

The United States Responds to the Global AIDS Pandemic

An Analysis of Projected Targets, Goals, and Resource Requirements

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Introduction

At the start of the 1990's, health experts estimated that between 15 and 20 million people¹ would be living with HIV by the end of the 20th century. A few short years later, the true magnitude of the epidemic is far more alarming: 34.3 million people were living with the virus as of 2000, and the epidemic showed few signs of diminishing.² Currently, the epidemic is overwhelmingly concentrated in sub-Saharan Africa, where it is further eroding the economic and social structures of a region already ravaged by poverty and instability. However, countries in Asia, Latin America/Caribbean, and within the former Soviet Union are now experiencing increasing numbers of infections and are at the brink of their own epidemics.

It can be argued that early predictions fell short of reality partly because communities, their governments, and their international development partners failed to respond adequately to the threat of a major epidemic. Countries that acted early to preempt an epidemic, such as Senegal, were successful in keeping HIV prevalence rates low and their example has been followed by others, such as the Indian state of Tamil Nadu. Those that attacked the epidemic vigorously once it was well established – Thailand and Uganda are the best known examples – also succeeded in stemming, and ultimately reversing, the mounting tide of HIV.

This small handful of success stories serves to illustrate what can be achieved, with the right leadership and resources. But because they are the exception, these stories serve also to highlight the lack of leadership and the inadequate resources that have until recently been the norm in the fight against AIDS, especially in Africa.

The United States Government (USG) has recognized HIV and AIDS as a major threat to well being and development in the world, and especially in Africa. It has identified the need for strong international leadership in tackling the politically sensitive issues of sex and drug injection, which spread HIV. And it has committed to increasing the resources available to help prevent the spread of the virus, to care for those infected, and to reduce the impact of the epidemic on those communities and families who are least able to cope with the devastation it can wreak.

These commitments have not been made in the abstract. They are accompanied by specific targets, and by estimates of the resources needed to make a real difference in the epidemic. These resources and achievement goals have not been arrived at in isolation: they are part of a growing international consensus about what it will take to confront this devastating epidemic. Nor is there any suggestion that the United States be responsible for providing all the resources. Many other bilateral and

¹ Chin J; Sato PA; Mann JM. Projections of HIV infections and AIDS Cases to the Year 2000. Bull World Health Organization, 1990, 68:1, 1-11

² UNAIDS, "Report on the Global HIV/AIDS Epidemic, June 2000". Geneva, 2000

international development institutions, together with national governments in badly affected countries, private companies, and foundations, have committed to increasing their contributions to meet the resource needs for HIV prevention and care.

This document focuses primarily on sub-Saharan Africa and covers three major data areas: (1) estimated resource needs for comprehensive prevention and care programs; (2) goals and targets for prevention and care; and (3) approximations of currently available resources from multiple sources. For each of these areas, this document describes the assumptions used in calculating the figures, and outlines the limitations of the data. It also gives an idea of the degree of consensus around the numbers. For the goals and targets section, an attempt is made to present the challenges inherent in estimating the impact on HIV transmission produced by different levels of program effort in various areas of prevention.

Investment options are discussed, and important gaps in current approaches are identified. Preliminary recommendations are made about resource allocation.

In addition, the document examines some of the necessary conditions that must be in effect in order for the other data to be valid – conditions such as political commitment and investment in essential infrastructure. It outlines some of the possible cost implications of ensuring that these conditions are met.

The calculations described in this paper represent the joint efforts of a number of agencies and academic institutions. These efforts are in their infancy, and it is clear that in several important areas (such as coverage, unit costs, and outcomes), insufficient data result in resource estimates whose accuracy remains open to debate. Further, where baseline data are poor, measuring progress toward stated goals will be difficult. One of the important conclusions that readers of this paper will draw is that far more attention must be paid to financial oversight and the monitoring of coverage, outputs, and outcomes, so that the accuracy of future estimates can be improved.

This paper restricts itself to considering resource needs and investment options in sub-Saharan Africa, an area where 70 percent of HIV infections are currently concentrated.

Summary and Recommendations

This paper describes the derivation of existing goals and targets for HIV prevention and care, and of the costs of meeting them. It is clear that far more information is needed to improve our understanding of both the cost of providing services, and of the relationship between the provision of services and the likely impact on the HIV epidemic. An effort is now underway to further develop our understanding in these areas, and the degree of international coordination in these areas is high. However, some things are already clear:

- In sub-Saharan Africa, the first priority remains prevention of the sexual transmission of HIV.
- Investment is desperately needed in information and services to support safe sexual behavior among uninfected youth.
- Prevention efforts in men and women with the highest partner turnover can also be expanded for maximum impact.
- Care efforts should center on the provision of treatment for common opportunistic infections and on palliative care.

- Support services should be centered on community models and should favor continued education for affected children.
- Investment in human resources is an important prerequisite if other investments are to pay off.
- Investment in basic health infrastructures will increase the likelihood of meeting targets.
- Poor commitment from governments in affected countries will jeopardize all efforts to confront the epidemic.
- Strong oversight mechanisms are needed to ensure best use is made of resources.
- Greater efforts must be made to monitor costs and coverage of interventions.

Using increased resources in this way, the international community and the governments and people of countries most affected by HIV can do much to slow the course of the epidemic. But the extent to which resources translate into lower rates of infection depends more than anything else on the commitment of the people of sub-Saharan Africa to confronting the reality of the behaviors that spread HIV.

Q.1. What financial resources are needed to achieve a halt in expansion of the epidemic in hard hit developing countries? A reversal (modest versus substantial proportions)?

Summary

- *The total estimated resource requirement to meet an expanded set of prevention and care targets is \$3.0 billion to \$4.9 billion per year for the next five years. These estimates are based on the cost of increasing the coverage or scale of HIV interventions essential to meeting these targets for prevention and care, which will contribute to curbing, halting, and ultimately reversing the course of the epidemic in hard hit developing countries.*
- *Between \$1.2 and \$2 billion per year over the next five years is estimated to be required, at a minimum, to substantially address the prevention needs of sub-Saharan Africa by 2005. This range represents an \$800 million to \$1.6 billion (or 66 percent to 80 percent) per year increase over current levels of spending on prevention in sub-Saharan Africa.*
- Two methods were used to derive this range of estimated resource needs for prevention. In the first approach, the unit costs of prevention interventions were multiplied by the estimated increased coverage, or scale, necessary for prevention programs to reach the outcomes that are envisaged. In the second approach, dubbed "the total prevention package," the estimated prevention resource needs figure represents the difference between the per capita expenditure on prevention programs by a country that has halted and reduced HIV transmission (i.e., Uganda) and those that have not (much of the rest of sub-Saharan Africa).
- *Between \$1.8 and \$2.9 billion per year over the next five years is estimated to be required, at a minimum, to address the care needs of orphans and people living with HIV and AIDS in sub-Saharan Africa. A unit cost method was used to derive this range of estimated resource needs for care. First, the unit costs of different aspects of care – palliative care, treatment of common opportunistic infections, prophylaxis to prevent opportunistic infections, access to highly active antiretroviral treatment (HAART), and support services for orphans – were calculated. Second, the numbers of people who will need care and who would have access to these services (without assuming improvements in health and social infrastructure) were calculated, and, finally, the unit costs were applied to a target percentage for this population.*
- *Between \$175 and \$250 million per year are needed to support children orphaned by AIDS in sub-Saharan Africa, utilizing interventions that support extended families within their communities.*

A. Challenges in Estimating Prevention Targets and the Associated Costs

The ultimate goal of all HIV prevention programs is to reduce the number of new HIV infections. The goals articulated in multiple international documents (see Question 2) are therefore stated in terms of the "number of new infections" (incidence), which is (for sub-Saharan Africa) half that which would be expected without a concerted international response. There are, however, some difficulties in this approach.

First, as mentioned above, estimates of expected infections are less reliable than estimates of the current number of infections. Early estimates of expected infections in sub-Saharan Africa massively underestimated the true course of the epidemic. Progress toward goals set in relation to expected numbers of infections are likely to be affected as much by the accuracy of the initial estimates as by the success of prevention programs.

Second, new infections with chronic, asymptomatic, and highly stigmatized conditions such as HIV are virtually impossible to measure outside the narrow and expensive confines of a scientific study because it is impossible to know when a person was infected. At best, it will be practical to measure prevalence (the proportion of people currently infected at a given point in time) in an age group such as women under 25, in which most infections are likely to be relatively recent.

Because measuring infection is so difficult, targets for outcomes (and in some cases for coverage of specific interventions) are also set. HIV can only be spread by a very limited number of activities. In sub-Saharan Africa, these are, overwhelmingly, unprotected sex between men and women, and to a much lesser extent childbearing and breastfeeding among HIV-infected women, and transfusion of contaminated blood. Only changes in these activities will produce changes in the likelihood that someone will become infected with HIV.

In setting these targets, certain assumptions must be made about the relationship between coverage of a certain intervention and the likely outcome. In some cases, this is relatively straightforward (e.g., counseling and testing, antiretrovirals for HIV-positive expectant mothers, blood safety measures). In other cases, however, the relationship between program coverage and outcomes is far harder to gauge. For example, while it is assumed that universal training in skills necessary for healthy sexuality will result in more young people adopting behavior that will keep them free of HIV, this relationship has not been well documented.

Also, assumptions have to be made about the relationship between outcome and effect. Again this is relatively straightforward in the biomedical interventions (such as blood safety measures), but, again, the same is not true for behavioral interventions.

Another gray area in setting goals and targets for HIV prevention is the effect of "scaling up" on the absorptive capacity of the health sectors in Africa.

Finally, it is not known how and to what extent different prevention programs interact to create synergies. Although computer models that illustrate these interactions exist, these synergies have never been quantified in practice.

In short, the relationship between coverage of prevention programs and the behavior change that results from them, as well as between behavior change and changes in new HIV infection rates, is not well documented, therefore limiting the rigor of estimations of essential coverage or scale of HIV prevention interventions. The exception is in biomedical interventions such as prevention of HIV transmission from mother to infant or through an infected blood transfusion. But together these two methods of HIV transmission account for at most 15 percent of new infections, so targets can certainly not be limited to these areas.

B. Two Methodologies for Estimating the Costs of Meeting Prevention Targets

To date, there have been two major approaches to estimating the costs of increasing the coverage or “scaling-up” prevention activities in sub-Saharan Africa to meet the needs of the raging HIV epidemic.

The first approach (the “unit cost of prevention” approach) involves estimating the cost of a particular prevention activity per unit of “output” – for example, number of teachers trained and the number of public information campaigns aired. These unit costs are then multiplied by the number of “units” that have to be produced to reach a certain level of coverage. The link between coverage and outcome (in the form of safe behavior) or impact (in the form of reduced transmission) is not specified. This method is described in greater detail below.

The second approach is an extension of the “empirical” approach to setting outcome targets described above. The starting point is a national HIV prevention program (such as Uganda’s) that has been shown to be successful in reducing infection rates. The total amount of money spent on that program is then divided by the total population of the country, to give an estimated unit cost per capita of a “successful” prevention package. In this approach there is no attempt to make any estimates about coverage of different elements of prevention programs.

Each approach has its strengths and weaknesses, as the following section illustrates.

The “Unit Cost of Prevention” Approach

The first approach described above has been developed by analysts at the London School of Hygiene and Tropical Medicine, in conjunction with the World Bank and other partners.³ It highlights the paucity of reliable information available on the cost of HIV prevention programs. Some 15 years after HIV prevention activities were initiated in Africa, a comprehensive search of published and gray literature yielded only 30 or so studies of the cost of particular interventions. It has therefore been necessary to extrapolate to a continent information that is derived from a handful of data points. The largest number of data points available for any single area of prevention activity is for sexually transmitted infection (STI) service provision, at seven. Most areas have cost data available for just one or two studies or countries.

