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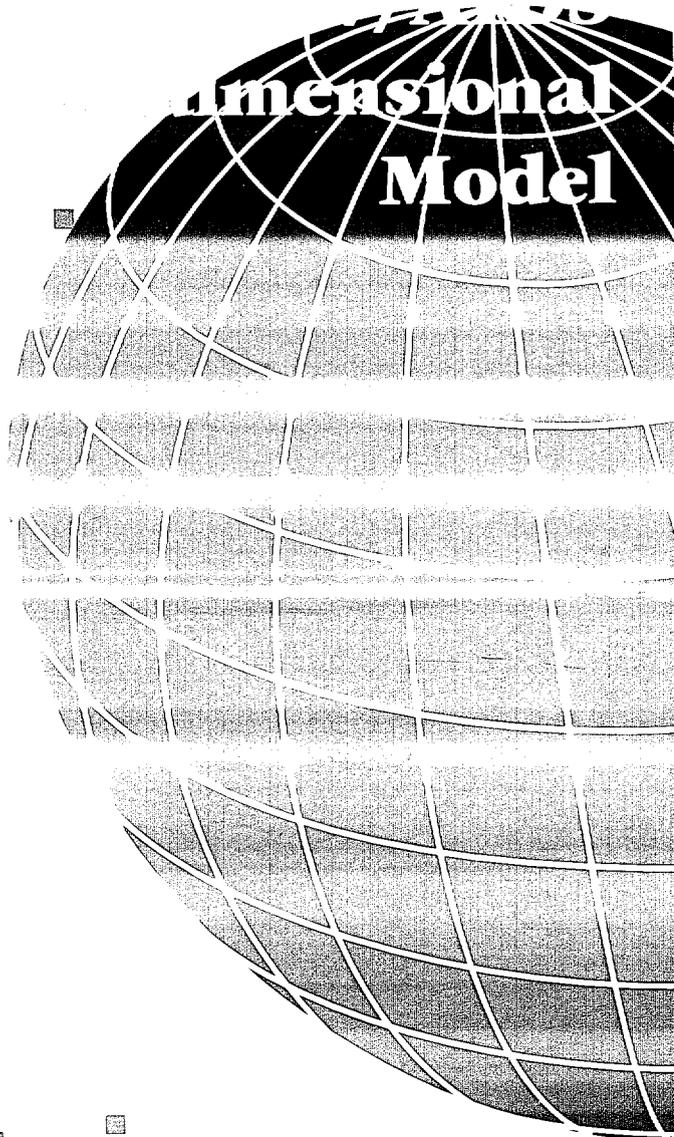


AIDSCAP



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HIV/AIDS PREVENTION AND CONTROL SERIES



## Dimensional Model

SERIES EDITOR

Latin America and Caribbean Regional Office  
AIDSCAP/Family Health International

Family Health International (FHI) is a non-governmental organization that works to improve reproductive health around the world, with an emphasis on developing nations. Since 1991, FHI has implemented the AIDS Control and Prevention (AIDSCAP) Project, which is funded by the United States Agency for International Development (USAID). FHI/AIDSCAP has conducted HIV/AIDS prevention programs in more than 40 countries, and the Latin America and Caribbean Regional Office (LACRO) has implemented interventions in 14 countries within the region.

December 1997

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The HIV/AIDS Prevention and Control SYNOPSIS Series

# THE HIV/AIDS MULTIDIMENSIONAL MODEL



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## TABLE OF CONTENTS

Acronyms	ii
Acknowledgements	iii
Prologue	v
Holographic Overview	ix
Introduction	1
The HIV/AIDS Multidimensional Model	5
The Bio-Medical Approach	5
The Public Health Approach	13
The Development Approach	22
Levels of Causation of Disease	31
Lessons Learned	33
Successful Multidimensional Approaches	33
Recommendations	41
References	45

## ACRONYMS

AIDS	acquired immune deficiency syndrome
AIDSCAP	AIDS Control and Prevention Project
ARV	antiretroviral
BCC	behavior change communication
CBO	community-based organization
C&M	care and management
CMC	civil-military collaboration
CSW	commercial sex worker
FHI	Family Health International
GDP	Gross Domestic Product
GNP	Gross National Product
GSI	Gender-Sensitive Initiatives
HDI	Human Development Index
HIV	human immunodeficiency virus
IDU	injecting drug use
LAC	Latin America and the Caribbean
LACRO	Latin America and Caribbean Regional Office
MOH	Ministry of Health
MWM	men who have sex with men
NACP	National AIDS Control Program
NGO	non-governmental organization
PAHO	Pan American Health Organization
PVO	private voluntary organization
PWA	people living with HIV/AIDS
RBI	Religious-Based Initiatives
STI	sexually transmitted infection
UNAIDS	Joint United Nations Programme on HIV/AIDS
USAID	United States Agency for International Development
WHO	World Health Organization

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Finally, we wish to extend our gratitude and appreciation to the USAID Global Bureau's HIV/AIDS Division, field Missions in Latin America and the Caribbean, and to the Population, Health and Nutrition Team in the Office of Regional Sustainable Development of the LAC Bureau, particularly James B. Sitrick, Jr.,

for the support and funding of the Information Dissemination Initiative and other LACRO programs.

## PROLOGUE

The HIV/AIDS Prevention and Control SYNOPSIS Series is a summary of the lessons learned by the Latin America and Caribbean Regional Office (LACRO) of the AIDS Control and Prevention (AIDSCAP) Project. AIDSCAP is implemented by Family Health International (FHI) and funded by the United States Agency for International Development (USAID). The series is a program activity of the LACRO Information Dissemination Initiative and was created with several goals in mind:

- to highlight the lessons learned regarding program design, implementation, management and evaluation based on five years of HIV/AIDS prevention and control experience in LAC countries
- to serve as a brief theoretical and practical reference regarding prevention interventions for HIV/AIDS and other sexually transmitted infections (STIs) for program managers, government officials and community leaders, non-governmental organizations (NGOs), private voluntary organizations (PVOs), policy and decision makers, opinion leaders, and members of the donor community
- to provide expert information and guidance regarding current technical strategies and best practices, including a discussion of other critical issues surrounding HIV/AIDS/STI programming
- to share lessons learned within the region for adaptation or replication in other countries or regions
- to advance new technical strategies that must be taken into consideration in order to design and implement more effective prevention and control interventions
- to advocate a holistic and multidimensional approach to HIV/AIDS prevention and control as the only way to effectively stem the tide and impact of the pandemic

AIDSCAP (1991-1997) was originally designed to apply the lessons learned from previous successful small-scale prevention projects (1987-1991) to develop comprehensive programs to reduce the sexual transmission of HIV, the primary mode of transmission of the virus. AIDSCAP applied three primary strategies — Behavior Change Communication (BCC), STI Prevention and Control, and Condom Programming — along with supporting strategies of Behavioral Research, Policy Development and Evaluation.

The success of this approach, based on the combination of strategies and targeted interventions, has been widely documented. The AIDSCAP Project, in fact, has been recognized as among the best and most powerful international HIV/AIDS prevention programs to date.<sup>1</sup> AIDSCAP has worked with over 500 NGOs, government agencies, community groups and universities in more than 40 countries; trained more than 180,000 people; produced and disseminated some 5.8 million printed materials, videos, dramas, television and radio programs, and advertisements; reached almost 19 million people; and distributed more than 254 million condoms.<sup>2</sup>

However, the pandemic continues to escalate at a rate that outpaces our successes. Thus, we need to build upon these successes, learn from our experiences, and determine what has worked and what is missing in order to respond with added effect in the future. The magnitude and severity of the HIV/AIDS pandemic calls for boldness, flexibility, wisdom and openness. The world cannot afford to continue to fight HIV/AIDS only with current thinking and tools. We must look toward new thinking and strategies that complement and carry the current state-of-the-art approaches forward in the fight against HIV infection.

Therefore, LACRO endorses, promotes and elevates *Gender Sensitive Initiatives* (GSIs), *Civil-Military Collaboration* (CMC), *Religious-Based Initiatives* (RBIs), and *Care & Management* (C&M) as the new prototype of technical strategies that must be incorporated on par with the strategies that have been implemented to date. Walls, barriers and biases have to come down in

order to unlock the strengths, benefits, potential, synergy and/or resources of GSIs, CMC, RBIs and C&M.

More importantly, approaches that compartmentalize strategies can no longer be justified. Despite the efforts to integrate and coordinate amongst and between technical strategies and different sectors of society, prevention programming is barely scratching the surface of what a real comprehensive effort should be. One of the most important lessons learned about HIV/AIDS is that it is not only a medical problem, nor is it exclusively a public health problem. Rather, the pandemic is in addition a socio-economic problem and, as such, threatens the sustainable development of developing countries and challenges the ethical foundations of the developed world. HIV/AIDS has become a challenge to health, development and humanity.

For lasting success, a genuine multidimensional approach is urgently needed. One that demands new forms of wealth distribution, educational opportunities and development; attempts to resolve the inequalities in gender and power; acknowledges the individual, environmental, structural and superstructural causes of and solutions for the pandemic; and aims to balance the disparity between the “haves” and the “have-nots,” resulting in more sustainable, equitable, effective and compassionate efforts.

Therefore, the SYNOPSIS Series reaffirms that current HIV/AIDS prevention and control strategies work, and contends that new technical strategies are needed and can be effective and complementary. The Series also strongly advocates for, and will discuss in a separate issue, the Multidimensional Model (MM) for the prevention and control of the pandemic. This model must guide national, regional and international planning and programming in order to achieve measurable and significant gains that can truly effect changes at the individual, societal, environmental and structural levels.

We trust the reader will be open to our futuristic thinking and will contribute to the further development of the strategies presented here as well as others. We hope the SYNOPSIS Series will

stimulate discussion and reflection, propel continued dialogue, and encourage the pioneering of new combinations of innovative approaches.

A handwritten signature in black ink, reading "R Calderón", with a horizontal line underneath.

*M. Ricardo Calderón, MD, MPH, FPMER.*  
Regional Director  
Latin America and Caribbean Regional Office  
AIDSCAP/Family Health International

## HOLOGRAPHIC OVERVIEW

This SYNOPSIS booklet describes and advocates a Multidimensional Model (MM) for the prevention and control of HIV/AIDS through a holographic approach. Holography is a special photographic technique that produces images of three dimensional objects. This photographic record is called a hologram, and one of its main applications is that any fragment of the hologram can regenerate the entire image, even if the fragment is extremely small. In other words, if a negative from an ordinary picture is cut into two, the print from each half would only show half of the picture. Conversely, if a holographic negative is cut in two, the print from each half would show the entire picture. If these halves are cut again, the print from any one of the pieces will reconstruct the whole picture.<sup>3,4,5</sup>

Utilizing the holographic model, this booklet was written such that any one of the sections (holograms) will provide the reader with an understanding of the whole subject matter. First, we describe the entire strategy or topic of discussion in one sentence, the widespread definition and/or our own definition of the subject (Hologram 1). Next, we present a one-paragraph abstract of the topic (Hologram 2), expanding upon the original definition. Then, we present the topic by providing a summary or recapitulation of the main points of each of the sections of the booklet (Hologram 3). Finally, the entire strategy is again presented by virtue of the complete text of the booklet (Hologram 4).

We anticipate that the Holographic Overview of the HIV/AIDS Multidimensional Model will benefit both the seasoned professional and the novice. It provides a quick, general overview of the multidimensional approach as well as context and background. It also directs the reader to specific sections that may be of greatest interest or that the reader would like to review first or at a later date. Thus, we hope this approach will enable the reader to make fuller use of the booklet as a reference guide, as it provides a simple and concise definition of the Multidimensional Model, a brief

description of the topic, a summary of the discussion, and finally, the complete text — all in one document.

