



In this Issue

Our feature story this month highlights the moderate-to-high level of pre-treatment HIV drug resistance in KwaZulu-Natal.

On page 2 we report on the visit by academics from the University of Georgia and congratulate Ms Gethwana Mahlase, CAPRISA's Rural Community advisor, on her graduation. We also report on AVAC Fellow, Ntokozo Zakwe, who is being hosted by CAPRISA.

The achievements of CAPRISA's associates and the INTEREST and AIRR conference is featured on page 3.

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CENTRE FOR THE AIDS PROGRAMME OF RESEARCH IN SOUTH AFRICA

Newsletter

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High levels of pre-treatment HIV drug resistance found in young women in KwaZulu-Natal

In this analytical study led by Dr. Ben Chimukangara at the KwaZulu-Natal Research Innovation and Sequencing Platform (KRISP), data from two large population-based HIV surveillance studies showed that one in nine ART-naïve adults had PDR most of which was resistant to the NNRTI class. The highest levels of PDR were found in young women - almost one in six ART-naïve women aged 15-34 years were infected with drug-resistant virus (**Figure 1**).

The study published in the journal *AIDS Research and Human Retroviruses*, aimed to estimate prevalence of pre-treatment HIV drug resistance (PDR) in KwaZulu-Natal in antiretroviral therapy (ART)-naïve adults in the community.

Sanger sequencing was performed on samples obtained from a longitudinal HIV surveillance program (study A, 2013–2014) and the HIV Incidence Provincial Surveillance System (HIPPS,

CAPRISA 251) (study B, 2014–2015).

A total of 1,845 sequences were analyzed (611 study A; 1,234 study B). An overall PDR prevalence of 9.2% [95% confidence interval (CI) 7.0–11.7] was observed for study A and 11.0% (95% CI 8.9–13.2) for study B. In study B, the prevalence of non-nucleoside reverse-transcriptase inhibitor (NNRTI) PDR exceeded 10% for sequences collected in 2014 (10.2%, 95% CI 7.5–12.9).

Genetic analysis of HIV from treated and untreated individuals provided some evidence that transmission of drug-resistant HIV was occurring predominantly from people who developed drug resistance on ART.

The findings highlight the need to develop simple, rapid HIV drug resistance tests and for broader public health measures to control the emergence and spread of drug-resistant HIV.

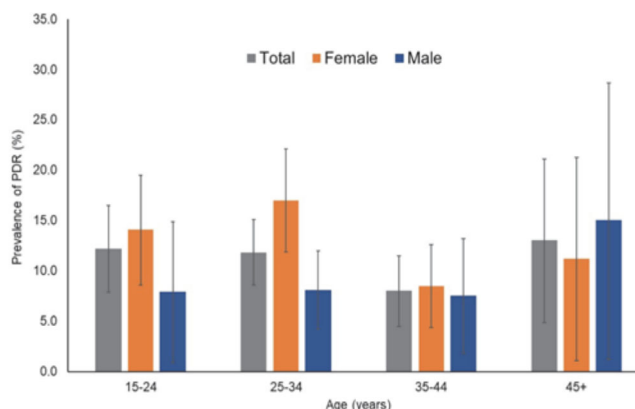


Figure 1: Estimated prevalence of pre-treatment HIV drug resistance by sex and age in HIPSS 2014-2015

For further reading:

Chimukangara B et.al, Moderate-to-High Levels of Pretreatment HIV Drug Resistance in KwaZulu-Natal Province, South Africa. *AIDS Research and Human Retroviruses*. 2019; 35(2):129-138
<https://www.ncbi.nlm.nih.gov/pubmed/?term=30430843>



Statisticians in dialogue



Back Row (L-R): Farzana Osman Statistician (CAPRISA), Adenike Soogun (Research Fellow, CAPRISA), Lara Lewis, Statistician (CAPRISA), Mesuli Mhlongo (Statistician, CAPRISA) and Prof Delia North, Professor Delia North (UKZN), Nobuhle Mchumu (Stats Fellow, CAPRISA). Front Row (L-R): Prof Christine Franklin, Dr Nonhlanhla Yende Zuma and Prof Dale Green.

CAPRISA's head of Statistics and Data Management, Dr Nonhlanhla Yende-Zuma, hosted academics from the University of Georgia's Department of Statistics and the College of Public Health on 13th May.

Professors Christine Franklin and Dale Green accompanied by Professor Delia North, Dean & Head of School of Mathematics, Statistics and Computer Science at the University of KwaZulu-Natal, visited CAPRISA's eThekweni Research Clinic and headquarters.

