

10 best resources in . . . cost analysis for HIV/AIDS programmes in low and middle income countries

LORNA GUINNESS,¹ RUTH LEVINE² AND MARCIA WEAVER³

¹Health Policy Unit, London School of Hygiene and Tropical Medicine, London, UK, ²Center for Health Education and Research and ³Department of Health Services, University of Washington, Seattle, USA

Cost analysis is a powerful tool; programmes can use the data to develop realistic budgets, calculate the most efficient use of resources, and understand the demands of scale-up or replication. To provide programme managers and decision-makers with a guide to costing in HIV/AIDS, we review the best resources in this area.

A *cost analysis* identifies all *inputs* or resources that a programme uses and their costs. A *cost-effectiveness analysis* goes one step further, measuring the impact a programme has on the HIV/AIDS epidemic relative to its cost (see HIV InSite website). Programme planners can use these findings to make informed decisions about how and where to channel resources. For detailed information on costing methodology, we recommend **Costing guidelines for HIV prevention strategies** (Kumaranayake et al. 2000, for UNAIDS) and for templates to help guide data collection, we refer you to online worksheets on the UNAIDS website.

Only a handful of published HIV/AIDS cost studies exist outside of sub-Saharan Africa, and even within sub-Saharan Africa, there are few studies relative to the many existing interventions. In line with much of the literature, we have classified the evidence according to the level of impact of the costs: (1) provider, (2) patient, and (3) national or international. The best place to keep track of such studies is at the website of the International AIDS Economics Network.

Costs of providing HIV/AIDS interventions

Prevention

Summaries of the evidence on total and average costs of HIV prevention strategies in low-income countries are contained in three important literature reviews of cost and cost-effectiveness analyses. The useful analysis by Kumaranayake and Watts, **Economic costs of HIV/AIDS prevention activities in sub-Saharan Africa**¹, compiles and standardizes estimates of the average cost of service per person per intervention associated with implementing 10 different types of prevention interventions.

To compare the cost-effectiveness of HIV/AIDS strategies with different outcomes such as prevention and care, a measure of outcome that is common to all is required, for example, improvement in health status. In **Cost-effectiveness of HIV/AIDS interventions in Africa**², Creese et al. used the

measure of Disability Adjusted Life Years (DALYs) gained in their meta-analysis of the cost-effectiveness of HIV/AIDS interventions in sub-Saharan Africa. They reviewed 24 cost-effectiveness studies to present the average costs and estimate the cost per HIV infection averted and cost per DALY gained. These findings are useful for beginning the process of prioritizing funding for interventions. A similar review by Walker, **Cost and cost-effectiveness of HIV/AIDS prevention strategies in developing countries**³, expands the evidence base to include Asia and Eastern Europe. Both reviews of the evidence on cost-effectiveness were hampered by the lack of existing studies and standardization across these studies. In conjunction with the review from Kumaranayake and Watts¹, these studies identify the difficulties of costing out particular HIV/AIDS prevention strategies and a major information gap in the current knowledge on costs of HIV/AIDS strategies.

Aside from costing and cost-effectiveness analysis, cost-benefit analysis has been used less frequently in the economic evaluation of HIV/AIDS programmes. In **Paying to waste lives: the affordability of reducing mother-to-child transmission of HIV in South Africa**⁴, Skordis and Natrass used this technique to assess the affordability of preventing mother-to-child transmission (PMTCT) of HIV in South Africa by comparing the costs and benefits of two antiretroviral (ARV) regimens to the cost of no intervention, and found a potential net benefit for the South African Ministry of Health to provide short-course ARV regimens (Zidovudine or Nevirapine) to pregnant women nationally.

Highly Active Anti-Retroviral Therapy (HAART)

Although increasing numbers of governments and NGOs are delivering HAART, there are still few studies that explore the full costs of implementation. Creese et al.² find that delivery of HAART (drug costs only) dramatically exceeds the cost-effectiveness ratio threshold for essential services in low-income countries, as recommended by the World Bank. Partners for Health Reform^{plus} (PHR^{plus}) is working on the costing of care and support, including HAART delivery, in a number of low and middle income countries. These analyses show a marked increase in the average annual cost per patient in Mexico after the initiation of triple therapy, primarily due to the cost of ARVs, and highlight the human resource deficits facing the Zambian health system as it aims to scale up antiretroviral therapy (ART).

