Sub-Saharan Africa • South Africa

Aspen Pharmacare

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Sector • Health
Enterprise Class • Southern MNC
Summary

In a conservative investment climate, Stephen Saad saw opportunity, and in a reparative health policy environment, he saw need. The opportunity: to build a major pharmaceutical manufacturer capable of supplying the South African market with brand name, generic and over-the-counter medicines at affordable prices. The need: to supply South Africans with the essential medicines required for the treatment of life-threatening diseases such as HIV/AIDS, tuberculosis and malaria.

Through a series of well-planned deals and calculated risks, the greatest being the 2.4 billion rand (US$340 million) acquisition of SA Druggists, Saad turned Aspen Pharmacare into the largest producer of tablets and capsules in Africa. By building the largest manufacturing plant in the country, Saad put Aspen Pharmacare in a position to supply South Africa’s national anti-retroviral treatment programme with approximately 60 percent of its current requirements.

Five and a half million South Africans are infected with HIV/AIDS, and more than 837,000 individuals urgently require access to life-prolonging antiretroviral medicines (ARVs). As is well-known, the national government could be doing more: only an estimated 21 percent of people living with the human immunodeficiency virus (HIV) who require antiretroviral treatment (ART) have access to such treatment in public clinics and hospitals.\(^1\) Unless the roll-out of the national ART programme expands significantly, 3.5 million South Africans will, according to current projections, die of AIDS-related infections by 2010.\(^2\)

The South African Government has started to move in the right direction. In 2004, it initiated a long-anticipated, free national antiretroviral treatment (ART) programme for its HIV-infected population.\(^3\) However, delays in the implementation of the ART programme have

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2 On the actuarial science that grounds such projections, see Bureau for Economic Research The Impact of HIV/AIDS on Selected Business Sectors in South Africa, 2005 (Stellenbosch University October 2005) 11-12, citing Rob Dorington and estimates projected by the Actuarial Association of South Africa (ASSA2002) Model. Dorington states: “By 2010, despite interventions and treatments, we estimate that nearly 3.5 million South Africans will have died of HIV/AIDS related causes.” Available at www.assa.co.za. Until recently, South Africa held the dubious distinction of having the largest number of individuals currently living with the virus in a single country. See Joint WHO/UNAIDS Fact Sheet N°283 (January 2005). India now holds that position. South Africa must also confront a growing tuberculosis (TB) epidemic, including multi-drug and extreme drug resistant TB. Indeed, TB and HIV co-infection is complicating treatment for both diseases. See Médecins Sans Frontières (MSF) “The TB/HIV Time Bomb: A Dual Epidemic Explodes in South Africa” available at www.msf.org.

been widespread. In March 2004, the South African Department of Health, pressed by the threat of legal action by national activist organizations, declared that they would need to purchase an emergency supply of antiretrovirals (ARVs) as a stop-gap measure until the formal public sector tender process for drug procurement was concluded. In May 2004, despite the emergency supply, drug shortages continued to be well-documented. Commentators observed that the South African Government was in the unenviable position of possessing “some generic medicines — sitting with the Medicines Control Council [South African equivalent of the US Federal Drug Administration] for more than a year awaiting registration”— while still being obliged “to purchase [ARVs] from brand name sources” at substantially higher prices.4

As the South African Department of Health has acknowledged, the solution to this dire situation—a free, sustainable, universal ART programme—depends upon both lower drug prices and an uninterrupted local supply of ARVs. Companies such as Aspen Pharmacare have recognized that the Government’s best hope for meeting public health needs over the long-term term rests on the state’s ability to nurture the country’s nascent generics industry (such an industry could also supply drugs to other African countries at affordable prices). While observing that the creation of such an industry posed an immense challenge for both governments and big business, The Economist magazine noted that Aspen Pharmacare provides a model for local generic firms and is currently “doing the most to supply the market with... generic drugs.”5

Unequal Access to Medicines

The health revolution in industrialized countries over the last 30 years can be measured in increased life expectancy—an additional four months over each calendar year6—as the near-eradication of treatable diseases such as malaria and tuberculosis (TB). However, the majority of the world’s population (80 percent) resides in the developing world, and they have not enjoyed the benefits of the health revolution. For example, a girl born today in Sierra Leone can expect to live almost 50 fewer years than a girl born in Japan,7 and children in Southern Africa now have a shorter life expectancy than their grandparents.8 To make matters

