

| BARRY SCHOUB |

TOP THREE AWARDS

- National Order of Mapungubwe (Silver), 2012
- Paul Harris Award from Rotary International
- First recipient of the Lifetime Achievement Award from African Society for Laboratory Medicine (ASLM), 2012

DEFINING MOMENT

“Three of the most significant challenges I have faced could be called the most defining moments of my career: In my youth, the challenge of creating a Department of Virology at Wits in 1978. Later, the challenge of creating the National Institute of Communicable Diseases in 2001 and now in my more senior years, the challenge of chairing the Board of the NHLS at a particularly difficult time in its history.

WHAT PEOPLE DO NOT KNOW

Schoub has a keen interest in natural history, religion and philosophy, and is a grandfather to seven grandchildren.



FOLLOWING IN THE FOOTSTEPS OF THE FAMILY

Barry Schoub knew he was going to be a doctor by the age of three. He hails from a family of doctors – his father, his brother and his half-sister were all doctors before him, and he says it made his decision very easy. “My dad told me when I was three years old, ‘You’re going to be a doctor’. My two sons are also doctors, so it runs in the family,” he says.

Now into his eighth decade on earth, Schoub started his academic career at the University of the Witwatersrand (Wits), graduating with his MBChB in 1967. He then moved to Stellenbosch University (SU), where he completed a specialisation in microbial pathology – “equal parts immunology, virology and bacteriology” – working at both Tygerberg and Groote Schuur Hospitals. Medical virology was in its infancy at the time, and Schoub says that he was attracted to the challenge and the newness of the field.

“It was well before the AIDS era, but also well before the haemorrhagic fevers, such as Ebola. The scientific challenges of dealing with viruses at that stage were quite significant. Techniques for detecting many important viruses hadn’t been perfected, and a lot of the biochemical and biophysical studies of viruses were still being developed.”

His MMed research during that time, which he completed in 1973, was aimed at finding new ways to detect antibodies against specific viruses. Schoub, who has more letters after his name than most (OMS, MBChB, MMed, MD, DSc, FRC Path, FCPATH, FRSSAf and MASSAf) describes his early work as “mundane”, but it set him on course for a successful career in virological research.

EARLY YEARS

Upon returning to Johannesburg in the 1970s, he joined the South African Institute for Medical Research (SAIMR) for around 18 months before being asked by Professor Wally Prozesky to join the University of Pretoria’s (UP) Department of Virology. Under Prozesky, then Head of Virology at UP, Schoub conducted research into infantile gastroenteritis in South African black populations to complete his Doctor of Medicine (MD) degree.

It was during this period that Schoub identified the first-ever case of rotavirus in an African population, which was published in the prominent medical journal *The Lancet* in 1975. Today, we know that rotavirus is the chief cause of severe diarrhoea in children, especially in developing countries. According to PATH (formerly the Programme for Appropriate Technology in Health), rotavirus still kills more than 200 000 children in Africa every year, despite the development of two effective rotavirus vaccines in 2006.

“We demonstrated that rotavirus was a cause of gastroenteritis in Africa, and that spurred the need for diagnostic techniques. It was important to demonstrate that a virus was the cause,” says Schoub when asked about the impact this work might have had. “I think the work showed the need to develop a vaccine, which we now have as part of the routine immunisation of children.”

Part of that research, which relied on data from clinical samples from Baragwanath Hospital and on studies in mice, also demonstrated the value of breastfeeding to prevent gastroenteritis and diarrhoea in infants. Schoub’s findings showed that mothers could transmit rotavirus antibodies in breast milk, a scientific result ahead of its time.

As a demonstration of just how contagious rotavirus can be (even in mice), Schoub had to isolate himself and his work. “I had to be kept well away from the mouse colony at UP – I was given a little dungeon to work in,” he says with a laugh.

After completing his MD, Schoub spent another year studying rotavirus in the laboratory of Dr Albert Kapikian, a prominent virologist at the National Institute of Health in the United States (US).

Schoub then returned home from the US and took up the post of Deputy Director at the newly-established National Institute of Virology (NIV), again under Wally Prozesky, at the age of 33. He was also appointed as the first Chair of Virology at Wits, which, he recalls, was quite a challenge to set up. He was responsible for managing and directing a small research team, which meant he spent less time on research and more on management



and administration. When Prozesky left the NIV in 1982 to become Deputy Vice-Chancellor at UP, Schoub replaced him as Director.

Not content with three degrees, two concurrent high-level research management jobs, and supervising student researchers, he went on to complete a Doctor of Science (DSc) thesis entitled *An Analysis of Viral Infections in Developing and Developed Communities in SA* in 1992. This thesis, which collated two decades of virological and epidemiological research into a single narrative, compared developed and developing communities to look for differences in the frequency and distribution of viral infections.