They held discussions with the statistics and data management team to gain insight into big data and statistical literacy at university and high school levels, which will benefit young statisticians pursuing careers research. Yende-Zuma said the visit presented an opportunity for future collaboration.

Community champion graduates

We congratulate CAPRISA's rural community advisor, Ms Gethwana Mahlase, on her graduation with her Master's in Social Science degree. Her masters examined the readiness of the Primary Health Care Clinics in Vulindlela for the provision of Pre-Exposure Prophylaxis (PrEP) to Adolescent Girls and Young Women (AGYW).

Mahlase examined the knowledge and attitude among Primary Health Care providers in six Primary Health Care Clinics in Vulindlela; their perceived barriers and benefits that could hinder or promote provider readiness for oral PrEP and the key influences for the oral PrEP provider readiness at a primary care provider in Vulindlela, KwaZulu-Natal.



CAPRISA hosts AVAC Advocacy Fellow

AVAC Advocacy Fellow Ntoko-zo Zakwe, a HIV prevention and women's health rights advocate, will be hosted by CAPRISA during her 12-month fellowship.

Twenty-seven-year old Zakwe's personal experience as a young woman in South Africa fuelled her passion in advocacy work for women. Zakwe has been invited to participate in the plenary program of the global Women Deliver 2019 Conference that will be held in Vancouver, Canada from 3 – 6 June.

The session is entitled: "The Power of Scale: Taking our business to scale and driving integration and social change". Professor Quarraisha Abdool Karim CAPRISA Associate Scientific Director, con-



gratulated Zakwe and said the conference was 'an amazing opportunity to advance the course of young women.' Zakwe was selected as a Johnson & Johnson Fellow to attend the Global Citizen Festival in 2016 and the Devex World conference last year.

She served as a District Administrator in the DREAMS Programme for the Health Systems Trust and is a chairperson of the UMgungundlovu District AIDS Council Youth Sector. Commenting on her Fellowship, Zakwe said: "I have always believed in advocating and fighting for the vulnerable populations and this fellowship will help me ensure that the next generation does not have to fight the same battles that we had to fight."



Research on the African continent in the spotlight



Left: Professor Kogie Naidoo with Dr Cate Hankins, Scientific Chair INTEREST Conference

Associate Professor Kogie Naidoo, CAPRISA Head of HIV and TB Treatment Research, delivered a presentation at the 2019 13th INTEREST Conference held at the Kempinski Hotel Gold Coast City Accra, Ghana, from the 14- 17 May.

Her presentation entitled: ‘Update on Tuberculosis- Epidemiology, New Drugs and Treatment strategies, TB vaccine development, Advocacy and Lessons Learnt from the United Nations General Assembly on TB’, elicited robust discussion.

Known as the “African CROI” the INTEREST Conference was a gathering of scientists in HIV treatment, pathogenesis, and prevention research in Africa, the US and Europe to share significant findings, encourage collaboration, and share experiences across various areas.

Naidoo said the conference provided a platform for robust engagement between scientists and programme implementers, providing valuable insights into the interdisciplinary research studies underway in Africa.

AIRR Community Meeting

Dr Cathrine Scheepers of the HIV Virology Section, National Institute for Communicable Diseases (NICD), attended the Adaptive Immune Receptor Repertoire (AIRR) Community Meeting IV:



“Bridging the Gaps” which took place on 11-15 May 2019 at the University of Genoa in Italy.

The theme of this meeting addressed technological gaps between large amounts of data and our ability to process them.

In recognition of her contributions to describing novel immunoglobulin alleles in the CAPRISA cohorts, Scheepers was appointed as a member of the Inferred Allele Review Committee (IARC) tasked with reviewing and validating novel heavy chain variable region gene (IGHV) alleles identified through AIRR data and their recommendation to IMGT (the international reference database for immunogenetics, www.imgt.org).

To date they have validated 9 sequences that have been accepted by IMGT for use by the broader community.

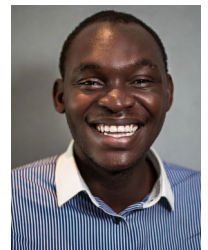
Congratulations...



Congratulations to three of CAPRISA’s Honorary Associate Scientists on their recent prestigious achievements. Professor Tulio de Oliveira (left) on his appointment as Affiliate Professor at the Department of Global Health (DGH), University of Washington, Seattle, USA; Professor Frank Tanser (middle) who was awarded a prestigious Royal Geographical Society Back Medal for conducting seminal research; and Dr Veron Ramsuran (right) who was awarded the prestigious African Academy of Sciences and Royal Society FLAIR Fellowship.

