

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

## **February 2012**

### **Background**

The rapid expansion of access to antiretroviral treatment (ART) under PEPFAR has been one of the program's most significant achievements, reaching 3.9 million people by the end of Fiscal Year (FY) 2011. With this foundation and new scientific evidence demonstrating the strong prevention effect of ART in reducing new infections, on World AIDS Day 2011, President Obama announced a new goal for PEPFAR of direct support for 6 million people by the end of 2013. The Administration also announced new goals for other combination prevention activities over the same timeframe.

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.<sup>1</sup> Finally, a recent study demonstrated that providing treatment to HIV-infected persons reduced 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.<sup>2</sup>

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 reach 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.<sup>3</sup> PEPFAR has experienced a striking historical decline in treatment costs over time, from over \$1100 per patient per year to approximately \$335. Central to this progress, and to the program's ongoing effort to drive costs still lower, is an explicit focus on ensuring optimal use of resources. The PEPFAR Impact and Efficiency Plan (IEAP) has made a critical contribution, as has the development of expenditure analysis (EA) systems that have been piloted in a number of countries and are being expanded to more. Despite pioneering successes in driving down treatment costs, PEPFAR is not resting on its laurels but pushing to do more, 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

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<sup>1</sup> 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.

<sup>2</sup> 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

<sup>3</sup> 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.

antiretroviral drugs (ARVs). These expenditure analyses provide more rapid, real-time cost estimates for program planning.

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 two peer-reviewed publications.<sup>4,5</sup> This effort has been expanded over time, incorporating data from 64 sites across seven countries, with new country-level studies currently underway or in planning in three additional countries. Augmenting PEPFAR’s understanding of treatment costs are 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, PEPFAR has developed and piloted expenditure analysis (EA) activities as a method to update cost estimates more rapidly. Completed in five countries over the last fiscal year, these analyses will begin to yield cross-program area cost data on a more 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. Standardization of tools and integration into routine PEPFAR reporting beginning in FY 2012 will provide data to define best value for investment strategies for PEPFAR at the global level.

The market for ARVs is dynamic and rapidly evolving, and accurately projecting resource needs depends critically on current and projected trends in drug prices and prescribing patterns. Thanks in large part to the efforts of PEPFAR’s Supply Chain Management System, programs have been able to obtain dramatic savings through increasing reliance on pooled procurement of low-cost, generic ARVs.<sup>6</sup> More information on this topic and the savings achieved through bulk procurement of generic ARVs is available in a peer-reviewed publication co-authored by Ambassador Eric Goosby, former Ambassador Mark Dybul, and others.<sup>7</sup>

## **Results**

CATEGORY	MEAN COST TO PEPFAR
Treatment, all patients	\$335
Treatment, pediatric patients	\$369
Treatment, adult patients	\$332
Second-line patients	\$816
First-line patients	\$305
Patients in lower-income countries	\$438
Patients in higher-income countries	\$139

<sup>4</sup> 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.

<sup>5</sup> 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.

<sup>6</sup> <http://www.pepfar.gov/documents/organization/105842.pdf>

<sup>7</sup> Holmes CB, Coggin W, Jamieson D, Mihm H, Granich R, Savio P, Hope M, Ryan C, Moloney-Kitts M, Goosby EP, Dybul M. Use of generic antiretroviral agents and cost savings in PEPFAR treatment programs. *JAMA*. 2010 Jul 21;304(3):313-20.

The chart above 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. The current cost of treatment per patient-year to PEPFAR is estimated to have declined 23% from the previous year. The decreased cost reflects both increased contributions from national partners in moderate-income settings as well as ongoing efficiency gains in programs.

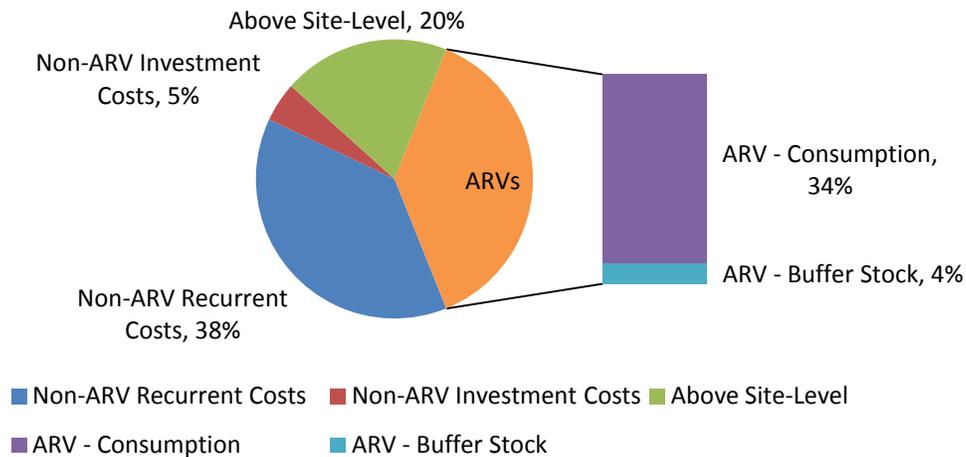
### **Elements of support for treatment**

