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The Surgeon General's

Call to Action

on

Global Health

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U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES

Office of the Surgeon General

"We have an obligation to assure something more like fairness and equity in human health. We do not have a choice, unless we plan to give up being human. The idea that all men and women are brothers and sisters is not a transient cultural notion…

It is a biological imperative"

-- Lewis Thomas, The Fragile Species

"You've got to be healthy and stay healthy. Without your health, you don't have anything. You can't provide for your family, you lose your job, you lose your house. You ain't got nothing without your health."

– Joe H., American from Wyandotte, Michigan.

Part I: Introduction

Purpose

In 2006, the health of the world's citizens is remarkably uneven. A child born today in Japan, for example, can expect to live to 82 years of age on average, whereas a it is unlikely that a newborn infant born in Zimbabwe will reach his or her 34th birthday. These disparities exist in a world that is become more closely drawn together in all domains, including health. The United States has a direct and growing stake in mitigating the global risks caused by such differences in health. We have a long and enduring tradition of compassion that compels us to help those around us in need. More than a humanitarian exercise, however, improving the health of people around the world directly serves our self-interest and our national security.

The health of all peoples has been interdependent since time began. In this current age of rapid travel, international commerce, and global communication, it is clear that artificial borders and geographic distances cannot isolate the health and safety problems and concerns of people in one community from those in another. Thus, health of an individual, community, or nation is GLOBAL by nature.

This Call to Action on Global Health by the U.S. Surgeon General is directed toward all Americans. It is an invitation to enhance the national and international action on global health with the purpose of improving the world's health.

The purpose of this Call To Action is:

1) to inform Americans on the importance of global health and the urgency of addressing the critical global health challenges of the 21st Century
2) to advocate for action to reduce the deepening disparities in global health
3) to protect the health of the American people, and
4) to elicit global cooperation and collaborative support from national and international organizations, as well as the American public, in health research and action.

What exactly is Global Health? Why is it important?

Simply put: Global health is the health of populations -- of humanity at large. It is ensuring health and safety millions of people at a time, just as family doctors care for one patient at a time. The Institute of Medicine (IOM), part of the U.S. National Academy of Science, has defined global health as referring to "health problems, issues, and concerns that transcend national boundaries, may be influenced by circumstances or experiences in other countries, and are best addressed by cooperative actions and solutions."

Global health is about recognizing that the health problems seen around the globe are also seen in our own backyards. Global health problems need to be directly faced, not only for purely selfish reasons, but because humanity will be better-off because of it. We cannot overstate the reality that problems in remote parts of the globe can no longer be ignored. Diseases that Americans once read about as affecting people in regions of the world that most of us would

never visit are now capable of reaching us directly. The hunger, disease, and death resulting from poor food and nutrition create social and political instability in many nations, and that instability may spread to other nations as people migrate to survive. The environmental conditions that poison our water and contaminate our air are not contained within national boundaries, but float on winds and waves to not-so-distant places. Failing to address global health issues outside our national border will only make the problems that much more challenging when they enter our country.

Global health is of fundamental moral, practical, and strategic importance to the United States for peace, prosperity, and well-being.

Caring about the health of others is a moral value shared by people of all cultures and religions. All societies, cultures, and religions value human life. All people harbor a compassion that drives us to help those who are suffering or in need. If we see an accident victim, a malnourished child, or a sick or vulnerable adult, we are compelled to help. We believe that to allow suffering to continue is inhumane. Implicit in this is a shared moral perception that taking care of the basic health and well-being of our fellow men and women is the "right thing to do." This is substantiated time and time again, particularly during times of crisis, such as the 2005 hurricanes that ravaged the southern gulf and east coasts of the United States, the 2004 Tsunami that devastated Southeast Asia, or the flooding that destroyed lives and land in Haiti in 2004. People everywhere continue to reach out to help in whatever way possible to alleviate human suffering.

Caring about the health of others is also of practical significance because of the interconnectedness of the world and the ability of disease to spread rapidly across borders. Global health is the awareness that SARS can emerge in Hong Kong and almost immediately strike Toronto; it is the understanding that the Hantavirus, first seen in Korea, can turn up years later in New Mexico; it is the recognition that the hemorrhagic fever of the African interior may take root in a Western metropolis or that an influenza pandemic could emerge in humans almost anywhere in the world and spread globally within days. Global health grasps that viruses, bacteria, and parasites can cross all borders -- so the fight against them must do the same.

Caring about the health of others is of strategic significance since health diplomacy, or working with other nations on shared health goals, promotes international cooperation, is critical to the long-term health and security of the American people. It is the way to protect, promote, and advance the health and safety of the nation. A global health perspective also recognizes that health cooperation is a critical aspect of international cooperation and diplomacy. Health diplomacy also acknowledges that poor health contributes to political and economic instability, two factors that threaten world peace. In countries with an adult HIV-prevalence rate of more than 20 percent, gross domestic product (GDP) can shrink by as much as 1 to 2 percent annually. Similarly, malaria in Africa reduces annual GDP growth by one percent. This decrease exacerbates poverty and economic stagnation, and seriously undermines the viability of affected states. Health is the common currency that can be used to help countries achieve their fullest potential and improve international relations.

In sum, increased action to improve global health improves lives, reduces the spread of disease, and contributes to global political stability and economic growth.

Why now?

In 1997, the seminal U.S. Institute of Medicine report *America's Vital Interest in Global Health,* concluded, "…the direct interests of the American people are best served when the United States acts decisively to promote health around the world." Since 1997, the need for greater U.S. investment in global health has only deepened. The challenges we face are extraordinary, but we are not starting from ground zero: The United States is a leader, a catalyst, and a partner in global health.

The new century has brought a myriad of new challenges and opportunities in global health. Vaccines, antibiotics, clean and available water, proper environmental sanitation, and other breakthroughs in scientific and health research and technology are among the many contributions to improved health. Improved health literacy is also critical to helping people improve their own health and the health of those around them. Health literacy is the ability of an individual to access, understand, and use health-related information and services to make appropriate health decisions. Yet new emerging diseases like the Human Immunodeficiency Virus/Acquired Immunodeficiency Syndrome (HIV/AIDS), Severe Acute Respiratory Syndrome (SARS), and Avian Influenza provide new challenges to a nation's public health capacity. Chronic diseases such as diabetes, heart disease, and asthma have reached epidemic levels. Unprecedented flows of people and goods across borders strain existing early warning disease

surveillance systems. Poverty and health disparities are major contributors to the numerous challenges to global public health. The time to react and respond is now.

The multiple connections and interactions which are integrating countries, economies, and populations are usually today described as "globalization." We live in an age of globalization, in which there is no longer a distinction between domestic and international health problems. Pathogens know no boundaries, and infectious diseases are carried, sometimes within hours, to our shores via travel and trade. The movement of two million people each day across national borders and the growth of international commerce contribute to health risks ranging from infectious disease spread by travelers to contaminated foodstuffs. Our response to these threats must match or surpass their speed of transmission. Failure to do so will have devastating consequences on more than just the physical health of our citizens; it will also have serious repercussions on the health of the U.S. economy and on our national security.

Globalization is also a positive force that has lead to improvements in social, economic, and political conditions worldwide. It also allows for increased information sharing for disease control and prevention. However, because of social and economic inequalities, not everyone reaps the benefits of globalization at the same time, and such disparity contributes to instability. Globalization means that countries are more interdependent than ever. No country can truly "go it alone" or try to shut out the rest of the world with respect to public health matters. To be successful in efforts to improve health status and prevent the occurrence of new disease outbreaks, Americans must adopt a global view of health. We must think beyond our borders: therefore, health is a legitimate driver of our national foreign and economic policy, and a benefit of globalization.

The new challenges and opportunities in global health increase the urgency to develop a proactive global health strategy. The United States has been a leader in addressing global health problems and continues to renew its commitment to improving global health. Through private contributions, government assistance, and other forms of technical cooperation, Americans have made significant improvements in health and development across the globe. These improvements have included developing systems for clean water and community environmental sanitation, providing basic immunizations and basic medications, and developing educational and related activities which support health systems. Together with its international partners, the United States has the demonstrated capacity to improve health and quality of life for millions.

Key messages

- Global health is important because it has a direct impact on our lives as Americans
- There are things everyone can do to improve global public health
- Partnerships, formed within the United States and globally, have the capacity to improve health and quality of life for millions

The next section will examine a few of the global health issues that must be addressed by Americans and the global community. These examples do not cover the vast spectrum of pressing global health issues. Rather, they are intended to be illustrative of some of the most critical and complex issues at hand.

DID YOU KNOW? As stated in Article 25 of the Universal Declaration of Human Rights, adopted by the General Assembly of the United Nations on December 10, 1948:
"Everyone has the right to a standard of living adequate for the health and well-being of himself and of his family, including food, clothing, housing and medical care and necessary social services, and the right to security in the event of unemployment, sickness, disability, widowhood, old age or other lack of livelihood in circumstances beyond his control."

Part II: Global Health Issues

The following sections will address just a few areas of global health that directly affect us all and are emblematic of the threats we are likely to face in the future. The people in the stories are fictional, but they represent real world experiences. As you read this section, keep in mind that each area raises the moral, practical, or strategic concerns we described in Section I. Perhaps more importantly, this Section considers human tragedies that are often preventable or at least can be managed to reduce the threat to global health. Using health diplomacy to alleviate these tragedies is both a moral imperative and in our vital long-term national interests.

