 1993 cost-effectiveness study based on data from Nigeria showed that routine delivery of yellow fever vaccine would be seven times as effective in reducing the number of cases and deaths as fighting epidemics with emergency mass immunization. Yet out of 45 countries at risk for yellow fever, less than one-third use yellow fever vaccine in routine immunization programs.



Conclusion

In the last century, medical advances have led to an unprecedented increase in longevity and quality of life for those fortunate enough to enjoy access to drugs and vaccines. Yet infectious diseases remain the main cause of mortality for the world's most vulnerable populations.

The reasons for these deaths – and for the emergence of drug resistance – are the same. We are not using our medicines widely. Nor are we using our medicines wisely. The challenge is to get the right lifesaving medicines and supplies to every patient throughout the world, each and every time. The World Health Organization is concerned that, unless we make wider and wiser use of the effective medicines we have now globally, they will not work for us later.

Two futures are equally conceivable as we enter the 21st century. Infectious diseases can continue to burden human development, new diseases can emerge and drug resistance can reverse the scientific progress of the past century. Or, we can make a massive effort to provide the medical advances of the past decade to all people, dramatically cutting the impact of infectious diseases, and preventing potential health, economic and security problems of tomorrow.

Unlike our ancestors of a thousand years ago, we know both the causes and the solutions for most of the infectious diseases that threaten us. How will history refer to us if we fail to control infectious diseases at the beginning of the new millennium?

Statement for the Record
House International Relations Committee
“Infectious Diseases and International Security”

David F. Gordon
National Intelligence Officer for Economics and Global Issues
National Intelligence Council

June 29, 2000

Mr. Chairman and distinguished members of the Committee, thank you very much for providing me the opportunity to participate in this important hearing on infectious diseases and their impact on international security. It is an honor for me to share the podium with Dr. Satcher and Dr. Heyman, both of whom I greatly respect and admire.

My testimony will be drawn largely from a declassified National Intelligence Estimate recently produced under my direction entitled “The Global Infectious Disease Threat and Its Implications for the United States.” As you know, Mr. Chairman, NIE’s are prepared for the President and other senior policymakers on issues that have strategic implications for the United States. They represent the most authoritative assessments of the Intelligence Community because they reflect the coordinated judgments of the senior officers of all the relevant agencies.

This NIE represents an important initiative on the part of the Intelligence Community to consider the broad national security and foreign policy dimensions of a non-traditional but highly lethal threat. It responds to a growing concern by senior US officials about the implications of this threat as manifested in the 1996 Presidential Decision Directive that called for a more focused US policy on infectious diseases, the State Department’s 1997 Strategic Plan for international affairs, and the unprecedented recent UN Security Council and World Bank-IMF sessions on the devastating impact of AIDS in Sub-Saharan Africa.

The Estimate examines the most lethal diseases globally and by region; develops alternative scenarios about their future course; examines international capacities to deal with them; and assesses their global social, economic, political,

and security impact. It then assesses the infectious disease threat from international sources to the United States and to US personnel and equities overseas.

- My remarks today will focus on the broader social, economic, political and security implications of the infectious disease threat.

The Estimate's most significant judgment is that new and re-emerging infectious diseases will pose a rising—and in the worst case, a catastrophic--global health threat that will complicate US and global security over the next 20 years. These diseases will endanger US citizens at home and abroad, threaten US armed forces deployed overseas, and exacerbate social and political instability in key countries and regions in which the United States has significant interests.

The security dimension of the global infectious disease threat manifests itself in a number of ways.

FIRST, is the link between infectious diseases and the increasing possibility of a biological warfare or biological terrorism attack against the United States or US equities overseas, as hostile states and terrorist groups exploit the ease of global travel and communications in pursuit of their goals. At least a dozen states are pursuing offensive BW programs, as are some terrorist organizations. The West Nile virus scare last year in New York City indicates the confusion and fear that even the possibility of a BW attack can sow, and highlights the importance of collaboration among public health authorities, law enforcement agencies, and the Intelligence Community in monitoring global BW threats.

SECOND, is the direct risk posed to US public health by the importation of infectious diseases, which do not respect national borders. In the opinion of the US Institute of Medicine, the next major infectious disease threat to the United States may be, like AIDS, a previously unrecognized pathogen- perhaps along the lines of ebola, a disease both lethal and rapidly spreading. Or it may be a new strain of influenza that develops in Asia. Flu now kills some 30,000 Americans annually. Epidemiologists generally agree that it is not a question of whether, but when, the next killer pandemic will occur. Or it may be multi-drug resistant TB, which was thought to be under control, but is now being brought into the US by some travellers and immigrants.

THIRD, is the potential impact on US troops abroad and on the readiness of certain foreign militaries and their ability to engage in international peacekeeping operations. US military personnel deployed in support of peacekeeping and humanitarian operations in developing and former communist countries will be at highest risk. The infectious disease burden will weaken the military capabilities of some countries—as well as international peacekeeping efforts—as their armies and recruitment pools experience HIV infection rates as high as 60 percent. The participation of militaries with high HIV infection rates will complicate the recruitment of other militaries for particular peacekeeping operations.

FOURTH, the worst infectious diseases—TB, malaria, and especially AIDS—are likely to slow economic development and undermine the social structures in some countries and regions of interest to the United States. This will challenge democratic development and transitions, and possibly contribute to humanitarian emergencies and military conflicts to which the United States may need to respond.

FIFTH, in the economic realm, infectious disease-related embargoes and restrictions on travel and immigration will cause frictions among and with key US trading partners and other states. And the issue of intellectual property rights with respect to new and existing drugs promises to become a major source of controversy between developed and developing countries.

Epidemiological Overview. Despite earlier optimism in the international health community, infectious diseases remain a leading cause of death, accounting for a quarter to a third of the estimated 55 million deaths annually worldwide and two-thirds of childhood deaths.