2019 James Gear Fellowship for NICD PhD graduate

Dr Batsirai Mabvokure from the HIV Virology Section, NICD (who recently graduated with his PhD) has been awarded the 2019 Poliomyelitis Research Foundation James Gear Fellowship. This Fellowship will support Mabvokure in his new Post-Doctoral position at John Hopkins University School of Medicine, and the John Hopkins Bloomberg School of Public Health in the Infectious Diseases Dynamics Group. Congratulations!





Scientific papers published in 2019

25 **Pillay T, Sobia P, Olivier AJ, Narain K, Liebenberg LJP, Ngcapu S, Mhlongo M, Passmore JS, Baxter C, Archary D.** Semen IgM, IgG1, and IgG3 Differentially Associate With Pro-Inflammatory Cytokines in HIV-Infected Men. *Frontiers in Immunology* 2019; 9:3141. doi: 10.3389/fimmu.2018.03141.

26 **Humphries H, Osman F, Knight L, Abdool Karim Q.** Who is sexually active? Using a multi-component sexual activity profile (MSAP) to explore, identify and describe sexually-active high-school students in rural KwaZulu-Natal, South Africa. *BMC Public Health* 2019; 19(1):317. doi: 10.1186/s12889-019-6602-y.

27 **Mahomed S, Padayatchi N, Singh J, Naidoo K.** Precision Medicine in Resistant Tuberculosis: Treat the correct patient, at the correct time, with the correct drug. *Journal of Infection* 2019;78(4): 261-268.

28 Tomita A, Ramlall S, Naidu T, Mthembu SS, **Padayatchi N**, Burns JK. Neurocognitive Impairment Risk Among Individuals With Multiple Drug-Resistant Tuberculosis and Human Immunodeficiency Virus Coinfection: Implications for Systematic Linkage to and Retention of Care in Tuberculosis/ Human Immunodeficiency Virus Treatment. *Journal of Nervous and Mental Disease* 2019; 207(4):307-310.

29 Ealand CS, Asmal R, Mashigo L, Campbell L, **Kana BD.** Characterization of putative DD-carboxypeptidase-encoding genes in Mycobacterium smegmatis. *Scientific reports* 2019; 9(1):5194. doi: 10.1038/s41598-019-41001-x

30 **Singh JA, Siddiqi M, Parameshwar P, Chandra-Mouli V.** World Health Organization Guidance on Ethical Considerations in Planning and Reviewing Research Studies on Sexual and Reproductive Health in Adolescents. *Journal of Adolescent Health* 2019; 64(4):427-429.

31 Moosa F, du Plessis M, Wolter N, Carrim M, Cohen C, von Mollendorf C, Walaza S, Tempia S, **Dawood H**, Variava E, von Gottberg A. Challenges and clinical relevance of molecular detection of Bordetella pertussis in South Africa. *BMC Infectious Diseases* 2019; 19(1):276. doi: 10.1186/s12879-019-3869-7.

32 **O'Donnell MR, Larsen MH, Brown TS, Jain P, Munsamy V, Wolf A, Uccellini L, Karim F, D'Olivera T, Mathema B, Jacobs WR, Pym A.** Early detection of emergent extensively drug resistant tuberculosis (XDR-TB) by flow cytometry-based phenotyping and whole genome sequencing. *Antimicrobial Agents Chemotherapy* 2019; 63(4): e01834-18.

33 Tomita A, Ramlall S, Naidu T, Mthembu SS, **Padayatchi N**, Burns JK. Major depression and household food insecurity among individuals with multidrug-resistant tuberculosis (MDR-TB) in South Africa. *Social Psychiatry and Psychiatric Epidemiology* 2019;54(3):387-393.

34 Chiliza TE, Pillay M, **Naidoo K**, Pillay B. Immunoscreening of the M. tuberculosis F15/LAM4/KZN secretome library against TB patients' sera identifies unique active- and latent-TB specific biomarkers. *Tuberculosis* 2019; 115:161-170.

*continuation from previous newsletter



CAPRISA hosts a DST-NRF Centre of Excellence in HIV Prevention



UNAIDS
CAPRISA is the UNAIDS Collaborating Centre for HIV Research and Policy



CAPRISA hosts a MRC HIV-TB Pathogenesis and Treatment Research Unit
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