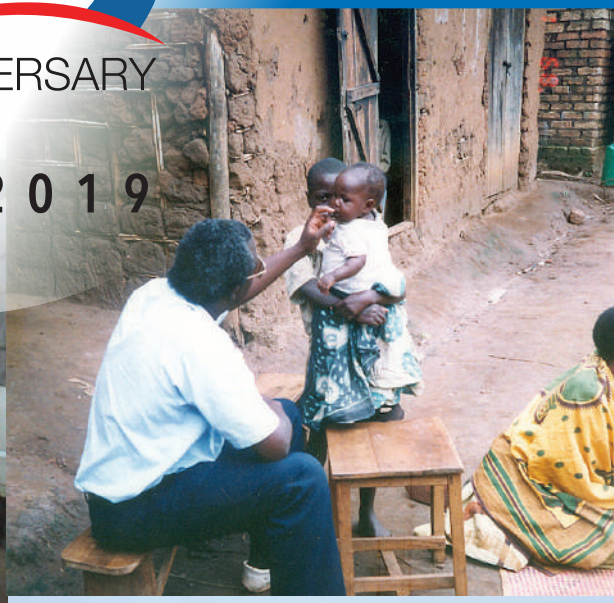
Rakai Health Sciences Program
Improved Health Through Research

30+ ANNIVERSARY

1989-2019



30TH ANNIVERSARY REPORT

The Rakai Health Sciences Program

The Rakai Health Sciences Program (RHSP) is a collaborative not-for-profit health research and service organization with a focus on community-based research, treatment and prevention of HIV and other communicable diseases in 9 districts (the Masaka region) of south central Uganda.

Vision Statement

To excel in Health Research, Disease Prevention and Care

Mission Statement

To conduct innovative health research on infectious diseases, non-communicable diseases and reproductive health, and to provide health services to improve public health and inform policy.

Objectives and Strategic Directions:

- To conduct research relevant to Uganda and internationally, on HIV, other infectious diseases, reproductive health, and non-communicable diseases
- To integrate research in epidemiology, demography, clinical, laboratory and social sciences
- To improve and develop infrastructure in support of research and service delivery in the Masaka region of Uganda.
- To build human capacity via training and provision of a career structure for Ugandan investigators and senior staff
- To create and build the program as a long-term, sustainable Ugandan national resource

Core Values

Creativity, Respect, Excellence, Accountability, Integrity, Team Work, Efficiency are the fundamental principles of RHSP which define its organizational culture and create a unique environment for health research and services.

Rakai Health Sciences Program Report 2019

Editorial: Prof. Ronald Gray, Prof. Maria Wawer and RHSP Team and Collaborators

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Contents

Forewords ..... *iv*
Acronyms ..... *ix*
Key Partners and Collaborators ..... *x*
Brief History of Research and Training Conducted by the RHSP ..... **xi**
RHSP Papers with 100 or more Scholarly Citations **21**
Recent Papers 2016-2019 and selected previous Rakai Publications **26**
Summary of RHSP Programmatic Services with Support from CDC Uganda / PEPFAR **43**
Fogarty International Training Center Beneficiaries **48**
RHSP Gallery **50**
Reflections on RHSP **62**

Foreword

Prof. David Serwadda
Co-Founder RHSP

I first became aware, through medical journals of an epidemic of immunosuppressive illness among white homosexual males in United states in 1983 while working as a young research scientist in the Uganda Cancer Institute. I quickly realised that Kaposi's sarcoma (KS) was one of the clinical manifestations of this disease and was a tumor we managed in the center among patients referred from all over Uganda. It quickly became apparent that all the KS patients with the clinical presentation similar to that described in US were residents of Rakai district. In the course of the next year and half it increasingly became clear to me that Rakai district had an HIV epidemic. Field Investigation of this epidemic in 1984/85 lead to the first confirmed documentation of this HIV epidemic in the Rakai/Masaka region. Two things really surprised me. First the extent of the epidemic in terms of its geographical distribution and second the wide clinical presentation which up to then was not well appreciated in Uganda. This led to a group of us to to study this epidemic further by presenting a proposal to CDC to study the dynamics of HIV transmission in Rakai district in 1986. This proposal was forward to USAID and eventually to Dr Maria Wawer, Columbia University.

Dr Nelson Sewankambo and I had the pleasure of meeting Dr. Maria Wawer in Mulago Hospital fourth floor for the first time in 1987 to discuss an implementation plan to move forward our studies in Rakai district. Although it never felt like it at the time, but this was truly the beginning of the Rakai Project which later morphed into the Rakai Health Science program (RHSP.)

I had no idea that this would mushroom over the years to be one of the first population based HIV research program in Africa that has created a world class research infrastructure in a rural site. Further, the research output over the years have made a significant contributions to our understanding of HIV transmission and thus provide possible pathways for HIV prevention trials. I am very proud of the opportunity RHSP has provided to training Ugandan and international students and therefore provide a platform for the next generation of research leaders. In addition, some of our major findings have been translated into strategies for services to the people of Rakai, Uganda and the world. Combined HIV interventions have decreased HIV incidence in Rakai from 2.5 to 0.8 per 100 person years, a decline of 68%.

All this would not have been possible without a strong partnership. I would like to express our sincere gratitude to the communities with whom we have walked this long journey. The Rakai district administration and Ministry of Health has been essential to supporting our work. The United states Government through NIH and CDC have been the pillar of our funding over the 30 years

Foreword

Prof. Maria Wawer
Co-Founder RHSP

When I first arrived in Uganda in August 1987, and met Drs. David Serwadda and Nelson Sewankambo, I think none of us expected – in our wildest imaginings – that the encounter would lead to 30+ years of productive collaboration and close friendship.

Just a few years earlier, David and Nelson, with Ugandan and British colleagues, had definitively established the presence of a raging HIV epidemic in rural Rakai. Since then they, and Uganda as a whole, began trying to address the clinical emergency posed by HIV, an endeavor greatly complicated by the depletion of human and material resources resulting from two decades of severe disruptions and civil war. On top of their clinical responsibilities at Mulago Hospital, David and Nelson had an additional vision: to determine the extent, risk factors and social/population-level effects of the HIV epidemic in Rakai – very much a public health perspective. They saw this as necessary to identify potential prevention strategies and to project future resource needs.

I had no HIV-related experience but had designed and implemented population-based surveys on reproductive health, so our interests and different skills meshed. Nonetheless I felt a bit hesitant since I was also involved in studies in Thailand, Brazil and French West Africa (all with great food, great music, not at all war-torn!) in contrast to the sad place Uganda was at that time. I mentioned this to Ron Gray, my husband (and since 1989, also a key Rakai Health Sciences Program researcher) who took one look at me and said that he could not imagine that anything else I could do would be more important. For once, I listened to Hubby, for which I am grateful. (Ron likes to say it is the only time I ever listened to him.)

These three decades, working with David, Nelson, and hundreds of Ugandan RHSP colleagues, have been a wild and rewarding ride. We are gratified that RHSP findings have contributed to the global understanding of HIV epidemic dynamics, furthered the development of effective HIV prevention strategies, and supported the rollout of HIV care and treatment services. It has been exceptionally encouraging to see HIV go from a death sentence to a chronic and manageable infection, and also – finally – see the beginnings of HIV epidemic control.

I wholeheartedly wish to thank David, Nelson, Ron, all RHSP principal investigators and colleagues in Uganda and internationally, the donors whose generosity and foresight have supported RHSP research and extensive service and training programs, the Uganda Ministry of Health and other policy makers, and most especially each and every participant in RHSP studies, for making this tremendous collaboration possible. I am also very heartened that the RHSP has enabled the development of a new generation (or two) of highly talented and committed investigators on both sides of the Atlantic who can lead this work for the next 30 years.

THE MISSION CONTINUES!

Foreword

Prof. N. Sewankambo
Co-Founder RHSP

In the last 30 years I have marveled at the considerable progress made in our understanding of the AIDS epidemic, patient management and prevention of new infections. The history of Uganda's contribution to the fight against AIDS can't be complete without a close look at the contribution of the Rakai Health Sciences Program (RHSP). I look back with a sense of satisfaction that the initial efforts to start the research initiative was the brain child of a team of Ugandans including myself who were self-motivated, were extremely curious and had a burning desire to address what appeared to be an emerging major problem in our midst. Without any research funding we travelled on pot-holed roads to Masaka hospital, Kalisizo health center and rural Rakai district communities to interview and examine patients suspected of slim disease (as the new disease had come to known by the local community), and collect biological specimens (blood, urine, stool and sputum).

As a young academic at the time, I plunged into doing research with very little resources available to us. All we had was a team of willing and enthusiastic researchers, a jeep provided by the British embassy in Kampala, supplies donated from different laboratories here and there, and a supportive UK public health lab in Porton Down, Salisbury that agreed to examine the human samples collected. After confirmation that the disease was like what was affecting gay men in North America, we became even more determined to do further research on this disease and hence the beginning of RHSP. The program started with extremely humble, simple infrastructure. Many scientists wondered how we could do so much high-quality research in such an environment. The thirty-year journey is ably presented in this report. It is gratifying for me to see that RHSP findings have contributed to making important differences in HIV care and prevention not only in the Rakai community and the country at large, but also globally.

I am thrilled with the recent scale up of RHSP's efforts in delivery of HIV treatment, care and prevention services and using program data to achieve maximum impact beyond the 90-90-90 targets. This puts the people at the center of our work. The beauty of RHSP work is the bidirectional influence between research and programming with each feeding into the other. I think about research as a vehicle for improving the health and wellbeing of mankind in both the near and distant future. If the people of Rakai allowed me to summarize their lived experiences I would say; "We have transformed from a life where selling coffins that lined the roads in trading centres was a lucrative business to a future lined with many opportunities. Long gone are the days when a weekly activity in our lives was burying the dead, and grandparents were left to care for their grandchildren. Adolescents now see a bright future and have overcome a sense of despair and life without a meaning."

RHSP is blessed with a workforce whose work ethic and culture, values and embeds quality, hard work, deep understanding of the research and program protocols and pursues strong collaborations with the government, communities and their leadership.

Foreword

Perspective from
Prof. Ronald Gray

I first came to Rakai in 1989 and was appalled by the terrible tragedy of the AIDS epidemic at that time, but impressed by the dedicated work of Drs. Serwadda, Sewankambo and my wife, Maria Wawer. This experience changed the trajectory of my professional and personal life and led to a long-term commitment to the Rakai program combining research with a concomitant component of HIV prevention and treatment services. The combination of science with services is a unique effort which has resulted in marked reductions in HIV incidence, AIDS related mortality and morbidity, and almost the complete eradication of infant infections. It is so gratifying that as a consequence of this team effort there is now the prospect of achieving epidemic control by 2030 (rather than waiting another 30 years!)

Rakai was the first research team to show that HIV viral load was the main determinant of HIV transmission risk, and this led to the concept of treatment as prevention, and ultimately the strategy of universal test and treat. Similarly, Rakai conducted one of the trials which demonstrated the efficacy of male circumcision for HIV prevention in men, and led to circumcision programs in 15 priority African countries which have performed over 20 million procedures. Uganda is a leader in this regard and has performed almost 4 million circumcisions.

This report summarizes 30 years of research and services to abate the HIV epidemic and ultimately to achieve the goal of an AIDS free generation. The Rakai collaboration has been a wonderful experience of collegiality and friendship which has made working in Uganda a professional and personal delight.

Foreword

Dr. Joseph Kagaayi
Executive Director

It is great honour to witness Rakai Health sciences (RHSP) Program mark over 30 years of contributing to the control of the HIV epidemic. I have only contributed to the last 20 years of of RHSP and so I cannot claim to know how it all started. However, I have seen the program evolve before my own eyes across multiple dimensions. Over the course of 30 plus years over 350 articles have been contributed by RHSP to the scientific literature; the program has established permanent presence in the greater Rakai district by moving away from rented space to permanent structures owned by the program which include state of the ART laboratory, information technology and data management infrastructure; the staffing level has increased from about 60 in the year 2000 to about 600 in 2019; the partnerships of the program have grown from a dual partnership of Ugandan and USA investigators to multiple partnerships across multiple countries in virtually all continents; the scope of research has increased from majorly observational epidemiological research to include interventional epidemiology, molecular epidemiology, implementation sciences, and clinical research; HIV service programs have expanded in scope and geographically from treatment of opportunistic infections, HIV testing and counselling and condom distribution in greater Rakai district to a comprehensive array of about ten HIV prevention and treatment services across 12 districts of south-central Uganda including Kalangala district, an archipelago of 84 islands; the results of the program have contributed immensely to the understanding of the HIV epidemic and contributed effective approaches to national and international policies of HIV treatment and prevention as has been summarized in this document; and lastly, deliberate efforts have been made to transition the leadership of the program to the younger generation to pave way for another 30 years of innovative scientific discovery.