- Twenty well-known diseases—including TB, malaria, and cholera—have re-emerged or spread geographically since 1973, often in more virulent and drug-resistant forms.
- At least 30 previously unknown disease agents have been identified since 1973, including HIV, Ebola, hepatitis C, and Nipah virus, for which no cures are available.

- Of the biggest killers worldwide, TB, malaria, hepatitis, and, in particular, AIDS continue to surge, with AIDS and TB likely to account for the overwhelming majority of deaths from infectious diseases in developing countries by 2020.
- In the United States, annual infectious disease-related deaths have nearly doubled to more than 170,000 annually after reaching an historic low in 1980.

The spread of infectious diseases results as much from changes in human behavior—including lifestyles and land use patterns, increased trade and travel, and inappropriate use of antibiotic drugs—as well as from mutations in pathogens. Microbial resistance has rendered many first line drugs such as penicillin and those used against malaria and many TB cases practically useless.

Regional Trends. The outlook for infectious diseases shows extreme geographic variation, both between and within regions. Developing and former communist countries will continue to experience the greatest impact from infectious diseases—but developed countries also will be affected. Although overall global health-care capacity has improved substantially in recent decades, the gap between rich and poorer countries in the availability and quality of health care is widening. Almost all research and development funds allocated by developed country governments and the pharmaceutical industry are focused on advancing therapies and drugs relevant to developed country maladies. In general, our study highlights a very close linkage between persistent poverty and malnutrition, poor levels of health-care provision, and social and political insecurity, on the one hand, and high levels of infectious disease prevalence on the other.

- **Sub-Saharan Africa** accounts for nearly half of infectious disease deaths globally—over 70 percent for AIDS, 90 percent for malaria, and 40 percent for diarrheal diseases. It will remain the region most vulnerable to diseases and with the least health-care capacity by far, with less than 40 percent of the populations in most countries having access to basic health care.
- **In Asia**, disease prevalence in South and Southeast Asia is almost as high as in Sub-Saharan Africa and access to basic health care just as low. Multi-drug resistant tuberculosis, malaria, and cholera are rampant, and the region is likely to witness a dramatic increase in infectious disease deaths, largely driven by

the spread of AIDS. India already has some 3 to 5 million HIV carriers and China nearly .5 million and by 2010, the region could surpass Africa in the number of HIV infections.

- **The former Soviet Union, (FSU)** and, to a lesser extent, **Eastern Europe**, also are likely to see a substantial increase in infectious disease incidence and deaths. This owes to the steep deterioration in health care and other services resulting from economic difficulties, which has reduced the population's access to basic health care from 95 percent before the fall of communism to a range of 50 to 90 percent today. TB-including multi-drug resistant TB- has reached epidemic proportions throughout the FSU-with over 100,000 cases annually in Russia alone. The HIV-infected population in Russia could soon exceed 1 million and double yet again by 2005.
- **Latin American** countries generally are making progress in infectious disease control, particularly against childhood diseases. The region's health-care capacity is substantially better than Sub-Saharan Africa's and somewhat better than mainland Asia's, with 40 to 70 percent of the population in most countries having access to basic health care. Nonetheless, uneven economic development and severe income disparities, periodic economic shocks, and rampant urbanization are disrupting disease control efforts and contributing to widespread resurgence of cholera, malaria, and TB, as well as to a growing AIDS problem.
- **In the Middle East and North Africa** health-care capacity varies considerably, with 70 to 90 percent of the populations in Israel and the Gulf States having access to basic health care and 40 to 50 percent in Iraq, Syria, Jordan, and North Africa. Although the region has high TB and hepatitis C prevalence, conservative social mores, climatic factors, and the high level of health spending in the oil-producing states tend to limit some globally prevalent diseases, such as HIV/AIDS and malaria.
- **Western Europe** faces threats from several infectious diseases, such as AIDS, TB, and hepatitis B and C, as well as from several economically costly animal diseases such as "mad cow disease" and its human variant, Creutzfeldt-Jakob disease. The region's large volume of travel, trade, and immigration increases

the risks of importing diseases from other regions, but its highly developed health-care system-which provides 90 to 100 percent of the population in most countries with access to basic health care- will limit their impact.

International Response Capacity. International organizations such as WHO and the World Bank, national organizations such as our own CDC, and NGOs will play an instrumental role in strengthening both international and national surveillance and response systems for infectious diseases. Nonetheless, progress is likely to be slow, and development of an integrated global surveillance and response system is at least a decade or more away.

- This owes to the magnitude of the challenge; inadequate coordination at the international level; and lack of capacity, funds, and in some cases, cooperation and commitment at the national level. Some countries, for example, hide or understate their infectious disease problems for reasons of international prestige and fear of economic losses in the trade and tourism areas.

Alternative Scenarios. We examined three plausible scenarios for the course of the infectious disease threat over the next 20 years. We assessed and critiqued the optimistic scenario within the health literature, more fully developed the pessimistic scenario, and offered a third scenario combining elements of the first two that we judged to be the most likely.

Steady Progress. The optimistic and, in our view, least likely scenario projects steady progress whereby the aging of global populations and declining fertility rates are reducing the infant demographic cohort most susceptible to infectious diseases. Together with socio-economic advances and improvements in health care and medical breakthroughs, this hastens movement toward a “health transition” in which non-infectious diseases such as heart disease and cancer would replace infectious diseases as the overarching global health challenge.

We believe this scenario is unlikely primarily because it gives inadequate emphasis to persistent demographic and socio-economic challenges in many developing countries, to increasing microbial resistance to existing antibiotics, and because related models have already underestimated the force of major killers such as AIDS, TB, and malaria.