Care

Whether receiving HAART or not, hospital- and home-based care are critical elements of care for persons living with HIV/AIDS (PLHA). Hospitals need to know what kind of care HIV-infected patients are receiving in their facilities and the associated costs to evaluate the level of care, strategize about more efficient methods of delivery, anticipate future budgetary needs, or judge if care is affordable. However, the evidence base is limited. The costs of scaling up care and support by NGOs are explicitly examined by **YRG CARE**⁵ in Chennai, India. Researchers found that the NGO was working below capacity, and that by taking on a greater number of clients, the average cost of services to the provider could be reduced. This change in the average cost is an important factor to note when estimating resource requirements for service expansion.

In **Costs of hospital care for HIV-positive and HIV-negative patients at Kenyatta National Hospital, Nairobi, Kenya**⁶, Guinness et al. compare the costs of anonymously tested medical ward patients. They found little difference by HIV status in the mean cost of treating patients at a time when specialized HIV services were unavailable. When looking at a country where specialized care was available, Hansen et al., in **The costs of HIV/AIDS care at government hospitals in Zimbabwe**⁷, used patient records to identify potential AIDS patients in government hospitals in Zimbabwe. They found, in contrast, that the cost of care for HIV-infected persons at government hospitals in Zimbabwe was almost twice that of HIV-negative individuals. This was due to longer periods of hospitalization and the availability and use of more specialized care.

Health system costs of providing home-based care for persons living with AIDS (PLAs) in the last month of life in South Africa were analyzed by Uys and Hensher in **The cost of home-based terminal care for people with AIDS in South Africa**⁸. The total combined cost to the home-based care provider, primary care clinics and hospitals would be US\$21.5 million in 2001 and US\$50.8 million by 2010. When compared with national spending levels the programme is considered affordable, but this is highly sensitive to the degree to which home-based care can be a substitute for hospital care – a shift of 10% of patients from home-based care to hospital care increases annual costs to US\$67 million by 2010.

Patient costs and equity

A societal perspective is included in Guinness et al.'s study of hospital care by examining the costs of care to the patients.⁶ In this case, researchers found that the majority of patients, 268 out of 344, paid for their own health care charges entirely out-of-pocket, calling into question the affordability of acquiring care. This cost burden on patients raises issues around equity and access to health care services, as does a *PHRplus* analysis of expenditures on HIV/AIDS care in Rwanda and the **YRG CARE**⁵ study which found that

lower-income households with a PLHA were spending up to 82% of their income on treatment and medical services.

Cost analysis at the national and global levels

At the macro-level, cost studies can help track and assess the impact of funds and also provide information for estimation of future resource requirements. National HIV/AIDS accounts provide a way to identify all government-based funding streams and the many recipients, including other government agencies, public hospitals, health care providers, HIV/AIDS organizations, and the private sector. Once the initial map has been charted, governments can then ascertain the adequacy of funds and determine if populations are being underserved or not served at all.

National HIV/AIDS accounts highlight the interplay of public and private funding, and the role of external donors and lenders by generating figures for national HIV/AIDS expenditures, total HIV/AIDS expenditures per capita, the distribution of total HIV/AIDS expenditures to prevention and care strategies, and total expenditures on antiretroviral drugs. Such analyses have been carried out in Brazil, Guatemala, Honduras, Mexico and Uruguay as well as Rwanda. The latter, which revealed striking inequities in the quality of HIV/AIDS care, was carried out in collaboration with the Rwandan Ministry of Health in 1998, and the methodology used is documented on the *PHRplus* website.

To estimate global resource requirements for HIV/AIDS, studies by Schwartländer (**Resource needs for HIV/AIDS**⁹) and the Commission on Macroeconomics and Health (**Macroeconomics and Health: Investing in Health for Economic Development**¹⁰) used evidence on costs from around the world to project the level of resources required to scale up HIV/AIDS programmes globally. Schwartländer⁹ estimated that in 2005 US\$9.2 billion annually would be needed to fund HIV prevention, care and support programmes in 135 low and middle income countries, with allocation varying by region, HIV prevalence rate, and balance of prevention versus care and support initiatives. The Commission on Macroeconomics and Health¹⁰ estimated the cost of scaling up HIV prevention and care programmes in 83 countries by 2007 at US\$14 billion. This study took into account the investment needed in infrastructure to achieve different levels of coverage and estimated that the annual incremental cost of HIV prevention in 2007 would be US\$6 billion, HIV care US\$3 billion, and HIV treatment US\$5 billion.