³ The methodology is described in some detail in Kumaranayake, Lilani, and Charlotte Watts, 2000. Economic Costs of HIV/AIDS Prevention Activities in Sub-Saharan Africa. AIDS Supplement, in press.

The authors have presented high, medium, and low estimates for unit costs for prevention. Recognizing that the delivery of prevention services depends upon the existence of a basic infrastructure, this method tries where possible to use the full economic costs of each prevention method (that is, to include the costs of use of facilities, staff training, and time in the cost estimates) rather than treat them simply as “add-on” or incremental costs to existing services. This was not possible for some interventions, such as prevention of mother-to-child transmission. The implications of limited existing infrastructure for the true cost of providing HIV prevention and care services are discussed later in this paper.

In an attempt to estimate the cost of “scaling up” existing prevention efforts to achieve far greater coverage, this method makes assumptions about the total size of the “target market” for a prevention method, what proportion of that market is currently served, and the target levels of coverage at some point in the future. Estimates of total “target markets” are made on the basis of population figures for each country in sub-Saharan Africa. Countries have been grouped into four levels of HIV prevention program strengths, and existing levels of coverage for each area of prevention have been estimated for each of the four groups. Coverage data are scarcer even than cost data: these assumptions therefore amount to guesswork informed by the opinion of country prevention workers. Coverage targets are also set according to the program strength level, and may differ for rural and for urban areas.

The cost of “scaling up” prevention is calculated by applying the unit cost of prevention for each method to the number of people targeted for coverage who are not already covered by an intervention. This approach ignores economies of scale, which may be achieved in some programs with high start-up costs but relatively low roll-out costs, such as school-based skills and information programs. A great deal of money is generally invested in getting education authorities on side, in developing appropriate materials and in training trainers for teachers, but these costs will be shared over large numbers of schools once the program is rolled out. The larger the number of schools reached, the lower the unit cost is likely to be. On the other hand, the approach also ignores the marginal costs of reaching extra people with a prevention effort. These can be very high, especially when trying to push programs into sparsely populated rural areas or when trying to reach marginalized populations such as unregistered sex workers. In short, it is not clear to what extent it is fair to assume that it will cost the same to treat a patient in a small pilot project providing STI care to teenagers in urban Zambia as it will to provide treatment to all women who need it in a remote desert settlement in Burkina Faso.

Using this methodology and working with available data, analysts have come up with the unit costs for prevention activities and the total cost estimates for scaling up prevention activities in sub-Saharan Africa shown in Table A (see Appendix).

Between \$1.6 and \$2 billion dollars will be needed every year (starting in 2000) if the necessary increased target coverage rates are to be achieved by the year 2005. The costs are annualized over the five-year period, but it is recognized that efforts to scale up some interventions may entail a high initial investment, with running costs diminishing over time.

Note that some provision is made for capacity building for countries with the very weakest HIV prevention programs. This money is intended for investment in capacity building and functioning of

the HIV prevention program itself, rather than for building up any other basic infrastructures needed to deliver some of these prevention services.

Since this approach to scaling up costs is entirely linear, the major determining factor governing the overall estimated cost of prevention is the coverage target (together with assumptions about current levels of coverage). Table B (see Appendix) shows the coverage assumptions that led to the \$2 billion estimate.

As stated, no direct assumptions are made about the target levels of prevention coverage and specific outcome or impact measures. But it is clear that estimates of coverage are far lower in some categories than those aimed at by the targets for an expanded response. For example, the coverage estimated for prevention of mother-to-child transmission assumes a maximum coverage of 10 percent, even in urban areas of countries with strong program efforts. Further, this is a measure only of pregnant women tested for HIV, and that number is likely to be higher than the proportion of women who test HIV-positive who receive antiretroviral therapy and breast milk replacement. Raising this threshold to 50 percent as envisaged in the targets for an expanded response (and building in an extra 10 percent to account for the dropout between those tested and those receiving interventions), the costs would rise dramatically higher than the \$14 million envisaged in Table A (see Appendix).

It can therefore be assumed that the prevention costs in Table A represent a bare minimum for meeting the challenges of scaling up HIV prevention and care in sub-Saharan Africa. It is also critical to note that these annual costs are **in addition to** the roughly \$350 million which is currently being spent each year on HIV prevention activities in the region.⁴

⁴ UNAIDS and Harvard School of Public Health. 1999 Level and Flow of National and International Resources for the Response to HIV/AIDS, 1996-1997. Geneva: UNAIDS

The “Total Prevention Package” Approach

An alternative method of costing prevention needs examines a country that has achieved roughly the level of success that is being aimed for, and to examine what was spent. This method does not seek to isolate the costs of individual parts of the national response. Rather, it looks at total HIV-related spending, and assumes that this will be enough to deliver a “total package” of prevention activities that leads to measurable success on a national level.

For reasons given above, the country most appropriate to the goals expressed in this analysis for sub-Saharan Africa is Uganda. The per capita spending on HIV prevention in Uganda is calculated, as is the per capita spending of other African nations. The difference between the two rates represents the additional spending that would be needed to potentially deliver the same successful “prevention package” to the rest of the continent.

This method is relatively straightforward (although determining internal and external spending on AIDS prevention is not always an easy exercise).⁵ It also has the significant advantage that the figure is a comprehensive one and already subsumes the structural and administrative uncertainties of resource allocation. Uganda has demonstrated that for less than \$2 per person, or \$46 per HIV-infected person, it can **in practice** deliver a measurable degree of behavior change and reduced HIV transmission, even given the limitations of infrastructure and the likelihood that some funds were probably diverted for other uses. However, most countries in sub-Saharan Africa for which data are available fall far short of these spending levels. The average spending on HIV prevention for countries for which data are available is 51 cents per capita, or \$15 per HIV-infected person. If Uganda’s spending levels by either measure were applied to sub-Saharan Africa as a whole, they would result in HIV prevention spending of approximately \$1.2 billion a year – approximately four times what is currently being spent.

Like other available methods, this method of estimating resource needs is not able to put a value on the intangible contributions of a vigorous political leadership and a motivated society. Without these assets, it is not possible to gauge whether the same level of spending elsewhere would produce levels of behavior change or reduction in infection similar to those seen in Uganda.

C. Estimating the Costs of Providing HIV-Related Care

Challenges in Setting Goals for HIV-Related Care and Support

In general, the relationship between the provision of HIV-related care and support and the desired outcome – longer, healthier, and better quality lives – is intuitively straightforward. There are, however, a few issues to take into account.

First, while prevention programs need to be provided for an entire population or sub-population, HIV-related care is only needed by a very specific group – men, women, and children who are

⁵ *ibid.*

infected with the virus and who are in, or approaching, the symptomatic stages of the disease. The target beneficiary population for care services is therefore not all people with HIV, but all people in need of care.

Second, HIV-related care – much more than prevention – is generally delivered through existing health infrastructures and services. The coverage and quality of health services (public, private, and non-profit) often define the limits of the potential for coverage of HIV-related health care services at any point in time. This must be taken into account in setting feasible targets for access to health care, and in calculating the costs of any potential expansion of coverage.⁶ (*See Appendix for a detailed description of the methodology used for estimating the cost of increased provision of care and expanded provision of AIDS-related care.*)

In sum, an estimated \$1.8 to \$2.9 billion is needed for scaling up care programs. As it will be necessary to increase the capacities within the existing systems (e.g., training) in order to be able to reach the 2005 targets, this amount of resources would be needed on a yearly basis starting now.

A high proportion of the costs of providing care are associated with the numbers covered, and these numbers are expected to rise only gradually between now and 2005. This analysis nonetheless envisages annual resource needs at final target levels from this year. This is in recognition of the recruitment, training, and service delivery development costs that must be met in the early years to enable coverage targets in the later years to be met. It is important to note that these costs are simply the funds needed to support adding substantial HIV-related costs to existing health services. They do **not** imply investment in overall strengthening of health or social infrastructures, although such a strengthening will inevitably be needed if more ambitious goals for the provision of care are to be met in the future. This is discussed further below.

⁶ The same limitations apply to some aspects of prevention, most notably STI care and the prevention of HIV infection from mother to child.

Q.2 To what extent do existing international targets (e.g., those developed by UNAIDS and USAID) correspond to these objectives? What level of (improvement in) health care infrastructure do they assume?

Summary

- *The various prevention targets established by the USG, the U.S. Agency for International Development (USAID), the United Nations (UN), and the broader international community are consistent with each other and with the targets envisaged in the Expanded USG Response. To the extent that there are variations, they are largely explained by differences in geographic scope.*
- *There is less consistency among care and orphans support targets. This reflects the relatively recent initiation of care programming in developing countries.*
- *The targets and resource requirements assume no significant improvements in the existing health infrastructure in affected countries. Improvements in health infrastructure, however, are greatly needed if services are to be delivered on a larger scale than is envisaged in this paper. Preliminary estimates indicate that it would require investments of \$6 - \$7 billion per year to bring the health infrastructure of all sub-Saharan African countries to the level of the ten best performing health systems on the continent.*
- *One critical assumption that has been made in this paper is based on the active role of leadership and governance in the beneficiary countries. The experience of Uganda, Thailand, and Senegal demonstrates that the impetus for, and sustained commitment to, a comprehensive response to HIV/AIDS must come from the very highest levels of government. The targets and analysis in this paper assume that such leadership will be exhibited.*

Table 1: Comparison of International Targets or HIV/AIDS Prevention and Care

	Prevention of Sexual Transmission	Prevention of Mother-Child Transmission	Care	Orphans
Possible USG Targets for an expanded response (with additional resources)	50% decrease in HIV incidence in Africa 30% decrease in HIV incidence elsewhere	50% of HIV infected women will have access to interventions to reduce mother-to-infant HIV infection.	At least 30% of HIV infected persons will have access to basic care and support services.	At least 30% of AIDS orphans will have access to basic community support services.
USG LIFE Initiative Targets	10% decrease in HIV incidence among 15-24 year olds	10% decrease in perinatal infections	50% of district/provincial governments will be able to implement care and support activities.	50% of households caring for children affected by AIDS will receive assistance from an institution or group outside the family.
International Goals to which LIFE is contributing (including goals identified at the ICPD +5 meeting)	25% decrease in incidence among 15-24 year olds	50% of HIV-infected pregnant women will have access to interventions to reduce mother-to-child transmission.	75% of HIV-infected persons will have access to basic care and support services at the home and community levels, including access to drugs for common opportunistic infections.	Orphans will have access to education and food on an equal basis with their non-orphaned peers.
International Partnership Against AIDS in Africa (IPAA) Targets (UNAIDS)	25% decrease in incidence among 15-24 year olds in the most affected countries	At least 50% of HIV-infected pregnant women will have access to testing, counseling, treatment and replacement feeding programs.	50% of all HIV-positive persons will have access to drugs for common opportunistic infections.	50% of families of children affected by AIDS will have access to an essential package of services, including health, education and food.

Degree of Correspondence Between Prevention Targets

The possible targets for an expanded USG response complement the goals set on a global level by other international agencies, although they are somewhat more ambitious. The United Nations, in its follow-up meeting to the Cairo Conference on Population and Development, endorsed a target of a 25 percent drop in HIV prevalence among people aged 15 to 24 by 2005. The goals of the USG's Leadership and Investment in Fighting an Epidemic (LIFE) initiative and of the multi-agency International Partnership Against AIDS (IPAA) in Africa mirror these goals in the areas of prevention, although it should be noted that LIFE targets only 14 African countries and India, whereas the UN and IPAA goals are broader in geographic scope.

