UNIVERSITY OF KWAZULU-NATAL ™
INYUVESI YAKWAZULU-NATALI

# Viral load monitoring & adherence

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SAHCS Conference 2018

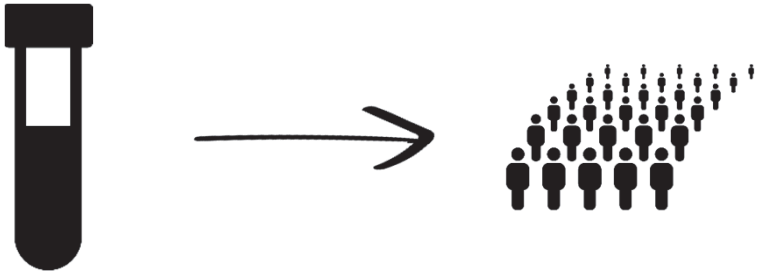
krisp


UKZN INSPIRING GREATNESS

# Viral load monitoring – why do we do it?

↓ Mortality & morbidity

↓ Emergence of HIV drug resistance



↓ Transmission

↓ Transmission HIVDR

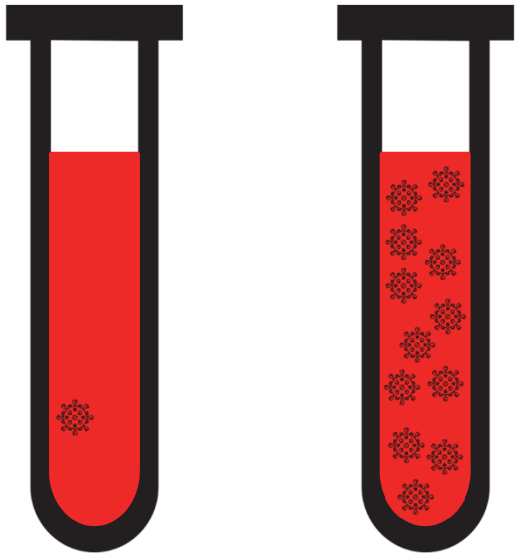
↓ Health care costs

# Interpreting viral load results

**Viral load <50 copies/mL**

Viral replication effectively suppressed

Does not mean that there is no virus in blood or in body



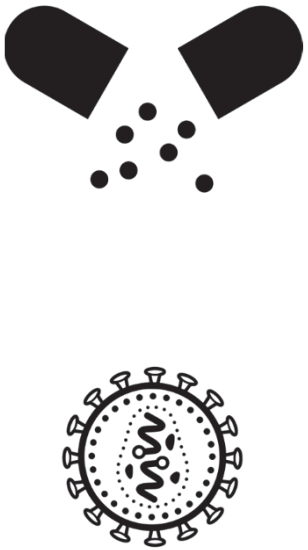
**Viral load ≥50 copies/mL**

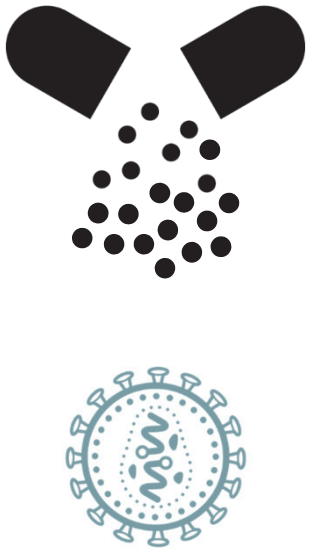
HIV is actively replicating

Further evaluation is required to find out why