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4 “Antiretroviral Sources of Supply May not be Able to Meet Popular Demand’ available at www.redribbon.co.za.
worse, many people in the developing world fall ill and die from diseases for which available treatments exist.9

The Millennium Development Goals (MDGs) recognize that there is a gap in life expectancy rates between the developing and developed world, in part, because of access to essential medicines to treat an array of preventable and treatable diseases. Millennium Development Goal 8, Target 17 is “[to] provide access to affordable drugs in developing countries... in cooperation with pharmaceutical companies”.10 Millennium Development Goal 6 takes specific aim at combating HIV/AIDS, malaria and other diseases.

Access to essential medicines for HIV/AIDS, in particular, should lead to a decrease in morbidity and mortality rates in the developing world. But as Jim Yong Kim, the former director of the HIV/AIDS Division at WHO, warns: “Expanding AIDS treatment is the most complex public health challenge the world has ever faced.”11 How, given the complexity of the problem, are governments, international organizations, civil society and pharmaceutical companies to engineer a significant reversal in current health outcomes?

Recent developments in the southern hemisphere suggest that public private partnerships of varying kinds can create sustainable ART programmes in developing countries. With appropriate government incentives, voluntary licenses and technology transfers from multinationals, generic pharmaceutical manufacturers located in developing countries could become low-cost producers of the life-extending drugs that HIV-infected individuals require. Indeed, Aspen Pharmacare has, with some support from the South African Government, followed this model. Aspen has been so successful that it is not hard to imagine that the company could soon possess a meaningful comparative advantage as a producer of ARVs and leverage that advantage to become a supplier of low-cost pharmaceuticals to HIV-infected individuals throughout the African continent. Aspen faces a number of sizable hurdles before it achieves such a goal.
Aspen Pharmacare Company Profile

Stephen Saad, the CEO of Aspen Pharmacare, is a pharmaceutical entrepreneur. At the age of 29, he sold his shares in the pharmaceutical group, Covan Zurich, to Adcock Ingram for 20 million rands (US$2.85 million). Saad did not rest on his laurels— or his capital. In 1997, the trio of Saad, current Aspen Deputy CEO Gus Attridge and Steve Surlese created Aspen. It began as a small business, in the port city of Durban, worth approximately 50 million rands (US$7 million). Based on a series of weighted risks, including taking on 2.5 million rands (US$350,000) in debt to grow the company, Saad identified a number of niche opportunities for Aspen.

The greatest risk, however, was Aspen’s hostile 1999 takeover of the underperforming yet heavyweight SA Druggists. The price tag was 2.4 billion rands (US$340 million). Based upon its short but successful track record, Aspen was able to raise the necessary capital from investors. A skeptical market assumed that Aspen would simply strip the company of its assets, and they were not far from the mark. As Saad admits: “One of the plans we had was to sell off the manufacturing business. But I realised we would be selling the heart and lungs.”

Instead, Aspen sold off SA Druggists’ non-core operations and invested more heavily in pharmaceutical manufacturing. It made significant investments in new facilities, while upgrading existing pharmaceutical manufacturing sites: four in South Africa and one in India. These sites house a total of nine manufacturing facilities (a tenth plant is in the pipeline). One of these manufacturing plants, in Port Elizabeth, is both the largest on the African continent and the leading producer of tablets and capsules in Africa.

Growing at an average rate of 40 percent per year, the company quickly established itself as a leading South African drug company. In August 2005, the Aspen Group announced annual revenues of 2.9 billion rands (US$467 million) and net profits of 494 million rands (US$75 million). Although the pharmaceutical industry is highly regulated and has high barriers to entry, SA Druggists’ credibility with doctors and pharmacists and its well-established brands offset these potential costs of doing business. Interview with Stavros Nicolaou, 15 December 2006


13 The Aspen company background is also based on interviews with Stavros Nicolaou (Aspen Pharmacare), 28 February 2006; 19 July 2006; and, 15 December 2006.

14 Aspen first developed a brand name based upon the quality and the affordability of its products. The Group’s product line extends from branded, generic, over-the-counter, fast moving consumer goods, to personal care, nutritional and nutriceutical products: penicillin, oral contraceptives, hormonals, fast-moving consumer goods (FMCG), complementary medicines, cosmetics, capsules, creams, ointments, lotions, powders, liquids and tinctures.
million). Aspen’s success correlates with an increase in the production of— and the demand for— generic medicines.