Degree of Correspondence Between Care and Support Targets

There is less correspondence among – and formality to – international targets for care and support, reflecting the relative inexperience of the international community in responding to HIV/AIDS care and support in developing countries. Nevertheless, the care and support targets in the USG's expanded response to the epidemic are similar to – though slightly more ambitious than – those adopted by the Joint United Nations Programme on HIV/AIDS (UNAIDS), the World Health Organization (WHO), and other partner agencies. They are, on the other hand, rather less ambitious than those adopted by the LIFE initiative, which aims for up to 75 percent coverage of some aspects of care. It should be noted, however, that while the UN and expanded response goals are universal, the LIFE initiative goals are restricted to the 14 countries where LIFE will be concentrating its efforts and resources.

A Note on Assumptions about Health and Social Infrastructures

The delivery on a large scale of many of the prevention and care initiatives to achieve the targets described above depend crucially on social infrastructure, and most particularly on the infrastructures in the health and education sectors.

Health Infrastructure

The targets and the cost calculations given in this paper take into account the limitations of existing infrastructure. They do not, however, begin to examine what extra funding would be needed to improve the infrastructure so that more ambitious targets can be met. For example, the cost estimates for preventing HIV transmission from mother to child assume an absolute maximum coverage of antenatal HIV testing of 10 percent of all pregnant women, and that is only in urban areas in the countries with the strongest HIV prevention programs. Similarly, costs for STI treatment are limited to a maximum of treatment of 40 percent of those who have access to health services – a proportion which averages around 50 percent for the region. These targets are considered by many to be realistic under current circumstances. Expanding basic infrastructure so that more ambitious targets can be reached will require substantial investments.

Work on estimating the costs of improving health infrastructure in order to better deliver health services has just begun. Two approaches are being developed, similar to the two approaches used in estimating the costs of prevention.

In the first approach, countries are ranked according to the performance of their health systems – a measure recently developed by WHO.⁷ Public spending on health per capita for the 10 countries with the strongest and most equitable health systems is considered, and an average is calculated. (A proportion of the spending is adjusted according to purchasing power parity, to iron out differences in income levels between countries.) This average per capita spending (\$32 in international dollars, \$67 with 60 percent calculated at purchasing power parity) is considered a benchmark amount necessary to buy a relatively high-quality basic health system. The investment that would be needed to bring all other countries up to this level is then calculated. This is an annual amount, including all recurrent expenditures as well as a portion for capital investment.

Overall, it is estimated that it would cost between \$6 and \$7 billion a year to bring all of sub-Saharan Africa up to health system delivery standards delivered by the 10 best performing countries in the continent.⁸ Clearly this investment would have benefits far beyond the provision of HIV-related services and should be shared across other target areas. Exactly how these costs should be apportioned is a matter for consideration.

The second approach to estimating the costs of improving health system infrastructures is similar to the unit cost approach used in prevention. It looks at the costs of improving the particular areas of health system infrastructure most necessary for delivering HIV-related prevention and care services. This work is still in progress, and results are not yet available.

Human Resources

One of the most severe constraints on the ability to deliver expanded HIV prevention and care services in sub-Saharan Africa is a lack of people. The long years of denial have meant that HIV-related skills have not been integrated adequately into basic training in either the medical or the educational field. Added to that, the AIDS epidemic is itself eating in to the relatively small stock of qualified doctors, nurses, teachers and other key staff. The field of counseling is particularly hard hit, because many people are motivated to become counselors when they find out that they themselves are HIV-infected. The involvement of people living with HIV can add to the quality of counseling, but it does mean that the turnover of people trained in this area is high.

For all areas of HIV-related prevention and care, training and the development of human resources is perhaps the most important immediate investment. Without the right people, none of the interventions described above can be sustained, let alone expanded.

Another concern related to human resources comes from efforts to improve the response itself. As more money, and more international agencies, move into a given country to play their part in expanding the response, the competition for qualified and competent personnel will be intense.

⁷ WHO. World Health Report 2000. Health systems: Improving Performance. Geneva, June 2000

⁸ It is worth noting that health system performance is not dependent just on resources. The best performer in sub-Saharan Africa by WHO standards is Senegal, a country with a 1998 per capita income of US\$ 520, and which spends 40 dollars a head of public money on health each year.

Since public sector salaries typically languish at the bottom of the heap, the first to jump into the arms of better paying international partners will often be civil servants. And yet maintaining the capacity for competent leadership within the government itself will be critical to the success of any large-scale effort to confront the epidemic. Although it has traditionally been outside the scope of donor involvement, supplementing the salaries of key individuals in order to encourage them to remain in public service may be an extremely worthwhile use of funds.

Leadership and Governance

The three success stories mentioned in this paper – Thailand, Senegal, and Uganda – have one thing in common. While community efforts eventually became integral to the national response, the impetus came from the very highest levels of government.

It is not possible to put a price on this leadership. But it is likely that without it, no amount of investment in particular interventions will achieve the same results as were achieved in these countries. Indeed, it is possible that in countries where commitment to tackling the difficult issues of sex and drug use is low, and where governance is poor, a large influx of funds will actually damage existing efforts to fight the disease. Weak commitment, poor governance, and large amounts of cash are a recipe for increased corruption and misuse of resources.

It is worth noting that the unit cost-based estimates for prevention and care resource needs do not take into account the possibility that a certain proportion of funds will be diverted to other purposes. The World Bank estimates that this proportion is often in the range of 30 percent. Solid government commitment to fighting the HIV epidemic and well-paid senior staff will help keep this figure down for HIV-related interventions even in countries that rate high on international indices of corruption such as that published by Transparency International. But it is also vital that sufficient funds are earmarked for oversight of funds and monitoring of their use. Program managers are unlikely to take the lead in budgeting for this financial oversight; it will be up to international partners to support systems that satisfy them that money is well spent. Funds for financial oversight are not included in current estimates of resource needs.

Better guidance from donor and lender agencies could also greatly improve the data available in the future to policymakers seeking to make the resource needs and distribution decisions described in this paper. Current practice is to report costs as line items across a range of different activities (i.e., x amount for overheads, y amount for salaries). Rarely is any attempt made to distribute costs according to intervention. In addition, coverage data are frequently not included in routine program monitoring. Without information on costs or coverage of different interventions, an improved analysis of resource allocation options will never be possible.

Q.3 What specific goals/targets with respect to aspects of prevention, treatment, and care have been employed in individual countries or regions that have succeeded in halting or reversing the expansion of the path of the disease? Is it appropriate to extrapolate from these to international goals and targets? To what extent do they correspond to existing international targets?

Summary

- Three countries (Thailand, Senegal, and Uganda) are recognized as having had success in halting and/or reversing the HIV/AIDS epidemic. Of these, *only the experience of Uganda is relevant to the situation facing most African countries*. In contrast to the current situation in much of Africa, the HIV/AIDS epidemic in Thailand was, at the time of the government's comprehensive response, confined largely to specific high-risk groups (sex workers and their clients, injecting drug users, and men who have sex with men). Similarly, the national response to HIV/AIDS in Senegal was implemented at a time when the epidemic was nascent, rather than generalized, as is now the case in many African countries. By contrast, Uganda was in a generalized epidemic when its prevention campaign came into full force, and therefore provides a reasonable basis for extrapolation.
- *The levels of behavior change and the coverage of services achieved by prevention programs in Uganda correspond to the targets set by the international community.*
- As discussed in the response to Question 1, *the estimated resource requirements for achieving the Expanded USG Response's targets for Africa correspond to Uganda's approximate per capita expenditures on prevention.*
- One caveat to extrapolating from Uganda's experience to derive Africa-wide prevention targets and associated cost estimates is that background HIV prevalence in Uganda during the period when it had success in halting the epidemic was less than current HIV prevalence in many sub-Saharan African countries today. The higher background prevalence that currently exists, particularly in eastern and southern African countries, suggests that higher targets for behavior change are needed to achieve the reductions in risk of HIV infection experienced in Uganda.

Country Case Studies

Thailand. One country often discussed in terms of HIV prevention success is Thailand. Thailand invested in collecting good information about HIV prevalence and, most importantly, about the behaviors that spread the disease. At the time when the national prevention campaign was launched, HIV was concentrated among sex workers. Their clients were clearly the principal

conduits of infection, both between sex workers, and to wives and other partners in the general population. There was little evidence, however, that the virus was then passed on by these women in the general population to other male partners. Led by the Prime Minister, the Thai Government acted quickly and decisively to encourage condom use in commercial sex encounters. These well-funded efforts targeted sex workers and their clients, but probably most importantly worked with brothel owners and the police to enforce zero tolerance for any premises where condoms were not available, and where their use was not enforced. This was the core of Thailand's success, and it was backed up by public information, by promotion of healthy sexuality among young people, by better STI services, and by active efforts to openly confront and destigmatize the epidemic. STI infections fell dramatically right from the start of the campaign – a sure sign that risk behavior was waning – and since the mid-1990s it has become clear that HIV infections have also fallen substantially. Epidemics in other sub-populations, such as men who have sex with men and injecting drug users, continue more or less unabated, and the next task for the Thai government and society is to tackle the spread of HIV in these groups.

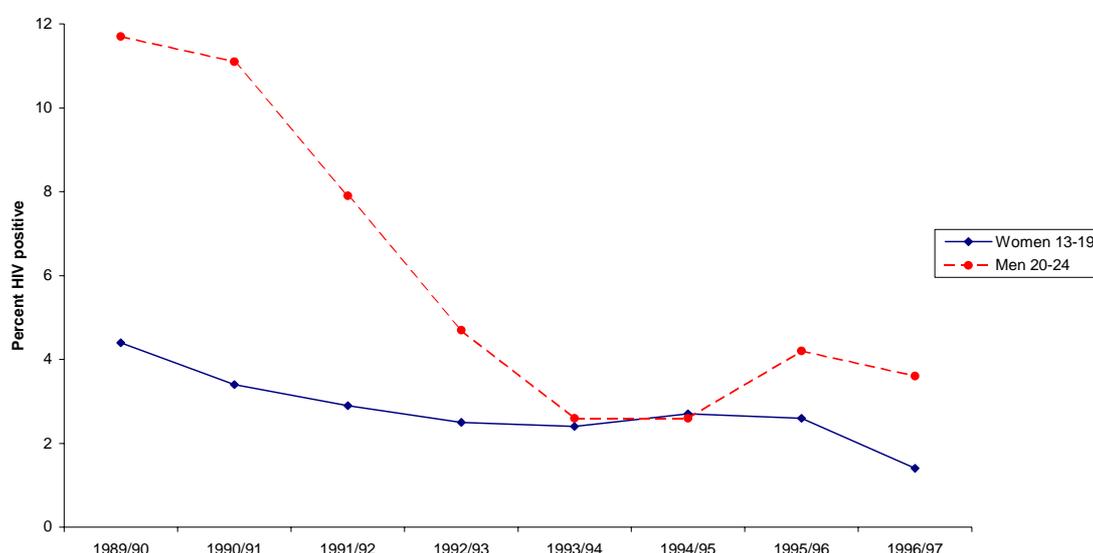
Thailand's success is relevant to many countries in Asia and Latin America, where the HIV epidemic remains concentrated largely in sub-populations with particularly high-risk behavior. However, it has less relevance for sub-Saharan Africa. This is not to say that sub-populations with high risk do not exist on the continent. They do, and sex workers and their clients, in particular, continue to contribute disproportionately to the spread of the virus because of their high turnover of partners. But HIV now spreads entirely independently of these groups in most countries in sub-Saharan Africa. In other words, if one were to remove all professional sex workers from the population, HIV would continue to spread relatively unabated in most African countries, because the reservoir of infection is already well established in the general population and because sexual mixing between men and women in a non-commercial setting is common. This is less true of most countries in Asia or Latin America.

