

The looming threat of HIV/AIDS drug resistance in South Africa

In the February 2004 issue of the *SAMJ*, this column commented approvingly on the 'Operational Plan for the Comprehensive Treatment and Care for HIV and AIDS' prepared by the Department of Health and approved by Cabinet on 20 November 2003. The hard-fought and long awaited rollout of antiretroviral treatment (ART) in the public sector represents the promise of a better quality of life for 5 million South Africans living with HIV and AIDS, but there are booby traps lurking in the way that could turn this bold venture into a horrific nightmare, and one of these is the threat of the development of widespread antiretroviral drug resistance.

Antiretroviral drug resistance develops when susceptible virus is selectively suppressed, creating space for drug-resistant mutant strains to predominate. A mutation is essentially a replication error, and because HIV replicates extraordinarily rapidly (on average, 10 billion HIV particles are produced and cleared everyday, with one new mutation introduced, on average, in each new genome),¹ mutations occur with great ease and rapidity. Over time, these mutants become the dominant strain.

Suboptimal adherence to ART promotes drug resistance by reducing the ability to suppress the virus effectively, thus accelerating the emergence of resistant strains. For this reason, it has been asserted that 'taking no drug at all is likely to be better than taking it erratically, with lapses in regular dosing that leaves adherence less than 85%'.¹

In the South African context, treatment adherence may prove to be the Achilles' heel in the ART rollout for a whole host of factors ranging from patient non-compliance to systemic deficiencies in drug availability and monitoring capacity. As noted in a previous editorial, the envisaged ART programme is unique and without precedent in the world in terms of sheer size and scope, and is destined to exert extraordinary pressures on our health infrastructure. Our track record in the implementation of mass health programmes is not great. South Africa's mass treatment programme of tuberculosis, with an overall cure rate well below the optimum as defined by the WHO, speaks to the inadequacy of our health system infrastructure to cope with campaigns of this magnitude.

In this regard, the warnings of Dr Peter Barron, Director of the Initiative for Sub-District Support of the Health Systems Trust, contained in a comprehensive address delivered at a symposium at Wits University on the topic of scaling up ART,² are worth quoting at some length. He cautions that 'the first principle of medicine is "Do no harm"'. Our aim must not only be to introduce antiretrovirals, but to make it work. If we do not do so, the intervention could do more harm than good. I believe that if we introduce an ART programme for these 5 million in the same way that we have approached the introduction of the termination of pregnancy programme, the cervical screening programme, the voluntary counselling and testing programme, and the prevention of mother-to-child transmission programme, then we will certainly do harm'.³

It is generally acknowledged that stronger health systems are essential for effective HIV and AIDS prevention and care.³

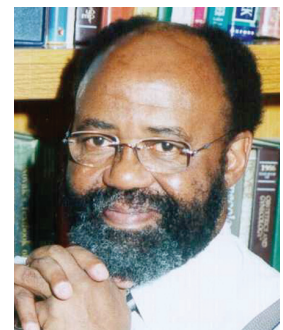
Yet, inherent in the mass management of the HIV and AIDS pandemic is the potential to weaken the very system needed to contain the disease. It is therefore essential that the pandemic not be managed so as to overwhelm the public sector health system by overstressing its finite resources. Successful implementation of the ART programme is not possible without increasing investment in the system. Barron points out that only about 15% of the total public sector health budget is devoted to primary care, and that adding on an ART programme 'without addressing the current under-funding will exponentially increase the under-funding on primary care', thus weakening the primary care system.

Drug resistance will be aggravated by jurisdictional resource inequities whereby the worst-resourced health districts expend R30 per capita as opposed to around R300 by the best-resourced ones. Paradoxically, the districts with the poorest infrastructure and the lowest resource provision have the greatest social, economic and health problems. If the resource-poor districts are selected to provide ART, the care will be inadequate and substandard, and will breed drug resistance.

However, the single greatest risk facing the introduction of an ART programme, according to Barron, is the shortage of skilled personnel in the public health sector, particularly in the rural and disadvantaged urban areas, which also happen to be the areas with the highest prevalence of HIV and AIDS. 'To expect a huge ART programme to be run by already overworked staff is wishful thinking and additional doctors, nurses and other health care workers will have to be added to the system.' Ironically, among the causes for the shortage are morbidity and mortality among health care providers due to HIV and AIDS.

In locations where ART has been successfully implemented in developing countries such as Barbados, Brazil and Nigeria, AIDS deaths have been halved, as have hospitalisation duration and hospital occupancy rates for the disease.⁴ South Africa can match these norms, but if antiretroviral drug resistance is allowed to become a dominant factor, we will have taken a huge step backwards. It is therefore imperative that the ART rollout is implemented with deliberate care, and that the necessary investment is made to strengthen the health system infrastructure and to achieve optimal staffing if the rollout is to become a success story.

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Editor



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2. Barron P. The challenges of rolling out antiretrovirals <http://www.hst.org.za/publications/543> (accessed 12 July 2004).
3. Buve A, Kalibala S, McIntyre J. Stronger health systems for more effective HIV/AIDS prevention and care. *Int J Health Manage* 2003; 18: Suppl 1, S41-51.
4. Schechter M. HIV treatment and care in resource-limited settings. <http://www.medscape.com/459943?src=search> (accessed 12 July 2004).