A history of HIV research in South Africa: What’s next?

SA HIV Clinicians Society Conference 2012

Salim S. Abdool Karim

President, Medical Research Council of South Africa
Director: CAPRISA & Pro Vice-Chancellor (Research): University of KwaZulu-Natal
Professor in Clinical Epidemiology, Columbia University
Associate Member, Ragon Institute of MGH, MIT and Harvard
Adjunct Professor of Medicine, Cornell University
Overview

• Historical phases of the HIV epidemic in South Africa
  1. Entry phase in selected high risk populations
  2. Initiation phase of the generalised HIV epidemic
  3. Phase of rapid HIV spread
  4. AIDS mortality phase
  5. ART impact phase

• Milestone events in 20 years of the HIV epidemic in SA

• Major South African scientific contributions in HIV

• What’s next in HIV research in South Africa?

• Conclusion
Historical phases of the HIV epidemic in SA: HIV infection among pregnant women

Entry phase in selected high risk populations

Initiation phase of the generalised HIV epidemic

Phase of rapid HIV spread

AIDS mortality phase

ART impact phase

Acquired immunodeficiency syndrome

A report of 2 South African cases

G. J. RAS, I. W. SIMSON, R. ANDERSON, O. W. PROZESKY, T. HAMERSMA

Source: Data from South African Department of Health Antenatal Surveys. www.doh.gov.za
Phase 1: Entry phase in selected high risk populations in South Africa

Absence of HIV infection in prostitutes and women attending sexually-transmitted disease clinics in South Africa

BARRY D. SCHOB, SUSAN F. LYONS, GILLIAN M. MCGILLIVRAY, ALAN N. SMITH, SYLVIA JOHNSON AND EPRAIM L. FISHER

AIDS and South Africa — towards a comprehensive strategy

Part I. The world-wide experience


Screening antenatal blood samples for anti-human immunodeficiency virus antibodies by a large-pool enzyme-linked immunosorbent assay system

Results of an 18-month investigation

M. SHAPIRO, R. L. CROOKES, E. O’SULLIVAN

Transfusion-related human immunodeficiency virus in patients with haemophilia in Johannesburg

R. J. COHN, A. P. MACPHAIL, E. HARTMAN, R. SCHWYZER, R. SHER
Historical phases of the HIV epidemic in SA: HIV infection among pregnant women

- **Entry phase in selected high risk populations**
- **Initiation phase of the generalised HIV epidemic**
- Phase of rapid HIV spread
- AIDS mortality phase
- ART impact phase

Source: Data from South African Department of Health Antenatal Surveys. www.doh.gov.za
## From phase 1 to phase 2:
Two independent HIV epidemics

HIV-1 subtypes in different risk groups in South Africa

*Carolyn Williamson, Susan Engelbrecht, Maureen Lambrick, Estrelita J van Rensburg, Robin Wood, Wilhelmina Bredell, Anna-Lise Williamson

**HIV prevalence in the general population 1985-1987**

<table>
<thead>
<tr>
<th>Year</th>
<th>Province</th>
<th>Group</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1985</td>
<td>KwaZulu Natal</td>
<td>Rural community</td>
<td>441</td>
<td>0.00</td>
</tr>
<tr>
<td>1986</td>
<td>Transvaal</td>
<td>Miners</td>
<td>17 021</td>
<td>0.01</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sex workers</td>
<td>1 200</td>
<td>0.00</td>
</tr>
<tr>
<td>1987</td>
<td>KwaZulu Natal</td>
<td>Antenatal women</td>
<td>500</td>
<td>0.00</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Outpatient</td>
<td>268</td>
<td>0.00</td>
</tr>
</tbody>
</table>

Phase 2: Initiation phase of the generalised HIV epidemic

AIDS clinic — a year on
D. J. MARTIN, J. F. G. TILLEY, A. N. SMITH, B. D. SCHOUB

HIV infection in South Africa, 1982 - 1988 — a review
R. SHER

Short-term predictions of the prevalence of human immunodeficiency virus infection among the black population in South Africa
G. N. PADAYACHEE, R. SCHALL

Vertically transmitted HIV-1 infection in children
A report of 23 cases
I. R. FRIEDLAND, M. SNIPELISKY
Historical phases of the HIV epidemic in SA: HIV infection among pregnant women

- **Entry phase in selected high risk populations**
- **Initiation phase of the generalised HIV epidemic**
- **Phase of rapid HIV spread**
- **AIDS mortality phase**
- **ART impact phase**

**Source:** Data from South African Department of Health Antenatal Surveys. www.doh.gov.za
Why is HIV so severe in South Africa?