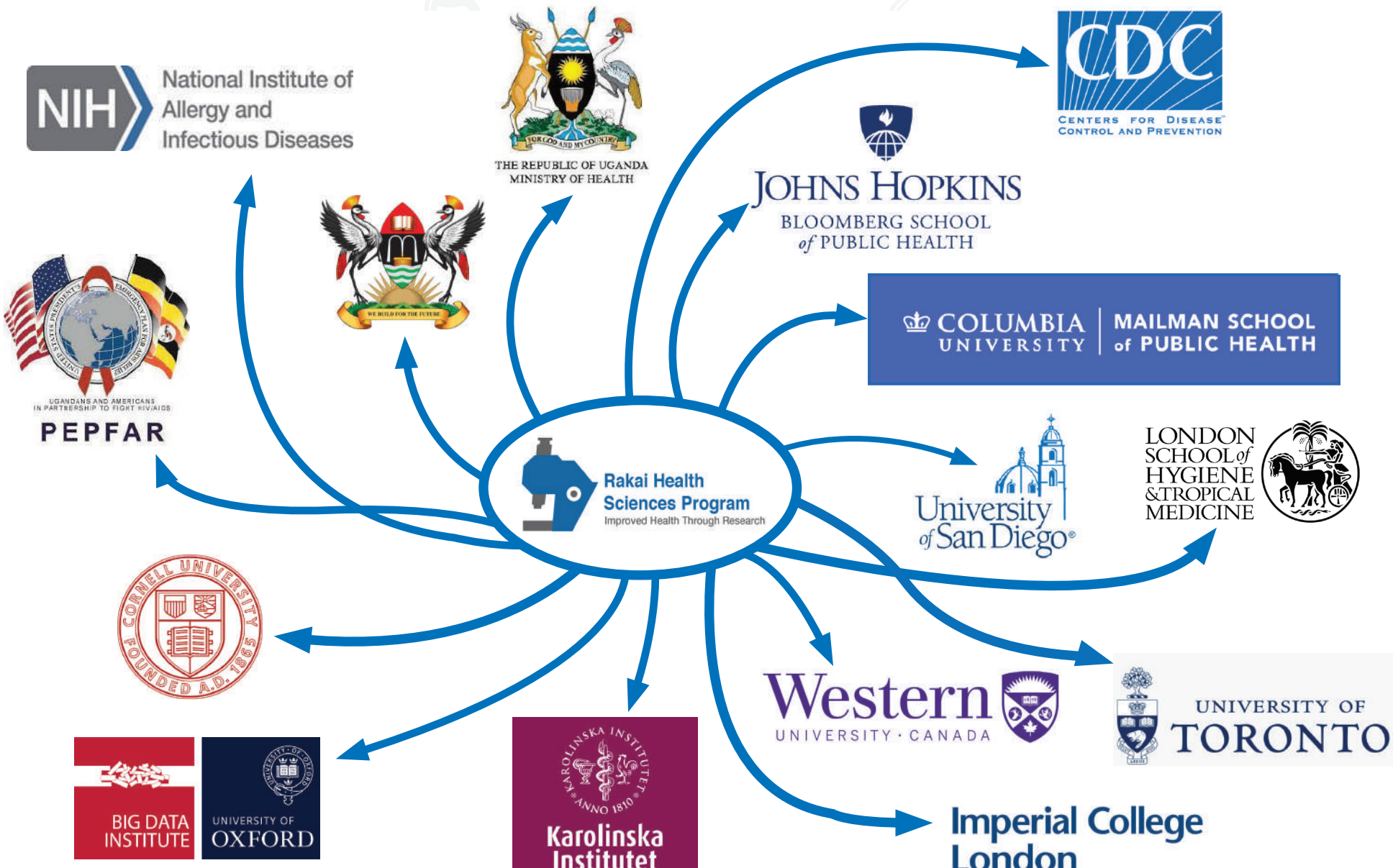
As I reflect on all these achievements, I cannot help but thank the founders of this great organization for being visionary, committed, and resilient in sustaining the program even in the absence of core funding for research. I still thank them for making deliberate efforts to prepare the next generation of young Rakai scientists for tasks that lie ahead. Such efforts have included high quality training in the best institutions in the world leading to masters and doctoral degrees. Currently, the program boasts of ten staff with doctoral training and over 30 with masters training in active service of the program. The selfless mentorship given by the founders during and following training has helped young scientists contribute to science through several publications and pursuit of research as principal investigators. I must thank the various partners and funders who have supported the multi-disciplinary work of RHSP; the Ministry of health and district local governments for their support; the communities for accepting to participate in our research; the field teams, under the leadership of various team leads, for connecting and engaging communities in research and services; the administrative team for supporting field teams with the needed logistics; the scientific team for the great science; the directors, with whom I work day-in and day-out, to ensure that the program attains its vision; and Board of directors for their strategic support and leadership.

Lastly, I would like to invite you to review this great document, which gives a chronological summary of the achievements of RHSP and great insights from world-class scientists. Enjoy.

Acronyms

AGYW:	Adolescent Girls and Young Women
AIRR:	Adjusted Incidence Rate Ratio
AOR:	Adjusted Odds Ratio
APRR:	Adjusted Prevalence Rate Ratio
ART:	Antiretroviral Therapy
CDC:	Center for Disease Control
CME:	Continuing Medical Education
COP:	Cooperative Agreement
DHIS:	District Health Information System
DHO:	District Helath Officer
DIR:	Division of Intramural Research
DLP:	District Led Programming
DTLS:	District Tuberculosis and Leprosy Suspension
EID:	Early Infant Detection
GBV:	Gender based Violence
GoU:	Government of Uganda
HAD:	HIV associated Dementia
HAND:	HIV Associated Neurocognitive Disorders
HIV:	Human Immuno-deficiency Virus
HMIS:	Health Management Information System
HPV:	Human Papilloma Virus
HSV2:	Herpes Simplex Virus Type 2
HTS:	HIV Testing Services
HUE:	HIV-Uninfected Exposed
HUU:	HIV-Uninfected Unexposed
ICER:	International Center of Excellence in Research
IP:	Implementation Partner
KP/PP:	Key Population/Priority Population
M&E:	Monitoring and Evalution
MISS:	Maternal Infant Supplementary Study
MoH	Ministry of Education
MTCT:	Mother To Child HIV Transmission
NIAID:	National Institute of Allergy and Infectious Disease
NIH:	National Institutes of Health
NTLP:	National Tuberculosis and Leprocy Program
OVC:	Orphans and Vulnerable Children
PEPFAR:	President's Emergency Plan For AIDS Relief
PLWH:	People Living With HIV
RCCS:	Rakai Community Cohort Study
RHSP:	Rakai Health Sciences Program
VMMC:	Voluntary Medical Male Circumcision

Key Partners and Collaborators



Brief History of Research and Training Conducted by the RHSP

Introduction

Researchers and collaborators on the RHSP have conducted studies with global policy implications. These include some of the first population-based assessments of the HIV epidemic in rural Africa and studies to elucidate risk factors for HIV acquisition. The RHSP's population-based cohort, first established in 1988 and subsequently reconfigured and expanded in 1994, became the Rakai Community Cohort Study (RCCS), and has served as the basis for all subsequent RHSP research.

Catherine Bbosa collecting samples from the field

Rakai Community Cohort Study (RCCS)

Rakai Health Sciences Program
Improved Health Through Research

Epidemiology / Observational studies
(Quantitative / Qualitative)
- HIV risk factors, epidemic dynamics, effects of migration, marital status, etc
- HIV prevention / care utilization
- Circumcision, STIs, OIs, malaria, HSV-2, HPV, HHV-8
- Social (intimate partner violence, alcohol use, etc.)
- Research ethics

Randomized trials
- STI control for HIV prevention
- Maternal-infant STI control
- Voluntary male circumcision for HIV/STI prevention in men and women
- HSV-2 suppression to reduce HIV progression
- Preventing intimate partner violence
- Enhanced family planning
- Enhancing demand for HIV services: Peer Smart, mLake, Stylish Man, Welcome in-coming Neighbor

Basic research;
HIV subtypes, virology, immunology, mucosal immun., microbiology, pathology, HIV latent reservoir and cure, transmission bottleneck, etc…

R C C S

Implementation Sci
Male circ, combined HIV interventions, p-MTCT, FP, HIV care/Rx cascade

Molecular Epi
HIV phylogenetics, ART resistance, viral introductions, source/sink

Clinical research:
Neurology, renal, liver, HIV progression, treatment outcomes, NC-cardiopulm studies

Clinical care/services
HIV, OIs, TB, STIs, p-MTCT, voluntary male circ

Training
Uganda, USA, Internat'l

Circumcision in progress

Key RCCS findings include the role of HIV viral load in HIV transmission and infectivity by stage of HIV infection, which served as the basis of global research to assess the efficacy and effectiveness of treatment as prevention, ultimately leading to the ART "test and start" strategy which has now become the standard of care. The RHSP was also one of three African sites to conduct trials of voluntary medical male circumcision (VMMC) for HIV prevention in men; the successful trials resulted in the WHO recommending the procedure be included in the combined HIV intervention package. Over 18 million circumcisions have been performed in Sub-Saharan Africa contributing to the reductions of male HIV infections in many countries, including Uganda. RHSP was the only VMMC trial site to also assess the beneficial effects of male circumcision for female partners, using data from the RCCS. Although circumcision of HIV+ men did not reduce HIV transmission to women within the timeframe of the study, circumcision of both HIV-negative and HIV-positive men significantly reduced women's rates of genital ulceration, HPV (the virus which causes cervical cancer) and several sexually transmitted infections.

RCCS Survey and Community Mobilization

Group photo of first counselors after training in HIV counseling with Robert Kelly who was the Technical Advisor.

Recently, the RHSP published RCCS results showing significant reductions in HIV incidence associated with higher rates of ART and VMMC coverage at the population level. The program continues to conduct extensive epidemiological research using traditional epidemiologic methods and cutting-edge approaches such as HIV phylogenetics using next generation sequencing. Recent studies have identified a number of Rakai populations requiring additional outreach including migrants, persons who are difficult to reach, and fishing communities, in order to determine how best to achieve HIV epidemic control.

Using the RCCS as a tool for identification of participants with specific characteristics, RHSP is currently enrolling individuals into multiple clinical, virologic and immunologic studies, including research on HIV viral reservoirs for research related to HIV cure.

Below, we list key studies and grants, and a sample of the 400 RHSP papers published to date.

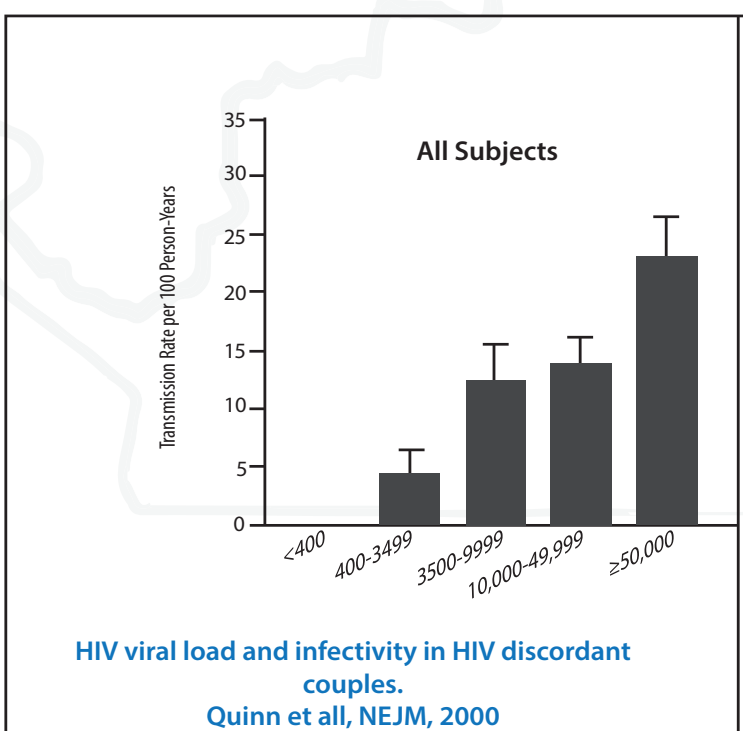
Year Primary grants	Study and Main findings (Main Policy Implications)	Selected Publications
1982 UK MRC and Cancer Research Campaign	**First report of AIDS in Eastern Africa** 29 cases of newly identified "Slim Disease" were the first AIDS cases reported in East Africa. Cases predominantly came from Rakai district leading to efforts by Ugandan investigators (Sewankambo, Serwadda, *et al)* to establish a population-based study in Rakai.	Serwadda et al. Lancet 1985
1988-1993 NIH R01 AI29314 USAID DPE 3030A 004049	**Initiation of the Rakai Health Sciences Program (then called the Rakai Project):** **Epidemiology and demography of HIV in Rakai**. HIV prevalence ranged from 8.6% in rural villages to 38.5% in main road trading centers. Incidence was 2.1/100 py and main risk factors were sexual risk behaviors and young age. Mortality among HIV+ adults was 118/1000py compared with 12.4/1000 py in HIV-negative persons. AIDS was associated with 52% of adult deaths. *(This study demonstrated the severity of the HIV epidemic motivating intensified prevention efforts)*	Berkley S et al, AIDS 1990;4:1237-42. Wawer et al. BMJ, 1991;303:1303-6 Serwadda et al AIDS 1992;6(9):983-9 Wawer et al. BMJ; 1994;308:171-3 Sewankambo et al. AIDS 1994;8:1707-13

Home based household census prior to first Rakai Cohort survey, 1989

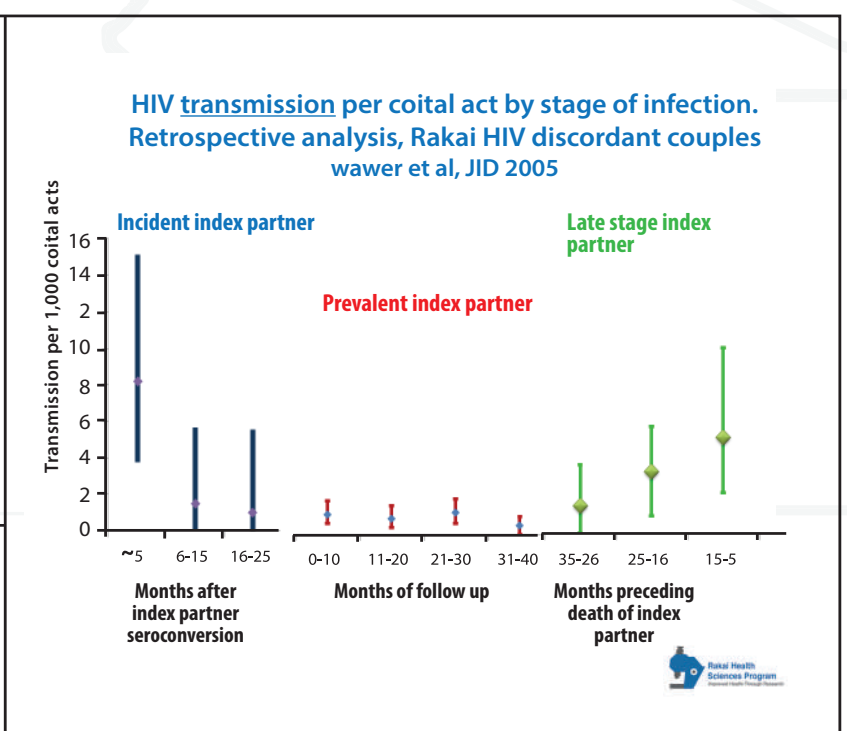
Year Primary grants	Study and Main findings (Main Policy Implications)	Selected Publications
1994-1998 NIH RO1-AI 34826, 5P30-HD 06268	**Community Randomized Trial of Sexually Transmitted Disease (STD) Control for HIV Prevention and Maternal-Infant Supplementary Study (MISS)** The cluster randomized trial of population-based STD control used mass, presumptive antibiotic treatment of curable STIs to determine effects on population HIV incidence and on mother- to-child HIV transmission (MTCT). STD control did not reduce HIV incidence or mother-to-child HIV transmission (MTCT), but significantly improved pregnancy outcomes and neonatal mortality. Placental malaria increased the rate of maternal-to-child HIV transmission 8-fold and formula feeding of infants born to HIV+ women increased infant mortality 6-fold. *(The lack of efficacy of STD control for prevention of incident HIV and prevention of MTCT was subsequently confirmed in multiple trials in other settings)*	Wawer et al. AIDS; 1998;12:1211-25 Wawer et al. Lancet 1999;353:525-35 Gray et al. AIDS 1999;13:2133-23 Gray et al. Amer J. Obs Gyn 2001:185: 1209-17 Sewankambo et al. Lancet 1997; 350 : 546-50 Serwadda et al. JID 1999;180:1316-9 Sewankambo et al. AIDS 2000;14: 2391-400 Wabwire-Mangen et al. Lancet;2001; 357(9251):233 Kigozi et al. Am J Obs Gyn;2003; 189:1398-400 Brahmbhatt et al. JAIDS 2008;47:472-6 Kagaayi et al. PLos One 2008;3:e3877