Progress Stymied. A worst-case—but more plausible—scenario projects little or no progress in countering infectious diseases over the duration of this Estimate. The scenario emphasizes the role of the least developed countries—where socio-economic progress is fitful and health-care capacity deteriorates—as a spawning ground. Under this scenario, AIDS reaches catastrophic proportions as the virus spreads throughout the vast populations of India, China, the former Soviet Union, and Latin America, while multi-drug treatments in developed countries encounter microbial resistance and remain prohibitively expensive for developing countries. Multi-drug resistant strains of TB, malaria, and other infectious diseases appear at a faster pace than new drugs and vaccines, wreaking havoc on world health.

Although more likely than the “steady progress” scenario, we judge that this scenario also is unlikely to prevail because it underestimates the longer-term prospects for socio-economic development, international collaboration, and medical and health care advances to constrain the spread of at least some widespread infectious diseases.

Deterioration, then Limited Improvement. The most likely scenario, in our view, is one in which the infectious disease threat—particularly from AIDS—worsens during the first half of our time frame, but decreases fitfully after that, owing to better prevention and control efforts, new drugs and vaccines, and socio-economic improvements. In the next decade, under this scenario, negative demographic and social conditions in developing countries, such as continued urbanization and poor health-care capacity, remain conducive to the spread of infectious diseases; persistent poverty sustains the least developed countries as reservoirs of infection; and microbial resistance continues to increase faster than the pace of new drug and vaccine development.

During the subsequent decade, more positive demographic changes such as reduced fertility and aging populations; gradual socio-economic improvement in most countries; medical advances against childhood and vaccine-preventable killers such as diarrheal diseases, neonatal tetanus, and measles; expanded international surveillance and response systems; and improvements in national health-care capacities take hold in all but the least developed countries.

- Barring the appearance of a deadly and highly infectious new disease, or a catastrophic upward lurch by AIDS, these developments produce at least

limited gains against the overall infectious disease threat, even as the remaining group of virulent diseases, led by AIDS and TB, continue to take a significant toll.

Social, Economic, and Political Impacts. The persistent infectious disease burden is likely to aggravate and may even provoke social fragmentation, economic decay, and political polarization in the hardest-hit countries in the developing and former communist worlds in particular.

Devastating Social Impact. At least some of the hardest-hit countries, initially in Sub-Saharan Africa and later in other regions, will face a demographic catastrophe as AIDS and associated diseases reduce human life expectancy dramatically and kill up to a quarter of their populations over the next 10 years. This will further impoverish the poor and often the middle class and produce a huge and impoverished orphan cohort unable to cope and vulnerable to exploitation and radicalization.

Until the early 1990s, economic development and improved health care had raised the life expectancy in developing countries to 64 years, with prospects that it would go higher still. The growing number of deaths from AIDS and related diseases such as TB, however, will slow or reverse this trend in heavily affected countries by as much as 30 years or more by 2010, according to the US Census Bureau.

- For example, life expectancy will be reduced by 30 years in Botswana and Zimbabwe, 20 years in Nigeria and South Africa, 13 years in Honduras, eight years in Brazil, four years in Haiti, and three years in Thailand.

AIDS in Sub-Saharan Africa has hit very hard the professional classes of teachers, civil servants, engineers and other skilled workers, who have formed the social backbone of recent advances in both political and economic life. The degradation of nuclear and extended families across all classes will produce severe social and economic dislocations with political consequences, as well. With as much as a third of the children under 15 in hardest-hit countries—some 42 million—expected to comprise a “lost orphaned generation” by 2010, these countries will be at risk of further economic decay, increased crime, and political instability as such young people become radicalized or are exploited by various political groups for their own ends; the pervasive child soldier phenomenon may be one example.

Economic Impact Likely to Grow. While difficult to measure precisely, infectious diseases—especially AIDS—are having a pernicious economic impact. The economic costs of the infectious disease burden are increasingly significant for the most seriously affected countries, despite the partially offsetting impact of declines in population growth, and they will take an even greater toll on productivity, profitability, and foreign investment. World Bank President James Wolfensohn recently declared AIDS to be the single biggest threat to economic development in Sub-Saharan Africa, and a growing number of studies suggest that AIDS and malaria alone will reduce GDP growth in several Sub-Saharan African countries by 20 percent or more by 2010.

The impact of infectious diseases—especially AIDS—at the sector and firm level already appears to be substantial and growing and will be reflected eventually in higher GDP losses, especially in the more advanced developing countries with specialized work force needs such as South Africa. Several individual firms and their AIDS consultants paint a bleak picture in recent surveys.

- Using broad measures of AIDS-related costs, such as absenteeism, productivity declines, health and insurance payments, and recruitment and training, they project profits to drop by 6 to 8 percent or more and productivity to decline by 5 percent
- They are especially troubled by the high rate of loss of middle and upper-level managers to AIDS and the dearth of replacements, as well as the loss of large numbers of skilled workers to AIDS in the mining and other key sectors.
- According to one expert, South African companies will begin to feel the full impact of the AIDS epidemic by 2005. One study of the projected impact of AIDS on employee benefit costs in South Africa concludes they will nearly triple to 19 percent of salaries from 1995 to 2005, substantially eroding corporate profits and incentives for foreign investment.

Infectious diseases are likely to add substantially to national health bills in already budget-strapped developing and transitional countries. AIDS, along with TB and malaria—particularly the drug-resistant varieties—makes large budgetary claims on national health systems' resources, and sets the stage for cruel budgetary

dilemmas and conflicts. For instance, treating one AIDS patient for a year in Sub-Saharan Africa costs as much as educating 10 primary school students for one year.

- In Zimbabwe, more than half the meager health budget is spent on treating AIDS, while in Kenya, AIDS treatment costs are projected to account for 50 percent of health spending by 2005.

