

Financing the Response to HIV in Low-Income and Middle-Income Countries

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Objectives: To describe levels of national HIV spending and examine programmatic allocations according to the type of epidemic and country income.

Methods: Cross-sectional analysis of HIV expenditures from 50 low-income and middle-income countries. Sources of information included country reports of domestic spending by programmatic activity and HIV services. These HIV spending categories were cross tabulated by source of financing, stratified by type of HIV epidemic and income level of the country and reported in international dollars (I\$).

Results: Fifty low-income and middle-income countries spent US \$ 2.6 billion (I\$ 5.8 billion) on HIV in 2006; 87% of the funding among the 17 low-income countries came from international donors. Average per capita spending was I\$ 2.1 and positively correlated with Gross National Income. Per capita spending was I\$ 1.5 in 9 countries with low-level HIV epidemics, I\$ 1.6 in 27 countries with concentrated HIV epidemics and I\$ 9.5 in 14 countries with generalized HIV epidemics. On average, spending on care and treatment represented 50% of AIDS spending across all countries. The treatment-to-prevention spending ratio was 1.5:1, 3:1, and 2:1 in countries with low-level, concentrated and generalized epidemics, respectively. Spending on prevention represented 21% of total AIDS spending. However, expenditures addressing most-at-risk populations represented less than 1% in countries with generalized epidemics and 7% in those with low-level or concentrated epidemics.

Conclusions: The most striking finding is the mismatch between the types of HIV epidemics and the allocation of resources. The current global economic recession will force countries to rethink national strategies, especially in low-income countries with high aid dependency. Mapping HIV expenditures provides crucial guidance for reallocation of resources and supports evidence-based decisions. Now more than ever, countries need to know and act on their epidemics and give priority to the most effective programmatic services.

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We declare that none of the competing interests found at <http://www.icmje.org/index.html#> are relevant and therefore have nothing to declare.

The authors of this paper declare no conflicts of interest.

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INTRODUCTION

Monitoring funding flows and actual spending for HIV responses requires reliable and timely information on expenditure levels and accurate descriptions of financing flows. Such monitoring can provide vital information for strategic and operations planning. Government spending is an indicator of a country's commitment to achieving universal access to HIV services. Similarly, international funding flows reflect the commitment of donor countries to support the international response to HIV, either directly or through multilateral organizations. Global funding for HIV rose from US \$1.6 billion in 2001 to an estimated US \$13.8 billion in 2008. Despite that increase in resources, the estimated global requirement of US \$25 billion for achieving universal access in 2010 will not be reached.¹

The current global economic recession is affecting countries at all levels of income. Especially in low-income and middle-income countries, government spending on social programs and healthcare is being threatened by reduced revenues, currency devaluation and potential reductions in external assistance. Slower economic growth in donor countries may reduce and alter aid flows to low-income countries that are highly dependent on external assistance.² Consequently, it is vital to make optimal use of the available financial resources at country level to provide effective prevention, treatment, care and support services as efficiently as possible to those in need. Until recently, however, most countries lacked appropriate tools for monitoring the actual spending of funds. The exceptions were mostly in Latin America and the Caribbean, where National AIDS Accounts were first introduced to measure financing flows. The National AIDS Spending Assessments (NASA), developed and implemented by the Joint United Nations Program on AIDS (UNAIDS) Secretariat, is the first tool to track and describe financing flows from funding sources to managers, service providers and ultimately to beneficiary populations. NASA was developed to produce accurate and detailed in-country estimates of the actual expenditures on HIV programs. It has been used to report progress on the 2001 Declaration of Commitment from the United Nations General Assembly Special Session on HIV/AIDS and to support countries in planning and monitoring their HIV activities.

This article describes the levels and patterns of domestic HIV spending from public and international sources, according to spending categories, epidemic types and country income levels.

METHODS

We conducted a descriptive analysis of domestic HIV spending by type of service and by funding source based on the NASA methods and definitions. The analysis included reported HIV expenditures from 50 low-income and middle-income countries in 2006.³ Spending categories, by programmatic activity and HIV services, were cross tabulated by source of financing and stratified by type of epidemic and income level.

