

## WORLD AIDS DAY

## ‘We will outsmart it, but we need time’

Today is World Aids Day. Nearly three decades since the first such day in 1988, what's the situation report on the fight to combat HIV/Aids? A leading South African epidemiologist and global figure in HIV/Aids research tells it straight. Stephen Coan reports

**T**HERE is no magic bullet, says Professor Salim S Abdool Karim, referring to the Joint UN Programme on HIV/Aids (UNAids) 90-90-90 initiative launched in 2014 which aims to end the Aids epidemic by 2030 with 2020 as the target year when 90 percent of those living with HIV will know their status, 90 percent with HIV will be on anti-retroviral therapy and 90 percent of those will have viral suppression.

“Globally, we have set an ambitious target to end Aids as a ‘public health threat,’” said Abdool Karim.

“People tend to overlook the last bit. They only see 90-90-90 as ending Aids. We cannot end Aids any time soon since there are 37 million people living with Aids worldwide and there's no cure. So Aids is not going to go away any time soon. We need to reduce the number of infections in order to reach a point where the epidemic is under control. This is what is meant by ending Aids as a public health threat.”

Africa has 70 percent of all HIV infections while southern and eastern Africa accounts for half of all global infections. Last year, an estimated 7 million South Africans were living with HIV while the same year saw 380 000 new infections and the deaths of 180 000 people from Aids-related illnesses.

There is no doubt 90-90-90 is a big ask for South Africa.

“Our country has a generalised epidemic with large numbers of the population affected. We have to aim for a high proportion of people living with HIV being virally suppressed to reduce the spread of the virus to others. For that to happen, people have to know they have HIV and take treatment diligently.”

Something that didn't happen here initially thanks to government-endorsed Aids denialism, but now that government policy has been reversed and anti-retroviral (ARV) treatment is readily available, have we rewound the clock?

“You can never make up for lost time once it's gone,” said Abdool Karim. “The Mbeki era denied several million people ARV treatment; many of those individuals died.”

“But what we did do during that time enabled the country to catch up quickly once things changed in 2009, when ARV roll-out went to scale post-Mbeki.”

During this denialist period, funding was not accessible to provide Aids treatment from the government or the Global Fund due to that body's undertaking to work only through the government.

But such constraints did not apply to the US President's Emergency Plan for Aids Relief (PEPFAR).

“So research centres such as CAPRISA (an Aids research centre based in Durban) and many other NGOs were already diagnosing and treating Aids during the Mbeki era with PEPFAR funding.”

“Accordingly, when the government reversed its stance, we had a rolling start, not a standing start, and we could scale up treatment much faster.”

Stigma and denialism within communities was also decreasing. “Ending discrimination at ground level is critical and treatment made that possible,” said Abdool Karim.

“In one of our study areas, sick people were being brought to our clinic in wheelbarrows. After two weeks of antiretroviral treatment, they would come back healthy and say: ‘I'm going back to work.’ Treatment made the denialists look silly.”

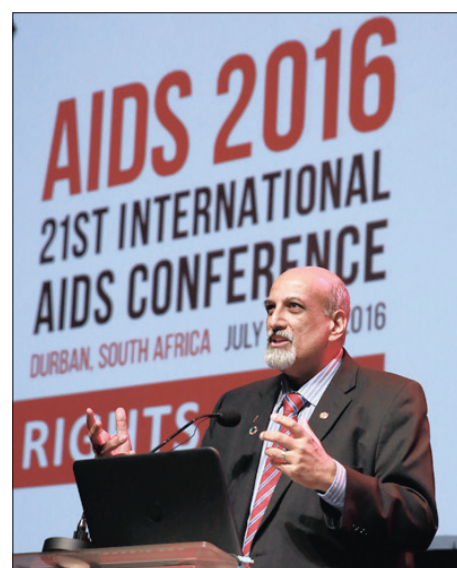
The post-2009 government intervention has been nothing short of miraculous, according to Abdool Karim.

“Life expectancy has increased, people are living about 10 percent longer. Post-HIV, lifespan was about 50 years, now it's 55 to 60 years. That is due to the decrease in Aids-related deaths thanks to treatment.”

“The other big positive is that South Africa turned HIV transmission from mother to child around; it was 25 to 30 per-



**PUBLIC HEALTH THREAT:** We need to reduce the number of infections in order to reach a point where the epidemic is under control, believes South African epidemiologist and infectious diseases specialist Professor Salim Abdool Karim. PICTURE: REUTERS



**CONFIDENT:** Professor Salim Abdool Karim says we can defeat the virus; it just won't happen soon. PICTURE: SUPPLIED

cent about 10 years ago while today, it's 1 to 2 percent. Fifteen years ago, most children born with HIV died before the end of their second year. Now they don't. So we have a

generation of HIV-free children.”

