# Does Laboratory Participation in EQA Programs Have an Impact on Laboratory Performance? Results of Two Years Evaluation of Laboratories Performances in the National Proficiency Testing Scheme, Nigeria.


**BY**

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# BACKGROUND

- CDC contracted Axios Foundation to Establish a National External Quality Assurance Laboratory (NEQAL) in Nigeria working with the Medical laboratory Science Council of Nigeria. (MLSCN)
- The Laboratory commenced the National Proficiency Testing Scheme (NPTS) in 2011.
- Commenced with initial panel distribution for HIV serology and CD4 with 81 and 68 public laboratories enrolled in the respective PT scheme.
- Laboratory enrolments increased to 224 public laboratories by February 2013. (224- CD4, 177- HIV Serology)
- Expanded to over 300 laboratories enrolled in 2013.

# HYPOTHESIS

- Does participating in an external quality assurance program improve laboratory performance.
- An evaluation of the performance of laboratories participating in the National Proficiency Testing Scheme (NPTS) in Nigeria from between April 2011 and February 2013 was conducted to determine if participation of laboratories improved laboratory performance.

# MATERIALS AND METHODS

- Proficiency testing materials were procured from accredited PT providers. Immune monitoring panels were received from the National Health Laboratory Service (NHLS) in South Africa while the HIV Serology panels were received from Thistle QA South Africa.

- The NPTS HIV serology panels were distributed monthly while CD4 Immune monitoring panels were distributed once every 2 months.

- For immune monitoring CD4 panels, 2 stabilized blood samples were distributed per trial while 1 serum/plasma sample was distributed per HIV serology round.

# MATERIALS AND METHODS

- PT result performance evaluation of proficiency test results was conducted by the PT panel providers using established provider method.

- **Thistle:** For the HIV Serology PT program, the consensus value method was used; with consensus sited as 80% agreement for results submitted by participating laboratories. Acceptable performance was by agreement with the consensus.

- **NHLS:** The immune monitoring CD4 PT program also used the consensus value method. A standard deviation index which indicated the degree of deviation from the consensus mean was calculated for each participating laboratory. Acceptable performance was within +/-2SD.

# MATERIALS AND METHODS

- Effectiveness was assessed by outlier percentage per parameter per trial conducted between April 2011 and February 2013. The percentage outlier was assessed per parameter.

- CD4 immune monitoring proficiency testing correlation trend for percentage outliers and linear regression values through all trials was determined.

- Statistical analysis was carried out using SPSS 18.0; level of significance at $P < 0.05$ and a 95% CI.

- Effectiveness of participation in the HIV serology PT Scheme was assessed based on acceptable performance and compliance with the national testing algorithm.