Spending information from public and international sources was collected using the NASA⁴ spending categories, a functional classification that includes health and nonhealth HIV services. HIV spending is structured into the following 8 categories of spending: (1) prevention, (2) treatment and care, (3) orphans and vulnerable children, (4) program management and administration, (5) human resources, (6) social protection, (7) enabling environment and (8) research. NASA is a tool for measuring all the resources included in the national HIV response and is based on the national health accounts framework.^{5,6} It is a comprehensive resource tracking methodology that applies standard accounting methods. The spending assessments reconstruct all transactions in the country, “following the money” from the funding sources to the agents and providers and eventually to the beneficiary populations. NASA verifies the amounts entered (using data triangulation) and applies a matrix system to reconcile all the figures and to avoid double counting.

The financial flows related to HIV national responses are organized in to 3 areas (finance, provision and consumption) and 6 vectors as follows: (1) financing sources (entities that provide money to the agents); (2) agents (entities that pool financial resources and pay for service provision and make programmatic decisions); (3) providers (entities that engage in the production, provision and delivery of HIV services); (4) production factors (resources used for the production of services); (5) HIV spending categories; and (6) beneficiary populations (targeted groups intended to receive the benefits from specific programs and activities).

NASA applies the accrual method to reconstruct all transactions from sources to agents, providers and users of services to estimate total spending. To increase reliability and reduce measurement error, all transactions in the system are reconstructed using both top-down and bottom-up approaches. A transaction is defined as a transfer of resources between different agents; more specifically it reflects the transfer of resources from a financing source to a financing agent and finally to the provider of goods or services. The provider invests in different production factors to generate HIV spending categories that are intended to benefit specific beneficiary populations. Resources from international sources are tracked to the origin to identify non-HIV earmarked funds and budgetary support. The NASA methodology for resource tracking

was presented, discussed and approved by the Global Consortium of Resource Tracking at several meetings during 2006.⁷

The sources of information for this analysis include national HIV spending as reported against United Nations General Assembly Special Session on HIV/AIDS (UNGASS) indicator number 1 and presented in a spreadsheet format.⁸ This is done by the national resource-tracking team using the National AIDS Funding Matrix or the NASA reports. From a total of 107 countries reporting spending information, we included data from the 50 countries that have complete reports of financing flows from sources to spending categories.

To produce meaningful comparisons, we first converted all expenditures to “Purchasing Power Parity,” adjusted by size of the population to report per capita spending. We then grouped countries by type of HIV epidemic. The “international dollar” (I\$) is used to represent a currency unit, which is meant to have the same purchasing power in a given economy as US \$1 has in the US economy. To report international dollars, 2006 spending was first converted from the national currency to US dollars, using official exchange rates and then converted to Purchasing Power Parity.⁹

Countries were classified by income level. Economies were divided according to their 2007 Gross National Income (GNI) per capita, calculated using the World Bank Atlas Methods.¹⁰ The groups are as follows: low income (\$935 or less); lower middle income (\$936–\$3705); upper middle income (\$3706–\$11,455); and high income (\$11,456 or more). Reports include neither out-of-pocket nor other types of private household spending. We excluded HIV spending reports from developed countries such as Australia, Poland and Japan.

RESULTS

The 50 low-income and middle-income countries included in our analysis spent a total of US \$2.6 billion on HIV programs and services during 2006. External and domestic sources of HIV financing varied among countries, as did the levels of total spending. In the 50 countries overall, 70% of HIV spending came from international donors. This proportion was even higher among the 17 low-income countries, where 87% of HIV funding came from international donors.

Table 1 shows the absolute and per capita amounts of domestic HIV spending in the 50 countries in 2006, when Brazil (US \$563 million) and the Russian Federation (US \$254 million) were the top spenders. Given their GNI levels, a large share of their spending came from domestic government sources. Although, in absolute terms, Brazil was the biggest spender of domestic public funds, Botswana had by far the highest per capita spending on HIV (US \$70.4) in 2006 followed by Swaziland (US \$17.3). Botswana is an outlier in this dataset with a high per capita spending relative to its small population of 1.8 million. Excluding Botswana, the remaining sub-Saharan African countries spent an average of US \$5.9 per capita on HIV—6 times more per capita than in countries with similar income levels elsewhere. In addition, there was a positive correlation between HIV prevalence and per capita spending (Pearson correlation coefficient of 0.8).