Disease

Miriam was worried. She suspected that her husband, David, was unfaithful to her when he was away from home on his job as a long-distance truck driver. One of her neighbors in their small village in Africa had contracted HIV from her husband, who worked for the same trucking company as Miriam's husband. Miriam tried to talk to David about his sexual behavior, but he told her that it was none of her business. "How could it not be my business?" she asked herself, "Don't I have a right to protect myself and my unborn baby from the deadly disease AIDS?" She tried to get David to use a condom when they had sex, but he refused, and she had no way to force him to do so or to deny him sex. To make it worse, her husband refused to let her go to the doctor by herself, and if she did, he would be furious and might hurt her. If it turned out she was HIV positive, she and her husband would be shamed. She felt trapped, alone, scared, depressed, and angry, but she had nobody she felt she could talk to about this, even though she knew of a nearby clinic that provided people with medication. So Miriam just hoped and prayed that she and her baby would be lucky and spared the devastation of AIDS.

If Miriam and her baby developed AIDS, it would have been a preventable tragedy. Miriam and her unborn child would face intolerable and unnecessary suffering and injustice. She is not empowered to take control over her health and the health of her family. Furthermore, if David was being unfaithful and he was HIV positive his indiscretions would spread the disease rapidly across large distances. The spread of the HIV/AIDS has already proven to have dramatic effects on entire populations in Africa, where thousands of adults and children are suffering and dying prematurely from a preventable disease. The disease has already spread rapidly to people on

other continents, including the thousands in the United States who are infected as well. There still is no cure, and treatment for the disease remains extremely expensive, in economic and human terms. As a result, HIV/AIDS and other diseases contribute to political and economic instability in many countries. By their nature, they can spread rapidly across national borders, and hence require international cooperation to be controlled, particularly in the area of prevention. Disease must thus be viewed as a global problem.

Disease has been a part of life since early times. Paintings and drawings from ancient civilizations such as that of Egypt depict humans exhibiting the symptoms or consequences of diseases such as polio. The human race learned long ago that infectious diseases do not respect national borders. The Black Death (bubonic plague) of the Middle Ages, for example, swept across Europe and killed an estimated one-quarter of the population. The worldwide influenza pandemic of 1918 resulted in some twenty to fifty million deaths. Health authorities predict that a future flu pandemic could infect anywhere from 20 to 50 percent of the world population, resulting in huge social and economic disruption, as well as extensive loss of life.

Many factors contribute to one's vulnerability to disease. Being poor, of a disadvantaged minority group, a migrant or refugee, a child, a prisoner, or having a weak immune system due to HIV or substance abuse or malnutrition are all factors that may lead someone to become ill. Physical and social environments also exert a profound effect on health. A wide range of conditions, such as poor sanitation, chemical toxins, inadequate access to health care, political instability, risky behavior, violence, etc., can all influence health and cause disease.

Infectious Disease

Despite the development of vaccinations, antibiotics, and other medical technologies, one-third of all deaths worldwide in 2003 were caused by infectious diseases according to the World Health Organization (WHO). Six global diseases (acute respiratory infections, HIV/AIDS, diarrhea, tuberculosis, malaria, and measles) accounted for roughly 90 percent of worldwide deaths from infectious diseases. It is especially distressing that many deaths due to infectious diseases could be prevented by existing public health strategies and the use of vaccines. Making vaccines and treatment more widely available, as well as developing vaccines and treatments against diseases for which none currently exist, would save millions of lives a year.

HIV/AIDS may be the defining medical and public health issue of our time. By 2005, HIV, the virus that causes AIDS, had infected a cumulative total of more than 60 million people, a third of who have died. More than one million Americans are living with HIV, and HIV/AIDS is an urgent and cascading problem in developing countries. According to the most recent global estimates by UNAIDS and the WHO, about 40 million people are infected with HIV globally, and 3.1 million adults and children died of AIDS in 2005. HIV/AIDS remains a constant crisis. Over the next twenty years, HIV/AIDS is expected to cause a decline in life expectancy in 51 countries. The disease, which is the fourth largest killer globally, is not spread evenly throughout Earth's population; about 95 percent of those infected are in the developing world and most of those are in Sub-Saharan Africa. HIV is causing enormous social disruption in many countries: millions of children have become orphans, and health care workers and facilities in many areas have been overwhelmed by the number of HIV/AIDS patients requiring medical care.

Women are more vulnerable to HIV than men because of biological and cultural factors. For example, because of the anatomy of their reproductive tract women are subject to more frequent infections of the reproductive tract than men which render them more vulnerable to infection with HIV. But cultural factors are even more important than biological ones with respect to the danger of women acquiring and spreading HIV/AIDS. In many populations women lack the power and economic independence to negotiate safe sex with their partners, for example, under many circumstances they cannot insist on the use of a condom and women who exchange sex for income are in even a weaker position to insist upon safe sex. (Germain, 2002)

Early Warning Systems: The importance of surveillance

One of the most valuable elements in global health is the ability to detect the first signs of an outbreak of infectious disease anywhere in the world. As a result of the AIDS pandemic and the concern about a pandemic influenza, particularly the current H5N1 strain of avian influenza, or "bird flu," an effective global surveillance network is a high priority. Stimulated in part by the AIDS pandemic, national and international groups, including the National Science and Technology Council in 1995 and the G-8 in 1997, called for the establishment of a global early-warning system for infectious diseases. Countries have been working together to help develop a global early-warning system that includes surveillance and outbreak response. Important progress has been made at the regional level, with the establishment of such international programs as the Caribbean Epidemiology Center's disease surveillance network; the Amazon and Southern Cone networks in South America; the Integrated Disease Surveillance and Epidemic Preparedness and Response Project in Africa; the Mekong Basin Disease Surveillance system in

Southeast Asia; and the International Circumpolar Surveillance system in Alaska, Canada, Greenland, and the circumpolar regions of Europe.

An immediate priority for the United States lies in disease surveillance along our borders with Mexico and Canada. Under the Security and Prosperity Partnerships of North America, HHS works to enhance infectious-disease surveillance capabilities within North America by creating public-health emergency preparedness systems along and across the U.S.-Mexico and the U.S.-Canada borders. Information about disease occurrence in the areas across and along the Southern and Northern borders is both a public health and national security imperative. The programs in development focus on early detection, accurate identification, and prompt reporting of infectious-disease outbreaks associated with potential bio-terrorism agents or other major threats to public health. The areas of primary emphasis include the training of epidemiologists, laboratory and clinical personnel, and information-technology specialists.

While HIV/AIDS attracts a great deal of international attention, other infectious diseases also have a significant impact on global health. Malaria, caused by several species of parasites in the genus *Plasmodium* and transmitted to humans by the bite of an infected mosquito, is another deadly infectious disease that continues to plague our world.

In spite of an overall decline in cases world wide since 1930, malaria cases in Africa has actually increased during the past few decades, and the disease remains endemic in Southeast Asia and the Americas. An estimated 500 million cases of malaria occur each year, which results in one to two million deaths, mostly children less than 5 years of age. In areas of Africa with high malaria transmission, an estimated one million people die of malaria each year, over 2,700 deaths per day, or two deaths per minute. The associated morbidity of this disease is

incalculable because many of the children who survive are repeatedly infected, with resultant poor nutrition, impaired development, and, perhaps, increased susceptibility to comorbid infections and associated disease. In Latin America, approximately forty percent of the region's 818 million people are at risk for malaria. Malaria morbidity and mortality numbers for the Americas region are 909,788 (based on number of positive blood slides), and 99 deaths, respectively for 2003. Latin America has made improvements in combating morbidity and mortality from malaria, but neglect will prejudice those improvements. Further, with evolving technology, we can reach the hard-to-serve in ways not previously possible.

Controlling malaria will contribute significantly to the internationally agreed upon development goals contained in the United Nations (UN) Millennium Declaration, which all 193 UN Member States have pledged to achieve by 2015. Beyond reducing the disease burden, a successful fight against malaria will have far-reaching impact on child morbidity and mortality, maternal health, and poverty, which in turn could increase global stability.

Malaria treatment, control and prevention should be an integral function of an effective health system, supported by strong community involvement. Sustained success in malaria reduction calls for development of the health sector; improved case management, the use of intermittent presumptive treatment programs for pregnant women, insecticide-treated bed nets, and spraying of households with insecticide.

In the past, chloroquine and sulfadoxine-pyrimethamine were highly effective standard treatments for preventing and treating malaria, but now some of the parasites have developed drug-resistance. In May 2005, the World Health Assembly (WHA), the supreme governing body of the WHO, passed by consensus Resolution WHA 58.2 for malaria control. This resolution calls for increased allocation of domestic resources; rapid scale-up of prevention, including free

or highly subsidized distribution of insecticide-treated nets to vulnerable groups; support for expanded household insecticide spraying; access to artemisinin-based combination therapy (ACT); and the development of new medicines to treat malaria, especially for children and pregnant women.

Roll Back Malaria

The WHO, the United Nations Children's Fund, the United Nations Development Programme and the World Bank launched Roll Back Malaria in 1998. The goal is to halve the burden of malaria by 2010. Reducing malaria requires commitment, coordination and financial support. The core technical strategies of RBM for the sustainable control of malaria are the following:

Improved and prompt access to treatment; increased use of insecticide-treated bed nets and control of mosquitoes; early detection of and response to malaria epidemics; and improved prevention and treatment of malaria in pregnant women in highly endemic areas. Stated simply, the RBM strategy is to combine both prevention and cure. To be successful, malaria control must be incorporated into all health and development policies, strategies and programs.