Seroprevalence of HIV infection in rural South Africa

AIDS 1992, 6:1535-1539

Quarraisha Abdool Karim, Salim S. Abdool Karim, Bipraj Singh*, Richard Short† and Sipho Ngxongo‡
Phase 3: Phase of rapid HIV spread
Temporal trends in HIV prevalence in a rural district in South Africa

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>20-24</td>
<td>6.9%</td>
<td>21.1%</td>
<td>39.3%</td>
<td>50.8%</td>
</tr>
<tr>
<td>25-29</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>30-34</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>35-39</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Phase 3: Phase of rapid HIV spread
Temporal trends in HIV prevalence in a rural district in South Africa

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>20-24</td>
<td>6.9%</td>
<td></td>
<td></td>
<td>50.8%</td>
</tr>
<tr>
<td>25-29</td>
<td>2.7%</td>
<td></td>
<td></td>
<td>47.2%</td>
</tr>
<tr>
<td>30-34</td>
<td>1.4%</td>
<td></td>
<td></td>
<td>38.4%</td>
</tr>
<tr>
<td>35-39</td>
<td>0.0%</td>
<td></td>
<td></td>
<td>36.4%</td>
</tr>
</tbody>
</table>

Phase 3: Phase of rapid HIV spread
Temporal trends in HIV prevalence in a rural district in South Africa

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>20-24</td>
<td>6.9%</td>
<td>21.1%</td>
<td>39.3%</td>
<td>50.8%</td>
</tr>
<tr>
<td>25-29</td>
<td>2.7%</td>
<td>18.8%</td>
<td>36.4%</td>
<td>47.2%</td>
</tr>
<tr>
<td>30-34</td>
<td>1.4%</td>
<td>15.0%</td>
<td>23.4%</td>
<td>38.4%</td>
</tr>
<tr>
<td>35-39</td>
<td>0.0%</td>
<td>3.4%</td>
<td>23.0%</td>
<td>36.4%</td>
</tr>
</tbody>
</table>

Phase 3: Phase of rapid HIV spread

High HIV Incidence and Prevalence Among Young Women in Rural South Africa: Developing a Cohort for Intervention Trials 2000

*†David Wilkinson, †S. S. Abdool Karim, ‡Brian Williams, and †Eleanor Gouws

Prevalence of HIV and HIV-related diseases in the adult medical wards of a tertiary hospital in Durban, South Africa 2001

M Colvin MS MBChB¹, S Dawood MBChB FCP², I Kleinschmidt MS¹, S Mullick MSc MBChB³ and U Lallo MBChB MD²

Prevalence of HIV Among Truck Drivers Visiting Sex Workers in KwaZulu-Natal, South Africa 2002

GITA RAMJEE, MSc, PhD, AND ELEANOR GOUWS, MSc, MPH

High Incidence of HIV-1 in South Africa Using a Standardized Algorithm for Recent HIV Seroconversion 2002

*Eleanor Gouws, †Brian G. Williams, ‡Haynes W. Sheppard, ‡Barryett Enge, and *Salim Abdool Karim
Historical phases of the HIV epidemic in SA: HIV infection among pregnant women

Entry phase in selected high risk populations → Initiation phase of the generalised HIV epidemic → Phase of rapid HIV spread → AIDS mortality phase

HIV Prevalence (%) vs Year

Source: Data from South African Department of Health Antenatal Surveys. www.doh.gov.za
Phase 4: AIDS mortality phase