All the more tragic that those saved from infection as infants should now be getting HIV as teenagers.

“In girls, from teenagers to young women in their early twenties, we are seeing high rates of infection and high vulnerability to infection. One of the main reasons for this risk is sex with men in their thirties who are HIV-positive.”

The vulnerability in young women is probably both behavioural and biological. The bacteria *Prevotella bivia*, currently the subject of a CAPRISA study, found in large amounts in the vaginas of younger women, increases the chances of HIV infection in women.

The age disparity in sexual activity was first identified in a 1990 study done by Abdool Karim's wife, Professor Quarraisha Abdool Karim, associate scientific director of CAPRISA and a member of the UNAids Scientific Expert Panel and scientific adviser to the executive director of UNAids. Follow-up studies show it is now entrenched with even higher infection rates.

“When you ask teenage girls why they are having sex with older men, they say: ‘What's an 18-year-old boy got for me?

What do I get? What presents do I and the family get?’ It's a quid-pro-quo activity.”

“In the communities where we conduct our research, people do not take the view that the age disparity among partners is wrong. It is part of the problem: we are fighting something that has become accepted. It's really a challenge.”

The Abdool Karims have spent nearly three decades working towards slowing the rate of new infections in teenage girls. “It became our life's calling to find solutions to that problem.”

The solution proved elusive until the appearance of an antiretroviral drug called Tenofovir. A CAPRISA study tested a microbicide gel containing Tenofovir and found it was effective in preventing HIV transmission in women, cutting the infection rate by 39 percent overall and 54 percent in women who used the gel diligently.

That was the good news but compliance to the necessary medication regime proved a stumbling block in subsequent studies of gels and pills. “If you are a healthy woman, why should you protect yourself against an infection you might not get? It was a tall order. Some women don't see themselves at risk while others are not able to take con-

trol of their lives and do it for themselves.”

Now the Abdool Karims are hoping for better success using broadly neutralising antibodies, so called because they are able to kill multiple strains of HIV. Rare individuals make such antibodies. One such person in KwaZulu-Natal is known only by the codename CAPRISA 256.

“For over a decade, she has developed very unusual antibodies.”

“The HI-virus hides its proteins under a layer of sugar, rather like a Smartie sweet,” said Abdool Karim. “We found that this woman's antibodies have ‘long arms’ that can reach through the sugar shield to reach the viral protein and neutralise the virus. CAPRISA 256 has one of the most potent antibodies in the world.”

However, their colleagues Lynn Morris and Penny Moore from the National Institute of Communicable Diseases in Joburg found this antibody works better for the subtype C virus found in southern Africa than the subtype B virus in the US and Europe.

Hence the CAPRISA researchers have teamed up with the National Institutes of Health in the US to combine the CAPRISA antibody with others that are more effective subtype B viruses.

## Early response is vital

WHY IS HIV/Aids still a huge problem in South Africa when it's no longer a headline issue in other countries?

“The ‘trick’ with any new infectious disease is to do everything you can early to prevent the virus gaining a foothold in the general population,” said epidemiologist Professor Salim S Abdool Karim, who has conducted research on HIV epidemiology, pathogenesis, prevention and treatment over 30 years.

“In the US, Europe and Australia, thanks to a quick response and effective interventions early on, it didn't get that foothold. It remained a disease in gay men, drug users and the incarcerated populations.”

Abdool Karim chairs the UNAids Scientific Expert Panel and is director of the Centre for the Aids Programme of Research in South Africa (CAPRISA), based at the University of KwaZulu-Natal, and the CAPRISA Professor of Global Health at New York's Columbia University.

In South Africa, HIV did not spread into the general population through gay and bisexual men: “The virus in men who have sex with men is a separate virus known as Subtype B while the virus found in the general population in southern Africa is Subtype C.”

The pathway for the disease to South Africa was created by the long established economic and labour migration patterns of the region, according to Abdool Karim. This is probably how HIV entered the general populations of Zimbabwe, Botswana, Zambia, Malawi and Mozambique.

