

2013 Report on Costs of Treatment in the President's Emergency Plan for AIDS Relief (PEPFAR)

Background

The rapid expansion of access to antiretroviral treatment (ART) under PEPFAR has been one of the program's most significant achievements, reaching 5.1 million people by the end of Fiscal Year (FY) 2012. With this foundation, sustained funding, and new scientific evidence demonstrating the strong prevention effect of ART in reducing new infections, PEPFAR is on track to realize the new goals announced by President Obama on World AIDS Day 2011 of direct support for 6 million people by the end of 2013.

In addition to the direct benefit in lives saved, treatment provides striking indirect benefits. For every 1,000 persons supported on treatment for one year, PEPFAR estimates that it prevents 449 children from becoming orphans. Healthier people have a positive impact on their local economies; studies on agricultural workers in western Kenya and elsewhere in Africa have demonstrated a reversal of low productivity after HIV-infected workers are started on treatment.¹ Another recent study demonstrates that providing treatment to HIV-infected persons reduces their risk of transmission to their non-HIV-infected partners by 96%, thus adding prevention of new infections to the other proven benefits of treatment.²

Given ambitious goals and limited resources, understanding the costs of treatment programs is an essential step toward making the most of available funds and saving as many lives as possible. PEPFAR has prioritized the use of empirical data and analysis to understand treatment costs, their drivers, and how efficiencies can extend the impact of programs. PEPFAR has been at the forefront of driving the collection and use of these data for its own efforts, as well as supporting multilateral efforts to drive efficient programming.³ PEPFAR has experienced a striking decline in treatment costs over time, from over \$1100 per patient per year to approximately \$338. Central to this progress, and to the program's ongoing effort to drive costs even lower, is an explicit focus on ensuring optimal use of resources. The PEPFAR Impact and Efficiency Plan (IEAP) has made a critical contribution on multiple levels. One part of IEAP, the PEPFAR Expenditure Analysis Initiative (EA), was incorporated into routine reporting in nine of PEPFAR's highest investment countries in FY2012. In these countries, all entities receiving PEPFAR funds reported their expenditures by program, expense category, and geographic region. The analysis provides expenditure breakdowns and unit cost data per

¹ Thirumurthy H, J G-Z, M G (2008) The economic impact of AIDS treatment: labor supply in Western Kenya. *Journal of Human Resources* 43: 511–552.

² Cohen MS, Chen YQ, Mccauley M, et al. Prevention of hiv-1 infection with early antiretroviral therapy. *N ENGL J MED* 2011; 365:493-505

³ Holmes CB, Atun R, Avila C, Blandford JM. Expanding the generation and use of economic and financial data to improve HIV program planning and efficiency: a global perspective. *J Acquir Immune Defic Syndr*. 2011 Aug;57 Suppl 2:S104-8.

achievement, such as expenditure per person on ART. The analyses were provided to the PEPFAR country teams to use for budget and target projections, partner management. In addition, EA greatly facilitates joint planning with country governments and other donors to ensure coordinated efforts in the national treatment goals and all HIV programming. This pioneering activity in resource tracking will be expanded to eleven more countries in FY2013 and to all PEPFAR programs by FY2014. PEPFAR will continue to lead the global community in these efficiency initiatives and will expand EA and other innovations in order to save even more lives.

Methodology

Informing PEPFAR's estimates of treatment costs are data from several sources. Initially, PEPFAR evaluated the costs of providing comprehensive HIV treatment, which comprises all the elements of ART and associated supportive care, through a series of centrally-supported and country-initiated studies of treatment costs. Complementing these intensive studies are data gathered through newly implemented expenditure analysis activities and through tracking of current acquisition costs for antiretroviral drugs (ARVs).

PEPFAR initiated the intensive study of treatment costs in FY 2006 with the PEPFAR ART Costing Project, a centrally funded evaluation of programs in five countries. Findings from this study, which provides detail on facility-level costs, trends and program characteristics, have been published in three peer-reviewed publications.^{4,5,6} This effort has been expanded over time, incorporating data from 93 sites across eight countries, with new country-level studies currently underway or in planning in two additional countries. Augmenting PEPFAR's understanding of treatment costs is a series of completed and ongoing country-focused studies.