The total mean per-patient cost of treatment reported here represents the full cost of providing ART and supportive services in FY 2011, 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:
  - building renovation and construction
  - laboratory and clinical equipment
  - in-service training of ART providers
  - ARV buffer stock (inventory) to support a reliable supply chain

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 38% 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 38% of total ART expenditures, costs above the site level for program management and support represent nearly 20%, and non-ARV investment (health systems) costs other than buffer stocks account for 5%.

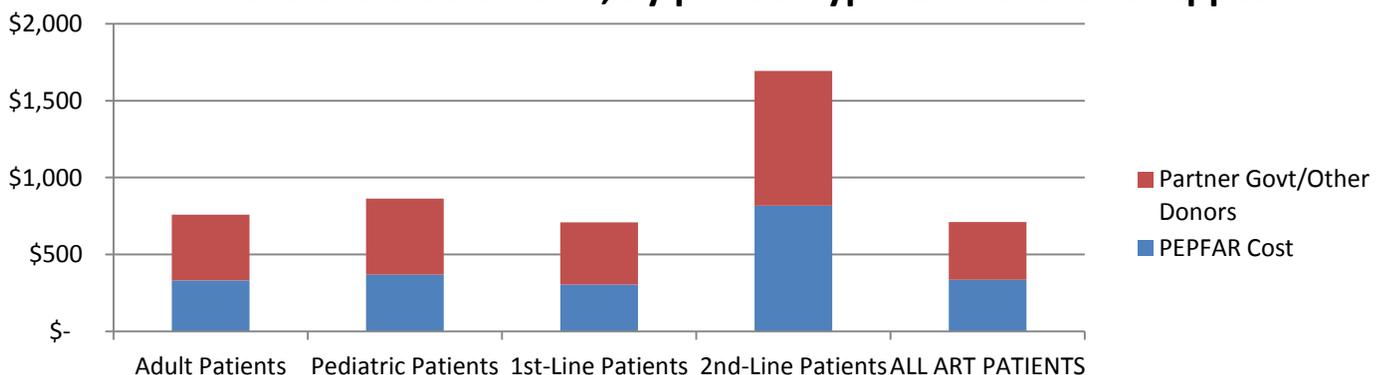
## Share of ART Costs, by major cost component



### 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 \$768. Excluding the contributions of partner governments and other donors, **the estimated PEPFAR cost per patient-year of treatment is \$335.**

## 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 \$863, and **the PEPFAR share of these costs at \$369.**
- For an **adult** ART patient, the mean is estimated at \$759, 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 with the introduction of two FDA-tentatively-approved generic formulations of second-line drugs (lopinavir/ritonavir fixed-dose combination), and new drug

combinations that are expected to enter the market in FY 2012.

- The current total cost per-patient year for **second-line patients** is estimated at **\$1,693**, and the **PEPFAR share of these costs at \$816**.
- This may be compared with an estimated \$708 total annual cost for **first-line patients**, and a **PEPFAR cost of \$305**.

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 **lower-income countries**,<sup>8</sup> the mean cost per patient-year of treatment when taking into account all sources of support is \$638. **The PEPFAR cost for these patients is \$438.**
- In **moderate-income countries**, the estimated mean cost from all sources of support is \$1,017 per patient-year of treatment. **The estimated PEPFAR cost is \$139**, reflecting the higher contribution to the treatment program by partner countries in these settings.

In terms of a comparison of PEPFAR's costs with those of other programs, there is 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 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.

Other international partners launched an effort to compare the costs of PEPFAR treatment sites and those of other donors. It was understood that this effort would be difficult 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). After working on this effort, those attempting it 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 in order to maximize the impact of taxpayer dollars to save lives represents an important development for the landscape of global health, and for development

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<sup>8</sup> For these studies, economies are classified according to 2009 Gross National Income (GNI) per capita, calculated using the World Bank Atlas method. 'Lower-income' includes what the World Bank classifies as 'low income,' with per capita GNI of \$995 or less, and 'lower middle income,' with per capita GNI of \$996 - \$3,945 (the former category includes inputs from Ethiopia, Uganda, Mozambique, Tanzania, Zambia and Rwanda; the latter includes data from Nigeria, Cote d'Ivoire, and Vietnam). For these studies, 'moderate-income' includes countries the World Bank classifies as 'upper middle income,' with per capita GNI of \$3,946 - \$12,195 (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.

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>.