Tuberculosis (TB) also continues to be a major killer. Tuberculosis is a contagious disease, caused by the bacteria *Mycobacterium tuberculosis* (Mtb), and is spread, much like the common cold, by coughs, sneezes, talk or spit. A person can become infected when even a few infected droplets are inhaled. One third of the world's population (approximately two billion people), is infected with Mtb. Most people who are infected are able to fight off active infection,

but may retain a latent TB (a time of infection with no signs or symptoms of active disease), while others appear to clear the organism completely. However, the WHO estimates that nearly eight million people develop active TB every year, almost 98 percent of whom live in the developing world. Although a cure was discovered over fifty years ago, TB kills between two and three million people every year, and not just in the developing world. In 2003 the 50 states and the District of Columbia reported 14,517 cases of tuberculosis. Tuberculosis has re-emerged along the U.S.–Mexico border. Mexicans and immigrants from other countries who move through Mexico cross this border to migrate to the United States. A quarter of all foreign-born tuberculosis patients in the United States are Mexican, and the United States and Mexico have a bilateral program to issue TB bi-national cards so treatment for tuberculosis can continue in both countries.

Of the approximate two million people who become sick with infectious tuberculosis each year, 300,000 have infections that are resistant to the first-line drugs used to treat TB. Tuberculosis is most often is found in the homeless and in those with HIV/AIDS. One third of the estimated 40 million people living with HIV/AIDS are also infected with tuberculosis. Each disease makes the other worse, accelerating the pathology caused by each infectious agent and hastening the death of the individual. Both diseases should be treated when they are present but there are times when an immune reconstitution syndrome develops with treatment of the HIV infection and fatal complications, such as TB meningitis, occur. There are many clinical trials, supported by the US National Institute of Allergy and Infectious Diseases, underway which are investigating the best timing of treatment for people infected with both pathogens. Another complication of co-infection is that TB is harder to diagnose in HIV-positive patients; therefore, treatment for tuberculosis often has been absent, inconsistent or inadequate, which may

contribute to the development of drug-resistant tuberculosis. Even where effective drugs are available, curing TB demands a long continuous pattern of treatment, six to nine months or perhaps even life, until a cure is achieved in an HIV infected person.

The Global Fund to Fight AIDS, Tuberculosis and Malaria

The Global Fund is a public-private foundation created to finance a dramatic turn-around in the fight against AIDS, tuberculosis, and malaria. The Global Fund receives most of its funding from national Governments; the United States is the largest contributor to the Fund, and has provided almost one-third of the $3.7 billion that it has received. The President's 2006 budget requested an additional $300 million. AIDS, tuberculosis and malaria kill over six million people each year, and the numbers are growing. To date, the Global Fund has committed U.S.$ 3 billion in 128 countries to support aggressive interventions against all three diseases. By funding the work of new and existing programs, it can save millions of lives, stop the spread of disease and halt the devastation to families, communities and economies around the world. As a partnership between Governments, civil society, the private sector and affected communities, the Global Fund represents an innovative approach to international health financing. The Global Fund is a results-based, grant-making body to which stakeholders from developing countries submit program proposals in a competitive, peer-reviewed process. HHS is a leader in facilitating these reviews. The submission

process was designed from the start to be inclusive of community and faith-based organizations, as well as representatives from Governments.

Global spread of infectious diseases is not restricted to human-to-human transmission. Diseases found in animals that can infect humans are known as "epizootic" diseases. These diseases become particularly dangerous when they mutate to allow for human-to-human transmission. The spread of West-Nile Virus and strains of influenza, including Avian Influenza A H5N1, is initially caused by animal-to-animal transmission.

Avian Influenza H5N1 has gained significant international attention. Most experts today view the increasing possibility of a pandemic influenza as the most significant global health emergency on the immediate horizon. A pandemic is a global disease outbreak, and an influenza pandemic occurs when a new influenza A virus emerges for which there is little or no immunity in the human population, begins to cause serious illness and then spreads easily from person to person worldwide. Historically, pandemics have traveled along sea-lanes, with global spread completed within six to eight months. Air travel has shortened this timeline considerably.

The 20th Century saw three influenza pandemics. 500,000 Americans died during the "Spanish flu" of 1918, and across the world approximately 20 million to 50 million people died. In 1957-58, the "Asian flu" caused 70,000 deaths in the United States. Then in 1968-69, the "Hong Kong flu" caused about 34,000 deaths in this country. Viruses containing a combination of genes from a human influenza virus and an avian influenza virus caused both the 1957-58 and the 1968-69 pandemics. Many scientists believe the cause of the 1918 pandemic was an avian, or bird, influenza virus, like the H5N1 influenza virus that is currently circulating in many parts of the world. Scientists think the present situation might resemble that before the 1918

pandemic. Similarities between the H5N1 strain of highly pathogenic avian influenza A and the 1918 virus include the gradual adaptation of an avian virus to a human-like virus, the severity of disease, its concentration in young and healthy people, and the occurrence of primary viral pneumonia (which cannot be treated) in addition to secondary bacterial pneumonia (which responds to antibiotics).

While no one can predict the timing of influenza pandemics, rapid international spread is certain once a virus with the appropriate characteristics appears. The speed of the spread of a disease does not predict how deadly it will be, but it raises questions about the surge capacity of health systems in our country as well as across the world if almost simultaneous outbreaks occur. Countries, including the United States, are already working together to take preventive measures to prepare for a possible global outbreak of pandemic influenza.

Children and Immunizations

Children are especially vulnerable to disease and injury, but the information and technologies exist to save the lives of millions of these children each year. Yet coverage of many basic interventions has either slipped or stagnated. In the 1990s, levels of immunization coverage stagnated or dropped in many countries. The WHO estimates that 2.5 million children died in 2002 from diseases preventable by vaccines currently recommended by WHO, plus vaccines that are soon expected. These vaccines include measles (540,000 deaths), Haemophilus influenza type B (Hib) (386,000 deaths), pertussis (294,000 deaths), neonatal tetanus (180,000 deaths), and tetanus (non-neonatal; 18,000 deaths). Additional deaths among children due to rotavirus, meningococcus, and pneumococcus approximate 1.1 million. A recent assessment by the Bellagio Study

Group on Child Survival indicates a stark and representative contrast between evidence and application in resource-poor settings. The deaths of an estimated two-thirds of children less than five years old could be averted with proven interventions that can be deployed in low-income countries. (Bellagio Study Group, 2003)

While the aforementioned diseases capture significant attention in the media and elsewhere, many other infectious diseases, continue to kill huge numbers of people worldwide. Childhood diarrhea is one such deadly condition, sometimes caused by rotavirus (other causes will be discussed in other sections), a highly contagious infection that affects 130 million infants and children worldwide by age two. The virus causes diarrhea and vomiting which results in dehydration and the most serious cases require hospitalization for intravenous fluids. Worldwide, rotavirus diarrhea results in hundreds of thousands of child deaths a year. In the United States rotavirus causes more than three million cases of childhood diarrhea each year, and leads to 55,000 to 100,000 hospitalizations and 20-100 deaths. Clinical trials for rotavirus vaccines are underway and when they are available widespread vaccination could save $500 million in health-care costs in the United States and worldwide could reduce deaths by 30 percent, and saving as many as one million children each year.

DID YOU KNOW? Just one vaccine-preventable disease, measles, was responsible for about 745,000 deaths in 2001. The measles vaccine is safe, effective and cheap, costing approximately U.S. $0.30 a dose, including needle, syringe, and disposal, and results in near-zero death rates. Some countries include measles mortality reduction strategies into their health care

programming, which may include vitamin supplementation, insecticide treated bed-netting, and other vaccinations. With intensified efforts to improve measles vaccine coverage in Africa, measles deaths fell to 454,000 in 2004, according to WHO and UNICEF.

Chronic Disease

Infectious diseases, however, are by no means the only cause of illness, disability and death in the world. The WHO estimated that in 2004, for example, non-communicable diseases accounted for about 60 percent of global deaths and almost half (47 percent) of the global burden of disease. The leading non-communicable diseases are cardiovascular diseases, cancers, respiratory disorders, digestive disorders, and neuropsychiatric disorders. Chronic diseases are not exclusive to the developed world. Rather, the developing world is becoming increasingly burdened with both chronic and infectious disease, partly due to the rapid adaptation of behaviors and lifestyles that adversely affect health.

The World Health Organization (WHO) reports that in 2002, approximately 16.7 million people died from cardiovascular disease (CVD). Cardiovascular disease includes coronary heart disease, stroke, hypertensive heart disease, inflammatory heart disease, rheumatic heart disease, and other heart diseases. Risk factors for CVD vary between developed and developing countries. However, among both developed and developing countries, most CVD is attributable to tobacco use, high blood pressure, high cholesterol and obesity. Coronary heart disease is decreasing in many developed countries, but it is on the rise in many developing and middle-income countries. Experts at the WHO and elsewhere attribute this change to increased longevity, urbanization, and lifestyle changes. In fact, the WHO reported in "*The Atlas of Heart*

Disease and Stroke" in 2004 that more than 60 percent of the global burden of coronary heart disease occurs in developing countries.

Moreover, approximately 15 million people worldwide suffer a stroke every year. Approximately 5 million of these people will die, while another 5 million are left permanently disabled, leaving a burden on their families and communities. The WHO reports that while the incidence of stroke may be decreasing in many developed countries, largely as a result of better control of high blood pressure and reduced smoking, it continues to increase world wide. This is likely attributable to the aging population, as well as uncontrolled increased blood pressure. The risk factors for cardiovascular disease and hypertension can be greatly reduced through proper diet, exercise, and medication. In fact, treating hypertension can reduce the risk of stroke by up to 40 percent. Key to achieving this reduction in risk, however, is improved health literacy.