The reader should note that while we have tried to include the key issues surrounding the prevention and control of HIV/AIDS in this SYNOPSIS, the booklet is not meant as an exhaustive discussion of all of the issues regarding the critical role and urgent need of a multidimensional approach in the fight against HIV/AIDS.

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## **The Whole Strategy**

### *Hologram 1: The Definition*

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The Multidimensional Model for the prevention and control of HIV/AIDS depicts a truly comprehensive, concerted, multidisciplinary and multisectoral strategy from the bio-medical, public health and development communities to effectively combat and stem the tide of the HIV/AIDS pandemic nationally, regionally and globally.

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## **The Whole Strategy**

### *Hologram 2: The Abstract*

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HIV/AIDS is not solely a medical or public health problem. It is a complex socioeconomic development problem and, as such, threatens the sustainable development of developing countries and challenges the ethical foundations of the developed world. The complexity of the pandemic requires innovative strategies that draw from state-of-the-art bio-medical and public health interventions but that must, in addition, include broad-based socioeconomic development initiatives and policies. Consequently, the Multidimensional Model (MM) for the prevention and control of HIV/AIDS is proposed to guide national, regional and international planning and programming in order to achieve measurable and significant gains that can truly effect changes at the individual, societal, environmental and structural levels. The model is applicable to many other medical and health problems which, like HIV/AIDS, are not a cause but a symptom of inequitable and dys-

functional development. The HIV/AIDS pandemic represents another wake-up call to the realization that a new form of development is needed — one that is more equitable and ethical, effective and reliable, sensitive and compassionate, and realistic and affordable.

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## **The Whole Strategy**

### Hologram 3: *The Summary*

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#### **Introduction**

The HIV/AIDS pandemic has become a permanent challenge to health, development and humanity. With an estimated 30.6 million adults and children currently living with HIV/AIDS, one in every hundred sexually active adults worldwide is infected with HIV. If current rates of transmission continue, more than 40 million people will be living with HIV by the year 2000. In spite of advances in the areas of prevention and treatment, the virus continues to spread at an estimated rate of 16,000 new infections a day. No country is beyond the reach of HIV/AIDS. The pandemic has moved beyond predominantly affecting “high-risk groups” associated with HIV/AIDS at the outset, to the general population, particularly women and those living in poverty and otherwise marginalized. The spread of the virus is fueled by poverty, precarious health conditions, illiteracy, the inferior status of women, as well as other sociocultural, structural and environmental factors. Today, more than 90 percent of all HIV infections are found in the developing world. Consequently, a successful HIV/AIDS prevention effort must be multidisciplinary and multisectoral in order to confront the pandemic for what it is, a complex socioeconomic development problem. Such a strategy is depicted in the Multidimensional Model for the prevention and control of HIV/AIDS.

#### **The HIV/AIDS Multidimensional Model**

The MM is conceptualized as a strategy that when viewed horizontally, it consists of three HIV/AIDS prevention and control approaches: *Bio-Medical*, *Public Health* and *Development*. Each of these approaches has three dimensions. When viewed vertically, the MM consists of a set of foundational disciplines or sciences

that support and guide interventions, a set of the impacts at the individual and collective levels caused by the pandemic, and a set of key interventions crucial to resolving the problem.

The top portion of the MM illustrates the **Bio-Medical Approach** and includes the foundational discipline, which is Bio-Medical Science, the impact, in this case the number of AIDS cases, and the key intervention which is the Treatment of AIDS cases. The middle portion of the MM represents the **Public Health Approach**, with its foundational discipline being Public Health, its impact shown as the number of HIV infections, and its key intervention of Prevention. The base of the MM reflects the **Development Approach**, which illustrates its underlying approach as Development, the effect exerted by HIV/AIDS as Socioeconomic Impact, and its key intervention as Investment.

What makes the MM “multidimensional” is not only the three horizontal approaches and nine vertical dimensions of the model, but also the fact that each approach and each individual dimension is intertwined with the others. Separately, each approach is and can only be partially effective. It is as a whole, that these approaches are truly effective and hold the only chance for humankind to control the HIV/AIDS pandemic.

#### **Levels of Causation of Disease**

HIV/AIDS is a complex problem with many *levels of causation*, from individual high risk behaviors to social and economic high risk situations. Sweat and Denison identify four levels of causation in HIV incidence: individual, environmental, structural and superstructural. *Superstructural factors* include macrosocial and macropolitical arrangements, physical and resource characteristics, and other elements, such as economic underdevelopment, sexism, and racism which often evolve over the long term. Mechanisms for change at this level include social movements, revolution, land distribution and war. *Structural factors* include laws, policies and standard operating procedures. Mechanisms for change at the structural level include constitutional and legal reform, civil and human rights activism, legislative lobbying and voting. *Environmental factors* include living conditions,

resources, social pressures and opportunities, examples of which include forced relocation/migration in pursuit of employment, and urbanization. Processes for change at the environmental level range from community organization and legal action to the provision of services. The *individual level factors* relate to how the environment is experienced and acted upon by individuals and may include, amongst others, isolation, boredom, and low perception of risk. Change at the individual level is most often achieved through education, counseling, reward and punishment, and the provision of information.

## **Lessons Learned**

### *Successful Multidimensional Approaches*

Successful and sustained public health interventions of the past have relied on changes at the individual as well as the structural and environmental levels. Examples of public health interventions that have moved beyond the individual to the structural and environmental levels include, but are not limited to the following: lowering cigarette consumption, seat-belt usage, fluoridating water, enriching foods with micronutrients, increasing educational opportunities for women which results in lower fertility rates, syphilis screening on all hospital admissions, and motorcycle helmet laws.

Given the epidemiology and demographic patterns of HIV, it is difficult to measure the success on HIV prevention programs in the short term. However, several initiatives illustrate that it is possible to reduce incidence of HIV when interventions reduce individual high risk and environmental and structural high risk situations. In Uganda, initial indications are that HIV prevalence is declining as a result of concerted efforts by the government, NACP, NGOs, religious organizations, communities and individuals to stop the spread of HIV. In Mwanza, Tanzania, a 42 percent reduction in new HIV infections has been reported as a result of a comprehensive STI case management program based on the syndromic approach. In Belle Glade, Florida, a sexuality peer education program succeeded in reducing the number of sexual relations and partners reported by adolescents, and in increasing

condom use. The 100 percent condom program pioneered in Thailand appears to have reduced the level of unprotected sex and the incidence of STIs and HIV. Unfortunately, HIV/AIDS prevention programs that have operated on these various and complementary levels are rare. However, results to date indicate that these reinforcing strategies achieve results beyond those attainable through purely individualistic approaches to risk reduction. Clearly, future HIV/AIDS prevention efforts need to be multidimensional and address individual risk factors as well as structural, environmental and superstructural high risk situations that facilitate HIV transmission.

**Recommendations:**

Lessons learned from the past decade of HIV/AIDS prevention efforts must guide future interventions in order to obtain optimal results, particularly in an era of declining donor support and constrained government budgets. HIV/AIDS must be integrated into broad-based development efforts that will not only reduce HIV but ameliorate the precarious conditions that put the majority of the world's inhabitants at risk to this and innumerable developmental ills. To maximize development efforts, funding must be targeted at long-term investments in education, infrastructure, health and production. Governments and international agencies need to move away from a focus on short-term results in HIV/AIDS prevention and control which are impossible to attain when confronting superstructural conditions such as global imbalances of wealth, power and resources. Clearly the most comprehensive way to address the pandemic is through a recognition of the four levels of causation, from superstructural to individual. Although many sets of interventions could be generalized, the design of interventions according to the four causation levels must be country-specific and culturally appropriate. The Multidimensional Model is proposed as a strategy to guide such thinking and programming, and to carry the current state-of-the-art approaches forward in the fight against HIV infection.

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## The Whole Strategy

Hologram 4: *The Detailed Description*

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### INTRODUCTION

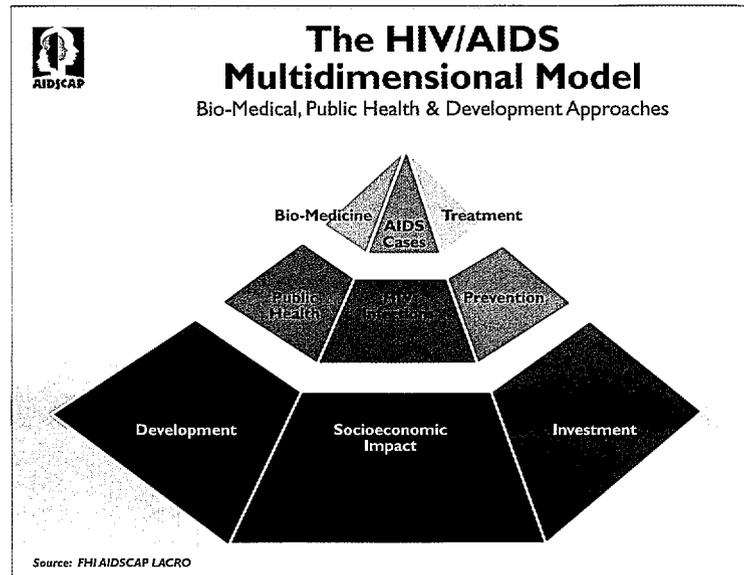
One of the most important lessons learned in the prevention and control of HIV/AIDS is that it is not solely a medical or public health problem. The pandemic is a complex socioeconomic development problem and as such, threatens the sustainable development of developing countries and challenges the ethical foundations of the developed world.

The HIV/AIDS pandemic has become a permanent challenge to health, development and humanity. Since the first cases of AIDS were diagnosed in the late 1970s, it is estimated that over 30 million people have become infected with HIV.<sup>6</sup> Around a quarter of those infected have died thus far, and in the absence of a cure the others are likely to develop AIDS and die also. In spite of advances in the areas of prevention and treatment, the virus continues to spread at a rate of an estimated 16,000 new infections a day, nearly double the previous daily estimate of 8,500. With an estimated 30.6 million adults and children currently living with HIV/AIDS, one in every hundred sexually active adults worldwide is infected with HIV.<sup>6</sup> If current rates of transmission continue, more than 40 million people will be living with HIV by the year 2000.<sup>7</sup> According to data provided to the Joint United Nations Programme

on HIV/AIDS (UNAIDS) and the World Health Organization (WHO), no country is beyond the reach of HIV. At the individual level, the pandemic has moved beyond predominantly affecting "high risk" groups associated with HIV/AIDS at the outset, to the general population, particularly women and those living in poverty and otherwise marginalized. The spread of the virus is fueled by poverty, precarious health conditions, illiteracy, the inferior status of women, as well as other sociocultural, structural and environmental factors. Today, more than 90 percent of all those living with HIV/AIDS are in the developing world.

The complexity of the pandemic requires innovative strategies that draw from the bio-medical and public health approaches, but that must in addition include broad-based socioeconomic development initiatives and policies. This SYNOPSIS will demonstrate that successful HIV/AIDS prevention efforts must be multidisciplinary and multisectoral in order to confront the pandemic for what it is, a complex socioeconomic development problem. The global response to HIV/AIDS, like many other diseases, has evolved over time, but it is clear that our response to date has not been effective at halting the spread of the pandemic. The HIV/AIDS pandemic serves as a reminder to humankind that social, economic and health problems cannot be "cured" with vertical, isolated, uncoordinated, and unintegrated approaches or responses. Instead, a truly integrated and long-term multisectoral response that incorporates broad-based socioeconomic development is necessary. Such a strategy is depicted in Figure 1, the Multidimensional Model (MM) for the Prevention and Control of HIV/AIDS.