# Understanding detectable viral load

**Insufficient drug levels in blood to suppress viral replication**





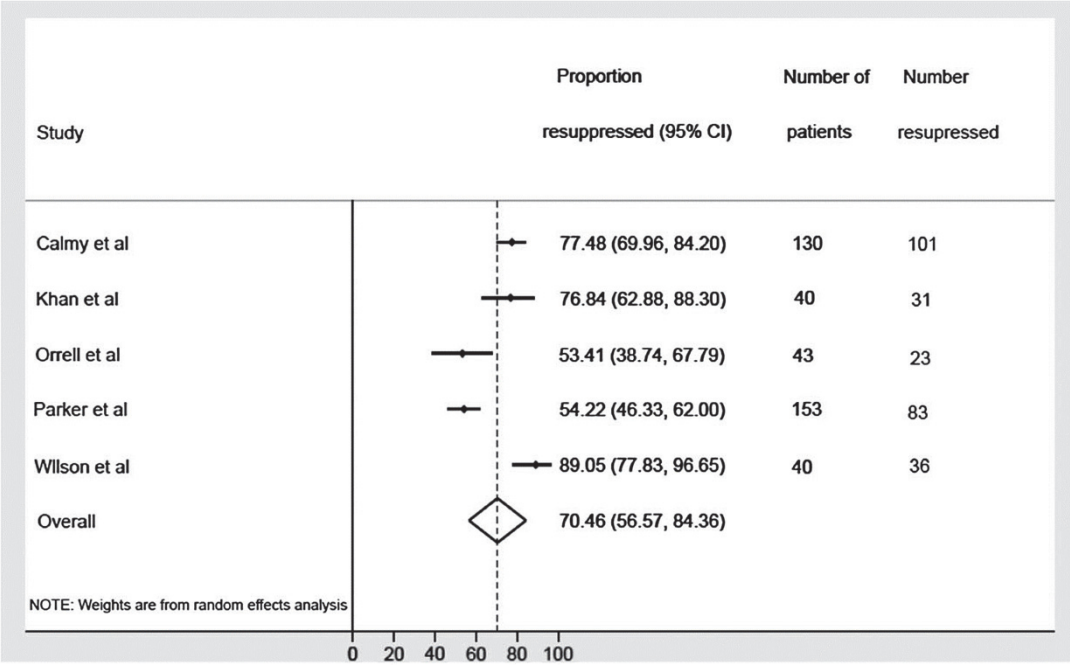
**Sufficient drug levels in blood but unable to suppress replication of drug-resistant virus**

**Once drug-resistant virus has emerged, even perfect adherence may not suppress viral replication**

# Viral load as a tool to improve adherence

## Does it work?

Meta-analysis of 5 studies exploring resuppression after adherence intervention in people with viraemia




70% of people resuppressed following adherence intervention

*N.B. Different VL thresholds to define initial viraemia and for resuppression*

Bonner JAIDS 2013

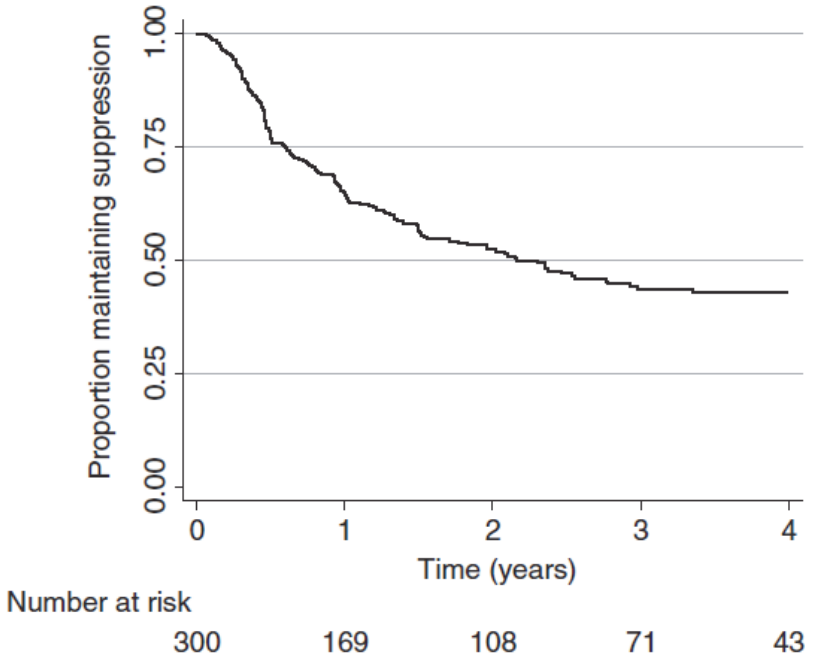
# Viral load as a tool to improve adherence

**Is resuppression durable?**

Cohort study (workplace HIV programme)

300 adults that had developed viraemia (VL >1000 copies/mL) on first-line ART then resuppressed to VL <400 copies/mL