TABLE 1. Reported Total, Per Capita Spending and Proportion of International Funding Among 50 Countries, 2006

Country	Region	Type of Epidemic	HIV Spending USD PPP	HIV Spending USD	Per Capita HIV Spending USD PPP	Per Capita HIV Spending USD	% of International Funding
Saint Lucia	Caribbean	C	1,656,640	1,000,199	10.159	6.134	79
Haiti	Caribbean	G	159,214,259	70,283,772	16.855	7.441	99
China	East Asia	C, L	324,163,635	138,927,272	0.245	0.105	23
Belarus	Eastern Europe and Central Asia	C	36,710,886	13,132,657	3.768	1.348	32
Bulgaria	Eastern Europe and Central Asia	C	17,126,083	6,603,845	2.226	0.858	51
Croatia	Eastern Europe and Central Asia	C	12,681,958	8,424,444	2.784	1.849	26
Latvia	Eastern Europe and Central Asia	C	10,231,298	5,748,000	4.470	2.511	1
Russian Federation	Eastern Europe and Central Asia	C	673,263,925	304,834,564	4.702	2.129	17
Ukraine	Eastern Europe and Central Asia	C	173,924,470	55,417,110	3.736	1.190	49
Georgia	Eastern Europe and Central Asia	L	12,920,605	5,262,783	2.915	1.187	89
Kyrgyzstan	Eastern Europe and Central Asia	L	28,343,298	7,917,122	5.390	1.506	91
Romania	Eastern Europe and Central Asia	L	165,925,868	76,088,416	7.706	3.534	7
Tajikistan	Eastern Europe and Central Asia	L	20,708,615	5,210,555	3.119	0.785	94
Argentina	Latin America	C	338,831,874	149,527,348	8.658	3.821	3
Brazil	Latin America	C	1,039,559,629	565,185,867	5.492	2.986	0
Colombia	Latin America	C	216,702,890	97,644,780	4.757	2.143	1
Costa Rica	Latin America	C	21,533,923	11,271,138	4.895	2.562	10
Ecuador	Latin America	C	23,891,176	10,209,005	1.810	0.773	68
El Salvador	Latin America	C	65,761,917	33,128,184	9.725	4.899	18
Panama	Latin America	C	26,780,571	14,164,456	8.146	4.309	3
Paraguay	Latin America	C	2,964,208	1,017,666	0.493	0.169	24
Peru	Latin America	C	70,534,176	32,387,033	2.557	1.174	59
Uruguay	Latin America	C	10,717,614	5,731,171	3.217	1.720	7
Honduras	Latin America	G	32,907,262	14,354,206	4.722	2.060	71
Bolivia	Latin America	L	13,922,725	4,024,538	1.488	0.430	91
Turkey	Middle East and North Africa	C	91,339,706	54,175,480	1.236	0.733	8
Algeria	Middle East and North Africa	L	8,422,684	3,673,850	0.253	0.110	69
Morocco	Middle East and North Africa	L	12,369,511	6,900,216	0.401	0.224	67
Indonesia	South and South East Asia	C	131,082,343	56,576,574	0.573	0.247	73
Nepal	South and South East Asia	C	28,080,194	8,896,695	1.016	0.322	98
Cambodia	South and South East Asia	G	137,839,832	44,179,433	9.709	3.112	86
Iran (Islamic Republic of)	South and South East Asia	L	109,296,819	32,777,972	1.555	0.466	9
Philippines	South and South East Asia	L	18,911,184	7,686,125	0.219	0.089	65
Cape Verde	Sub-Saharan Africa	C	993,180	799,656	1.915	1.542	0
Botswana	Sub-Saharan Africa	G	299,183,958	143,406,319	161.011	77.176	9
Burkina Faso	Sub-Saharan Africa	G	111,277,918	43,274,746	7.750	3.014	78
Central African Republic	Sub-Saharan Africa	G	28,547,696	14,693,667	6.694	3.445	96
Cote d'Ivoire	Sub-Saharan Africa	G	70,614,017	39,130,061	3.733	2.069	88
Democratic Republic of the Congo	Sub-Saharan Africa	G	85,222,518	41,033,064	1.405	0.677	100
Ghana	Sub-Saharan Africa	G	55,427,763	22,982,243	2.409	0.999	79
Guinea-Bissau	Sub-Saharan Africa	G	7,148,416	2,859,367	4.344	1.738	100
Lesotho	Sub-Saharan Africa	G	45,132,529	24,436,397	22.624	12.250	81
Mali	Sub-Saharan Africa	G	58,201,200	26,772,552	4.863	2.237	68
Mozambique	Sub-Saharan Africa	G	206,414,790	95,505,350	9.843	4.554	85
Niger	Sub-Saharan Africa	G	50,474,919	21,632,108	3.674	1.575	48
Rwanda	Sub-Saharan Africa	G	245,147,769	84,742,439	25.903	8.954	95
Swaziland	Sub-Saharan Africa	G	94,897,047	49,113,384	83.712	43.325	60
Togo	Sub-Saharan Africa	G	18,315,939	8,434,972	2.857	1.316	88
Zambia	Sub-Saharan Africa	G	343,682,683	189,929,904	29.384	16.239	85
Mauritius	Sub-Saharan Africa	L	2,944,628	1,501,345	2.353	1.200	29
Grand Total	—	—	5,761,948,749	2,662,610,049	2.129	0.984	35

