According to the available evidence, the Human Immunodeficiency Virus (HIV) and the Acquired Immunodeficiency Syndrome (AIDS) were not a problem in Southern Africa during the early 1980s. The incidence was numbered in the tens of hundreds, indicating that the problem had not yet become a public health issue. But a quarter-of-a-century later, the situation had changed dramatically. Today an estimated 25.4 million people in sub-Saharan have contracted HIV or AIDS. This figure represents some 30% of all those in sub-Saharan Africa who have been infected by the pandemic. In the Southern African region alone, HIV/AIDS deaths are now estimated at 2.4 million. The majority of those infected are in the highly productive and sexually active 18–49-year age group.

Almost in unison, governments have reacted with shock and have attempted to come to grips with the dynamics of HIV and AIDS. They have sought to understand the virus, how it is transmitted and which groups of their populations are at greatest risk. They have also tried to assess the impact of the virus on the fabric of their societies, and to seek counter-measures that might have the effect of reducing the incidence of HIV and AIDS to the low levels of the pre-1980s.

In the preceding 25-year period, policy responses by governments appear to have traversed a similar course, generally divided into three phases. The first response was to create a special unit within the health ministry of each country. In some cases this had strong and direct links
with the Office of the Presidency and had responsibility for formulating HIV/AIDS counter-measures. However, as the impact of the virus continued to escalate, dedicated national commissions took over responsibility for each country’s HIV/AIDS policy. Finally, the available evidence suggests that the various national commissions have realised their lack of capacity to address sector-specific problems. They have therefore called on their countries’ agriculture, mining, transport, education, security and other sectors to come up with policies appropriate to their particular circumstances, but still in line with national HIV/AIDS policies.

Seen from this perspective, the policy-formulation process appears to have turned full circle over the quarter-of-a-century period referred to. Indeed, many of the economic sectors are no further forward than they would have been 25 years ago. This is because questions around HIV/AIDS have continued to be posed without adequate explanation. We are now therefore faced with the need to embark upon an urgent multifaceted research response in the realms of both medical science and each country’s social and economic framework.

The research initiative reported in the present document forms part of this overall response. It has focused on the complex phenomena of HIV and AIDS and how these relate to African armed forces in Africa. Findings have been extrapolated from a limited assessment of the situation in the armed forces of five Southern African countries, namely Botswana, Swaziland, Tanzania, Zambia and Zimbabwe.

**HIV/AIDS AND AFRICAN ARMED FORCES**

The armed forces constitute one of African countries’ most important sectors. They provide both national security and employment, and they are also a symbol of a country’s sovereignty and nationhood. Any threat to a country’s military institutions therefore has far-reaching implications, going beyond the men and women in uniform. The threat posed by HIV/AIDS has the potential to undermine all that is represented by the armed forces. In common with other sectors which operate in part in a country’s more remote regions—such as agriculture (and its farm workers), transport (and its truck drivers) and education (and its teachers)—the armed forces of Africa face their own particular problems in interfacing with the many dimensions of HIV/AIDS.

Knowledge of how HIV/AIDS has affected the armed forces, and the extent of the impact of the pandemic on the armed forces, is still not
clear. This is not surprising. From a medical science perspective, there is still insufficient knowledge about the period HIV/AIDS takes to produce its disabling effects, even though the gestation period after victims have been infected is estimated as some ten years. There is also a related, but more immediate, window period of approximately 90 days during which time those infected show no signs of the infection when they are medically examined. Both these factors make it difficult to be certain about who is and who is not infected by the virus. Even when individuals test positive, medical science does not yet fully understand the nature and extent of factors, such as the side-effects of taking antiretroviral drugs (ARVs).

Another problem has been that research into HIV/AIDS within African armed forces has been ring-fenced and off-limits for several reasons, including a desire to protect national security concerns by not speculating about the level of infection in the armed forces, even when there has been extensive probing into the effect of the pandemic on the human resource capacity of the various armies.

Another issue has had to do with the use of research that was generated in the 1980s. Even if this research were to be made known, there would still be the broader question of what impact HIV/AIDS has had on the integrity of the armed forces’ primary role of maintaining national security.

There remain significant impediments to research on HIV/AIDS in the armed forces. Any research initiative has to deal with the constraints, suspicions and reluctance to provide data by those in positions to do so. This situation allowed conclusions to be drawn, suggesting that the prevalence of HIV/AIDS in the armed forces was twice or even five times as high as in the population as a whole—even when such conclusions were not based on empirical studies or comparative data.