Continued suppression without virological failure occurred in 49% (median follow-up 2.4 yrs)




Hoffmann TMIH 2014

# Viral load as a tool to improve adherence

## Does it work with second-line ART?

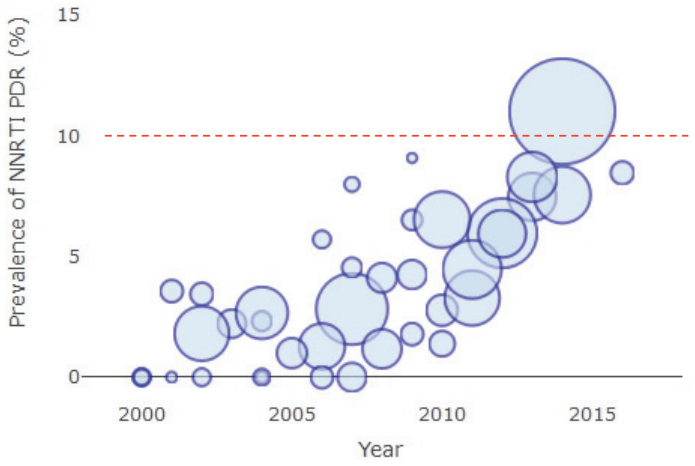
- Prospective cohort study (Themba Lethu clinic)
- 388 adults with VL >400 copies/mL on second-line ART who received enhanced adherence counselling and repeat viral load
- 249 (64%) resuppressed VL <400 copies/mL

Fox TMIH 2016

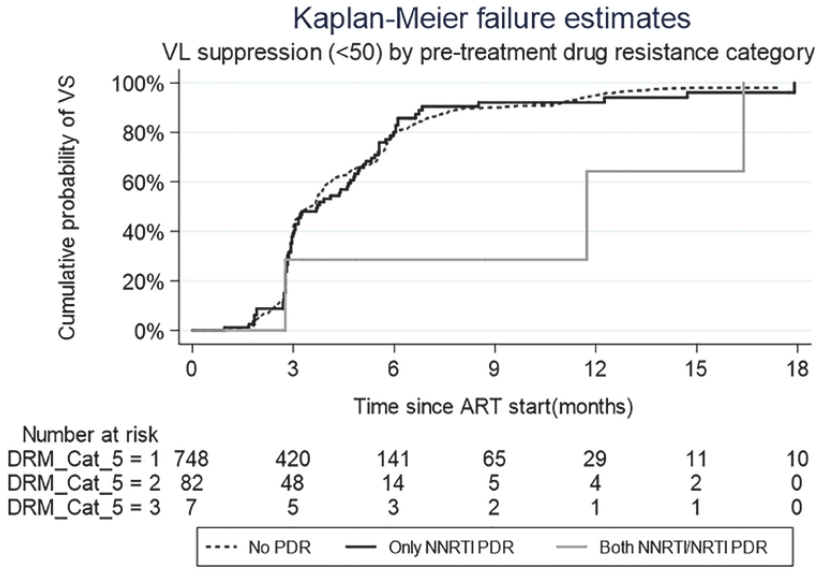
# Viral load as a tool to improve adherence

## Is usefulness limited if higher levels of pretreatment drug resistance?

Meta-analysis of NNRTI PDR in ART-naïve adults in South Africa 2000-2016




NNRTI PDR has no effect on probability of viral suppression with TDF/FTC/EFV




Chimukangara AIDS 2018
Derache CID 2018

# Viral load as a tool to improve adherence

## What about in routine care settings?

- Cluster randomized trial of enhanced adherence counselling in DoH facilities in 4 provinces (GP, LP, NW, KZN)
- Enrolled adults on first-line ART with VL >400 copies/mL

12 Intervention clinics
EAC implemented by routine staff

→

71/358 (20%) repeat VL done
11/71 (15%) suppressed (VL <400)

