

FIGHTING FOR THE FUTURE

Professor Abdool Karim is not only fighting an epidemic, she is fighting for a better future...

World-renowned South African scientist Professor Quarraisha Abdool Karim, who has shattered the glass ceiling and now beckons women to come up and join her, is not keen on being photographed in a stereotypical laboratory setting. For she's not one for lonely ivory towers or stereotypes, even of women as scientists excelling in a male-dominated field, where she has reached the pinnacle of success and global recognition.

Abdool Karim, 56, laughs, waving aside the idea of yet another photograph of herself in a white coat peering into a test tube and highlighting her latest scientific breakthrough, of which there have been many during her illustrious career.



As a world-renowned global epidemiologist and associate scientific director of the Centre for the Aids Programme of Research in South Africa (Caprisa) at the University of KwaZulu-Natal's Nelson R Mandela School of Medicine in Durban, the self-effacing Abdool Karim in fact spends many hours in the laboratory seeking solutions to the world's major problems regarding the HIV/Aids pandemic.

Caprisa is a designated UNAIDS Collaborating Centre for HIV Prevention Research, comprising five institutions including the University of KwaZulu-Natal, University of Cape Town, University of Western Cape, the National Institute for Communicable Diseases and Columbia University in New York. She co-founded the centre with her scientist husband Professor Salim Abdool Karim in 2002.

Abdool Karim breaks stereotypes of aloof scientists, religion and gender as she travels globally addressing high-level scientific conferences and engages at grassroots level in hospitals and clinics with nurses, doctors and patients - sex workers, housewives, working mothers and teenage mothers - at the epicentre of the epidemic in KwaZulu-Natal.

Abdool Karim listens to people, especially the women who bear the burden of the disease, and for whom she is determined to find solutions as she labours tirelessly at the frontline of the battle to find a vaccine and a cure for the disease. And she is making strides.

She was principal investigator of the landmark Caprisa 004 tenofovir gel trial, which provided proof-of-concept for the use of antiretrovirals (ART) to prevent HIV infection in women, an achievement highlighted by Science as one of the top 10 scientific breakthroughs in 2010.

She is an associate editor of the SA Medical Journal and vice president of the African Academy of Science. She has received dozens of academic fellowships and published at least 127 peer-reviewed scientific papers listed on her 57-page long resume.

As a member of the International Aids Society Governing Council she was instrumental in bringing the International Aids Conference to Durban, which attracted 15 000 delegates in 2000.

For her achievements over the decades she has received a string of no less than 24 local and global honours and awards, the latest being the 2016 L'Oréal-UNESCO "For Women in Science" Laureate for Africa and the Arab States Award.

But Abdool Karim was just starting her scientific career when HIV/Aids emerged in the United States as Gay Related Immune Deficiency (GRIDS) in 1981.

Fascinated by immunology and inspired by cutting-edge scientists like Professor Ruben Sher and Professor Zena Stein, she had a desire to make a difference in the world and plunged into the coalface of research into the epidemic. Her work has focused largely on understanding the evolving epidemic; factors influencing infection in adolescent girls and young women and sustainable strategies to introduce ART in resource-constrained settings.

Abdool Karim remembers when the epidemic was in its infancy in SA and how it astounded scientists with its rapid growth, as apartheid and its migratory labour practice had created the perfect storm.

She has worked on answers ever since, watching first-hand, the devastation of millions of lives at its height in the 1990s.

“We went from a less than one percent infection rate. And in 1991 we saw doubling, in 1992 we saw doubling, so that in the first five years we saw the prevalence going up until it was 15 and 16 percent. This was unprecedented. When we had the epidemics in East and Central Africa they were not of this order in magnitude,” she said.

“In Southern Africa we did not have a face for Aids because what we had was the early stages of the spread of HIV, which was largely silent and asymptomatic.”

But by the mid-90’s scientists were recording HIV transmission to infants, who were dying within the first two years of their lives, while mothers were getting sick and dying.

“Then in the period 1995 to 2000, large numbers of people in the prime of their lives aged 30 to 45, men and women, were dying. I would go into some communities and women would say the fate of women is to die by the age of 25,” she said.

Abdool Karim, also a former member of the board of directors of the Treatment Action Campaign Foundation, notes that the political climate of HIV/Aids denialism at the time and the lack of treatment did not help to curb the disaster.

The latest World Health Organisation (WHO) research shows that HIV/Aids prevalence is now 18 percent in SA, still the highest in the world, followed by Nigeria, which has 9 percent prevalence. HIV/Aids accounts for 42 percent of maternal deaths, mostly young women, in SA.

“Whether it’s Umlazi or Kwamashu or uMgungundlovu you are seeing young women aged 25 to 29, sick and dying; so what happens in a community is that people (men looking for sex) look for the healthy people and then the 20 to 24 year olds are getting sick, so then they go younger,” she said.

Abdool Karim remains focused on finding solutions to the disease, the burden of which remains borne by these young women. They often become infected after having sex with older men who drive luxury cars and promise them overseas trips and shopping sprees.