Home visit, MISS Study 1996

Year Primary grants	Study and Main findings (Main Policy Implications)	Selected Publications
1999-2004 NIAID Intramural Program International Center for Excellence in Research (ICER), NIH: RO1-AI 34826, 5P30-HD 06268, Henry M Jackson Foundation HM/F 586/CFDA12.420, World Bank, Rockefeller Foundation.	**Post-STD Trial Analyses of HIV infectivity** In order to better understand the lack of effect of STD control on HIV incidence, the RHSP undertook intensive analyses of factors affecting HIV transmission/acquisition. HIV viral load and genital ulcer disease are the main determinants of HIV infectivity. Transmission was highest with recent infections and AIDS. *(The finding that HIV viral load was the main determinant of transmission laid the basis for future treatment as prevention)* Male circumcision protected men from HIV acquisition, particularly in discordant couples where the female partner was HIV+. *(This provided the rationale for the subsequent trials of circumcision for HIV prevention)* There was no evidence of HIV risk from medical injections, transfusion or hormonal contraception in Rakai.	Quinn et al. NEJM 2000;342:921-9 Gray et al. Lancet 2001:357:1149-53 Wawer et al. JID 2005;191:1403-9 Gray et al. JID:2004:189:1209-15 Kiwanuka et al. AIDS 2004;18:342-4 Serwadda et al. JID 2003;17:2539-41 Kiddugavu et al. AIDS 2003;17:233-40 Kelly et al. AIDS 1999;13:399-405 Gray et al. AIDS 2000;14:2371-81 Gray et Lancet 2005;366:1182-88



HIV viral load and infectivity in HIV discordant couples.
Quinn et all, NEJM, 2000



Year Primary grants	Study and Main findings (Main Policy Implications)	Selected Publications
1994-2009 DAMD17-98-2-8007; Henry M. Jackson Foundation 5D43TW00010 NIH R01A134826, NIH R01 A134265, 5P30HD06826, F31HD063345, U01AI075115, NIAID Intramural ICER,	**Research on Interpersonal Violence (IPV) and Alcohol Abuse Effects on HIV Risk** Interpersonal violence (IPV) is common (28.5% per year), and is associated with increased risk of incident HIV (aIRR 1.55). A community randomized trial of integrated IPV and HIV prevention found the intervention reduced IPV (aIRR 0.79) and incident HIV (aIRR 0.67). Physical IPV was associated with marital dissolution. Men who report perpetrating IPV also report more HIV-risk behaviors Alcohol use with sex was associated with sexual coercion (aOR 1.85) and increased HIV incidence (aIRR 1.58 in men and aIRR 1.81 in women). *(These studies suggest that reduction of IPV and alcohol misuse can be important for HIV prevention programs.)*	Kouyoumdjian et al. AIDS 2013;27; 1331-8. Wagman et al. Lancet Glob Health 2015; 3:e23 Wagman et al. Eval Program Plann; 2018:129-37. Wagman et al. Int J Pub Health, 2016;61:961-70. Newman et al. Int J Public Hlh 2018;61(8):961-70J Zablotska et al AIDS 2006;20:1191-6 Zablotska et al. J Virol. 2015; 89:8206-18. Redd et al. AIDS Behav 2009;13:225 Mullinax et al AIDS Ed Prevention 2017; 29: 527

The Rakai Community Cohort Study was accompanied by a health team which provided basic care at the time of the survey.

(Please note: this was before ART was available in Uganda.) The health team would borrow a municipal building for this "mobile clinic".

Year Primary grants	Study and Main findings (Main Policy Implications)	Selected Publications
1994-2019 NIH RO1 HD28883 NIH RO1 AI34826 NIH RO1 AI3426S, NIH R01 AI34826-03, 5P30HD06268 NIH R01HD072695 Fogarty TW-00-004, D43 TW0010, Rockefeller Foundation HS94-108, World Bank, John Snow Inc 5024-30.	**Demographic and Contraception Studies Associated with HIV and ART** Prior to ART availability, mortality among HIV+ adults was 118/1000 py compared to 12.4/1000 py in HIV-uninfected. After availability of ART, mortality among HIV+ adults per 1000 py declined to 43.9 for males and 24.1 for females. The incidence of orphanhood was 8.2% with an HIV+ parent prior to ART availability and declined to 3.4% following ART scale up. The 2-year mortality rate in infants born to HIV+ mothers was 165/1000 if the child was uninfected and 540/1000 if the child was infected. Mortality of children born to HIV+ mothers increased with formula feeding (18%) compared to breastfed (3%). *(WHO included these data in its guidelines on infant feeding in HIV+ mothers.)* Fertility was reduced by 55% in ART-naïve HIV+ women and declined with HIV viral load. ART initiation was associated with a 46% increase in fertility. HIV incidence was lower among married women (0.93/100py) than never married (1.51/100 py and previously married women (2.85/100py). Divorce and widowhood were increased among HIV+ persons (RR 1.94 and 7.56, respectively). Use of hormonal contraception by HIV+ women increased over time but was not associated with disease progression, HIV viral load, or the risk of HIV acquisition. HIV was an important predictor of unwanted pregnancy. Unintended pregnancy decreased over time associated with due to increases in ART availability.	Sewankambo et al. AIDS 1994;8:1707-13 Reniers et al. AIDS 2014;(28S 4):S533-42 Gray et al. Lancet 1998;351:98-103 Nabukalu et al. Pop Studies 2019; DOI: 10.1080/00324728. Porter et al. Demography 2004;41:465-82 Makumbi et al. AIDS 2005;19:1669-76 Makumbi et al. Trop Med Int Hlth 2012;17(8):e94-102 Makumbi et al. AIDS Res Treatment 2011; Article ID 519492 Nalugoda et al. JAIDS 2014;65:91-8 Kagaayi et al. PLoS One, 2008;3:e3877 Kidagavu et al. AIDS 2003;17:233-40. Polis et al, Contraception, 2012;86:725-30. Polis et al. AIDS 2010;24:1937-44 Polis et al. JAIDS 2011;56:125-30. Lutalo et al. AIDS 2013;27 (Suppl1):S27-34 Grilo et al. BMC Women's Health 2018;18(1)46:

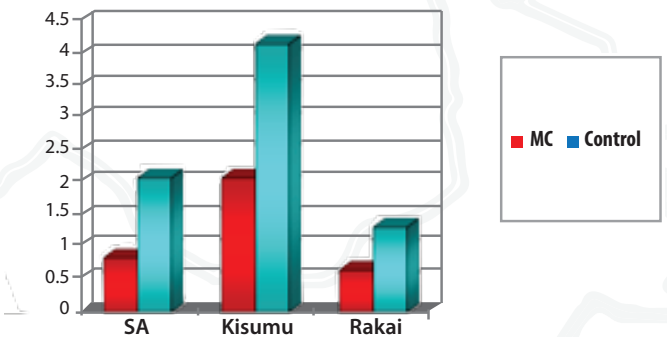
Year Primary grants	Study and Main findings (Main Policy Implications)	Selected Publications
2000-ongoing NIH U01AI100031, NIH RO1 A1001040. NIH R01MH105313, NIH R01 HD061092 NIH 1R01HD091003	**Qualitative Research** RHSP established a Social and Behavioral Sciences department to inform biomedical research and HIV prevention strategies. Peer Health Workers can complement clinic staff in providing ART and women can play a major role in motivating partners to accept MC. Hotspot fishing communities are characterized by lack of social cohesion, commercial sex, risk denial and alcohol abuse. Interventions such as partner notification and HIV self-testing may hold promise if appropriately tailored. Among youth, recent HIV seroconverters described relationships marked by poor communication, suspicion and mistrust, and larger, more transitory sexual networks.	Arem et al. J Clin Microbiol. 2004 Apr;42(4):1794-6. Neal et al Int J STD AIDS Patient Care STDs. 2011;25(12):719-24 Nakyanjo et al. AIDS Care 2019;31:443- 50. Lubega et al. BMC Pub Health, 2015: 15:1033 Mullis et al. AIDS Res Hum Retroviruses. 2013 Aug;29(8):1146-50. Quinn et al. AIDS Behav. 2018;22:3407- 16 Higgins et al. Am J Public Health 2014;104(4):2412-7 Kreniske et al. J Adolescent Health 2019 in press Mathur et al. Culture Hlth Sexuality 2016;18(5):538
2004-2007 NIH: UO1 AI1171-01-02, NIAID Intramural ICER, NIH FIC 2D 43 TW0001019-AITRP, 5D43TW001508, D43TW00015, Bill and Melinda Gates Foundation 22006	**Randomized Trials of Male Circumcision for HIV and STI Prevention in Men and Women** Voluntary Medical Male Circumcision (VMMC) reduced male HIV acquisition by ~60%, but did not affect acquisition by female partners of HIV+ circumcised men over two years follow up. *(The Rakai trial along with similar trials in Kenya and South Africa led UNAIDS to recommend circumcision of HIV uninfected men for HIV prevention, and that MC should be provided for HIV+ men if there are no medical contraindications.)* VMMC reduced genital ulceration and HPV infection in HIV+ and HIV-neg men and in women. VMMC also reduced BV and trichomonas infection in female partners, and HSV-2 infection in men. VMMC did not affect risk of syphilis or mycoplasma. VMMC did not affect men's sexual pleasure, and women favored intercourse after their partner's VMMC, primarily because of improved genital hygiene. VMMC was safe in HIV-infected men.	Gray et al Lancet 2007;369:657-66 Wawer et al Lancet 2009;374:229-37 Tobian et al. NEJM 2009;360:1298-309 Safaeian et al. Sex Trans Infect 2008;84(4):306-11 Wawer et al Lancet 2011;377:209-18 Serwadda et al JID 2010;201(10):1463-9 Gray et al. JID 2010;201(10):1455-62 Kigozi et al. PLoS Med 2008;5:e116 Gray et al. PLoS Med 2009; 6(11) e1000187 Tobian et al. Lancet ID 2011;11:604-12 Tobian et al. JID 2012;;205(3):1479-80 Tobian et al. AIDS 2012;26(1):1555-65 Gray et al. AIDS 2012;26(5):609-15 Tobian et al. JID 2013;207:1713-22 Tobian et al JID 2013;1207(11):1713-22 Ssekubugu et al, Qual Health Res 2013; 23: 795-804. Wilson et al. Sex Trans Infect. 2013;53(6):1361-71. Tobian et al. Sex Trans Inf 2014;90:150-4 Kigozi et al, Urology, 2014 83: 294-7. Kigozi et al, Brit J Urol, 2014;113: 127-32.

Results: 3 randomised trials of MC for HIV prevention

Orange Farm, SA, Auvert, PLos 2005

Kisumu, Kenya: Bailey et al, Lancet 2007

Rakai, Uganda. Gray et al, Lancet, 2007



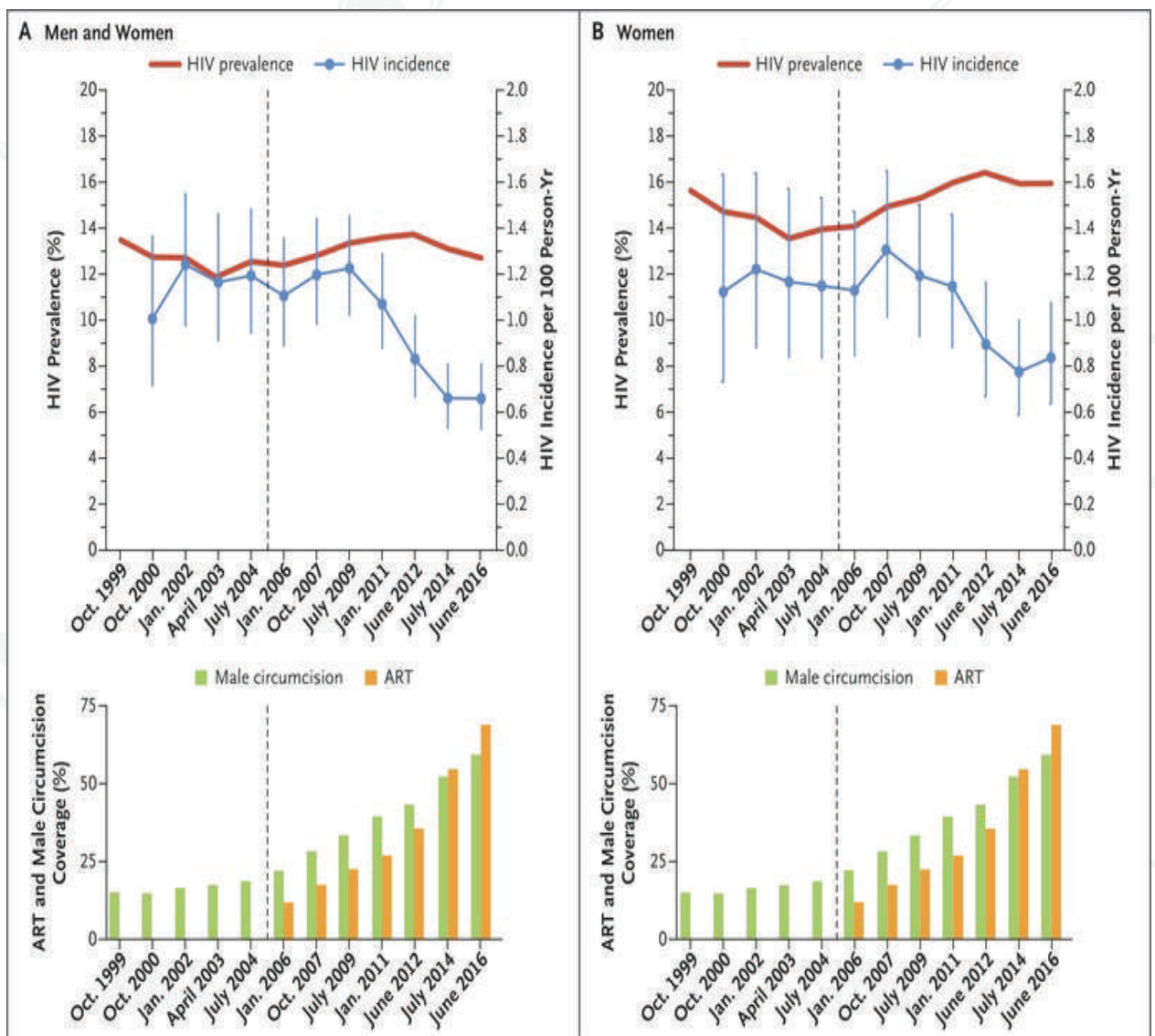
	SA	Kisumu	Rakai
Incidence RR	0.41	0.47	0.43
	(0.24-0.67)	(0.28-0.78)	(0.24-0.75)

