CHILDREN ON THE BRINK

EXECUTIVE SUMMARY

Updated Estimates & Recommendations for Intervention

By Susan Hunter and John Williamson

UNITED STATES AGENCY FOR INTERNATIONAL DEVELOPMENT

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Children on the Brink 2000 tells a compelling story about millions of children who have fallen victim to the global HIV/AIDS pandemic. More than 44 million children in 34 developing nations will likely have lost one or both parents by 2010. Most of these deaths will result from HIV/AIDS and complicating illnesses. The human and social dimensions of these losses are staggering.

In countries across Africa, Asia, and Latin America, HIV/AIDS is unraveling years of progress in economic and social development. Life expectancy — which has been rising for three decades — will drop to 40 years or less in 10 sub-Saharan African countries by 2010. In all 34 countries included in this study, AIDS-related mortality will eliminate the gains made in child survival over the past 20 years. In at least seven sub-Saharan African nations, infection levels in the general population are 20 percent or higher. In Asia, Latin America, and the Caribbean, epidemics are escalating rapidly.

"More than 44 million children in 34 developing nations will likely have lost one or both parents by 2010. Most of these deaths will result from HIV/AIDS and complicating illnesses."

The scope and complexity of the challenges facing children affected by HIV/AIDS cannot be overstated; they are more likely to drop out of school, contract HIV, or be forced to work in order to survive. USAID is working diligently to improve the safety, health, and survival of these children. A commitment of more than $1.2 billion to HIV/AIDS programs over the last decade has enabled the USAID to establish effective partnerships with international organizations, donors, national governments and non-governmental organizations; develop innovative approaches to HIV/AIDS prevention; and build community capacity to slow the spread of the epidemic.

The first Children on the Brink report — published by USAID in 1997 — elicited a remarkable response and helped to break the silence about HIV/AIDS worldwide. Children on the Brink 2000 builds on that legacy. This report should serve as a call to action for developed and developing nations alike. The ultimate benefactors will be the children whose futures are very much at risk as a consequence of this unrelenting pandemic.

J. Brady Anderson
Administrator
U.S. Agency for International Development

Overview

According to revised 2000 estimates from the U.S. Census Bureau, 15.6 million children under 15 have already lost their mother or both parents to AIDS or other causes. By 2010, there will be 24.3 million maternal and double orphans. If children who have lost their father are also included, the global total will be 44 million by 2010.

The human and social costs these estimates represent are staggering. The challenges faced by children, families, communities, and their governments in managing the impact of HIV/AIDS will be enormous. And their message is unmistakable: The world community must unite in compassionate response and support.

Children on the Brink 2000 updates the 1997 publication, Children on the Brink: Strategies to Support HIV/AIDS. The 1997 version, the first comprehensive global estimates of orphans of HIV and other causes, helped raise world awareness of the impending calamity of the HIV/AIDS pandemic in developing countries.

In the two-and-a-half years since Children on the Brink was published, over 5 million adults have died from HIV/AIDS (98 percent in developing countries), leaving at least that many new orphans.

This executive summary of Children on the Brink 2000 includes:

1. New orphan estimates for 34 countries (See Appendix I for statistical tables and figures.)
2. A description of what children, families and communities are doing to address their growing orphan problems.
3. Strategies for intervention that have been adopted.
4. A new strategic agenda to guide coherent action by the world community,

While Children on the Brink 2000 updates the 1997 publication, the fundamental messages of that first document are still valid:

- The scale of the problem is enormous: The number of children and young people orphaned by AIDS around the world is staggering.
- Children's safety, health and survival are increasingly at risk. In some countries more than 20 percent of all children under age 15 are already orphaned by AIDS or other causes of death.
- We are still on the upward side of the curve: With few exceptions, the number of children being orphaned in the study countries will accelerate through at least 2010.
- The problem is long-term: Projection estimates based on current trends show that in many countries, the proportion of orphaned children will remain tragically high until 2020 or 2030.

The HIV/AIDS pandemic is producing orphans on a scale unrivaled in world history. Our experience with orphaning as a social problem is limited. Historically, large-scale orphaning has been a sporadic, short-term problem caused by war, famine or disease. AIDS has transformed it into a long-term chronic problem that will extend at least through the first third of this century.

Photo courtesy of UNICEF/Jeremy Hartley

A New Strategic Agenda

The challenges faced by children affected by HIV/AIDS cannot be overstated. Families, communities and governments responsible for these children must improve the effectiveness and coordination of programs to help them. Eight fundamental considerations must be taken into account in developing a new strategic agenda to address the issue.

Urgency: Some 34.6 million children in the countries included in this report have lost one or both parents to all causes, including AIDS. The number of orphans will grow as the epidemic grows in Africa, Asia, Eastern Europe, Latin America and the Caribbean. These estimates, large as they are, represent only a portion of the total number of children affected by HIV/AIDS worldwide.

Scale: Programs so far have reached only a tiny fraction of the most vulnerable children in countries hardest hit by AIDS. Intervention programs must quickly be brought to a national scale, which will require that national leaders develop alternative funding resources, including community and voluntary resources and donor financing. Increased scale will also require a broadened base of effort – a network of interrelated programs rather than a few massive ones.

Duration: Intervention programs must be sustainable for at least two decades. This means that the programs must rely on family and community-based initiatives. This, in turn, requires that poor families and communities be able to support themselves economically.

Hitting Moving Targets: We do not yet have the data to cope with ongoing national strategy development. Regular national estimates of vulnerable children and inventories of their status and needs are required so that policies can be adjusted to keep pace with the epidemic's growing and changing impacts.

Integration: Assistance programs must be integrated with basic health and education services to succeed over the long term. Infrastructure, especially safe water and sanitation, is needed by families caring for vulnerable children. Common to effective HIV/AIDS programs has been the use of a set of mutually reinforcing strategies that address risk and vulnerability to HIV and the care of those infected.

Complexity: HIV/AIDS affects every sphere of life, especially when coupled with pre-existing conditions such as severe poverty. There are no simple solutions. Collaborative, complex interventions are needed to respond to the broad range of needs of children, families and communities.

Collaboration: No single group or individual has the capacity to make a definitive difference. Openhearted sharing and cooperation must be institutionalized at local, regional and national levels to ensure the wisest use of scarce resources.

Strategy Building: All of these issues are best addressed by developing a national strategic plan for orphans and other vulnerable children, families and communities.

Photo courtesy of PAHO.

New Orphan Estimates

Children on the Brink 2000 includes orphan estimates for 34 countries, 11 more than the original version. Most of the increase in coverage has been in sub-Saharan Africa, where estimates are now available for more than half of the countries. HIV infection levels in at least seven sub-Saharan African countries are now 20 percent or greater. In Asia, Latin America and the Caribbean, epidemics are also escalating, but from much lower levels. The increased numbers of orphans and the social and economic dislocation now being experienced in sub-Saharan Africa may be replicated in several countries in Asia, Latin America and the Caribbean.

Children on the Brink 2000 estimates include orphans for all causes of death. AIDS currently accounts for only about half of all orphans in many of the countries included in this study. Including orphans from any cause in the estimates is consistent with policy decisions in many countries where policymakers are devising programs to assist all orphans. This avoids stigmatization of AIDS orphans and discourages efforts to single them out for special benefits. Children orphaned by AIDS have the same needs, rights and problems as children orphaned by any cause of death.

These estimated numbers of orphans do not include HIV-positive infants and young children. In the 34 countries in this study, the U.S. Census Bureau estimates that half of all HIV-positive children will die before their first birthday. Most of the rest will die before their fifth birthday. This explains the small number — 1.3 million — of HIV-positive children worldwide. Since the large majority of orphans due to AIDS are HIV-negative, the worldwide total of children orphaned by AIDS will continue to grow through at least 2020.

The ratio of AIDS and non-AIDS deaths among adults varies by country, depending on when the epidemic started, and the level of adult deaths prior to AIDS.

AIDS orphans are distributed among world areas in the same patterns as HIV prevalence, so that countries with the highest infection levels often have the highest orphan rates. The increase in orphan rates lags behind HIV infection levels by about ten years, the time it takes the average person who contracts the virus to succumb to full-blown AIDS. AIDS-related deaths in a

Photo courtesy of UNICEF/Andrew.