**Generic Drugs and Voluntary License**

A generic drug is a pharmaceutical product that is usually intended to be interchangeable with an innovator product (a proprietary or brand name product). It is generally, but not always, manufactured without a license from the innovator company. It is generally, but not always, marketed after the patent on the original product expires. More importantly for our purposes: generic drugs are much cheaper to purchase than branded drugs.

The use of generic drugs offers one possible solution to the problem of access to medicines for the treatment of HIV/AIDS and an array of other intractable infectious and tropical diseases in developing countries. As WHO explains, “Because of their low price, generic drugs are often the only medicines that the poorest can access. The Trade-Related Aspects of Intellectual Property Rights (TRIPS) agreement does not prevent governments from requiring accurate labelling or allowing generic substitution. Indeed, it is argued that competition between drug companies and generic producers has been more effective than negotiations with drug companies in reducing the cost of drugs, in particular those used to treat HIV/AIDS.”

The South African Department of Trade and Industry recognized these benefits and introduced a Strategic Investment Programme (SIP) to induce Aspen to invest R200 million (US$28.5 million) in a manufacturing facility in Port Elizabeth capable of producing— amongst other medicines— significant amounts of generic ARVs. On the back of that investment, and the ‘promise’ of a mass ART programme in South Africa, Aspen has secured voluntary licenses from a significant number of multinational patent-holders to produce a broad array of ARVs.

These voluntary license agreements contain, as a rule, zero to five percent royalty charges, backward technology transfers and assistance with respect to both the manufacture and the distribution of the pharmaceutical. GlaxoSmithKline, which has signed seven voluntary licensing agreements for ARVs in Africa, five in South Africa and two in Kenya, outlines the pharmaceutical company’s perspective on voluntary licenses as follows:

> Voluntary licences (VL) enable local manufacturers to produce and sell generic versions of our products. A decision to grant a VL depends on a number of factors including the severity of the HIV/AIDS epidemic in that country, local healthcare provision and the economic and manufacturing environment... Selecting the most appropriate licensee is key. We need to be sure that the manufacturer will be able to provide a long-term supply of good-quality...

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medicines and will implement safeguards to prevent the diversion of medicines to wealthier markets.\textsuperscript{18}

One might well wonder why a multinational pharmaceutical company would agree to “give away” its patented processes for the manufacture of drug that continues to be extremely profitable. However, a genuine financial interest attaches to well-enforced voluntary licenses and makes them highly attractive to pharmaceutical companies. The licenses ensure better resource allocation in the markets where pharmaceutical companies derive the better part of their profits: Europe, North America and parts of Asia. Voluntary licenses eliminate the production and the marketing of high-cost drugs in regions that will show little or no meaningful profit. At the same time, the voluntary license eliminates the need for multinationals— and various states— to police the grey markets in drugs that inevitably occur when purchasers of brand name pharmaceuticals in developing countries who benefit from differential pricing attempt to resell the brand name product in markets in the developed world. Voluntary licenses to generic manufacturers in developing countries eliminate such arbitrage and safeguard more lucrative markets.

The ultimate benefits of voluntary licenses are shared. In 2001, before South African companies started producing ARV generics, the cost of ARVs to the patient was more than 3,000 rands per month (US$428). Today, Aspen Pharmacare can supply triple combination therapy to the South African government at 90 rands (US$13) per patient, per month.\textsuperscript{19}

\textbf{Access to Medicines through Voluntary Licenses not Litigation}

The access to and supply of low-cost generic medicines is a political battle— not just a problem of resource allocation to be solved by market efficiencies. It is fiercely contested on national and international fronts. A brief history of this charged environment further reflects Aspen’s remarkable achievements.

\textsuperscript{18} GSK (GlaxoSmithKline) Corporate Social Responsibility Report 2005.