C, concentrated; G, generalized; L, low-level; PPP, purchasing power parities.

Overall, funding from international donors represented 70% of HIV spending in the 50 countries. Those funds were channeled to the countries through a variety of recipients—mainly governments, nongovernmental and faith-based organizations. In low-income countries, a much bigger share of the HIV response is financed from international sources. Countries with more elevated incomes are deriving higher proportions of their overall funding from domestic public resources. Figure 1 shows proportions of domestic and international funding for the 20 countries with the highest absolute amount of HIV spending in 2006.

Figure 2 shows the relationship between three dimensions of AIDS financing in 47 countries: the percentage of funding received from external sources (on the horizontal axis), the prevalence of HIV (on the vertical axis) and the level of per-capita spending on AIDS, depicted using a spread of bubbles of different sizes. While there is no significant correlation or any specific distribution pattern, it is interesting to look at the ways in which the countries can be grouped.

High HIV prevalence countries, located in the upper right corner of the graph, show not only high spending levels, but also a greater percentage of expenditures coming from external sources. This is the case for Lesotho, Mozambique, Zambia and Swaziland, which have both a high HIV burden and high aid dependency, and could feel the impact of funding cuts from international donors. Since these countries may have a more limited ability to shift domestic budgetary resources to HIV to maintain their programs, they may require emergency assistance in some instances. However, the economic crisis in rich countries has put a strain on donor assistance programs across the board, including funding for HIV/AIDS.

Countries with a high spending burden and low aid dependency, such as Botswana, will likely be affected to the degree that external shocks affect the national economy and

result in reduced income and increased fiscal deficits. The impact of the crisis would therefore also affect middle-income countries that are heavily dependent on domestic budgets. These countries are also most at risk of cuts to any external assistance that they currently receive, since middle-income countries have been considered a low priority for receiving external aid.

In contrast, there is a greater chance that countries which have both a low prevalence rate and disease burden, such as Indonesia and Ecuador, will be better placed to reallocate funds to HIV programs from within their national budgets, regardless of their level of aid dependency.

In the set of upper middle-income countries, 99% of antiretroviral treatment (ART) is financed with domestic public resources, whereas in lower middle-income countries, domestic public resources provide 74% of the overall funding, and the Global Fund to Fight AIDS, Tuberculosis and Malaria (Global Fund) provides 24%. In low-income countries, the financing pattern is more diverse and funding sources include nonreimbursable loans from various development banks, the Global Fund, United Nations agencies, multilaterals and from domestic public funds. The main source of funds for ART in low-income countries is bilateral assistance, which finances 53% of ART.

Overall per capita HIV spending was \$ 2.1. Countries with low-level epidemics spent an average \$ 1.5 per capita on HIV and those with concentrated epidemics spent \$ 1.6, whereas countries with generalized epidemics spent \$ 9.5 per capita. The resource allocation to specific programs addressing HIV prevention, care and treatment efforts, and nonhealth categories varies among countries.