Even given the budgetary dominance of AIDS, few countries will be able to afford the high cost of multi-drug treatment for AIDS—or for drug-resistant TB and malaria—ensuring that such diseases will continue to be highly prevalent. Only about 1 percent of AIDS patients even in relatively well off South Africa currently undergo multi-drug treatment, for example, while it would cost Russia several billion dollars annually to provide such treatment for its surging AIDS case load.

Potentially Destabilizing Political Impact. The political impact of infectious diseases is likely to be indirect and very difficult to assess with any precision. The infectious disease burden threatens to add to political instability and slow democratic development in Sub-Saharan Africa, parts of Asia, and the FSU, while also increasing political tensions in and among some developed countries.

- The severe social and economic impact of infectious diseases, particularly AIDS, and the infiltration of these diseases into the ruling political and military elites and middle classes of developing countries are likely to intensify the struggle for political power to control scarce state and societal resources.

The human losses from infectious diseases in the most affected countries will hamper the development of a civil society and other underpinnings of democracy and will increase pressure on democratic transitions in regions such as the FSU and Sub-Saharan Africa where the infectious disease burden will add to economic misery and political decay.

- In Russia, for example, the failed effort last year to impeach President Yeltsin included an article stating that his policies had betrayed a callous attitude toward the health of the Russian public.

- In South Africa, the spiraling and previously under-reported AIDS epidemic centered in the black majority will accentuate already wide economic disparities between black and white South Africans, and challenge the government of President Mbeki.

A CIA-sponsored study on the causes of instability in 127 cases over a forty-year period ending in 1996 suggests that infant mortality—which is highly correlated with infectious diseases—is a powerful predictor of political instability. High infant mortality has a particularly strong correlation with the likelihood of state failure in partial democracies.

International Security and Peacekeeping. Infectious diseases also will affect international security and peacekeeping efforts as militaries and military recruitment pools experience increased deaths and disabilities from infectious diseases. The greatest impact will be among hard-to-replace officers, non-commissioned officers, and enlisted soldiers with specialized skills and among militaries with advanced weapons and weapons platforms of all kinds.

- HIV/AIDS prevalence in the militaries of the heavily affected countries is considerably higher than their civilian populations, owing to risky lifestyles and deployment away from home. Commencement of testing and exclusion of HIV-positive recruits in the militaries of a few countries such as Uganda is reducing HIV prevalence, but it continues to grow in most militaries.
- Militaries in key FSU states also are increasingly experiencing the impact of negative health developments within their countries, such as deteriorating health infrastructure and reduced funding. One in three Russian draftees currently is rejected for various health reasons, compared to one in 20 in 1985.
- Mounting infectious disease-caused deaths among the military officer corps in military-dominated and democratizing polities also may contribute to the deprivation, insecurity, and political machinations that inclines some to launch coups and counter-coups aimed, more often than not, at plundering state coffers.

It is difficult to make a direct connection between high AIDS and other infectious disease prevalence in military forces and performance in battle. But, given that a large number of officers and other key personnel are dying or becoming disabled, combat readiness and capability of such military forces is bound to deteriorate.

- Infectious disease-related deaths and disabilities are likely to have the greatest impact on Sub-Saharan militaries, particularly those that have achieved at least a modest level of modernization.
- Over the longer term, the consequences of the continuing spread of deadly diseases, such as AIDS, on the capabilities of the more modernized militaries in FSU states and possibly China and certain other susceptible states with large armies and modern weapons arsenals, may be severe as well.

The negative impact of high infectious disease prevalence on national militaries is likely to be felt in international and regional peacekeeping operations as well, limiting their effectiveness and also making them vectors for the further spread of diseases among coalition peacekeepers and local populations.

- Although the UN officially requires that prospective peacekeeping troops be “disease free,” it is difficult to enforce this rule with such methods as HIV testing, given the paucity of available troops and the likely noncompliance of many contributing states.
- Healthy peacekeeping forces will remain at risk of being infected by disease-carrying forces and local populations, as well as by high-risk behavior and inadequate medical care.

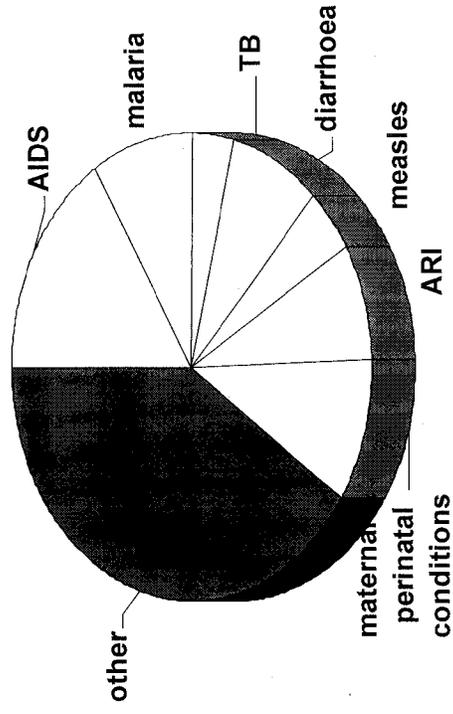
I welcome your questions and comments.