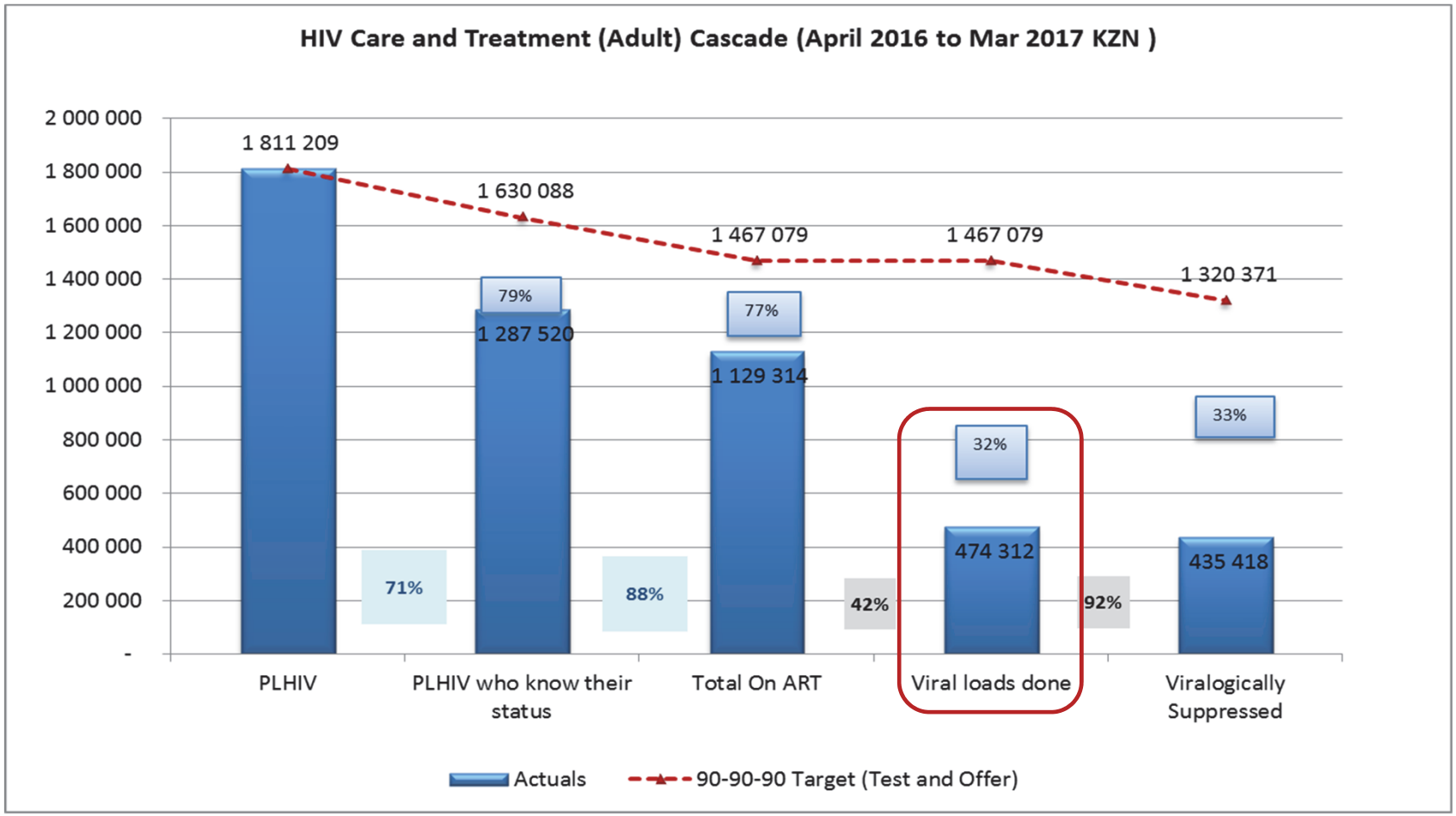
12 Control clinics
Routine care

→

68/505 (13%) repeat VL done
24/68 (35%) suppressed (VL <400)

