

# Lessons Learned from Scale-Up of Viral Load Testing in LMIC: Could Viral Load Testing be Harnessed to Help Reduce HIVDR?

Steven J. Reynolds, MD, MPH  
Senior Clinician

Section on International HIV/STD Research  
NIAID/NIH ICER Program Uganda

**NIH**

National Institute of  
Allergy and  
Infectious Diseases



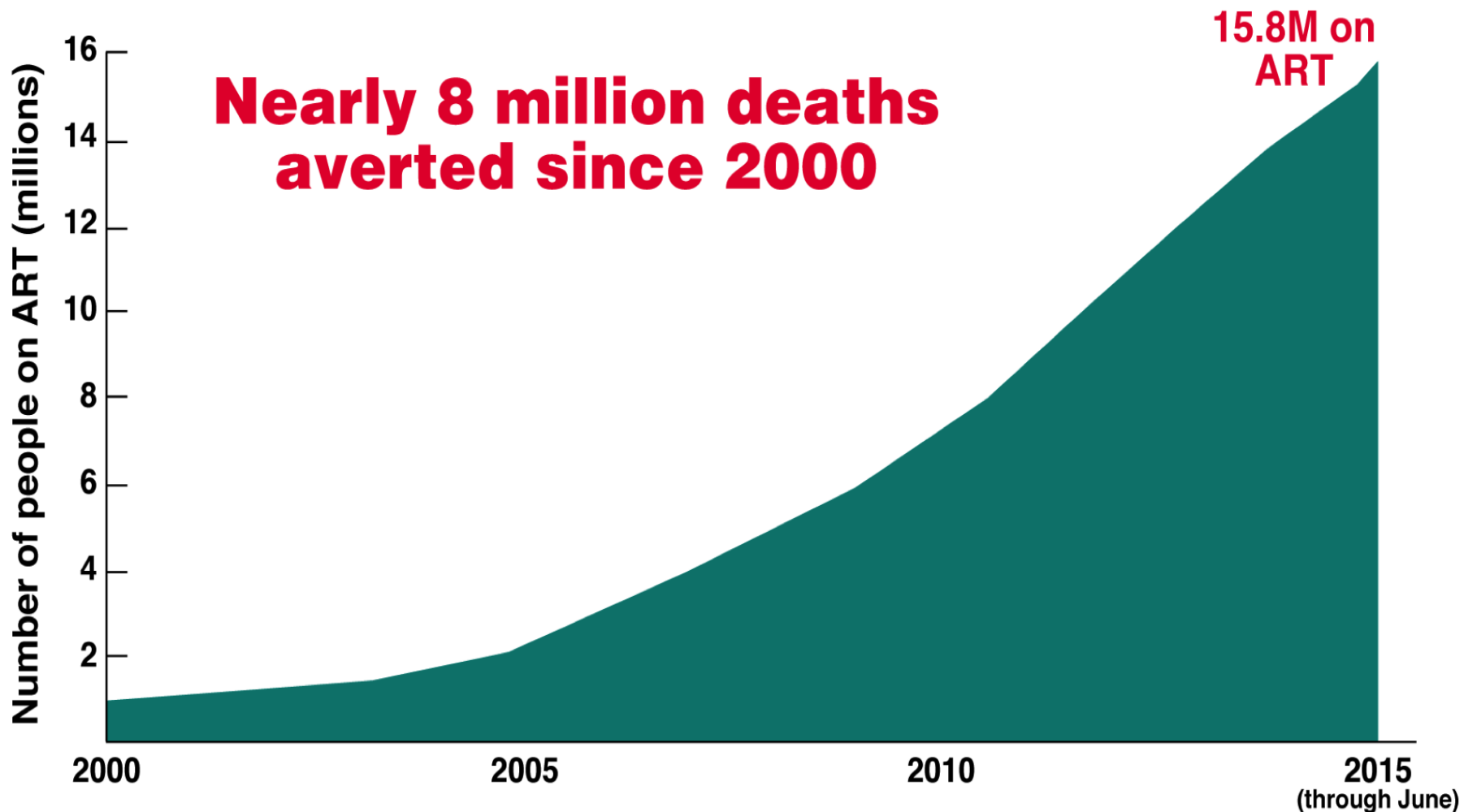
**Rakai Health  
Sciences Program**

Improved Health Through Research

# Outline

- Review shifting WHO monitoring guidelines
- Potential benefits of VL monitoring to reduce HIV DR
- Current challenges faced in the field as we scale up VL monitoring
- Future monitoring options

# Number of HIV-Infected People Globally Receiving Antiretroviral Therapy (ART), 2000-6/2015



# WHO HIV Treatment Guidelines

**2003**

- 1) Clinical monitoring
- 2) CD4 monitoring if available
- 3) Viral load monitoring not recommended due to cost/complexity