“And people coming from those countries to work in South Africa, mostly on the mines, meant it was only a matter of time before we got it.” – Stephen Coan

“We hope to have both antibodies put into humans by the middle of 2017,” said Abdool Karim. “The monkey studies with the CAPRISA 256 antibody are very promising but that doesn't mean it will work in humans. It will be a five-year development programme just to see if it does work and that it is safe. Only then will we consider production. In scientific medicine, developing new treatments is not achieved quickly.”

The same applies for a cure to the disease. “This virus is ‘smarter’ than us at the moment; it presents a challenge by hiding deep in our cells that is currently beyond our ability to defeat it. We will outsmart it, but we need the time.”

“Research in this country is world-class, we are right up there in the front line with the support of funders from the US and local funders like the National Research Foundation, Medical Research Council and the Department of Science and Technology.”

“While the existing laboratory technology is enabling scientists to understand the virus better, the new technologies coming along will open up further ways of understanding the virus.”

“I am confident the scientific progress we are making in Aids will place us in a good position to defeat this virus and save millions of lives.”

Stephen Coan is a Joburg-based journalist

## Aleppo's underground hospitals take strain, but carry on

LOUISA LOVELUCK

Beirut

**T**HESE days, hospitals feel like the most dangerous places to be in east Aleppo, doctors say.

Throughout the city's rebel-held districts, medical facilities are in the Syrian government's crosshairs. The medical charity Doctors Without Borders has recorded 33 hospital attacks since the area came under siege in July, and the pace has quickened.

Last Monday, al-Bayan Hospital was hit, its staff members choking on dust as they processed what had happened. The sound of the warplane had been clear. That they were its target wasn't.

In video footage from the immediate aftermath, workers cried out for their colleagues as the air turned white.

“The ambulance driver, where is he?”

“He's here.”

“Is anyone hurt?”

An hour later, the Omar Abdulaziz hospital was bombed, just as it was preparing

to reopen from an earlier attack. “Our new maternity unit has been destroyed. We hadn't even used it,” said Farida Muslim, a gynaecologist there.

As the Syrian government mounts an all-out offensive to retake east Aleppo, the health network there is makeshift, and easily movable.

Most facilities operate out of basements to minimise the impact of airstrikes. When there's an attack, staff members jump into action, taking everything they can grab below ground or moving equipment to a safe location as colleagues stay to repair the damage. Facilities forced out of action in a moment can be back online within hours.

But as the government siege starts to bite – no aid supplies have entered the city since July – the process is becoming harder by the day. The underground facilities have a limited number of beds, and shrinking staff numbers mean specialists must work at multiple hospitals to serve as many patients as possible.

Supplies are also dwindling. Doctors



**DEVASTATION:** In the Aleppo children's hospital – bombed five times – doctors are getting used to scrambling to protect newborns already underground. PICTURE: REUTERS

make emergency trips to deliver drugs to sister hospitals, only to find that they need them again for their own patients. Equipment also requires back-up fuel supplies, which are running out.

“There are days when I feel like a useless repairman,” said a doctor, speaking on condition of anonymity because his hospital had told him not to speak to the media. “One day I'm mending a child ripped by

shrapnel, even though I know he could be back in my clinic tomorrow. The next day I'm picking up parts of my windows and I just feel they'll shatter again.”

In the children's hospital – bombed five times – doctors are getting used to scrambling to protect newborns already underground. On Friday, the staff shared photographs of babies placed on the floor of the basement, bundled together in blankets.

Government bombing and shelling of east Aleppo in the past week have left more than 300 people dead and almost 1 000 injured. With the rise in hospital attacks, wounded residents are opting to stay away from medical facilities, heading instead for nearby houses in the hope that a doctor will reach them there.

For Wissam Zarqa, an English teacher from Aleppo, this new practice led him to spend hours on Monday accompanying a friend in search of his father, thought to have survived a bomb three days earlier.

“We went to many houses where people have been moved,” Zarqa said. “He couldn't find him and now he is looking for

## MSF's presence

DOCTORS Without Borders (MSF) has been supporting eight hospitals in east Aleppo with medical supplies since 2014.

MSF also runs six medical facilities across northern Syria and supports more than 150 hospitals and health centres across the country, many of them in besieged areas.

Despite its best efforts, there are many areas – including west Aleppo – where it's unable to work, yet it continues to push to provide humanitarian and medical aid in these areas. – Staff Reporter

other houses where his father might be.”

Doctors Without Borders say what remains of east Aleppo's health system hangs by a thread. “The consequences of indiscriminate bombing are clear,” said Luis Montial, the deputy head of mission.

“What isn't clear is how much longer the health system, already on its knees, can carry on.” – The Washington Post