PROBLEM

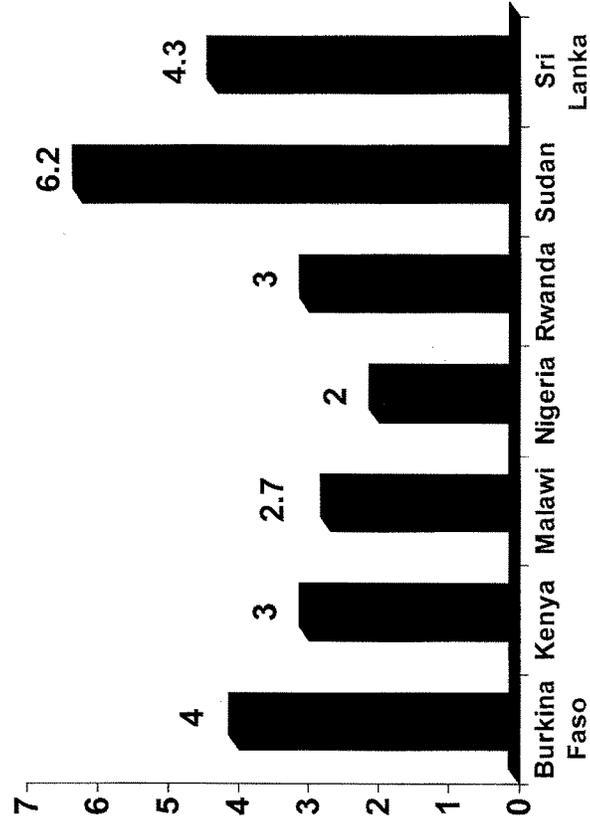
“Infectious diseases are the leading killer of young people in developing countries”

Most deaths among young people in developing countries are caused by just a few illnesses

Ages 0 - 44 in South-East Asia and Africa

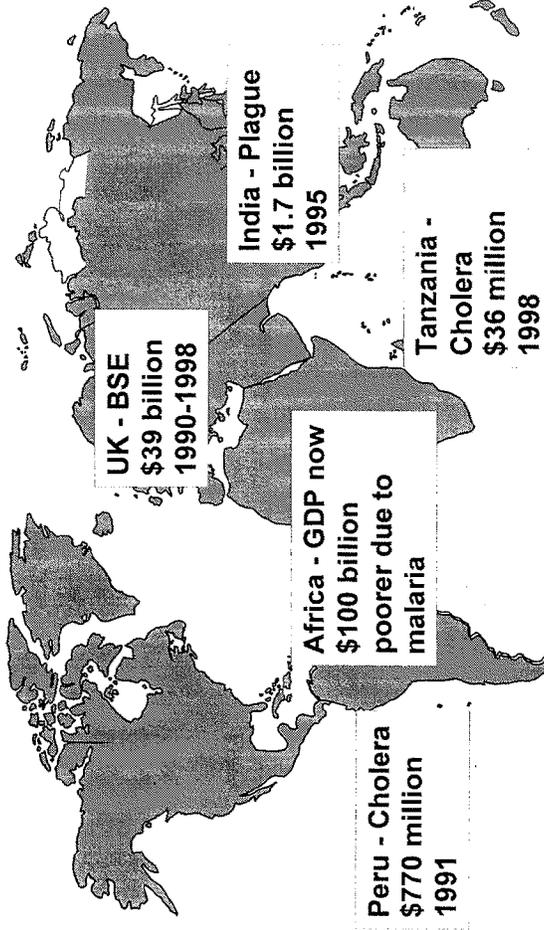


Days of work lost : Malaria



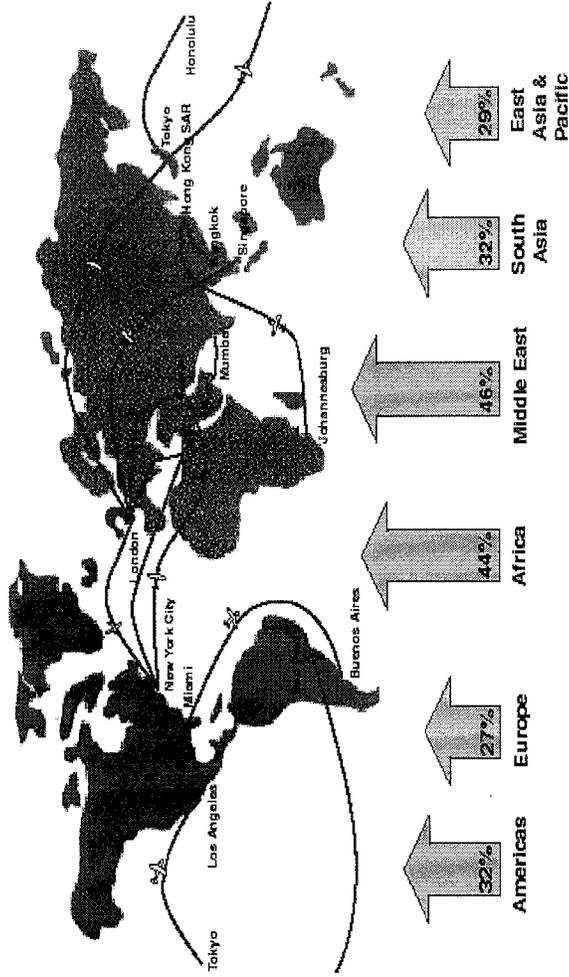
World Health Organization - CDS

Economic cost of infectious diseases



Frequent Flyers

Most Popular Air Routes Between Countries, 1997



Percentage increase in international arrivals, 1993 to 1997

Defending national borders

A strong defense must include protecting the population from microbial invaders

DISEASE

150 million deaths
From AIDS, TB and malaria since 1945

DEATHS

WAR

23 million deaths
Military and civilian from war 1945 -1993

\$15 billion
Estimated global spending for prevention and control of AIDS, TB and malaria, 1995

PREVENTION BUDGET

\$864 billion
Global military spending, 1995

World Health Organization - CDS

SOLUTIONS

*“We now have the means to
stop infectious diseases with
affordable and highly effective
solutions.”*

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World Health Organization - CDS

Significant Breakthroughs in our Lifetime

Disease	Effective prevention/ treatment developed	Effective strategy developed
TB	1945 – Streptomycin 1952 – Isoniazid 1970 – Rifampicin	1980s – Directly Observed Treatment, Short-course (DOTS)
Malaria	1946 – Chloroquine	1980s – IMCI, rapid treatment of childhood illness
AIDS	1930s – Latex condom	1980s – Social marketing of condoms
Diarrhoeal disease	1980s – Oral rehydration	1980s -- IMCI
ARI - Pneumonia	1928 – Penicillin	1980s – IMCI
Measles	1943 – Vaccine	1970s – Expanded Programme on Immunisation (EPI)