Figure 1



The Multidimensional Model is conceptualized as a strategy that when viewed horizontally, it consists of three HIV/AIDS prevention and control approaches: *Bio-Medical*, *Public Health* and *Development*. Each of these approaches has three dimensions, for a total of nine. When viewed vertically, the MM consists of a set of “*foundational disciplines*” or sciences that support and guide interventions, a set of the “*impacts*” at the individual and collective levels caused by the pandemic, and a set of “*key interventions*” crucial to resolving the problem.

The top portion of the MM illustrates the **Bio-Medical Approach** and includes the foundational discipline, which is Bio-Medical Science, the impact, in this case the number of AIDS cases, and the key intervention, which is the Treatment of AIDS cases. The middle portion of the MM represents the **Public Health Approach**, with its foundational discipline being Public Health, its impact shown as the number of HIV infections, and its key intervention of Prevention. The base of the MM reflects the

**Development Approach**, which illustrates its underlying approach as Development, the effect exerted by HIV/AIDS as Socioeconomic Impact, and its key intervention as Investment.

What makes the model “multidimensional” is not only the horizontal approaches and the vertical dimensions, but also the fact that each approach and each individual dimension is intertwined

with the others. Separately, each approach is and can only be partially effective. It is as a whole that these approaches are truly effective and hold the only chance for humankind to control the HIV/AIDS pandemic.

The HIV/AIDS pandemic represents another wake-up call to the realization that a new form of development is needed — one that is more equitable and ethical, effective and reliable, sensitive and compassionate, and realistic and affordable.

This SYNOPSIS describes key and controversial issues regarding HIV/AIDS utilizing the three approaches and nine dimensions of the MM. As a result of this discussion, it will become evident that such a multidimensional and interdisciplinary strategy must guide future efforts in order to genuinely confront the pandemic. It is our intent that the MM should serve as a guide to national, regional, and international planning and programming in order to achieve measurable and significant gains that can

truly effect changes at the individual, societal, environmental and structural levels. In addition, this model is applicable to many other medical and health problems, which, like HIV/AIDS, are not a cause but a symptom of inequitable and dysfunctional development processes. Consequently, the HIV/AIDS pandemic represents yet another wake-up call to the realization that a new form of development is needed — one that is more equitable and ethical, effective and reliable, sensitive and compassionate, and realistic and affordable.

## THE HIV/AIDS MULTIDIMENSIONAL MODEL

### The Bio-Medical Approach

#### *Foundational Discipline: Bio-Medical Science*

The Bio-Medical science continues research and development efforts on alternative treatments for opportunistic infections, a vaccine, and medication that completely destroys HIV. This strong bias in the West for bio-medical approaches was evident at the XI World Conference on HIV/AIDS in Vancouver, during which media coverage of the event focused on the dramatic medical breakthroughs of the triple combination or "cocktail" therapies. The Conference barely touched on the plight of the majority of those infected by HIV who live in the developing world. For these individuals, hope for a cure, and even access to the drug treatments, is unrealistic given the costs of medications. In addition, "potential cures and vaccines for AIDS also raise the specter of life for the 'haves' and death for the 'have nots.'" \*

While there is no 100 percent effective treatment available today for HIV/AIDS, current therapy relies on two types of treatment. The first and most effective is the treatment of opportunistic infections with antibiotics, antimycotics, radiotherapy, chemotherapy and surgery. The second treatment option is to attack the virus directly. This is more difficult since the virus lives in human cells, and any attack against the virus could destroy the healthy cells of an individual at the same time. However, results from medical studies have shown the quality and quantity of life of HIV-positive people who take these medications can be enhanced and prolonged. The use of triple combination therapy has shown that viral loads can be reduced by 99 percent and mortality can be reduced by as much as half.<sup>9</sup> Triple combination therapy involves the use of at least one protease inhibitor and two reverse transcriptase inhibitors, i.e., AZT, 3TC and Indinavir. The three types of antiretroviral (ARV) drugs approved by the U.S. Food and Drug Administration are: 1) nucleoside reverse transcriptase inhibitors (AZT, ddI, ddC, 3TC and d4T); 2) non-

The development of effective drugs will not necessarily be the solution to the HIV/AIDS pandemic. Drugs do not constitute a cure, are not effective in everyone, and it is currently impossible to say how long their effects will last.<sup>6</sup> The production of a vaccine is certainly critical in the fight against HIV/AIDS, but it will not be the answer to the problem either.

nucleoside reverse transcriptase inhibitors (neparine and rescriptor); and 3) protease inhibitors (saquinavir, ritonavir, indinavir and nelfinavir).

In terms of the development of effective drugs against the virus, research is both essential and necessary. However, the development of effective drugs will not necessarily be the solution to the HIV/AIDS pandemic. The cost of such drugs is, and will continue to be, prohibitively high for developing countries whose health sectors and budgets are already burdened by competing health needs. According to UNAIDS, access to antiretroviral (ARV) therapy is difficult or impossible in the developing world. Drugs do not constitute a cure, are not effective in everyone, and it is currently impossible to say how long their effects will last.<sup>6</sup>

The production of a vaccine is certainly critical in the fight against HIV/AIDS, but it will not be the answer to the problem either. An effective vaccine

will not have an impact on the millions of persons who are already infected. The development of an effective vaccine is years away, and during this time many millions more will become infected. If and when an effective vaccine is discovered, it is also crucial to understand that the cost of its administration and availability would be prohibitive for the majority of those affected who live in the developing world.

Years of experience with immunization programs help illustrate this point; that in spite of having safe, effective and inexpensive vaccines, it is often difficult to reach entire populations. Currently there are inexpensive vaccines, ranging from 1 to 5

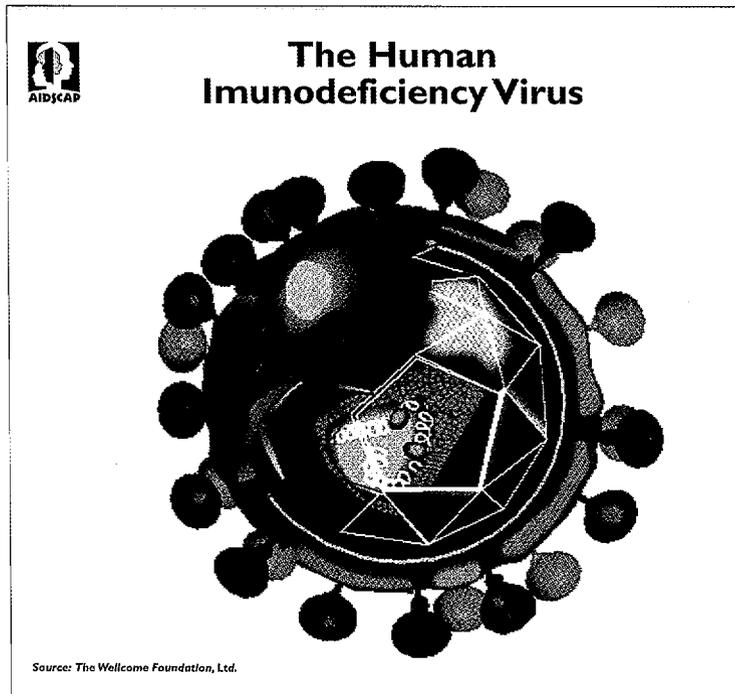
cents each, for measles, whooping cough, and tetanus, but many countries continue to experience epidemics of these preventable childhood illnesses. As is the case for Hepatitis B, which shares the same routes of transmission as HIV, a safe vaccine has been developed but universal vaccination has not been possible. Experts agree universal coverage will continue to be difficult until infant vaccination programs and the accompanying infrastructure mature in these countries.<sup>10</sup>

AIDS is a not disease, but a combination of more than 70 conditions that appear as a result of damage to the immune system and other parts of the body produced by HIV. Hence, AIDS is a syndrome; that is, a group or cluster of diverse signs, symptoms, infections and conditions.

#### *Impact: AIDS Cases*

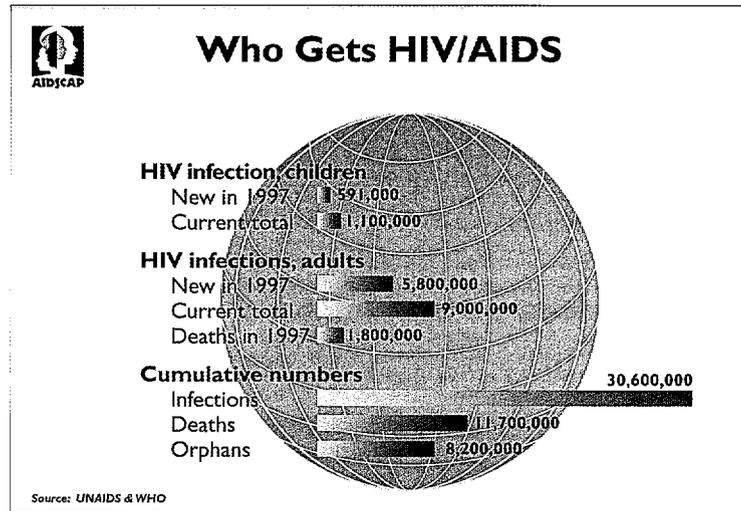
Viruses are the smallest organisms capable of producing disease and can only reproduce themselves within a live cell of a superior organism. The human immunodeficiency virus (HIV) belongs to a group of retro-viruses that are called "slow viruses" since the signs and symptoms of the disease appear gradually over a long period of time. HIV (Figure 2) is responsible for the final stage of the infection commonly known as AIDS, Acquired Immuno-Deficiency Syndrome. AIDS is a not disease, but a combination of more than 70 conditions that appear as a result of damage to the immune system and other parts of the body produced by HIV. Hence, AIDS is a syndrome; that is, a group or cluster of diverse signs, symptoms, infections and conditions.

Figure 2



AIDS represents the terminal phase of HIV infection, following an asymptomatic period that commonly lasts from two to twelve years. According to the latest data (Figure 3), a total of 2.3 million people died from HIV/AIDS related illnesses during 1997, a 50 percent increase from 1996. The total number of cumulative deaths since the beginning of the pandemic is estimated to be 11.7 million. There are an estimated 30.6 million persons currently living with HIV/AIDS worldwide. Of these individuals, more than 90 percent live in the developing world: 68 percent in Africa, 21 percent in Asia, and 5 percent in Latin America and the Caribbean.<sup>6</sup> Clearly the pandemic's impact is being felt hardest in the developing world and increasingly among women, who now constitute 40 percent of those living with HIV/AIDS.

Figure 3



With respect to the populations affected by AIDS, we can no longer speak of specific groups exclusively at high risk as was done at the outset of the pandemic. HIV/AIDS is presently characterized as a series of sub-epidemics in each country that affects homosexuals, bisexuals, heterosexuals, commercial sex workers (CSWs), women, adolescents and children. AIDS is also the primary cause of mortality in many cities and countries, especially among the young, women and marginalized populations.

A resurgence of sexually transmitted infections (STIs), including syphilis and gonorrhea, is a worrisome trend given that the presence of STIs increases susceptibility to HIV infection during sexual intercourse. During 1995, WHO estimated 333 million new cases of curable STIs were contracted.<sup>6</sup> In the Russian Federation between 1994 and 1995, syphilis incidence rates increased from 81.7 cases per 100,000 to 172. Clearly, the control and treatment of STIs continues to pose a challenge to public health and to the reduction of the sexual transmission of HIV.