Scope of the Study
Countries Included in Children on the Brink 2000

East Africa
- Burundi
- Ethiopia
- Kenya
- Rwanda
- Tanzania
- Uganda

West & Central Africa
- *Benin*
- Burkina Faso
- Cameroon
- Central African Republic
- Congo
- Democratic Republic of Congo
- Côte d'Ivoire
- *Gabon*
- *Ghana*
- Nigeria
- *Togo*

Southern Africa
- Botswana
- Lesotho
- Malawi
- *Mozambique*
- *Namibia*
- South Africa
- *Swaziland*
- Zambia
- Zimbabwe

Asia
- *Cambodia*
- *Myanmar*
- Thailand

Latin America/ Caribbean
- *Bahamas*
- Brazil
- Guyana
- Haiti
- *Honduras*

Countries new to this edition are listed in Italics. Source: U.S. Census Bureau

given country start to decrease seven to 10 years after seroprevalence declines. The proportion of children orphaned, however, remains high for at least another five years because children must mature beyond 15 years of age to be removed from the estimates.

Status of the Epidemic

In at least seven sub-Saharan African countries, HIV infection levels in the general population are 20 percent or greater. One in three adults in Botswana and one in four adults in Zimbabwe and Swaziland are infected. One in five adults in South Africa, Lesotho, Namibia and Zambia are infected. AIDS is now the leading cause of death for people ages 15 to 49 in Malawi, Tanzania, Uganda, Zambia and Zimbabwe. According to UNAIDS, in virtually any country where 15 percent or more of adults are currently infected with HIV, at least 35 percent of boys now age 15 will ultimately die of AIDS. In Africa, only Uganda and Senegal seem to have curbed their growing epidemics.

Strong prevention programs have reduced risk and lowered or stabilized HIV rates in some Asian countries, such as Thailand and the Philippines. In many others, however, transmission through intravenous drug use is spreading and condom use remains rare. Rates in most of Latin America and the Caribbean remain relatively low, although the changing composition of infected populations suggests that the epidemic is increasing in the heterosexual population.

Impacts on Children

It is difficult to overstate the trauma and hardship that the increase in AIDS-related morbidity and mortality has brought upon children. Denied the basic closeness of family life, children lack love, attention and affection, similar to children living in war-affected areas. They are pressed into service to care for ill and dying parents, removed from school to help with farm or household work, or pressured into sex to help pay for necessities their families can no longer afford. They receive less access to health care. They are often treated harshly or abused by step or foster parents. The relatives and neighbors charged with caring for a child frequently take the child's property

In 1990, AIDS accounted for just 16.4 percent of parental deaths leading to orphaning. By 2010, that number will rise to 68.4 percent.

or inheritance, leaving them more vulnerable to mortality, illness and exploitation.

In Asia and Latin America, HIV-positive children have more access to drugs and therapy because incomes are higher and health and social services are better. In sub-Saharan Africa, over the past decade, child health has been deteriorating due to the HIV/AIDS pandemic and other factors. In some countries, half or more children suffer severe or moderate malnutrition. Where child health is fragile, the infection of a caregiver can precipitate the death of a child. According to the Census Bureau, only 5 of 51 countries in sub-Saharan Africa will attain the target of 45 child deaths per 1,000 live births by 2015 that was set in 1994 at the Cairo Conference on Population and Development.

Children can be amazingly resilient, trying to cope with increasingly difficult circumstances. Children are stepping in to act as household heads even when a parent is still living. They are supporting younger brothers and sisters and often help other vulnerable children with food, shelter and friendship. They are often active members of orphan committees in AIDS-affected villages.

Impacts on Families

Where surveys have been conducted, social service programs and government safety nets have been found to be extremely limited, which means that families and communities are providing the bulk of care to children affected by the epidemic. Although traditional African value systems uphold such an approach, monitoring systems are needed to determine if these systems are providing adequate support.

Measures of family breakdown in AIDS-affected developing countries have not been defined or studied in other than the crudest ways. Anecdotal evidence suggests that children are increasingly living in evolving family forms — families headed by grandparents, by children themselves and by single parents. In Zambia, a 1996 survey in a heavily affected area revealed that almost 75 percent of families included at least one orphan. The first "post-epidemic" censuses are now being carried out. It is likely that information on household change will be available from these sources in a few years.

Photo left courtesy of UNICEF/Pirozzi.

The loss of productive adults means that more children are living with caregivers too old or too young and/or impoverished to provide adequately for them. Often they are living with young aunts, uncles, or siblings or in a household headed by another child.

In at least eight countries of sub-Saharan Africa, between 20 percent and 35 percent of children under 15 have lost one or both parents from all causes.

The extended family system is not infinitely elastic. In private, some guardians express dismay about having to restart families late in their lives, with the attendant loss of personal freedom and anxiety about meeting the financial and emotional needs of small children. Often, the adults themselves are traumatized by multiple deaths within their families, just as the children are.

Chronic malnutrition is widespread. Orphan caregivers are predominantly poor women. Children in these households are significantly more disadvantaged than children in two-parent families, largely because women have less access to property and employment. Female-headed households are invariably larger and poorer than male-headed households.

Impacts on Communities

Community-based support for families and children affected by HIV/AIDS is the only alternative for care in many countries. Fortunately, as the number of orphans and other vulnerable children mushrooms, communities are creating volunteer structures to offer assistance. This is in part traditional, as chiefs had to shelter all vulnerable people in their communities. It is also necessary because no other care is available. While most governments have professed increased support for children in response to the child rights movement of the early 1990s, investments in social infrastructure actually declined in the 1980s and 1990s as economic conditions deteriorated.

In all study countries, there are groups of community members who have organized themselves to identify vulnerable children, develop resources through local fund raising (sales of crops from community plots, crafts sales or

support from NGO donors) and set up day care centers. These groups are promoting other needed changes, such as increasing acceptance of women and young people in the power structure, opening and strengthening civil society, and expanding acceptance of development programs in agriculture, education and health. As a consequence, the productivity of available labor increases.

The Private Sector

Business is primarily concerned with the epidemic's impact on labor costs, long-term labor supply and customer base. HIV/AIDS can change the labor market quickly and drastically, causing companies to lose skilled workers. Training costs go up, as do those associated with treatment, sick leave and lost productivity. The epidemic has meant fewer dollars for health benefits, pensions and sick leave because more is going into training and replacement costs. UNAIDS reports that in countries in Africa hardest hit by AIDS, illness and death have jumped from last to first place in the list of reasons for people leaving a company, while old age retirement slipped from the leading cause of employee dropout in the 1980s to just 2 percent by 1997.

Some companies are responding by training widows and orphans to take over their male relative's job. Often they must deal with government policies and international sensitivities on child labor to do so, but the approach can provide security and continuity to AIDS-affected families. Most governments have stepped in to review labor laws to maintain mandated benefits and prevent discrimination against surviving widows and children. This trend should be encouraged.

Photo courtesy of World Vision/Don Watkins.

The Role of the International Community

In the two-and-a-half years since the original Children on the Brink was published, one of the most important changes has been the recognition that the orphan crisis and the overall AIDS pandemic are key world development issues. The UN Security Council and the White House National Security Council have both acknowledged the epidemic as a threat to international security because of the potential for destabilization caused by population loss from the epidemic as well as particularly high infection rates in armies, especially in officer cadres.

The visit by Sandra Thurman, Director of the White House Office for National AIDS Policy, to Africa in 1999 expanded public awareness of the horrific impacts of the pandemic. The White House was able to secure $20 million in additional funding for education and community care programs as part of the LIFE Initiative. The National Black Leadership Coalition has lent its support to expanding awareness and assistance. Charitable support from private donors and from pharmaceutical companies has provided a high-profile boost.

In January 2000, World Bank President James Wolfensohn told the U.N. Security Council that HIV/AIDS was having more impact than all the wars of the 20th century combined. Yet of the $1 billion to $2.3 billion needed annually to mount an effective prevention campaign in sub-Saharan Africa, only $160 million was available in 1997. More was spent on Y2K celebrations worldwide than to arrest the impact of HIV/AIDS.

There is growing worldwide support for debt relief so that recipient nations can increase their investment in improving the welfare of their poorest people. The UNAIDS International Partnership Against AIDS in Africa is made up of African governments, the United Nations and donors from the public, private and community sectors. It hopes to mobilize support to implement broadened national responses to HIV/AIDS to cancel foreign debt so more government resources can be devoted to combating HIV/AIDS and its effects.

Strategies for Intervention

When HIV/AIDS strikes, the first line of response comes from the children, families and communities themselves. The extent to which the work of other agencies — governments, NGOs, religious institutions and donors — is effective is a function of how well they support the efforts of children, families and communities. Five basic strategies of intervention can help such efforts:

1. Strengthen the capacity of families to cope with their problems.
2. Mobilize and strengthen community-based responses.
3. Increase the capacity of children and young people to meet their own needs.
4. Ensure that governments protect the most vulnerable children and provide essential services.
5. Create an enabling environment for affected children and families.