In 2001, the Government of the Republic of South Africa was at loggerheads with foreign multinational and local pharmaceutical companies over patent rights. The dispute ultimately took the form of a lawsuit by the Pharmaceutical Manufacturers’ Association of South Africa—filed on behalf of 39 drug companies—to prevent the Medicines and Related Substances Control Amendment Act (Medicines Act) from taking effect. The applicants contended that the Medicines Act contravened both the South African Constitution and the TRIPS Agreement. The basis of their complaint was that the Act granted the Minister of Health unlimited discretion to ignore the country’s patent laws. Shortly after the trial began in March 2001, it became clear that the section of the Medicines Act at the center of the dispute was modeled on a draft legal text prepared by the World Intellectual Property Organization (WIPO) Committee of Experts. Given WIPO’s involvement and WIPO’s role in TRIPS enforcement, it became impossible for the drug companies to argue that the Medicines Act violated TRIPS. In April 2001, due to their weak legal position and the strong international support for South Africa’s attempt to provide cheaper medicines to meet a public health epidemic, the companies dropped the suit. While the suit ultimately set no legal precedent, the outcome tilted the balance of power back, ever so slightly, toward the developing countries’ rights to access essential medicines.

By 2002, with the price of ARV drugs still unaffordable for the majority of South Africans, the Treatment Action Campaign (TAC) lodged a complaint with the Competition Tribunal. The complaint asserted that a proposed merger between Glaxo Wellcome and Smithkline Beecham would so increase the new company’s South African market share as to inevitably lead to monopoly-like prices for a significant number of ARVs. The Competition Tribunal rejected this contention. The Tribunal’s concerns were largely allayed by the agreement of the merging parties to issue voluntary licenses for several drugs: antiemetic Kytril, anti-viral Famciclovir and antibiotics Polysporin, Cicatrin and Neosporin. In the settlement agreements with Boehringer Ingelheim and GlaxoSmithKline (GSK), several existing voluntary licensing agreements with Aspen for ARVs were given extended reach. The licenses permitted both the production and the sale of nevirapine, AZT and lamivudine (commonly known as 3TC) within South Africa and for export to 47 countries in Africa for a royalty of no more than five percent of net sales. By signing these voluntary licenses, both GSK and Boehringer Ingelheim had agreed not to seek enforcement of their patents on the

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21 Case No 4183/98 (Witwatersrand High Court, filed 18 February 1998).
24 See Glaxo Wellcome and Smithkline Beecham v Competition Commission Case No 58/AM/May (28 July 2000).
25 See Hazel Tau Competition Commission Case No 2002 Sep 226.
African continent. These agreements demonstrated that voluntary licenses could— in the right environment— be profitably exploited in the service of a free, universal ART programme for the treatment of HIV/AIDS.

From the authors’ perspective, these ongoing legal disputes between the South African government, civil society and the pharmaceutical manufacturers mask the manner in which voluntary licenses from established multinationals to existing local generic manufacturers defy traditional notions of how development objectives should be attained. Instead, they demonstrate the potential for businesses to meet significant development and public health challenges while still achieving a profit. For example, Aspen Pharmacare is currently producing significant amounts of first and second line ARVs, as well as multi-drug resistant (MDR) tuberculosis drugs under voluntary licenses with Eli Lilly, GlaxoSmithKline, Gilead Sciences, Boehringer Ingelheim, Bristol-Myers Squibb, F. Hoffmann-La Roche Ltd., and Merck Sharpe & Dohme. As the public record demonstrates, Aspen alone has voluntary licenses to produce the following 13 TB and HIV/AIDS drugs: Nevirapine, Efavirenz (Stocrin), Atazanavir, Tenofovir, Tenofovir+Emcitrabine (a combination drug), Lamivudine (3TC), Zidovudine, Lamivudine+Zidovudine, Stavudine, Didanosine, Saquinavir, Capreomycin and Cycloserine. Aspen has recently reached agreement on additional voluntary licenses.

These agreements are not aberrations: 93 percent of Aspen’s requests for voluntary licenses have been granted. Given the growing TB epidemic in South Africa, the specter of multi-drug and extreme drug resistant TB, and the complications associated with the treatment of HIV and TB co-infection, the recent manufacturing, supply and distribution agreement between Aspen and Lupin Ltd of India to produce first and second line TB drugs complements Aspen’s aforementioned voluntary licenses for ARVs.

Aspen now has 11 AIDS drugs in its collection, and it expects that number to grow. In March 2005, Aspen announced that it had increased its AIDS drugs production by 30 percent.