After early studies had helped fuel an armed forces HIV/AIDS stigma, misunderstandings and a resulting lack of collaboration between researchers and the armed forces establishment continued. Against this background, initiatives are urgently needed to help provide solutions to the multifaceted challenges.

Such initiatives need to involve the skills of the research community, working closely with the military. Only then will it be possible to analyse the effects of the pandemic and to reduce its impact in the shortest possible time.

For any assessment of recent and complex HIV/AIDS scenarios and their relationship with the armed forces, it is clear that there is an urgent
need for research that takes account of professional concerns and that is structured to increase our understanding of the related dynamics of the pandemic.

**METHODOLOGY**

The project described in the present document has relied on action research methodology. This is a tool that combines empirical research with probable intervention strategies for the purpose of improving conduct and practice.² This innovative approach is applicable to many subject areas. Those most relevant to our own focus include education awareness, health delivery and medicines, security, and legislation and policies that continually react to changing environments in qualitative and quantitative ways, guided by a high-value system. Hence, the end-game of an action research methodology is not only the results of certain conduct but also the improved qualitative nature of that particular outcome.

**PROJECT OBJECTIVES**

The research project described was structured to achieve at least three related objectives while laying the ground-work for more in-depth work in the future, either with the same institutions or with sister organisations in the Southern African region. Once confidence, research skills and capacity have been developed, it is hoped that they will be employed for a more extensive study involving medical and social science collaboration on the impact of HIV/AIDS on the armed forces, on the preparedness of—and structural and internal effects on—the armed forces, and on the economic implications of combating the pandemic in the defence and security sector.

This has three interlinked objectives, namely to:

- trace and document empirically the policy responses by military institutions since the advent of HIV/AIDS;

- develop research and analysis tools on the issue within the armed forces and civil society; and

- provide a best-practice model to guide other military establishments on the continent.
Consequently, the more specific and limited objectives were to:

• produce a country-based experience account of how states and their armed forces have dealt with HIV/AIDS over the past 25 years;

• seek to establish a body of researchers on the issue, drawn from the armed forces and civil society to offer probable solutions; and

• provide a regional model to serve as the foundation for future best-practice guidelines for the relationship between HIV/AIDS and the armed forces of Africa.

DEFINITIONS

HIV is the virus that enters human bodies and affects the immune system. This type of virus is a member of a special class of the retroviruses. The HI virus can only replicate inside a living organ, affecting the cells and the surface of the special protein called CD4 lymphocyte. This process makes HIV dangerous as it attacks the immune system, which is the group of cells and organs designed to protect the body by fighting viruses and infections. According to Avert.org:

HIV has a number of tricks that help it to evade the body’s defences, including very rapid mutation. This means that once HIV has taken hold, the immune system can never fully get rid of it.\(^3\)

Once the above happens, “a damaged immune system is not only more vulnerable to HIV, but also to the attacks of other infections”. Available evidence suggests that this condition, in association with what are commonly referred to as opportunistic diseases, deteriorates and develops into Acquired Immunodeficiency Syndrome (AIDS) after some ten years.\(^4\)

HIV/AIDS IN SOUTHERN AFRICA

Sub-Saharan Africa is the region in the world that has been hardest hit by the HIV/AIDS pandemic. The reasons have included the:

• complexity of the disease in relation to this region’s inadequate financial and other resources;
• intransigence of pharmaceutical companies, which have been determined to exact profits on research and development before releasing new medicines;

• confusion regarding the strategic focus on the pandemic, which included the shift in leadership in 1996 from the widely criticised World Health Organisation (WHO) under the influence of the World Bank, to the UNAIDS cluster approach under Peter Piot, which changed the existing strategy;\(^5\) and

• lack of a coordinated approach by the African continent’s political leaders.

In combination, these reasons have exacerbated the impact of HIV and AIDS on the continent. HIV and poverty have made a lethal combination. The fact that those most affected by the pandemic have been the economically productive and sexually active 15–49-year age group has had a further negative impact on already sick economies.