Senegal. In terms of confronting the HIV epidemic in Africa – the main focus of this paper – African solutions are needed. And they do exist. In sub-Saharan Africa, two countries are generally touted as “success stories” in HIV prevention. The first is Senegal, which acted very early on to preempt an epidemic. Through vigorous condom promotion, aggressive management of STIs among legal sex workers, active engagement of civil groups in fostering acceptance of people with AIDS, and strong support from both Islamic and Christian leaders, Senegal has been successful in keeping HIV prevalence in the general population to levels below 2 percent. Universal male circumcision, delayed sexual debut, and strong social control of women's sexuality no doubt also played their part. Because the intervention was preemptive, it is not possible to know what the course of the epidemic in Senegal would have been if the government and society had not responded as they did. This makes it difficult to estimate to what extent the national response achieved the goals of HIV prevention as they are expressed in the Expanded USG Response.

Uganda. The second success story in Africa is Uganda. The AIDS epidemic established itself very early and very rapidly in a Uganda just climbing out of decades of chaos and conflict. The vigorous national response, although the earliest in Africa, did not come until HIV prevalence levels had already risen to some 15 percent nationwide. The response included widespread public education, active condom promotion, and the establishment of voluntary counseling and testing facilities. People with HIV were involved in the response, and a strong central leadership encouraged participation in HIV prevention and care activities at the community level. By the mid-1990's, Uganda was beginning to see a fall in HIV prevalence among young women attending prenatal clinics in urban areas. Among pregnant teenagers, HIV prevalence dropped from around 27

percent to 10 percent between 1991 and 1996 at a Kampala site, for example,⁹ while in the city of Fort Portal a similar decline among teenagers was observed, from 32.2 percent in 1991 to 10.3 in 1997.¹⁰

By the end of the decade, longitudinal studies in rural areas confirmed that new infections were falling dramatically, especially among young women. While more than 3000 individuals in one rural study are tested each year, numbers when broken down by age group and sex are quite small, and rates are therefore rather unstable. As an indication, HIV incidence rates among women aged under 35 averaged 6.7 per 1,000 between 1990 and 1992, before soaring into double figures. By 1996, however, only two women per thousand were infected in that age group. Prevalence rates among young women show a clearer and even more dramatic drop, while among men the decline in prevalence comes at a later age, as illustrated in the following table.¹¹ If HIV prevalence among young people is used as a proxy for incidence, Uganda is apparently well on its way to achieving the goals envisioned in the Expanded USG Response.



HIV prevalence among women aged 13-19 and men aged 20-24, Masaka, Uganda, 1989-1997

Sadly, some 70 percent of Africans live in countries where one in 20 adults is already infected HIV. In other words, most people live in countries that have passed the point where preemptive interventions such as Senegal's might be effective. For this reason, Uganda is a more appropriate model for most countries on the continent, and it is from Uganda that targets may be derived.

⁹ Asiimwe-Okiror, Godwill, Alex Oppio, Joshua Musinguzi J et al. 1997. "Change in Sexual Behaviour and Decline in HIV Infection Among Young Pregnant Women in Urban Uganda." *AIDS* 14:1757-1763

¹⁰ Kilian, Albert, Simon Gregson, Bannet Ndyabangi et al. 1999. "Reductions in Risk Behaviour Provide the Most Consistent Explanation for Declining HIV-1 Prevalence in Uganda." *AIDS* 13 (3): 391-398.

¹¹ Kamali, Anatoli, Lucy Carpenter, James Whitworth et al. 2000. "Seven-Year Trends in HIV-1 Infection Rates, and Changes in Sexual Behaviour, Among Adults in Rural Uganda." *AIDS* 14 (4): 427-434

What outcomes are thought to have contributed to the falling rates of HIV infection recorded among young Ugandans? Some evidence suggests that more young people are putting off having sex until later in their teen years than ever before. Nationally representative behavioral studies carried out in 1989 and 1995 recorded a rise of about two years in the age at which young men and women first had sex. In the rural study cited, median age at first sex continued to rise for young men throughout the late 1990s, reaching 18.2 years by 1997. Among rural girls the rise appeared to have stalled, with the median remaining constant at 16.7 years throughout the late 1990s.

A rapid rise in condom use was also recorded among young people during this period. In the national studies, 61 percent of boys and 44 percent of girls aged 15-19 reported in 1995 that they had ever used condoms, compared with just 20 percent of boys and 10 percent of girls six years earlier. In the rural study area, ever-use of condoms rose by remarkably similar margins between 1993 and 1997. And condom use was relatively high during casual sex for men and women of all ages. Some 60 percent of men and 40 percent of women reported they had used a condom the last time they had sex with someone they considered a casual partner. Some reductions in the number of casual partners were also recorded, although these data are less consistent.

While it is not possible to draw a direct mathematical link between the recorded changes in behavior and in infection rates, it is not unreasonable to assume that the increase in age at first sex and levels of condom use recorded equate well with changes in HIV infection of the magnitude recorded in both urban and rural areas of Uganda. Since the changes are of a magnitude (and in a time frame) similar to those expressed in the goals of this analysis, the targets expressed here are based on the outcomes achieved in Uganda. It is important also to note that these outcomes are the product of a spectrum of prevention efforts ranging from school and other public education to the provision of condoms, STI care, and easy access to HIV counseling and testing services. This analysis does not give specific targets for each of these areas; it assumes that the behavioral outcomes recorded and proxy indicators of impact reflect the combined success of these efforts.

It should be noted that in Uganda, the recorded levels of safe behavior produced a halving in infection rates when, at the time major program efforts were introduced, HIV prevalence was on the order of 25 percent in urban and 10 percent in rural areas. In a few countries in sub-Saharan Africa, HIV prevalence levels already far exceed these rates. In these countries, higher targets for condom use and other outcomes are likely to be necessary to achieve the same level of reduction in the risk of infection. The level of program coverage needed to produce these outcomes is likely to vary with social structures, program quality, and other factors.

Q.4 What is the relative sensitivity of outcomes to the addition of resources in the following areas? How are outcomes influenced by the mix of resources among them?

- Prevention, including mother-to-child transmission
- Health care intervention, including infrastructure
- Support for orphans

Summary

- Additional resources directed to HIV/AIDS prevention programs would fill many critical gaps that currently exist in providing services to at-risk populations in Africa. In particular, these additional resources would support:
 - *Increased provision of preventive services to the sub-populations at highest risk of HIV infection.* In many parts of sub-Saharan Africa, huge gaps remain in providing even the most basic services (i.e., information, education, condoms) to those sub-populations at highest risk (i.e., those with high partner turnover).
 - *A necessary broadening of prevention efforts to the general population.* HIV prevalence in many parts of sub-Saharan Africa is now so high that efforts that concentrate on the highest-risk populations alone are inadequate to meet the challenges of the epidemic in those countries. Prevention programs need instead to expand their focus to changing the norms of sexual behavior among the general population. Evidence from some countries (i.e., Uganda, Brazil, Mexico) suggests that changing societal norms toward safer sexual behavior is possible.
 - Greatly expanded provision of prevention interventions specially designed for youth, such as reproductive health education and life skills education. Where such programs have been implemented on a large scale (e.g. Zambia), they have been successful. In many sub-Saharan countries, however, resources have been insufficient to put in place comprehensive prevention programs for both in- and out-of-school youth.
- *There are important synergies to be gained between increased investments in prevention and in care, particularly in higher prevalence settings.* The provision of care services increases the demand for, and improve the effectiveness of, prevention services. In fact, many of the most effective interventions in the response to the HIV/AIDS pandemic (e.g., voluntary counseling and testing, therapy for HIV-positive expectant mothers, STI treatment and treatment of opportunistic infections) rely on this interaction between prevention and care services. Furthermore, increased investment in prevention reduces HIV prevalence and therefore reduces the burden of care on communities and countries.
- *The increased advocacy for the provision of increased care services in Africa has merit, but should be seen as a complement to, rather than a substitute for, increased provision of prevention services.* Prevention of sexual transmission of HIV remains the overwhelming first priority in sub-Saharan Africa, and the argument for the cost-effective provision of care services derives its strength principally from its effects on enhancing the effectiveness of these prevention efforts.

The Effect of Adding Extra HIV/AIDS Resources to Prevention Efforts

As is by now clear, the interactions between different prevention efforts are very poorly described, so it is not easy to state with authority what difference extra funding in various areas would make to overall success in altering the path of the HIV epidemic.

The most important effect of increased resources directed at the prevention of HIV transmission and acquisition is to fill crucial programming gaps that currently exist. This is described below.

There are two major approaches to prevention. One is to work with highly infected populations, to keep them from infecting other people. The other is to work with uninfected populations, to help them to stay uninfected. Both are important at all stages of a heterosexual epidemic, but the balance shifts over time. When HIV remains concentrated principally among sex workers and their clients, major emphasis should be put on breaking the transmission links between those people and the remainder of the population. This is the Thai model as described in the response to Question 3 in this paper.

Dedicating some resources to reducing transmission among those people most likely to spread HIV to others remains important in all epidemics. However, as prevalence in the adult population rises to very high levels (as in Africa today), this approach becomes relatively less important. The emphasis shifts to working with young people, from before the outset of their sex lives, to instill in them behaviors that will protect them from infection through contact with the already highly infected pool of older adults. In other words, instead of trying to reduce the risk of transmission in an already risky behavior, for example by encouraging sex workers to use condoms, the emphasis shifts to trying to reduce the risky behavior itself, for example by making the purchase of sex socially unacceptable among a new generation of young men, and making condom use in all non-procreational sex a norm. While this may sound Quixotic, it is well on its way to being achieved, even in some of the more macho cultures of the world that were originally thought to be hostile to condom use. Brazil and Mexico have both recently reported that over 40 percent of young people now use a condom the very first time they have sex, and among young men in Brazil close to 70 percent now report they use condoms with every casual partner.¹²

Although much is made of the increase in prevention efforts in many sub-Saharan African countries, huge gaps remain in the provision of even the most basic information and services to these two key groups: people with high partner turnover and young people. A recent mapping exercise in the South African city of Cape Town, for example, identified hundreds of bars where men and women said they went to meet new partners. A spot check of 363 of these sites revealed that only 3 percent of them had condoms available on site, and even fewer had any posters or other information about HIV prevention. The 352 bars with no condoms or information illustrate an obvious opportunity for investment in effective HIV prevention among people with a high turnover of partners.¹³

¹² PAHO and UNAIDS. *The HIV Epidemic in the Americas*. Washington, 2000

¹³ MEASURE Evaluation. *Focusing AIDS Prevention Where it Matters Most*. Chapel Hill NC 2000

Among young people, there is also much to be done in many countries. In Kenya, for example, one-third of 19-year-old girls in some parts of the country are already infected with HIV¹⁴, but there is as yet no reproductive health education or skills training in schools. The government has committed verbally to introducing these topics to the secondary school curriculum, but fierce opposition from parents, religious groups, and some teacher organizations has stalled the process. In any case, most young people will not benefit from these efforts even when they do take off. Less than a third of young Kenyans enter secondary school.¹⁵ In other countries, young people have access to information but still find it difficult to access the services they need to act on that information. Efforts to provide services designed especially to meet the needs of young people have proved successful in the few countries where they have been tried – Zambia is one example. There is enormous scope to increase these activities continent-wide.

The Effect of Mixing Increased Resources Between Prevention and Care

Interactions are not, of course, limited simply to different areas of prevention. They exist also between prevention and care¹⁶. The availability of care services greatly increases the incentive to find out one's HIV status, for example, and the counseling that should be provided with HIV testing can contribute to the adoption of safe behavior for the future. The provision of services to prevent HIV transmission from mother to infant can lead to early discovery of HIV infection and can provide an entry point to prophylaxis and appropriate care where necessary.