Circumcision in Progress

Year Primary grants	Study and Main findings (Main Policy Implications)	Selected Publications
2004-ongoing PEPFAR CDC: NU2GGH00817; NU2GGH00817; NU2GGH002009	**ART rolled out in Rakai (PEPFAR Program)** In Rakai district, by July 2019, 32,535 persons had tested HIV+ of whom 28,731 accepted their results (88.3%), 26,343 (91.7%) were on ART and 22, 899 (86.9%) were virologically suppressed.	
2004-ongoing NIAID Intramural ICER	**Antibody studies of HIV, HSV2, HCV and HIV cross-sectional incidence testing performance** HIV antibody maturation differs between HIV subtypes A and D. HIV subtype D has a blunted antibody response which occurs early in infection resulting in misclassification of recent infections using cross-sectional incidence assays. Adjusting for subtype-specific performance characteristics, accurate cross-sectional incidence estimates can be generated. The performance of HSV-2 serologic tests varies depending on the geographic source of samples. HCV serology is problematic in East Africa due to high false positives requiring additional expensive subtype testing.	Laeyendecker et al J Clin Microbiol. 2004;42(4):1794-6. Gamiel et al Clin Vaccine Immunol. 2008 15(5):888-90. Neal et al Int J STD AIDS. 2011;22:342-4. Mullis et al. AIDS Res Hum Retroviruses. 2013;29(8):1146-50. Laeyendecker PLoS One. 2013 13;8(11):e78818. Longosz et al AIDS Res Hum Retrovir; 2014;;30(4):339-44. Mullis et al Clin Infect Dis. 2013; 57:1747-50. Laeyendecker et al AIDS Res Hum Retroviruses. 2019;35(4):364-367.

Year Primary grants	Study and Main findings (Main Policy Implications)	Selected Publications
2005-ongoing 5U2GGH00817, NIAID Intramural ICER	**Combination HIV Prevention and effects on HIV Incidence** The HIV epidemic in Rakai is heterogeneous with prevalence varying from 14% in agrarian villages, 17% in trading centers to 42% in fishing communities. In the non-fishing communities, between 1999 and 2016, ART coverage increased to 72% in women and 61% in men, with viral suppression increasing to 75%, reaching the UNAIDS 90-90-90 target. Circumcision coverage increased to 59%; we estimated that each 10% increase in VMMC was associated with ~13% reduction in male incidence. HIV incidence declined by 42%; declines were most marked in men (adj IRR 0.46) than women (adj IRR 0.68), because of the dual protection afforded by VMMC and higher female ART use. Delayed sexual debut among adolescents increased from 30% to 55% and was associated with reduced incidence. ART initiation was lower in men than women (aPRR 0.75), youth 15-24 (aPRR 0.72) and new in-migrants (aPRR 0.75). ART and circumcision prevalence were historically lower in the hyperendemic fishing community hotspots. However, with intensive rollout of HIV services and ongoing implementation science research to motivate adoption, HIV incidence was halved between 2011-12 and 2016-17 (3.43/100 person years to 1.58/100 PY (aIRR 0.52). *(These observational studies demonstrated that combination HIV interventions particularly ART and VMMC can substantially reduce HIV incidence at a population-level, but current interventions are still insufficient for HIV elimination.)*	Grabowski et al NEJM 2017;377:2154-66. Reynolds et al. AIDS 2011;25(4):473-7. Santelli et al. Glob Soc Welf 2015;2(2):87-2013 Santelli et al. AIDS 2015;29(2):211-19 Chang et al Lancet HIV 2016;3(8):e388-96 Kong et al JAMA 2016;316(2):182-90. Billoux et al. J Int AIDS Soc 2017:20:21590 Kong et al AIDS 2017; AIDS 31(5):735-37 Billoux et al. AIDS 2018;32(6):819-24. Kagaayi et al, CROI, 2018 

HIV Incidence declines associated with increased ART and circumcision Coverage



Grabowski et al NEJM 2017

Year Primary grants	Study and Main findings (Main Policy Implications)	Selected Publications
2005-ongoing Doris Duke Charitable Foundation. NIH T32-AI07291, NIAID Intramural ICER, K23-MH086338, NIH R01MH107275, D43TW01055 NIH RO1 AI114438 NIH RO1 AI143333 NIH RO1 MH115799	**Implementation Science Studies of HIV Prevention, Care and ART Provision** During early ART scale -up one-third of ART eligible persons failed to enroll into care. Non-enrolment was greater among men, the young, and the socially isolated. Peer Health Worker support reduced long-term virologic failure in ART patients and was cost saving. Use of cell phone (mHealth) improved patient care. ART adherence counseling increased durable viral suppression. Peer support facilitates compliance with pre-ART care and improved quality of life. There is good compliance with use of bed nets and protected water supplies by HIV+ patients. *(Community health workers can successfully use mobile health tools to counsel high-risk fishing village residents.)* Recent grants are directed at groups historically been less likely to engage in HIV services, including new in-migrants, hard-to-reach populations and with respect to male circumcision, adult males.	Kagaayi et al JAIDS 2005;39(1):121-4 Chang et al PLoS One2010;5(6):e10923 Chang et al AIDS Patient Care 2008;22: 173-4 Chang et al. AIDS Care 2013;25(5):652-6 Chang et al AIDS Behav 2011;15:1776- 84. Nakigozi et al AIDS Care 2011; 23:764- 70 Nakigozi et al. Biomed Res Int 2013; 470245 Billoux et al. PLoS One 2015;10: :e0127235 Long et al JIAPAC; 165):499-505. Nakigozi et al JAIDS 2015;70(1):75-82 Monroe et al. BMC Infectious Diseases 2017;10:54. Chang et al. Trials 2017;18(1):494.

Community randomized trial of "Stylish Man" intervention promoting VMMC among men >18+ years

Total MMC both periods	Interventions		Control	
Age Group				
10-17 years	1589	55.8%	1758	78.9%
18+ years	1259	44.2%	471	21.1%
Total	2848	100%	2229	100%

PRR of VMMCs in age group 18+ years, intervention vs control: 2.09 (1,91,2.29) P< 0.0001

Year Primary grants	Study and Main findings (Main Policy Implications)	Selected Publications
2006-2011 NIH RO1-AI 34826, NIH RO1 AI47608 5P30-HD 06268	**Cervical and vaginal infections and STIs** Prior studies showed high rates of BV (47%) and 73.6% had persistent BV over time. Gonorrhea prevalence was 2.15%, Chlamydia 4.0% and trichomonas 10.6%. Syphilis seropositivity was 10.6%. HSV-2 seroprevalence was 71% in HIV+ and 59% in HIV-negative persons.	Thoma et al. STDs 2011;38(1):111-116 Thoma et al, J Ped Adolesc Gyn. 2011;24: 42-7.
2007-ongoing CDC PEPFAR NU2GGH00817 NU2GGH002009	**Circumcision Program established in Rakai and national training program initiated with CDC PEPFAR Support** >93,000 VMMCs have been conducted by the RHSP (~70% of non-Muslim men were circumcised in the RCCS between 2007-2019)	
2007-2018 NIH 1U01AI100031-01,	**Implementation science studies of circumcision** The mean age of VMMC acceptors is 26.1 years and there is no evidence of behavioral risk compensation following MC. Mobile circumcision camps provide better population coverage and higher acceptance than static facilities and reduce the cost per procedure ($23 vs $35, respectively.) The Shang Ring and PrePex devices are acceptable and reduce surgical time, but the PrePex is associated with severe adverse events due to self-removal of the device.	Kiggundu et al. BJU 2009;104(4):529-31 Buwembo et al. BJU 2012;109(1):104-8. Kigozi et al. JAIDS 2013;63(5):617-21 Kigozi et al. PLoS One2014;9(8):e100008 Kagaayi et al. AIDS 2016;30(13):2125-9 Alfonso et al. JAIDS 2016;73:564-71. Liu et al. JID 2016;214(4);595-8 Kong et al. AIDS 2017;31(5):735-7 Kankaka et al. AIDS Care 2018;30:990-6

Year Primary grants	Study and Main findings (Main Policy Implications)	Selected Publications
2007-2019 NIAID Intramural ICER	**ART Clinical/Clinic Based Studies** WHO clinical staging missed almost half of clients who would be eligible for ART based on the CD4 criteria. Long-term CD4 monitoring in ART patients is not needed in patients with virologic suppression. Early virologic monitoring in ART patients predicts long-term virologic failure and allows for differentiated care. Delayed 2nd line ART switching in patients with virologic failure is associated with increased mortality. *(These findings have led to an emphasis on viral load monitoring of ART patients.)* Point of care (PIMA) CD4 assay has high sensitivity and specificity. Rapid HIV tests have high sensitivity and specificity. Acyclovir in HIV/HSV-2 coinfected persons reduced the rate of disease progression in persons with viral loads >50,000 cps/mL prior to ART eligibility. Transmitted drug resistant mutations are low in Rakai. Long-term non-progression in ART-naïve persons is common (~9%).	Kagaayi et al AIDS 2007;21(9):1208-10 Reynolds et al AIDS. 2009;23:697-700. Galiwango et al. PLoS One 2014;9(3):e Galiwango et al J Virol Methods 2013;192(1-2):26-7 Reynolds et al Lancet Inf Dis 2012;12(8):441-8 Kagulire et al. Int J STD AIDS 2011; 6:308-9 Laeyendecker et al JAIDS 2009;52:316-9 Tobian et al. J Infect Dis. 2013; 208: 839-46. Rositch et al . Plos One. 2013;8(1): e55383 Gianella et al. JID 2015 Sep 15;212(6):899-903. Billioux et al. Plos One 2015 May 26;10(5):e0127235. Seremba et al. AIDS. 2017 Mar 27;31(6):781-786. Ssempijja et al. BMC Inf Dis.2017 22;17:582. Ssempiija et al Open Forum Inf Dis 2018;5(10):212 Reynolds et al. AIDS Res Hum Retroviruses 2017;33(5):448 Reynolds et al. AIDS Patient Care STDs, 2014 ;29(11) :575-8 Tobian et al. J Infect Dis. 2013, 2015 Tobian et al. ,Plos One 2015 10(5):e0127235. Sempiija et al Open Forum Inf Dis 2018;5(10):212

Year Primary grants	Study and Main findings (Main Policy Implications)	Selected Publications
2008-ongoing NIH K23AI083100, NIAID Intramural ICER, R01AI128779, RO1AI123002, K23AI093152, I087409-02, NCI, B&M Gates Foundation 2200602, CIHR– 246415, HBF-115704, Doris Duke - 2011036	**Genital correlates of HIV risk and mechanisms for protective effects of male circumcision:** These studies utilize foreskin tissues and genital swabs from the circumcision trials. The risk of male HIV acquisition is increased with larger foreskin surface area in uncircumcised men. HSV-2 increases the density of CD4+ and CD8+ cells in the foreskin. Penile cytokines (IL-8 and MIG) are associated with increased HIV acquisition in men and are reduced by VMMC. The inner foreskin mucosa has higher target cell density and is enriched for pro-inflammatory cytokines suggesting it is a preferential site for HIV entry. Higher HIV neutralizing IgA levels are associated with reduced HIV acquisition. Surgical circumcision reduces the load of penile anaerobes, but VMMC with the PrePex device increased the anaerobe load. *(This finding led WHO to recommend two tetanus toxoid immunizations prior to use of the PrePex device).* Wound healing is slower among HIV+ men and penile HIV shedding is increased for 3 weeks following VMMC and is exacerbated by immune activation. *(This finding reinforced the need for 6 weeks sexual abstinence following VMMC in HIV+ men)*	Kigozi et al AIDS 2009;23:2209-13 Johnson et al. AIDS 2009;23(14):1607-15 Johnson et al. JID 2011;203:602-09 Dinh et al. PLoS One 2012;7(7):e41271 Liu et al. MBio 2013;4(2):e00076-13 Prodger et al. Mucosal Immunology 2012;5:121-6 Kigozi et al. BJU 2014;113(1):127-32 Liu et al. MBio 2015;6(3):e055589-15 Liu et al. MBio 2017;8(4)e00966-17 Prodger et al. PLOS Pathol 2016;12(11): e1006025 Galiwango Am J Reprod Immunol 2019;13:e13143 Hibrod et al. PLoS Pathol 2014;10(10): e1004416 Kigozi et al. PLoS One 2014;9(11): e110382 Prodger et al. Mucosal Immunol 2014;7(3):634-44 Tobian et al. PLoS Med 2015;12(4): e1001820 Patel et al. Clin Inf Dis 2017;64: 776-84

