



Financial resources required to achieve universal access to HIV prevention, treatment, care and support

Methodology for Care and Treatment Interventions

Draft
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Methodological Annex - III

Uniting the world against AIDS

Global Resource Needs Estimates for HIV/AIDS: Methodology for Care and Treatment Interventions

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Estimating the global resources needed for HIV/AIDS is an ongoing activity that began in 2001. Each subsequent round of estimates has aimed to improve the methods and figures by incorporating new data and methodologies with each cycle. The updating process also presents an opportunity to provide coordination, communication and agreement that would support the technical working groups in conducting estimates of HIV and AIDS resource needs.

In this most recent round, the methodology to estimate resources required for care and treatment has been revised. The new methodology contains six main categories of care and treatment interventions:

1. Antiretroviral therapy
2. Routine counselling and testing
3. Treatment and care of opportunistic infections
4. Essential illness prevention interventions for PLHIV
5. Nutrition supplements for those on ART
6. Incremental costs for ART patients with tuberculosis

The resources required for each category is the product of three variables: target population, unit cost, and coverage. The proposed definition for each of these variables is described for each category below.

Under the projected current Scale-up, coverage will grow by 675,000 per year. Coverage targets are based on two scenarios.

- In the first scenario, Universal Access by 2010 assumes 80% ART coverage; thus, people in need are identified three years before death in the absence of ART, which is the optimal time to commence ART.
- Phased scale-up, coverage will grow by 1 million patients per year to reach 10.5 million on ART by 2015.

Note that the previous category of *Palliative Care* has been subsumed under two other categories here: drug costs are now under treatment and care of opportunistic infections, and counselling costs are subsumed under essential illness prevention interventions.

A. Antiretroviral therapy(ART)

Target population: Estimates of those in need of ART are based on the methodology recommended by the UNAIDS Reference Group on Estimates, Modelling, and Projections (which are incorporated into the Spectrum model). This approach assumes that the median time from infection to need for treatment for adults is 8 years (7.5 for males and 8.5 for females). The median time from need for treatment to AIDS death in the absence of treatment is 3 years. For those on ART, survival for both first and second line therapy is estimated as 85% in the first year, and 95% each year thereafter.

Unit cost:

(1) Drugs: A weighted average of drug costs for four different first-line regimens and two different second-line regimens is used, weighted by the proportion of patients on each regimen.¹ Separate prices are available for low-income and middle-income countries. Drug costs for children are assumed to be equal to those for adults.

Drug unit cost (weighted average-US\$)	
	2006
Low-income	
1st line	\$221.84
2nd line	\$1,635.00
Middle-income	
1st line	\$249.84
2nd line	\$4,716.50

The cost of 1st line drugs for low-income countries is assumed to increase to US\$500 by 2015 (as efavirenz gradually replaces stavudine and nevirapine), and the cost of 2nd line drugs for low-income countries is assumed to decrease to US\$600 by 2015. The cost of both 1st and 2nd line drugs for middle-income countries is assumed to increase/decrease at the same rate as the cost for low-income countries. Further details of the calculations are available from the authors.

(2) Lab costs: Calculated as the annual median cost for lab tests across recent literature. Recent studies in various countries (Cote d'Ivoire, Ethiopia, Mexico, Nigeria, Rwanda, South Africa, Thailand, Zambia) are used as the basis.² The median cost is \$190.94 per patient per year.

¹ WHO, UNAIDS, UNICEF. Towards universal access: Scaling up priority HIV/AIDS interventions in the health sector, April 2007; F Renaud-Thery, BD Nguimfack, Current use of ARVs in selected Resource-Limited Countries, HIV/AIDS programme/WHO, presented at 15-16 February 2007 - Global Resource Needs Estimates Technical Working Group Meeting

² Goldie SJ, Yazdanpanah Y, Losina E, et al., "Cost-Effectiveness of HIV Treatment in Resource-Poor Settings - The Case of Cote d'Ivoire." NEJM 355;11(1141-1153); G Kombe, D Galaty, R Gadhia, C Decker. The Human and Financial Resource Requirements for Scaling Up HIV/AIDS Services in Ethiopia.

(3) Service delivery costs: Service delivery costs are based on a standard number of in-patient days and out-patient visits per patient per year and country specific costs for in-patient days and out-patient visits. The number of in-patient days is the median number of in-patient days for ART patients (1.56) from recent studies (the same studies as used for ART lab costs described above). The annual number of out-patient visits for ART patients (9.5) is the median of the same studies. The country-specific costs per in-patient day are the costs of one bed day at a primary-level hospital as reported in the WHO-CHOICE database of service delivery costs.³ The cost of an out-patient visit is for a 20-minute outpatient visit at a health centre, from the same WHO database. Representative regional costs are shown below.