1. Strengthen the capacity of families to cope with their problems.

It is a tribute to the strength of families worldwide that the extended family has not collapsed in the face of the pandemic. Although AIDS puts families under incredible stress, the majority of families are still providing some level of care for affected children. In most of the world, families are extended networks linked by expectations and obligations of sharing and support. Despite the pressures of AIDS, migration from rural to urban areas and severe poverty, the overwhelming majority of orphans and other children affected by AIDS are living with immediate or extended family members.

The ability of households to care for their children or take in orphans depends largely on their economic resources. Research has shown that it is critically important to help households shore up their economic capacity before AIDS has undermined their capacity to support themselves. Arranging access to savings and credit mechanisms is, therefore, crucial. In Uganda, for example, three out of four members of a successful village banking program are caring for orphans. In many countries, self-organized rotating savings and credit mechanisms are helping people cope economically.

Another effective coping strategy is to reduce the demands on household members' labor, freeing them to undertake income-producing activities. Supporting community-based child care, improving village water supply and sanitation, and enabling artisans to produce fuel-efficient stoves to reduce the time spent collecting firewood are all examples of this.

Programs that support home care of HIV/AIDS patients further strengthen the ability of a family to cope. Children's problems start long before a parent dies of the disease, and these programs help the patient and help identify the needs of the children. Parents can be encouraged to write wills, make arrangements for their children's care once they are too sick to do so, and talk to their children about the future.

Photo courtesy of UNICEF/Donna DeCesare.

2. Mobilize and strengthen community-based responses.

For those children whose families cannot provide adequate support, the community becomes the safety net. The most vulnerable children are those least able to make their needs known. An active effort is needed to identify them and mobilize local resources to respond. There are already numerous examples of systematic efforts to do just that.

Community mobilization efforts can encourage local leaders to protect the property and inheritance rights of widows and orphans, organize cooperative child care, organize orphan visitation programs and provide financial support. Communities often rally around activities to provide care for children. They are motivated not only by compassion and religious conviction, but also by the recognition that they, too, may require such help in the future.

The more the community is involved in these activities, the greater the chance for success. In Malawi, for example, district AIDS committees have learned mobilization skills and have set up AIDS committees within health catchment areas. These committees, in turn, have mobilized and supported village committees to raise funds and channel resources to affected children and adults. These village committees have developed community gardens, grown and distributed improved sweet potato and cassava varieties to needy households, and organized youth groups that use drama to educate others about HIV prevention. The whole community has become part of the solution.

One of the most important benefits of community mobilization is the sense of empowerment it provides. Changing current behavior to avoid a future illness requires the belief that it is possible to have some control over what happens. Collaborative action — by its very nature — helps build this belief.

Key Determinants of an Orphan's Well-Being

- Age and sex of child
- Death of parents (mother, father, both)
- Age of guardian
- Number of children and adults in foster family
- Proportion orphaned in a geographic area
- Inclusion of child in family and community life
- AIDS-related stigma and discrimination
- Access to health, education and social service
- Income support to foster family
- Availability of government safety nets

3. Strengthen the capacity of children and young people to meet their own needs.

The illness or death of a parent often catapults a child into a harsh world. Frequently children drop out of school, imperiling their long-term futures, to work at home or on the farm, to replace lost income and support their families. They are often separated from their own siblings. Their nutrition and health frequently decline. They may be pressured to exchange sex for money or goods, increasing their own risk of HIV infection and causing great psychological harm. Often it is female children who suffer the most.

Every Zambian child born today stands a 50 percent chance of contracting HIV and dying of AIDS unless significant, effective interventions are put into place immediately.

The first line of defense is to enable children to stay in schools so that they may learn the skills to care for themselves. Interventions to help them remain in school must address the specific factors that cause them to drop out. These include school expenses, vocational training fees, the need to care for parents or younger siblings and the need to compensate for lost income. Successful interventions include the following:

- changing policies regarding fees or requirements for uniforms (or providing the necessary uniforms or school supplies)
- paying school or training fees
- providing at least one meal a day at school
- constructing school facilities or providing needed

equipment in exchange for admitting vulnerable children

- arranging half-day school hours to permit students to work
- arranging apprenticeships with local artisans

One of the most important points is to recognize that children and adolescents are part of the solution to the HIV/AIDS problem. Encouraging children, supporting them in defining their own needs and giving them a role in deciding how these needs should be met are crucial. A child without hope or sense of control over his or her own life is far less willing to avoid behavior that could cause future HIV infection. Many youths who become involved in addressing HIV/AIDS issues realize that their communities need them. Consequently, they have more reason to avoid HIV infection. UNAIDS reports that where HIV prevention has been successful, young people have been at the forefront of change. The most spectacular decline in HIV infection has been among young people.

Even children living on the street can be reached through well-tailored programs. In Ethiopia, cooperation between the government and NGOs has helped shift attitudes among urban residents and the police. Police officers are now trained to better understand how children end up on the street. Children's protective units, staffed by police officers and social workers, now operate in four cities. In Kenya, special community schools with shortened hours have been established to enable street children to work while going to school. And a local Kenyan NGO has developed a training program that supports itself through items produced by the children.

4. Ensure that governments protect the most vulnerable children and provide essential services.

Many children, especially those who have lost both parents, fail to receive help from either their families or the community. As signatories of the UN Convention on the Rights of the Child, national governments have the ultimate responsibility to ensure that children are protected and cared for. To do this they need adequate resources. Unfortunately, many agencies and donors have so far paid too little attention to the massive scale of the problem. Programs to date have reached only a small fraction of the most vulnerable children in countries hardest hit by AIDS. A 1997 UNICEF Program Consultation in Uganda with participants from 21 countries identified three actions essential to program development for orphans: political

Photo courtesy of UNICEF/Roger Lemoyne.

will, strategic readiness, and safety nets for children and families.

Political will. Not all governments are yet convinced about the impact of the epidemic on their national well-being. Much of the lack of political will originates in lack of data. Capacity building, management training and investments in data collection can all help provide the information needed to demonstrate that HIV/AIDS can be as much of a threat to a country's political stability as any outside enemy.

Strategic readiness. Few countries have a strategy for dealing with the epidemic and its consequences, much less an overarching, multisectoral plan. As with political will, efforts in this area are hampered by lack of data and a variety of political and economic issues. Systematic HIV/AIDS impact and barrier assessments can help governments examine the adequacy of their services. The technology exists to do this, but so far few governments have taken advantage of it. Governments must find new pathways and models — forming new partnerships with families, communities and children themselves, donor states and neighboring countries — to meet the needs of their most vulnerable citizens. Based on 15 years of action against the AIDS epidemic, UNAIDS concludes that among the vital elements of a successful response is a single, powerful national AIDS plan.

Safety nets for children and families. Governments like Uganda, which responded openly to the epidemic, have become stronger and have found extensive international support for their efforts. More countries need to follow the Ugandan model. Distortions in the distribution of wealth, the aging patterns of populations and social constraints on resources all restrict access to resources.

5. Create an enabling environment for affected children and families.

In addition to the strategies for direct intervention enumerated above, all parties must work together toward the overarching goal of creating an enabling environment for those affected. This means changing public recognition of HIV/AIDS from "their problem" to "our problem" by providing information, challenging myths and ensuring basic legal protection. Reduction of stigma reduces the stress of people living with HIV/AIDS and creates opportunities for affected children.

A 1998 study in Kenya found that 36 percent of girls 15 to 19 could not name a single way to protect themselves from AIDS.

Public attitudes have already been changed in countries where political leaders and popular public figures have spoken openly on AIDS. Policymakers, religious leaders, journalists, musicians, sports figures and all those with a voice that reaches the wider community have a role to play in broadening public support for families and children.

Laws should be changed to reduce the vulnerability of children and families. Laws and policies should promote the rights of women and children. Women's rights to own land and hold jobs must be supported. Men must be encouraged to take economic responsibility for their families.

Building a viable future for children on the brink is a massive task, one that is in all our hands. Strong leadership in Africa at all levels, combined with innovative international programs, has already shown that the future of children can be ensured. It is up to all of us to see that the rights of children as human beings are protected, respected and fulfilled so they can grow into a strong generation and contribute all that is necessary to repair the damages of HIV/AIDS.

Photo courtesy of PAHO/Gaggero

Appendix I
Statistical Tables

Photo courtesy of PAHO/Waak.

