Rakai Community Cohort Study Evolution and Early Findings

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Genesis of the first Rakai community cohort

From the beginning, the backbone for the Rakai Health Sciences Program was envisioned as a

Population-based cohort

Clinic-based research is extremely valuable, but cannot inform us about persons who do not come to clinic

A population-based cohort includes many important subgroups i.e. discordant couples, pregnant women, recently in-migrated

Rakai Cohort first funded by NIH RO1 on HIV Epidemic Dynamics (1989)

First RHSP Community Cohort, established in 1988

(Wawer, Serwadda et al, BMJ, 1991)

21 randomly selected community clusters of households

All households within cluster boundaries

All consenting/assenting persons aged 13+ years in study households

1,292 persons

Basic Rakai Cohort design elements. 1

- Community mobilization (leaders, community meetings) prior to the census/survey
- Census: door-to door in every household within each Rakai Cohort community cluster
- Census data on:
  - All residents
  - Transients
  - Relationship of each to head of household
  - Age, gender
  - Migration(s)
  - SES data (dwelling characteristics, possessions)
  - Changes household composition

Geographic Prevalence of HIV, Rakai, 1989

(Wawer et al, BMJ, 1991)

HIV Prevalence	Overall	Men	Women
Rural:	**12%**	**8%**	**9%**
Secondary Road:	**23%**	**26%**	**29%**
Main road/trading:	**35%**	**26%**	**47%**

Rakai homestead type in the 80s

Major towns of Rakai in the 80s

Demographic impact of HIV in Rakai

Sewankambo et al, AIDS, 1994.

	Mortality/1000 person years, persons aged 15+ years	Relative risk, 95% CI
HIV-negative	**12.4**	**9.5 (6.0-14.9)**
HIV+	**118.4**	

HIV prevalence was ~13% in the Rakai region
52% of adult deaths were attributable to HIV.

Overall crude death rate in Rakai
~28.1/1000 population.
Overall crude birth rate
~ 45.7/1000 population.

Even accounting for infant and child mortality, the higher crude birth rate assured continued population growth.

Discordant couples and HIV social dynamics

Serwadda et al, AIDS, 1995

- 79 HIV discordant couples
- Female was HIV+ index partner in
  - 43% of all couples
  - 57% of couples in trading centers
  - Only 20% of couples in rural villages ($p < 0.008$)
- Reported condom use was higher in couples with an HIV+ woman (17.1%) than in couples with an HIV+ man (9.5%).
- NB: ART was not yet available in Uganda; RHSP recommended and offered condoms.

HIV incidence RCCS, ages 15-39

Wawer et al, BMJ,1994

Variable	Incidence rate/100 py	Rate Ratio (95% CI)
Total	3.2	
Place of residence		
Trading center	4.3	1.6 (0.5-4.9)
Trading village	3.3	1.2 (0.4-3.8)
Rural village	2.7	1
History of STI past year		
Yes	6.6	2.4 (0.9-6.0)
No	2.7	1
Number of sex partners past year		
2 or more	8.3	**3.4 (1.3-9.0)***
0-1	2.5	

Marital status, injections, travel, occupation: all not significant

1993: Disaster strikes the first Rakai cohort…

- First NIAID RO1 ended, and other funds bid for and had been assured of did not materialize (stuff happens).

- The cohort ended and the RHSP had to discard over 10,000 precious early HIV epidemic samples (literally, no funds to pay for electricity and our freezer got moldy).

- However, out of the ashes….

New cohort arise

1994: RHSP/RP was awarded an NIAID RO1 to conduct a community based trial of bacterial STI mass treatment for HIV prevention.