Morbidity and Mortality in South African Gold Miners: Impact of Untreated Disease Due to Human Immunodeficiency Virus

Elizabeth L. Corbett, Gavin J. Churchyard, Salome Charalambos, Badara Samb, Vicky Moloi, Tim C. Clayton, Alison D. Grant, Jill Murray, Richard J. Hayes, and Kevin M. De Cock

2002

SOUTH AFRICAN CAUSE-OF-DEATH PROFILE IN TRANSITION — 1996 AND FUTURE TRENDS

Debbie Bradshaw, Michelle Schneider, Rob Dorrington, David E Bourne, Ria Laubscher

2002

High AIDS-related mortality among young women in rural KwaZulu-Natal

M Mashego, D Johnson, J Frohlich, H Carrara, Q Abdool Karim

2007

Effect of Human Immunodeficiency Virus Treatment on Maternal Mortality at a Tertiary Center in South Africa

A 5-Year Audit

Vivian Black, MD, Sebastian Brooke, BS, and Matthew F. Chersich, MD, PhD

2009
Phase 4: AIDS mortality phase
Has HIV incidence changed from 1990 to 2005?

MRC HIV survey (Abdool Karim et al)

HSRC Mandela survey (Shisana et al)
I KNOW YOU'VE ALL BEEN WAITING A LONG TIME FOR THIS...
THEN WE CONCUR: THERE IS NO CAUSAL LINK BETWEEN HIV AND AIDS!

PRES. MBeki’s SELECT ADVISORY PANEL OF INTERNATIONAL AIDS EXPERTS

heft by apology to BEANHALL M & G ZAPIRO
ALL THESE VEGETABLES PREVENT THE ROLLOUT OF ANTIRETROVIRALS — TRUE OR FALSE?

AFRICAN POTATO

BEETROOT

LEMON

GARLIC

MANTO

FALSE: LEMON IS NOT A VEGETABLE.
Historical phases of the HIV epidemic in SA: HIV infection among pregnant women

- **Entry phase in selected high risk populations**
- **Initiation phase of the generalised HIV epidemic**
- **Phase of rapid HIV spread**
- **AIDS mortality phase**
- **ART impact phase**

**Source:** Data from South African Department of Health Antenatal Surveys. www.doh.gov.za
Phase 5: ART impact phase

Changes in Pediatric HIV-Related Hospital Admissions and Mortality in Soweto, South Africa, 1996–2011: Light at the End of the Tunnel?  
Tammy Meyers, MD,* Angela Dramowski, MD,† Helen Schneider, MD,‡ Nicolene Gardiner, MD,§ Louise Kuhn, MPH, PhD,¶ and David Moore, MD#  

HIV Treatment as Prevention: Systematic Comparison of Mathematical Models of the Potential Impact of Antiretroviral Therapy on HIV Incidence in South Africa  

Rates and Predictors of Failure of First-line Antiretroviral Therapy and Switch to Second-line ART in South Africa  
Matthew P. Fox, DSc, MPH,*† Gilles Van Cutsem, MD, DTM&H, MPH,‡ Janet Giddy, MBChB, MFamMed,§ Mhairi Masekwe, MBChB, MSc,¶ Olivia Keiser, PhD,¶† Hans Prozesky, MD, Robin Wood, MMed, FCP(SA), BSc, BM,** Miguel A. Hernán, MD, DrPH,†‡¶‡ Jonathan A. C. Sterne, PhD, MA, MSc,§§ Matthias Egger, MD, MSc, FFPHM,¶ and Andrew Boulle, MBChC, MSc, FCPH(SA), PhD,¶¶ for the IeDEA-SA collaboration  

Second-Line Antiretroviral Therapy: Long-Term Outcomes in South Africa  
Richard A. Murphy, MD, MPH,* Henry Sunpath, MBBS, MPH,† Carmen Castilla, MD,‡ Shameez Ebrahim, BPharm,¶ Richard Couri, MBChB,§ Hoang Nguyen, MD, MPH,¶ Daniel R. Kuritzkes, MD,¶ Vincent C. Marconi, MD,# and Jean B. Nachega, MD, MPH, PhD**
Major South African scientific contributions in HIV