Fox TMIH 2018

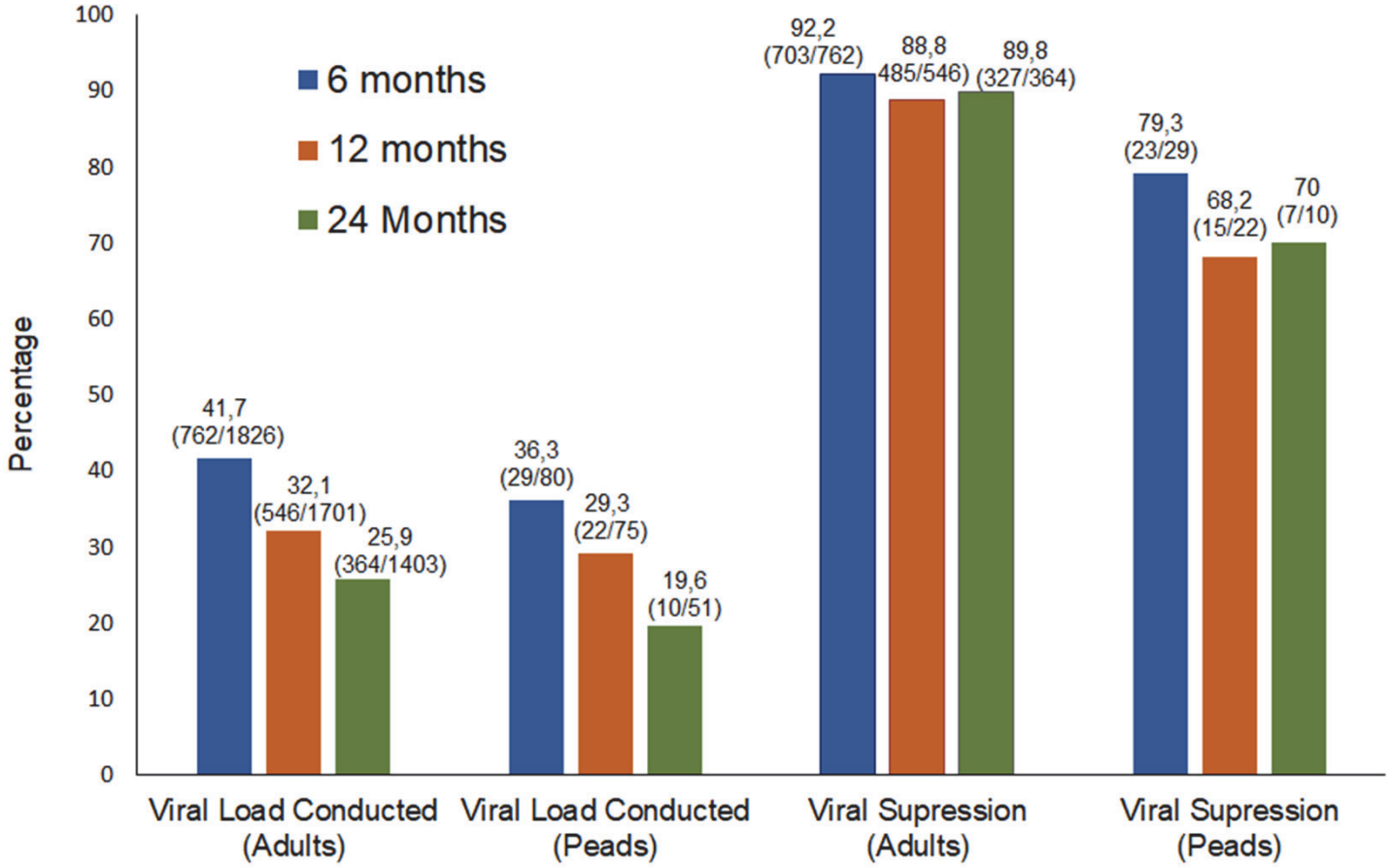
# Viral load testing



# Viral load testing performance

File audit in KZN found fewer than 50% of VL tests done as expected at all time points