Year Primary grants	Study and Main findings (Main Policy Implications)	Selected Publications
2009-ongoing Gates Foundation Cooperative Agreement 081113, NIAID Intramural ICER NIH grants R01AI110324, U01AI100031, U01AI075115, R01AI110324, R01AI102939, K01AI125086-01,	**HIV and HSV2 Phylogenetics** Previously transmitted strains are preferentially transmitted and emergence of X4 strains do not impact CCR5 variant levels. RHSP contributed 50% of all East African HIV sequence data to the PANGEA phylogenetics Consortium. Viral clustering cutoff values were established. Using viral deep sequencing to construct partial sexual networks allows inference of the directionality of transmission with an error rate of 16.3% which can be used to infer sources of infection spread. Acquired ART resistance is low in Rakai. At the community level, HIV epidemics are extremely diverse with many transmission chains and frequent viral introductions from outside the community. Using viral deep sequencing to construct partial sexual networks allows inference of the directionality of transmission with an error rate of 16.3% and can be used to infer sources of infection spread. High prevalence Lake Victoria fishing communities are not disproportionately disseminating infection into the general population of Rakai, demonstrating that HIV geographic hotspots can be sinks as well as sources of HIV infection and that targeting interventions to hotspots may not impact the general population epidemic.	Eshleman et al AIDS. 2009;23(7):845-52. Galiwango et al. AIDS Res Hum Retroviruses. 2012 ;28(7):729-33 Reynolds AIDS Res Hum Retroviruses. 2012 ;28(12):1739-44. Newman et al. J Virol. 2015;89(16): 8219-32. Lamers et al. J Virol. 2015;89(16):8206-18. Redd et al AIDS Res Hum Retroviruses. 2012; 28(3):289-94. Blacquart et al. ELife 2016;5:e20492 Lamers et al. AIDS Res Hum Retroviruses. 2016 ;32(9):904-8 Rose at al. AIDS Res Hum Retroviruses. 2017;33(3):211-218. Ratmann et al. Nature Communic. 2019;10(1):1411 Grabowski et al., PLoS Medicine. 2014. 11(3):e100160 Ratmann et al. Lancet HIV. In Press Ratmann et al. Nature Comm. 2019. 10(1):1411

Flow of HIV infections between Fishing Community hotspots and general inland populations

A

reconstructed HIV-1 transmission events

from inland community

from fishing community

from outside Rakai area

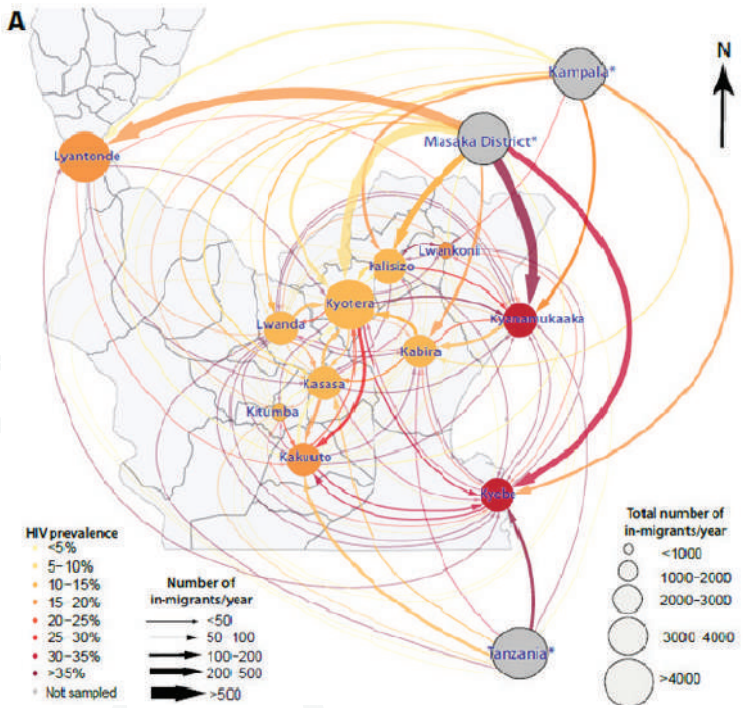
Fishing communities are not major sources of infection into the general population of Rakai

Combination HIV prevention targeted on fishing communities is unlikely to affect the general epidemic

Year Primary grants	Study and Main findings (Main Policy Implications)	Selected Publications
2009-ongoing NIAID Intramural ICER, NIH Bench to Bedside Award, Henry M. Jackson Foundation DAM17-98-2-8007, NIH R01 A134826 NIH R01 A134265, 5P30HD068265, D43TW00010, 2D 43 TW0001o-19, P30AI027757, UK MRC, World Bank, European Research Council PBDR-339251	**The impact of HIV viral factors and subtypes on disease progression, set point viral load, superinfection and infectivity** HIV subtype D was associated with faster disease progression but lower infectivity compared to subtype A, independent of viral load. Thus, the prevalence of subtype D has decreased in the population over time. Also, subtype D initially predominated in southern Rakai suggesting it was transmitted from Tanzania. It is estimated that viral genetics explain~ 37% of variation in set point viral load. There was tradeoff between subtype-associated infectivity and disease progression resulting in a reduction of set point viral load and reduced incidence over time in Rakai. Inter-subtype superinfection was identified in 18% of discordant couples. Intra-host viral diversity is greater than inter-host diversity, and viral populations of newly infected persons resemble donor variants earlier in disease, suggesting that sexual transmission constrains viral diversity. Markers of microbial translocation are not associated with disease progression in Rakai. Studies of the viral reservoir in HIV+ persons on ART with viral suppression showed that the viral reservoir in Ugandans had a three-fold lower frequency of replication competent HIV in resting CD4 cells than Americans. *(This is of relevance to HIV cure research.)*	Kiwanuka et al. AIDS 2009;23:2479-84 Kiwanuka et al. JAIDS 2010;54(2):180-4 Redd et al. PNAS 2009;106(16):6718-23. Hollingsworth et al. PLoS Path 2010;6: e1000876 Sagar et al. JID 2009;199(4):580-9 Redd et al. J Clin Micro 2011;49:2859-67 Redd et al. JID 2012; 206(9):1433-42 Eller et al. J Infect Dis. 201 2015,211: 1574-84. Pena-Cruz Retrovirology. 2013; 26;10: 162. Ng et al. J Infect Dis. 2014 1;209(1):66- 7373. McPhee et al. AIDS Res Hum Retro 2019;35(1):49-51 Prodger JL, et al. Clin Infect Dis. 2017;65:1308-15
2010-ongoing NIH RO1-AI-16078, RO1 MH099733, P30 MH075673; R25 MH080661-08, R25 NS065729-0552, P30 AI094189-01AI. , Amer Cancer Soc MRSG-07-284-01-CCE, DAMD17-98-2-8007, NIH Bench to Bedside Award, NIAID Intramural ICER,	**HIV, Non-Communicable Diseases and Neurological Sequelae** n ART naïve individuals there was higher prevalence of decreased GFR and a higher incidence of GFR over time. The prevalence of liver fibrosis is increased in HIV+ (17%) compared to HIV-neg persons (11%). Liver stiffness is associated with monocyte activation and use of traditional herbal medicines. Hypertension is high in HIV+ persons (26.3%). HIV Associated Neurocognitive Disorders (HAND) was present in 59% of antiretroviral naive HIV+ individuals. Impaired cognition was more frequent with subtype D (55%) than A (24%). ART reduced HIV associated dementia but not other components of HAND. Peripheral neuropathy is increased in HIV+ persons (RR 2.82).	Lucas et al. JAID 2010, 55(4):491-4 Stabinski et al. Antiviral Therapy 2011;16:405-11 Sander et al. Trop Med Int Health 2015;20(3):391-6 Redd et al. AIDS Res Retroviruses 2013;29(7):1026-30. Auerbach et al. PLoS One 2012;7(11): e41737 Abassi et al. J Neurovirol 2017;23(3): 369-75 Saylor D et al. Neurology 2017;89(5): 485-91 Sacktor N. JAIDS 2019;81(2):216-23 Saylor D et al, J Neurovirol 2019; 25(3):410-14 Rubin LH et al, J Neurovirol. 2019 (in press). Sacktor NJ Acquir Immune Defic Syndr. 2019;81(2):216-23. Saylor D Neurovirol. 2019.June 4 [Epub ahead of print] Kisakye et al, AIDS Care, 2019:31:836-9.

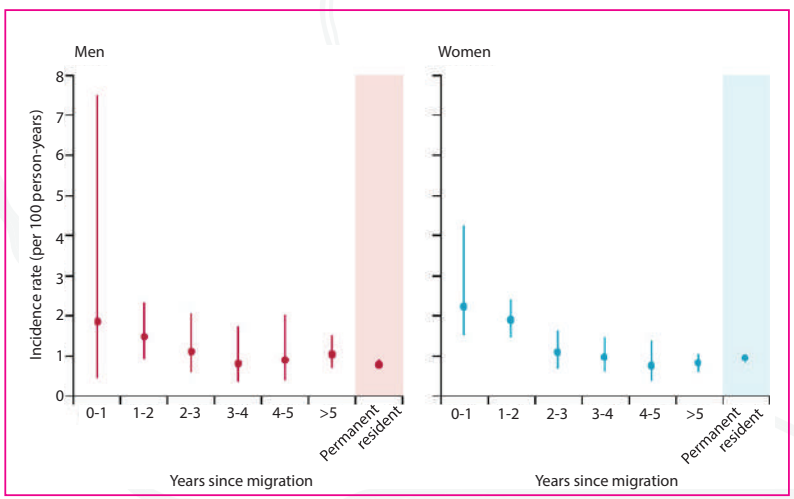
Year Primary grants	Study and Main findings (Main Policy Implications)	Selected Publications
2012-ongoing NIH R01 HD061092 NIH 1R01 HD091003 NIH R01 HD072695	**Studies of Youth and HIV Risk** Substantial declines in sexual experience occurred among adolescents and young adults between 1999 and 2011. There were also reductions in multiple partnerships, concurrency and HIV incidence in adolescent women. Changes in HIV incidence and risk behaviors coincided with increases in school enrolment, declines in adolescent marriage and availability of ART and VMMC. There were also reductions in adolescent pregnancy.	Santelli et al AIDS 2015;29(2):211-219. Santelli et al Global Social Welfare 2015;2(1):87. Mathur et al JAIDS 2019; 69(1):75. Kreniske et al, Hlth Educ Behav. 2019; 46: 550-8.
2016-ongoing R01AI110324, U01AI100031, U01AI075115, R01HD072695	**Migration and HIV Risk** In and out migration is frequent in RCCS (~10/100 py) and is most common among persons aged 15-24. HIV prevalence is significantly higher among female migrants than permanent residents (aPRR 1.41), particularly in hotspot fishing communities. This was not observed among male migrants. Among youth, in- and out migration, and travel has increased over time. Mobile youth were more likely to report HIV-risk behaviors including: alcohol use, sexual experience, multiple partners, and inconsistent condom use. HIV incidence is significantly increased among in-migrants over 2 years following migration (aIRR 2.11). Despite declines in HIV incidence among permanent residents over time, there was no temporal reduction of incidence among recent in-migrants. *(Findings suggest that migration is a major source of new HIV infections in general populations.)* *Migrants into HIV hotspots have high prevalence of HIV, but out-migration from hotspots is diffuse and low.)* HIV-positive migrants are less likely to self-report ART and be virally suppressed than on-migrants.	Grabowski et al. Nature Communic 2019, submitted Olawore et al. Lancet HIV 2018;5:e181-9 Wagman et al. Nature Communic. 2019;10(1):1411 Schuyler et al. Global Public Health. 2017; 12(8):1033 Billioux et al. JIAS. 2017. 20(1):21590

Migration flows and HIV in Rakai



Grabowski et al. Nat CommunicSubmited

Migrants are at increased risk of HIV acquistion for 2 years after migration



Olawore et al. Lancet HIV 2018

	TRAINING GRANTS and Outcomes	
1990-Ongoing Fogarty AIDS International Training and Research, TW00010, D43 TW001508, D43TW009578, D43TW010557	Primarily via support from the NIH Fogarty International Center (FIC), the RHSP has trained 15 doctoral, 8 post-doctoral, 69 master's degree and 21 bachelor's degree Ugandan trainees. Additionally, 70 candidates have received non-degree training or attended courses. The non-degree training includes "mini-sabbaticals" whereby RHSP scientists come to Johns Hopkins University to work on papers, dissertation research or lab rotations. Additionally, Makerere and Johns Hopkins Universities have a memorandum of understanding whereby Makerere University recognizes credits earned for advanced courses at Hopkins for doctoral trainees ("Sandwich PhDs"). RHSP has provided internships for Ugandan and international students, conducted training of trainers particularly in VMMC provision for Ugandan and other African personnel, and provided practical training for Uganda Ministry of Health service providers, including ART and TB care, quality assessment and quality improvement.	

RHSP Papers with 100 or more Scholarly Citations

	Publication	Times Cited*
1	Quinn TC, Wawer MJ, Sewankambo N, Serwadda D, Li C, Wabwire-Mangen F, Meehan MO, Lutalo T, Gray RH. Viral load and heterosexual transmission of human immunodeficiency virus type 1. Rakai Project Study Group. N Engl J Med. 2000;342(13):921-9.	3286
2	Gray RH, Kigozi G, Serwadda D, Makumbi F, Watya S, Nalugoda F, Kiwanuka N, Moulton LH, Chaudhary MA, Chen MZ, Sewankambo NK, Wabwire-Mangen F, Bacon MC, Williams CF, Opendi P, Reynolds SJ, Laeyendecker O, Quinn TC, Wawer MJ. Male circumcision for HIV prevention in men in Rakai, Uganda: a randomised trial. Lancet. 2007;369(9562):657-66.	2488
3	Gray RH, Wawer MJ, Brookmeyer R, Sewankambo NK, Serwadda D, Wabwire-Mangen F, Lutalo T, Li X, vanCott T, Quinn TC. Probability of HIV-1 transmission per coital act in monogamous, heterosexual, HIV-1-discordant couples in Rakai, Uganda. Lancet. 2001;357(9263):1149-53.	1462
4	Wawer MJ, Gray RH, Sewankambo NK, Serwadda D, Li X, Laeyendecker O, Kiwanuka N, Kigozi G, Kiddugavu M, Lutalo T, Nalugoda F, Wabwire-Mangen F, Meehan MP, Quinn TC. Rates of HIV-1 transmission per coital act, by stage of HIV-1 infection, in Rakai, Uganda. J Infect Dis. 2005;191(9):1403-9.	1458
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Prof. David Serwadda handing over laptops to Prince Jjunju at the Launch of RHSP and Nabagereka Development Foundation Partnership

A dream Girl who has benefited from the program in her garden

Programs Director Dr Nakigozi Gatrude with Regional Managers

Summary of RHSP Programmatic Services with Support from CDC Uganda / PEPFAR

RHSP Service Provision

In addition to research aimed at ameliorating the effects of HIV, the RHSP has been committed to the provision of HIV interventions, starting with HIV prevention education in the 1980s, counselling and testing for individuals and couples in the 1990s, and the provision of ART in 2004 and circumcision in 2007. This matured into a currently a comprehensive program of combined interventions which include antiretroviral therapy (ART) both for treatment and for prevention of HIV transmission, voluntary medical male circumcision (VMMC), prevention of mother to child HIV transmission (p-MTCT) and rollout of pre-exposure prophylaxis (PrEP).