**2009**

- 1) Clinical monitoring
- 2) CD4 monitoring
- 3) VL monitoring to confirm suspected treatment failure
- 4) Encourage expansion of viral load monitoring

**2006**

- 1) Clinical monitoring
- 2) CD4 monitoring needs to be expanded and not seen as a luxury
- 3) Viral load monitoring if available

**2013**

- 1) Routine VL monitoring recommended as preferred method to identify treatment failure

# Immunologic Monitoring Does Not Work

Failure of immunologic criteria to appropriately identify antiretroviral treatment failure in Uganda

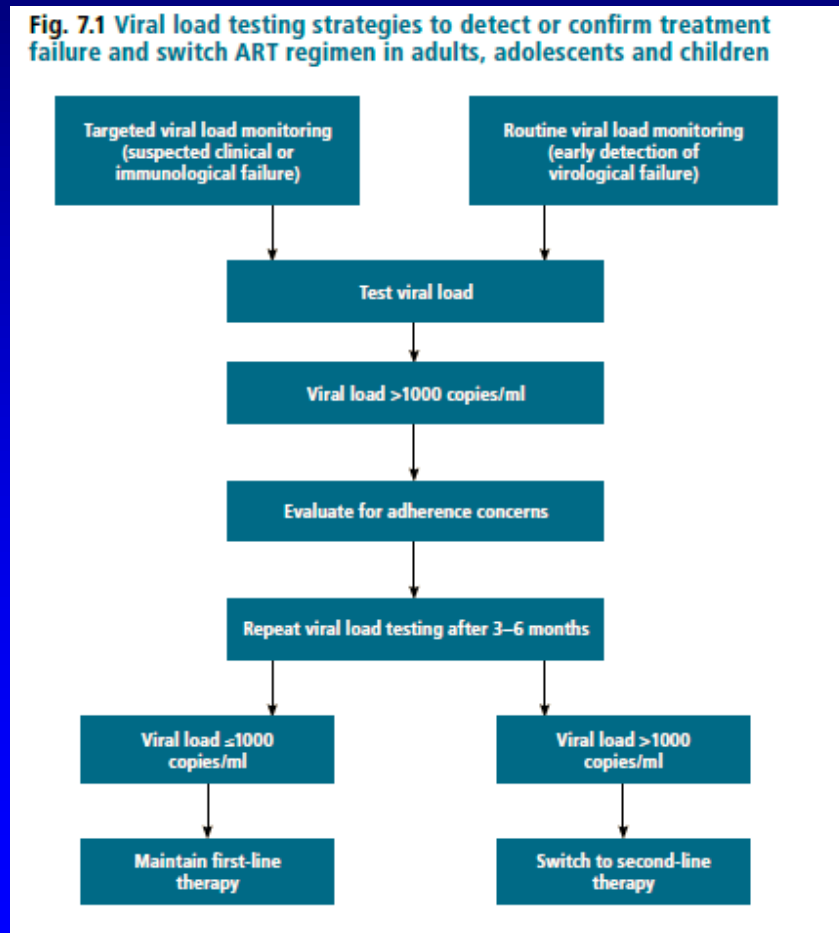
Steven J. Reynolds<sup>a,b</sup>, Gertrude Nakigozi<sup>c</sup>, Kevin Newell<sup>d</sup>,  
Anthony Ndyanabo<sup>c</sup>, Ronald Galiwongo<sup>c</sup>, Iga Boaz<sup>c</sup>,  
Thomas C. Quinn<sup>a,b</sup>, Ron Gray<sup>e</sup>, Maria Wawer<sup>e</sup>  
and David Serwadda<sup>f</sup>