No clear spending patterns are evident for countries with the same types of epidemics, as can be seen in Figure 3. Expenditures on prevention account for 32% of HIV spending

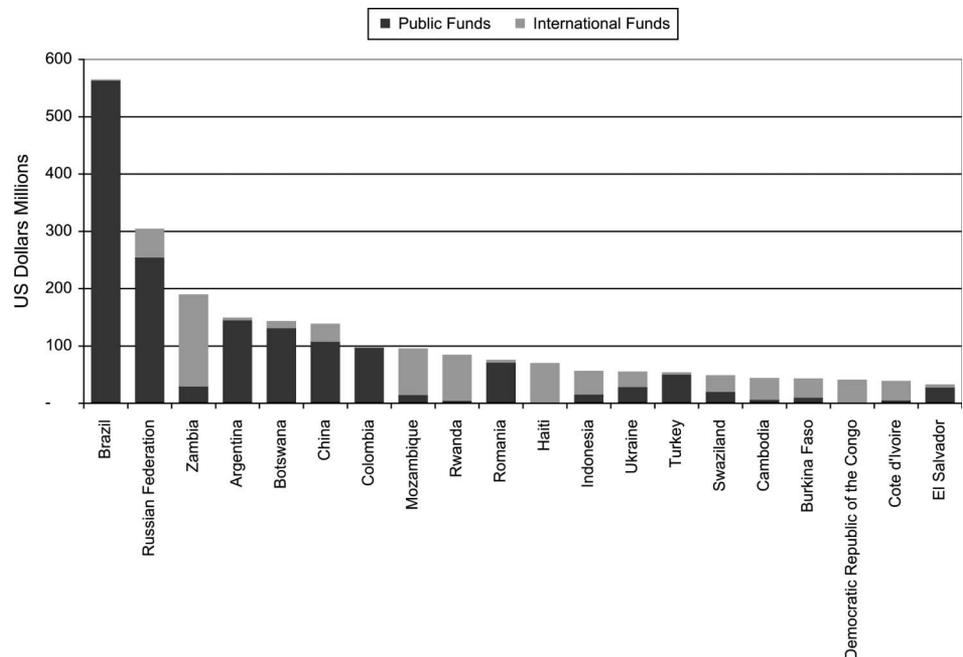


FIGURE 1. Annual spending from public and international sources: 2006 top spending countries (USD million).

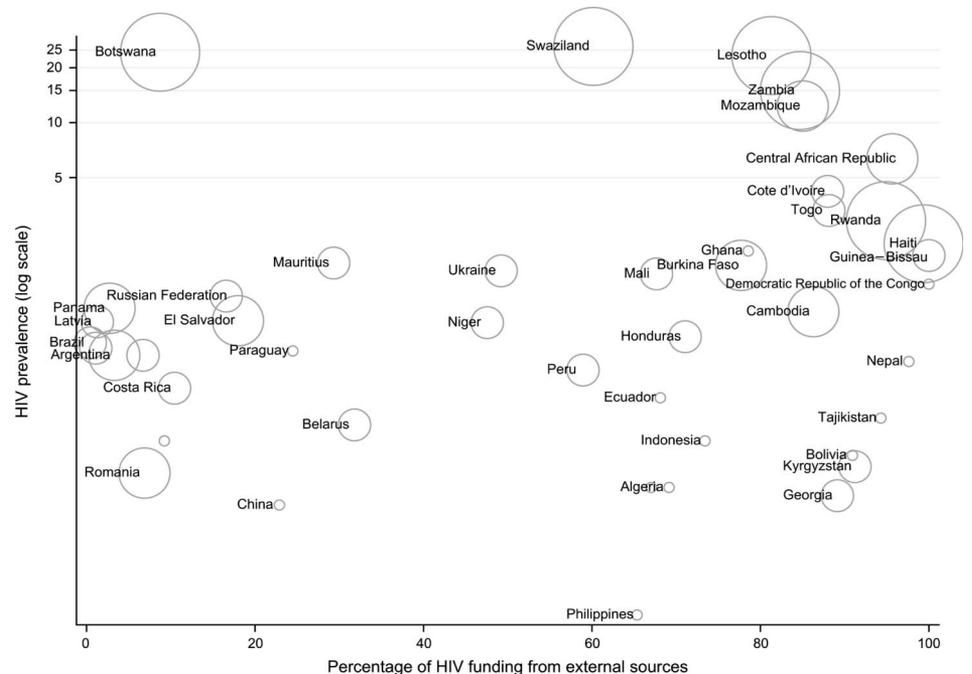
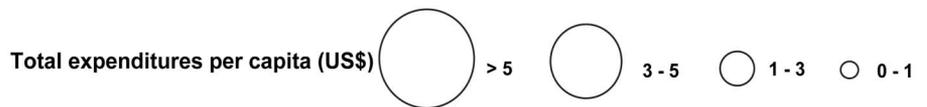