Major contribution = Article with a South African as first or last author AND >100 citations in Scopus

- HIV epidemiology
- Preventing mother to child transmission
- Preventing sexual transmission of HIV in men and women
- HIV pathogenesis and vaccines
- Tuberculosis and HIV co-infection
- HIV Treatment
Major contributions to understanding HIV epidemiology

Young people’s sexual health in South Africa: HIV prevalence and sexual behaviors from a nationally representative household survey

Audrey E. Pettifor, Helen V. Rees, Immo Kleinschmidt, Annie E. Steffenson, Catherine MacPhail, Lindiwe Hlongwa-Madikizela, Kerry Vermaak, and Nancy S. Padian

HIV epidemiology

HIV infection among youth in a South African mining town is associated with herpes simplex virus-2 seropositivity and sexual behaviour

Bertran Auvert², Ron Ballard², Catherine Campbell⁴, Michel Caraë⁵, Mathieu Carton⁶, Glenda Felehr⁷, Eleanor Gouws⁸, Catherine MacPhail⁸, Dirk Taljaard⁸, Johannes Van Dam⁹ and Brian Williams⁵

Unsafe sexual behaviour in South African youth

Liberty Eaton¹*, Alan J. Flisher¹, Leif E. Aarø²

The Impact of Migration on HIV-1 Transmission in South Africa

A Study of Migrant and Nonmigrant Men and Their Partners

MARK N. LURIE, PhD,* BRIAN G. WILLIAMS, PhD,* KHANGELANI ZUMA, MA,§ DAVID MKAYA-MWAMBURI, MD,* GEOFF P. GARNETT, PhD,† ADRIAN W. STURM, MD,‖ MICHAEL D. SWEAT, PhD,* JOEL GITTELSON, PhD,* AND SALIM S. ABDool KARIM, MDCHB, PhD**

Who infects whom? HIV-1 concordance and discordance among migrant and non-migrant couples in South Africa

Mark N. Lurie²,³, Brian G. Williams², Khangelani Zuma⁴, David Mkaya-Mwamburi⁵, Geoff P. Garnett⁶, Michael D. Sweat⁴, Joel Gittelsohn⁴ and Salim S. Abdool Karim⁸

HIV/AIDS epidemiology, pathogenesis, prevention, and treatment

Viviana Simon, David D Ho, Quarraisha Abdool Karim

2001
114 citations

2003
163 citations

2003
145 citations

2003
111 citations

2006
126 citations
Major contributions to the prevention of mother to child transmission

1999
Influence of infant-feeding patterns on early mother-to-child transmission of HIV-1 in Durban, South Africa: a prospective cohort study
Anna Coutsoudis, Kubendran Pillay, Elizabeth Spooner, Louise Kuhn, Hoosen M Coovadia, for the South African Vitamin A Study Group*
371 citations

2001
Method of feeding and transmission of HIV-1 from mothers to children by 15 months of age: prospective cohort study from Durban, South Africa
Anna Coutsoudis a, Kubendran Pillay a, Louise Kuhn b, Elizabeth Spooner c, Wei-Yann Tsai c and Hoosen M. Coovadia a, for the South African Vitamin A Study Group*
232 citations

2007
Mother-to-child transmission of HIV-1 infection during exclusive breastfeeding in the first 6 months of life: an intervention cohort study
Hoosen M Coovadia, Nigel C Rollins, Ruth M Bland, Kirsty Little, Anna Coutsoudis, Michael L Bennish, Marie-Louise Newell
248 citations
Preventing mother to child transmission

The Effects of Vitamin A Supplementation on the Morbidity of Children Born to HIV-Infected Women

Anna Coutsoudis, PhD, Raziya A. Bobat, MBChB, Hoosen M. Coovadia, MD, Louise Kuhn, PhD, Wei-Yann Tsai, PhD, and Zena A. Stein, MBChB

1995
116 citations

Randomized trial testing the effect of vitamin A supplementation on pregnancy outcomes and ear mother-to-child HIV-1 transmission in Durban, South Africa