*Key Intervention: Treatment*

The developing world currently has serious constraints maintaining an adequate and sufficient supply of antibiotics, analgesics, antipyretics and antidiarrheal drugs which are inexpensive, let alone expensive antiretroviral drugs. Although people living with HIV/AIDS in the developed world have benefitted from antiretroviral treatments, the cost of these therapies is not and will not be a feasible option for the developing world. Estimates reveal that the annual cost of AZT (Azidothymidine) for one person, as a percentage of 1989 per capita GNP, ranged from 14 percent in the United States and 22 percent in Australia, to 85 percent in Brazil, to 500 percent or more in Rwanda, Uganda, and other sub-Saharan countries.<sup>11</sup> In spite of the cost of such medications, it is important to note the usefulness and importance of AZT, particularly in reducing vertical, or mother-to-child transmission. Trials have indicated AZT does provide a 67 percent reduction in risk of HIV transmission from mother to child. Again, the implications for developing countries are also striking. In terms of cost, most countries cannot afford AZT treatment for HIV-positive pregnant women, and universal counseling and testing in early pregnancy is not feasible in most contexts, further reducing the chances of identifying pregnant women who are infected and who could benefit from such treatment.

AIDS has become a two-world disease: the wealthy versus the indigent.

Dr. Gary Cohan

The newly developed cocktail therapy has benefitted individuals in industrialized countries but still remains out of reach for most in the developing world. The average cost per year for this therapy in the United States is between \$15,000 to \$20,000, including laboratory tests and doctor's office visits. The drugs must be taken properly — three times a day, with no food for an hour before or two hours afterward. This regimen requires discipline, and if neglected, patients risk developing drug-resistant strains of the virus. Furthermore, 15 to 33 percent of people who received

this treatment have shown no improvement or are not able to tolerate the side effects.<sup>12</sup> It is also not known for how long this therapy works.

In the United States, insurance companies and Social Security currently pay more than \$1.5 billion in disability benefits each year to about 100,000 AIDS patients. For many of the poor — about half of AIDS patients qualify for Medicaid — protease inhibitors are somebody else's miracle since they are not covered by Medicaid. Thus, as Dr. Gary Cohan, a Los Angeles AIDS Specialist says, AIDS has become a two-world disease: the wealthy versus the indigent.<sup>12</sup>

Additionally, a serious problem is emerging from false expectations about this therapy. Since the viral load (the presence of HIV in the blood) drops to undetectable levels, people tend to believe the virus has been eradicated from their bodies. Many individuals think a morning-after pill to undo any damage from the previous night's unsafe behaviors and practices has been discovered. Even before the appearance of protease inhibitors, there were signs younger people were shrugging off the danger of AIDS, a trend substantiated by a second wave among younger gay men and rising incidence of HIV-positive teenage girls who get the virus from infected men. Clearly, while these new therapies are beneficial, they are not the solution to the world's deadliest pandemic.<sup>12</sup>

While the bio-medical approach clearly can make a contribution to the fight against HIV/AIDS, it is not the most comprehensive approach.

It is evident that "AIDS will not surrender quickly to a technological fix, the type of solution of which the Western medical establishment is particularly fond." <sup>8</sup> While the bio-medical approach clearly can make a contribution to the fight against HIV/AIDS, it is not the most comprehensive approach. Countries that focus the majority of their attention and resources in the hope of a medical "cure" will short-change other more effective and equitable approaches to combating the pan-

demic. The medical, public health, political and social leadership must focus on the total course of the HIV infection rather than on the terminal phase of the disease. A concentrated focus on AIDS cases, instead of the whole spectrum of HIV infection, has left many nations unable to succeed in their fight against this pandemic.

In addition, it is important to realize that although the pandemic surfaced in the late 1970s, it is still nascent in much of the world, particularly in South and South-East Asia where the epidemic emerged in the late 1980s.<sup>6</sup> This means that for the approximately 2.4 billion people in the world, that is, for “developing areas which include half of the world’s population, two-thirds of the population of developing countries, and nearly 40 percent of the population of low-income countries,” the full extent of the pandemic and its impact have yet to be evidenced.<sup>13</sup> Therefore, the real problem and challenge is not only to develop an effective drug or vaccine, but rather, how can effective drugs and vaccines be made available, accessible and affordable to populations in the developing world.

The public health approach to HIV/AIDS, although a step in the right direction, is like the bio-medical approach—too limited in its scope.

Given the biology of HIV and the epidemiology of AIDS, Earickson proposes a broader three-pronged approach to confronting the pandemic. It includes research on vaccines and drug development, modification of human behavior to interrupt contact diffusion, and education of populations in an attempt to arrest the disease.<sup>8</sup> As is detailed in the following section, this public health approach to HIV/AIDS, although a step in the right direction, is like the bio-medical approach—too limited in its scope.

## The Public Health Approach

### *Foundational Discipline:* Public Health

Utilizing public health tools, including information about HIV's demographic and epidemiologic patterns, several emerging trends can be said to characterize the second wave of the pandemic. HIV seroprevalence studies among pregnant women indicate the movement of HIV into the general population. In HIV/AIDS epidemiology, a seroprevalence of 1 percent or more among pregnant women has been used to indicate the epidemic is well established in a country and has spread through a cross section of its population. Between 1985 and 1995, HIV seroprevalence in pregnant women in selected urban areas in Africa increased as follows: Nairobi, Kenya, from 0.2 to 13 percent; Abidjan, Ivory Coast, from 0.2 to 16 percent; Lilongwe, Malawi, 2 percent to 22 percent; Lusaka, Zambia, from 7 to 24 percent, and Kampala, Uganda, from 10 to 30 percent.<sup>13</sup> In Thailand, HIV prevalence in women attending antenatal clinics rose steadily from 0 percent in 1989 to 2.3 percent in 1995.<sup>6</sup> This trend suggests a "*generalization*" of the pandemic away from high risk groups to the general population.

In terms of the predominant modes of transmission, HIV/AIDS infection rates among heterosexual populations are rising worldwide. In spite of epidemiologic diversity across regions, heterosexual transmission is consistently rising in both Europe and the United States, where homosexual and injecting drug use had been the predominant modes of transmission at the outset of the pandemic. The evolution of AIDS in the United States, one of the world's wealthiest nations, should serve as a warning sign for the rest of the world. The first wave of the epidemic affected middle-class and upper-income white males — predominantly homosexuals. This has given way to the second wave of the epidemic among poor urban non-white males and females through heterosexual transmission and injecting drug use. According to the latest figures, the epidemic in the U.S. is decreasing among male homosexuals and white adults, and increasing in Hispanic and African-American populations, including women.<sup>6</sup> This trend suggests a "*heterosexualization*" of the HIV/AIDS pandemic.

As the HIV/AIDS pandemic evolves, epidemiologic data suggests it is increasingly affecting two groups that have always been the most vulnerable to infectious diseases: women and children.

Once characterized by infection rates among men that were 12 times higher than that of women, HIV/AIDS is increasingly affecting women as is evidenced by the declining male:female ratio. In the Americas as a whole, the male:female ratio of reported AIDS cases fell from 12:1 in 1986 to 3.7 in 1994. In the Caribbean, the ratio is currently 1.5 males to 1 female. It is projected that reported AIDS cases by sex will continue to follow this "inverse or reversal" trend as it has in Africa, where for every female infection there are now 0.87 male infections. With increasing numbers of women becoming infected this trend clearly indicates a "*feminization*" of the HIV/AIDS pandemic.

Biological, socioeconomic and cultural factors continue to make women more vulnerable to HIV infection. A survey carried out among women in Uganda revealed they perceived themselves to be in more danger of HIV infection than men because: 1) they are less able to make decisions about sex; 2) their husbands are free to have many partners; 3) they may have to use sex as a means to earn a living for themselves and their children; and 4) the age of their first sexual contact is usually between 14 and 15 years.<sup>14</sup> In addition, it is often the case that women themselves are not engaging in risky behaviors but they are exposed to HIV/AIDS as a result of their partners' sexual activities.<sup>15</sup> Their predominant risk factor in such a situation is that they are in a stable relationship or married from which many are not able to escape due to social, cultural, religious, and economic constraints and barriers.

Concurrent with the "feminization" of the HIV/AIDS pandemic, is "*verticalization*," the increase of new infections among children, particularly through perinatal, or mother-to-infant transmission. Aside from actual numbers, the epidemics in women and children clearly show epidemiologic curves with a parallel relationship.<sup>16</sup> Furthermore, data indicate that at least one of every three children born to an HIV infected mother will be seropositive.

## The Trends of HIV/AIDS

### "Ricardo's 'izations'"

- |                       |                   |
|-----------------------|-------------------|
| ■ generalization      | ■ juvenalization  |
| ■ heterosexualization | ■ marginalization |
| ■ feminization        | ■ pauperization   |
| ■ verticalization     | ■ ruralization    |

Another particularly worrisome trend is the "*juvenalization*" of the pandemic, whereby increasingly younger age groups are becoming affected than at the outset. In the Southern Cone of Latin America (Chile, Argentina, Uruguay and Paraguay), there was a marked increase in infections among adolescents and young adults. During the period of 1990 and 1992, more AIDS cases were reported among 17 to 32 year olds than 27 to 42 year olds, the most affected age group during the previous period of 1983-1989.<sup>17</sup> In Zambia, more than 12 percent of 15-16 year olds seen at antenatal clinics were HIV positive.<sup>6</sup> Clearly the pandemic is affecting increasing numbers of adolescents and young adults, many of whom are about to enter the most productive years of their lives.

A dual trend of "*marginalization*" and "*pauperization*" characterizes the current spread of HIV/AIDS globally. Data indicate a shift of new HIV infections to communities under served by socioeconomic, educational and/or health infrastructures (marginalized), and to populations that live in poverty or extreme poverty. One of the primary reasons for the rapid increase in HIV/AIDS is the correlation between poverty and HIV susceptibility or vulnerability. This correlation has resulted in high infection rates among the poorest populations in cities as diverse as Bombay, Edinburgh, New York and Rio de Janeiro. Poor people tend to have less education and high illiteracy rates that limit their access to HIV/AIDS information and services. In addition, those who have little or no

education tend to initiate sexual activity without knowledge of contraception and/or STI prevention. Poverty creates conditions that facilitate the spread of HIV/AIDS and constrains effective responses. It can be said poverty affects safer sex behaviors given that for the poor there are more pressing priorities than HIV/AIDS, such as the next meal, clothing, and shelter. The poorer a woman is, the less opportunity she has to protect herself from STIs.<sup>16</sup> Alcohol, drugs and sex are often times the only way to escape an inhospitable existence. In many communities, a vicious cycle exists between poverty, alcohol, drugs and HIV/AIDS.