FIGURE 2. Relationship between HIV prevalence, HIV funding from external sources and per capita expenditures.



in low-level epidemics, 25% in concentrated epidemics and 30% in generalized epidemics. Treatment-to-prevention spending ratio was 1.5:1, 3:1, and 2:1 in countries with low-level, concentrated and generalized epidemics, respectively. Treatment and care absorb large shares of the overall funding in many countries, leaving prevention interventions underfunded.

Furthermore, countries with concentrated epidemics often opt for broad prevention programs rather than more cost-effective interventions that focus on most-at-risk populations and that match national epidemiological priorities. Expenditures addressing most-at-risk populations represented less than 1% of spending on HIV prevention in countries with generalized

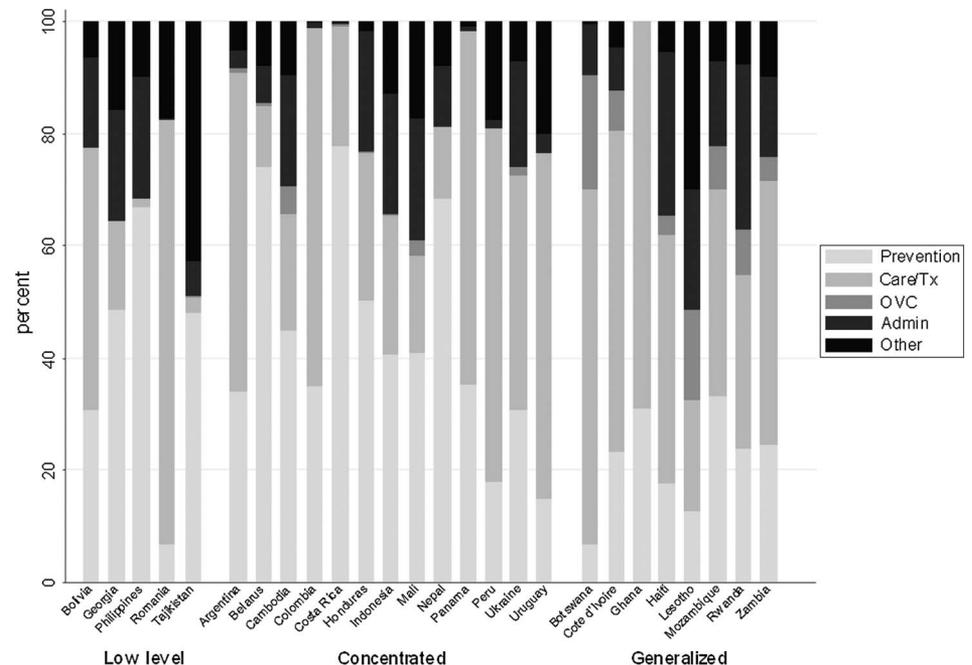


FIGURE 3. Allocation of HIV resources by country and type of epidemic.

epidemics, almost 7% among those with low-level epidemics and less than 6% in countries with concentrated epidemics, as shown in Figure 4. Most of the funds for programs targeting most-at-risk populations come from international sources.

DISCUSSION

HIV spending in low-income and middle-income countries has increased significantly in recent years, from US \$1.6 billion in 2001 to an estimated US \$13.8 billion in 2008. The total amount spent in the 50 countries analyzed here represents almost one third of the US \$8.9 billion available for HIV in low-income and middle-income countries in 2006.¹ This is the first report analyzing data on HIV spending from a large group of countries. Previous estimates of resources available had been derived from a few countries¹¹ and from individual country reports.^{12–18}

Funding from public and international sources has been essential to scale up HIV activities and, once accounted for and reported, serves as a concrete indication of national and international commitments to the HIV response. Accurate assessment of available and needed resource flows, and of the gap between the 2, is crucial to maintain adequate levels of funding and to achieve universal access to HIV prevention, treatment, care and support.