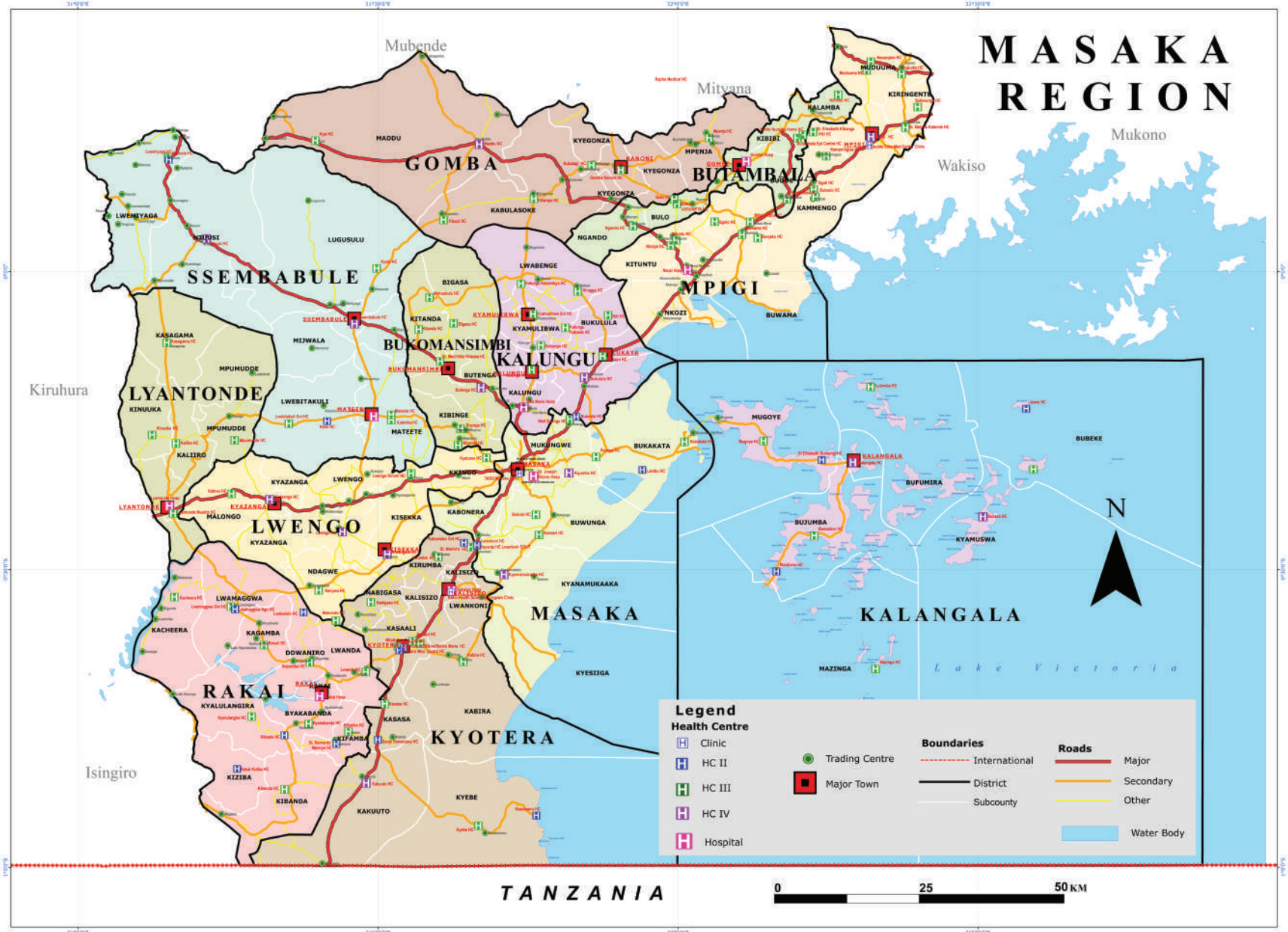
HIV Services, Masaka Region HIV Program

With support from the President's Emergency Plan for AIDS Relief (PEPFAR) through the Centers for Disease Control and Prevention (CDC), RHSP initiated provision of ART within Rakai District in 2004. In 2017 this role was substantially expanded when, under a PEPFAR/ CDC cooperative agreement (CoAG), the RHSP became an implementing partner supporting a comprehensive HIV program in 12 districts in the Masaka region. These include Lwengo, Bukomansimbi, Lyantonde, Masaka, Kalungu, Sembabule, Mpigi, Gomba, Butambala, Rakai, Kyotera and the multi-island district of Kalangala.

The focus of this program is to support all four thematic areas of the National HIV/AIDS Strategic Plan for 2016-2020, including the provision of 1) comprehensive HIV/ AIDS prevention, 2) HIV and TB care and treatment for adults and children 3) systems strengthening, and 4) social support including the DREAMS (Determined, Resilient, Empowered, AIDS-free Mentored and Safe) for adolescent girls and young adult women, and services for orphans and vulnerable children.

The purpose of the current PEPFAR-supported program is to achieve epidemic control in all districts of the Masaka region and to reinforce health systems so that the district local government systems are capable of sustaining the quality of services beyond the project period with minimal extra partner support for sustained epidemic control. In order to achieve this goal, the RHSP partners with Uganda Ministry of Health personnel and clinics in the "District Led Programming (DLP)" strategy.

Map showing the geographic scope of the Masaka Region HIV program



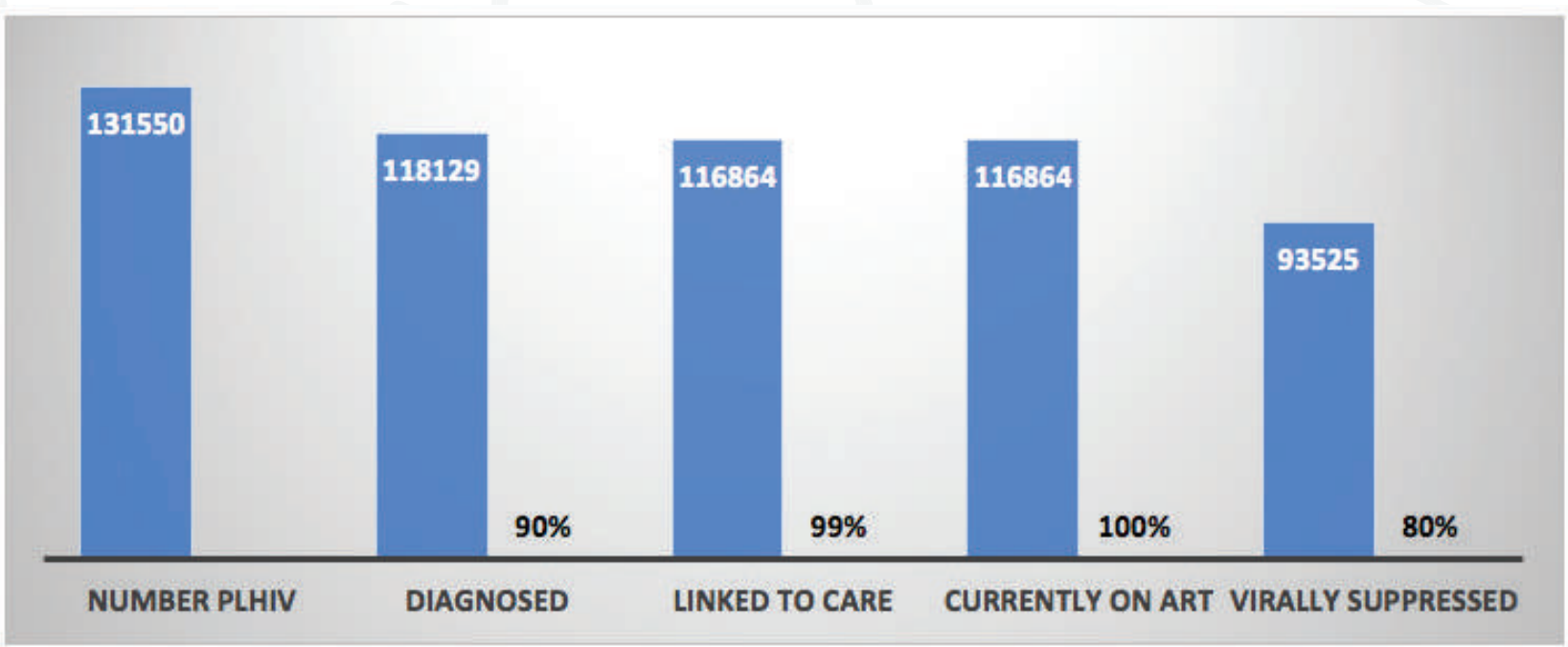
Key achievements under the Masaka Region Program

ART - Antiretroviral Treatment

Currently, 117,000 persons in the Masaka Region are on ART.

As shown in Figure 1, the Program has achieved UNAIDS targets for HIV viral suppression. With respect to the HIV care cascade, 90% of HIV-infected persons now know their result, ~99% of these individuals were linked to care and initiated ART, and ~80% were virologically suppressed. Via an active PMTCT B+ program, ~90% of HIV-positive pregnant women were on ART and HIV infection among infants and young children has declined to 0.9%. Pregnant women whose partners remain of unknown status are given HIV self-testing kits to facilitate diagnosis among men.

Figure showing the 95-95-95 Cascade for Masaka region



OVC - Orphans and Vulnerable Children

RHSP has supported 35,569 OVC in the Masaka region.

RHSP supports OVC services in the districts of Kalangala, Masaka, Bukomansimbi, Lyantonde, Sembabule, Kalungu, Mpigi and Lwengo, with focus on pediatric case finding, supporting viral suppression, preventing new infections/GBV among 10-14 years and AGYWs (15-17 years).

DREAMS - Determined Resilient Empowered Aids Free Mentored and Safe

Have supported 115,700 adolescent girls and young women (AGYW) aged 15-24 in the Masaka region.

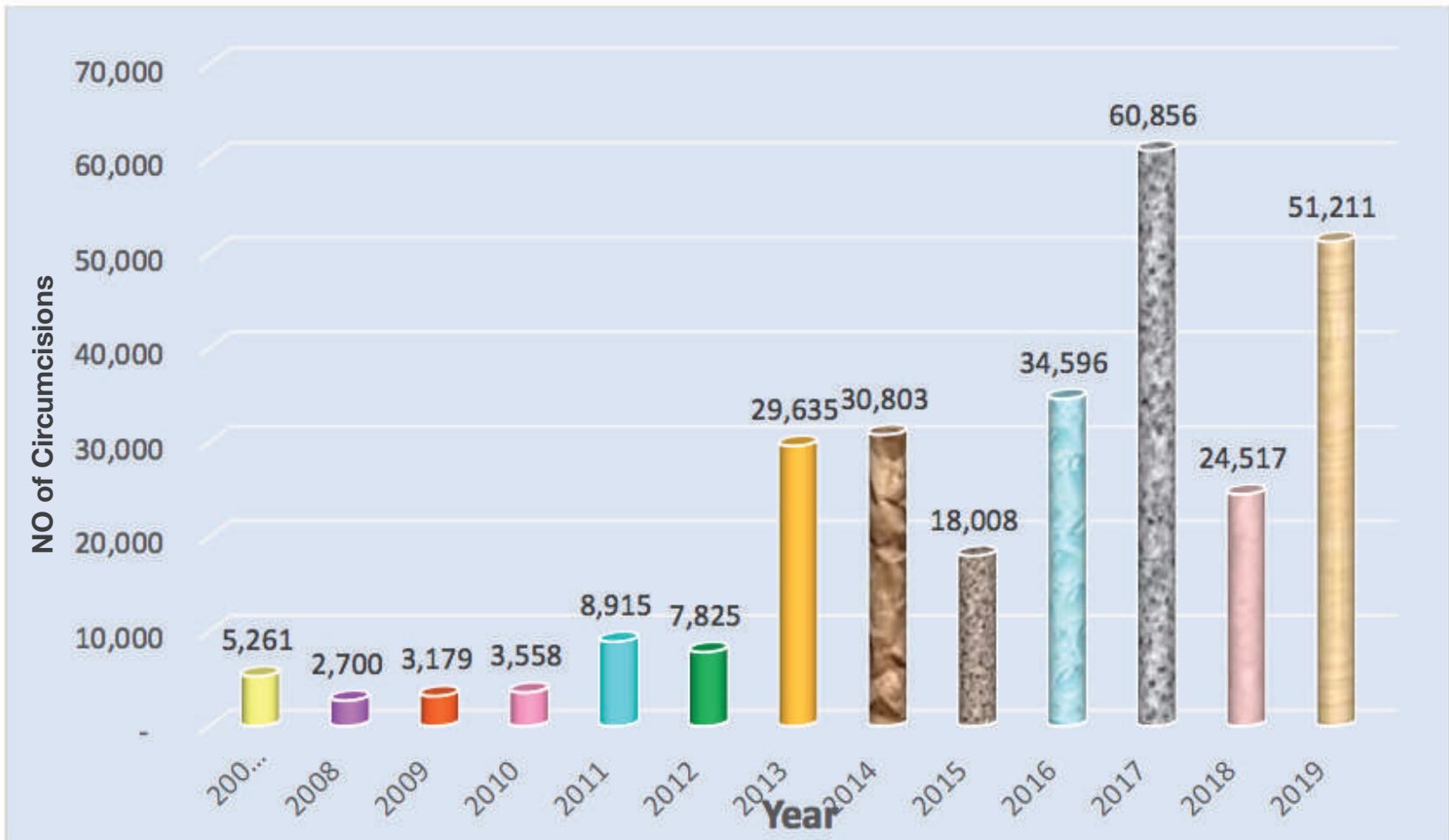
"DREAMS" is the acronym for Determined Resilient Empowered AIDS-free Mentored and Safe AGYW. DREAMS focuses on the reduction of HIV incidence in AGYW by delivering a package of evidence-based interventions that include; condom promotion, HIV testing and counselling, community mobilization and norms change, post-violence care, parenting/care-giver programs, expanded and improved contraceptive mix, combined socio-economic approaches, educational subsides and cash transfers. In particular, DREAMS focuses on adolescent girls and young women engaged in transactional sex work; those who have given birth by age 19 years; and those who are pregnant; married and those in school.

