PROGRAMME REVIEW
Health economics and systems

Highlights

- Intermediate analysis of HIV's economic impact across Southern African firms in the absence of ART showed impacts varying from 0.1% – 6.7% of payroll.
- Results from the cost and cost effectiveness study of the new post sexual assault health care guidelines in South Africa were found to be extremely useful by the National Department of Health and were written up in reports, presentations and journal articles.
- Participation in the steering committee of an international conference on cost benefit and cost effectiveness analysis of HIV/AIDS interventions.
- Substantial progress made in the economic evaluation of ART implementation among the AngloGold Ashanti workforce. The cost of providing treatment shows substantial declines over a two and a half year period followed by small increases with increasing numbers of patients changing to a second line treatment. Substantial economic savings occur from reduced absenteeism and health care utilisation and these are higher in employees starting treatment earlier.

Overview

The work conducted by the Health Economics and Systems Programme complements much of the research conducted by the Aurum Institute.

The aim of the programme is to continuously review and evaluate health systems and programmes in both public and private sectors to help ensure that health care is provided efficiently and equitably to improve the lives of individuals, communities and society as a whole. To this end, economic theory is used to better understand the health issues and the methods, processes and systems utilised in improving public health. More specifically we:

- Economically evaluate health care interventions and new technologies for both public and private sectors.
- Conduct major disease impact assessments in households, communities, government and the private sector.
- Develop monitoring systems for and evaluate both public and private health care systems and policies to comment on and assist with overall health systems development.
- Ensure that research results feed into decision-making and policy through effective engagement with all stakeholders.

Review of progress – 2006

In 2006 the programme had four projects, three continuing and one new project for that year.

Economic analysis of antiretroviral therapy implementation for HIV-infected employees in a large workplace programme.

This project seeks to quantify the economic costs and savings associated with employees accessing antiretroviral treatment (ART) from an employer-provider perspective. With a number of the participating companies providing their own health services, this project provides an ideal opportunity to quantify a variety of costs and savings that may be expected to arise from ART including:

- health care costs associated with treatment provision and treatment of side effects contrasted with health care savings from decreasing need for hospital outpatient and inpatient care.
- productivity costs including those associated with absenteeism, productivity at work and labour turnover.

We compare models of hospital, clinic and GP based delivery by investigating determinants of variation in programme costs and cost effectiveness.

Information arising can be useful for public sector programmes to indicate the extent to which the general burden to the State might

be alleviated by individuals having good access to the public sector ART programme. This information is otherwise hard to follow up in the public sector setting where individuals access a variety of healthcare providers, making the quantification of utilisation and cost declines more difficult. Productivity costs are also harder to follow up where ART recipients may work in a number of environments.

There are many varied aspects to this project. Human resource time quantifications for the delivery of ART in different settings are made using direct observation time and motion studies, time diaries and retrospective provider recall. This contributes positively to debates on the human resource skills mix required for scaled-up treatment access in South Africa. Resources used to treat side effects are measured for patients on differing treatment regimens and both private and public sector costs are applied to these to comment on the additional cost that treating side effects might add to any antiretroviral programme. Labour productivity improvements that might be attributable to HIV/AIDS treatment versus a range of other important influences are investigated in selected workplaces through the analysis of data provided in a multilevel modelling framework.

Treatment delivery costs, side effects, health care utilisation and productivity information has been collected over a five-year period for over 3,000 individuals accessing the employer sponsored ART programme across 25 differing delivery sites. To date the average cost of treatment provision per patient per month on treatment across programme sites has declined over the first two and a half years of implementation, but thereafter has shown small increases. This is largely due to increasing numbers of patients changing to second line therapies with the associated increases in laboratory monitoring, drug cost and patient visit time. Figure 1 shows this trend and the main contributors to cost of treatment provision over time (excluding side effect treatment and health care utilisation declines).

Absenteeism declined significantly among employees on treatment, with substantial additional savings being recorded as a result of patients with higher initial CD4 counts starting treatment. Figure 2 shows these trends and includes absenteeism for those that drop off the treatment programme but remain in the employ of participating companies.

For employees leaving the workforce through death or ill health retirement (or any other reason) their absenteeism is included post treatment up to the point of separation from the workforce. This is to avoid bias that might arise from including individuals only reaching two years on treatment successfully.

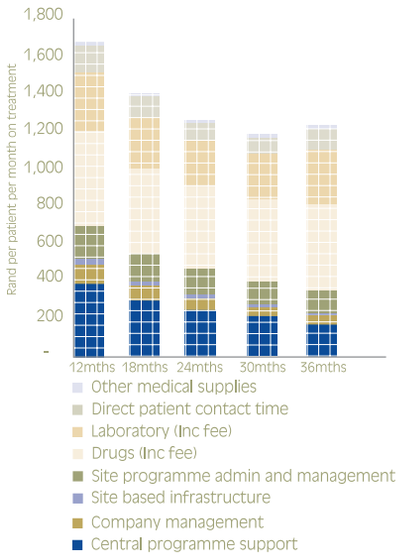
While an increase in the CD4 count is the main driver, levels of absenteeism among patients on ART are also influenced by the labour intensity of the job, the cost of absence to the worker and any TB episode in the year prior to starting treatment (regardless of CD4).