The interaction between prevention and care is seen also in measures of success. Better care means longer and healthier life for people living with HIV. This contributes to a rise in HIV prevalence, and because healthier people are sexually active for longer, also increases the length of time during which an infected person is likely to pass on the virus. Indicators of prevention success focus on 15-24 year-olds partly because mortality and survival biases are less pronounced in this group than among older adults, but successful care will inevitably have some effect on prevalence even among these young people. This is one reason why it is necessary to include behavioral outcome targets among the measures of prevention success, rather than relying exclusively on measures of prevalence. Equally, the need for HIV-related care is directly related to prevention success, although the time lag between these elements is longer. Success in prevention today translates into a lower demand for care in five or six years' time, and thus into a higher likelihood of achieving future coverage targets. Sometimes, the implications of these interactions are unpleasant. Success in preventing HIV transmission from mother to child will, in the absence of interventions to significantly prolong the mother's life, inevitably lead to an increase in orphanhood and greater need for orphan support services.

Despite the difficulties of disentangling the independent effects of each of these areas, one thing is abundantly clear. **Prevention of the transmission of HIV between men and women during sex**

¹⁴ National AIDS Control Program, Kenya and the Population Council. 1999 "The Multi-Center Study on Factors Determining Differential Spread of HIV infection in African Towns. Kisumu: Population-Based and Commercial Sex Workers Survey Findings." Paper presented at a public dissemination meeting, Nairobi.

¹⁵ Kenya. 1999. National Council for Population and Development. *Kenya Demographic and Health Survey 1998*. Macro International, Calverton Maryland

¹⁶ Health Technical Services Project, USAID. 1998. "Integrating HIV/AIDS Prevention, Care and Support: A Rationale" Arlington, VA.

remains overwhelmingly the first priority for sub-Saharan Africa. Fewer infections in sexually active adults means fewer infected blood donors and fewer infected mothers, and this in turn translates into less expenditure on secondary prevention activities such as prevention of transmission from mothers to children or through blood transfusion. Fewer infected people also means less need for care, and fewer orphans.

This may seem obvious, but the cost effectiveness of secondary prevention methods and care activities is far easier to quantify than that of primary prevention of sexual transmission. Moreover, these activities are politically far less sensitive than condom promotion for young people and other effective methods to prevent sexual transmission of HIV. As is the case with all aspects of health, there is far more public demand for care than for prevention. Finally, there is more money to be made out of care than out of prevention, both for the pharmaceutical industry and for people in affected countries who manage health care systems. For all of these reasons, there is a danger that the call for extra spending on care (as well as prevention of transmission from mother to child and blood safety) will be louder than the call for effective prevention of sexual transmission of HIV. The USG has a responsibility to ensure that effective prevention of sexual transmission, politically unpalatable as it may be among policymakers in the affected counties, remains at the top of the agenda.

Q. 5. Estimate current annual levels of:

- US assistance for prevention, care, treatment, orphan support, and research
- EU, Japan, and other OECD country assistance
- Developing country resources

Summary

- *In 2000, US assistance for the response to the global AIDS pandemic was \$235 million, \$200 million of which was obligated through USAID and \$35 million through the Centers for Disease Control and Prevention (CDC). It is estimated that total USG funding for FY 2001 will equal \$335 million.*
- In 1998, the UNAIDS Secretariat undertook the first comprehensive study on the funding of the national response to HIV/AIDS in developing countries and countries in transition. *In 1996 a total of \$548.5 million was spent on HIV/AIDS programs for the developing world. Of this total, \$266 million (48 percent) was contributed by national governments. World Bank loans constituted \$127.5 million (23 percent of the total). Official development agencies, including the European Commission (EC), contributed \$ 100 million (18 percent) through bilateral or multi-bilateral channels, and the United Nations agencies contributed \$ 49 million (9 percent).*
- *Although national funding provided half of the reported funds overall, this distribution was skewed, with Brazil and Thailand contributing a high proportion of national funding, while 29 of the 64 respondent countries reported that national sources represented less than 10 percent of HIV/AIDS funds. The proportion of total funds contributed by the national government was much higher in those countries of eastern Europe (79 percent) and Latin America (67 percent) included in the study than in those countries in sub-Saharan Africa (9 percent) and the Caribbean (8 percent).*
- In 1996, funding for AIDS in sub-Saharan Africa totaled \$141 million, composed of \$65 million from donors, \$28 million through UN Agencies, \$28 million through World Bank loans, and \$12 million from national governments.
- Total development agency funding is estimated to have increased from \$280 million in 1996 to approximately \$450 million in 2000.
- *Ascertaining resources expended by host country governments in responding to the epidemic in their own countries has proved to be extremely problematic. This is particularly true when focusing on expenditures for care and support activities. In 1996, it was estimated that only 9 percent (\$12,699,000) of the total funding for HIV/AIDS for the region was provided through national governments in sub-Saharan Africa.*

- To supplement its monitoring of donor country HIV/AIDS obligations, the *UNAIDS Secretariat is in the process of establishing a process to systematically monitor pledges and allocations to HIV/AIDS.*

US Assistance for the Response to AIDS

The table below presents a breakdown of HIV/AIDS funding to USAID by key interventions for 2000 and the proposed funding levels for 2001 based on a budget request level of \$244 million for the Child Survival and Infectious Disease Account (CSD) with additional funding from other accounts (i.e., ESF, FSA and P.L. 480 Title II monies).

Table 2: USAID HIV/AIDS Funding By Major Components (\$ Millions)

<u>Component*</u>	<u>FY 2000</u>	<u>Percent</u>	<u>Proposed for FY 2001***</u>	<u>Percent</u>
Primary Prevention	142	71	180	69
MTCT	4	2	10	4
Other (IEC; VCT; BCC)+	138	69	170	65
Care and Support	38	19	53	20
Children Affected by AIDS**(orphans)	20	10	26	10
Community and Home Based Care/Support	18	9	27	10
Capacity Building/ Surveillance/Policy	20	10	27	11
Total	200	100	260	100

*Funding amounts for each component were derived from emphasis area and activity coding. UNAIDS is involved in all these components. In FY 2000, UNAIDS received \$15 million and in FY2001, \$17 million is proposed. These amounts include funding for UN cosponsors' activities through the UNAIDS Secretariat.

**Includes \$4 million CS Funds under the Displaced Orphans and Children's fund, and \$10 million of P. L. 480 Title II funding

***Estimated amounts

+IEC: Information, Education and Communication; VCT: Voluntary Counseling and Testing

BCC: Behavioral Change Communication

In 2000, additional funding of \$35 million for the response to the global AIDS pandemic was provided to the CDC to assist with prevention, including the reduction of mother-to-child HIV transmission; care and support for HIV-infected persons and for the building of infrastructure, especially the development of surveillance systems. Funding requests for other Federal agencies for FY 2001 are still being finalized. It is estimated that an additional \$80 million may be made

available to selected Federal agencies, including the Department of Health and Human Services (DHHS), Department of Defense (DOD), and the Department of Labor (DOL).

Overall Bilateral Donor Assistance

Development Agency Funding for HIV/AIDS for 1996-1997

In 1998, the UNAIDS Secretariat undertook the first comprehensive study on the funding of the national response to HIV/AIDS in developing countries and countries in transition. The study used three sources of information to track HIV/AIDS financing in 1996 and 1997. First, fifteen development agencies reported on their financing of HIV/AIDS activities. Second, 64 developing countries and countries in transition provided information on the funds they spent on HIV/AIDS programs. Third, data were gathered from the EC, the UNAIDS Secretariat, the United Nations Children's Fund (UNICEF), the United Nations Development Programme (UNDP), the United Nations Population Fund (UNFPA), the United Nations Educational, Scientific, and Cultural Organization (UNESCO), WHO, and the World Bank through reviews of agency records, financial reports, and interviews.

Few development agencies have a budget line for HIV/AIDS activities. Only two of the countries included in this study, Belgium and the United States, reported having such a budget line. During the early years of the epidemic, development agencies contributing funds to HIV/AIDS disbursed it to vertical programs and projects, i.e. HIV/AIDS-specific activities. It was therefore relatively simple to track HIV/AIDS development agencies. Today, development agencies are increasingly funding integrated programs and projects that include HIV/AIDS components but address a wider set of issues. This trend is favorable to the expansion and sustainability of the response to the pandemic. This "mainstreaming" of HIV/AIDS activities, however, means that the funds supporting activities relevant to HIV/AIDS are much more difficult to track than they were in the past. Most development agencies were unable to approximate the percentages of their integrated project funds that addressed HIV/AIDS. In such cases, 25 percent of the project funds were counted as HIV/AIDS funds.

Table 3: HIV/AIDS Development Agency Disbursements for Selected Donor Countries at Current Prices and Exchange Rates, 1996-1997

Donor Country	1996 HIV/AIDS Development Agency (US\$ million)	Percent of Total 1996 HIV/AIDS Development Assistance Provided by Country	1997 HIV/AIDS Development Assistance (US\$ million)	Percent of Total 1997 HIV/AIDS Development Assistance Provided by Country
Australia	12.56	4%	11.55	4%
Belgium	10.76	3%	4.33	2%
Canada	10.04	3%	12.55	4%
Denmark	12.74	4%	8.74	3%
Finland	0.77	...	1.14	...
France	21.5	7%	DNA	-
Germany	6.14	2%	12.65	5%
Japan	9.67	3%	9.38	3%
Luxembourg	0.60	...	DNA	-
Netherlands	35.46	11%	33.75	12%
Norway	13.49	4%	14.19	5%
Sweden	15.75	5%	10.74	4%

Switzerland	1.75	1%	1.60	1%
UK	25.9	8%	24.48	9%
USA	137.51	44%	135.19	48%
Sub-total	314.64	100%	280.29	100%
European Commission	27.98		26.09	
Total	342.62		306.38	

DNA= data not available

...= less than 0.5%

Australia, Belgium, Canada, Denmark, Finland, Germany, Japan, the Netherlands, Norway, Sweden, Switzerland, the United Kingdom, and the United States reported having disbursed \$292.5 million and \$ 280.3 million to HIV/AIDS activities in developing countries and countries in transition in 1996 and 1997, respectively (see Table 9).¹⁷ In addition, France and Luxembourg, which were unable to provide information for 1997, reported disbursing \$21.5 million and \$603,000, respectively, for 1996. In total, these 15 donor countries reported having committed \$314.6 million in 1996 and \$280.3 million in 1997.

Together, the thirteen donor countries that provided information for both 1996 and 1997 provided approximately 80 percent of all official development assistance in both those years. With France and Luxembourg included in 1996, the sample of donor countries included provided 96 percent of development assistance for 1996. When looked at as a proportion of total official development assistance allocated each year, HIV/AIDS assistance allocated by the thirteen donor countries in 1996 was 0.6 percent of overall official development assistance. In 1997, this proportion increased to 0.7 percent. This apparent increase was due mostly to a 13 percent reduction in overall development assistance funding provided by these thirteen donor countries; contributions to HIV/AIDS stayed the same.

Of the total HIV/AIDS assistance allocated by the EC and by the 13 donor agencies that provided data for 1996 and 1997, approximately 50 percent was earmarked for specific countries or regions each year. In both years, countries in sub-Saharan Africa received the largest proportion of resources (\$114 million in 1996 and \$102 million in 1997). Countries in Asia and the Pacific received the next largest amounts (\$42 million in 1996 and \$33 million in 1997). Reported findings increased markedly for HIV/AIDS projects in Eastern Europe, from less than \$300,000 in 1996 to more than \$3 million in 1997.