Orphan Estimates for the 34 Study Countries 1990

Country	Population of children <age 15	Maternal & double orphans[a] from all causes	Maternal/double orphans as % of children <age 15	% of maternal/ double orphans from AIDS	Paternal orphans[a] from all causes[b]	Paternal orphans as % of children <age 15	Total orphans from all causes	Total orphans as % of children <age 15
East Africa								
Burundi	2,453,420	151,902	6.2	23.1	227,853	9.3	379,755	15.5
Ethiopia	21,910,544	1,242,085	5.7	15.1	1,863,128	8.5	3,105,213	14.2
Kenya	11,548,769	243,223	2.1	40.2	364,835	3.2	608,058	5.3
Rwanda	3,307,953	281,560	8.5	12.9	422,340	12.8	703,900	21.3
Tanzania	12,272,459	308,038	2.5	41.5	462,057	3.8	770,095	6.3
Uganda	8,362,273	557,184	6.6	29.1	835,776	10.0	1,392,960	16.6
Southern Africa								
Botswana	577,484	10,050	1.7	9.8	15,075	2.6	25,125	4.4
Lesotho	729,963	18,421	2.5	1.5	27,632	3.8	46,053	6.3
Malawi	4,340,904	255,502	5.9	37.9	383,253	8.8	638,755	14.7
Mozambique	6,463,509	354,208	5.5	3.8	531,312	8.2	885,520	13.7
Namibia	627,554	17,288	2.8	6.8	25,932	4.1	43,220	6.9
South Africa	13,769,200	237,441	1.7	6.4	356,162	2.6	593,603	4.3
Swaziland	390,595	13,594	3.5	2.9	20,376	5.2	33,960	8.7
Zambia	3,821,268	328,666	8.6	61.2	492,999	12.9	821,665	21.5
Zimbabwe	4,667,540	165,768	3.6	57.8	248,652	5.3	414,420	8.9
West & Central Africa								
Benin	2,246,636	117,980	5.3	0.7	176,970	7.9	294,950	13.1
Burkina Faso	4,298,605	187,465	4.4	16.9	281,198	6.5	468,663	10.9
Cameroon	5,311,584	166,186	3.1	9.6	249,279	4.7	415,465	7.8
Central African Republic	1,243,292	67,306	5.4	31.3	100,959	8.1	168,265	13.5
Congo, Rep.	979,219	33,849	3.5	16.3	50,774	5.2	84,623	8.6
Congo, Dem. Rep.	18,040,365	994,851	5.5	12.9	1,492,277	8.3	2,487,128	13.8
Côte d'Ivoire	5,660,130	305,699	5.4	29.3	458,549	8.1	764,248	13.5
Gabon	362,340	16,166	4.5	1.3	24,249	6.7	40,415	11.2
Ghana	6,716,517	220,593	3.3	1.3	330,890	4.9	551,483	8.2
Nigeria	42,186,461	1,347,726	3.2	1.7	2,021,589	4.8	3,369,315	8.0
Togo	1,792,394	45,233	2.5	6.6	67,850	3.8	113,083	6.35
Subtotal, Sub-Saharan Africa	**184,188,978**	**7,687,974**	**4.2**	**18.1**	**11,531,961**	**6.3**	**19,219,935**	**10.4**

Orphan Estimates for the 34 Study Countries 1990

Country	Population of children < age 15	Maternal & double orphans[1] from all causes	Maternal/double orphans as % of children < age 15	% of maternal/ double orphans from AIDS	Paternal orphans[2] from all causes[3]	Paternal orphans as % of children < age 15	Total orphans from all causes	Total orphans as % of children < age 15
Asia								
Cambodia[4]								
Myanmar	14,166,906	467,455	3.3	2.7	701,183	4.9	1,168,638	8.2
Thailand	16,223,391	167,028	1.0	0.0	250,542	1.5	417,570	2.6
Subtotal, Asia	**30,390,297**	**634,483**	**2.1**	**2.0**	**951,725**	**3.1**	**1,586,208**	**5.2**
Latin America & The Caribbean								
Bahamas	84,652	736	0.9	10.9	1,104	1.3	1,840	2.2
Brazil	52,462,653	399,998	0.8	5.2	599,997	1.1	999,995	1.9
Guyana	207,153	3,228	1.2	2.0	4,842	1.8	8,070	3.8
Haiti	2,660,464	128,220	4.8	24.2	192,330	7.2	320,550	12.0
Honduras	2,176,167	20,999	1.0	3.9	31,499	1.4	52,498	2.4
Subtotal, Latin America	**57,651,089**	**553,181**	**1.0**	**9.5**	**829,772**	**1.4**	**1,382,953**	**2.4**
Total, 34 Study Countries	**272,150,364**	**8,875,638**	**3.3**	**16.4**	**13,313,457**	**4.9**	**22,189,095**	**8.2**

1. Maternal orphans: children who have lost their mothers.
   Double orphans: children who have lost both parents.
2. Paternal orphans: children who have lost their fathers.
3. A ratio of 40% maternal/double to 60% paternal was used to expand U.S. Census Bureau estimates of maternal orphans for 1995.
4. No data available.

Source

Shaded columns: U.S. Bureau of the Census

Unshaded columns: S. Hunter, 2000 (developed using U.S. Census Bureau estimates, African censuses, and research studies).

Orphan Estimates for the 34 Study Countries 1995

Country	Population of children <age 15	Maternal & double orphans[a] from all causes	Maternal/double orphans as % of children <age 15	% of maternal/double orphans from AIDS	Paternal orphans[a] from all causes[b]	Paternal orphans as % of children <age 15	Total orphans from all causes	Total orphans as % of children <age 15
East Africa								
Burundi	2,615,326	200,142	7.7	36.1	300,213	11.5	500,355	19.1
Ethiopia	25,776,890	1,718,760	6.7	29.3	2,578,152	10.0	4,296,920	16.7
Kenya	12,517,352	456,353	3.6	63.0	684,530	5.5	1,140,883	9.1
Rwanda	2,538,560	385,455	15.2	18.4	578,183	22.8	963,638	38.0
Tanzania	14,211,760	486,940	3.4	58.1	730,410	5.1	1,217,350	8.6
Uganda	10,200,290	841,118	8.2	45.5	1,261,677	12.4	2,102,795	20.6
Southern Africa								
Botswana	622,312	19,906	3.2	53.7	29,859	4.8	49,765	8.0
Lesotho	796,837	22,283	2.8	8.8	33,425	4.2	55,708	7.0
Malawi	4,450,393	352,934	7.9	51.8	529,401	11.9	882,335	19.8
Mozambique	7,608,304	469,453	6.2	16.7	704,180	9.3	1,173,633	15.4
Namibia	704,365	27,230	3.9	33.4	40,845	5.8	68,075	9.7
South Africa	14,355,406	289,354	2.0	17.3	434,031	3.0	723,385	5.0
Swaziland	440,426	18,592	4.2	20.0	27,873	6.3	46,455	10.5
Zambia	4,222,463	480,120	11.4	70.7	720,180	17.1	1,200,300	28.4
Zimbabwe	4,833,536	304,812	6.3	75.7	457,218	9.5	762,030	15.8
West & Central Africa								
Benin	2,622,720	135,927	5.2	2.1	203,891	7.8	339,818	13.0
Burkina Faso	4,985,120	253,490	5.1	30.6	380,235	7.6	633,725	12.7
Cameroon	5,980,467	206,049	3.4	23.5	309,074	5.2	515,123	8.6
Central African Republic	1,414,023	94,531	6.7	45.7	141,797	10.0	236,328	16.7
Congo, Rep.	1,097,748	47,411	4.3	31.8	71,117	6.5	118,528	10.8
Congo, Dem. Rep.	21,891,409	1,287,426	5.9	21.5	1,931,139	8.8	3,218,565	14.7
Gabon	381,354	18,237	4.8	5.3	27,356	7.2	45,593	12.0
Côte d'Ivoire	6,731,608	440,745	6.5	44.5	661,118	9.8	1,101,863	16.4
Ghana	7,687,215	252,778	3.3	5.6	379,167	4.9	631,945	8.2
Nigeria	47,958,551	1,611,331	3.4	7.2	2,416,997	5.0	4,028,328	8.4
Togo	2,023,446	57,941	2.9	21.1	86,912	4.3	144,853	7.2
Subtotal, Sub-Saharan Africa	**208,667,897**	**10,479,316**	**5.0**	**31.6**	**15,710,974**	**7.5**	**26,190,290**	**12.6**