Sub-Saharan Africa remains by far the world’s worst-affected region, with some 25.4 million people (the estimates vary between 23 million and 28.4 million) infected by HIV at the end of 2004, or an increase of one million compared with 2002 (estimate band: 22.5–27.3 million). While the population of sub-Saharan Africa is some 10% of world population, nearly two-thirds (64%) of all the world’s population—and 76% of all the world’s female population—known to be infected by HIV live in this region. In Zambia and Zimbabwe, some 20% of all adults are infected with HIV or have AIDS, while the prevalence in both Swaziland and Botswana is near 40%.\(^6\)

Many sub-Saharan countries have declared HIV/AIDS a national emergency in a bid to start manufacturing generic AIDS drugs under the World Trade Organisation (WTO). While Western pharmaceutical companies’ ARVs are priced between $300 and $1,000 for a month’s dosage, the majority of the sub-Saharan African population live below the World Bank poverty threshold of $1 per day. And while the face of the epidemic has changed in Western Europe and the United States (US) with the advent of highly active antiretroviral therapy (HAART), the situation in Africa has been different, as most of those affected have no access to ARVs. Even those who have access to ARVs have problems of maintaining or accessing nutritious/balanced diets, which are essential for the management of HIV/AIDS.
THE HUMAN IMMUNODEFICIENCY VIRUS

The HI virus is a retrovirus belonging to the genus Lentivirus. There are two types of HI viruses, HIV-1 and HIV-2. HIV-1 is the most common globally and is more virulent than HIV-2. HIV-2 is more common in West Africa. HIV causes AIDS: the disease is characterised by the destruction of the immune system by invading T-helper lymphocytes (CD4+ T-lymphocytes) that would ordinarily fight off such viral infections. The clinical progression is the same but slower in HIV-2 infection. There are many strains of both types and the virus mutates rapidly, making it especially difficult for researchers to find an effective treatment or vaccine.

The two viruses cannot be distinguished from each other under the electron microscope. The difference is in the molecular weight of the proteins and the order of the regulatory genes.

THE TRANSMISSION OF HIV/AIDS

HIV infection is primarily transmitted through heterosexual intercourse and perinatal (mother-to-child) transmission during pregnancy, at birth and while breastfeeding. Another recognised mode of transmission is through contaminated blood and blood products. Other modes of transmission include the re-use of hypodermic needles, syringes, scissors and surgical knives. The virus is also transmitted through homosexual intercourse between men.

STRUCTURE OF HIV

The HI virus particle measures about 100 nanometres (nm) and has a lipoprotein envelope. There are 72 glycoprotein complexes in the envelope, measuring about 10 nm. These are made up of an external (gp120) and a transmembrane (gp41) protein, the two being loosely bound.

The viral envelope is also made up of different proteins—for example, HLA Class 1 and Class 2 molecules—which the virus acquires during the binding process with the host cell.

Also present are adhesion proteins such as ICAM-1. The p17-protein matrix is found in the inner envelope. The p24 capsular antigen is cylindrical and holds the two copies of the HIV-RNA. On the viral ribonucleic acid (RNA) are various enzymes—reverse transcriptase (RT), integrase and protease.
HIV ENTRY IN HOST CELL

The HI virus enters its target cells by attaching itself to CD4 receptors. The CD4 receptor is a glycoprotein found on the surface of approximately 60% of all T-lymphocytes, T-cell precursor cells in the bone marrow, thymus, monocytes, macrophages, eosinophiles, dendritic cells and microglial of the central nervous system. HIV also needs to bind to a core-receptor, CCR 5 to enter the human cell. Once the virus enters the human cell, it transcripts a deoxyrinucleic acid (DNA) copy of itself, which integrates into the host DNA when the T-cell is activated.

ACUTE HIV-1 INFECTION

The acute HIV-1 infection is seen in 40–90% of the cases, with a symptomatic infection associated with high viral replication and specific immune response against the HI virus. This is usually 11–15 days after contracting the infection. It is associated with a rise in viral load and a fall of more than 100 CD4 cells/mm³ in the first few weeks. The acute HIV infection rarely lasts more than one month.

With the worldwide rate of 14,000 new cases a day, acute HIV-1 infection becomes an important differential diagnosis in a patient with fever, malaise, maculopapular rash and lymphadenopathy. In many patients the acute infection is not diagnosed, and most patients are treated for malaria or influenza.