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26 The brand name in South Africa is Stocrin; in Europe and other locations it is Sustiva.
27 Interview with Stavros Nicolaou, 19 July 2006.
28 See “Big Boost for Fight against TB” Fin24, 26 September 2005.
29 Aspen’s success has not gone unnoticed. Aspen was the world’s first pharmaceutical manufacturer to be granted US Food and Drug Administration (FDA) approval for the manufacture of co-packed generic anti-retrovirals (ARVs) manufactured at its world class oral solid dose (OSD) facility. The Clinton Foundation chose Aspen as the first company in the southern hemisphere to manufacture generic ARVs for their programme. It did so, as Stavros Nicolaou notes, because it was impressed by the manner in
since late 2004 to cope with demand. While about 50 percent of Aspen’s local AIDS drugs sales were to the private sector, Saad predicted significant increases in public sector volumes as more government clinics and hospitals started treating patients.

Aspen also anticipates significant growth across the continent: Nigeria and Uganda have already placed orders. However, regulatory hurdles in African countries delayed PEPFAR orders. Indeed, Aspen Senior Executive and Head of Strategic Trade, Stavros Nicolaou, cautioned that “supplying both African governments and PEPFAR projects is still in its infancy” and that many of the Aspen generics are still in the process of being registered in the various African countries.

Barriers to Long-Term Success

Aspen’s first challenge is to convince the South African government that tax relief and investments should be continued. As things stand, the discontinuation of the Strategic Incentive Programme places a question mark over the state’s commitment to the creation of a viable generics industry in South Africa. Aspen’s second challenge involves increasing production in a way that meets current demand for the full set of first and second line ARVs. Aspen’s third challenge—a marker of its success—is the presence of new competitors who threaten the company’s market share. Amongst Aspen’s chief local competitors in the ARV generics market are Adcock-Ingram, Sonke Pharmaceuticals (Pty) Ltd. and Cipla-Medpro, a joint venture between Cipla Ltd of India and Medpro Pharmaceutica, a South African generic pharmaceutical company. Adcock Ingram, a South African subsidiary of Tiger Brands, and the second largest generics’ producer in the country, plans to enter the ARV market with a unique single tablet, triple-combination therapy. However, according to some analysts,
economies of scale, partnerships with northern multinational pharmaceutical companies, a market for generic drugs in sub-Saharan Africa, FDA approval and black empowerment initiatives\(^{35}\) (an absolute imperative for doing business in post-apartheid South Africa) suggest that Aspen has a good chance of remaining the market leader.\(^{36}\)

Aspen’s fourth challenge— and a challenge to all generic ARV manufacturers— is to ensure ongoing access to the active pharmaceutical ingredients (APIs) necessary to produce ARVs. As we have documented elsewhere, most generic manufacturers are currently dependent upon generic manufacturers of APIs in India, China and other countries in Asia.\(^{37}\) Should the epidemic become a national health priority in India or China— India already has the largest number of persons living with HIV/AIDS in the world— domestic demand for APIs may exhaust the existing supply. Generic manufacturers from other nations would be left out in the cold. Aspen has attempted to insulate itself from the vagaries of API availability by purchasing the largest fine chemicals manufacturer in South Africa and by initiating joint ventures with two Indian manufacturers of APIs: Lupin and Matrix.\(^{38}\)

Aspen’s fifth challenge is to negotiate the uncertainty surrounding the enforcement of international and domestic intellectual property regimes. Thus far, Aspen has avoided confrontation with both governments and multinationals by securing voluntary licenses and tech transfers for the better part of its ARV product line. However, IP and especially TRIPS-related questions hover over the generic APIs produced by India and China. For example, now that India has passed IP legislation intended to make the nation TRIPS-compliant, non-Indian manufacturers must ask whether their access to Indian APIs will be deleteriously affected. Aspen’s cooperative approach to its relationships with both government and multinationals should serve it well in future negotiations.

*Given that the HIV and Aids pandemic is widespread globally and expected to grow in the next five to ten years, there is clearly a viable market for ARV drugs, which will be volume driven. Worldwide there are about 40 million people currently infected with the virus. There are 25.4 million people infected in sub-Saharan Africa, with six million of these residing within our borders. Adcock Ingram aims to be a key player in the ARV market…. [and] plans to formulate and strengthen key relationships and partnerships, to facilitate entry into the ARV market, are being implemented.*

Available at www.tigerbrands.co.za/Investor/InvestorCentre/2005Results/AnnualReport/downloads/pdf

35 Aspen chose not to close its factories under Saad’s leadership but instead expanded manufacturing from 30 percent into 100 percent of its core business. This decision flowed in large part from consultation with and cooperation from the trade unions. Indeed, the trade unions now hold almost 17 percent of Aspen’s shares. Aspen’s new manufacturing operations, in particular its new plant in Port Elizabeth, are responsible for the creation of approximately 1,400 new jobs in the Eastern Cape (one of South Africa’s poorest provinces.)