Orphan Estimates for the 34 Study Countries 1995

Country	Population of children < age 15	Maternal & double orphans[1] from all causes	Maternal/double orphans as % of children < age 15	% of maternal/ double orphans from AIDS	Paternal orphans[2] from all causes[3]	Paternal orphans as % of children < age 15	Total orphans from all causes	Total orphans as % of children < age 15
Asia								
Cambodia	4,926,903	68,306	1.4	26.4	102,459	2.1	170,765	3.5
Myanmar	13,415,264	530,947	4.0	5.9	796,421	5.9	1,327,368	9.9
Thailand	15,190,551	194,829	1.3	5.3	292,244	1.9	487,073	3.2
Subtotal, Asia	**33,532,718**	**794,082**	**2.4**	**7.5**	**1,191,123**	**3.6**	**1,985,205**	**5.9**
Latin America & The Caribbean								
Bahamas	87,849	1,098	1.2	36.4	1,647	1.9	2,745	3.1
Brazil	51,712,817	516,558	1.0	19.7	774,837	1.5	1,291,395	2.5
Guyana	232,752	3,545	1.5	5.4	5,318	2.3	8,863	3.8
Haiti	2,836,462	154,813	5.5	32.6	232,220	8.2	387,033	13.6
Honduras	2,438,005	24,239	1.0	9.7	36,359	1.5	60,598	2.5
Subtotal, Latin America	**57,307,885**	**700,253**	**1.2**	**22.2**	**1,050,380**	**1.8**	**1,750,633**	**3.1**
Total, 34 Study Countries	**299,508,500**	**11,973,651**	**4.0**	**29.4**	**17,960,477**	**6.0**	**29,934,128**	**10.0**

1. Maternal orphans: children who have lost their mothers.
   Double orphans: children who have lost both parents.
2. Paternal orphans: children who have lost their fathers.
3. A ratio of 40% maternal/double to 60% paternal was used to expand U.S. Census Bureau estimates of maternal orphans for 1995.

Source

Shaded columns: U.S. Bureau of the Census

Unshaded columns: S. Hunter, 2000 (developed using U.S. Census Bureau estimates, African censuses, and research studies).

Orphan Estimates for the 34 Study Countries 2000

Country	Population of children <age 15	Maternal & double orphans[a] from all causes	Maternal/double orphans as % of children <age 15	% of maternal/ double orphans from AIDS	Paternal orphans[a] from all causes[a]	Paternal orphans as % of children <age 15	Total orphans from all causes	Total orphans as % of children <age 15
East Africa								
Burundi	2,854,493	232,187	8.1	48.1	283,784	9.9	515,971	18.1
Ethiopia	30,144,741	2,317,260	7.7	45.8	2,832,207	9.4	5,149,467	17.1
Kenya	12,985,458	547,520	4.2	69.0	669,191	5.2	1,216,711	9.1
Rwanda	3,106,905	421,511	13.6	30.7	515,180	16.6	936,691	30.1
Tanzania	15,853,895	689,888	4.4	70.0	843,196	5.3	1,533,084	9.7
Uganda	11,923,399	1,059,329	8.9	55.3	1,294,735	10.9	2,354,064	19.7
Southern Africa								
Botswana	640,070	46,032	7.2	84.0	56,261	8.8	102,293	16.0
Lesotho	849,119	34,115	4.0	42.1	41,696	4.9	75,811	8.9
Malawi	4,659,452	426,421	9.2	64.1	521,181	11.2	947,602	20.3
Mozambique	8,201,818	680,273	8.3	42.1	831,445	10.1	1,511,718	18.4
Namibia	760,182	55,834	7.3	68.2	68,242	9.0	124,076	16.3
South Africa	14,093,765	577,445	4.1	62.1	705,766	5.0	1,283,211	9.1
Swaziland	493,451	33,746	6.8	56.1	41,245	8.4	74,991	15.2
Zambia	4,561,504	562,417	12.3	76.3	687,399	15.1	1,249,816	27.4
Zimbabwe	4,496,405	480,016	10.7	87.0	586,686	13.0	1,066,702	23.7
West & Central Africa								
Benin	3,035,188	151,032	5.0	9.7	184,595	6.1	335,627	11.1
Burkina Faso	5,689,351	326,220	5.7	45.4	398,713	7.0	724,933	12.7
Cameroon	6,577,736	254,432	3.9	44.8	310,972	4.7	565,404	8.6
Central African Republic	1,526,260	176,830	11.6	54.1	216,126	14.2	392,956	25.7
Congo, Rep.	1,202,517	61,838	5.1	46.5	75,580	6.3	137,418	11.4
Congo, Dem. Rep.	25,087,723	1,510,507	6.0	29.6	1,846,175	7.4	2,245,571	13.4
Côte d'Ivoire	7,500,047	561,001	7.5	56.8	685,668	9.1	1,246,669	16.6
Gabon	402,501	20,455	5.1	21.1	25,001	6.2	45,456	11.3
Ghana	8,184,200	270,456	3.3	18.5	330,557	4.0	601,013	7.3
Nigeria	54,053,337	2,091,416	3.9	27.0	2,556,175	4.7	4,647,591	8.6
Togo	2,315,487	76,827	3.3	44.6	93,900	4.1	170,727	7.4
Subtotal, Sub-Saharan Africa	**231,198,004**	**13,665,008**	**5.9**	**47.2**	**16,701,676**	**7.2**	**30,366,684**	**13.1**

Orphan Estimates for the 34 Study Countries 2000

Country	Population of children < age 15	Maternal & double orphans[1] from all causes	Maternal/double orphans as % of children < age 15	% of maternal/ double orphans from AIDS	Paternal orphans[2] from all causes[3]	Paternal orphans as % of children < age 15	Total orphans from all causes	Total orphans as % of children < age 15
Asia								
Cambodia	5,115,941	167,887	3.3	27.1	205,195	4.0	373,082	7.3
Myanmar	12,428,196	537,940	4.3	13.2	657,482	5.3	1,195,422	9.6
Thailand	14,493,241	222,716	1.5	19.9	272,208	1.9	494,924	3.4
Total, Asian Countries	**32,037,378**	**928,543**	**2.9**	**17.3**	**1,134,886**	**3.5**	**2,063,429**	**6.4**
Latin America & The Caribbean								
Bahamas	88,006	1,648	1.9	63.7	2,014	2.3	3,662	4.2
Brazil	50,278,034	816,735	1.6	51.8	998,232	2.0	1,814,967	3.6
Guyana	200,955	3,846	1.9	22.8	4,701	2.3	8,547	4.3
Haiti	2,825,683	157,916	5.6	39.8	193,008	6.8	350,924	12.4
Honduras	2,664,300	29,499	1.1	30.1	36,054	1.4	65,553	2.5
Total, Latin America	**56,054,978**	**1,009,644**	**1.8**	**49.2**	**1,234,009**	**2.2**	**2,243,653**	**4.0**
Total, 34 Study Countries	**319,290,360**	**15,603,195**	**4.9**	**45.5**	**19,070,195**	**6.0**	**34,673,767**	**10.9**

1. Maternal orphans: children who have lost their mothers.
   Double orphans: children who have lost both parents.
2. Paternal orphans: children who have lost their fathers.
3. A ratio of 45% maternal/double to 55% paternal was used to expand U.S. Census Bureau estimates of maternal orphans for 1995.

Source

Shaded columns: U.S. Bureau of the Census

Unshaded columns: S. Hunter, 2000 (developed using U.S. Census Bureau estimates, African censuses, and research studies).