Regional Service Delivery Costs for ART patients	Annual cost of Inpatient Days (ART patient)	Annual cost of Outpatient visits (ART patient)	Total annual service delivery cost (ART patient)
Sub-Saharan Africa	\$18.43	\$53.62	\$72.05
East Asia	\$36.48	\$64.36	\$100.84
Oceania	\$56.33	\$77.62	\$133.94
South and South-East Asia	\$29.20	\$64.77	\$93.98
Eastern Europe and Central Asia	\$52.07	\$71.82	\$123.89
Western and Central Europe	\$106.23	\$239.38	\$345.61
North Africa and Middle East	\$63.44	\$73.68	\$137.12
Caribbean	\$58.92	\$70.52	\$129.45
Latin America	\$59.34	\$72.91	\$132.25

B. Provider initiated counselling and testing

PHRPlus, Feb 2005 ; Bautista SA, Dmytraczenko T, Kombe G, Bertozzi SM. "Costing of HIV/AIDS Treatment in Mexico." PHRPlus report, June 2003; PHRPlus. Nigeria: Rapid Assessment of HIV/AIDS Care in the Public and Private Sectors. August 2004; Cleary SM, McIntyre D, Boule AM. "The cost-effectiveness of Antiretroviral Treatment in Khayelitsha, South Africa - a primary data analysis." Cost Eff Resource Alloc 2006, 4:20; Katajima T, Kobayashi, Y, Chaipah W, Sato H, Chadbunchachai W, Thuennadee R. "Costs of medical services for patients with HIV/AIDS in Khon Kaen, Thailand." AIDS 2003 Nov 7;17(16):2375-81; Chandler R, Decker C, Nziyige B. "Estimating the Cost of Providing Home-based Care for HIV/AIDS in Rwanda." PHRPlus paper June 2004; Kombe G, Smith O. "The Costs of Anti-Retroviral Treatment in Zambia." PHRPlus October 2003. Huddart J, Furth R, Lyons JV. "The Zambia Workforce Study: Preparing for Scale-up." April 2004; available at www.qaproject.org; Badri M, Maartens G, Mandalia S, Bekker LG, Penrod JR, et al. (2006) Cost-Effectiveness of Highly Active Antiretroviral Therapy in South Africa. PLoS Med 3(1): e4 doi:10.1371/journal.pmed.0030004.

³ Available at: <http://www.who.int/choice/costs/en/>.

Target population: Medical patients, calculated as the percentage of the population that both needed care and reported utilizing services using WHO World Health Surveys for all available countries. When country-level estimates are unavailable, regional medians are used. In addition, sex workers, MSM and IDU reached by outreach programs are targeted, as well as infants born to HIV positive mothers.

Unit cost: Identical to the country-level unit costs used for the VCT intervention in calculating costs for prevention.

C. Treatment and care of opportunistic infections

Target population: We assume that treatment and care of opportunistic infections is required the year leading up to dying from AIDS (either without ever having ART or after stopping ART), as well as for another year before beginning ART. Thus the target population is calculated from the Spectrum model outputs: number of AIDS deaths, and number of those newly-needing ART.

Unit cost:

(1) Drug/lab costs: US\$48.67 - Calculated as the annual median cost for drugs and lab tests across recent literature, based on several recent studies.⁴

(2) Service delivery costs: The product of the annual median number of inpatient days for OI patients (9.7) across recent literature⁵ and country-specific costs for one bed day at a primary-level hospital (WHO CHOICE database), and the annual median number of outpatient visits for OI patients (5.5) from recent literature and country-specific costs for one 20-minute outpatient visit at a health centre. Representative regional costs are shown below.

Regional Service Delivery Costs for OI patients	Annual cost of Inpatient Days (OI patient)	Annual cost of Outpatient visits (OI patient)	Total annual service delivery cost (OI patient)
Sub-Saharan Africa	\$114.57	\$30.90	\$145.48
East Asia	\$226.83	\$37.09	\$263.92
Oceania	\$350.23	\$44.73	\$394.96