In adults, high levels of viral suppression in tests done



# Priority interventions – five step plan

**Viral load champion**

**Viral load anniversary**

**Synchronized data sources**

**Viral load priority clinic**

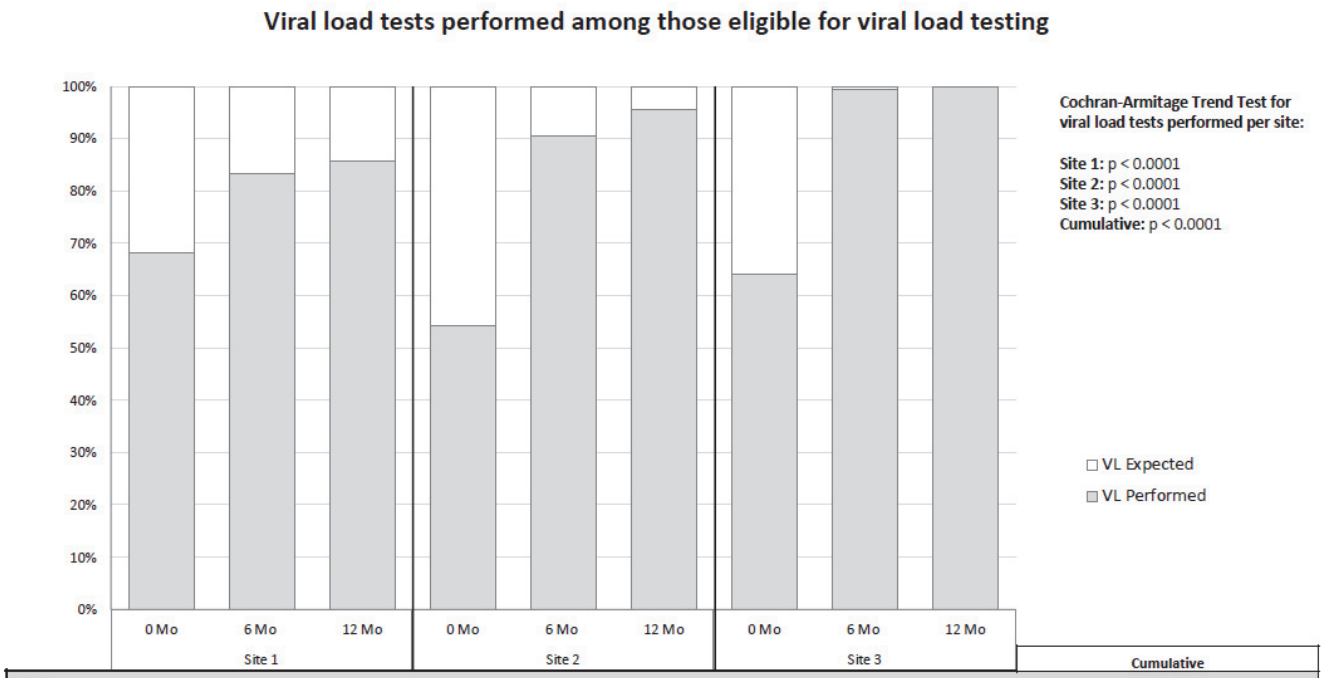
**Cascade to all clinics**

# Viral load testing performance

Significant improvement in VL tests performed at three pilot sites after implementation of 5 step plan