Although efforts are being made at country level to increase financing from public domestic sources and reduce current funding gaps, low-income countries rely heavily on external funding, whereas countries in higher income brackets spend more of their own resources. This raises the question of sustainability and whether low-income countries can rely indefinitely on international aid to pay for treatment programs.

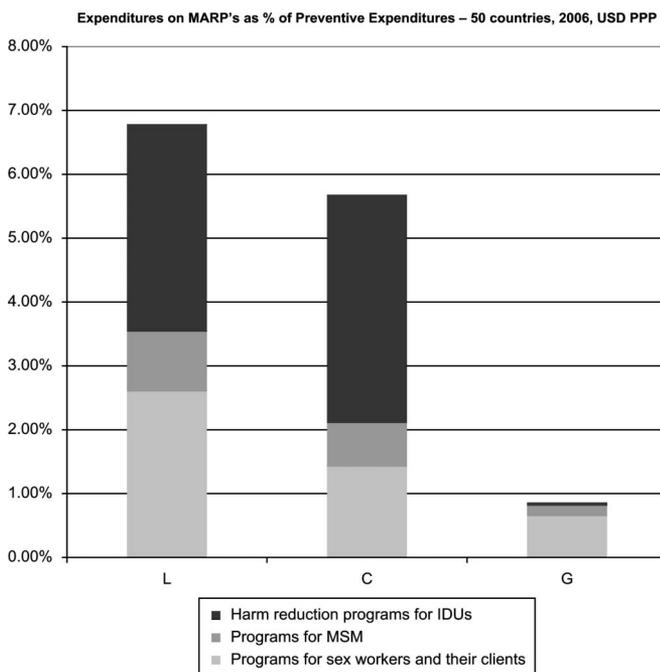


FIGURE 4. Percent of spending on programs directed at the populations most at risk for HIV, as a percentage of total prevention spending, by type of epidemic.

The global economic crisis is affecting countries differently, and their capacities to respond vary substantially.² However, national budgets are highly unlikely to increase substantially during the economic crisis. Among middle-income countries, the global economic crisis will impact the national economies mainly through lower investment leading to lower economic output and tax revenues, lower demand for exports, lower levels of remittance income and currency devaluation. For example, Argentina, Brazil and Russia self-finance their HIV programs. But as revenues fall and fiscal space diminishes, it is possible that social sector spending might be reduced. Social and political pressure will determine whether and to what extent that happens. For example, Brazil kept its commitment of providing free access to ART during and after its national monetary crisis in the late 1990s.

Countries with low-level epidemics spent an average IS 1.5 per capita on HIV and those with generalized epidemics spent IS 9.5 per capita. The observed spending can be compared with expected costing as reported by the National Strategic Plans or resource needs estimates. Annualized resource needs per capita by type of epidemic are an average IS 2.5 in countries with low-level epidemics and IS 18.7 in countries with generalized epidemics.¹⁹

We found a positive correlation between HIV prevalence and per capita spending, however, the allocation of resources seems to be unbalanced. According to the latest resource needs estimates published by UNAIDS,¹ about 45% of the total funds available should be invested in prevention interventions. Yet, in the 50 countries analyzed, prevention efforts were receiving about 20% of overall HIV expenditure. Expenditure patterns for countries with generalized epidemics did not differ from those with concentrated epidemics.

In many countries, treatment and care take the largest share of the funding, leaving prevention interventions underfunded. In addition, many countries where HIV infections are concentrated primarily among certain subpopulations still opt for broad prevention programs rather than targeted cost-effective interventions that are aimed at those most-at-risk populations. Overall, the amounts allocated to interventions for most-at-risk subpopulations are very low—less than 10% of total spending for prevention—and are largely financed from international resources. The exception is Eastern Europe, where countries spent a comparatively larger share of their available funds on HIV programs aimed at injecting drug users.