Anna Coutsoudis, Kubendran Pillay, Elizabeth Spooner, Louise Kuhn and Hoosen M. Coovadia for the South African Vitamin A Study Group

1999
142 citations

Pharmacokinetics and Antiretroviral Activity of Lamivudine Alone or When Coadministered with Zidovudine in Human Immunodeficiency Virus Type 1–Infected Pregnant Women and Their Offspring


Departments of Obstetrics and Paediatrics, University of Natal, Durban, South Africa; Joint United Nations Programme on HIV/AIDS, Geneva, Switzerland; National AIDS Therapy Evaluation Centre, Amsterdam, The Netherlands; Glaxo Wellcome Research and Development, Ltd., Greenford, United Kingdom; British Columbia Centre for Excellence in HIV/AIDS, Vancouver, Canada

2002
120 citations

A Multicenter Randomized Controlled Trial of Nevirapine Versus a Combination of Zidovudine and Lamivudine to Reduce Intrapartum and Early Postpartum Mother-to-Child Transmission of Human Immunodeficiency Virus Type 1

Obayendre Moodley,1 Jagdeepa Moodley,1 Hoosen Coovadia,1 Glenda Gray,2 James McIntyre,2 Justin Hidhwaye,2 Cheryl Nkudum,2 David Hall,2 Marie Gligoros,2 Patrick Robinson,2 Lynette Bosshoff,2 and John L. Sullivan2 for the South African Intrapartum Nevirapine Trial (SAINT) Investigators

2003
202 citations
Major contributions to the prevention of sexual transmission in men

Randomized, Controlled Intervention Trial of Male Circumcision for Reduction of HIV Infection Risk: The ANRS 1265 Trial

Bertran Auvert\textsuperscript{1,2,3,4}, Dirk Taljaard\textsuperscript{5}, Emmanuel Lagarde\textsuperscript{2,4}, Joëlle Sobngwi-Tambekou\textsuperscript{2}, Rémi Sitta\textsuperscript{3,4}, Adrian Puren\textsuperscript{5}

Infection-Free Probability As a Function of Time and of Randomization

Infection-Free Probability As a Function of Time and of Randomization
Major contributions to the prevention of sexual transmission in women

Effectiveness and Safety of Tenofovir Gel, an Antiretroviral Microbicide, for the Prevention of HIV Infection in Women

Quarraisha Abdool Karim,1,2,4† Salim S. Abdool Karim,3,2,4† Janet A. Frohlich,2 Anneke C. Grobler,1 Cheryl Baxter,4 Leila E. Mansoor,5 Ayeshia B. M. Kharsany,5 Sjenziwe Sibeko,6 Koleka P. Mlisana,4 Zahreen Omar,7 Tanuja N. Gengiah,7 Silvia Maarschalk,7 Natasha Arulappan,7 Mukelsiwe Mlotshwa,7 Lynn Morris,8 Douglas Taylor,8 on behalf of the CAPRISA 004 Trial Group

2010
569 citations
## Prevention of sexual transmission

<table>
<thead>
<tr>
<th>Title</th>
<th>Year</th>
<th>Citations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reducing the Risk of HIV Infection among South African Sex Workers: Socioeconomic and Gender Barriers</td>
<td>1995</td>
<td>101 citations</td>
</tr>
<tr>
<td>‘I think condoms are good but, aai, I hate those things’: condom use among adolescents and young people in a Southern African township</td>
<td>2001</td>
<td>204 citations</td>
</tr>
<tr>
<td>Peer education, gender and the development of critical consciousness: participatory HIV prevention by South African youth</td>
<td>2002</td>
<td>121 citations</td>
</tr>
</tbody>
</table>
Major contributions to HIV pathogenesis and vaccine research

**PD-1 expression on HIV-specific T cells is associated with T-cell exhaustion and disease progression**

Cheryl L. Day1,2,4, Daniel E. Kaufmann4*, Photini Kiepiela1, Julia A. Brown1, Eshia S. Moodley1, Sharon Reddy1, Elizabeth W. Mackey2, Joseph D. Miller3, Alasdair J. Leslie3, Chantal DePierres3, Zenele Mncube1, Jaikumar Duraiswamy3, Baogong Zhu4, Quentin Eichbaum2, Marcus Altfeld2, E. John Wherry6, Hoosen M. Coovadia1, Philip J. R. Gaulder1,2,4, Paul Klenerman3, Rafi Ahmed5, Gordon J. Freeman5 & Bruce D. Walker1,2,7

*Note: The authors' affiliations and roles are detailed above.