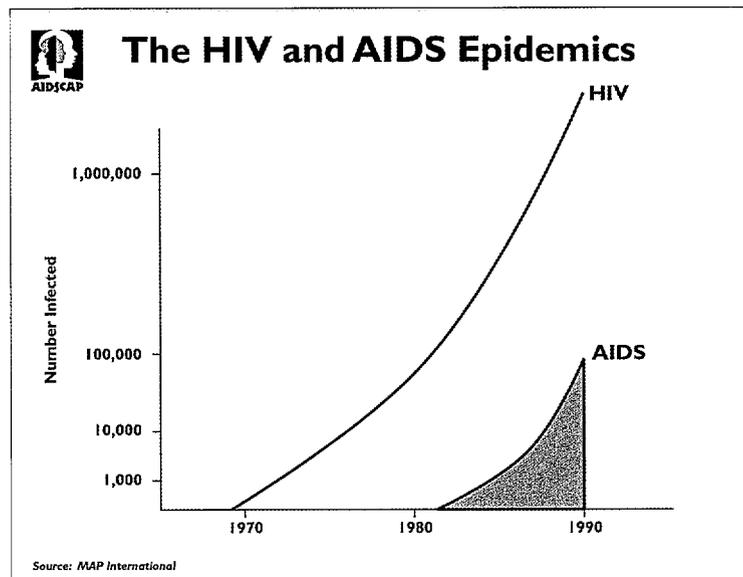
The "*ruralization*" of the epidemic is another trend that characterizes the second wave of the pandemic. The spread of HIV to rural areas is fueled by internal population movements within countries, migratory work, and rural-urban migration by those in search of employment and increased opportunities. Men often seek employment in urban areas and are away from home for extended periods of time, often engaging the services of CSWs and, therefore, increasing their own and their partners' vulnerability to HIV/STIs. Unfortunately, the circumstances that precipitate internal population movements are common in much of the developing world, thus further contributing to the spread of HIV into rural areas.

Mexico provides a good example of the ruralization of the pandemic. Within Latin America, Mexico reports the second highest number of AIDS cases after Brazil, and together they account for 7 out of 10 cases in the region. In Mexico, there is evidence of continued increasing HIV incidence among MWM, although the rise is not as rapid as it was in the 1980s. Transfusion-associated HIV infection and AIDS cases have drastically declined, as in the rest of the region, due to effective blood screening. This has resulted in an apparent slowing of AIDS cases among women, but there is, in fact, a much younger epidemic of heterosexually-acquired HIV infection emerging among women. Consequently, two epidemics are currently observed in Mexico: an urban epidemic, which is more mature and affects predominantly MWM; and an emerging epidemic, which is predominantly spread through heterosexual transmission particularly in rural areas.<sup>17</sup>

### *Impact: HIV Infections*

Analysis of the pandemic in terms of HIV infections more correctly defines the magnitude and severity of the problem. The HIV pandemic cannot be seen, since infected individuals have not developed any symptomatology or opportunistic infections (Figure 4). The undetected HIV pandemic of the 1970s dictated the course of the AIDS pandemic in the decade of the 1980s. Similarly, the present AIDS pandemic of the 1990s has already been determined by infections incurred during the 1980s.<sup>19</sup>

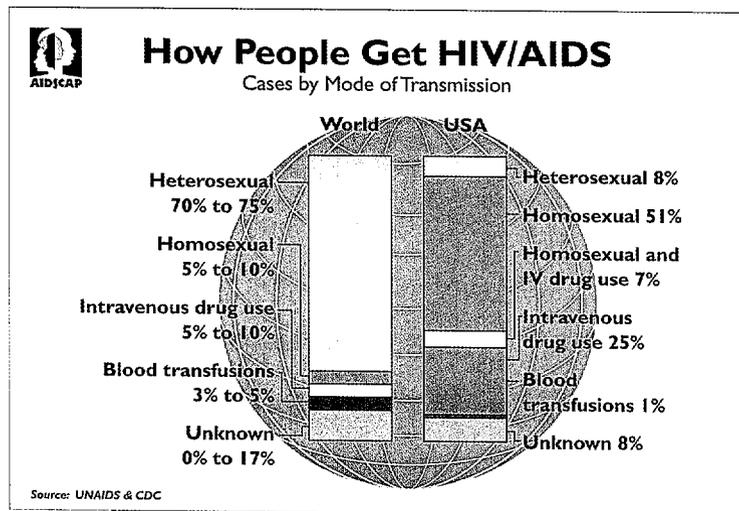
*Figure 4*



Currently (Figure 5) sexual transmission of HIV accounts for 75 to 85 percent of all new cases of HIV infection worldwide. Heterosexual contact accounts for more than 70 percent of infections and homosexual contact for 5 to 10 percent, although the proportions vary across countries and regions. Transmission due to infected blood or blood products accounts for between 3 and 5 percent of all adult infections, and the sharing of HIV-infected needles by drug users accounts for 5 to 10 percent of adult cases.

In many areas of the world, including the former Soviet republics, injecting drug use (IDU) is the dominant mode of transmission.<sup>6</sup> Vertical transmission from infected mother to infant accounts for 90 percent of the 1.1 million children currently living with HIV/AIDS.

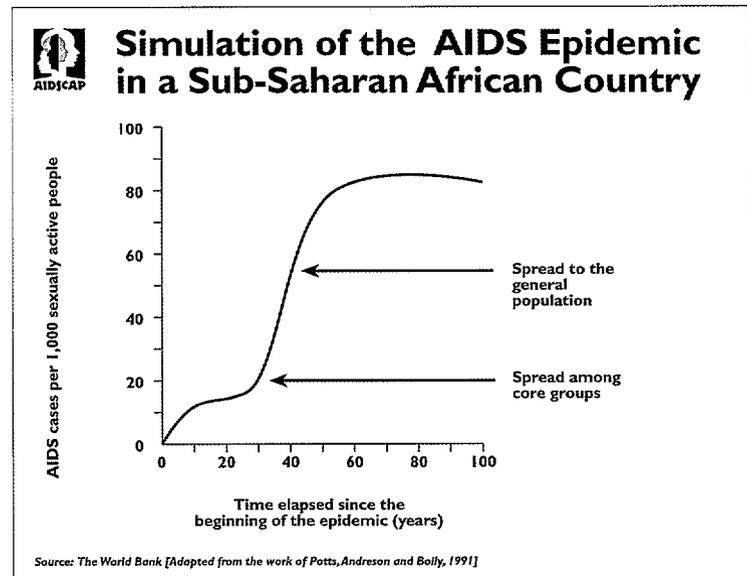
Figure 5



According to UNAIDS, there are currently an estimated 30.6 million adults and children living with HIV/AIDS in the world: 20.8 million in Sub-Saharan Africa, 6.4 million in Asia and the Pacific, and 1.6 million in Latin America and the Caribbean.<sup>6</sup> Studying the magnitude of HIV infections forms the basis for the Public Health Approach. This approach substitutes the population for the individual as the unit of analysis, and uses epidemiology as a systematic mechanism to study demographic profiles of disease and models of health service provision. In this way, the HIV pandemic has come to be likened to the image of waves that represent the dispersion of infection from members of a high risk group, who do not use condoms and frequently change partners, to the rest of the community (Figure 6). The first wave produces an epidemic which is small but marked by rapid development and elevated

levels of infection in high risk groups — CSWs, MWM, and persons with STIs and multiple sex partners. The second wave generates an epidemic of slower development but one of greater magnitude among the general population. Given HIV's classification as a "slow virus," the interval between these two waves can be of one or more decades. This suggests that even in the most affected areas, the pandemic is still in its initial phases.<sup>20</sup>

Figure 6



*Key Intervention: Prevention*

Information about HIV's demographic and epidemiologic patterns serves as the foundation for the primary intervention utilized in Public Health, namely Prevention. The goal of prevention is to anticipate the precursors and risk factors of a disease with interventions. For example, sexual transmission of HIV is the principal mode of transmission of new infections reported to the WHO, followed by transmission due to the sharing of HIV-infected equipment by drug users, and the use of infected blood or blood products. Utilizing the public health approach, an effective manner of detaining the pandemic is by means of prevention strategies that diminish sexual transmission, the predominant mode of infection. The promotion and practice of abstinence, mutual fidelity, sex without penetration and sex with protection/condoms are forms of safer sex that help prevent HIV infection. Likewise, adequate STI treatment diminishes the incidence of HIV. The screening of blood and blood products has also greatly reduced HIV transmission in countries where it has been universally implemented.

Other strategies, such as needle/syringe exchange programs, have made risk reduction possible for IDUs as well as their partners. Unsafe drug injecting practices contribute directly to HIV spread and facilitate heterosexual transmission. Prevention methods include ready access to sterile injection equipment, community outreach, expansion of drug abuse treatment, bleach distribution, and HIV counseling and testing. Dar Jarlais et al showed in a five city international study in 1995 that it is possible to prevent HIV transmission among IDU when programs have the following three components in common — early start (interventions initiate while seroprevalence is still low (less than 5 percent), ready access to sterile injection equipment, and community outreach.<sup>6</sup>

A commitment to providing adolescents with quality sexuality education is another intervention that can reduce transmission of HIV among an age group increasingly becoming affected by the pandemic. Contrary to popular belief that sex education increases promiscuity, newly published data reveals the reverse is true; that good quality sexuality education helps delay first intercourse and lowers rates of teen pregnancy and STIs.<sup>6</sup>

During the six years of the AIDSCAP project, achievements in Latin America and the Caribbean were very exciting and encouraging. In the region as a whole, where AIDS was once perceived as a "homosexual" disease and a disease of foreigners, governments are increasingly recognizing the gravity and potentially devastating impact of the pandemic and the importance of taking preventive action to avoid the type of crises faced in other regions. AIDSCAP/LACRO's programs targeted a diverse array of populations including: male and female CSWs, MWM, hotel workers, STI clinic attendees, residents of impoverished and marginalized communities, adolescents, factory and agricultural workers, college students, women, and general population adults. In every population, increased knowledge of HIV/AIDS transmission and prevention methods was recorded. Knowledge of two or more methods of HIV transmission and prevention in both high and low risk target populations became nearly universal. Unfortunately, while knowledge of HIV transmission and prevention is high in most populations, deficiencies remain in terms of specific knowledge and beliefs in inaccurate means of HIV transmission (such as, mosquitoes and social contact with an HIV+ individual). While target populations accepted and understood information on HIV/AIDS conveyed to them by mass media campaigns, peer educators and outreach workers, they were slow to reject the persistent rumors, gossip and sensationalistic news which convey misinformation.<sup>21</sup>

In addition to improved knowledge, condom use increased in every AIDSCAP LAC country. While condom use was only moderately accepted among men and women over 30 years old in the context of "regular relationships," 100 percent condom use is becoming a norm among female CSWs and, to a lesser degree MWM, in many settings. In general populations targeted by AIDSCAP, significant increases were noted in terms of the ability of individuals to discuss HIV/AIDS and negotiate condom use. In addition, a high percentage of men report having changed their behavior to reduce their risk of HIV infection. The most common specific steps taken were having "fewer partners" or "avoiding commercial sex" or being more "selective" of sexual partners. The extent to which these changes occurred, as well as the protective

effect of this incremental behavior modification, is difficult to assess, but undoubtedly provides some degree of reduced exposure and risk for HIV infection. A smaller percentage of women generally report "change behavior," due to lower rates of high risk behaviors and/or their lack of power or control in critical areas of their lives before they can begin to negotiate protective sex with their partners.<sup>21</sup>

The Public Health approach has guided the prevention efforts for much of the last decade. The Public Health approach is certainly more effective, broad and expansive than a purely bio-medical approach and deserves on-going support, attention and resources. However, why has this approach, in combination with advances in the bio-medical field, been unable to halt the transmission of HIV? Why does HIV continue to make significant inroads among groups once not considered to be at risk, in spite of effective targeted interventions and combination of strategies during the past decade?

### **The Development Approach**

#### *Foundational Discipline:* Development

The trends described in the previous section, coupled with the resilience of the HIV pandemic to respond to the public and bio-medical approaches, necessitate more comprehensive and lasting strategies.

The lesson learned to date is that change in behavior can slow the transmission of HIV, particularly among high risk groups in the short term, but these efforts require political, social and economic support in order for behavior change to be effective and long-lasting, or sustainable.