There also is a considerable mismatch between the burden of HIV in specific most-at-risk subpopulations and the allocation of prevention resources. For example, in Latin American countries (Argentina, Brazil, Colombia, Honduras, Panama, Peru and Uruguay), it is estimated that 60% of people living with HIV are men who have sex with men, but only 0.5% of the funds allocated for prevention interventions are targeted at this group.²⁰ The reasons for such trends vary, with stigma still seeming to play an important role. Poor epidemic surveillance systems and data are also a factor, along with political reticence and misunderstandings among policy-makers about how HIV epidemics evolve.

Resource allocations could be improved by conducting a thorough analysis of a country's epidemic to lay a firm basis for evidence-based decisions. Currently, NASA data show

clearly that most countries are not allocating their HIV resources in ways that are likely to achieve the greatest possible impact. There are several possible explanations for this. Governments often feel compelled to satisfy several different interest groups and might do so by designing multisectoral but unfocused strategies. Existing data are sometimes interpreted incorrectly or in contradictory ways, leading to inefficient use of resources. Poor planning and lack of political will are other possible factors.

This study is based on a secondary analysis and thus has some limitations. Country reports are often incomplete and present variable levels of measurement error. Expenditures are estimated from different sources of information and in some countries, there is a lack of comprehensive and routine expenditure records and accounting information systems. To increase reliability and reduce measurement error, all financial flows for the national HIV response were grouped in to 3 areas: finance, provision and consumption. Expenditures were reconciled from these 3 areas by triangulating the data. In addition, all transactions in the system were reconstructed and reconciled using both top-down and bottom-up approaches.

UNAIDS-led teams of health economists have improved and refined the substantive basis for estimates of financial needs, whilst also working closely with countries to generate reliable data through the NASA resource tracking methodology. Another approach to estimating the resources available for HIV infections uses budgetary analysis, and has been used in several African countries.²¹ Budgetary analysis is relatively easy to conduct using central level records, however, budgets do not represent a comprehensive account of all the resources consumed in HIV program activities.

Our analysis is limited to external and government sources of funding, neither of which include out of pocket or other private forms of household and business spending. Among low-income households, out of pocket spending is high on average and varies from 20%–80% of the total health expenditures.²² In most African countries, the health financing systems are too weak to protect households against health shocks. Thus, borrowing and selling assets to finance health care are common strategies.²³ It has been estimated that a person living with HIV in Kenya, for example, spends 11 times more out of pocket on health care than does the average Kenyan,²⁴ and in Zambia, such a person spends 8 times more out-of-pocket than the average national.²⁵ Anecdotal reports also suggest that a substantial amount of this money is spent on traditional medicines. As National Health Accounts demonstrate, poor countries and poor people most in need of protection against financial catastrophe tend to have the least protection in the form of prepayment or risk sharing.

Investment in HIV programs rose considerably in the 2000s. Service coverage has increased (although universal access has not yet been achieved), and there is evidence of positive effects on countries' health systems generally. In many countries, infrastructure (especially laboratory systems) has been strengthened, whereas primary health care services have improved in some places, although there are also some claims of negative effects.²⁶ Whether HIV spending has diverted resources from health systems or enhanced them is a rather contentious issue. The global health agenda is shifting

from an emphasis on disease-specific approaches to a focus on strengthening of health systems. These 2 approaches are often referred to as vertical and horizontal approaches to health improvement. A better balance needs to be struck between the 2 approaches, so that efforts at fighting specific diseases and strengthening health systems can support each other effectively.²⁷

The HIV epidemic has forced policy makers, health care professionals and users of the services to think differently about how services are financed, how resources are allocated, how health systems are structured, how services are delivered to patients and how the resulting activity is monitored and evaluated to improve the effectiveness, efficiency, equity, and acceptability of the response.²⁸

Many countries fail to devote adequate resources to address their national epidemics or chose not to implement evidence-based programming.²⁹ The global economic recession will force countries to rethink national strategies, especially in low-income countries with high aid dependency. Mapping HIV expenditures based on NASA can provide guidance for the reallocation of resources and support evidence-based decision making. More than ever, countries need to know their epidemic and both resource allocations and their HIV programs need to reflect those data and analyses. Use of the NASAs promotes transparency and enables countries to better understand the different financial dimensions of their response to HIV, both of which can help them to take effective action to manage and reverse their HIV epidemics.

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