Schoub says this kind of epidemiological work has value when planning disease interventions: "If we understand the prevalence, how a disease is spreading – where, how, what demographic groups are affected, what ecological factors are affecting it – that can tailor-make your intervention." He found that infantile gastroenteritis and viral pneumonia were most prevalent in developing communities, while in developed communities, diseases like hepatitis A and glandular fever were more common. This clearly demonstrated that early exposure helped protect people against viral infections – privileged children were protected from many pathogens at a young age, so when they were exposed as adolescents or young adults, they remained susceptible and experienced the illness.

The study also showed the devastating effect of measles in South African black populations, and revealed early evidence of the HIV epidemic spreading into the general population. "I think my work has made a contribution to policy level interventions in SA – a small contribution," says Schoub, in his characteristically humble fashion.

With experience in epidemiology, virology and research management, it was a natural step for Schoub to be included in the World Health Organisation's (WHO) Advisory Committee for Polio Eradication (ACPE). During the 2000s, the ACPE oversaw the international effort to eradicate polio by providing policy recommendations to national health departments all over the world.

"When the eradication programme started in 1988, it seemed very simple, because we took lessons from the smallpox eradication campaign," ex-

plains Schoub. But it quickly became obvious that eradicating polio would be far more complex a task. For a start, most people infected with polio only carry the virus rather than showing symptoms. On top of that, there are complexities associated with the oral polio vaccine because it uses a live version of the virus.

“The oral polio vaccine is a live virus that multiplies and accumulates mutations, and can actually back-mutate to cause paralysis. “This necessitated some changes in immunisation strategies,” says Schoub. However, he adds, the rate of paralysis is only one in every two million or so doses. The injectable, killed vaccine does not cause paralysis.

Other challenges the committee faced “were not virological but political” – it was a challenge to get buy-in from all health departments worldwide. Schoub also consulted on measles, influenza and respiratory syncytial virus for the WHO. For his work on polio, Schoub received the Paul Harris Award from Rotary International. While he is no longer part of the ACPE, he says that the WHO still calls on him from time to time for expert advice.

Meanwhile, back in South Africa, changes were afoot at the National Institute for Virology. Schoub explains: “I was involved in the transformation of the SAIMR to become the National Health Laboratory Service (NHLS), and the NIV to become the National Institute for Communicable Diseases (NICD).” Bacteriology, parasitology and microbiology research was added to human virology to form the NICD in 2002.

Schoub was the first Director of the NICD, and he speaks highly of the scientists and administrators who worked with him, attributing some of his research achievements to their hard work. “They say scientists are an irascible group, but I must be honest and say the ones I worked with, I really enjoyed their company – we were friends as well as colleagues.”

One cannot mention epidemiology in South Africa without touching on the subject of HIV/AIDS; Schoub, of course, played a significant role in HIV/AIDS research. His DSc revealed early evidence that HIV was spreading in this country, and as Director of the NICD he oversaw critical work by pio-

neering HIV/AIDS researchers such as Lynn Morris and Caroline Tiemessen. He was also involved in setting up the first HIV research unit under the Medical Research Council of South Africa (MRC).

“We started to detect HIV in the white gay male population in the mid-80s, and then in the African population only in the mid-90s. We charted the expansion but also demonstrated the different subtypes.” South Africa mostly has subtype C, while in the developed world it is mostly subtype B.

AIDS DENIALISM

What followed in later years was the dark period of AIDS denialism in South Africa, during which Schoub sat on the Presidential Advisory Council for HIV/AIDS (PACHA). While thousands died without access to antiretroviral drugs, the AIDS dissidents held the country hostage by pushing an agenda rather than engaging in scientific discourse around very real issues. “They were very uncomfortable, unproductive, negative get-togethers. There was no scientific discourse; these cowboys were punting an agenda that there wasn’t evidence for,” Schoub says. “I don’t have a very loud voice, and I was shouted down.”

The PACHA meetings led to a massive research effort at the NICD to prove or disprove what Schoub calls “dissident assertions” about the cause of AIDS, research performed in parallel with the Centres for Disease Control (CDC) in Atlanta, US. He says this research had some value in that “it showed how reproducible the serological tests (tests based on blood and other bodily fluids) were. Our results and the CDC results were virtually 100% concordant, so that was one positive spin-off. Otherwise it was just a tremendous waste of scientific energy, let alone resources”.

Schoub retired from his position as Director of the NICD in 2010, and had been working hard on his tennis topspin until May 2015, when he was asked to chair the board of the National Health Laboratory Service (NHLS).

Though he may not make the assertion himself, Schoub has undoubtedly made a tremendous and global contribution to public health.

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Academy of Science of South Africa (ASSAf), (2017). Legends of South African Science.

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