Karim depends on her team’s entrepreneurial innovation and on constantly applying for research grants from abroad, mostly the United States, to keep research for answers flowing and the centre with its 300 KZN staff afloat on a \$12-million annual budget. But local funding is scarce.

“We have got to get the private sector locally investing more in science. Drug companies who do the most innovation are not interested in things they think are going to be given away for free. They have shareholders who want money so they invest in things that people can pay for and those are disease and threats to people in the north,” Karim said.

“But now, with globalization, we are seeing TB is as much a threat in the north as it is in the south and suddenly we wake up with XDR (Extensively Drug Resistant) and MDR (Multi-Drug Resistant) TB and that’s why this institute was built. Nobody is going to trip over themselves to come and sort this out.”

Karim views the Department of Science and Technology’s recent R9-million grant to Caprisa as a “significant” contribution and potential catalyst to encourage other governments to fund research.

“If you want to do game-changing research you have to raise a lot of money. So to have the Department of Science and Technology investing that amount of money in Aids research in this country is very significant and important,” she said.

Abdool Karim said the country had already done a “great job” in treatment with some 3,4 million people, just over half of the 6,4 million people living with HIV/Aids, on antiretroviral treatment, and in reducing mother-to-child transmission rates from between 30 and 40 percent to less than two percent. However there were still an estimated 1 000 new infections daily.

“Reducing and preventing sexual transmission of HIV is our challenge, so the grant is significant from a scientific point of view – to be investing in one of the remaining challenges in our response and to be investing in SA capacity building,” she said.

Abdool Karim said research questions remained around why women had a higher infection rate than men when exposed to HIV/Aids as 10 percent of the women in the placebo arm of the Caprisa 004 trial had become infected.

“We are trying to understand why in terms of sociological and structural issues and in terms of biology. Even as we are trying to figure out who is infecting who and why women are so vulnerable, particularly adolescent girls and young women, we need to ask what can we do?”

Abdool Karim, acutely aware of gender power imbalances in society, recalled how it was sex workers who asked her for an empowering solution to the dilemma of clients insisting on unprotected sex and who beat them up or cut 25 percent off their pay if they insisted on using a condom.

She found that women in relationships faced similar abuse, as they were not able to insist on partners wearing condoms. The solution turned out to be the ground-breaking tenofovir gel discovery.

“We tried many different products and failed. Science is a slow process and it can take a decade before you have a breakthrough,” she said.

Now, Karim’s team has discovered three women in the province who have broad-based antibodies – there only around 20 people with these antibodies worldwide – that are able to fight 70 percent of viruses, possibly even HIV/Aids. Caprisa scientists have been able to isolate the antibodies and study the evolution of the HIV virus with the antibodies.

“We are able to produce the antibodies in the laboratory and have run trials on animals. It takes 18 months to produce quality antibodies that can be tested in human trials and we will be ready to do this in 2017,” she said.

Karim believes a cure and vaccine for HIV/Aids may not be too far off and that answers might lie in the yet untapped potential of genetic technology.

“Right now all the scientific advances we have made have reached a tipping point where we can talk about epidemic control. Epidemic control means that the rates of new infections are going down. It’s no longer a public health threat in terms of new infections or of people getting sick and dying,” she said.

“But to end Aids we need a vaccine and a cure because once the virus comes in and you are on treatment you have viral suppression. As soon as you stop treatment the virus comes out, so you have to get the virus out of the body and that’s where the cure comes in. To prevent new infections you need a vaccine. I don’t think our imaginations have quite grasped the whole new era of gene technology. It is certainly making strides in paediatric diseases and cancer therapy so it is not so futuristic,” Abdool Karim said.

What keeps Caprisa at the cutting edge of scientific discovery – the centre has regularly produced ground-breaking research in the field of HIV/Aids and TB since inception – is its global collaboration and capacity. Each partner brings unique research capabilities, ranging from immunology to virology, and it has access to between 20 to 30 top laboratories across the US with regular technology and skills transfers.

“We are dealing with a major problem that is locally important and we are here in the midst of it in the epicentre. What kind of scientists are we if we are not making the cutting-edge findings and advancing this war? The fact that globally it has benefit is a bonus,” she said.

Apart from Abdool Karim’s proudest moment, which was the tenofovir gel trial success and the honour of receiving the Unesco award, she gets most satisfaction out of how her work has enabled her to impact the next generation of women scientists.

“We have more women PhD graduates than we do men in most parts of the world but when you get to leadership you still find men at the top levels. Many women find it’s a choice of balancing.”

“They say ‘ I want to be a mother and I can’t do both’ so I say ‘but you can do both and really it is about choices you want to make. If you want to be a mother you can be, but if you want to be a mother and a scientist you can do that too’. I’ve been able to do it and to me that’s what the 21st century should be about, that you can make choices and nobody is putting barriers and ceilings on what you can and can’t do. You are your own glass ceiling.”