The final analysis of the information obtained to date will be released in mid-2007.

The economic cost of untreated HIV/AIDS across nine Southern African firms

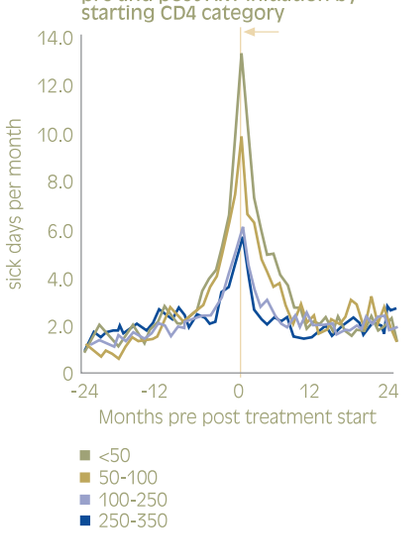
This is a four year project funded by GlaxoSmithKline. This project aims to provide an evidence-based assessment of the cost of HIV/AIDS to participating companies under a no antiretroviral treatment scenario. A consistent approach is taken across firms to aid the comparison and aggregation of results. Human resource costs, including employee recruitment benefits, recruitment, training and management costs, are quantified, as are health care costs, which include medical aid costs and the direct provision of health care. Productivity costs (which are a function of absenteeism), lowered productivity at work and labour turnover are assessed as well as the economic costs of company-provided HIV prevention, care and support programmes (excluding ART).

Figure 1: Trends in average direct cost of treatment provision per patient per month on treatment



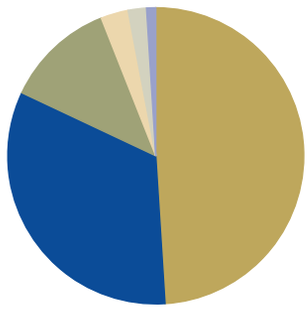
Source: Muirhead D, Kumaranayake L, Charalambous S et al (2007) Determinants of costs of private sector antiretroviral implementation in South Africa – 4 years experience of a large workplace programme. AIDS (forthcoming).

Figure 2: Trends in absence pre and post ART initiation by starting CD4 category



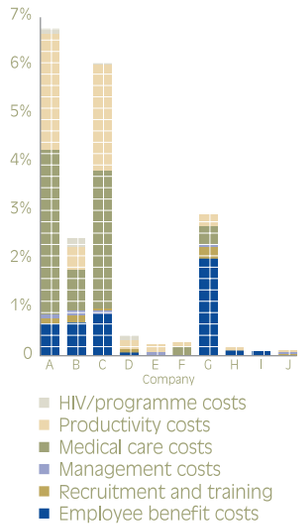
Source: Muirhead D, Kumaranayake L, Rice N (2007) Exploring the impact of HIV/AIDS and its treatment on individual worker, team and firm level productivity in South Africa. Presentation to the International Health Economics Association Conference. Copenhagen. 2007.

Figure 3: Percentage breakdown of HIV economic impact across 9 firms



Source Van Zyl A, Muirhead D, Kumaranayake L et al (2007) Determinants of labour cost of HIV/AIDS in Southern African firms. Presentation to the International Health Economics Association Conference, Copenhagen. 2007.

Figure 4: Components of total economic impact as a percentage of payroll across participating firms



Source Van Zyl A, Muirhead D, Kumaranayake L et al (2007) Determinants of labour cost of HIV/AIDS in Southern African firms. Presentation to the International Health Economics Association Conference. Copenhagen. 2007.

A prevalence and incidence costing approach is taken. The former provides estimates of total economic cost of untreated HIV/AIDS on an annual basis and cost as a percentage of payroll and annual turnover to aid in cross company comparison. The latter provides the present value of the cost associated with one newly infected employee over the course of his working life. The incident cost provides the employer with a meaningful comparison of the cost of an employee accessing ART to that of an HIV positive employee who does not receive ART.

A cost model of HIV impact to firms under differing programme availability scenarios including VCT, wellness (excluding ART) and wellness (including ART) is being designed through collaboration with mathematical epidemiologists and modellers at the London School of Hygiene and Tropical Medicine. This model will make best use of the data provided across the participating companies and will be made publicly available through Internet access with accompanying guides.

Data has been collected and analysed across nine firms over a three year period. Weighted average impact as a percentage of payroll amounted to just over 5% across the firms (range = 0.1% – 6.7%). The average incident cost of an HIV infection in the workforce amounted to six times the annual salary of the same level of employee (with a range from half to seven times annual salary).

Figure 3 shows the percentage contribution of differing cost types to total HIV economic impact across these nine firms and Figure 4 shows the total economic impact as a percentage of payroll in each of the participating firms and its breakdown by major cost category.