Orphan Estimates for the 34 Study Countries 2005

Country	Population of children <age 15	Maternal & double orphans[a] from all causes	Maternal/double orphans as % of children <age 15	% of maternal/ double orphans from AIDS	Paternal orphans[a] from all causes[b]	Paternal orphans as % of children <age 15	Total orphans from all causes	Total orphans as % of children <age 15
East Africa								
Burundi	3,113,240	262,133	8.4	57.0	262,133	8.4	524,266	16.8
Ethiopia	34,557,933	3,042,025	8.8	58.3	3,042,025	8.8	6,084,050	17.6
Kenya	12,364,247	743,504	6.0	78.7	743,504	6.0	1,487,008	12.0
Rwanda	3,039,490	388,211	12.8	51.7	388,211	12.8	776,422	25.5
Tanzania	17,681,917	925,649	5.2	77.8	925,649	5.2	1,851,298	10.5
Uganda	13,587,441	1,129,190	8.3	58.0	1,129,190	8.3	2,258,380	16.6
Southern Africa								
Botswana	621,580	85,075	13.7	93.4	85,075	13.7	170,150	27.4
Lesotho	872,307	62,963	7.2	71.1	62,963	7.2	125,926	14.4
Malawi	4,734,313	499,935	10.6	72.9	499,935	10.6	999,870	21.1
Mozambique	8,414,513	983,153	11.7	62.5	983,153	11.7	1,966,306	23.4
Namibia	790,305	101,937	12.9	84.0	101,937	12.9	203,874	25.8
South Africa	13,179,300	1,252,139	9.5	85.0	1,252,139	9.5	2,504,278	19.0
Swaziland	530,008	63,705	12.0	77.8	63,705	12.0	127,410	24.0
Zambia	4,889,414	614,596	12.6	79.9	614,596	12.6	1,229,192	25.1
Zimbabwe	4,067,419	622,143	15.3	92.1	622,143	15.3	1,244,286	30.6
West & Central Africa								
Benin	3,439,766	186,079	5.4	25.3	186,079	5.4	372,158	10.8
Burkina Faso	6,376,983	412,908	6.5	56.8	412,908	6.5	825,816	12.9
Cameroon	7,127,658	322,547	4.5	59.7	322,547	4.5	645,094	9.1
Central African Republic	1,354,617	179,549	13.3	60.1	179,549	13.3	359,098	26.5
Congo, Rep.	1,324,916	71,827	5.4	53.5	71,827	5.4	143,654	10.8
Congo, Dem. Rep.	28,929,936	1,711,187	5.9	36.5	1,711,187	5.9	3,422,374	11.8
Côte d'Ivoire	8,178,431	671,776	8.2	65.3	671,776	8.2	1,343,552	16.4
Gabon	420,575	25,785	6.1	42.8	25,785	6.1	51,570	12.3
Ghana	8,051,005	303,467	3.8	35.9	303,467	3.8	606,934	7.5
Nigeria	60,441,470	3,058,927	5.1	49.8	3,058,927	5.1	6,117,854	10.1
Togo	2,450,172	102,323	4.2	62.0	102,323	4.2	204,646	8.4
Subtotal, Sub-Saharan Africa	**250,538,964**	**17,822,733**	**7.1**	**60.9**	**17,822,733**	**7.1**	**35,645,466**	**14.2**

Orphan Estimates for the 34 Study Countries 2005

Country	Population of children <age 15	Maternal & double orphans[1] from all causes	Maternal/double orphans as % of children <age 15	% of maternal/ double orphans from AIDS	Paternal orphans[2] from all causes[3]	Paternal orphans as % of children <age 15	Total orphans from all causes	Total orphans as % of children <age 15
Asia								
Cambodia	5,368,421	211,261	3.9	28.1	211,261	3.9	422,522	7.9
Myanmar	11,659,373	522,861	4.5	21.1	522,861	4.5	1,045,722	9.0
Thailand	14,711,277	250,816	1.7	33.2	250,816	1.7	501,632	3.4
Total, Asian Countries	**31,739,071**	**984,938**	**3.1**	**25.7**	**984,938**	**3.1**	**1,969,876**	**6.2**
Latin America & The Caribbean								
Bahamas	85,311	2,141	2.5	77.6	2,141	2.5	4,282	5.0
Brazil	47,852,940	1,151,051	2.4	68.6	1,151,051	2.4	2,302,102	4.8
Guyana	184,446	5,401	2.9	52.5	5,401	2.9	10,802	5.9
Haiti	2,774,712	159,804	5.8	46.4	159,804	5.8	319,608	11.5
Honduras	2,822,763	47,162	1.7	59.4	47,162	1.7	94,324	3.3
Total, Latin America	**53,720,172**	**1,365,559**	**2.5**	**65.7**	**1,365,559**	**2.5**	**2,731,118**	**5.1**
Total, 34 Study Countries	**335,998,207**	**20,173,230**	**6.0**	**59.5**	**20,173,230**	**6.0**	**40,346,460**	**12.0**

1. Maternal orphans: children who have lost their mothers.
   Double orphans: children who have lost both parents.
2. Paternal orphans: children who have lost their fathers.
3. A ratio of 50% maternal/double to 50% paternal was used to expand U.S. Census Bureau estimates of maternal orphans for 1995.

Source

Shaded columns: U.S. Bureau of the Census

Unshaded columns: S. Hunter, 2000 (developed using U.S. Census Bureau estimates, African censuses, and research studies).

Orphan Estimates for the 34 Study Countries 2010

Country	Population of children <age 15	Maternal & double orphans[a] from all causes	Maternal/double orphans as % of children <age 15	% of maternal/double orphans from AIDS	Paternal orphans[a] from all causes[b]	Paternal orphans as % of children <age 15	Total orphans from all causes	Total orphans as % of children <age 15
East Africa								
Burundi	3,394,398	298,838	8.7	64.1	243,436	7.1	534,236	15.7
Ethiopia	38,677,577	3,774,384	9.8	67.3	3,088,132	8.0	6,862,516	17.7
Kenya	11,517,416	746,598	6.5	80.9	610,853	5.3	1,357,451	11.8
Rwanda	2,980,406	365,489	12.3	70.4	299,036	10.0	664,525	22.3
Tanzania	19,290,445	1,181,807	6.1	83.2	966,933	5.0	2,148,740	11.1
Uganda	15,381,394	1,148,668	7.5	59.1	939,819	6.1	2,088,487	13.6
Southern Africa								
Botswana	558,640	113,048	20.2	96.3	92,494	16.6	205,542	36.8
Lesotho	865,984	95,782	11.1	83.5	78,367	9.0	174,149	20.1
Malawi	4,674,103	553,003	11.8	78.4	452,457	9.7	1,005,460	21.5
Mozambique	8,227,998	1,218,941	14.8	73.8	997,315	12.1	2,216,256	26.9
Namibia	788,111	139,033	17.6	90.1	113,754	14.4	252,787	32.1
South Africa	11,619,097	1,969,813	17.0	92.3	1,611,665	13.9	3,581,478	30.8
Swaziland	539,952	95,563	17.7	86.8	78,188	14.5	173,751	32.2
Zambia	5,169,675	645,260	12.4	82.4	527,940	10.2	1,173,200	22.6
Zimbabwe	3,698,605	695,226	18.8	94.6	568,821	15.4	1,264,047	34.2
West & Central Africa								
Benin	3,801,561	233,063	6.1	40.7	190,688	5.0	423,751	11.1
Burkina Faso	7,056,787	507,454	7.2	65.3	415,190	5.9	922,644	13.1
Cameroon	7,636,633	398,652	5.2	68.8	326,170	4.3	724,822	9.5
Central African Republic	1,680,843	285,636	17.0	82.3	233,702	13.9	519,338	30.9
Congo, Rep.	1,435,663	80,095	5.6	58.8	65,532	4.6	145,627	10.1
Congo, Dem. Rep.	32,855,946	1,912,001	5.8	43.1	1,564,364	4.8	3,476,365	10.6
Côte d'Ivoire	8,823,708	777,806	8.8	72.0	636,387	7.2	1,414,193	16.0
Gabon	433,133	31,769	7.3	58.1	25,993	6.0	57,762	13.3
Ghana	7,687,982	334,888	4.4	50.0	273,999	3.6	608,887	7.9
Nigeria	65,941,098	4,168,533	6.3	64.1	3,410,618	5.2	7,579,151	11.5
Togo	2,502,360	126,366	5.0	72.5	103,390	4.1	229,756	9.2
Subtotal, Sub-Saharan Africa	**267,249,515**	**21,892,708**	**8.2**	**69.9**	**17,912,216**	**6.7**	**39,804,924**	**14.9**

Orphan Estimates for the 34 Study Countries 2010

Country	Population of children <age 15	Maternal & double orphans[1] from all causes	Maternal/double orphans as % of children <age 15	% of maternal/ double orphans from AIDS	Paternal orphans[2] from all causes[3]	Paternal orphans as % of children <age 15	Total orphans from all causes	Total orphans as % of children <age 15
Asia								
Cambodia	5,779,090	209,424	3.6	29.0	171,347	3.0	380,771	6.6
Myanmar	11,078,715	479,927	4.3	26.1	392,668	3.5	872,595	7.9
Thailand	14,529,924	254,090	1.7	39.0	207,092	1.4	461,982	3.2
Total, Asia	**31,387,729**	**943,441**	**3.0**	**30.6**	**771,906**	**2.5**	**1,715,347**	**5.5**
Latin America & The Caribbean								
Bahamas	79,724	2,318	2.9	82.7	1,897	2.4	4,215	5.3
Brazil	45,685,687	1,208,064	2.6	72.0	988,416	2.2	2,196,480	4.8
Guyana	179,254	8,295	4.6	72.7	6,787	3.8	15,082	8.4
Haiti	2,854,540	161,098	5.6	51.6	131,807	4.6	292,905	10.3
Honduras	2,872,903	75,600	2.6	76.9	61,855	2.2	137,455	4.8
Total, Latin America	**51,672,108**	**1,455,375**	**2.8**	**70.7**	**1,190,761**	**2.3**	**2,646,136**	**5.1**
Total, 34 Study Countries	**350,309,352**	**24,291,524**	**6.9**	**68.4**	**19,874,883**	**5.7**	**44,166,407**	**12.6**

1. Maternal orphans: children who have lost their mothers.
   Double orphans: children who have lost both parents.
2. Paternal orphans: children who have lost their fathers.
3. A ratio of 55% maternal/double to 45% paternal was used to expand U.S. Census Bureau estimates of maternal orphans for 1995.