In order to effectively confront the pandemic, one must examine the socioeconomic impact as well as the social, economic and cultural factors that facilitate the transmission of HIV.

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the transmission of HIV. In other words, effective responses must address individual as well as structural and environmental factors which facilitate the spread of HIV. These socioeconomic risk factors manifest themselves in inequalities in wealth, power and autonomy. Since these disparities are often quite large, societies are fragmented and HIV is spread more quickly. Affluent individuals may travel extensively, experience greater individual freedom and adopt lifestyles that place them at risk

of infection. The poor and marginalized are often unable to make decisions and changes to their life's circumstances, are frequently forced to live away from their homes and families, and may become involved in commercial sex work due to isolation and/or economic necessity, thus placing themselves at higher risk.<sup>18</sup>

Therefore, while both rich and poor are affected by the disease, the rapid advance of HIV can be attributed, at least in part, to the correlation existing between poverty and vulnerability to HIV infection. To fully understand this premise, it is important to examine the socioeconomic impact of HIV/AIDS on: *health, family, businesses, government, and the macroeconomy.*

#### *Impact: Socioeconomic Impact*

The impact of HIV/AIDS on the *health* of individuals includes high morbidity and mortality due to AIDS, increased morbidity of HIV-related diseases, such as STIs and tuberculosis, an increase in other health problems, and an increase in health care costs. While the most recent successes in health have increased life expectancy in the developing world, much of this progress is being eroded by HIV/AIDS. The impact of HIV/AIDS related deaths is projected to reduce life expectancy by 10 percent in Brazil, and by as much as 50 percent in Zambia and Thailand. It is estimated AIDS will increase the mortality rate by 30 to 40 percent in Brazil and Haiti, and by more than 300 percent in Zambia and Zimbabwe.<sup>13</sup>

The World Bank developed projections for life expectancy and mortality rates for a hypothetical country in East Africa with a population of 10 million and HIV prevalence of 0 percent to 5 percent from 1975 to 1985, 10 percent in 1990, and 20 percent by 2020. Without AIDS, the crude death rate would have declined from 15 to 8 per 1000 by the year 2020. The scenario with AIDS would result in an increase in the crude death rate to 21 per 1000 by the year 2000, before declining to 17 per 1000 in the year 2020. By the year 2020, half of all mortality would be due to AIDS. In terms of life expectancy, without AIDS life expectancy at birth would have increased from 51 years in 1985-1990 to about 62 years in 2015-2020. With AIDS, life expectancy declined to 40 years in 2000-2005, before increasing to about 43 years by 2015-2020.<sup>22</sup>

In addition to reducing overall life expectancy and increasing mortality, HIV/AIDS has disproportionately affected poor minorities and those otherwise marginalized. In the United States, a review of death rates by race/ethnicity for HIV infection among men aged 25-44 years in 1991 revealed that HIV/AIDS affects the black and Hispanic populations disproportionately. The incidence of AIDS among whites in the United States is 189 per million, while African-Americans have an incidence of 578 per million and Hispanics 564 per million.<sup>23</sup> Hence, the probability of an African-American or Hispanic becoming infected is almost three times higher than that of a white. In addition, the probability of a minority woman becoming infected is 13 times higher for an African-American and 9 times higher for a Latin woman than for a white woman.

It is evident that the second wave of the pandemic has affected minority populations that live in communities characterized by poverty, unemployment, injecting drug use, discrimination, violence and precarious health conditions. The threat of increased HIV infection can, therefore, be predicted wherever such communities exist, and in the case of the developing world, these conditions are not the exception but more often the rule.

The pandemic has affected minority populations that live in communities characterized by poverty, unemployment, injecting drug use, discrimination, violence and precarious health conditions. In the case of the developing world, these conditions are not the exception but more often the rule.

The economic impact of HIV/AIDS on *families* can be measured in terms of the cost to the individual with HIV/AIDS and the cost to the family. The cost to the individual is both direct (cost of treatment), and indirect (loss of productivity or foregone income due to illness and death). Estimates of the direct costs to an individual with HIV/AIDS in Zaire and Tanzania ranged from US\$132 to \$1,585 per patient, similar to costs associated with other serious diseases treated under similar circumstances. Indirect costs were also estimated and ranged between \$890 to \$5,093 per individual with HIV/AIDS. Other estimates revealed that indirect costs accounted for more than 80 percent of the total estimated cost to the individual. This is due to the high value attributed to the relative youth of people with AIDS.<sup>15</sup> Costs to a family are difficult to calculate particularly since women most often bear the burden for caring for a sick family member, and the

value of the foregone work (household, food provision, reproduction) cannot be adequately measured. In addition to the economic costs, HIV/AIDS places a strain on the social fabric of families who are often not able to cope with the loss of a wage-earner and are, thus, further marginalized or victimized.

In terms of an individual's loss of productive years due to AIDS, an average of 21 years was projected in a study conducted in Nicaragua, El Salvador and Guatemala in 1995. This represents an average of 70 percent of potential earnings lost, or the equivalent of \$30,333 per person with AIDS. By the year 2000, the economic impact of HIV/AIDS on these three countries will equate to a mean estimated total loss of \$376 million.<sup>24</sup>

The economic impact of HIV/AIDS on *businesses* can be measured by estimating reductions in revenue due to lost productivity, absenteeism, recruiting and retraining time. Increased expenditures are also incurred due to rises in health care costs, funeral expenses and life insurance costs. The financial costs of AIDS to a Kenyan business in these areas were estimated to be 59 percent due to absenteeism, 12 percent to additional training costs, 12 percent to funeral assistance and 6 percent to burial costs.<sup>25</sup> The impact on businesses is expected to be largely sector-specific and determined by the availability of skilled labor to replace labor losses due to the pandemic.<sup>15</sup> Some sectors such as long-distance transportation/trucking and mining, where workers are away from home for extended periods of time placing them in high risk situations, are likely to feel the effects of the pandemic very acutely.

In terms of the economic impact on *governments* and *societies*, HIV/AIDS will continue to strain already overburdened health care systems in much of the developing world. The direct costs to governments include expenditures on health care, including hospital and hospice care for individuals affected by HIV/AIDS, as well as on prevention and control programs. In Kenya in 1992, HIV-positive patients occupied an estimated 40 percent of hospital beds. A study carried out by the World Bank estimated the potential AIDS treatment costs as a share of total and public health expenditure in 5 African countries if all infected individuals sought treatment. In Kenya, treatment costs would consume 23 percent of public expenditures on health, while in Rwanda, these costs would account for 66 percent of public health expenditures in 1990.<sup>26</sup> An estimate of the total cost of hospital treatment for individuals with HIV/AIDS in Nicaragua in 1995 was US\$235,000. By the year 2000, it is estimated these costs will increase to US\$1,100,000, placing further pressure on already overextended medical services.<sup>24</sup>

In terms of societal costs, HIV/AIDS will result in a loss of educated and skilled labor, particularly since the pandemic affects the most economically active segment of society. Replacement costs for lost skilled labor, care for orphans, and unemployment due to

HIV/AIDS related disability represent additional societal costs. In many cities worldwide, HIV/AIDS is now the leading cause of death among women. In the United States, HIV infection was the sixth leading cause of death among 25-44 year old women. However, in New York City, AIDS is now the leading cause of death among 25-39 year old women, replacing cancer, homicide and injuries.<sup>23</sup> In São Paulo, Brazil, HIV/AIDS- related deaths among women have surpassed neoplasms, accidents, homicides and pneumonia as the leading cause of death. This trend will place increasing pressure on urban health care systems, which often serve poor minority populations, and increase societal costs of caring for orphans and those otherwise displaced by the pandemic.

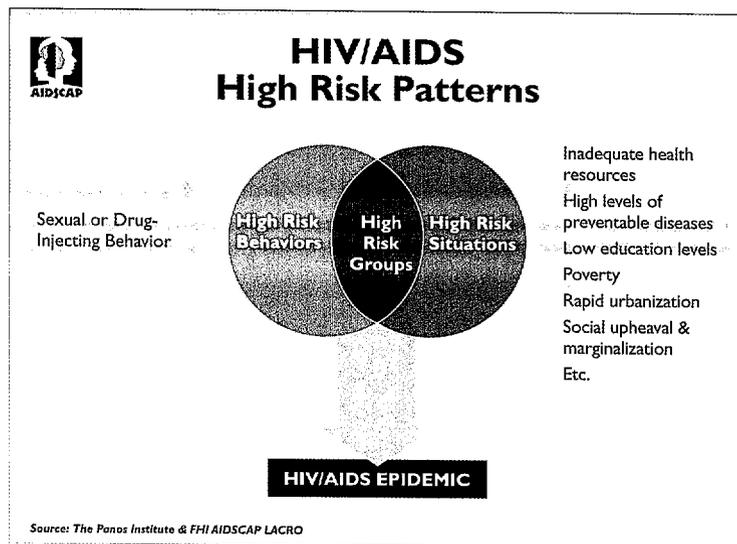
Although difficult to measure, HIV/AIDS will have a *macroeconomic* impact due to reduction in per capita Gross Domestic Product (GDP) as a result of reduced worker productivity, reduction in tourism, worsened dependency ratio, changes in population and unemployment, and increased expenditures on health care.<sup>25</sup> According to a World Bank study, the higher the percentage of AIDS patients in the country, the higher the loss in GDP. Projections conducted by the World Bank, Georgetown University and USAID in Zimbabwe, Tanzania, and Malawi estimated reductions in GDP due to AIDS mortality by the year 2000. According to these projections, a country could lose as much as 22 percent of its per capita income due to HIV/AIDS.<sup>25</sup>

Clearly, HIV/AIDS will have a significant economic impact at all levels of society, but these numbers scarcely reflect the true magnitude of the pandemic's impact. Broader measurements such as the impact of HIV on the Human Development Index (HDI) are being developed to better measure the effects of the pandemic on life expectancy at birth, adult literacy rate, gross school enrollment ratio, and adjusted per capita GDP. Predictably there is an impact on life expectancy, and preliminary work suggests an overall negative impact on the HDI, especially on the gender-sensitive variables.<sup>27</sup>

### *Key Intervention: Investment*

The HIV/AIDS pandemic is shaped by a multitude of factors, and these in turn influence and determine its dimensions.<sup>18</sup> As we know, high risk behaviors that allow for the transmission of HIV put individuals who practice these behaviors at risk. Some people's behavior place them at repeated risk; for example, an injecting drug user may regularly share needles, or a person may have intercourse with several partners without using a condom. However, such behavior is not always from choice: a commercial sex worker of either sex may not be able to insist that his/her client use a condom. In epidemiological terms, these people constitute *high risk groups*.<sup>28</sup> Yet it is not sufficient to target only the individuals. To effectively address the HIV/AIDS pandemic, one must also confront *high risk situations* (Figure 7), the conditions which are as great a factor in the spread of HIV/AIDS as individual behavior. It is critical to understand that high levels of preventable disease, low levels of education, inadequate health resources, poverty, urbanization, social upheaval and marginalization, all facilitate the transmission of HIV.<sup>28</sup>

Figure 7



HIV/AIDS is a complex problem that defies the established bio-medical and public health models and demands an examination of social, political and economic inequalities and new forms of development.