Understanding these costs is important in establishing a baseline against which to compare ART intervention programmes in the medium term, and to show just what it costs a business for an HIV-positive employee to remain untreated.

Safeguarding Soweto and Masiphumelele households – doctor versus nurse-based provision of ART – a CIPRA project

The Aurum Health Economics Programme is undertaking the economic evaluation component of an NIH-funded, randomised household study of doctor- versus trained nurse-based delivery of ART. The study is a collaborative project among a range of research groups primarily the Wits Health Consortium and the Desmond Tutu HIV Research Unit of the University of Cape Town, and is one of five projects covered under a broader NIH-CIPRA grant. The study is being conducted in Soweto, Johannesburg and Masiphumelele, Cape Town. Households are allocated to either the trained nurse- or doctor-based ART delivery programme by randomising the first household member presenting to the study (the index patient). The economic evaluation will compare the relative cost effectiveness of the approaches from a societal perspective. The economic study therefore quantifies each model of delivery for:

- costs of providing ART including, staff time, programme infrastructure and monitoring and expert clinical support, all drugs and laboratory tests, and the treatment of side effects.
- costs and savings to the patient and his/her household from being on antiretroviral treatment, including indirect costs/savings related to patient and household member's time, expenditure changes and travel costs.
- life years gained through the construction of a Markov model modelling progression from end-of-follow-up CD4 and viral load values.
- quality of life at differing periods after starting ART using a modified version of the quality-of-well-being (QWB) scale.
- quality adjusted life years through the application of utility values attached to health states measured in the QWB above.

- patient preferences for delivery models of ART through the conduct of a discrete choice exercise with a sample of patients from both study arms.

Both household costs and quality of life are measured prospectively through questionnaires administered by trained treatment counsellor interview in the respondents preferred language at differing periods post ART start. These questionnaires are double entered into a purpose designed database. Costs of health care utilisation and provision are calculated through data collected on the case report form and transferred into a database through Datafax with patient records followed from participating hospitals for the costing of inpatient and outpatient care. Patient preferences will be quantified through a discrete choices exercise on a sample of participants in 2007/08. Final cost effectiveness analysis and reporting is expected in late 2008.

Calculating the expected value of information from new TB diagnostics – the FIND project.

The Foundation for Innovative New Diagnostics (FIND) is funding a study running alongside Aurum's broader Thibela TB prevention study to investigate the most efficient diagnostic pathways for sputum negative TB cases. The economic analysis will be framed as an expected value for information model (a type of cost effectiveness study specifically applied to diagnostic information) from a provider perspective comparing MIGIT versus LJ culture based protocols, with and without the addition of the new rapid MPB64 test. This project began in the second half of 2006 and will run for two years.

The Aurum Health Economics Programme has also recently completed projects on gender based violence and HIV, an important area of work that we intend to continue in the future.

In addition to the projects detailed above, Aurum Health Economics Programme staff have been involved in a number of local and international research dissemination and skills development initiatives. These included being part of the steering committee for an international conference on cost benefit and cost effectiveness analysis of HIV/AIDS interventions in low income settings hosted by the Harvard School of Public Health's Harvard AIDS Institute in Boston in September 2006. The publication of a special AIDS supplement of research conducted by delegates at the conference is expected in late 2007.

Challenges

Health economics is a scarce skill in South Africa and this poses challenges in both attracting and retaining staff. In 2006, a number of staff left the programme, compounding the challenges in terms of workload for remaining staff, knowledge retention and recruitment. However, two new members of staff have joined us, one with a Masters in Economics and one about to complete a Masters in Public Health (with modules in health economics).

A key challenge remains finding the balance between providing operational support to a number of key stakeholders, particularly in HIV/AIDS reporting and information management, on the one hand, and completing research analyses and outputs on the other. Both are essential to decision making, both in South Africa and more broadly.

Future plans and opportunities

2007 will bring additional new projects on the economic analysis of both TB and HIV prevention and care activities in workplace settings, and an extension of our HIV impact assessment programme to firms in higher skilled sectors of the labour market. The Aurum Health Economics Programme will continue to aim to speak to Aurum's broader health care and research programme. To this end, proposals to complete health economics studies alongside two of Aurum's biggest programmes are also intended for 2007. The focus will be on efficiency and equity issues in public-private mix arrangements.

In all the work we do, we aim to address the priorities of the South African government and produce information and outputs useful to policy and decision makers and to government processes.

While this expanding work programme is important, a key area of focus in health economics for 2007 is the analysis and writing up of the work done over the past four years, particularly two of our major projects, the AngloGold Ashanti ART economic evaluation programme and a cross-firm economic cost assessment of untreated HIV/AIDS.

Capacity building in health economics is a priority. We are pleased to report that internally we have one team member completing a PhD with another planning to commence a PhD. Another team member is completing a Masters degree, one is planning to undertake a Graduate Diploma in Health Economics and two others are in the process of reading for a Bachelor of Commerce in Economics. By encouraging these study efforts, we aim to assist in addressing the scarcity of health economics skills in South Africa.