RHSP Voluntary Medical Male Circumcision Program

Following the successful outcome of the Rakai Circumcision Trial in December 2006, RHSP has provided VMMC services to the general population of Rakai District and subsequently to the Masaka region. Services are provided via static clinics and mobile VMMC camps supported by CDC Uganda/PEPFAR.

RHSP also provided VMMC training for 872 surgeons, 956 theater assistants and 794 counselors. Of note, RHSP also provided "training of trainers" to 79 surgical trainers, 32 theater assistant trainers, and 19 counsellor trainers, for a total of 130 trainers nationally: these themselves went on to train hundreds of other in VMMC skills. This effort "kickstarted" the national VMMC program.

From 2007 to 2017, RHSP performed 281,064 circumcisions regionally (see Figure below).



Number of circumcisions per year performed by RHSP from 2003-19

As a country, Uganda has performed more VMMCs – over 3 million - than any of the other 14 VMMC priority countries in Africa.

Fogarty International Training Center Beneficiaries

Aaca Okui, Lillian	Kairana, Robert	Lawino, Anna
Abenakyo, Vicky	Kakaire, Robert	Ludigo, James
Aliddeki, Noelyne	Kakembo, Rebecca	Lutalo, Tom
Aluma, Simon	Kankaka, Edward Nelson	Mabrizi, Joseph
Amaniyo, Lucy	Kasango, Asani	Makumbi, Fred
Azire, Jim	Kasule, Biyinzika Kenneth	Masembe, Ssendawula Frederick
Baale, Eugene	Kato, Emmanuel	Matovu, Idi
Bagenda, Danstan	Kayongo, Milly	Matovu, Joseph
Balikuddembe, Ambrose	Kibirige-Schacklett, Catherine	Mawemuko, Susan
Basiima, Jesca	Kiddugavu, Mohammed/Meddie	Mayanja, Robert
Batebi, Irene	Kiggundu, Valerian	Mbabali, Ismail
Batte, James	Kighoma, Nehemiah	Mondo, George
Boaz, Iga	Kigongo, Stephen	Mpoza, Bryan
Buwembo, Denis	Kigozi, Darix S.	Mubiru, Francis Xavier
Bwanika, John Baptist	Kigozi, Godfrey	Mugamba, Stephen
Byarhanga, Aggrey	Kigozi, Grace	Mugerwa, Abdul Isa Katumba
Daama, Alex	Kimera, Edward	Mugisha, Emmanuel
Ddaaki, George William	Kisakye, Alice	Mukakalisa, Maria
Ddembe, Margaret	Kitibire, Florence	Muroka, Daniel
Ecuru, Julius	Kivumbi, Apollo	Musoke, Miph Boses
Galiwango, Ronald	Kiwanuka, Deus	Musoke, Richard
Juuko, Stephen	Kiwanuka, Noah	Mussiige, Adrian
Kagaayi, Joseph	Kiyonga, Chrispus	Mutebi, Ronald
Kaggwa, Esther	Kyomuhenda, Sophie	Mutuluuza, Cissy Kiyo

Muwanika, Richard
Mwebesa, Minnie
Mwinike, Joshua Barak
Nabasumba, Alice
Nabukenya, Dorothy
Nakalanzi, Margaret
Nakamya, Phyellister
Nakigozi, Gertrude
Nalugoda, Fred
Nalwanga Kibuuka, Hannah
Namuguzi, Dan
Namatovu, Susan
Nampijja, Resty
Namukwaya, Zikulah
Namuli, Christine
Namutete, James
Nanteza, Barbra
Nantongo, Agnes
Nantume, Betty
Ndyanabo, Anthony
Nkakalukanyi, Daniel
Nkale, Fausta
Nkale, James
Nkalubo, Violet
Nyende, Noah

Ocholo, Pius Opendi
Okech-Ojony, Joa J.
Okwi, Lilian
Ruwangula, Andrew
Sakor, Moses
Sebaggala, Kutta Stephen
Sekitoolek, Cissy
Sembatya, Joseph Lister
Senkunja, James
Serwadda, David
Ssebugenyi, Ivan
Ssekasanvu, Joseph
Ssekubugu, Robert
Ssemanda, John Baptist
Ssempiija, Victor
Ssenfuka, James
Ssenkunja, James
Ssennono, Mark
Ssettuba, Absalom
Ssetube, Absalom
Wabwire, Deo
Wabwire-Mangen, Fred
Wandera, Fred
Wasswa, Francis
Wasswa, John Bosco

Watya, Stephen Genga
Yeku, Manyi
Buyinza, Godfrey
Nankabira, Joan
Wandera, Bonnie
Nsekanabo, Robert
Kasozi, Dickson
Kamawaka, Victor
Nammanda, Josephine
Buwembo, John Martin
Ankunda, Denis
Apica, Betty
Ocama, Ponsiano
Seremba, Emmanuel
Gemangie, Godfrey

RHSP Gallery

Milano Inn in Kyotera town where Rakai Project started out from.

RHSP Co-founders; Dr Ron Gray, Maria Wawer, David Serwadda, Nelson Sewankambo with colleague Fred Wabwiire and visitor from US

Stanley Musgrave, first technical advisor training counselors.

First makeshift Rakai Project laboratory inside Milano Inn.

RHSP head office premises in kalisizo, kyotera.

Oliver Leayendeckar, Dr. Steve Reynolds and Dr.Tom Quinn

HIV rapid tests

Kabaka Ronald Mutebi with a delegation of RHSP Senior Management during a courtesy visit to RHSP head office premises.

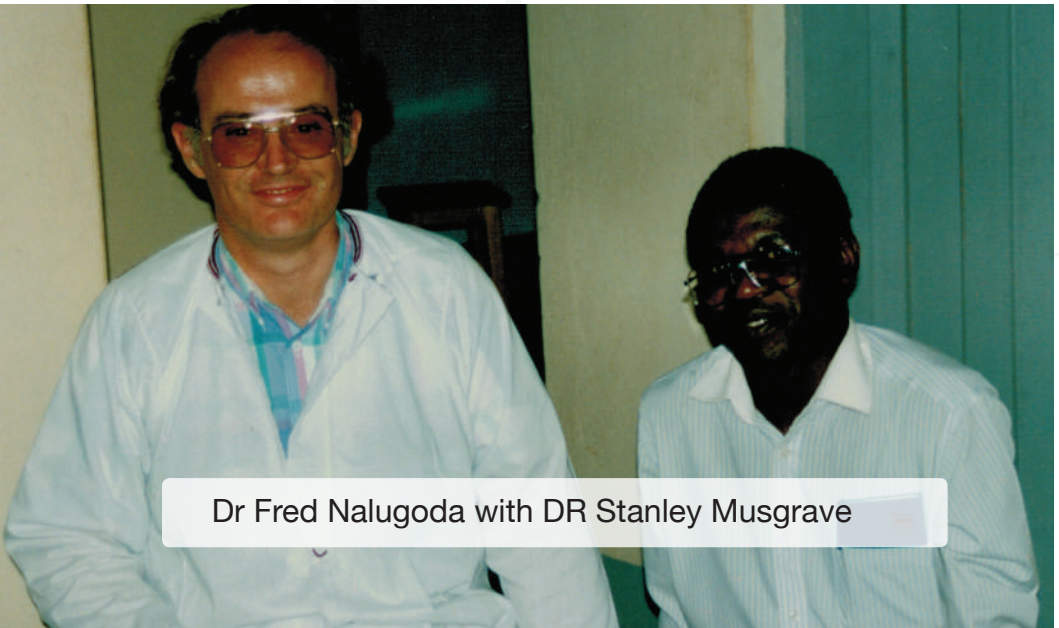
Ambassador Deborah Malac officially launching MV RHSP, a medical water vessel that shall extend HIV care and treatment services to people living on far to reach islands on Lake Victoria

Kalangala district leadership team, CDC team led by Ambassador Malac and RHSP team at Kalangala Health Centre IV during a courtesy visit

RHSP's Prof. Serwadda David, Dr Kagaayi with Ambassador Malac and Kalangala LC5 Chairman aboard the MV RHSP

A visit to Bufumira Island by CDC, RHSP and Kalangala district leadership teams

Blood samples drawn off a client using the rapid HIV test kit in an RCCS hub.



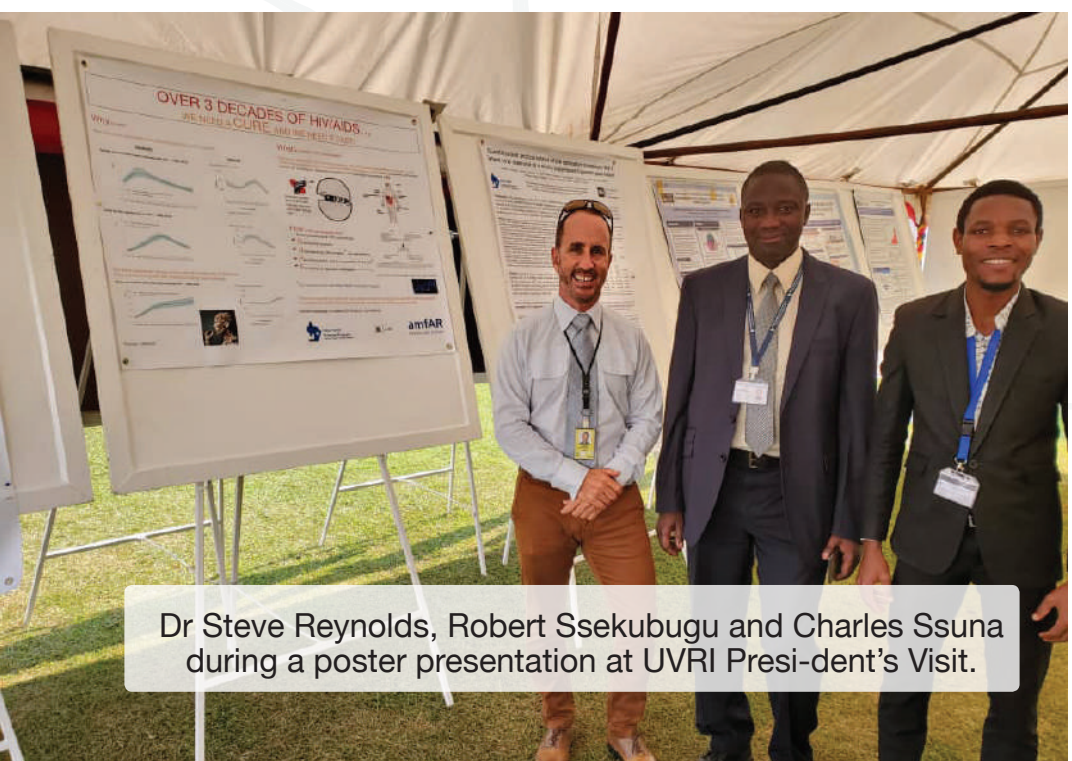
Dr Fred Nalugoda with DR Stanley Musgrave

Dr Steve Reynolds at a home visit during the Malaria study.

First Rakai Project vehicle which was used to traverse communities.

Dr Steve Reynolds and Prof. David Serwadda during a field visit.