**PD-1 is upregulated on HIV specific CD8 T cells**

2006
772 citations
## HIV pathogenesis and vaccines

<table>
<thead>
<tr>
<th>Title</th>
<th>Authors</th>
<th>Year</th>
<th>Citations</th>
</tr>
</thead>
<tbody>
<tr>
<td>The CCR5 and CXCR4 Coreceptors Are Both Used by Human Immunodeficiency Virus Type 1 Primary Isolates from Subtype C</td>
<td>Tonie Cilliers,1 Jabulani Nhlapo,1 Mia Coetzee,1 Dragana Orlovic,2 Thomas Ketas,3 William C. Olson,3 John P. Moore,4 Alexandra Trkola,5 and Lynn Morris1,9</td>
<td>2003</td>
<td>101 citations</td>
</tr>
<tr>
<td>Dominant influence of HLA-B in mediating the potential co-evolution of HIV and HLA</td>
<td>Photini Klepiela,1 Alasdair J. Leslie,1 Isabella Honeyborne1,2, Dannii Randhuth,2 Christina Thobakgale1, Senica Chetty1,3 Prinshna Rathnathasan,4 Corey Moore,4 Katja J. Pfaeffert,5 Louise Hilton2, Peter Zimbwa,5 Sarah Moore,5 Todd Allen,5 Christian Brandt,6 Marylyn M. Addo,1 Marcus Alfred1, Ian James1, Simon Mallai1, Michael Gumore1, Linda D. Barber,5 James Szlinder,5 Cheryl Day,5 Paul Klemann, James Mullins1,5, Bette Korber,5 Helen S. Cooper,5 Bruce D. Walker2,3,5 &amp; Philip J. R. Goddard2,3,5</td>
<td>2004</td>
<td>353 citations</td>
</tr>
<tr>
<td>Nature of Nonfunctional Envelope Proteins on the Surface of Human Immunodeficiency Virus Type 1</td>
<td>Penny L. Moore,1,9 Emma T. Crooks,1,2 Lauren Porter,1,9 Ping Zhu,2,3 Charmagne S. Cayanan,4,9 Henry Grise,2 Paul Corcoran,1 Michael B. Zwick,9 Michael Franti,9 Lynn Morris,2 Kenneth H. Roux,9 Dennis R. Burton,1 and James M. Binley1,9</td>
<td>2006</td>
<td>114 citations</td>
</tr>
<tr>
<td>CD8+ T-cell responses to different HIV proteins have discordant associations with viral load</td>
<td>Photini Klepiela1, Kholiswa Ngumbela1, Christina Thobakgale1, Dhanvanthie Ramduth1, Isabella Honeyborne1,2, Fasha Moodley,3, Shabashini Reddy1, Chantal de Pierres3, Zenele Msucube1, Nompumelelo Mkhwanazi1, Karen Bishop6, Mary van der Stok1, Kribskamie Nair2, Naureen Khan1, Hayley Crawford2, Rebecca Payne1, Alasdair Leslie1, Julia Prud1, Andrew Prendergast2, John Frater1, Noel McCarthy1, Christian Brandt6, Gerald H. Lear3, David Nickle1, Christian Rousseau1, Helen S. Cooper5, James M Mullins1,5, David Heckerman5, Bruce D Walker2,3,5 &amp; Philip Goddard2,3,5</td>
<td>2007</td>
<td>361 citations</td>
</tr>
<tr>
<td>Neutralizing Antibody Responses in Acute Human Immunodeficiency Virus Type 1 Subtype C Infection</td>
<td>E. S. Gray,1,9 P. L. Moore,1,9 I. A. Choge,1 J. M. Decker,2 F. Bibollet-Ruche,2 H. Li,2 N. Leseka,1 F. Treurnicht,1 K. Misana,4 G. M. Shaw,4 S. S. Abdool Karim,4 C. Williamson,4 L. Morris,1,9 and the CAPRISA 002 Study Team</td>
<td>2007</td>
<td>122 citations</td>
</tr>
</tbody>
</table>
Major contributions to HIV and TB co-infection