# RESULTS: PERCENTAGE OF LABORATORIES WITH OUTLIER RESULTS REPORTED ON CD4 PT PANELS

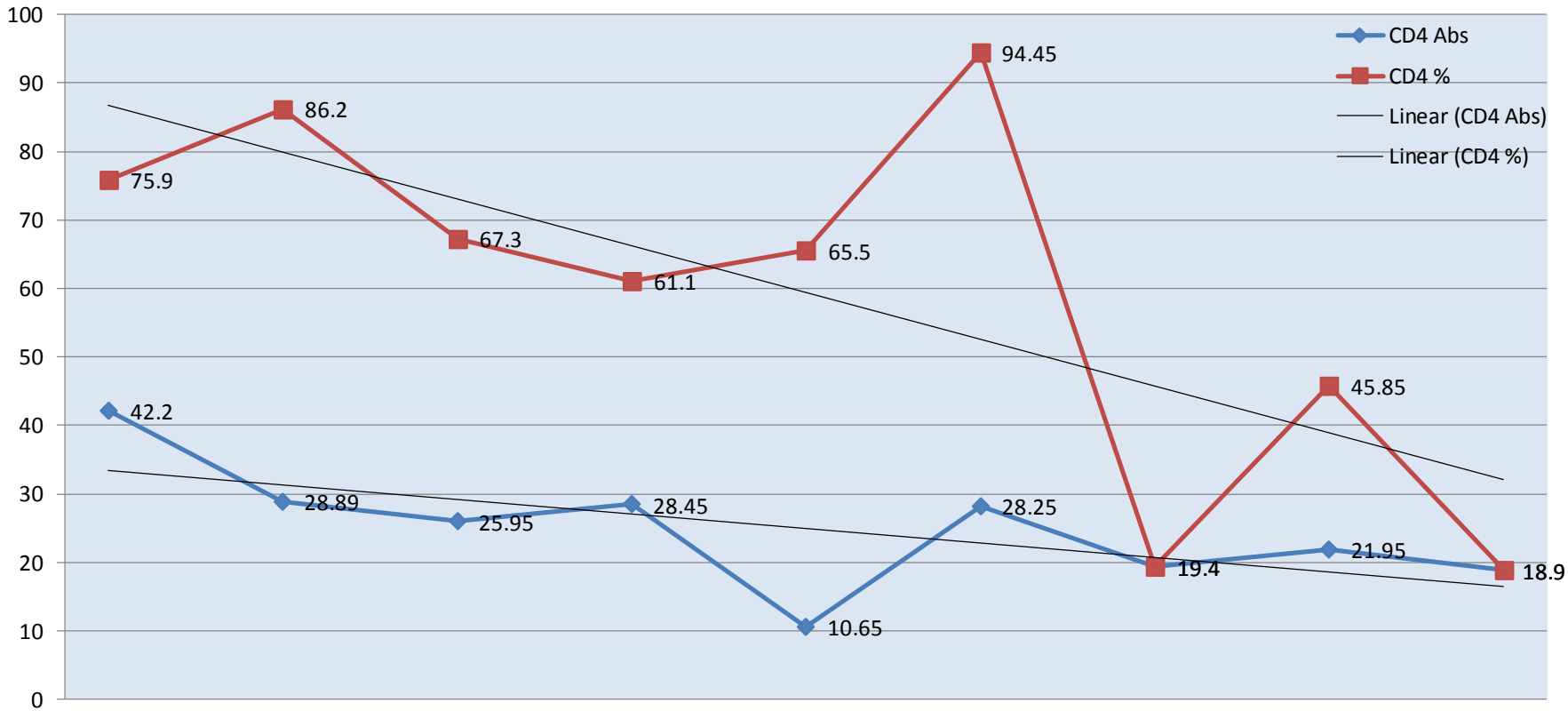
**Percentage Outlier Decline for CD4:** For the CD4 Absolute Count, a declining outlier percentage from Trial 7 (42.2%) through to Trial 18 (14.6%) was noted with a correlation value of -0.460 and a statistically significant regression value of 0.410 (P=0.025) was observed.

# **RESULTS:** PERCENTAGE OUTLIER PER IMMUNE MONITORING CD4 TRIAL

| | Trials | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Parameters | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| CD4% | 75.9 | 86.2 | 67.3 | 61.1 | 65.5 | 94.45 | 19.4 | 45.85 | 18.9 |
| CD4 Absolute | 42.2 | 28.85 | 25.95 | 28.45 | 10.65 | 28.25 | 19.4 | 21.95 | 18.9 |

CD4 Absolute Count – r= -0.46, R2=0.41 (P= 0.025)

# RESULTS: PERCENTAGE OF LABORATORIES WITH OUTLIER RESULTS REPORTED ON CD4 PT PANELS



# RESULTS: HIV SEROLOGY

- Recorded improvement with each subsequent cycle with accuracy of up to 99.5%.
- Increase in cumulative percentage of participating labs complying with the national testing algorithm per cycle.
- This progressively increased from 62.2% of laboratories complying in the first cycle to eventually: 80.6%, 84.3% and 95.1 % for the last 3 cycles 37, 38 and 39.

# RESULTS: HIV SEROLOGY

| 2011- 2013 | | | |
|---|---|---|---|
| 1st Cycle | Cycle 37 | Cycle 38 | Cycle 39 |
| 62.2 | 80.6% | 84.3% | 95.1% |

# DISCUSSIONS

## HIV Serology

- Majority participating labs persistently recorded improvement with each subsequent cycle with accuracy of up to 99.5%.

- Progressive increase in adherence to the national HIV testing algorithm, from 62.2% to 95.1% was achieved through the PT program.
  - adherence to and non-compliance to the national HIV testing algorithm was a key quality factor observed through the NPTS program and must be addressed through QA.

## CD4 Count Enumeration

- Participating in a CD4 PT scheme reduced the percentage of absolute CD4 count outliers thus improving the accuracy CD4 absolute counts in laboratories.

# CONCLUSION

- Enrolment and participation of laboratories in PT schemes potentially improves the quality of laboratory services.
- Improvement in performance in CD4 and HIV serology proficiency testing by participating labs in Nigeria suggests that the quality of routine testing of CD4 immune monitoring and HIV serology performed by these laboratories has improved as well, with positive implications for patient care.
- Implementing National PT schemes creates awareness and additional capacity building avenues to improve the quality of test results and patient care

## RECOMMENDATIONS

- We recommend that all national laboratories be enrolled in PT schemes for all parameters to improve the quality of laboratory services and ultimately patient care.

# THANK YOU