DID YOU KNOW? Heart disease and stroke together constitute the leading cause of death worldwide, resulting in about 17 million (about one-third of) all deaths per year.

Diabetes has become one of the major causes of premature illness and death in most countries, especially because it increases the risk of CVD. An estimated six deaths per minute, or 3.2 million deaths per year, are attributed to diabetes or related conditions. In addition to the deaths resulting from the disease, diabetes leads to various disabilities, including loss of limbs and or vision, which frequently carry economic and social consequences. In 2003, the Pan American Health Organization (PAHO) reported that expenditures associated with permanent and temporary disabilities from diabetes were over 50 billion dollars in Latin America and the

Caribbean alone. These costs are in addition to those for insulin and other drugs, hospitalization, and other medical care for persons with the disease.

The *World Cancer Report* (Stewart and Kleihues, 2003) predicts that cancer rates are set to increase globally at an alarming rate, as much as 50 percent by 2020. Malignant tumors were already responsible for 6.2 million deaths internationally in 2000. Cancer has emerged as a major public health problem in developing countries, matching its effect in industrialized nations. The three leading cancer killers are lung, stomach and liver cancer. The *Cancer Report* indicated that one-third of cancer cases could be prevented through reduction of tobacco consumption, healthy lifestyle and diet, and early detection through screening.

Tobacco is the second major cause of death and the fourth most common risk factor for disease worldwide. It is responsible for approximately five million deaths each year. The economic costs of tobacco are also high, estimated to be $200 billion a year globally, with a third of this loss occurring in developing countries. The WHO reports that if current smoking patterns continue, it will cause some 10 million deaths each year by 2020. Half the people that smoke today -approximately 650 million people- will eventually be killed by tobacco. Tobacco control measures can have a significant impact on reducing tobacco consumption, hence decreasing the burden of disease and death due to tobacco use.

The Framework Convention on Tobacco Control

The World Health Organization (WHO) Framework Convention on Tobacco Control (FCTC) is the first global health treaty negotiated under the auspices of the WHO. This convention is an evidence-based treaty that reaffirms the right of all people to the highest standard of health. It represents a paradigm shift in developing a regulatory strategy to address

addictive substances; in contrast to previous drug control treaties, the WHO FCTC asserts the importance of demand reduction strategies as well as supply reduction issues. The WHO FCTC was developed in response to the globalization of the tobacco epidemic. The spread of the tobacco epidemic is exacerbated by a variety of complex factors with cross-border effects, including trade liberalization, direct foreign investment, global marketing, transnational tobacco advertising, promotion and sponsorship, and the international movement of contraband and counterfeit cigarettes.

There are currently 168 countries who are signatories to the FCTC, and 128 who are parties to it (i.e., their national legislative bodies have approved the country's participation). While the United States signed the FCTC treaty in May 2004, Congress has yet to ratify the it, therefore the United States has not yet become a formal party to this agreement.

Mental illness also takes a heavy toll in human misery and death. It is estimated that nearly 450 million people are afflicted with mental, neurological or behavioral problems worldwide at any given time. Moreover, the WHO estimates that depression was found to be the second leading cause of disability worldwide. Even though mental illness has high economic and social costs, stigmatization of mental health continues to have a tremendous effect on individuals who are in need of care. It causes enormous suffering and should be considered life-threatening, with approximately 873,000 people who commit suicide annually.

Nonetheless, the world has been slow to recognize and respond to mental illness. Mental health problems are frequently not considered as high a priority in health care systems as physical problems, because people often do not recognize the seriousness of mental illness and frequently lack understanding about the benefits of care and treatment. As the WHO points out,

policy makers, insurance companies, health and labor policies, and the public at large – all discriminate between physical and mental problems. Furthermore, the WHO reports that most middle and low-income countries devote less than 1% of their health expenditure to mental health. Consequently mental health policies, legislation, community care facilities, and treatments for people with mental illness are not given the priority they deserve. The *2005 Mental Health Atlas,* published by WHO shows no substantial change in global mental health resources since 2001, while there continue to be marked and growing differences in availability between high- and low-income countries. For example, the WHO survey of 192 countries does show a slight increase in the total number of psychiatrists from 3.96 to 4.15 per 100,000 people worldwide, distribution across regions ranges from 9.8 in Europe to just 0.04 in Africa.

There are numerous other important diseases (e.g., arthritis, asthma, and pneumonia), both infectious and non-communicable, that contribute to global health care problems, but will not be discussed here due to space constraints. While not exhaustive, this section was intended to highlight some of the diseases that are facing the global population.

Women's Health

Numerous studies have demonstrated that women's health is directly linked to women's education and empowerment. As primary caretakers in many societies, women play a critical role in curbing the spread of disease. Educated women are also in a better position to care for themselves and their children. Despite improvement in the status of the world's women, they still face substantial discrimination in many ways. Large gaps exist between women and men in access to education, health, nutrition, and political

power. These inequalities directly and indirectly lead to significant health problems for women that also have an impact on their families and communities.

Today many of the health challenges facing women worldwide (such as high rates of maternal mortality, HIV infection, and sexual violence against women and girls) stem from a basic denial of women's rights as human beings. Inequality between men and women is a major threat to women's health. In some societies where it is unacceptable for women to leave the house without their husbands' permission, pregnant women who need medical assistance face a risk of serious complications and death if their husbands are not home to grant them permission to seek medical care. Pregnant and childbearing women die because their basic nutrition is compromised, their reproductive rights are violated, and their access to medical care is denied as a result of gender inequality (Germain, 2002). As long as these inequalities persist, health outcomes will remain far from optimal; not only for women, but for the vulnerable populations they traditionally care for, including children and the elderly. Allowing such disparity to persist presents a significant moral challenge to all populations.

Food and Nutrition

Diane was a self-proclaimed couch-potato, with a love for all things chocolate. Unfortunately, her 13 year old daughter, Sarah, had followed her example from an early

age and was already nearing 165 pounds on her 5'1" frame. Lately Sarah had been complaining of being more tired than usual, would sometimes get light headed, and she was constantly drinking any beverage she could get her hands on. Diane was starting to become concerned, so she took her daughter to the pediatrician. The doctor took some blood samples and called them back to let them know that Sarah had developed Type II diabetes. She would need to go on a strict diet and exercise regimen or face insulin shots. Moreover, she needed to start monitoring her glucose level several times a day. They left the office stunned. Diane always believed that Type II was an adult disease, but yet her adolescent daughter was diagnosed. The doctor said the girl's obesity, triggered by too many sweets and junk food, and sedentary lifestyle were to blame. Diane realized that the time had come for a change in both their lives.

Food is the sustenance of life. Yet, every year millions of people across the globe develop some form of disease related to their diet, just like Sarah. Too much of the wrong kinds of food, just as well as too little of nutritious foods contribute to disease and premature death. With all the knowledge, wealth, technology and transportation mechanisms the world has developed, there is little reason why any child or adult should suffer from poor nutrition resulting in malnourishment or obesity today. The solutions to both problems are well known. Yet, every nation faces issues related to food supply, food safety, and proper nutrition.

Food and health are intimately related. Not getting enough to eat can lead to reduced physical capacity, higher rates of illness, and premature death. Diets that are deficient in certain

vitamins or minerals can result in disease and disability. UNICEF reports that deficiencies of micronutrients such as iron, iodine, vitamin A, and folate affect nearly one-third of the world's population, and result in reduced mental and physical development of children, poor pregnancy outcomes, diminished work capacity of adults, and increased morbidity and premature mortality among populations.

The 2006 UNICEF report "Progress for Children: A Report Card on Nutrition" cites that more than one quarter of all children under the age of five in developing countries are underweight, many to a life-threatening degree. Poor nutrition remains a global epidemic contributing to more than half of all child deaths, about 5.6 million per year. Malnourished children in South Asia, Bangladesh, India and Pakistan account for half of all the world's underweight children: approximately 47 percent of India's under-five population is underweight, dragging down the regional average. In the famine-prone Eastern and Southern Africa region 29 percent of children under-five years of age are underweight. Despite some improvements several countries are falling behind again, with drought-related food crises and the rise of HIV/AIDS impacting the populations dramatically. Some reports indicate that the Western and Central African regions have done better, partly due to strides made by some countries to support exclusive breastfeeding for infants and community-based health care.

Females are much more likely to suffer from malnutrition and associated health problems than males. Girls and women receive less food than men and boys when food is scarce. Women also generally receive less protein-rich food than men even when they are pregnant or nursing. This is true even though women are responsible for most of the world's food production, processing and preparation.

Bilateral cooperation to prevent birth defects

Nearly a decade of activity between HHS/CDC and the Chinese Ministry of Health (MOH) on the control of spina bifida offers a model for collaboration. The community intervention program conducted by the Chinese MOH in collaboration with HHS/CDC demonstrated that an inexpensive nutritional supplement of folic acid (to prevent folate deficiency) taken before and during early pregnancy could reduce the occurrence of spina bifida (and anencephaly, a more severe form of the defect) by 85 percent in the northern part of China (around Beijing), where the defect is approximately 10 times more common than it is in the south around Shanghai. This definitive study has lead to the implementation of folic acid supplementation around the globe.