HIV/AIDS is a complex problem that defies the established bio-medical and public health models and demands an examination of social, political and economic inequalities and new forms of development. There is an urgent need to identify and implement development efforts that are more effective, equitable, sustainable and compassionate. While recent health achievements have increased life expectancy in much of the developing world, many of these hard-won successes are being reversed by the pandemic's impact. In order to stop this reversal and lessen the socio-economic impact of HIV/AIDS, development efforts must be implemented that

foster long-term investment. Governments, international donors, and lending institutions must focus on investments which will have an impact on poverty and inequality. Policies that open educational opportunities, particularly the education of girls and young women, and increase employment and wages, and reduce poverty will allow for improvements in health, nutritional and educational status.

The HIV/AIDS Multidimensional Model recognizes the welfare of a population cannot be improved by purely medical or public health approaches. In order to reduce the impact and spread of HIV/AIDS, high risk situations that put individuals at risk need to be addressed. In short, the resolution of medical and health problems is founded on improving the precarious socioeconomic conditions in which the majority of the world's population lives.

As Josef Decosas states, "HIV is an important piece in the puzzle of international development. It is linked to all the other pieces by a labyrinth of causal pathways. It is an indication of uneven or dysfunctional social development, it is the cause for developmental delays, and it is the result of inadequacies in the development of social and health services."<sup>27</sup>

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*Josef Decosas*

In spite of the daunting complexity and severity of the problem, HIV/AIDS prevention efforts have enjoyed some success in instances where both high risk behaviors and situations have been addressed. Although it is difficult to measure the true impact of these programs in the short-run, initial indications are positive.

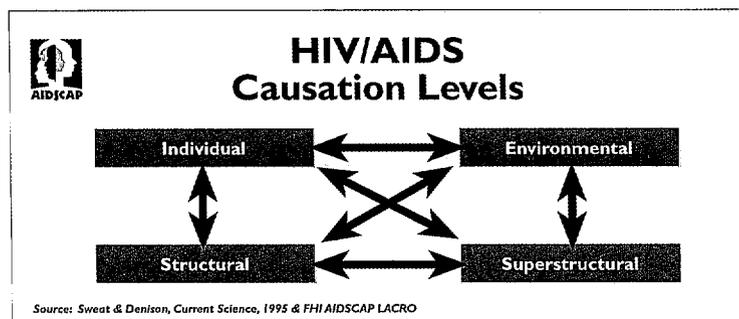
## LEVELS OF CAUSATION OF DISEASE

The perspective that HIV/AIDS is predominantly a disease of the individual has dominated prevention efforts for much of the past decade. The mandate of USAID's AIDSCAP project has been to reduce the sexual transmission of HIV/AIDS through prevention interventions focused largely on changing individual behavior. The primary prevention strategies utilized by AIDSCAP were: behavior change communication (BCC), prevention and control of STIs, and condom promotion, distribution and marketing. However, as has been discussed, structural and environmental factors, such as poverty and discrimination, contribute significantly to the spread of HIV, both in the industrialized and developing worlds.

In addition to its primary strategies, AIDSCAP implemented a series of policy initiatives designed to complement primary risk reducing strategies. These policy initiatives fostered change of structural and environmental elements in an effort to create environments supportive of individual efforts to reduce high risk behavior, reduce high risk situations, and hence be more effective and sustainable. Policy initiatives targeted decision makers and leaders at all levels of society, from government to the grassroots, and raised awareness of the importance of supporting HIV/AIDS related policy and planning. Policy-related activities included socioeconomic impact studies of HIV/AIDS, workshops to disseminate the results of these studies, and the support of legislation.

It is important to clarify that the "structural interventions" discussed in this SYNOPSIS are distinct from the "structural adjustments" promoted and implemented by international lending institutions. These structural adjustments have, together with economic recessions, intensified the effects of poverty in several countries. This has caused a reduction in basic social services, and infrastructure and educational opportunities, along with an increase in unemployment, poverty and land ownership. Many of these structural adjustments and economic forces have Africa more vulnerable to HIV/AIDS because they have resulted in increased migration, the separation of families and increased commercial sex work.<sup>29, 30</sup>

Figure 8



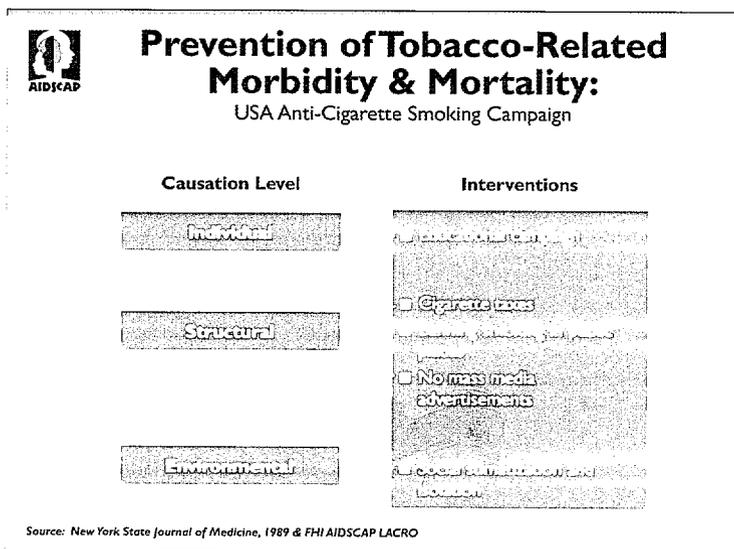
As has been discussed, HIV/AIDS is a complex problem, with many *levels of causation* (Figure 8), from individual high risk behaviors to social and economic high risk situations. Sweat and Denison identify four levels of causation in HIV incidence: individual, environmental, structural and superstructural. *Superstructural factors* include macrosocial and macropolitical arrangements, physical and resource characteristics, and other elements, such as economic underdevelopment, sexism, racism that often evolve over the long term. Mechanisms for change at this level include social movements, revolution, land distribution and war. *Structural factors* include laws, policies and standard operating procedures. Mechanisms for change at the structural level include constitutional and legal reform, civil and human rights activism, legislative lobbying and voting. *Environmental factors* include living conditions, resources, social pressures and opportunities, examples of which include forced relocation/migration in pursuit of employment, and urbanization. Processes for change at the environmental level range from community organization and legal action to the provision of services. The *individual level factors* relate to how the environment is experienced and acted upon by individuals and may include, amongst others, isolation, boredom, and low perception of risk. Change at the individual level is most often achieved through education, counseling, reward and punishment, and the provision of information.<sup>30</sup> Therefore, for HIV/AIDS prevention and control programs to be effective, a holistic approach is required in order to encompass all the levels of society and the economy.

## LESSONS LEARNED

### Successful Multidimensional Approaches

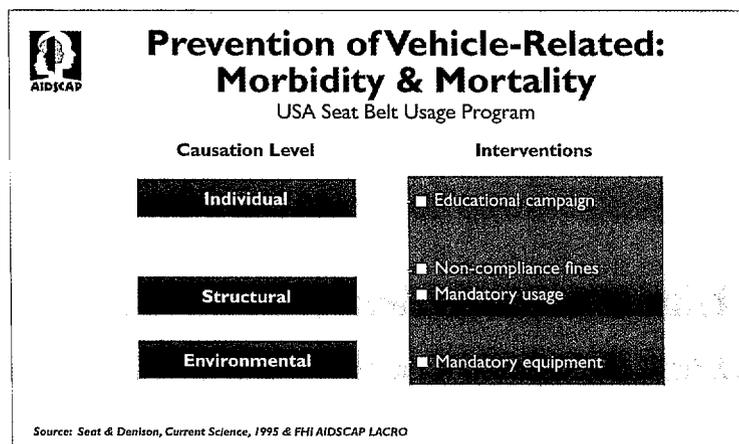
Successful and sustained public health interventions of the past have relied on changes at the individual as well as the structural and environmental levels. The massive effort in the United States to reduce cigarette smoking (Figure 9) is an example of an intervention that has worked at many levels and ultimately succeeded in lowering cigarette consumption. Initial efforts targeted the individual smoker and eventually evolved to include structural changes, such as cigarette taxes, banning smoking in public places and designating special sections in airplanes for smokers. On the environmental level, smokers have been stigmatized and labeled as outcasts and forced out onto sidewalks to smoke, further reinforcing these messages. The combination of structural and environmental pressures intensified the response of the individual and produced results beyond what would have been attained through purely an individual approach.<sup>30</sup>

Figure 9



Another example of an intervention initiated at the individual level and then expanded to include structural and environmental factors is seat-belt usage programs (Figure 10). Initial efforts to increase seat-belt usage were targeted at the individual, but it was not until laws were passed requiring seat-belt usage, including fines for non-compliance, that usage increased significantly in the United States. This effect was complemented at the environmental level with legislation that mandated the installation of seat belts in new vehicles<sup>30</sup>. Again, structural and environmental level interventions produced changes in behavior that would have been difficult to attain with purely individual approaches.

Figure 10



Other examples of public health interventions that have moved beyond the individual to the structural and environmental levels include: fluoridating water; enriching foods with micronutrients; increasing educational opportunities for women, which results in lower fertility rates; syphilis screening on all hospital admissions of reproductive age women; and motorcycle helmet laws.

Given the epidemiology and demographic patterns of HIV, it is difficult to measure the success of HIV prevention programs in the short term. However, several initiatives illustrate that it is possible to reduce incidence of HIV when interventions reduce high risk at several levels — individual, environmental and structural.

#### Behavioral studies in Uganda

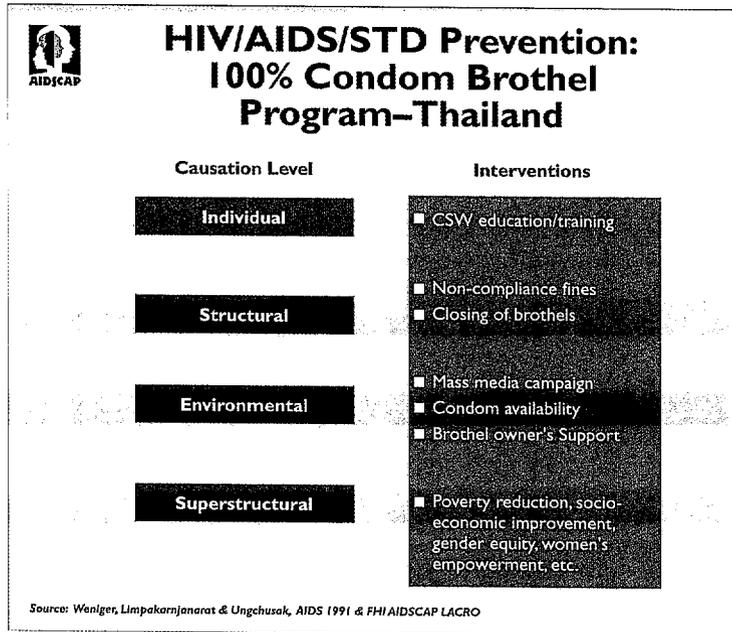
indicate younger people are initiating sexual relations later, having fewer partners, and using condoms more frequently.<sup>6</sup>

In Uganda, a country severely affected by the epidemic, initial indications are that HIV prevalence is declining as a result of concerted efforts by the government, NACP, NGOs, religious organizations, communities and individuals to stop the spread of HIV. Between 1990 and 1995, HIV prevalence in women at sentinel surveillance sites decreased by 29 percent. During this time period, prevalence of HIV also diminished by 35 percent in young women aged 15 to 19 and 20 to 24.<sup>6</sup> Preliminary data for 1997 from three surveillance sites indicate HIV infection levels between 5 per-

cent and 9 percent, representing a decrease of one-fifth from 1996 levels. Additionally, the decrease in seroprevalence has been significant among younger age groups. This trend is supported by behavioral studies indicating that younger people are initiating sexual relations later, having fewer partners, and using condoms more frequently.<sup>6</sup>