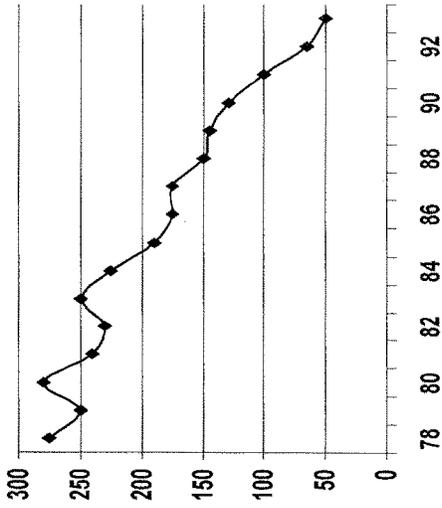
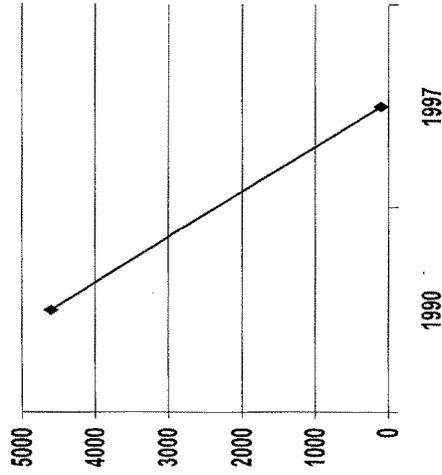
World Health Organization - CDS

Effective Interventions at Low Cost

Intervention	Prevention or treatment cost (US\$)	Effectiveness when used consistently and correctly
Six months of chemotherapy to treat TB	\$20	95%
Antimalarials	\$0.05	99%
Years supply of condoms to prevent HIV	\$14	95%
Rehydration salts to treat diarrhoeal diseases	\$0.33	Highly effective
Five days of antibiotics to treat pneumonia	\$0.27	90%
Measles	\$0.26	98%

World Health Organization - CDS

Free treatment reduces malaria deaths in Viet Nam **ORT reduces diarrhoeal deaths among children in Mexico**



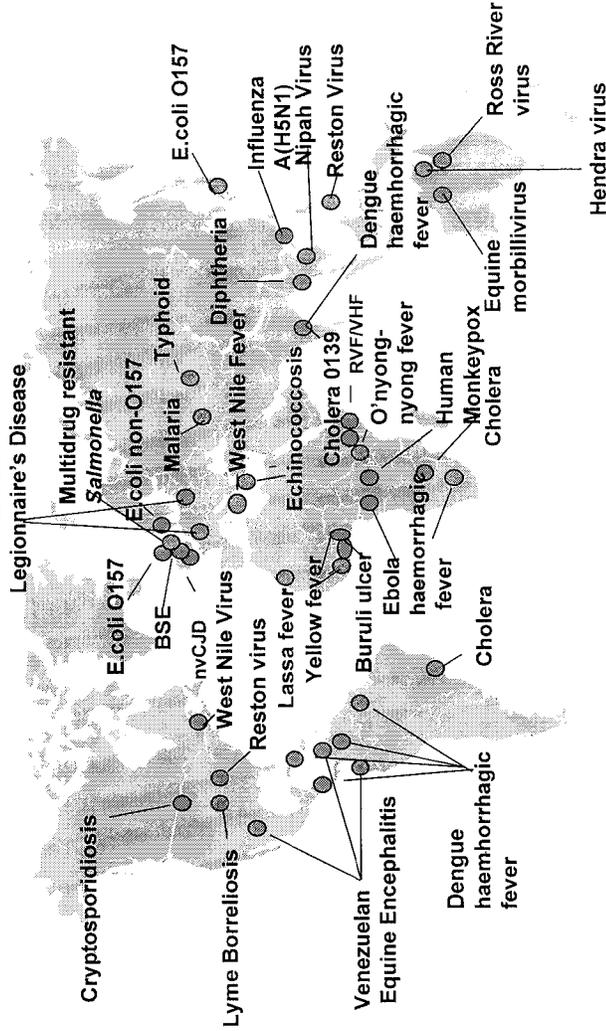
URGENCY

*“We are in a race against time
to bring down levels of
infectious diseases worldwide,
before the diseases wear the
drugs down first.”*

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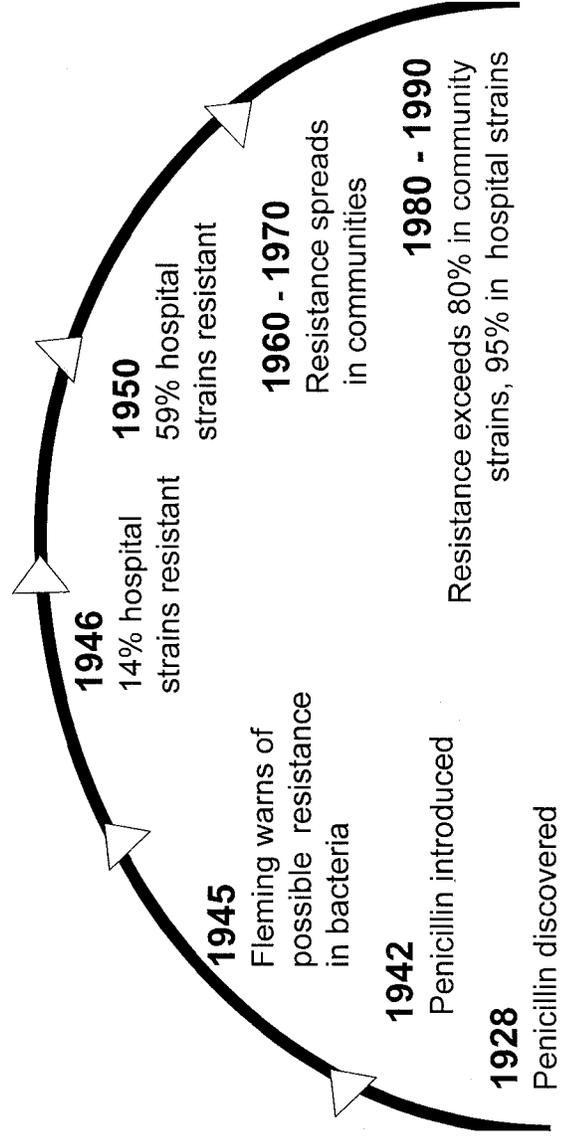
Emerging, re-emerging infectious diseases