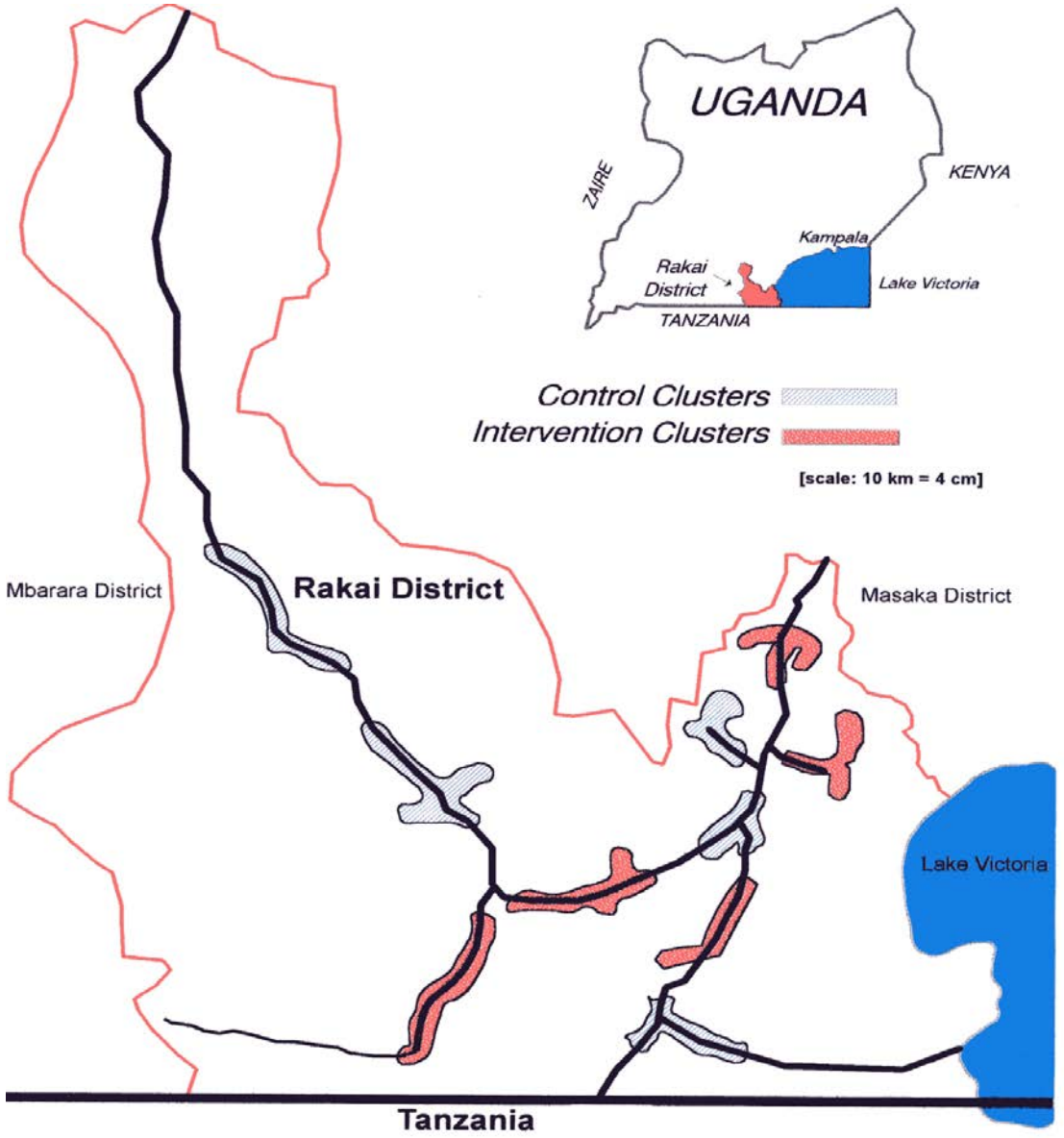
Results of the trial will be presented in a later session.

The funding enabled RHSP to;

Establish a new community-based open cohort (RCCS).

Data from the prior cohort greatly facilitated the process:
For example, we already knew

- background HIV incidence in various types of communities.
- travel patterns between communities, etc



Clusters, new RCCS 1994

10 clusters of 3-5 villages each (40 villages)

Along main and secondary roads (baseline HIV incidence at ≥2/100 py)

Separated by swamps/big hills to reduce contamination

Total population: 12,000 HIV-neg and 1,600 HIV+

Another RCCS evolution

In 2010, RCCS added
4 fishing communities
on Lake Victoria.

- New fish processing plant
- Relatively better road
- Huge population growth
  (from 100s to 4,000+)
- HIV prevalence 43%
- HIV incidence 2011:
  3.4/100py

Fishermen straightening nets in preparation for fishing

The Cohort Evolves and Adapts

Earlier Practice	Turning point	Current Practice
Door-Door/home based survey procedures	2007	Community Central hub-based survey procedures
Use of pen/pencil and paper	2010	Use of electronic data capture
Laboratory based HIV testing	2011	Rapid HIV testing (Primarily)
Enrolments based on living in a “stable” community as a permanent resident residence – to enhance follow up.	2014	Enrolments include transient and migrant population

Home based survey interview

Waiting area at the community central hub

Survey Interview at the HUB

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

In Summary

- Almost all the studies we shall discuss today have been directly or indirectly been possible through the Rakai Community Cohort Study (RCCS)

Thank you.