In Mwanza, Tanzania, a 42 percent reduction in new HIV infections resulted from a comprehensive STI case management program based on the syndromic approach. The program consisted of a community-based randomized intervention trial in a rural area of northwestern Tanzania. The objectives were to establish a program based on syndromic management of STIs in the general population and to measure the impact of this intervention on the incidence of HIV infection and on the prevalence and incidence of STIs. The improved STI services were designed to be feasible rather than optimal, were integrated with the Tanzanian primary health care system, and were based on syndromic treatment algo-

Figure 11



In Mwanza, Tanzania,  
a 42 percent reduction  
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program based on the  
syndromic approach.

rithms as recommended by WHO. Clearly, this intervention illustrates that a comprehensive multisectoral approach — from the community to the government that incorporates structural interventions, in this case the integration of STI protocols and treatment into existing health services — can have an impact in reducing HIV.<sup>31</sup>

The 100 percent condom policy pioneered in Thailand is an example of a structural and environmental intervention which, from initial indications, appears to have reduced the level of unprotected sex and the incidence of

The 100 percent condom policy pioneered in Thailand is an example of a structural and environmental intervention which, from initial indications, appears to have reduced the level of unprotected sex and the incidence of STIs and HIV.<sup>30</sup>

STIs and HIV.<sup>30</sup> “The 100 percent condom program (Figure 11) was an attempt by Thai authorities to ensure, by administrative means, that condoms were used in commercial sex establishments.<sup>32</sup> These “administrative means” included: mandatory use of condoms by CSWs with all clients; enforcement of condom use by brothel owners assisting CSWs with uncooperative clients; monitoring of condom use in brothels (checking of wastebaskets); requiring CSWs to get regular STI check-ups; and sanctioning brothel owners for non-compliance, and in the case of repeated violations, closure of their establishments. The program was also supported by a media campaign advising men to use condoms with CSWs.

A survey among military recruits in Thailand indicates this program has had an impact on increasing condom use, reducing the number of sexual encounters with CSWs and lowering seroprevalence. A baseline survey in 1991 revealed 59 percent of military recruits had sexual relations with a CSW during the past year, with 61 percent reporting condom use with a CSW. HIV prevalence among military recruits in 1991 was 10.4 percent. In 1993, 44 percent of military recruits surveyed reported having sexual relations with a CSW during the previous year, and condom usage with CSWs increased to 84 percent. Seroprevalence among these recruits remained relatively stable between 10.4 percent and 12.5 percent. In 1995, the number of recruits reporting encounters with CSWs declined to 23 percent and condom usage was reported by 93 percent of the recruits. Seroprevalence had also declined to 6.7 percent.<sup>33</sup> In addition, the number of males with gonorrhea receiving treatment at Thai Government clinics declined dramatically from more than 100,000 in 1987 to around 10,000 in 1993. The number of males with chancroid and three other STIs rapidly declined during this period also.<sup>32</sup>

The 100 percent condom program is an example of an environmental and structural intervention that “re-engineered” the social norms of a given setting. In this case, commercial sex establishments, by changing the social and physical environment and implementing policies and laws which created a structure supportive to the adoption of a given behavior, in this case the usage of condoms.<sup>30</sup>

In determining whether this specific environmental and structural change was adaptable to other geographic areas, AIDSCAP/LACRO supported formative research in the Dominican Republic to determine the feasibility and acceptability of establishing a 100 percent condom policy in sex establishments in Santo Domingo. Research results indicated considerable support for such a policy at the individual level from CSWs, brothel owners/managers, and most clients. Unfortunately, lack of legislative support from the government mandating a 100 percent condom policy and, thus, the enforcement of an incentive/sanction system, has resulted in the initiative not been fully implemented. Clearly, support for this policy at the structural level is needed to reinforce changes in behavior at the individual and environmental levels.

In Belle Glade, Florida, a community-based, peer education project succeeded in reducing the number of sexual relations and partners reported by African-American and Haitian adolescents.

In Belle Glade, Florida, an agricultural community with the highest cumulative per capita incidence of AIDS in the United States,<sup>34</sup> a community-based, peer education project succeeded in reducing the number of sexual relations and partners reported by African-American and Haitian adolescents ages 13-18, and in increasing condom use. The project aimed to change adolescents' behaviors by increasing awareness of HIV prevention and transmission and increasing access to and use of condoms, including access to teen clinic services. These activities contributed to fostering an environment where peer pressure promoted responsible sexuality. In 1992, 53

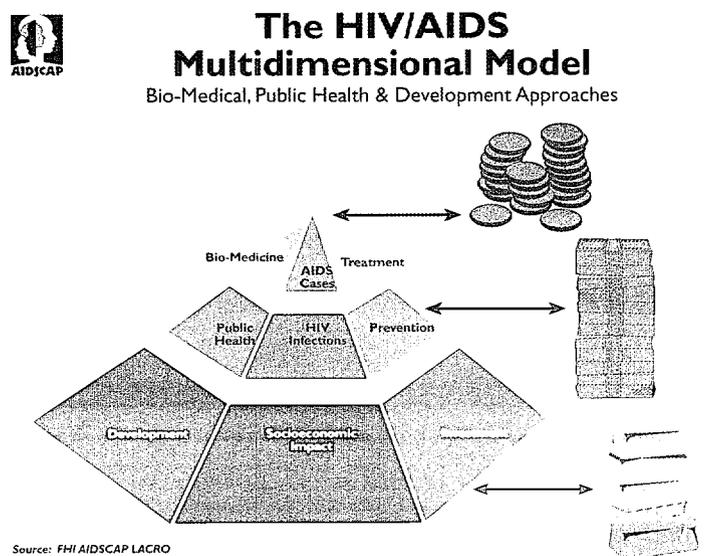
percent of adolescents surveyed reported having sexual relations with an average of 1.5 partners per month; 62 percent of the adolescents reported using a condom during the last act of sexual intercourse. In 1994, following implementation of the program, 43 percent of these teens reported having sexual relations and had reduced their average partners per month to 0.9. Similarly, condom usage increased to 72 percent.<sup>35</sup>

Unfortunately, HIV/AIDS prevention programs operating on these various and complementary levels are rare. However, results to date indicate that these reinforcing and multilevel strategies achieve results beyond those attainable through purely individualistic approaches to risk reduction. Clearly, future HIV/AIDS prevention efforts need to be multidimensional and address individual risk factors as well as structural, environmental and superstructural high risk situations that facilitate HIV transmission.

## RECOMMENDATIONS

Lessons learned from the past decade of HIV/AIDS prevention efforts must guide future interventions in order to obtain optimal results, particularly in an era of declining donor support and constrained government budgets. It is imperative that donors and governments continue to support bio-medical and public health interventions. Ideally, however, each approach should be given highest priority followed by prevention and then bio-medical interventions, as is reflected in the diagram below. As has been demonstrated in this SYNOPSIS, the bulk of assistance must be targeted towards development and investment in long-term solutions that ameliorate high risk situations, such as poverty, inequality, substandard health services and limited educational opportunities, particularly for women and young girls. Clearly, HIV/AIDS prevention interventions that focus solely on changing individual behavior are

Figure 12



Source: FHI AIDS CAP LACRO

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HIV/AIDS prevention interventions that focus solely on changing individual behavior are not sustainable, since the risk situations that make the individual vulnerable in the first instance remain unchanged.

not sustainable, since the risk situations that make the individual vulnerable in the first instance remain unchanged. The individual may learn and adopt new behaviors, but the odds are against them sustaining these changes over the long term, particularly if they are poor and otherwise marginalized.

Efforts to reduce deaths from diarrheal disease through the introduction of oral rehydration therapy (ORT) help illustrate this point. Donor support for the development and introduction of ORT has been significant and these therapies have dramatically reduced deaths from diarrheal disease. However, the underlying

causes of diarrhea, precarious living conditions and poor health, water and sanitation, remain largely unchanged.<sup>36</sup>

The HIV/AIDS pandemic has challenged cultural and social norms regarding sexuality. Ironically, the pandemic has resulted in a growing conservatism in sexual behavior, but the need to provide information has meant a significant increase in public discussion of sexuality.<sup>37</sup> This window of opportunity must be seized to further discussion of sexuality, increase tolerance, and elicit compassion and acceptance of those marginalized by the epidemic. Stigmas and prejudices towards people afflicted and affected by HIV/AIDS must be overcome, and a compassionate environment nurtured. Government officials, religious, business and community leaders, and individuals need to be proactive in fostering this type of environment — one that will reverse the trend of “*clandestinization*” of the epidemic, which often forces people living with HIV/AIDS (PWAs) to deny their condition for fear of discrimination. In addition, all sectors of society, including the government, the military, religious organizations and businesses, must play an active role in supporting responsible sexuality, promoting tolerance and ceasing the condemnation of individuals with HIV/AIDS as immoral.

Clearly, the most comprehensive way to address the pandemic is through a recognition of the four levels of causation of disease. As has been illustrated, interventions and efforts that work solely at the individual level or that happen in isolation of one another will be only temporarily successful. Given the continued spread of the pandemic, particularly among the general population, it is evident the current approaches have only been partially effective. However, the reality is that the pandemic is still nascent in much of the developing world and there is time to act and implement multidimensional interventions to reduce the impact of the pandemic. Like the HIV/AIDS pandemic, our thinking and approaches have and must continue to evolve. The root of the problem is socioeconomic and superstructural; thus, it must be addressed as such in order to be resolved. Although many sets of interventions could be generalized, the design of interventions according to the four causation levels must be country-specific and culturally

The design of interventions according to the four causation levels of disease must be country-specific and culturally appropriate. Since there is no standard recipe or protocol, each society or country must tackle the unique environmental and structural spheres within which individuals exist.

appropriate. Since there is no standard recipe or protocol, each society or country must tackle the unique environmental and structural spheres within which individuals exist. Given the complexity and scope of the problem, it is important that responses be broad and include all sectors and levels of society, from the individual response to the government and the private sector.

Therefore, we must look toward new thinking and strategies that complement and carry the current state-of-the-art approaches forward in the fight against HIV infection. This is the reason why AIDSCAP/LACRO proposes the MM as a framework to guide such future interventions. In addition, LACRO endorses and promotes *Gender Sensitive Initiatives (GSIs)*, *Civil-Military Collaboration (CMC)*, *Religious-Based Initiatives (RBIs)*, and

Development is a long-term and multidimensional process that ultimately seeks to balance out the disparities between the “haves” and “have-nots” — only with such an approach can the pandemic be truly understood and confronted.

*Care & Management (C&M)* as the new prototype of technical strategies that must be incorporated on par with the strategies implemented to date. These proposed strategies are meant to complement individual prevention strategies and foster positive change in the environmental and structural levels.

The Multidimensional Model for the prevention and control of HIV/AIDS is broad and supports change at many levels. HIV/AIDS must be integrated into broad-based development efforts that will not only reduce HIV, but ameliorate the precarious conditions that put the majority of the world’s inhabitants at risk to this and innumerable developmental ills. To maximize development

efforts, funding must be targeted at long-term investments in education, infrastructure, health and production. Donors need to move away from a focus on short-term results in HIV/AIDS programming that are impossible to attain when confronting super-structural conditions, such as global imbalances of wealth, power and resources. Development is a long-term and multidimensional process that ultimately seeks to balance out the disparities between the “haves” and “have-nots” — only with such an approach can the pandemic be truly understood and confronted.

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**Functional Organizational Chart  
Latin America & Caribbean Regional Office  
FHI/AIDSCAP**