While these intensive studies represent a wide range of countries and service environments, they represent only a sample of PEPFAR-supported treatment activities and are best suited to understanding costs at the facility level. To complement these site-level studies, the PEPFAR expenditure analysis will provide more rapid cost

⁴ Menzies NA, Berruti AA, Berzon R, Filler S, Ferris R, Ellerbrock TV, Blandford JM. The cost of providing comprehensive HIV treatment in PEPFAR-supported programs. *AIDS*. 2011 Sep 10;25(14):1753-60.

⁵ Filler SJ, Berruti AA, Menzies N, Berzon R, Ellerbrock TV, Ferris R, Blandford JM. Characteristics of HIV care and treatment in PEPFAR-supported sites. *J Acquir Immune Defic Syndr*. 2011 May;57(1):e1-6.

⁶ Menzies NA, Berruti AA, Blandford JM. (2012) The Determinants of HIV Treatment Costs in Resource Limited Settings. *PLoS One*. 7(11):e48726. doi: 10.1371/journal.pone.0048726

estimates on a regular basis, capture developing trends in dynamic programs, and provide PEPFAR country teams with additional tools to identify and ensure efficient program implementation and management. In addition, PEPFAR actively collaborates with multilateral institutions such as the Global Fund, UNAIDS, and the World Bank to work towards stronger systems for tracking fiscal data and using these data for stronger programs that make maximal progress towards an AIDS-free generation.

Results

The chart below shows the estimated mean cost of treatment, per patient-year, to PEPFAR. These estimates are based on a sampling of PEPFAR-supported treatment sites across 12 countries and seek to capture all elements of support for treatment at the site level and above. Although the estimated mean total cost per patient year of treatment declined by 3.6% when all funding sources are included, the unit cost to PEPFAR is estimated to have increased by 0.8% (\$3) from the previous year. The increased cost to PEPFAR, despite declines in ARV prices, reflects the additional costs associated with PEPFAR's aggressive scale-up in low and lower-middle income countries in order to reach the World AIDS Days target of 6 million patients on treatment by the end of 2013. While the overall cost of treatment declined globally, PEPFAR's share of this cost increased marginally due to expanded services in those low-resource environments where PEPFAR bears a larger percentage of treatment costs compared to upper-middle income countries. The current model will be updated in 2013 when data from the expenditure analysis and other initiatives are available to quantify ongoing efficiency gains and project decreases in costs. Investments made by PEPFAR for scale up over the past year should also increase efficiency and reduce costs for future treatment support.

CATEGORY	MEAN COST TO PEPFAR
Treatment, all patients	\$338
Treatment, pediatric patients	\$391
Treatment, adult patients	\$332
Second-line patients	\$716
First-line patients	\$308
Patients in low and lower-middle income countries	\$441
Patients in upper-middle income countries	\$124