AIDS, 2009; 23(6).

**Next Question:** What is the impact of delays in identifying treatment failure on antiretroviral resistance?

# 2013 WHO recommendations

- Viral Load is recommended as the preferred monitoring approach to diagnose and confirm ARV treatment failure



# VL as an early adherence check

- Checking VL within the first 6 months to identify adherence problems and intervene prior to development of HIVDR
- Observational data from South Africa and Rakai suggest resuppression common
- 1841 ART initiators in Rakai between 2005 and 2011, 148 (8%) had VL>400 copies/ml at 24 weeks and given extended adherence counseling
- 85 (60%) subsequently had VL<400 copies/ml at 48 weeks with a median duration of suppression of 240 weeks (IQR 193-288)
- VL>2000 copies/ml strongly associated with non-suppression at 48 weeks (Adj OR 7.4, 95% CI 3.4-16.3)

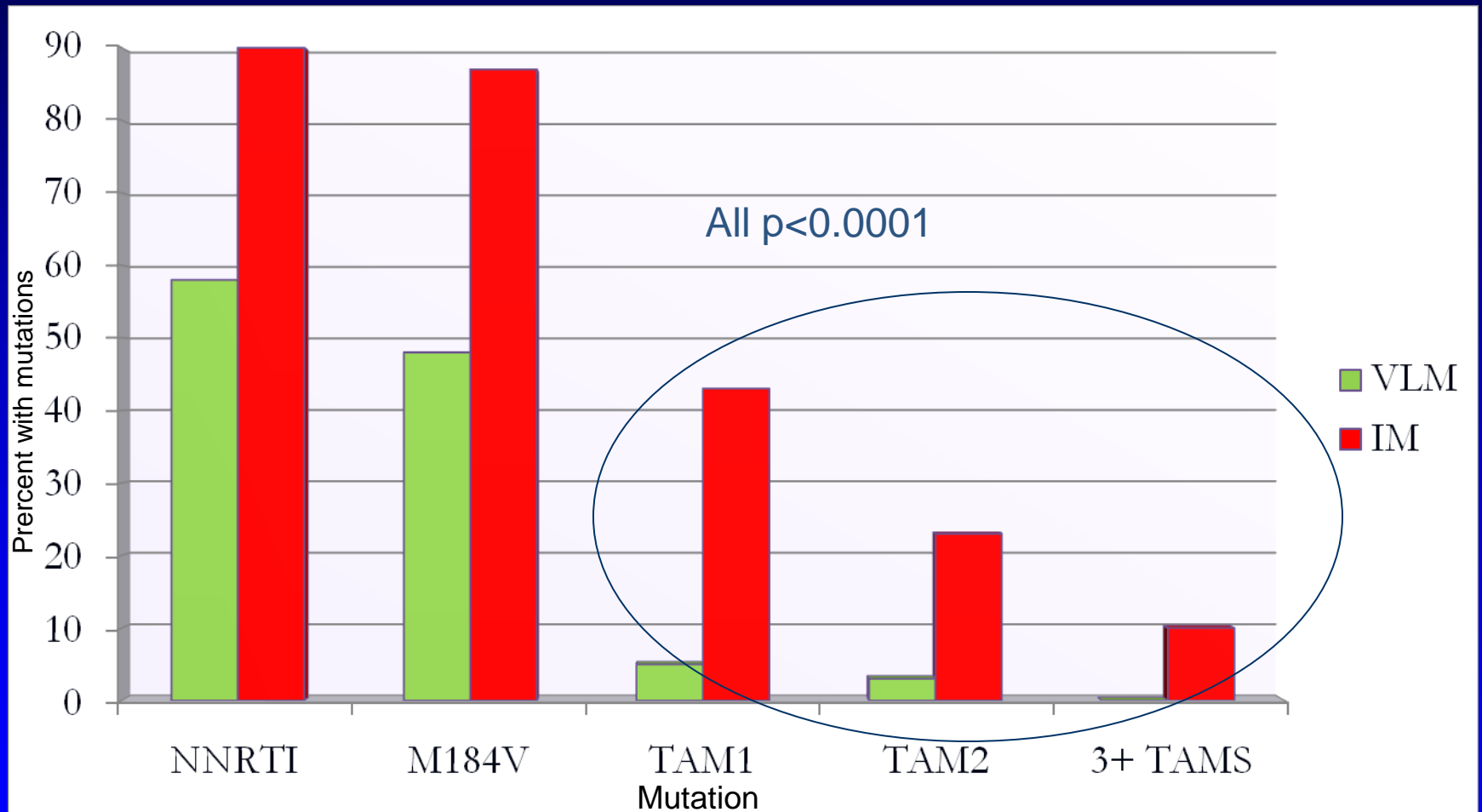
•Billioux, Reynolds, PLOS One 2015

# Viral Load Monitoring to Reduce HIVDR

- Cross sectional observational design
- Setting: Infectious Diseases Institute, Kampala, provides specialized HIV treatment/care to 10 000 clients
- IDI Cohort: 559 ART naïve clients recruited in 2004-5 and monitored with CD4/VL every 6 months (VLM group)
- TAMS study: 998 IDI general clinic clients who had been on first line ART for 36-40 months monitored by CD4 only every 6 months (IM group)
  - Clients failing therapy at 36-40 months were genotyped and rates of resistance compared between groups