1996 to 2000



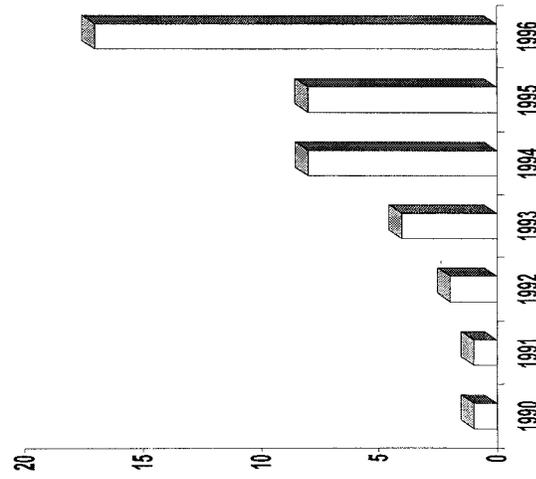
World Health Organization - CDS

The Discovery and Loss of Penicillin in treating *Staphylococcus aureus*



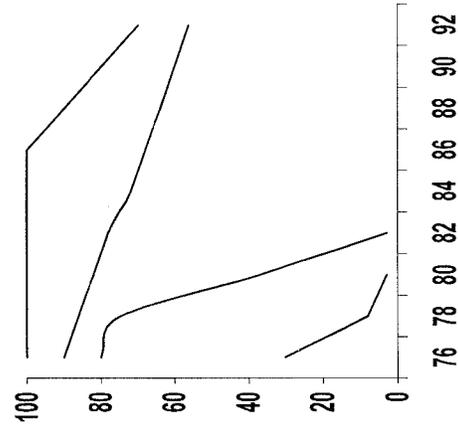
World Health Organization - CDS

Salmonella Resistance in Germany



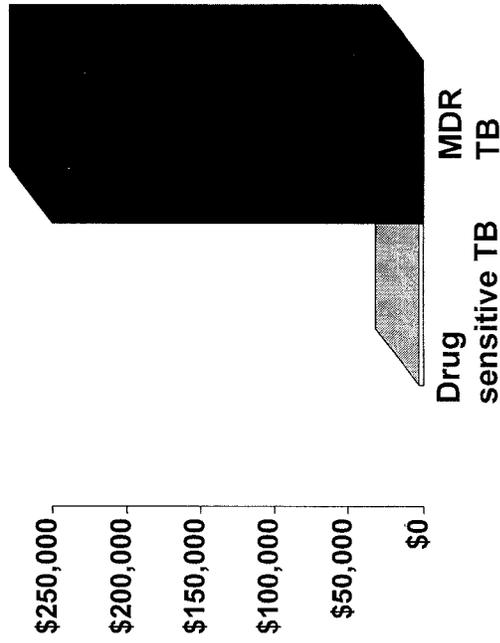
Declining Response to Antimalarial Drugs