During this stage of infection there are no antibodies to help with the
diagnosis, but antibodies against HIV-1 are present after four to six weeks. A definitive diagnosis can only be made by identifying HIV-1 RNA or the p24-antigen. However, this is a highly skilled and expensive process requiring laboratory equipment that is rarely available in Africa. Furthermore, even where there is adequate technical support, HIV identification is complex; it can usually be made only by a doctor with considerable experience of the symptoms. A correct diagnosis at this stage can, however, result in the patient receiving therapy whereby the viral set-point—normally 10,000–50,000 copies/ml—can be reduced to a significantly low level. The viral set-point is significant in disease progression, with the higher the viral load, the faster the fall in the CD4 cells. The risk of transmitting the infection to the patient’s sexual partner can also be reduced, as, without treatment at this stage, the patient is highly infectious because of the high viremia.

NATURAL COURSE OF HIV-1 INFECTION

The acute infection stage is followed by a chronic phase of a period of years without showing any symptoms of HIV infection. This phase is associated with a rise in the CD4 cell count within a few months after the acute infection. The rise rarely gets back to the normal CD4 cell count and is usually followed by a gradual fall over a period of eight to ten years. The normal CD4 count in an uninfected healthy person is 500-1,200 CD4+ T cells/mm³. When the CD4 cell count falls below 200 CD4 cells/mm³, the patient reaches a level of immunodeficiency and the onset of opportunistic infections by viruses, bacteria, fungi and parasites. Also common at this stage are kaposis sarcoma, malignant lymphomas, HIV encephalopathy and the wasting syndrome. With a fall below 50 CD4 cells/mm³, cases of CMV retinitis and atypical tuberculosis infection are observed.

Figure 2 (over page) shows the course of HIV infection. Half of the patients without HAART die in the first ten years from an AIDS-defining illness, which usually occurs within two to four years of the start of a patient’s first AIDS complication. Without therapy, more than 90% of all HIV cases die. In the present HAART era, this course of HIV infection is rarely seen in Western Europe. The infection time course, the Centre for Disease Control (CDC) classification and the WHO classification of HIV infection are given in Figure 2 and in tables 1 and 2 (over page). The WHO classification is used in countries with inadequate resources and is purely a clinical classification.
Figure 2: HIV infection time course

Table 1: The 1993 revised CDC system for HIV infection classification

<table>
<thead>
<tr>
<th>CD4+ T cell categories (Cell/cu mm)</th>
<th>Clinical categories</th>
<th>A</th>
<th>B</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. &gt;500 cells/mm³</td>
<td>A1</td>
<td>B1</td>
<td>C1</td>
<td></td>
</tr>
<tr>
<td>2. 200–499 cells/mm³</td>
<td>A2</td>
<td>B2</td>
<td>C2</td>
<td></td>
</tr>
<tr>
<td>3. &gt;200 cells/mm³</td>
<td>A3</td>
<td>B3</td>
<td>C3</td>
<td></td>
</tr>
</tbody>
</table>

A = The acute HIV infection; asymptomatic HIV infection and persistent generalised lymphadenopathy (PGL).
B = Symptomatic infection but non-AIDS defining, e.g. oral candidiasis, persistent or recurrent fever of >38.5°C, intermittent diarrhoea longer than a month’s duration, oral hairy leukoplakia, recurrent herpes zoster or simplex but which is not AIDS defining, idiopathic Thrombocypenic purpura.
C = A3, B3, C1, C2, C3 AIDS defining diseases such as tuberculosis (pulmonary and extra-pulmonary), recurrent bacterial pneumonias within 12 months, non-healing ulcerative herpes simplex or disseminated herpes zoster, pneumocystis carinii pneumonia, CMV retinitis, kaposi sarcoma, toxoplasma infection and cryptococcal meningitis.
Table 2: WHO system for HIV infection classification

<table>
<thead>
<tr>
<th>Stage</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>HIV disease is asymptomatic and not categorised as AIDS PGL. Acute HIV infection.</td>
</tr>
<tr>
<td>2</td>
<td>Includes minor mucocutaneous manifestations and recurrent upper respiratory tract infections. Herpes zoster within the previous five years. Unintentional loss of ≤10% of body weight.</td>
</tr>
<tr>
<td>3</td>
<td>Includes unexplained chronic diarrhoea or fever for longer than one month, Severe bacterial infections and pulmonary tuberculosis. Oral hairy leukoplakia, oral candidiasis, vaginovaginal candidiasis. Unintentional loss of ≥10% body weight.</td>
</tr>
<tr>
<td>4</td>
<td>AIDS defining includes toxoplasmosis of the brain, candidiasis of the oesophagus, trachea, bronchi or lungs, cytomegalovirus retinitis, lymphomas and kaposi sarcoma.</td>
</tr>
</tbody>
</table>

NOTES