Maternal malnutrition is a serious problem that affects both children and their mothers. Folate deficiency results in approximately 200,000 babies born yearly with severe and crippling neural tube defects every year. Each year millions of children in the developing world suffer from growth retardation directly related to their intra-uterine conditions. Furthermore, iodine deficiency, the leading cause of preventable mental retardation, results in as many as 37 million babies a year born with learning disabilities. According to UNICEF and the Micronutrient Initiative (2004), iodine deficiency is estimated to have lowered the intellectual capacity of almost all of the 80 nations reviewed by as much as 10 to 15 percent. Decreased intellectual capacity reduces Gross Domestic Products (GDP), diminishes productivity, and impairs development of populations. Iron deficiency is a major cause of maternal deaths, and in the 6 to 24 month age group impairs the mental development of 40 percent to 60 percent of the developing world's children. Iron deficiency in adults is so widespread that it is lowering the

energies of nations and the productivities of workforces—with estimated losses of up to 2 percent of the GDP in the worst affected countries.

Vitamin A deficiency compromises the immune systems of approximately 40 percent of the developing world's pre-school children, leading to mortality of an estimated one million children each year. In addition, nearly three million preschool children are rendered blind as a result of vitamin A deficiency. Yet, solutions can be as simple as a capsule of vitamin A costing just a few cents delivered during immunization – a program currently saving around 350,000 lives per year by boosting immune systems. Furthermore, fortifying staple foods with key nutrients like iron and iodine is a proven way to protect millions of children against damaging deficiencies and developmental delays.

Clearly, thousands in the developing world still suffer from hunger and malnutrition, and so those who can look elsewhere for sustenance do. This contributes to waves of migration, both legal and illegal, to countries with more resources. These countries, including the United States, while better off, are not always prepared for the burden of caring for the incoming population. Working with the countries of origin, to prevent hunger and resulting migration, benefit both sides.

DID YOU KNOW? Malnutrition is the most common risk factor causing disease and injury.

Not all nutrition-related health problems are due to lack of food or of particular nutrients, however. Too much food can make an individual overweight, even obese, increasing the risk of diabetes, heart disease, and other health problems. Foods high in saturated fats can increase the body's cholesterol level, a risk factor in heart disease and stroke. Nonetheless, even healthy foods, if consumed in excessive amounts, can result in obesity and related risks.

The links between diet, physical activity and diseases such as diabetes, hypertension and heart disease are well established. Research has demonstrated that obesity increases the risk of developing diabetes, hypertension, heart disease, stroke, colon cancer, post-menopausal breast cancer, osteoarthritis and a variety of other health problems.

In the United States, obesity has become an epidemic. Changes in lifestyles over the past few decades, such as reduced demands for physical work and an increase in dining out and consuming fast foods, have led to an increase in the weight of the average American. The U.S. Department of Health and Human Services' Centers for Disease Control and Prevention (CDC) reported that the proportion of overweight adults increased 50 percent in ten years, and the proportion of overweight children more than doubled between 1976 and 2000. The CDC estimates 3,000 Americans a year die from complications related to obesity, and the country spends 117 billion dollars a year on disease related to overweight and obesity.

This epidemic of obesity is not unique to the United States. The WHO estimates that one billion adults worldwide are overweight, and at least 300 million are clinically obese. It is a serious threat to health in other countries as well, both developed and developing countries. As people in developing countries adopt Western lifestyles of unhealthy high fat, high sugar, low fiber, high calories diets, along with lower levels of exercise, obesity increasingly becomes a problem. Due to these lifestyle changes, diseases traditionally associated with developed countries, such as hypertension and heart disease, are increasing significantly in developing countries as well.

Food can also be a source of disease in another way. Food that has been contaminated by microorganisms, pesticide spray residues, or other agents can make people sick. In 2004, for example, 317 people became ill in Kenya and 125 died as a result of consuming maize affected

by a toxic mold (Aflatoxin) that can grow on certain crops. Many food products are imported daily to the United States from other countries, and the U.S. Food and Drug Administration of the Department of Health and Human Services works closely with foreign growers to ensure that those food products are safe. In addition to accidental poisoning, health officials must also be alert these days to the possibility of individuals such as terrorists intentionally introducing poisonous agents into the food supply. Emergency preparedness can play a critical role in preventing such an incident from occurring. Food production systems and corresponding food safety and security vulnerabilities vary widely with agricultural systems, production methods, and amount of government regulatory oversight. Only by working with the countries from which the food originates can a safe and sufficient food supply be ensured.

Water and Air

Raul's rural village in South America never had the luxury of being connected to city water pipes, with clean, chlorinated water. Instead, he and his neighbors had to collect water from rain-water collection buckets they placed outside their homes. Sometimes, though, when the rains did not come, they had to collect water from the nearby river. The rains had not come in a while, and Raul was forced to collect drinking water from the river. While there, he also collected some vegetables to eat that had been watered with water from the river. Over the next few days, he and his wife suffered terrible bouts of diarrhea and fever. They grew increasingly weak and had no energy to go look for food or help. There was no doctor for miles around to treat them, and even if there was, she doubted they would be able to pay for any medicines the doctor might recommend.

Raul had no way of knowing for sure that the river was polluted by human excrement due to rains and heavy flooding upstream. However, even basic public health precautionary methods like handwashing and boiling of water or charcoal filtering can be difficult to undertake in the poorest and most remote areas. Lack of infrastructure, coupled with lack of access to health care, can create hazardous living conditions.

The physical environment exerts an enormous influence on global health. In particular, the air we breathe and the water we drink plays a major role in the state of our health. Water and air are essential to life, but can become sources of disease or factors exacerbating disease if contaminated.

Globally 2.3 billion people suffer from diseases associated with contaminated water – mostly the poor from virtually all developing countries. Water-related diseases cause an estimated 12 million deaths a year, nearly half of them due to diarrheal diseases, with children being the most likely victims. Some of the most prevalent water-borne diseases include: cholera, enterotoxigenic *Escherichia coli*, and typhoid fever. These types of diseases are prevalent where there is a lack of clean water and basic public health practices such as handwashing, proper washing of foodstuffs, and sewage removal.

DID YOU KNOW? Nearly 80 percent of childhood diseases that result in death are caused by contaminated water. (WHO and UNICEF, 2000)

Water shortages usually lead to problems of water quality since sewage, industrial waste and agricultural and urban run-off overload the capacity of bodies of water to break down or dilute these wastes. Other causes of water crises may arise from natural disasters, such as hurricanes and earthquakes, often leave many thousands of residents of the affected areas without access to safe drinking water for days and weeks after these incidents. The earthquake and tsunami of December 2004 is an example of such a disaster that left thousands temporarily without access to safe drinking water. Yet, simple preventive public health measures were rapidly implemented, and massive outbreak of disease was averted.

Rivers, oceans and the atmosphere cross national and international borders. Pollution of air and water is thus not confined to the countries in which it occurs. For example, high levels of toxic chemicals known as polychlorinated biphenyls (PCBs) have been found in Inuit people living in some of the most remote areas of the Artic Circle. Ingested PCBs can be stored in the fatty tissue of animals, and in this case elevated concentrations of PCBs were found in the blubber of whales and seals, one of the major food sources for the Inuits. (Population, 2000) Protecting the Earth's air and water to ensure the health of humans is therefore a global task.

Fresh water is considered a renewable resource, but there are limits on the supplies available. In many countries or regions, shortages of fresh water are the main obstacles to agricultural and industrial production. The U.S. Agency for International Development (USAID) reports that nearly half a billion people in 31 countries face serious water shortages today.

In addition to being contaminated by disease-causing microorganisms, water can be polluted by chemicals that are injurious to health. The contamination of water by heavy metals such as lead and mercury is a problem for developing and industrialized countries alike. Birth

defects, bone malformations, and brain damage are but a few of the many health problems attributed to heavy metal pollution. Uncontrolled emissions from industrial plants and the contamination of water sources from mining operations threaten drinking water quality globally. (Chanlett, 1979)

The use of pesticides is also of concern to health officials, scientists, and government leaders around the world. These chemicals can persist in the environment for long periods of time, and are often found in the fatty tissues of animals and humans exposed to them. Release of these chemicals into the air or water can negatively affect the health of biological organisms many miles from the point of discharge. Runoff from pesticides used on food crops, for example, can enter and contaminate lakes, rivers and other bodies of water. Chlorinated hydrocarbon pesticides are much more closely regulated than they once were, but they can still pose a threat to health, especially since they decompose slowly and can remain in the water or soil for long periods of time. Even the less dangerous and less persistent pesticides introduced in recent times can have negative effects on health. When such chemicals are found in water supplies, they usually occur in small amounts. Nonetheless, if consumed they may potentially cause chronic health problems such as organ failure, cancer, or birth defects. (*Population*, 2000)

Air pollution is a major environment-related health threat to children and a risk factor for both acute and chronic respiratory disease. While second-hand tobacco smoke and certain outdoor pollutants are known risk factors for acute respiratory infections, indoor air pollution from biomass fuel is one of the major contributors to the global burden of disease. Indoor air pollution from the combustion of coal or unprocessed biomass fuels such as wood or waste represents perhaps the largest energy-related source of ill health. In fact, biomass fuels are used to meet the energy needs of half of the world's population. They are often burnt in open fires or

inefficient stoves in poorly ventilated houses and give off smoke and chemicals that contribute to diseases of the lungs and heart. Because of the presence of known cancer-causing chemicals in the indoor air, there is also an increased risk of lung cancer. Women are generally responsible for cooking and looking after children in these homes, and they and their children are at the greatest risk.