Improvement sustained at 12 months post-intervention

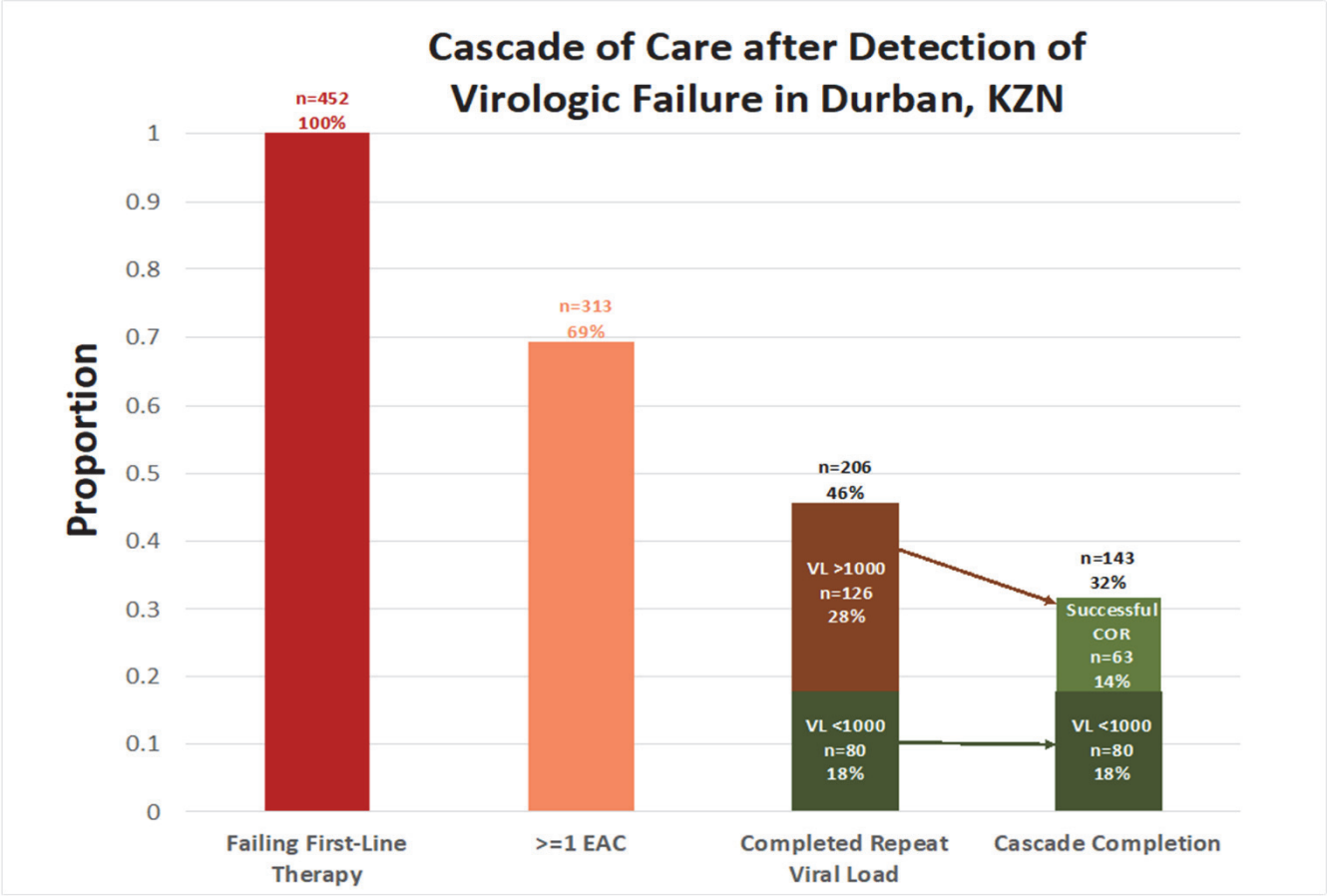
Viral load suppression rates high




| | Site 1 | | Site 2 | | Site 3 | | Cumulative | |
|---|---|---|---|---|---|---|---|---|
| **0 Mo** | | | | | | | | |
| VLP/VLE | 140/205 | 68% | 84/155 | 54% | 323/504 | 64% | 547/864 | 63% |
| VLS/VLP | 112/140 | 80% | 78/84 | 93% | 307/323 | 95% | 497/547 | 91% |
| **6 Mo** | | | | | | | | |
| VLP/VLE | 995/1194 | 83% | 793/878 | 90% | 3101/3124 | 99% | 4889/5196 | 94% |
| VLS/VLP | 840/995 | 84% | 758/793 | 96% | 2996/3101 | 97% | 4594/4889 | 94% |
| **12 Mo** | | | | | | | | |
| VLP/VLE | 2262/2636 | 86% | 1742/1824 | 96% | 6636/6636 | 100% | 10640/11096 | 96% |
| VLS/VLP | 1920/2262 | 85% | 1646/1742 | 94% | 6519/6636 | 98% | 10085/10640 | 95% |

# Viral load testing cascade

Despite improvement in VL testing performance, persistent gaps in action taken after high VL



# Viral load testing – is it cost-effective?

- Systematic review of cost-effectiveness of viral load monitoring
- Three key factors that determine cost-effectiveness
  1. Low-cost approaches to VL monitoring (e.g. dried blood spots or less frequent VL monitoring)
  2. Action based on VL results
  3. VL-informed differentiated care

5.6 million VL tests done per year in NHLS (ZAR ~1.9 billion)

Barnabas JIAS 2017

# Summary

- Viral load is a useful tool to assess adherence and to prompt intervention
- Early detection of high viral load and prompt intervention can lead to resuppression
- Coverage of routine VL testing can be improved with a relatively simple set of priority interventions (five step plan) within QI framework
- More work is needed to strengthen action based on VL results

# Acknowledgements

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