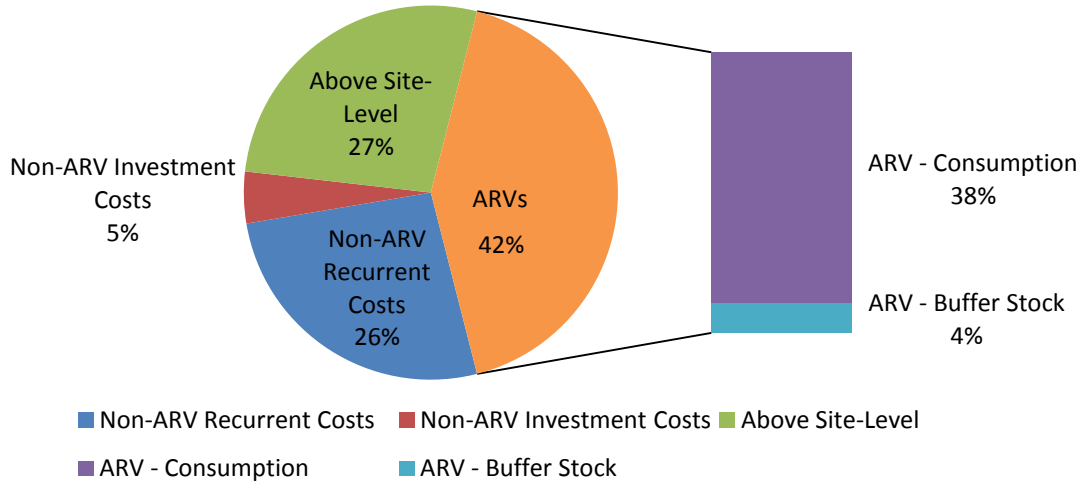
Elements of support for treatment

The estimated total mean cost per patient-year of treatment that is reported here represents the full cost of providing ART and supportive services in FY 2012, and includes all resources required to provide comprehensive treatment at and above the site level. These include:

- Antiretroviral drugs (ARVs) for patient treatment
- Non-ARV recurrent costs such as:
 - clinical staff salaries and benefits
 - laboratory and clinical supplies
 - non-ARV drugs for opportunistic infections
 - building utilities
 - travel
 - contracted services
- Investment (health system strengthening) costs such as:
 - ARV buffer stock (inventory) to support a reliable supply chain
 - building renovation & construction
 - laboratory and clinical equipment
 - in-service training of ART providers
- Program management and central support costs

With respect to these cost components and recognizing that there are other important sources of support for treatment—including the Global Fund, national and other multilateral partners—purchases of ARVs represent 42% of the annual cost of treatment to PEPFAR. Investment in ARV buffer stocks represents a significant share of total ARV costs and is necessary to avoid drug stock-outs that would lead to poor patient outcomes, especially during periods of rapid program scale-up. Non-ARV recurrent costs represent 26% of total ART expenditures, costs above the site level for program management and support represent nearly 27%, and non-ARV investment (health systems) costs other than buffer stocks account for 5%.

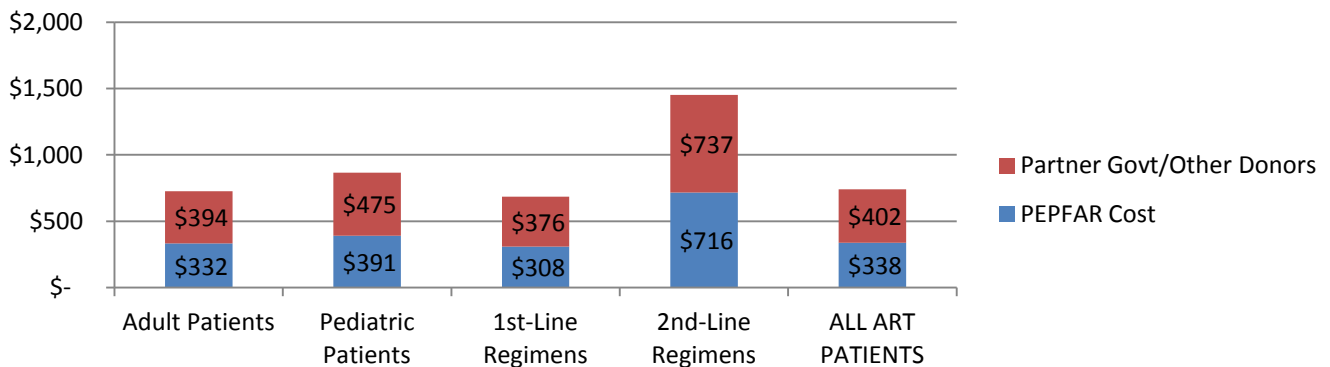
Share of ART Costs, by major cost component



Cost estimates

The estimated mean total cost per patient-year of treatment in the programs, including financial and in-kind contributions from all sources (including partner governments and other bilateral and multilateral donors), is \$740. Excluding the contributions of partner governments and other donors, **the estimated PEPFAR cost per patient-year of treatment is \$338.**

Total Per-Patient Cost, by patient type and source of support



Available data, and data-sharing agreements with partner governments and organizations, do not permit some breakouts of costs (e.g. urban and rural providers, or providers by country) at this time, though some additional breakouts may be possible in future years. However, other key cost breakouts are currently possible.