In addition, outdoor air pollution is a serious problem in cities throughout the world, particularly in the megacities of developing countries. WHO estimates that a quarter of the world population is exposed to unhealthy concentrations of air pollutants. Of those exposed, children are particularly at risk due to the immaturity of their respiratory organ systems. Outdoor air pollution is largely and increasingly a consequence of the combustion of fossil fuels for transport, power generation and other human activities. Combustion processes produce a complex mixture of pollutants that comprises both primary emissions, such as diesel soot particles and lead, and the products of atmospheric transformation, such as ozone and sulfate particles formed from the burning of sulfur-containing fuel. The removal of lead from gasoline has been a major improvement to the overall health of millions of people especially children whose developing brains were most affected, as well as to the environment. This was achievable through massive international cooperation and understanding of this issue.

Another effect of air pollution is that the ozone layer in the stratosphere above Earth's atmosphere is being damaged by the release of various chemicals used in refrigerants, aerosols, and other equipment, as well as organic solvents. Depletion of the ozone layer is likely to lead to higher levels of ultraviolet radiation reaching the Earth's surface. Certain wavelengths of this radiation increase the incidence of skin cancer and cataracts in humans. (WHO, 1992; WHO, 1993)

A related issue concerns the build-up of greenhouse gases in the atmosphere, which is believed likely to lead to global warming and a rise in the sea level. The climate changes that would result from global warming could have various direct and indirect effects on the health of humans. For example, heat stress and heat stroke, which can be fatal, may become more common, especially among susceptible groups such as older adults, children, and those with heart problems. The distribution of insects and other organisms that serve as hosts to the microorganisms that cause infectious diseases is likely to be affected. This could lead to changes in disease patterns. For example, malaria might appear in areas where it is currently unknown because of the spread of the mosquito that carries the disease. Global warming could also adversely affect health if changes in rainfall diminished the variety or quantity of crops available, which could lead to or aggravate food shortages. (WHO, 1992; WHO,1993)

Injuries and Violence

Joe Williams was enjoying his vacation abroad with his wife, 10-year old daughter, and 8-year old son. They were in the second week of their trip, and the large city they were visiting was crowded but exciting. Joe was a little nervous about driving in a foreign country where he was unsure of local driving customs and regulations, especially in this city, where the traffic was so heavy. But he gamely drove out of the hotel parking area that evening to search for a restaurant across town that was recommended by his guide book. Rush hour traffic was particularly bad that day, and suddenly a car cut in front of Joe. He hit the brakes but could not stop in time. The next thing Joe remembered was

waking up in the hospital with a broken leg. He was relieved to learn from a nurse that his wife and the children were not seriously injured. Joe reflected that they had been lucky, although the accident sure put a damper on their vacation plans.

Joe was one of millions of people injured in traffic crashes every year. In this age of global travel, it is becoming more common for persons to become involved in traffic crashes in countries other than their own. Being involved in a crash is traumatic enough in itself. Having to deal with police, insurance and the health care system in a foreign country makes the situation that more stressful.

Injuries are one of the great unrecognized problems for global health. Injuries continue to rank among one of the leading causes of death and disability, regardless of age, sex, or income. The WHO reports that almost 50 percent of the world's injury mortality occurs in young people aged 15-44 years, the most economically productive members of the global population. They write:

> "Injuries have traditionally been regarded as random, unavoidable "accidents". Within the last few decades, however, a better understanding of the nature of injuries has changed these old attitudes, and today both unintentional and intentional injuries are viewed as largely preventable events. As a result of this shift in perception, injuries and their health implications have demanded the attention of decision-makers worldwide and injury policy has been firmly placed in the public health arena. Furthermore, the growing acceptance of injuries as a preventable public health problem over the past decade or so has lead to the development of preventative strategies and, consequently, a decrease in the human death toll due to injuries in some countries."

World wide, an estimated 1.2 million people are killed in road crashes every year, and as many as 50 million are injured. The WHO estimates that roughly 70 percent of the deaths occur in developing countries. Sixty-five percent of deaths involve pedestrians, and 35 percent of pedestrian deaths involve children. Five issues are directly involved in creating safer roads and better drivers: speed, alcohol, helmets, seat belts, and visibility. In the United States, a person dies in an alcohol-related traffic crash every three minutes. Thousands are injured every year, as well, and all are preventable through responsible behavior. Abroad, Americans and travelers visiting foreign countries are often unaware of the hazards of international road travel and may not understand road regulations, cultures, and conditions.

As countries grapple with how to reduce and eliminate such injuries, meaningful dialogues about strategies and models to prevent injury can benefit the global community. In fact, the theme for World Health Day in 2004 was "Road safety is no accident." The idea behind the slogan is to change the perception that injuries and deaths resulting from crashes are accidental. Indeed, such harm is completely preventable through proper interventions and behavior change.

Violence and injuries significantly affect the lives and health of people in all countries. The 2002 WHO *World Report on Violence and Health* noted that each year more than 1.6 million people lose their lives to violence. It is the leading cause of death for people aged 15-44 years worldwide, accounting for about 14 percent of deaths among males and 7 percent among females. Yet with prevention, the disability and deaths they cause on a daily basis can be greatly reduced. Weapons, terrorists, and other contributors to violence daily cross national borders. Refugees fleeing areas of violence also move across borders, which can sometimes create

914 stresses on the host country if it is not prepared. Inappropriate housing settlements can become
915 epicenters for disease outbreaks and environmental health problems, resulting in further
916 suffering, disease spread, and potential clashes with local populations. Violence contributes to
917 instability of governments and institutions, making the world less safe. People often enter into
918 conflict – nationally or internationally - because they lack resources, including good health.
919 However, health can serve as a common currency among opposing groups and can, in fact,
920 potentially reduce further violent outbreaks. Health diplomacy can help reduce violence and
921 improve health.

922 It is only in recent decades, however, that violence has been treated as public health
923 issues. The CDC, for example, began studying injuries in the 1970s and violence prevention in
924 the 1980s. In fact, Surgeon General Julius Richmond in the 1979 Surgeon General's Report
925 "Healthy People, stated that the consequence of violent behavior could not be ignored in the
926 effort to improve the nation's health. This issue was later echoed in 1991, when former Surgeon
927 General C. Everett Koop wrote:

928 "Identifying violence as a public health issue is a relatively new idea….Over the years we
929 have tacitly and, I believe, mistakenly agreed that violence was the exclusive province of
930 the police, the courts, and the penal system….But when we ask them to concentrate more
931 on the prevention of violence and to provide additional services for victims, we may
932 begin to burden the criminal justice system beyond reason. At that point, the professions
933 of medicine, nursing and the health-related social services must come forward and
934 recognize violence as their issue and one that profoundly affects the public health."
935

The 2002 *World Report on Violence and Health* divided the subject into seven topics: child abuse and neglect by caregivers, youth violence, violence by intimate partners, sexual violence, elder abuse, suicide, and collective violence. The report emphasized that in addition to death and disability, violence contributes to a variety of other health consequences, including depression, alcohol and substance abuse, smoking, eating and sleeping disorders, and HIV and other sexually transmitted diseases. It also stressed, however, that violence is preventable.

DID YOU KNOW? Data from the WHO indicates that more than five million people die each year as a result of violence or injuries.

The cost of violence is not only lives lost. In fact, a substantial portion of the cost of violence comes from the impact on victims' health and the related burden on health institutions. Injuries can often result in disability, chronic pain, and drastic changes in lifestyle. Whether or not someone survives a serious injury, and the chances that he or she will suffer a long-term impairment, depends on such factors as prompt and appropriate medical attention, timely transportation to a medical facility, and an adequate health care infrastructure. Furthermore millions are disabled and/or suffer psychological trauma due to violence or injuries. The mental health consequences of violence are just as serious as physical injuries and are often long lasting.

Collective violence can result from conflicts between nations and groups, state and group terrorism, gang warfare and other causes. It is estimated that 191 million people, a staggering number, died as a direct or indirect result of conflict in the twentieth century, well over half of them civilians. Death rates due to collective violence are disproportionately high in low and middle-income countries, about six times the rates seen in high-income countries. In addition to the loss of life, large numbers of people suffer physical, often disabling, injuries in violent conflicts each year. Numerous others suffer from various psychological and behavioral

problems, and conflicts can also interfere with food production and distribution, resulting in famine.

Women are the overwhelming majority of victims of sexual and intimate partner violence. In various surveys, anywhere between 10 percent and 69 percent of women responding have reported that they were physically assaulted at some point by an intimate partner. Physical violence in these relationships is also often accompanied by psychological abuse. Sexual violence is also often linked to intimate partner violence, with the evidence suggesting that almost one in four women experience sexual violence by an intimate partner. Sexual violence affects both the physical health and psychological well-being of its victims, resulting in such problems as unwanted pregnancies, HIV/AIDS, depression, post-traumatic stress disorder, and suicide.

Suicide is one of the leading causes of death globally, and was responsible for approximately one death every forty seconds in 2000. Although many more women report attempting suicide than men, men successfully commit suicide about three to four times as often as women. Psychiatric and social problems, as well as substance abuse, are significant risk factors in suicide.

The public health community has embraced the concept that violence and injuries are predictable and preventable. They are global in that they can happen to anyone, anywhere, at any time. They are human-made problems amenable to rational analysis and countermeasures. While they involve multiple segments of society, such as the criminal justice system and civil engineering, public health has a major role to play in attacking these problems by developing appropriate surveillance systems and science-based prevention strategies.

Health Systems

Central to achieving good health is the presence of a functioning health system. The ideal health system would empower people to obtain convenient, good quality, and affordable health information and services. What are the elements that would make this dream a reality? What exactly is a health system? The *World Health Report 2000* defines health systems as "all the organizations, institutions and resources that are devoted to producing health actions." The four vital functions of the health system include *service provision, resource generation, financing and stewardship*. Different kinds of systems develop or evolve for various political, sociological, or historical reasons. A system can be mixed private and public, like in the United States, where care is provided by private physicians or practitioners and paid for with private health insurance, as well as public financing (Medicare and Medicaid). Or the system could be largely public, as in many other countries, where a Ministry or Department of Health employs physicians, owns hospitals, and assumes a larger burden of the cost of health care.