For each year, Tanzania, Uganda, and Zimbabwe were the largest single recipients of funding, with more than \$10 million a year earmarked for each country. In addition to country-earmarked funds, each country also received a portion of regionally and globally earmarked funds.

World Bank Loan Assistance for HIV/AIDS

The World Bank began providing funding for HIV/AIDS prevention and care projects as part of its broader health and social sector projects in 1986. Freestanding HIV/AIDS loans have been

¹⁷ OECD yearly exchange rates were used to convert all donor country currencies into US Dollars. All amounts are reported in current US Dollars unless stated otherwise. Unless otherwise specified by the source of information, multiple-year grants were distributed equally among all years of the grant period.

provided since 1989. Between 1986 and 1997, the World Bank committed \$582.7 million in multiple year loans in support of HIV/AIDS prevention and control to more than 60 projects throughout the world.

The World Bank could not provide information on yearly disbursements of loans. One way to approximate the annual disbursement rate is to assume that it remains constant throughout the life of the loan, and that the HIV-specific component is disbursed at the same rate as the overall loan. Using these assumptions, the total estimated yearly World Bank loan disbursements to HIV/AIDS would be \$72.5 million for 1996 and \$77.3 million for 1997. The corresponding figures for the countries included in the survey would be approximately \$69 million for each of the two years.

Table 4: Country-Reported HIV/AIDS Financing, by Type of Funding Institution, at Current Prices, 1996

Country	Development Assistance Agencies		UN		World Bank		National Government		Total Funds Reported by Country
	US\$	% of total funds	US\$	% of total funds	US\$	% of total funds	US\$	% of total funds	US\$
Angola	427 535	93%	5 000	1%	28 562	6%	-	-	461 097
Botswana	-	-	-	-	-	-	2 711 640	100%	2 711 640
Burkina Faso	567 979	12%	2 354 627	50%	1 813 186	38%	--	-	4 735 792
Central African R.	557 701	29%	604 968	31%	498 598	26%	292 385	15%	1 953 652
Chad	75 000	6%	105 000	9%	731 233	62%	277 648	23%	1 188 881
Côte d'Ivoire	6 152 853	85%	375 000	5%	-	-	725 806	10%	7 253 659
D. R. of Congo	2 000 000	55%	1 325 431	37%	300 000	8%	-	-	3 625 431
Ethiopia	848 639	65%	346 657	27%	-	-	110 294	8%	1 305 590
Ghana	1 654 829	76%	514 373	24%	-	-	17 367	1%	2 186 569
Kenya	8 476 095	39%	1 470 000	7%	8 000 000	37%	3 537 500	16%	21 483 595
Madagascar	374 000	49%	322 171	43%	59 400	8%	-	-	755 571
Malawi	4 455 015	70%	764 524	12%	-	-	1 124 633	18%	6 344 172
Mauritania	18 571	21%	48 500	55%	-	-	21 429	24%	88 500
Mauritius	10 499	7%	75 426	54%	-	-	54 726	39%	140 651
Mali	DNA	-	DNA	-	DNA	-	70 909	2%	3 649 851*
Mozambique	2 373 277	82%	122 000	4%	385 360	13%	-	-	2 880 637
Namibia	463 000	39%	301 000	25%	-	-	435 700	36%	1 199 700
Nigeria	3 467 609	90%	363 406	9%	21 250	1%	9 756	-	3 862 020
Rwanda	6 690 152	65%	3 497 107	34%	37 500	-	-	-	10 224 759
Senegal	3 294 925	74%	545 532	12%	280 000	6%	352 000	8%	4 472 457
Sudan	900	-	278 200	65%	-	-	150 000	35%	429 100
U.R. of Tanzania	899 357	39%	1 393 159	60%	-	-	33 333	1%	2 325 849
Uganda	13 583 800	36%	13 459 690	36%	8 000 000	21%	2 540 000	7%	37 583 490
Zambia	3 822 806	62%	2 200 882	35%	-	-	190 878	3%	6 214 566
Zimbabwe	5 319 725	38%	45 000	-	8 569 000	61%	43 802	-	13 977 527
Total Sub-Saharan Africa	65 534 267	46%	30 517 653	22%	28 724 089	20%	12 699 806	9%	141 054 756
Bangladesh	2 013 034	91%	210 312	9%	-	-	-	-	2 223 346
Cambodia	2 135 180	56%	1 242 315	32%	400 000	10%	61 392	2%	3 838 887
China	2 139 152	35%	876 136	14%	363 000	6%	2 755 507	45%	6 133 795
Fiji	6 273	4%	138 127	96%	-	-	-	-	144 400
India	3 674 554	10%	1 176 334	3%	25 424 465	67%	7 467 222	20%	37 742 575
Indonesia	3 602 806	33%	5 288 376	48%	1 511 323	14%	516 893	5%	10 919 398
Lao PDR	1 195 927	77%	347 000	22%	18 400	1%	-	-	1 561 361
Myanmar	-	-	1 064 079	56%	-	-	844 000	44%	1 908 079
Nepal	52 083	18%	213 295	75%	-	-	18 274	6%	283 651
Pakistan	170 000	8%	100 000	5%	-	-	1 779 448	87%	2 049 448
Philippines	7 565 000	85%	295 000	3%	64 000	1%	931 000	11%	8 855 000
Papua New Guinea	175 000	5%	2 915 753	91%	-	-	109 653	3%	3 200 406
Thailand	2 710 324	3%	1 734 898	2%	-	-	74 062 123	94%	78 507 345
Viet Nam	764 000	13%	585 896	10%	-	-	4 545 455	77%	5 895 351
Total Asia and Pacific	26 203 333	16%	16 187 521	10%	27 781 188	17%	93 090 967	57%	163 263 042

Table 4 (continued). Country-Reported HIV/AIDS Financing, by Type of Funding Institution, at Current Prices, 1996

Country	Development Assistance Agencies		UN		World Bank		National Government		Total Funds Reported by Country
	US\$	% of total funds	US\$	% of total funds	US\$	% of total funds	US\$	% of total funds	US\$
Brazil	-	-	-	-	63 766 667	32%	133 951 111	68%	197 717 778
Costa Rica	-	-	-	-	-	-	71 810	100%	71 810
Ecuador	4 500	100%	-	-	-	-	-	-	4 500
El Salvador	-	-	35 000	100%	-	-	-	-	35 000
Guatemala	53 784	100%	-	-	-	-	-	-	53 784
Honduras	1 257 644	28%	30 183	1%	3 146 541	71%	-	-	4 434 368
Nicaragua	107 176	57%	79 580	43%	-	-	-	-	186 756
Paraguay	-	-	63 600	3%	-	-	2 025 950	97%	2 089 550
Uruguay	-	-	57 000	17%	-	-	278 000	83%	335 000
Total Latin America	1 423 104	1%	265 363	-	66 913 208	33%	136 326 871	67%	204 928 546
Bahamas	-	-	7 524	61%	-	-	4 900	39%	12 424
Dominican Republic	6 177 778	89%	337 036	5%	-	-	403 703	6%	6 918 517
Haiti	1 143 200	52%	553 649	25%	513 200	23%	-	-	2 210 049
Jamaica	96 421	15%	158 447	25%	-	-	383 881	60%	638 749
Trinidad & Tobago	39 941	47%	9 953	12%	-	-	34 738	41%	84 632
Total Caribbean	7 417 399	76%	1 056 656	11%	513 200	5%	792 484	8%	9 779 739
Albania	11 694	38%	19 140	62%	-	-	-	-	30 834
Azerbaijan	-	-	28 017	100%	-	-	-	-	28 017
Belarus	5 500	-	46 518	4%	-	-	1 120 608	96%	1 172 626
Bulgaria	4 900	2%	425	-	-	-	283 691	98%	289 016
Kyrgyzstan	-	-	350 395	82%	-	-	75 917	18%	426 312
Latvia	-	-	32 496	3%	-	-	1 222 783	97%	1 255 279
Poland	20 000	1%	222 373	8%	-	-	2 451 223	91%	2 693 596
Romania	481 000	8%	118 040	2%	3 583 333	63%	1 512 000	27%	5 694 373
Republic of Kazakhstan	25 000	1%	113 500	4%	-	-	2 746 667	95%	2 885 167
Russian Federation	855 492	6%	31 000	-	-	-	13 997 200	94%	14 883 692
Ukraine	80 000	48%	85 000	52%	-	-	-	-	165 000
Total Eastern Europe	1 483 586	5%	1 046 904	4%	3 583 333	12%	23 410 089	79%	29 523 912
Total all regions	102 061 689	29%	49 074 097	9%	127 515 018	17%	266 320 217	44%	548 549 995

* Includes total development and UN agency funding

DNA = data not available

Development Agency Funding in 1998

In 2000 a second analysis was conducted on development agency funding for AIDS, which focused on 1998. This data is presented in the following table.

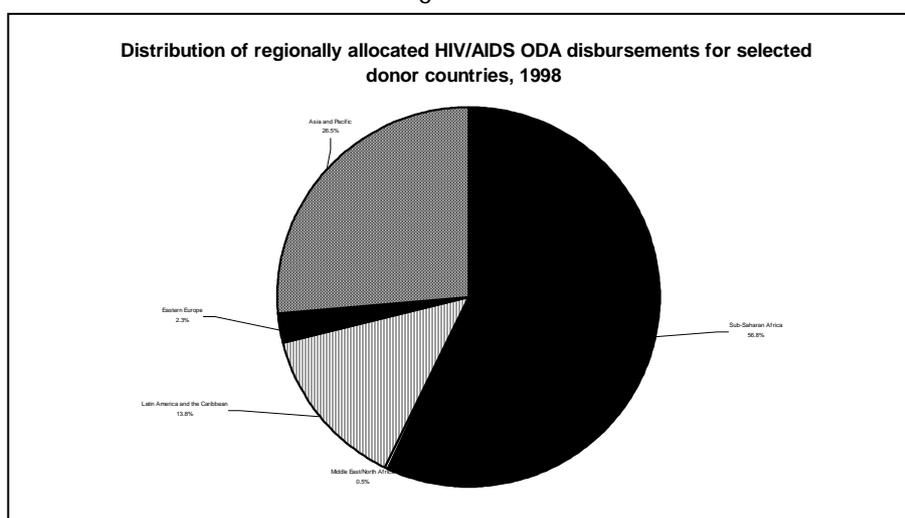
Australia, Belgium, Canada, Denmark, Finland, Germany, Japan, the Netherlands, Norway, Sweden, Switzerland, the United Kingdom, and the United States reported having disbursed almost \$300 million for HIV/AIDS activities in developing countries and countries in transition in 1998.