- The mean cost per patient-year of ART for **pediatric** patients is estimated at \$866, and **the PEPFAR share of these costs at \$391.**
- For an **adult** ART patient, the mean is estimated at \$726, and **the PEPFAR portion at \$332.**

A similar pattern is exhibited for patients receiving second-line ARVs, which typically include more branded formulations. These drugs are usually more expensive than first-line ARVs, although costs of second-line therapy are beginning to decline, partly due to the introduction of two FDA-tentatively-approved generic formulations of second-line drugs (lopinavir/ritonavir fixed-dose combination).

- The current total cost per-patient year for **second-line patients** (both adult and pediatric) is estimated at **\$1,453**, and **the PEPFAR share of these costs at \$716.**
- This may be compared with an estimated \$684 total annual cost for **first-line patients** (both adult and pediatric), and a **PEPFAR cost of \$308.**

The estimated cost per patient-year of treatment varies widely across individual patient settings, and reflects differences in program maturity and scale, as well as country settings.

- In **low-income and lower middle-income countries**,⁷ the mean cost per patient-year of treatment when taking into account all sources of support is \$642. **The PEPFAR cost for these patients is \$441.**
- In **upper middle-income countries**, the estimated mean cost from all sources of support is \$941 per patient-year of treatment. **The estimated PEPFAR cost is \$124**, reflecting the higher contribution by partner countries to the treatment program in these settings.

In terms of a comparison of PEPFAR's costs with those of other programs, there are not sufficient, comparable data to make a meaningful comparison possible. In this report, the estimated mean cost includes central support costs that occur above the level of

⁷ For these studies, economies are classified according to 2010 Gross National Income (GNI) per capita, calculated using the World Bank Atlas method. The World Bank classifies countries with per capita GNI of \$1,005 or less as 'low income,' and countries with per capita GNI of \$1,006 - \$3,975 as 'lower middle income,' (the former category includes inputs from Ethiopia, Uganda, Mozambique, Tanzania, and Rwanda; the latter includes data from Nigeria, Cote d'Ivoire, Vietnam, and Zambia). The World Bank classifies countries with per capita GNI of \$3,976 to \$12,275 as 'upper middle income,' (including data from Botswana, Namibia, and South Africa). Estimates for global mean costs and the USG share reflect weighting by the number of patients directly supported by PEPFAR that fall into each national income category.

service provision, including the resources required for national management of the program. Capturing these higher level support costs is a heightened emphasis in PEPFAR's second phase, in which country ownership and sustainability are critical. As the vast majority of patients supported on ART through PEPFAR receive services in the public sector, revenue streams from the partner government and individual donors contribute to the overall expenditures for ART.

Additionally, as PEPFAR has evolved from an emergency response to one focused on creating sustainable, country-owned programs, PEPFAR-supported treatment programs increasingly represent the efforts and resources of multiple partners, including partner governments and the Global Fund. A recent effort by an international partner to compare the costs of PEPFAR treatment sites and those of other donors proved challenging because nearly all sites PEPFAR supports are within partner countries' national systems and have multiple streams of resource inflows (for example, the government paying for infrastructure, the Global Fund buying ARVs, and PEPFAR paying for laboratory and health worker training). The implementers of this evaluation ultimately concluded that the comparison was no longer possible or useful. What is possible and useful is to understand cost drivers at the patient and program level. By focusing on these drivers, as described in this report, PEPFAR seeks to support the maximum number of persons on ART at minimum unit expenditure by strategically leveraging other donor contributions and building the capacity of partner nations to fund and manage ART services.

Conclusions

PEPFAR's success in driving down unit costs maximizes the impact of taxpayer dollars to save lives and represents an important development for the landscape of global health, and for development more broadly. Ongoing work within PEPFAR will utilize expenditure analysis and focused costing studies to continue to identify cost drivers and maximize the efficiency of programs in order to meet the new goal of supporting 6 million people on treatment. PEPFAR is currently the global leader in applying this type of analysis and is actively working with multilateral partners such as the Global Fund, the World Bank, UNAIDS, the Gates Foundation, and others to use these data as a basis for tracking expenditures in relation to outputs and ensuring maximal value for investment. For further information on PEPFAR's efforts to increase impact and efficiency, see <http://www.pepfar.gov/smart/index.htm> and <http://www.pepfar.gov/documents/organization/195700.pdf>.