Health systems in all countries, developing and developed, are in need of reform. According to the World Bank, public and private expenditures on health care worldwide were $1,700 billion, about 8 percent of world economic output. (IOM, 1997) In spite of the increasing costs of health care, large portions of the world's population have little or no access to affordable health services. Even in wealthy countries such as the United States, the health system is not working efficiently and effectively in making decent health care available to every citizen. Many countries are working to reform their health systems in an attempt to reduce costs, improve the quality of care, and assure universal access to health services.

The Institute of Medicine reports, however, there has been unfortunately relatively little exchange of information and experience among these countries. In addition, there is little

support for health systems research. A recent review (Travis, et al, 2004) points the scarcity of health systems research globally, compared to drug development or intervention effectiveness research. Without the opportunity to learn from others' experiences, policy makers are left with a great deal of uncertainty regarding the best approaches for strengthening their health systems. Researchers and policy makers are also confounded about what works in health systems because of the absence of agreement on how to measure health systems outcomes. There is a general consensus that a health system's performance should be judged on its ability to achieve improved access, equity, quality, efficiency and sustainability of the system, but these ideals are hard to measure. Because of the complexity of this subject, international collaboration in defining health systems and health system outcome measures, cooperation in health systems research, as well as exchange of information on what works are high priorities on the list of requirements to achieve improved global health.

Conclusion -

Disease, food and nutrition, water and air, and injuries and violence have a direct impact on the health of all people around the globe. The problems are similar, and the solutions are similar, regardless of the country or population. The issues described in this section are more than a problem for underdeveloped countries that are far away from the United States. Even the most seemingly remote public health crisis can make its way to our shores, thanks to trade, travel, and nature, itself. The world is more interconnected now than it has ever been in history, and each person has a role to play in addressing global health concerns.

By sharing knowledge and best public health practices broadly, and by working together across nations, nations are better suited to better address the public health threats that affect all humans. Working together in health will help break down international barriers that sometimes even contribute to health problems. In short, by recognizing shared problems, countries can take steps to address them collaboratively in a way that benefits all.

Health Disparities: Poverty and health

In spite of the remarkable advances in medicine and public health, disparities in global health status, as revealed by numerous measures, are striking. While one-fifth of the world's population enjoys an average life expectancy approaching eighty and a life comparatively free of disability, two-thirds of the world's population, living in the least well-off countries of Africa, Asia and Latin America, suffer overwhelmingly from the world's burden of illness and premature death. It has been estimated that the peoples of Sub-Saharan Africa and India together bore more than 40 percent of the total global burden of disease in 1990, although they make up only 26 percent of the world's population. (Murray and Lopez, 1996)

Poverty and health are inextricably intertwined. The conditions typically associated with poverty, such as poor nutrition and lack of access to health care, lead to disease, disability and death, as well as social instability. On the other hand, disease and poor health is an impediment to economic progress through decreased labor productivity. It is estimated than more than one-fifth of the world's population lives in extreme poverty. And the gap between the income of the richest 20 percent and the poorest 20 percent of the world's population doubled between the 1960s and the 1990. Nonetheless, according to former WHO Director-General Gro Harlem

Brundtland, approximately 90 percent of global health resources are concentrated on 10 percent of the world's health problems. Those who cannot read, obtain clean water, or avoid environmentally induced disease, and who are permanently under the threat of physical violence and the effects of crime - are invariably poor - whatever their income. (IOM, 1997)

Health disparities are by no means limited to developing countries. Great disparities exist within the populations of industrial nations as well, often based on race and class. In the United States, African Americans live, on average, five years less then the white population, and death rates for Hispanics in 2001 were significantly greater than those of the non-Hispanic white population for the four leading causes of death. Sudden infant death syndrome among American Indians and Native Alaskans occurs 2.3 times higher than among whites. Asian women have five times the rate of cervical cancer that white women do. Minorities and low-income populations have a disproportionate burden of death and disability from a variety of health conditions. These populations are less in general less likely to have health insurance and access to good medical care.

International Health Regulations

Another aspect of U.S. health diplomacy has been active participation in the shaping of new revisions of the International Health Regulations (IHRs). The IHRs provides tools governments and public health officials can use to control the spread of dangerous diseases. The IHRs, approved in 1969, were originally designed to help monitor three serious infectious diseases—cholera, plague, and yellow fever. By the Twenty-First Century, they sorely needed updating. This need was clear during the SARS outbreak of 2003, and then because of international

concern about pandemic and avian influenza. In May 2005, the WHO approved a new set of health regulations to manage public health emergencies of international concern, to come into force by July 2007. The revisions to the IHRs took years of often-difficult negotiations. The 2005 IHRs give expanded temporary authorities to the WHO during public-health emergencies of international concern. The regulations respect the rights of sovereign States, while setting forth clear guidelines for open and responsible disease reporting. They carry obligations for Member States to strengthen prevention activities, report suspect cases and share tissue samples, as well as to take appropriate safety measures at airports, ports and ground crossings to prevent and contain the spread of disease, thereby ensuring the maximum security against the international spread of diseases with minimum interference with world traffic. Global health would clearly be enhanced if all countries voluntarily adhered immediately to the IHRs.

Part III: The Way Forward

This *Surgeon General's Call to Action on Global Health* makes clear that health issues cannot be successfully dealt with solely within national boundaries. The agents that cause infectious diseases cross national boundaries with people, animals, and products. Water, air and other elements that make up our environment cannot be confined within the borders of individual nations and the quality of these environmental resources impact on our health in important ways. In today's world, the economies of nations are closely interconnected and are significantly affected by health conditions. Many health problems and factors that influence health are common to multiple, or in some cases all, nations. Knowledge gained in one country about a

particular disease or risk factor is likely to be applicable in other countries as well. It is essential that nations share information and cooperate in actions related to health.

Eliminating health disparities, both among and within countries, is predicated on increasing health literacy. Even the seemingly simple things that people can do to stay healthy and safe, such as getting regular medical check-ups and eating healthy foods, can be struggles for many families. Yet, people around the globe, including highly educated individuals, have trouble understanding basic health information. Health literacy is the ability of an individual to access, understand, and use health-related information and services to make appropriate health decisions. It is estimated that in the United States alone, low health literacy adds as much as $58 billion per year to health care costs. Low health literacy is a threat to the health and well-being of all people and to the health and well-being of health care systems. Basic health education can be communicated through schools, family members, health professionals, lay community health workers, public and private institutions, and the media. Everyone has a role to play.

No one nation can independently improve health systems and health outcomes across the world. There is little question that the people of the United States will not only join with other nations help to shape the future of global health, but will offer American medical and technical expertise and economic support at the same time. A public that is literate and knowledgeable about health and works as private individuals to reduce its own risk factors and those of families is highly desirable. It is equally important that experts respectfully and effectively communicate concerning health as a regular matter, and redouble their efforts in times of crisis or impending crisis. Although great progress has been made on vaccines, drugs, improved sanitation, control of disease-transmitting insects, and effective prevention to reduce the threat of many once damaging or lethal diseases, such as HIV/AIDS, polio, malaria, smallpox, diphtheria, typhoid

fever, rubella and measles in the United States, and in some cases, worldwide, the work that remains overshadows what has been achieved. Biomedical research and concepts of global medicine in medical education as well as scientific exchanges need continual support.

Countries can learn from one another in their struggle to protect and improve their health of their populations. This exchange of information is a two-way street. Although it is true that developing countries can benefit from knowledge and use of the advanced health technologies available in industrialized nations, there is also much that the latter can learn from the former. For example, disadvantaged groups in the United States share similar health risks with resource poor nations, such as tuberculosis, micronutrient deficiencies and peri-natal infections. Thus, there are lessons to be learned domestically from research conducted in low- and middle-income nations. For example, landmark studies conducted in Tanzania demonstrate that unless drug treatment for tuberculosis is properly supervised tuberculosis rapidly becomes resistant to available drugs. This finding has been applied in community health programs in metropolitan New York and other cities where tuberculosis is a public health problem. Moreover, the most daunting problem facing national health care and national economies in the 21st century will be the increasing public share of today's health care bill, which in the United States is projected to grow to a 1.6 trillion to a 2.3 trillion in 2015. To guide health care reform, the United States and other nations can benefit from experiences of other countries which have achieved high health status and reduced health care costs in such fields as primary and ambulatory care, and other areas.

Governments and non-governmental organizations around the world are already engaged in many programs that contribute to global health. In the United States, for example, President Bush in 2003 announced his Emergency Plan for AIDS Relief, committing $15 billion over five

years for the hardest hit countries, including continuing bilateral support for more than 120 countries and enhanced focus in 15 countries in Africa, the Caribbean and Asia. The Department of Health and Human Services (HHS) draws upon the technical expertise found in its agencies, including the Centers for Disease Control and Prevention (CDC), the National Institutes of Health (NIH), and the FDA, to further global health goals in a number of ways. Through the Centers for Disease Control and Prevention, for example, the Department provides substantial funding and technical support to the WHO Global Polio Eradication Initiative. HHS is also actively supporting health reconstruction in war-torn countries, such as partnering in the establishment of women's teaching clinics in Afghanistan. Through the National Cancer Institute, HHS is partnering in the establishment of the King Hussein Cancer Center in Jordan as a regional cancer treatment facility. HHS works internationally across a broad range of health issues confronting our nation and the world.