Table 5: HIV/AIDS Disbursements for Selected Donor Countries at Current Prices and Exchange Rates, 1998

Donor country	1998 HIV/AIDS Development Assistance (US\$ million)	Percent of total 1998 HIV/AIDS Development Assistance
Australia	12.2	4%
Belgium	5.2	2%
Canada	14.8	5%
Denmark	7.8	3%
Finland	1.5	<1%
Germany	15.0	5%
Japan	14.0	5%
Luxembourg	2.0	1%
Netherlands	21.5	7%
Norway	14.9	5%
Sweden	15.2	5%
Switzerland	2.1	1%
UK	26.3	9%
USA	147.3	49%
Total	300.0	100%

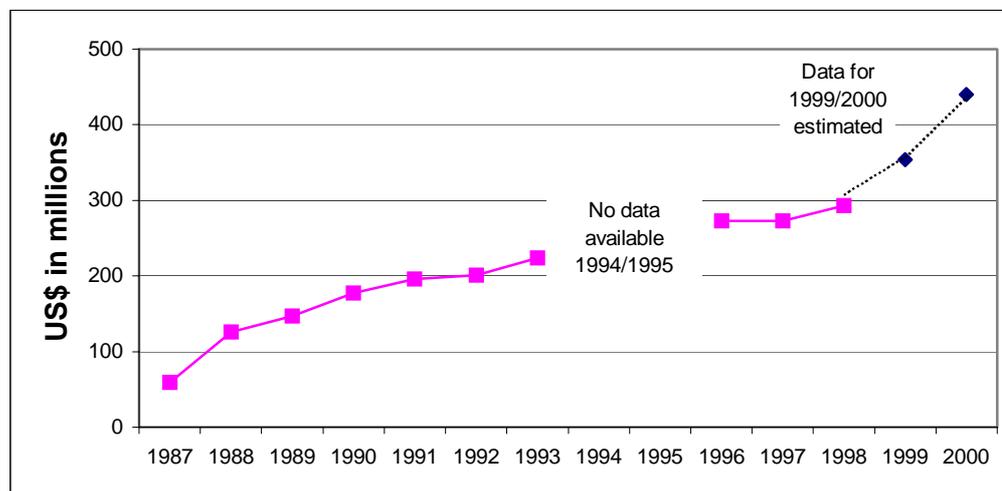
The United States was by far the largest donor of HIV/AIDS development assistance, disbursing \$147.3 million (49 percent). The United Kingdom and the Netherlands were the next largest donors, disbursing \$ 26.3 million (9 percent) and \$ 21.5 million (7 percent), respectively. Data could not be obtained from France or the European Union.

An additional way to assess the flow of HIV/AIDS assistance is to review the regional distribution of these funds. Over one third (35 percent) of the \$300 million reported was earmarked for “global or interregional activities.” It is not possible to disaggregate these funds, though a substantial proportion - including core contributions to the UNAIDS Secretariat – are eventually allocated to regions. Of the remaining 65 percent (\$195 million), 56.8 percent was earmarked for activities in sub-Saharan Africa, 26.5 percent was allocated to activities in Asia/Pacific; 13.8 percent to activities in Latin America/Caribbean; 2.3 percent to activities in Eastern Europe; and 0.5 percent to activities in the Middle East/North Africa region.



Reported Development Agency Spending on HIV/AIDS

Extrapolating the previous development agency funding data, it is possible to estimate global development funding levels for 2000.



Developing Country Resources

Ascertaining resources expended by host country governments in their response to the HIV/AIDS pandemic has proved to be extremely problematic. The only recent credible analysis of host country funding was the previously mentioned study by UNAIDS in collaboration with the Harvard School of Public Health, which covered the years 1996-1997.

Country reports on the financing of HIV/AIDS activities varied considerably in their level of completeness and detail. Data reported for 1997 were less complete than the data reported for 1996. Analyses were therefore limited to country-reported data for 1996.

Most of the country reports presented HIV/AIDS resources obligated by national AIDS programs, development agencies, the UNAIDS Secretariat, UNAIDS cosponsors, and other international institutions. The country surveys included very little information on other government spending, spending by local NGOs and institutions, funding obligated by district or municipal governments, or by the private sector. This is partly due to the fact that UNAIDS Secretariat and UNAIDS cosponsor staff working at the national level served as the focal points for gathering the data. More importantly, however, it is difficult to track resources channeled through mechanisms other than the national AIDS programs and international institutions.

Most country responses also centered on the HIV/AIDS expenditures of the health sector; few included information on cross-sector spending on HIV/AIDS. Similarly, while countries, like development agencies, were asked to report on both discrete and integrated HIV/AIDS activities, most of the activities reported were discrete. Resources allocated to discrete activities represented 96 percent of all allocations in 1996.

With the exception of Brazil and Thailand, expenditures for prevention activities were much better covered than those related to care and support. Country respondents were not asked to report expenditures for mitigating the impact of HIV/AIDS, such as paid sick leave, early retirement, or social programs targeting orphans and other affected populations. No information was requested on HIV/AIDS care costs incurred by health insurance schemes; similarly, no information was requested on out-of-pocket spending on HIV/AIDS care. Finally, the information collected rarely included expenditures for governmental staff salaries and infrastructure.

The limited information on resources allocated to care is one of the weaknesses of this study. Not taking into account the resources that countries spend on the care and support of HIV/AIDS means that in general, but especially for countries with high prevalence rates and public hospital services, national resource allocations are grossly underestimated. As early as 1988, people living with HIV occupied 53 percent of the beds in a Kinshasa hospital.¹⁸ Similarly, a 1991-92 study of two Zambian district hospitals showed that 44-47 percent of bed-days were taken up by patients with HIV-related conditions. These studies were conducted before the epidemic peaked in both countries and therefore prior to the peak impact on the health system.

The study was unable to track funds spent for care and support of people living with HIV/AIDS. The funds reported in the study also do not sufficiently reflect the costs related to infrastructure of the national programs, such as staff cost for the national programs or general cost for the health care system.

Tracking of resources at the national level remains difficult. In most countries, the structures that would allow easy tracking of national and international resources made available to the national response to HIV/AIDS are non-existent. While it seems possible to capture the majority of funds made available within the health sector for prevention, other sources of funding are more difficult to assess. In a specific follow-up survey to this study, country respondents indicated that tracking of funding from other than the national program, and national and international NGOs, would require a substantial time investment. Information on funding provided by the private sector, insurance companies, and out-of-pocket expenditure is not available in most countries, notwithstanding the probability that these categories may become increasingly important as care becomes more widely available even in the poorest countries.

¹⁸ A. Buvé. "AIDS and Hospital Bed Occupancy: An Overview," *Tropical Medicine and International Health*. 1997, 2(2): 136-139.

Q.6. Estimate global and regional resource gaps for different targets (e.g., halting the expansion of the pandemic versus reversing it versus making as much of an impact as is practicable given the constraints of culture, poverty, distance, and other factors).

Summary

- *The resource gap for HIV/AIDS prevention is analyzed under three scenarios, under which resource needs for care and support remain constant. In the area of prevention, the three scenarios are: reversing HIV prevalence rates by 50 percent in five years, similar to Uganda's experience; stabilizing HIV prevalence rates at current levels over the next five years; and halting the expansion of the epidemic, or a 100 percent decline in new infections in five years.*
- *To reverse HIV prevalence rates by 50 percent throughout sub-Saharan Africa and maintain the proposed targets for care, the existing resource gap is approximately \$2.5 to \$4.4 billion.*
- *To stabilize prevalence, whereby the number of new infections equals the number of deaths from AIDS, the resource gap is approximately \$2.2 to \$3.9 billion.*
- *To completely halt the epidemic, whereby within five years there would be no new HIV infections, the resource gap is approximately \$2.9 and \$5.1 billion.*

Resource Gap Analysis

The resource gap for HIV/AIDS **prevention** is analyzed under three scenarios. The resource needs for care and support remain constant. In the area of prevention, the three scenarios are:

- Reversing the prevalence rates, or a decline by 50 percent in five years, similar to Uganda's experience.
- Stabilizing HIV prevalence rates at current levels over the next five years. This may be more in line with the existing cultural, social, and economic situation.
- Halting the expansion of the epidemic, or a 100 percent decline in new infections (incidence), in five years.

Reversing the Prevalence Rates of the Epidemic:

Estimates of resources required for prevention that are presented in this document in the answer to Question 1 are based on the experience of Uganda and through the use of the "Unit Cost of Prevention Approach." These estimates reflect the total prevention resources required for every country in sub-Saharan Africa to reverse prevalence rates. The different social, political, economic, and cultural environments will lead to different results in each country. However, as a rough estimate, we might expect that, with the availability of required funding at the level estimated, the

region as a whole would experience a decline in HIV prevalence similar to that in Uganda. HIV prevalence dropped by two-thirds in Kampala and Fort Portal and by significant, although smaller amounts, in other sites. Overall, prevalence has probably declined by about 50 percent over a period of five to six years. This has amounted to about 70 percent decline in incidence or new infections. Therefore, the prevention resources required to achieve a similar impact in the entire region would be about \$1.2-\$2.0 billion as estimated in the response to Question 1. Adding the estimated requirements for care (\$1.8-\$2.9 billion) brings the total need to \$3.0-\$4.9 billion. Current spending is estimated at \$500 million. Thus, the current annual shortfall is \$2.5-\$4.4 billion.

Stabilizing Prevalence Rates at the Current Levels:

There are indications of stabilization at current levels in sites in some countries, such as Kenya, Zambia, and Zimbabwe. The stabilization in prevalence levels would require that incidence decline until it equals the number of AIDS deaths. In countries with stable prevalence, about half of the persons infected with HIV will die during the next five years, assuming a ten-year period from infection to full-blown AIDS and in the absence of life-prolonging drugs. To achieve stable prevalence in the entire region of sub-Saharan Africa, incidence rates must decline by 50 percent. This seems to be in line with the current social, economic, and cultural milieu. At best, this would be an intermediate goal, since it would still mean millions of new infections and deaths each year, but is a necessary first step to more ambitious goals.

A reduction in the annual number of new infections by about 50 percent is somewhat less than the decline experienced in Uganda, where incidence declined by about two-thirds from its peak. If we assume that the resources required are proportional to the amount of decline, then the prevention resources required to halt the expansion would be \$0.9-\$1.5 billion. Adding resources needed for care brings the total requirement to \$2.7-\$4.4 billion. Thus, the shortfall would be \$2.2-\$3.9 billion.

Halting the Epidemic:

It would undoubtedly be very expensive to completely eradicate HIV by eliminating all new infections. However, an ambitious goal might be to reduce new infections to very low levels. This would lead to a rapid decline in HIV prevalence as those currently infected die of AIDS and essentially no new infections occur. HIV prevalence would decline to close to zero within 10-15 years after achieving the goal of no new infections.

A 100 percent decline in incidence would be a larger reduction (by about one-third) than that experienced by Uganda. Thus, as a rough approximation we can estimate that the prevention resources required would be one-third greater than those presented in the first scenario (reversing the epidemic). The annual prevention resources needed would be \$1.6-\$2.7 billion, and the total resources needed, including care, would be \$3.4-\$5.6 billion. The gap, when compared to current spending, would be \$2.9-\$5.1 billion annually.

The above cost estimates are based on the assumption that the minimal improvements in health systems provided for under the base estimates will be adequate to extend the level of services required for halting the epidemic. This is unrealistic, as many people in sub-Saharan Africa do not have access to the formal health system. Achieving and maintaining very low incidence levels will require a systematic strengthening of the health systems. The costs for health system strengthening are estimated to be about \$6-\$7 billion per year. Additional resources may be

required to strengthen education and other systems that reach youth and adolescents with life skills information. Thus, the total cost of such a program would be closer to \$10 billion a year. Of course, this level of investment would increase the quality of life and enhance development in many ways, in addition to controlling the HIV/AIDS epidemic.

Table 6: Annual Estimated Needs and Available Funding for Sub-Saharan Africa for HIV/AIDS Prevention and Care in FY 2000, Under Three Scenarios, in Millions of US Dollars

Scenario	Amount Needed (in \$US millions)	USAID Funding FY 2000 ¹⁹	Other USG (CDC)	Total Spending on Sub-Saharan Africa ²⁰	Resource Gap
Reversing Prevalence					
Prevention	\$ 1,200 – 2,000	\$ 99	\$ 34	\$ 425	\$ 775 – 1,575
Care	\$ 1,800 – 2,900	\$ 35	-	\$ 75	\$ 1,725 – 2,825
Total	\$ 3,000 – 4,900	\$ 134	\$ 34	\$ 500 ²¹	\$ 2,500 – 4,400
Stabilizing Prevalence					
Prevention	\$ 900 – 1,500	\$ 99	\$ 34	\$ 425	\$ 475 – 1,075
Care	\$ 1,800 – 2,900	\$ 35	-	\$ 75	\$ 1,725 – 2,825
Total	\$ 2,700 – 4,400	\$ 134	\$ 34	\$ 500 ³	\$ 2,200 – 3,900
Halting the Epidemic					
Prevention	\$ 1,600 – 2,700	\$ 99	\$ 34	\$ 425	\$ 1,175 – 2,625
Care	\$ 1,800 – 2,900	\$ 35	-	\$ 75	\$ 1,725 – 2,825
Total	\$ 3,400 – 5,600	\$ 134	\$ 34	\$ 500 ³	\$ 2,900 – 5,100

¹⁹ USAID worldwide HIV spending is \$200 million in FY 2000.