36 Financial Mail op cit, p. 38.


38 Stavros Nicolaou states that these joint ventures create a *strategic stockpile* of APIs for Aspen. Interview with Stavros Nicolaou (Aspen Pharmacare), 15 December 2006.
Innovation and Replicability

This analysis of Aspen Pharmacare reveals at least five potentially replicable and unquestionably innovative business responses to the problem of providing affordable ARVs, as part of a sustainable national ART programme, in a developing country. First, Aspen recognized that the costs of building a large-scale manufacturing plant would be more than off-set by the profits to be secured from the public demand and the private demand for ARVs in South Africa and on the rest of the continent. Second, Aspen convinced the State to provide various forms of incentives to build a plant sufficiently large enough to meet South Africa’s growing need for affordable, generic ARVs. Third, Aspen’s ability to negotiate voluntary licenses with multinational drug companies allows drugs under patent to be distributed at significantly reduced prices and should enable the state to reach a larger number of individuals with HIV/AIDS. Fourth, Aspen’s knack for securing voluntary licenses avoids putting South Africa in the politically uncomfortable position of breaking foreign patents and the legally undesirable position of weakening the state’s own intellectual property regime. Fifth, Aspen’s joint ventures with Indian generic manufacturers Matrix and Lupin provides some assurance it will continue to possess an uninterrupted supply of the active pharmaceutical ingredients (APIs) required to manufacture ARVs.

A DFID study of generic pharmaceutical companies suggests that Aspen’s business model could be replicated in other developing countries with the requisite levels of infrastructure, access to active pharmaceutical ingredients, skilled human capital, existing manufacturing plants and appropriate government incentives. It must be noted that many African countries do not yet possess those necessary features. The DFID study also supports the claim that South Africa requires a state-sponsored, socio-industrial policy that will create additional incentives for private investment in infrastructure, manufacturing and advanced training.

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39 See DFID’s Leveraging the Private Sector for Public Health Objectives (2004). The DFID study, which was particularly concerned with domestic production in sub-Saharan Africa, concentrated on the following factors: quality; geographical accessibility; physical availability; acceptability; affordability; the feasibility of domestic production of medicines to combat TB and malaria, as well as HIV/AIDS; government strategy and the domestic market.
References


Case No 4183/98. Witwatersrand High Court. Filed 18 February 1998.


Case No 2002 Sep 226. Hazel Tau Competition Commission.


Smart, Theo. “Antiretroviral Sources of Supply May not be Able to Meet Popular Demand.” Available at www.redribbon.co.za.


**Interviews**

Ten personal interviews with Aspen Pharmacare, Government officials, the CSIR and individuals from the University of KwaZulu-Natal, the University of the Witwatersran, and Ashira Consulting.
Appendix A: Aspen’s Financial Highlights 2006

<table>
<thead>
<tr>
<th>Category</th>
<th>2006</th>
<th>2005</th>
<th>Percentage Change</th>
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<td><strong>Revenue</strong></td>
<td>R3,449 billion</td>
<td>R2,815 billion</td>
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<tr>
<td><strong>Normalised earnings per share</strong></td>
<td>182 cents</td>
<td>138 cents</td>
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<tr>
<td><strong>Distribution per share</strong></td>
<td>62 cents</td>
<td>48 cents</td>
<td>+29%</td>
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**Group summary**

- **Revenue**
- **Normalised operating profit**
- **Normalised profit after tax**
- **Net cash from operating activities**

**Ordinary share performance**

- **Earnings per share – basic** (cents)
- **Headline earnings per share** (cents)
- **Normalised earnings per share** (cents)
- **Distribution per share** (cents)
- **Operating cash flow per share** (cents)

*Compound growth represents five-year compound annual growth, calculated for the period 2002 to 2006.*

Appendix B: Aspen Organigram

September 2007

The information presented in this case study has been reviewed and signed-off by the company to ensure its accuracy. The views expressed in the case study are the ones of the author and do not necessarily reflect those of the UN, UNDP or their Member States.

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