Conclusion

Cost analysis of HIV/AIDS programmes is still in its infancy. Compared to the thousands of interventions that are in motion, only a handful of individual programme cost analyses exist. The tide is shifting though, and more people are becoming aware of the benefits and multiple uses of costing studies. As the number of studies based on standardized methodology increase, programme planners at all levels

Box 1. Prevention or treatment: the cost-effectiveness debate

Using cost-effectiveness analysis in prioritizing HIV/AIDS interventions has always produced a stir among policy-makers. In 1999, the World Bank emphasized that as 'the future of the epidemic lies in those that are not yet infected', policy should focus on prevention. In 2002, Marseille et al. took this controversial position forward and advocated HIV prevention, palliative care and treatment of opportunistic infections over HAART in sub-Saharan Africa, based on available cost-effectiveness data and the severe under-funding of international AIDS initiatives. In their analysis, Marseille and colleagues found that for every life-year gained through HAART, prevention interventions accounted for 28 life-years gained.

Piot et al. argued that this approach did not take into account the vast negative impact, in sub-Saharan Africa, of having 28 million HIV-positive persons in a society. Providing HAART would increase quality of life, reduce demand on the health system, promote the health of families and young dependents, preserve the economy, and buoy up the faltering work sector. Piot and colleagues argue treatment must be offered in conjunction with prevention. A book edited by the Agence Nationale de Recherches sur le Sida provides an economic argument to support this view.

Like Marseille, Creese et al. also found that the majority of HIV prevention approaches were more cost-effective than treatment interventions. However, the review highlights the need for transparency in decision-making and better information on the costs and effects of different combinations of interventions in various settings.

Agence Nationale de Recherches sur le Sida. 2003. *Economics of AIDS and access to HIV/AIDS care in developing countries: issues and challenges*. ANRS. [<http://www.iaen.org>]

Creese A, Floyd K, Alban A, Guinness L. 2002. Cost-effectiveness of HIV/AIDS interventions in Africa: A systematic review of the evidence. *The Lancet* 359: 1635–42.

Marseille E, Hofmann PB, Kahn JG. 2002. HIV prevention before HAART in sub-Saharan Africa. *The Lancet* 359: 1851–6.

Piot P, Zewdie D, Türmen T. 2002. Correspondence: HIV/AIDS prevention and treatment. *The Lancet* 360: 86–7.

World Bank. 1999. *Confronting AIDS. Public priorities in a global epidemic*. New York: Oxford University Press for the World Bank.

will have better information on what interventions cost, their impact on HIV transmission, and the trade-offs of particular strategies. Using guidelines and tracking the current state of knowledge is vital to improve costing for transparency and informed decision-making. These references should help any analyst to do so.

Websites

International AIDS Economics Network [<http://www.iaen.org>]

UNAIDS [<http://www.unaids.org>]

Partners for Health Reform *plus* [<http://www.phrplus.org/hiv.html>]

HIV InSite [<http://hivinsite.ucsf.edu/InSite?page=kb-08-01-04>]

Guidelines and worksheets

Kumaranayake L, Pepperall J, Goodman H, Mills A, Walker D. 2000. *Costing guidelines for HIV prevention strategies*. Best Practice Collection. Geneva: UNAIDS. [<http://www.unaids.org/publications/documents/economics/costeffec/Costingguidelines.pdf>]. Accessed 12 February 2004.

Readings

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(7) Hansen K, Chapman G, Chitsike I, Kasilo O, Mwaluko G. 2000. The costs of HIV/AIDS care at government

hospitals in Zimbabwe. *Health Policy and Planning* **15**: 432–40.

(8) Uys L, Hensher M. 2002. The cost of home-based terminal care for people with AIDS in South Africa. *South African Medical Journal* **92**: 624–8.

(9) Schwartländer B, Stover J, Walker N et al. 2001. Resource needs for HIV/AIDS. *Science* **292**: 2434–6.

(10) Macroeconomics and Health: Investing in Health for Economic Development. 2001. Report of the Commission on Macroeconomics and Health. World Health Organization. [<http://www.cid.harvard.edu/cidcmh/CMHReport.pdf>]. Accessed 12 February 2004.

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Biographies

Lorna Guinness, MSc in Health Policy and Planning, is a Wellcome Trust research fellow at the London School of Hygiene and Tropical Medicine, UK, working on the economics of HIV/AIDS interventions.

Ruth Levine, MA in journalism, is a technical writer and research consultant at the Center for Health Education and Research at the University of Washington. She currently works with the International Training and Education Center on HIV (I-TECH).

Marcia Weaver, PhD is a Research Associate Professor in the Department of Health Services at the University of Washington. She is an economist who currently works with the Seattle site of the HIV/AIDS Treatment Adherence, Health Outcomes and Cost Study, and is a consultant to the International Training Center on HIV (I-TECH).

Correspondence: Lorna Guinness, Research Fellow, Health Policy Unit, London School of Hygiene and Tropical Medicine, Keppel Street, London WC1E 7HT, UK. Tel: +44 20 7927 2008; Fax: +44 20 7637 5391; Email: lorna.guinness@lshtm.ac.uk