²⁰ Includes all donors, lending agencies and host country public sector. Does not include foundations or personal out-of-pocket expenditures.

²¹ Of this amount, approximately \$415 million is funded through developed country grants and loans and \$85 million derives from host country governments, primarily for inpatient care costs.

Appendix

Table A: Low and high cost estimates for scaling up HIV/AIDS prevention activities in sub-Saharan Africa (all cost estimates are given in million US\$, 2000 values)

	LOW	HIGH
Scaling up prevention programs		
Youth-focused interventions	226	335
Interventions focused on sex workers	105	199
Increased public sector condom provision	13	37
Condom social marketing	76	149
Strengthening STI services	350	415
Voluntary counseling and testing	44	160
Workplace interventions	82	100
Strengthening blood transfusion services	3	11
Mother-to-child transmission	5	14
Mass media	99	105
Start-up capacity development (for countries with very weak programs only)	3	12
Surveillance, monitoring, and evaluation	50	77
Subtotal for <i>scaling up</i> prevention	1,056	1,614
Estimated current expenditures (2000)		
International resources	200	250
National resources	100	125
Total resource needs for prevention	1,356	1,989

Table B: Baseline (2000) and target (2005) coverage assumptions for prevention programs in sub-Saharan Africa

			Very Low Program strength		Low Program strength		Medium Program strength		Strong Program strength	
Form of intervention	Potential target group	Measure of coverage	Baseline	Target	Baseline	Target	Baseline	Target	Baseline	Target
Youth-focused interventions	Male and female youth enrolled in school.	Proportion 6 – 11 receiving HIV education	5%	50%	5%	50%	10%	50%	20%	50%
In-school youth	6 – 11 12 – 16	Proportion 12 – 16 receiving HIV education	20%	80%	20%	80%	30%	80%	50%	80%
Youth-focused interventions	Males and females 12 – 16	Proportion 12 – 16 receiving HIV education	5%	50%	5%	50%	10%	50%	20%	50%
Out-of-school youth										
Sex worker interventions	4% urban women aged 15 – 49. Average 2 sex acts per week	Proportion total reached Proportion using condoms often	20% 10%	60% 70%	20% 10%	60% 70%	40% 20%	60% 70%	50% 30%	60% 70%
Strengthening public sector condom distribution	All sex acts with non-regular partners 20% sex acts in regular partners	Proportion using condoms often in non-regular partnerships Proportion using condoms in regular partnerships	10% 2%	70% 2%	10% 1%	70% 2%	20% 2%	70% 2%	40% 2%	70% 2%
Condom social marketing	All sex acts with non-regular partners 20% sex acts in regular partners	Proportion using condoms often in non-regular partnerships Proportion using condoms in regular partnerships	10% 2%	70% 2%	10% 2%	70% 2%	20% 2%	70% 2%	40% 2%	70% 2%
Strengthening STI services	Men and women with curable STIs and access to health services	Among those with access to health services, proportion of curable STIs treated by health service	5%	30%	5%	30%	15%	30%	20%	40%
Voluntary counseling and testing	Current sexually active population	Proportion receiving VCT urban Proportion receiving VCT rural	1% 0%	5% 5% (including MTCT testing)	1% 0%	5% 5% (including MTCT testing)	1% 0%	5% 5% (including MTCT testing)	1% 1%	5% 5% (including MTCT testing)
Strengthening blood transfusion services	Blood for transfusion	Proportion units of blood for transfusions tested Urban Rural	70% 70%	100% 100%	70% 70%	100% 100%	90% 75%	100% 100%	90% 90%	100% 100%
Mother-to-child transmission	Pregnant women aged 15 – 49	Proportion pregnant women tested HIV Urban Rural	0.5% 0%	10% 5%	0.5% 0%	10% 5%	0.5% 0%	10% 5%	0.5% 0%	10% 5%
IEC / mass media	National campaigns for entire country	Number campaigns per year	2	6	2	6	2	6	2	6

Examples of “very low program strength” include Angola and Sierra Leone; “low” includes Benin and Chad; “medium” includes Botswana, Kenya, and Mozambique; “strong” includes Senegal and Uganda.

Methodology for Estimating the Cost of Increased Provision of Care

Notwithstanding the difficulties in accurately predicting the cost of increased provision of care, a “unit cost” approach that was used in estimating the costs of prevention may be applied to the care arena. This is a three-step process.

Step 1: Estimating units costs of care (the supply side)

- 1.1. The unit costs of different aspects of care – palliative care, treatment of common opportunistic infections, prophylaxis to prevent opportunistic infections, and of highly active antiretroviral treatment (HAART) are calculated, incorporating the costs of the necessary associated diagnostic tests and laboratory procedures. These costs vary little across countries, since they are generally incurred in internationally traded goods.
- 1.2. The cost of labor necessary for the provision of care is calculated separately and is scaled according to a country’s economic situation, in order to reflect different wage scales.

Step 2: Estimating the market for care (the demand side)

- 2.1. The population in need of treatment is defined as those who would die from AIDS within two years if untreated with antiretrovirals. This value is estimated as two times the number of people who die of HIV/AIDS without treatment in a given year. **These estimates are presented in Table C, below.**
- 2.2. A feasible ceiling for the potential coverage of AIDS care interventions is derived by estimating the number of people who have access to public sector or not-for-profit sector health care²². This is achieved using World Bank classifications to sort African countries as low income, lower-middle income, and upper-middle income, and estimating the median rates of access to health care (i.e., proportion of births attended by a trained health care worker, proportion of all tuberculosis (TB) cases covered by directly observed treatment therapy (DOTS), and vaccine coverage rate for infants) within these country classifications. It is reasonably assumed that coverage beyond this estimated ceiling cannot be realistically achieved within the near future.
- 2.3. The actual target coverage rates for 2005 are set in relation to the number of people projected to be in need of care in that year (some 6.4 million people in sub-Saharan Africa, compared with 4.5 million in 2000), and are expressed as a percentage of the ceiling identified in step 2.2. **These targets are presented in Table D, below.**

Step 3: Estimating the total cost of increasing the provision of AIDS care

- 3.1. The unit cost for each aspect of care is multiplied by the corresponding target coverage rates, and these subtotals are added to give an estimated total cost of care. **This cost is presented in Table E, below.**

²² No valid information exists about quality and coverage of the private sector for the vast majority of developing countries.

Estimates of the Cost of Expanded Provision of AIDS-Related Care

Estimates of the cost of providing a given level of coverage of care have recently been developed by UNAIDS in conjunction with numerous other partners. These methods have used the “unit cost” method described above.

The following tables present the target coverage rates of care services (as a percentage of the population with access to other forms of health care and as a percentage of the total population needing care) and the consequent resource requirements for financing these target coverage rates.

Table C: Estimates of People Living With HIV and of the Population in Need of Care in Africa (millions)

	2000	2005
People living with HIV	24.5	28.7
People needing care	4.5	6.4

In calculating the need for care services (and the likely costs), it is necessary to estimate what proportion of people living with HIV are in, or fast approaching, a stage of immune deficiency in which they are likely to need care services.

A small number of cohort studies in developing countries – principally in Uganda – have recorded the natural history of HIV infection in resource-poor settings. They show that HIV progresses to AIDS and then to death in a way that is very similar to the pattern recorded in industrialized countries before antiretroviral therapies were widely available.²³ However, because pathogens that cause common opportunistic infections are more prevalent in sub-Saharan Africa than in industrialized countries, people tend to contract these diseases slightly earlier on in the course of their HIV infection. And because care for these diseases is often poor, the time between symptomatic infection with an AIDS-defining disease and death is also shorter. In the models used to calculate HIV-related mortality in sub-Saharan Africa, the median progression from symptomatic AIDS to death is considered to be one year.

²³ Boerma, JTies, Andrew Nunn, James Whitworth. 1998. “Mortality Impact of the AIDS Epidemic: Evidence from Community Studies in Less Developed Countries.” *AIDS* 12 Suppl 1:S3-14.

Table D: Coverage rates expressed as a proportion of those who need treatment *and* who are covered by the public and other non-profit health care system (%)

Care intervention	Low			High		
	LI	LMI	UMI	LI	LMI	UMI
Palliative care	49	56	63	70	80	90
Treatment of opportunistic infections	28	42	56	40	60	80
Prophylaxis of opportunistic infections	10	32	46	15	45	65
HAART	5	13	25	10	25	50

Existing health infrastructure is taken into account in the calculations displayed in this table. An average of access to three common primary health services – trained attendant at birth, DPT immunization coverage among infants, and TB cases covered by DOTS therapy – is used as a proxy for the strength of the health infrastructure. This average is set as an **upper limit** for potential coverage.

The coverage targets set for 2005 refer to the percentage of those people in need of care who **already have access to basic health services** who then receive HIV-related care. In other words, if basic health services reach 60 percent of people (measured by the three-item proxy described above) and target coverage for palliative care is 50 percent, it means that 50 percent of the 60 percent with access to health services will receive care, or 30 percent of all those in need of care.

Table E: Overall target coverage rates of *all* persons who need treatment in sub-Saharan Africa in 2005 (%)

Care intervention	Low	High
Palliative care	28	40
Treatment of opportunistic infections	18	25
Prophylaxis of opportunistic infections	14	20
HAART	6	12

Table F: Estimates of the cost for care for people with HIV/AIDS in sub-Saharan Africa (US\$ million, 2000 values)

Cost of Care²⁴	Low	High
Palliative care	30	43
Treatment of opportunistic infections	151	216
HIV testing in treatment sites	4	5
Prophylaxis of opportunistic infections	15	22
Service delivery cost (in- and outpatient visits)	748	1,068
Care for orphans	175	250
Subtotal care (without HAART)	1,123	1,604
HAART ²⁵ (at 1,400 US\$ ppy)	462	923
HAART lab cost	166	331
Subtotal HAART	627	1,254
Total Care	1,750	2,858

The cost of orphan support programs is slightly better documented than the cost of medical care programs. Many countries with mature HIV epidemics have been working for close to a decade on developing models of orphan care. The most effective and affordable models seem to be those based on the contributions of time and care of people (principally women) in the community. With training, a small stipend, and limited resources for material support, these carers support orphans in the households into which they have been absorbed. Child-headed households are given special support. This model of external care and support from within the community reduces the barriers to taking in orphans among families whose own resources are already strained. Orphans are frequently clustered into a single household with an average of between three and four per household. Costing of this model shows that psychological and material support can be delivered to orphans for between \$30 and \$50 per affected household per year.²⁶

²⁴ The above cost estimates do not include resources needed to increase the basic capacity of the health system (including the building and upscaling of facilities) in order to achieve the scaling up to the targets set for 2005.

²⁵ The costs for antiretroviral treatment are calculated on the assumptions that drugs could be made available in all countries in SSA at yearly cost of \$1,400. If the cost were twice as high (\$2,800) the total care cost would increase by about \$1 billion.

²⁶ Geoff Foster. AIDSCare.