⁴ Goldie SJ, Yazdanpanah Y, Losina E, et al., "Cost-Effectiveness of HIV Treatment in Resource-Poor Settings - The Case of Cote d'Ivoire." NEJM 355;11(1141-1153); Bautista SA, Dmytraczenko T, Kombe G, Bertozzi SM. "Costing of HIV/AIDS Treatment in Mexico." PHRPlus report, June 2003; P Vinard, B Nziyige, S Rugabirwa. Etude sur le cout de la prise en charge des PVVIH. Prejet Int/107 - Initiative ESTHER en collaboration avec la CNLS. Dec 04-Mar 05; Chandler R, Decker C, Nziyige B. "Estimating the Cost of Providing Home-based Care for HIV/AIDS in Rwanda." PHRPlus paper June 2004; Kombe G, Smith O. "The Costs of Anti-Retroviral Treatment in Zambia." PHRPlus October 2003. Huddart J, Furth R, Lyons JV. "The Zambia Workforce Study: Preparing for Scale-up." April 2004; available at www.qaproject.org.

South and South-East Asia	\$181.59	\$37.33	\$218.92
Eastern Europe and Central Asia	\$323.74	\$41.39	\$365.13
Western and Central Europe	\$660.51	\$137.96	\$798.47
North Africa and Middle East	\$394.44	\$42.46	\$436.91
Caribbean	\$366.39	\$40.64	\$407.03
Latin America	\$368.98	\$42.02	\$411.00

D. Essential illness prevention interventions for PLHIV: (Based on WHO, “Guidelines on Essential Prevention Interventions for Adults and Adolescents Living with HIV infection in Resource-Limited Settings,” DRAFT, January 31, 2007, and consultation with WHO experts)

(1) OI Prophylaxis

Target population: All identified PLHIV except no prophylaxis is provided if the person is on ART

Unit cost:

Prophylaxis dosage are taken from WHO, “Antiretroviral Therapy for HIV Infection in Adults and Adolescents in Resource-Limited Settings: Towards Universal Access,” 2006 revision, and prices are from UNICEF, UNAIDS, WHO, MSF Project, “Sources and prices of selected medicines and diagnostics for people living with HIV/AIDS,” June 2005. Service delivery costs are assumed to be covered in other visits.

Drugs included are:

- Cotrimoxazole (US\$6.57)
- Isoniazid (US\$0.70)

(2) Counseling (safe sex, treatment adherence, family planning, STI): 3 times the country-specific cost per 20 minute visit at a health centre (from WHO CHOICE database).

The median costs by region are shown below:

Region	Median Cost for Counseling Per Person (US\$)
Sub-Saharan Africa	16.93
East Asia	20.32
Oceania	24.51
South and South-East Asia	20.45
Eastern Europe and Central Asia	22.68
Western and Central Europe	75.59
North Africa and Middle East	23.27
Caribbean	22.27
Latin America	23.02

(3) STI screening

Target population: All identified PLHIV each year.

Unit cost: The cost of the screening for PLHIV is assumed to include the cost of one health center visit of 20 minutes duration, and the cost of one rapid syphilis test (\$0.74), the average of the costs reported in P Vickerman et al., “Modelling the cost-effectiveness of introducing rapid syphilis tests into an antenatal syphilis screening programme in Mwanza, Tanzania,” *Sexually Transmitted Infections* 2006;82(suppl_5):v38-v43. We assume that treatment costs are included under the STI treatment prevention intervention cost.

E. Nutrition supplements

Target population: Those newly receiving ART and malnourished.⁶ Assume that supplementation is for six months.

Unit cost: Country-level costs provided by country experts at various workshops. When a country-level cost is unavailable, a regional median cost is used. The median costs by region are shown below:

Nutrition costs	Per Person Per Year
Sub-Saharan Africa	\$73.97
East Asia and the Pacific	\$268.33
South and South-east Asia	\$45.00
Eastern Europe	\$54.59

F. Incremental costs for ART patients with tuberculosis

Target population: ART patients with active tuberculosis

Unit cost: Six months of drugs (separately for males/females) as specified in: WHO, “Antiretroviral Therapy for HIV Infection in Adults and Adolescents in Resource-Limited Settings: Towards Universal Access,” 2006 revision.

- Males: Substitute efavirenz for nevirapine in regimen for six months – difference in cost is US\$74.00 in low-income countries, and US\$144.50 in middle-income countries.
- Females: Substitute abacovir for nevirapine in regimen for six months – difference in cost is \$1.02 per pill, twice daily = US\$372.30.

⁶ “Malnourished” is defined as prevalence of undernourishment, and is taken from the World Development Indicators online database, available at:

<http://web.worldbank.org/WBSITE/EXTERNAL/DATASTATISTICS/0,,contentMDK:20398986~menuPK:64133163~pagePK:64133150~piPK:64133175~theSitePK:239419,00.html> ,