RHSP Principal Investigators with visitors from NIH & CDC

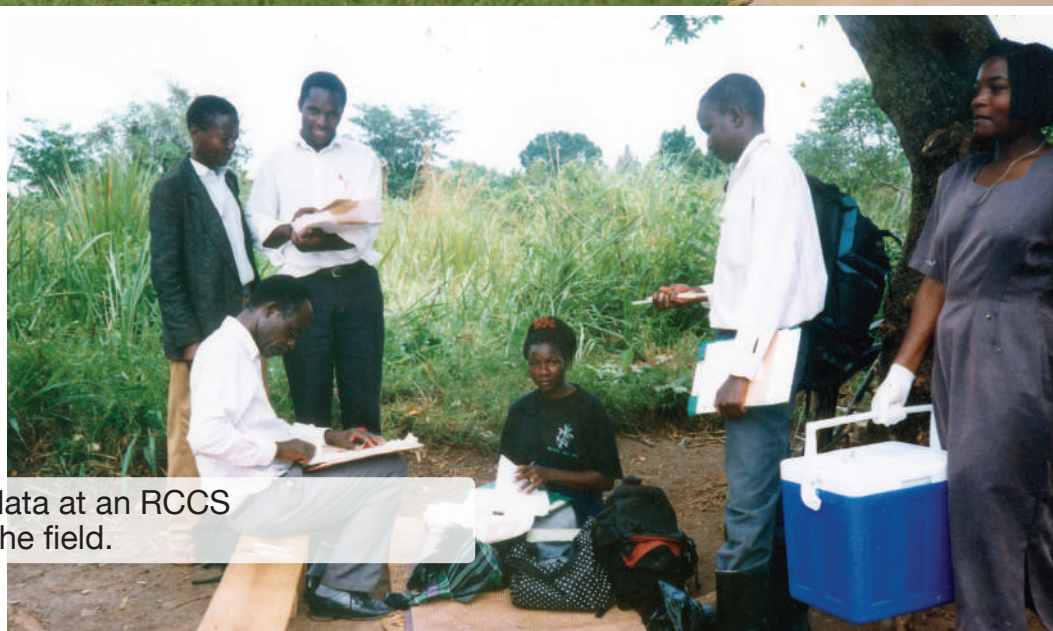


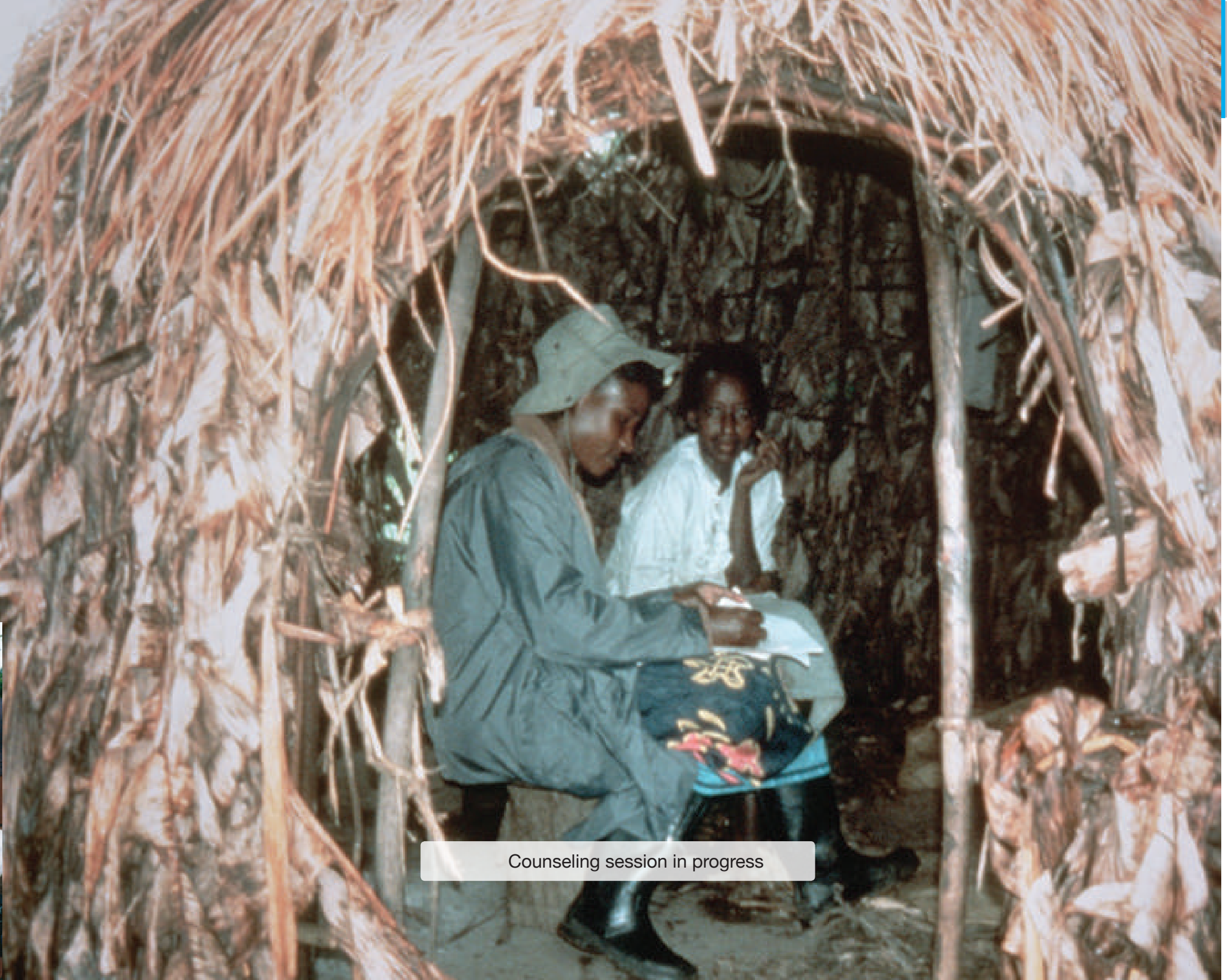
Dr Steve Reynolds, Robert Ssekubugu and Charles Ssuna during a poster presentation at UVRI Presi-dent's Visit.

Uganda Parliamentary Committee on HIV/ AIDS visit to RHSP.

RCCS Hub in Field

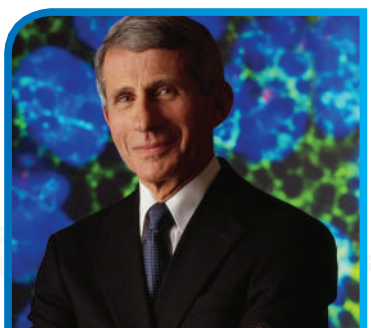
Counselors analyzing data at an RCCS mobile hub in the field.





Counseling session in progress

Reflections on RHSP



"From its start in 1987 during the early, dark days of the HIV pandemic up through today, the Rakai Health Sciences Program has been in the vanguard of HIV/AIDS research. RHSP investigators have contributed numerous critical insights and clinical advances that have accelerated HIV research and improved HIV prevention, treatment, and care globally. NIAID deeply values the more than three decades of extraordinary partnership that we and the RHSP have established.'

Anthony S. Fauci, MD,
Director of the National Institute of Allergy and Infectious Diseases, National Institutes of Health

"RHSP has been and is all about the people; the people receiving services and providing information, the breadth and wealth of talented people working together, the development of individual members of staff and the evolution of the team."

Dr Stan Musgrave
Trial Coordinator ARRISA - UK Norwich Clinical Trial Unit

After completion of my medical internship at Masaka Regional Referral hospital, I excitedly expressed interest to join the then Rakai Project, conducting HIV research and community services. I did not intend to stay in such a rural setting for more than two years. The great working relationship with RHSP colleagues, national and international mentors, the communities served and the satisfaction from the impact of the work supported by Rakai Health Sciences Program has seen me stay for 16 years (and still counting). It has been a very fulfilling experience to be part of the great RHSP team and to contribute to improvement of health through research and service provision.

Dr Gertrude Nakigozi
RHSP Programs Director

"We at Fogarty are delighted that the Rakai Health Science Program is marking three decades of groundbreaking research discoveries that have significantly advanced our understanding of the virus, how to treat it and reduce its transmission. We see these accomplishments as a strong validation of the Fogarty mission to build scientific capacity where it's needed most. We're proud to have supported research training for more than 140 Rakai scientists since 1988—in the dark days when an HIV diagnosis was an almost-certain death sentence--and congratulate RHSP on helping bring us to a time when HIV is a manageable, chronic illness."

Roger I. Glass, M.D., Ph.D.
Director, Fogarty International Center
Associate Director of Global Health Research, U.S. National Institutes of Health

It is March 1995 very early morning. I hear a knock on my door at my first and newly acquired work place (Gombe hospital, Mpigi district). I wake up, open the door, only to be surprised to see Dr. Noah Kiwanuka. He was on a mission to head hunt a doctor who was willing to work in a very remote village with hundreds of people sick and dying of 'slim disease'. I reluctantly accepted an interview with Prof. Nelson Sewankambo and agreed to take the job in Rakai against the wishes and advise of my family. I joined Rakai on 'fool's day' (April 1st 1995), feeling like a fool leaving a permanent job to join a young organization offering a 1 year contract! I purposed to run out the one-year contract and go back to a permanent job. As I write this, 24 years later, I know that the decision to stay with Rakai is one of the best decisions I ever made. I know for sure that I am part of a great team of men and women who have enormously contributed to improving health through research, training and quality service provision. A big thank you to both my local and international mentors.

Dr Godfrey Kigozi
RHSP Research Director

The little Project that could… What started with a staff of six using one vehicle kindly lent to us by the Ugandan AIDS Control Programme, has become a multidisciplinary group of hundreds working together in the RHSP to address the ongoing challenges posed by HIV. The RHSP grew slowly, but developed deep roots. It's been exhilarating, frustrating, easy, difficult and everything in between. The virus has caused the frustrations and difficulties. RHSP colleagues, collaborators, community leaders, research and services participants, all working together against the common foe, have provided the hope and energy to persevere. Support from donors and exchange of ideas with HIV researchers globally have greatly contributed to the effort. The battle is not over, but I am very hopeful that the effort will be sustained and ultimately we shall see the end of the epidemic in Rakai, in Uganda, and globally. I am grateful to have been able to participate in this effort.

Prof. Maria Wawer
Co-Founder RHSP

"The 24 years I have been at RHSP have been the greatest opportunity of my life. Working with the communities everyday to transform their lives has been an amazing journey. I have worked with a dedicated, humble, and a multi displinary team of scientists ready for victory."

Grace Kigozi
Head of Department QCI

"Working in collaboration with RHSP over the last 16 years has been the most amazing experience of my medical career. Working together with my fantastic colleagues both in Uganda and North America through challenging and rewarding times has yielded one of the strongest most productive collaborations on the continent.

Dr. Steve Reynolds
NIH ICER Scientific Director

Community Advisory Board member and Health Mobiliser
"The beginning was not easy, having to ride a bicycle around the communities to mobilise people who were very hesitant, but the professional and very supportive RHSP Staff made things easy."

Nulu Kiwanuka
Former CAB Member and Pioneer Community Worker

It is hard to believe that 30 years with Rakai could pass so quickly and productively. It has been the most gratifying experience of my medical career and the partnership ensures that there is never a dull moment in our marital or professional lives.

Prof. Ronald Gray
Principal Investigator

"I have participated in almost all RHSP complex situations. When community participation research was low, I was at the center of designing appropriate approaches to gain research compliance. During the circumcision trials I participated closely in the operationalization of Participants Follow-up Systems and messaging. Interestingly, I have also been involved in the mobilization of co-workers to stay focused on program activities. Sometimes I was engaged in infrastructure development. It is so exciting, looking back at what I have done and where we are with RHSP."

Ludigo James
RHSP Supervisor Clinical Services

"The RHSP is world-class African HIV research organization doing cutting-edge research informing on the ground HIV treatment and prevention programs. It has been an absolute honor and privilege to work with the RHSP on understanding the evolving nature of the African HIV epidemic and the impact of treatment and prevention programs on disease transmission over the last decade. I look forward to working RHSP over the next decade as it brings the epidemic in Uganda and beyond to its end."

Mary Kathryn Grabowski, PhD
Assistant Professor Johns Hopkins School of Medicine, Pathology
Johns Hopkins Bloomberg School of Public Health, Epidemiology (Joint)

"Unless a cure or vaccine is got to eliminate HIV, there is great need to monitor the epidemic. Keeping HIV at bay is also a factor of the politics of the country. The moment you have political instability which could cause challenges in health service delivery systems where people would not be getting their medication as required, you would have an epidemic looming. RHSP needs to continue keeping tabs on the epidemic and pursue attainment of an HIV free generation."

Dr. Joseph Kagaayi
Executive Director

"Looking back at how HIV/AIDS Care services were resented, it's unbelievable the enthusiasm I see in the communities now towards HIV testing and seeking for Treatment. Thanks to all the players!"

Aisha Nalukwago
Team Leader RCCS

Prof. Nelson Sewankambo
Co-Founder RHSP

" This is a critical moment and we should not only to look at what has gone well but also look into the future through a critical lens defining what needs to be done differently or added in the coming decades in order to have a much greater impact on society and with sustainable development in mind. As the world focuses on the Sustainable Development Goals (SDG) agenda 2030 we should ask ourselves how RHSP will contribute towards achieving this agenda. For example, how can RHSP be an exemplar in leaving no one behind or contribute to SDG 17 on partnerships through creating strong mutually beneficial strategic collaborations within and outside the country. The next step will require enlisting local communities as true partners with a strong voice in research and programming and acting as strong agents of change. "Prof Nelson Sewankambo, Co-Founder RHSP

"What has always struck me about RHSP was the amazing depth and breadth of the people making the science and the programs happen. From the field to the lab to the laptop, from local leadership to international collaborators, there is an amazing spirit and capacity among the team. I think people know they are part of a special group capable of making substantial impact on people's lives near and far and this helps drive our collective actions."

Dr Larry Chang
Associate Director, Johns Hopkins Global Health Initiative
Associate Professor of Medicine

"Rakai Health Sciences Program has been a leader in producing top quality research findings that have shaped our understanding of the HIV epidemic in Uganda and intervention approaches that have contributed to epidemic control globally. On behalf of the Uganda Virus Research Institute and on behalf of the MRC/UVRI & LSHTM Uganda Research Unit, I take this opportunity to congratulate the team for the 30 years of research excellence. We have greatly benefited from our partnership and collaborations over the years."

Prof. Pontiano Kaleebu
Executive Director Uganda Virus Research Institute

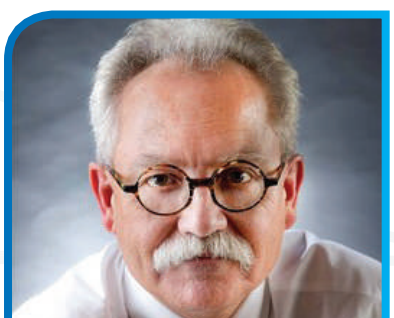
"Over 30 years ago, we started in a small office of about 8x8ft with 3 staff and volunteers. Today the program and the research service are coordinated on a large Complex with over 500 staff from all parts of the country."

Dan Tebukooza
Former Senior Records person

"We have moved from not knowing what this epidemic was or what was causing it; to understanding the dynamics of HIV transmission; gone through a number of HIV interventions which weren't as successful as we anticipated; gradually leaped into interventions that have been fairly successful and ultimately seen biomedical interventions like antiretroviral treatment and circumcision scaled up to reduce HIV incidence. We think that if antiretroviral treatment and availability of drugs for HIV negative people who are at high risk of acquiring HIV (PReP) is scaled up with previous interventions, we can be able to reduce or eliminate new infections and achieve epidemic control.

Prof. David Serwadda
Board Chair RHSP

"It has been an incredible privilege to work with RHSP on issues of youth and HIV over past 14 years. Young people are our the future. Rakai has taught me much about the role of strong science in advancing HIV prevention and the importance of understanding the fundamental roles of education, families, and communities in shaping the transition of young people to a healthy and HIV-free future. " Prof. John Santelli, MD, MPH Columbia University Mailman School of Public Health



Prof John Santelli

"Can't imagine how long I have participated in HIV research - from a ' brief case Milano' Project to a wider Rakai Program! I can recall very well all over a thousand staff that have serviced this organization – some of whom are now within and outside Uganda. Our challenges in implementation of activities from day one up to now citing a few like when we were chased out of the communities, temporary closure of the Project to community driven implementation of activities. Our "Rakai" participants/ staff /donors have contributed a lot to this success."

Joseph Lister Ssembatya
Head of Community Service

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Website: www.rhsp.org