Effect of highly active antiretroviral therapy on incidence of tuberculosis in South Africa: a cohort study
Motasim Badri, Douglas Wilson, Robin Wood

<table>
<thead>
<tr>
<th></th>
<th>HAART</th>
<th>Non-HAART</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number of cases of tuberculosis</td>
<td>Patient-years</td>
</tr>
<tr>
<td>Overall</td>
<td>9</td>
<td>375-1</td>
</tr>
<tr>
<td>CD4 count (cells/μL)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;200</td>
<td>5</td>
<td>148</td>
</tr>
<tr>
<td>200–350</td>
<td>2</td>
<td>121-2</td>
</tr>
<tr>
<td>&gt;350</td>
<td>2</td>
<td>100-1</td>
</tr>
<tr>
<td>WHO stage</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 or 2</td>
<td>1</td>
<td>219</td>
</tr>
<tr>
<td>3 or 4</td>
<td>8</td>
<td>172-75</td>
</tr>
<tr>
<td>Socioeconomic status</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>6</td>
<td>166-21</td>
</tr>
<tr>
<td>High</td>
<td>3</td>
<td>208-89</td>
</tr>
</tbody>
</table>

HAART=highly active antiretroviral therapy. *Per 100 patient-years.

Tuberculosis incidence and cases averted, stratified by baseline CD4 count, WHO stage, and socioeconomic status
HIV and TB co-infection

Immune reconstitution disease associated with mycobacterial infections in HIV-infected individuals receiving antiretrovirals

Stephen D Lawn, Linda-Gail Bekker, Robert F Miller

Tuberculosis among HIV-infected patients receiving HAART: long term incidence and risk factors in a South African cohort

Stephen D. Lawn\textsuperscript{a,b}, Motasim Badri\textsuperscript{a} and Robin Wood\textsuperscript{a}

Burden of tuberculosis in an antiretroviral treatment programme in sub-Saharan Africa: impact on treatment outcomes and implications for tuberculosis control

Stephen D. Lawn\textsuperscript{a,c}, Landon Myer\textsuperscript{b,d}, Linda-Gail Bekker\textsuperscript{a} and Robin Wood\textsuperscript{a}

Undiagnosed Tuberculosis in a Community with High HIV Prevalence

Implications for Tuberculosis Control

Robin Wood, Keren Middelkoop, Landon Myer, Alison D. Grant, Andrew Whitelaw, Stephen D. Lawn,

Timing of Initiation of Antiretroviral Drugs during Tuberculosis Therapy

Major contributions to HIV treatment

Outcomes after two years of providing antiretroviral treatment in Khayelitsha, South Africa

David Coetzee\textsuperscript{a}, Katherine Hildebrand\textsuperscript{a}, Andrew Boulle\textsuperscript{a}, Gary Maartens\textsuperscript{b}, Francoise Louis\textsuperscript{c}, Veliswa Labatala\textsuperscript{c}, Hermann Reuter\textsuperscript{c}, Nonthutuzelo Ntswana\textsuperscript{c} and Eric Goemaere\textsuperscript{c}

Survival of adults on antiretroviral treatment
HIV treatment

Early mortality among adults accessing a community-based antiretroviral service in South Africa: implications for programme design

Stephen D. Lawn\textsuperscript{a,c}, Landon Myer\textsuperscript{a,b,d}, Catherine Orrell\textsuperscript{a}, Linda-Gail Bekker\textsuperscript{a} and Robin Wood\textsuperscript{a}

2005
201 citations

Patient Retention in Antiretroviral Therapy Programs in Sub-Saharan Africa: A Systematic Review