Non-governmental organizations (NGOs) are becoming increasingly important in implementing global health programs. (Gellert, 1996) It is estimated that NGOs, many of them quite small, provide approximately 20 percent of health aid to developing countries. (IMVA website) Various American NGOs are involved in global health activities. Global Links, for example, recovers unused medical supplies, equipment and furnishings from American hospitals and makes them available to hospitals and clinics serving the poor in developing countries. (Global Links website) Satellife develops solutions, through innovative applications of information and communications technology, to fulfill the information needs of health professionals working in communities around the world where medical journals and the internet are not readily available or affordable. The Global Health Council identifies important world health problems and reports on them to the American public, international and domestic

government agencies, academia, and the global health community in an effort to make global health a priority for everyone.

Governments and NGOs around the world are contributing to the advancement of global health. Two examples of international health activities of the French government, for example, are the provision of support for malaria research and training in Africa through its Institut de Recherché pour le Développment and a contribution of over 5 million dollars in 2003 to strengthen the battle against HIV/AIDS in Mozambique. (IRD website; Multilateral Initiative on Malaria website; Global Health Council website) The Japanese government has invested about 118 million dollars to provide grants and technical cooperation to Vietnam's health sector since 1991. These projects cover preventive medicine as well as treatment. With respect to NGOs, examples of their contributions include the efforts of United Kingdom-based Healthlink Worldwide to improve the health of disadvantaged and vulnerable communities in developing countries through the use of health communications and support for advocacy initiatives, and the program of the Africa Foundation (based in South Africa) to provide access to drinking water to rural communities in Africa. (Healthlink website; Africa Foundation website)

In addition to governments and organizations of individual countries, various international bodies are also involved with global health. Most prominent among these is the World Health Organization (WHO) and its various regional offices, such as the Pan American Health Organization (PAHO), which is the specialized health agency of the United Nations (UN). WHO is a collaborative effort of the nations of the world, and is governed by 192 member states through the World Health Assembly. WHO is involved in more global health activities, on its own or in cooperation with governments, NGOs, and others, than can be enumerated here. Just to mention a few examples, it organizes vaccination campaigns and emergency relief health

services, collects and publishes health statistics and reports, and develops international agreements on health issues such as tobacco control. Another international body involved with health is the United Nations Children's Fund (UNICEF), which operates programs in areas such as vaccination, nutrition and HIV/AIDS.

One of the global health efforts sponsored by United Nations was the development of the internationally agreed upon goals contained within the Millenium Declaration signed by 189 countries (including the United States) in 2000 (commonly referred to as the Millenium Development Goals). These goals include targets for improving health in a number of areas, such as maternal health, child mortality, environmental sanitation and HIV/AIDS. The Declaration calls for the achievement of its goals by 2015.

Academic institutions (especially schools of medicine, nursing and public health), corporations (especially in the health sector), and other institutions have also played, and must continue to play, a vital role in global health. The efforts on the part of all of these groups have led to significant improvements in health on a global basis in recent decades. Smallpox was eliminated in the 1970s, and polio is close to being eradicated worldwide.

There are many other examples that could be cited, but a common element in all of these achievements has been a highly effective social mobilization. For example, the Bellagio Study Group on Child Survival Study noted that: "The child survival revolution of the 1980s was a worldwide movement that reached beyond the public health community to mobilize parents, teachers, village chiefs, rock stars, prominent sports people, and presidents. The actions needed were simple, clear and communicated consistently through all available channels."

The WHO has urged that all medical education include an international component. This would strengthen skills in treating patients in places with no hospitals and little health care, and

include more knowledge of diseases endemic in other countries. A time spent in a health-care system in another country and other forms of exchange programs would broaden the skills of these new internationally skilled health-care workers. The professional visits of foreign scientists and engineers and the training of highly qualified foreign students are important for maintaining the vitality and quality of the U.S. research enterprise. This research, in turn, underlies national security and the health and welfare of both our economy and society. It is clearly in our national interest to help developing countries fight diseases such as AIDS, improve their agricultural production, establish new industries, and generally raise their standard of living. There is no better way to provide that help than to train young people from such countries to become broadly competent in relevant fields of science and technology.

Thus there is room for optimism when it comes to improving global health. However, it will take the kind of social mobilization noted above, involving people from all walks of life, to achieve the desired outcomes. In addition, strong and unified leadership will be needed at the international, national and community level. The following factors are among those that will be needed for success in the endeavor to improve global health:

- research and evidence-based decisions;
- an educated and informed public;
- broad partnerships between governments, NGOs and development agencies;
- recognition of the role of women;
- systems of public health that promote equity and efficiency;
- complementary steps in strengthening education;
- adequate and targeted human and financial capital; and
- awareness and commitment to action by all sectors of society.

The understanding and support of the American people in improving global health and a sure knowledge of its relevance to their daily lives is of vital importance. An alert and informed public will help in safeguarding families and communities and in lending a hand elsewhere. Some concepts are familiar, such as the provision of aid during humanitarian disasters. Working with the great international health agencies will help us plan and work effectively with other nations and regions of the world. Health diplomacy, while not new, is increasingly important to improving global health, increasing the stability and security of our nation as well as benefiting others. Understanding the possibility of global disease spread helps each one of us to be alert to the health of the rest of the world. Health diplomacy extends the benefits of America's medical research, among the best gifts to the world, to improve health and increase world security.

But beware the simple answer. The cure of one disease, no matter how deadly, is not the answer. Even a cure, an absolute eradication of HIV/AIDS, will not end the need for attention to better global health. Vigilance, collaboration and coordination are key. Preparing for an avian flu pandemic, whether it appears this year or the next, teaches many lessons and raises serious questions about planning. It will undoubtedly improve the ability to respond to other health emergencies, whether manmade or natural in origin. Improving the health of the peoples of the world demands a steady commitment of resources, minds and souls. To that end, the participation in and awareness of all Americans in a broad and purposeful global health endeavor will serve us and future generations.

We share one earth, regardless of our place of birth. Public health, now more than ever, is global health. We must recognize that, as human beings, we are all connected.

CALL TO ACTION:

There are steps that can be taken by individuals, institutions and governments to advance global health. The Surgeon General has identified as priorities the following activities for immediate action by the American public, health and related professionals, government, the private sector and the media to improve the situation regarding global health. With the cooperation of all of these segments of society, Americans can make a substantial contribution to the goal of improving global health.

A. American Public

The American public must become better informed on issues of global health. We suggest that Americans as individuals and in groups:

- Support increased U.S. investment in global health;
- Encourage policy makers to make global health initiatives a higher priority;
- Support non-governmental organizations involved in global health through donation of time or cash;
- Promote public awareness of what global health is and why it is important for the country;
- Improve their own health literacy as a means to improve their health and the health of the world around them;
- Practice basic hygiene, such as hand washing to prevent illness and staying home when sick to prevent transmitting your illness to others;
- Explore and promote the infusion of global health awareness in the education system; and

- Work to decrease stigmatization of individuals and nations with respect to particular diseases or other heath problems.

B. Professionals

Health workers and other professionals involved with health must be become more knowledgeable and proactive with respect to global health activities and education. We suggest that professionals:

- Work to incorporate global health as an integral part of the curriculum of public health education;
- Encourage their professional associations to become better informed about changing patterns of disease associated with globalization;
- Support mid-level professionals and community health workers to become knowledgeable about global health and integrate a global approach in their work;
- Develop and implement research and demonstration programs around specific global public health issues;
- Encourage partnerships across disciplines and geographical borders;
- Support time-limited projects through grant funding;
- Promote and sustain projects that work, and share “best-practices” and evidence-based strategies that could be utilized globally;
- Promote health literacy as means to improve health; and
- Promote policies, activities, and partnerships that decrease “brain drain”

C. Government

Governments at all levels can have a major impact on global health through their policies and actions. Specifically we suggest the U.S. Federal Government:

- Review current global health activities and develop a strategic approach for the U.S. Government in global health;
- Consider expanding assistance to improve the health of people around the world as an element of U.S. foreign policy;
- Consider the health of people around the world as an element of U.S. foreign policy;
- Respect the value of multilateral partnerships for health, as well as enhance effective collaboration between governments to promote global health;
- Promote cooperation and exchange in health of states and cities with global partners;
- Adhere to the revised International Health Regulations (2005) as soon as possible; and
- Ratify the Framework Convention on Tobacco Control.

D. Private Sector

Commercial enterprises and non-profit institutions have an important role to play with respect to promoting global health. We suggest that the private sector undertake the following activities:

- Prioritize the development of products which respond to major global health needs;
- Promote corporate social responsibility and measures that improve public health;
- Explore and develop ways to improve health in the settings/countries where they are active, not just for their own workers;
- Increase the level of partnership designed to promote global health; and
- Work together, particularly with non-governmental organizations, to mobilize public support

for global health.

E. Media

The media has a significant influence on the thinking of the public, government officials, industry executives, and all Americans. Therefore it can make a substantial contribution to the area of global health. We suggest the media:

- Work to expand health literacy and recognize that it can be used as tool to extend health to the world;
- Promote awareness of global health through media campaigns, programming and other outlets;
- Provide professional education for media professionals on global health;
- Foster international media collaboration to combat myths (such as the notion that polio vaccination causes sterilization);
- Encourage development of educational materials for medical professional dialog with international clients;
- Engage media personalities in promotion of global health;
- Encourage global media to integrate global health into content and advertising; and
- Encourage global media industries to partner/mentor/support developing country media

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