# Viral Load Monitoring to Reduce HIVDR

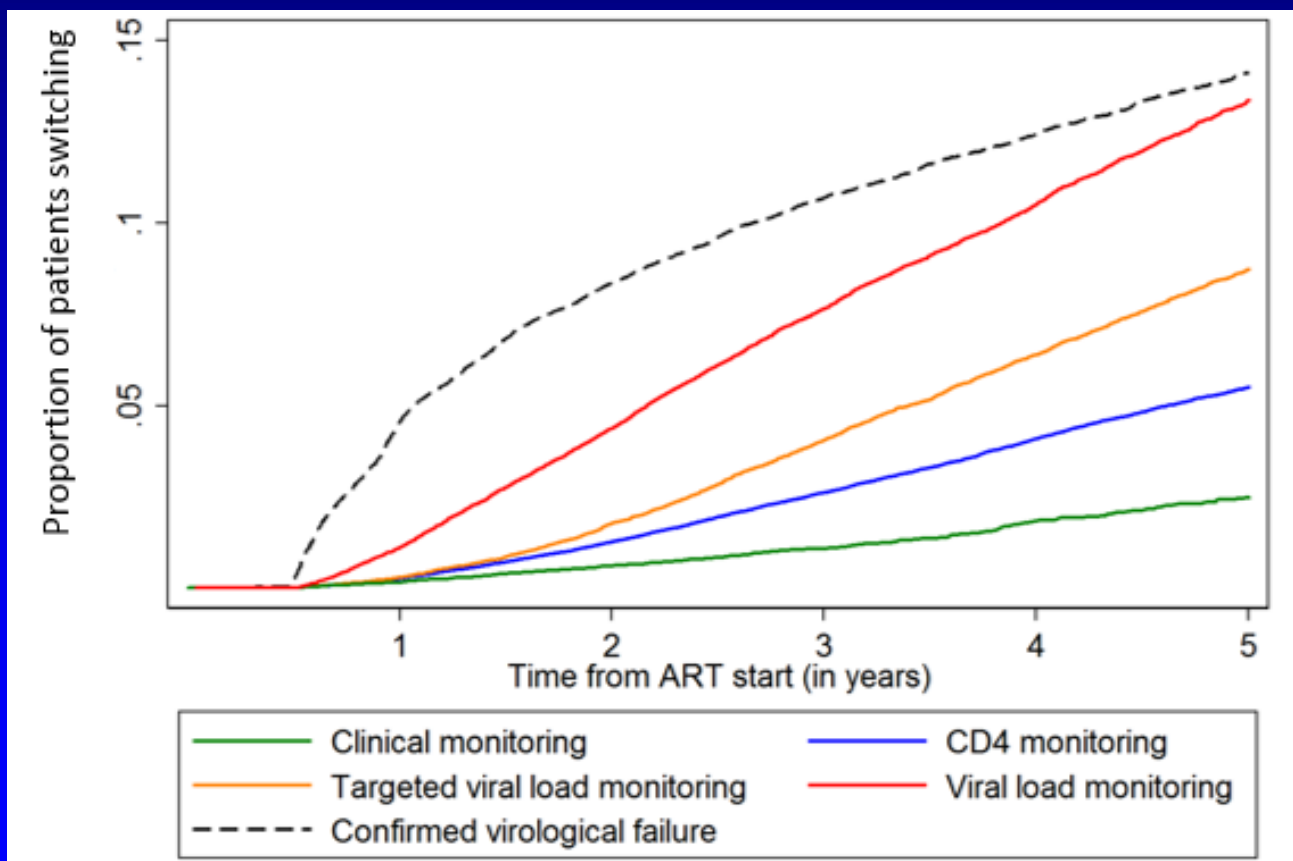


# STORM CLOUDS ON THE HORIZON

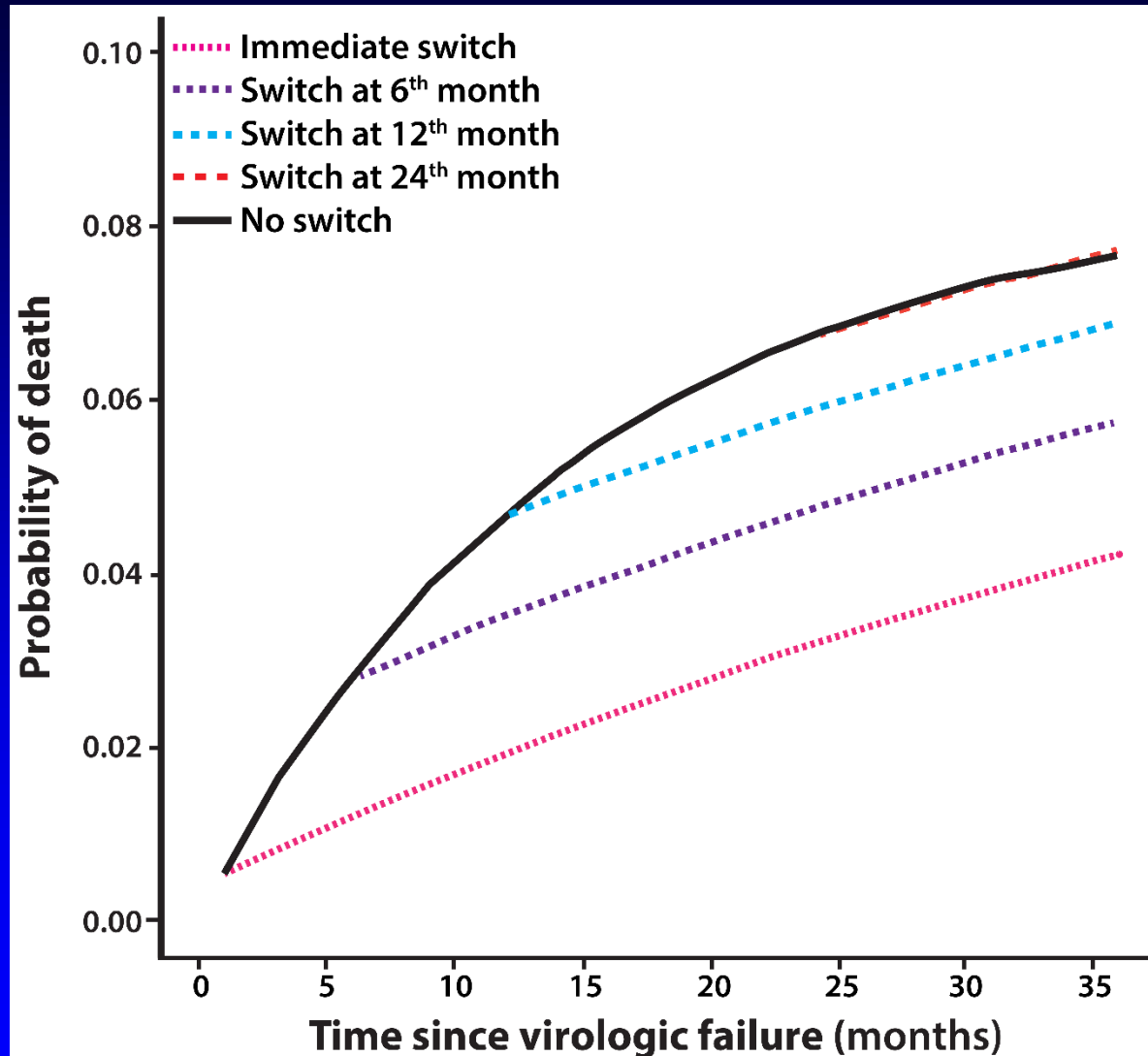


# Delayed Switching

- Despite the increased availability of viral load monitoring, many programs in sub-Saharan Africa are switching individuals late after first failure detected



# Mortality Increases As Treatment Switch is Delayed



# Shift from CD4 to VL, reluctance both from providers and patients

- Audit of VL monitoring in Rakai fishing communities
- Out of a total of 796 Clients on ART only 335 (42%) had a VL result present

Time Point	VL Present	VL Missing