Sydney Rosen\textsuperscript{1,7}, Matthew P. Fox, Christopher J. Gill\textsuperscript{1,7}

2007
271 citations

Early Antiretroviral Therapy and Mortality among HIV-Infected Infants

Avy Violari, F.C.Paed., Mark F. Cotton, M.Med., Ph.D., Diana M. Gibb, M.D., Abd el G. Babiker, Ph.D., Jan Steyn, M.Sc., Shabir A. Madhi, F.C.Paed., Ph.D., Patrick Jean-Philippe, M.D., and James A. McIntyre, F.R.C.P.G., for the CHER Study Team\textsuperscript{a}

2008
321 citations

Early mortality among adults accessing antiretroviral treatment programmes in sub-Saharan Africa

Stephen D. Lawn\textsuperscript{a,b}, Anthony D. Harries\textsuperscript{b,c,d}, Xavier Anglaret\textsuperscript{e,f}, Landon Myer\textsuperscript{g,h} and Robin Wood\textsuperscript{a}

2008
222 citations
What’s next in HIV research in South Africa?

Evolution of an HIV glycan-dependent broadly neutralizing antibody epitope through immune escape
Penny L. Moore1,2, Elin S. Gray1, Constantinos Kurt Wibrin1,2, Jinal N. Bhiman1,2, Molati Nonyane1, Daniel J. Sheward1, Tandile Hermanus1, Shringkhala Bajmaya1, Nancy L. Tumba1, Melissa-Rose Abrahams2, Bronwen E. Lampson1, Njabulo S. Rancho1, Liua Ping1, Nobubelo Ngandu1, Quarraisha Abdool Karim6, Salim S. Abdool Karim6, Ronald I. Swanstrom3, Michael S. Seaman3, Carolyn Williamson3 and Lynn Morris1,2.

Evaluation of the Effectiveness of the National Prevention of Mother-to-Child Transmission (PMTCT) Programme on Infant HIV measured at Six Weeks Postpartum in South Africa
Ameena Goga, Thu-Ha Dinh, Debra Jackson et al.

FACTS 001: A Phase III, Multi-Centre, Randomised Controlled Trial to Assess the Safety and Effectiveness of the Vaginal Microbicide 1% Tenofovir Gel in the Prevention of Human Immunodeficiency Virus Type 1 Infection in Young Women, and to Examine Effects of the Microbicide on the Incidence of Herpes Simplex Virus Type 2 Infection
Helen Rees, Glenda Gray et al.

Effect of ART coverage on rate of new HIV infections in a hyper-endemic, rural population: South Africa
Frank Tanser, Till Bärnighausen, Erofili Grapsa and Marie-Louise Newell
Converting Science into Policy
HIV prevention successes: 2010 - 2012

• **HIV testing campaign:** 13 million HIV tests in 2010/1

• **Condoms:** 492m male condoms in 2010 (↑ by 30% in 5yrs)

• **Medical Male circumcision:** 250,000 in 2011
  ↑ 50-fold from 5190 circumcisions in 2008

• **Preventing mother-to-child transmission:**
  ▪ 98% of women receive HIV test during pregnancy
  ▪ 92% of HIV+ mothers receive ART prophylaxis
  ▪ Vertical transmission rate in 2011 = 2.7%

South Africa’s laudable achievements:
Deaths are lower & people are living longer than 5 years ago - due to AIDS treatment

1. Deaths in children <5yrs: ↓ 43%
   (42 per 1000 live births in 2011)

2. Adults deaths: ↓ 20%
   (40% premature deaths in 2011)

3. Life expectancy: ↑ by 6 years
   (60 years in 2011)

Acknowledgements

Thanks to the HIV Clinician’s Society for their untiring efforts over many years to improve the quality of care we, as clinician’s, can offer our patients.

Thank you to the many great scientists whose work I have cited - for their seminal contributions over the last 30 years of the HIV epidemic.

Thanks to all those patients, participants, advocates and research teams that have made South Africa a powerhouse of AIDS research globally