Source

Shaded columns: U.S. Bureau of the Census

Unshaded columns: S. Hunter, 2000 (developed using U.S. Census Bureau estimates, African censuses, and research studies).

Appendix II

A Brief Note on Methodology

To estimate the number of orphans a country will have and the percentage of children under age 15 who will be orphaned in any given year, it is necessary to have population data and incidence and prevalence data in a country. Whereas the two are interrelated because population projections depend on the expected impact of HIV/AIDS on mortality, each is drawn from separate databases.

The data and technical expertise required to estimate the effect of AIDS on a population are extensive. At present, only three authorities make such estimates with a global scope: the U.S. Census Bureau, the U.N. Secretariat's Population Division and UNAIDS. Until recently, more organizations had attempted to undertake these kinds of estimates, but there has been some convergence among competing models of the impact of the HIV/AIDS pandemic on global and national populations. Readers interested in a brief description of earlier models are referred to the methods annex of the original Children on the Brink.

Although agreement on various aspects of these population models has increased, they are not well-known or widely used in many countries in sub-Saharan Africa. This appendix contains a brief description of the models to encourage basic familiarity with the procedures and an understanding of where information, software and technical support can be obtained to create national models of epidemic impact.

A. Estimating the Effect of HIV/AIDS on a Population

Estimates of orphan numbers require base population estimates, including the expected number of women and men between ages 15 and 49 who are alive at each of the estimate periods (2000, 2005, 2010). Convergence of estimates is far from complete, according to the most recently published comparison (Stover and Way, 1998). Major differences between the United Nations and U.S. Census Bureau projections still exist. For example, the Census Bureau estimates that by 2005, the mortality effect of AIDS will be 2.2 times larger than that projected by the United Nations, and 3.5 times larger by 2025. Overall, the Census Bureau projects a total population loss of 118.9 million people in 24 heavily infected sub-Saharan African countries by 2015, compared with United Nations estimates of 60.5 million.

At the core of these differences are differences in opinion about fertility and AIDS-related parameters. The United Nations is more optimistic about the prospects of fertility declines in Africa, Asia and Latin America, and about the estimation of the following AIDS-related parameters: HIV prevalence (56% of the difference in projected mortality); the incubation period or time between HIV infection and full blown AIDS, which UNAIDS estimates at 10 years and the Census Bureau at 7.5 years (14% of difference in projections); and perinatal transmission, which the United Nations estimates at 30% compared with Census Bureau estimates of 39% (7% of projected differences). Differences in opinion about the start of the epidemic in various countries accounted for 16% of the differences in projected mortality. Unfortunately, recent data on AIDS and mortality are surprisingly limited, and until these gaps are filled, it will be impossible to resolve these differences in projection models (Timaeus, 1998).

Although UNAIDS issues official annual reports on the global HIV/AIDS pandemic on World AIDS Day (December 1), it updates its country-specific HIV/AIDS statistics every two years and releases the information midyear at the international AIDS conferences. A comprehensive update was released in June 2000. It includes data from 169 countries on AIDS deaths, cases of

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AIDS Model Parameters
U.S. Census Bureau

Life expectancy for children with HIV
- Half die before age 1.
- Half die before age 5.

Fertility
- Total fertility reduced by 20% to account for loss of fertility by women with HIV.

Incubation period
- Median time from HIV infection to AIDS, 7.5 years; AIDS to death, 1 year.

Perinatal transmission rate
- 39% of infants born to women with HIV will also have HIV.

AIDS among adults and children, adults and children living with HIV/AIDS, adult and child infection levels, and estimates of the proportion of people infected by various modes of transmission. These are prepared in cooperation with national AIDS control programs, but there is debate in some countries about the sources and reliability of the data, most of it due to misunderstandings rather than true data error.

While UNAIDS collects epidemic data from national programs, it does not use the data to make projections about the impact of the epidemic because similar projections have been very controversial in the past. The only publicly available projections of epidemic patterns and impact are contained in U.S. Census Bureau reports.

Sources of AIDS Projection Models, Estimates and Data

UNAIDS: www.unaids.org
Biannual updates of worldwide AIDS data; epidemiological facts sheets by country; special impact studies, technical updates, best-practice reports.

U.S. Bureau of the Census: www.census.gov
Worldwide HIV/AIDS data set; biannual *World Population Reports* provide estimates of HIV/AIDS effects on population parameters in heavily affected countries and special sections and reports on impact. U.N. Secretariat Department of Economic and Social Information and Policy Analysis, Population Division Biannual world population estimates.

Macro International: www.macroint.com
Demographic and Health Survey data and special reports.

The Futures Group: www.tfgi.com
AIDS reports and projections for many countries in sub-Saharan Africa; sectoral impact models.

The Census Bureau is the largest repository of HIV/AIDS data in the world. The International Program Center's Health Studies Branch has collected HIV and AIDS data since the mid-1980s and makes annual updates of its complete database available free of charge. These data have been used to update the Census Bureau's biannual World Population Profile since 1994. Each year the Profile is produced, the Census Bureau produces a focus chapter or separate publication that compares estimates and projections with and without AIDS. It provides information on the parameters and assumptions used, and shows the impact of AIDS on key demographic indicators (population growth rates, life expectancy, infant and child mortality rates, crude death rates).

Using its vast collection of HIV seroprevalence data and sophisticated computer models, the Census Bureau plots epidemic data collected by individual countries on low, medium, and high epidemic curves. HIV/AIDS impact estimates are made if a country has an infection level of 5% or greater in urban areas and sufficient epidemic data to ensure reliability of the estimates. These estimates are carefully reviewed and evaluated by Census Bureau and UNAIDS staff who have many years of experience in this work, but surprises are nevertheless possible as more data on the pandemic become available. A fuller description of the methodology is included in each World Population Profile publication (see for example Stanecki and Way, 1998: B–6–7).

B. Estimating Numbers of Orphans

Orphan data and estimates for heavily infected countries may be found in several sources: national AIDS control programs; as part of the national AIDS strategy or plan; the household schedule of Demographic and Health Surveys (DHS); national censuses; special national studies, particularly World Bank poverty surveys that include household data; regional or local studies; and Children on the Brink. They vary widely (Table 4), depending on whether they include the following:

1. AIDS orphans or orphans from all causes of death.
2. Maternal (mother dead), paternal (father dead), or double (both parents dead) orphans. Maternal and double orphans are estimated from maternal deaths, and these estimates are most common. However, as a rule of thumb, paternal orphans are often as numerous as maternal orphans, and in many cases are, in fact, double orphans because they are abandoned or their mothers die soon after their fathers do.
3. Children under 15 (the demographic cutoff) or children under 18 (the legal cutoff in many sub-Saharan African countries).
4. Orphan estimates also vary by time period. Children on the Brink includes the only projections of orphans through 2010.

5. Orphan estimates can be cumulative (all orphans since the beginning of the epidemic), or cross-sectional (totals at a given date).

Although the estimates from these sources seem to vary widely, when they are compared on the same criteria, they are similar. For example, UNAIDS reported the cumulative global total of maternal and double orphans as 8.2 million for the end of 1997, but Children on the Brink estimated 35 million maternal, paternal, and double orphans in 2000, numbers that are seemingly irreconcilable. However, of the latter number, 15.6 million are maternal and double orphans. A large proportion of these are not AIDS orphans (about 50%); thus, the estimate for maternal and double orphans of AIDS is about 7.8 million. If orphans who are no longer under age 15 and those from countries other than the 23 in Children on the Brink are subtracted from the UNAIDS estimates, the figures are roughly comparable. Children on the Brink estimates are also comparable with estimates that were generated a decade earlier (Preble, 1990; Hunter and Williamson, 1997: Annex 2).