6 months	70 (44%)	88 (56%)
12 months	97 (46%)	113 (54%)
24 months	46 (43%)	60 (57%)

**MISSED OPPORTUNITY TO DETECT FAILURE**

# Can we safely drop CD4 monitoring?

- As Viral Load monitoring in RLS expands, Ministries of Health are considering dropping CD4 monitoring
- Analysis of 1533 clients receiving ART in Rakai
- Only 43 clients who achieved a VL<400 copies/ml and CD4>200 experienced a subsequent drop in CD4 below 200
- Most (83%) achieved CD4>200 on their next visit and none of those with declines had an opportunistic infection

# Future Strategies

- **Simpler technologies entering the market both for traditional lab and POC which could help in VL scale up**
- **Research looking at using early VL results to risk stratify clients for differentiated care (early suppressors may be followed less frequently)**
- **Use of mobile/smart phone technologies to both remind providers VL is due and also for result reporting**

# Conclusions

From: Folkers, Greg (NIH/NIAID) [E] [<mailto:GFOLKERS@niaid.nih.gov>]

Subject: Journal Watch: No More Excuses: HIV Viral Load Monitoring Lowers Costs

## **No More Excuses: HIV Viral Load Monitoring Lowers Costs**

*And it improves survival, to boot.*

*Ref: R.L. Hamers et al, AIDS 2012, 26:1663-1672*