Rate of declining response of
P. falciparum to antimalarial drugs



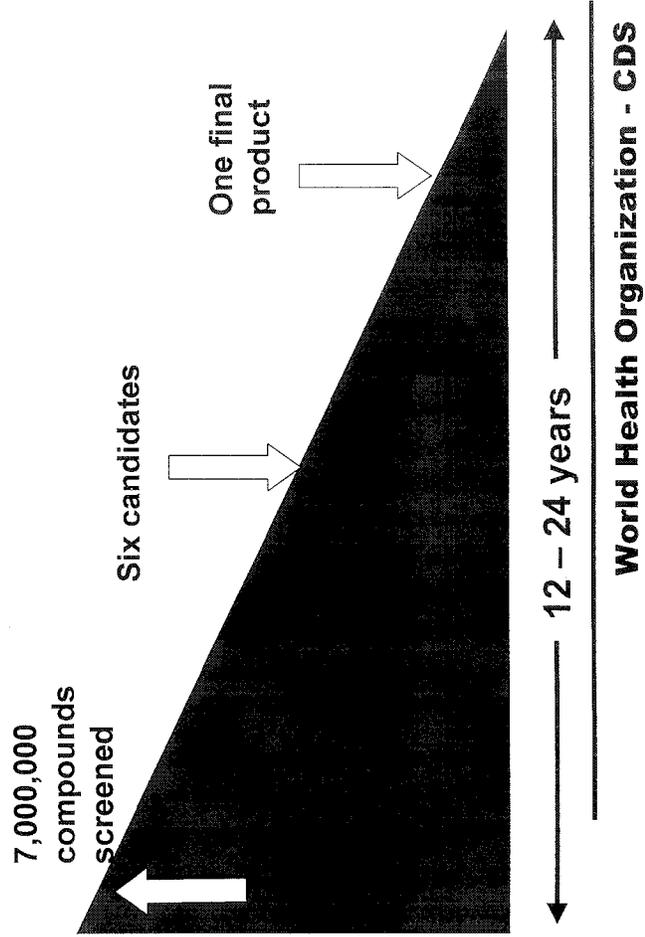
World Health Organization - CDS

Cost of Treating Multidrug-resistant TB



World Health Organization - CDS

The Lengthy Drug Research Pipeline



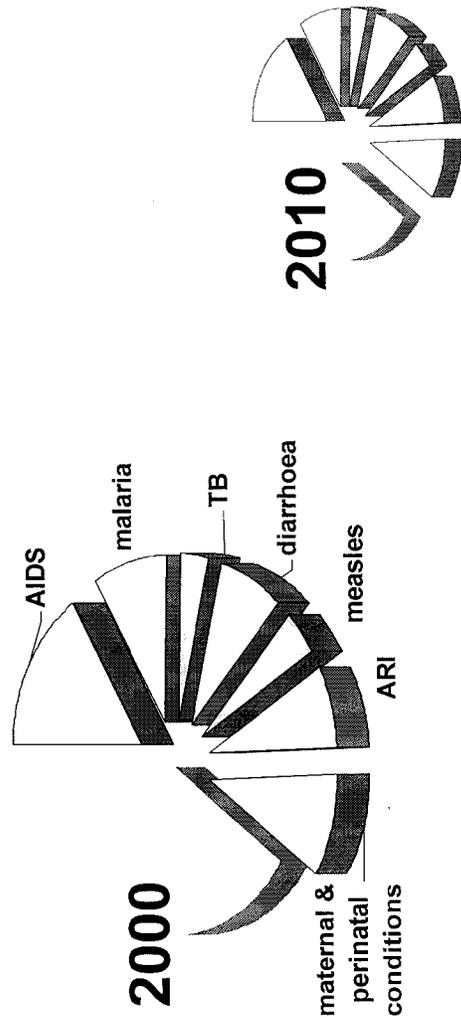
ACTION

“We need a massive effort to use existing tools more widely and wisely.”

A Massive Effort Against Diseases of Poverty

- Broaden the paradigm from vaccines as a means of preventing mortality and alleviating poverty, to also emphasize drugs and other products.
- Aimed at high mortality causes of poverty: tuberculosis, malaria, AIDS, diarrhoeal diseases, acute respiratory infections, unsafe pregnancy
- Implementation wisely and widely through health sector, NGOs, communities and other proven means.

It is Possible to Dramatically Reduce Deaths Due to High Burden Diseases This Decade



In a Shrinking World, Disease Anywhere Means Disease Everywhere

Health: Multilateral action, including from the developing world, is needed to combat deadly illnesses.

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Every year, the United States spends more than \$230 million immunizing its citizens against a disease, polio, that was eliminated in this hemisphere in 1994. But because polio still can be found—some 5,000 current cases—in other parts of the world, immunizations here must continue.

This is just one example of the heavy cost that international infectious diseases impose on Americans, the subject of our committee's hearing today. Additional costs are incurred from strengthened pathogens that are resistant to drugs. For example, the U.S. has incurred \$2,000,000 in extra costs for patients with tuberculosis. But that cost may be 100 times higher if the patient has drug-resistant TB.

As a result of the underuse of antibiotics in the developing world and the overuse in the developed

world, viruses are developing stronger strains that are able to overcome standard antibiotics. A report by the World Health Organization, released last week, indicated that "almost all infectious diseases are slowly but surely becoming resistant to existing medicines."

These new, troubling developments come as our global economy and advanced technology make it possible to spread a small, deadly virus to a remote area. The West Nile virus, which is common in the United States, has been found in 62 cases of encephalitis and deaths was the first in the West Nile virus was identified in the Western Hemisphere. The appearance of the West Nile virus in dead crows found in New York and New Jersey in recent weeks means that federal, state and local authorities in Connecticut, New York and New Jersey once again must undertake comprehensive mosquito control measures to prevent another outbreak.

With one out of every two deaths in the developing world attributed to infectious diseases, the threat to economic growth and political stability are even greater there. In Zimbabwe, a pivotal country in southern Africa, political instability combined

with an alarmingly high HIV infection rate—25% of women at some urban clinics test positive—threaten to destabilize the entire continent.

The House of Representatives has taken action by passing bipartisan legislation that would authorize \$500 million over the next five years for a World Bank AIDS trust fund, yet much more needs to be done. Acute respiratory infections such as pneumonia, kill 1 million more people each year than does AIDS. Four other killers—diarrheal diseases, tuberculosis, malaria and measles—combine with AIDS and respiratory infections to account for 90% of total infectious disease deaths worldwide.

While there has been vigorous political debate about the role the U.S. should play in multilateral issues such as peacekeeping and the international criminal court, we can be much more unified on the international public health crisis. The simple truth is that the United States cannot go it alone in the fight against international infectious diseases.

The WHO has estimated that the international community needs to commit \$1.5 billion per year over the next 10 years for the medicines and prevention tools to stop the spread of the "Big Six" killer

infectious diseases. The U.S. already is the world's major contributor to the WHO and other international health organizations. We must continue that commitment, urging our allies to follow our lead.

Next month, the heads of state of the world's seven largest economies and Russia—the G-8—will gather in Okinawa, Japan, where infectious diseases will be one of the primary issues. It is imperative that concrete policies be put into place now. For instance, educating health care workers about the appropriate use of anti-microbial drugs, as the WHO has recommended, will cost little but have an enormous impact. Increasing funding for research into new drugs and vaccines will pay dividends for generations to come.

Attention from the G-8 is important and laudable, but the developing world must be brought into the discussions as well. This can be fostered by the WHO and the rest of the United Nations, a cause that everyone in Washington can support.

Rep. Benjamin A. Gilman (R-N.Y.) is chairman of the House International Relations Committee. Rep. Sam Gejdenson (D-Conn.) is the committee's senior Democrat.