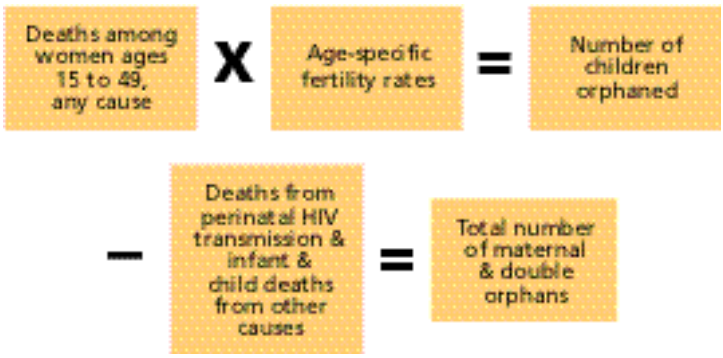
The demographic model most frequently used for estimating maternal and double orphans from any cause of death is conceptually simple (Figure). The researcher first estimates the effect of AIDS mortality on women of childbearing age using a broader, parent model of the demographic impact of HIV/AIDS. The number of women who will die of AIDS is then multiplied by their expected fertility (total or age-specific, depending on the researcher). This yields the total number of children who will be orphaned by AIDS. From this number one subtracts the number of children who will die of HIV-related causes (perinatal transmission) and non-HIV-related causes. The remainder is the total number of orphaned children who are expected to survive until age 15. Each year, the modeler subtracts children who reach the age of 15, and adds children who are newly orphaned, using a cumulative cohort technique. These estimates include only children under age 15, the traditional demographic cutoff point for childhood; although, in most countries, children do not reach the age of majority until 18 or later.

The countries included in Children on the Brink 2000 represent 18% of the total population of their regions, an increase of 3% over the original Children on the Brink. Most of the increase in coverage has been in sub-Saharan Africa, where estimates are now available for more than half of the countries. While total population coverage is low, representation of AIDS-affected countries is high. Low rates of HIV prevalence in most countries in Asia, Latin America and the Caribbean and in developed countries not included in this report indicate that AIDS-related orphans are still proportionately few.

C. Estimating Paternal Orphans

Demographers generally prefer to estimate only maternal and double orphans for methodological reasons, but the number of children who are paternal orphans is also important for reasons described in Section II of this report. There is as yet no generally accepted methodology for estimating paternal orphans, although demographers in India have projected the number of paternal orphans on the basis of maternal and paternal life expectancies (Pathak et al., 1979). Most demographers hesitate because it is easier to relate children to their biological mother, because male fertility is not a familiar subject, and because there has been

Calculating Orphans from AIDS or Other Causes



no pressing need for such a methodology in the past. Orphan estimates also do not include children whose living parents are absent from the household, although analysis of DHS data sets shows that large proportions of children of all ages live with foster parents (Bruce and Lloyd, 1992; Bruce et al., 1995).

Children on the Brink 2000 uses the same approach as the original Children on the Brink to estimate paternal orphans. The Census Bureau's estimates of maternal and double orphans are expanded using African census data, DHS data, and data from small surveys (table). These data show that the ratio of maternal, paternal and double orphans changes over time as AIDS mortality increases. Censuses conducted in Africa before AIDS indicate a ratio of maternal–paternal–double orphans of 32–61–7. Two population surveys conducted as part of the Tanzanian and Ugandan DHS indicate that the ratio had shifted slightly due to AIDS mortality, to 30–60–10 (maternal–paternal–double), indicating that a higher proportion of orphans had lost both their parents. In two areas with extremely high AIDS mortality (the Rakai district of Uganda and the Kagera region of Tanzania), the ratio of maternal–paternal–double orphans was 25–55–20 and 25–50–25, respectively. It is unclear whether ratios such as these are common in severely affected areas, but demographic simulations and field data suggest that, over time, female deaths and the proportion of double orphans both increase.

Population-based seroprevalence surveys in Africa suggest that 12 to 13 women are infected for every 10 men (UNAIDS, 1999). However, mortality studies using data from 1992 to 1996 suggest that male mortality is increasing more than women's except in Uganda (Timaeus, 1998: S25). These differences may simply signify the lag effects between male and female infection patterns and death. Once this swing takes place, there will still be a lag in the orphan populations until the older cohorts grow older than 15, so the shift to an even ratio of male and female deaths from AIDS is not expected to result in even ratios (50% maternal/double and 50% paternal) until 2005.

The Census Bureau's estimates of maternal and double orphans from all causes are understood to be a proportion of the total orphans (maternal, double and paternal), and are expanded using ratios derived from censuses and DHS. The ratios used were chosen both to approximate changes in ratios seen from empirical studies and to produce relatively smooth growth in orphan populations that would be consistent with the estimates of maternal and double orphans provided by the Census Bureau: 40–60 maternal and double to paternal for 1990 and 1995; 45–55 for 2000;

Comparison of Orphan Estimates from Five Sources

Source	Year	Time Period	Orphan Ages	Cause of Death	Definition	Countries	Totals
UNAIDS	1998	Cumulative since pandemic began to end of 1997	Under 18	HIV/AIDS	Maternal (mother) Double (both parents)	All countries with AIDS data	8 million end of 1997
Children On the Brink	1996	Cross-sectional End of 1990, 1995, 2000 2005, 2010	Under 15	All Causes	Paternal (father) Maternal Double	23 Total 19 African 4 Other	35 million 2000 40 million 2010
African Census Data	Various	Cross-sectional 1960s to 1990s	Under 15 Under 18	All Causes	Maternal Paternal Double	Various	NA
DHS Data	1980s	Cross-sectional 1990s	Under 15	All Causes	Maternal Paternal Double	Various	NA
NACP Estimates	1990s	Cross-sectional	Under 15 Under 18	HIV/AIDS	Maternal Double	Various	NA

50–50 for 2005; 55–45 for 2010. Lacking real data for later years of the epidemic, the base ratio was adjusted by 5 percent for each 5–year interval thereafter.

The total number of orphans (maternal, paternal, and double) is roughly two times the number of maternal and double orphans. While orphan populations will increase in sub-Saharan Africa through at least 2010, orphan populations are projected to decline in most of the non-Sub-Saharan African countries included in this study. This is a result of a decline in fertility rates and a decrease in the number of children born—that is, a decrease in the potential orphan population—rather than a decline in HIV prevalence.

High-quality, comprehensive and systematic information such as census or DHS data on children's health status, family arrangements, and other aspects of well-being are quite limited or outdated in severely infected countries. According to one demographer who has analyzed African census and DHS data over the past four decades, "Adult mortality has not been a priority either for health program or data collection for at least 25 years. Fertility surveys have become established as the main form of demographic inquiry in developing countries and have seldom included questions designed to measure adult mortality. Both officials in national statistical offices in Africa and their advisers and consultants have failed to rise to the challenge posed by the HIV epidemic. ... Data collected in certain DHS surveys in the last few years have made it possible to begin to measure the demographic catastrophe that is unfolding in Africa. The huge increases in mortality that these data document are unprecedented and represent a major setback to development in Africa. The scope for improving projections of future HIV-related mortality in Africa remains limited by the failure to measure how many people the epidemic in the continent has killed so far" (Timeaus, 1998: S26).

Under these circumstances, governments are challenged to develop programs for families and children that rely on vision and experience by policymakers rather than technical data and tools. The fact that countries are moving ahead "without the benefit of data at a national and subnational level[s] on the scale of AIDS mortality or on the age, sex, and other characteristics of those dying from HIV infection" (Timeaus, 1998: S15) is a demonstration of considerable courage to break through layers of denial about the epidemic. Investment in data collection systems could radically improve this situation and avert costly mistakes. Many new issues of data collection and measurement have been raised by concern for growing numbers of orphaned and vulnerable children:

1. ***Paternal orphans.*** Although estimates of paternal orphans are frequently ignored in official AIDS statistics, such data is collected in censuses and DHS surveys. The collection of data in some DHS on all children born suggests that a reliable method will soon be developed (Ezeh et al., 1996).
2. ***Vulnerable children.*** Vulnerability is difficult to place into operation because there is relatively little data on children, and that available concerns children in stable households (censuses, DHS). Also, populations of vulnerable children overlap, which compounds measurement problems (Hunter, 1998 and 1999).
3. ***Indicators of vulnerability.*** Indicators that are important signals of worsening social and economic impact are being developed for children, families and communities.
4. ***Methods for comparing data,*** including enumeration, DHS, censuses and methods for comparing overlapping populations of vulnerable children.
5. ***Multisectoral modeling*** to better understand the epidemic's future implications for the supply and demand for health, education and social services.
6. ***Research and monitoring on family and community change.*** Indicators would be useful for monitoring changes in family and community structure. These could include gross measures such as the disappearance of communities, medium-level indicators such as the number or viability of community organizations, and quantitative and qualitative indicators of community involvement and participation.

There are many other pressing research issues related to defining children's needs and changes and family and community adaptation under the unprecedented conditions of extremely high mortality of the HIV/AIDS pandemic (Webb et al., 1999). The bulk of the research has concentrated on improving prevention programs, but methods are needed for estimating impact and planning systems of care.

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