

Benefits of Routine HIV Screening of Sick Children in Nigeria

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The findings and conclusions in this posters are the authors and do not necessarily represent the views of the Centers for Diseases Control and Prevention

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Background

- In Nigeria, routine screening of children for HIV exposure and infection in health care settings is not standard of care.
- HIV prevalence in Nigeria is low (4%) compared to other African settings. Thus, the benefit of routine HIV testing in settings other than antenatal clinics with PMTCT services is unclear.
- Multiple studies have shown that if HIV-infected children are not identified early and enrolled into treatment programs, there is a 50% mortality rate by age two.
- In March 2007, Nigeria instituted an early infant diagnostic (EID) testing program, wherein, eligible infants* in various clinical settings were screened and tested with DNA Polymerase Chain Reaction (PCR), to determine their HIV status and to refer infected infants to care and treatment programs.

*Eligible Infants were (a) Known HIV-exposed i.e. born to known HIV-positive mothers and, (b) Unknown HIV-exposed i.e. infants whose mothers status is unknown, most present with signs and symptoms of HIV



Objectives

- In the context of Nigeria's EID program, we sought to:
 - Evaluate the importance of routine screening of sick infants for HIV in health care settings in Nigeria.
 - Identify factors associated with HIV infection among infants tested as part of the EID program.

Methods

- Between March - December, 2007, the EID program was instituted at 6 health facilities in Lagos, Nigeria, as part of a demonstration phase.
- Dried Blood Spot (DBS) samples collected from infants were shipped by courier service or a hospital vehicle to a centralized lab for HIV PCR testing.



- All samples testing positive and 10% of the negatives were sent to a 2nd lab for retesting as part of a quality control/ quality assurance procedure.


Map of Clinical Sites & Labs

Six clinical sites in Lagos State

- Isolo General Hospital (IGH)
- Lagos Island Maternity Hosp. (LIMH)
- Lagos State Univ. Teaching Hospital (LASUTH)
- Massey Street Children's Hospital (MSCH)
- National Institute of Medical Research (NIMR) Hospital
- Surulere General Hospital (SGH)

Two Labs (Lagos & Plateau State)

- NIMR Lab, Lagos State
- PLASVEREC Lab, Plateau State (2° lab for QA, Q/C)

Lab = 

Health Facility = 



Methods

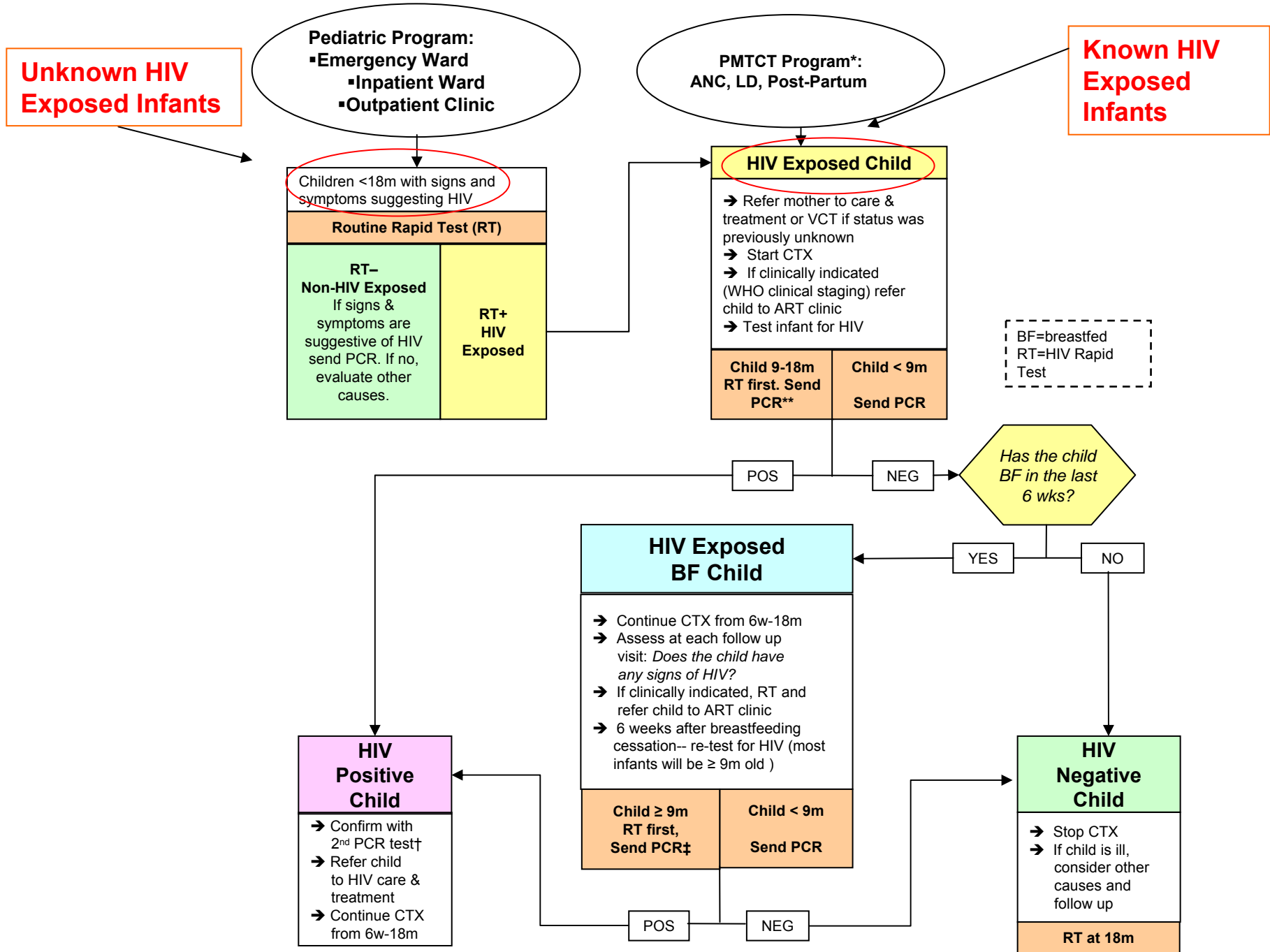
Enrolled infants were between 6 weeks-18 months and included:

- **Known HIV-exposed infants:** Well or sick infants known as HIV exposed from PMTCT programs or other settings referred for PCR testing.
- **Unknown HIV-exposed infants:** Sick infants with signs and symptoms of HIV or infants whose mother's status was unknown. These infants were screened with rapid antibody tests and, if found positive (i.e. HIV-exposed), they were tested by PCR to confirm the diagnosis.

Key data collected using a standardized demonstration form included:

- Where the child was seen
- Reason for the visit
- Clinical signs and symptoms of HIV
- PMTCT interventions received

National EID Algorithm



Results

HIV PCR Results by Facility

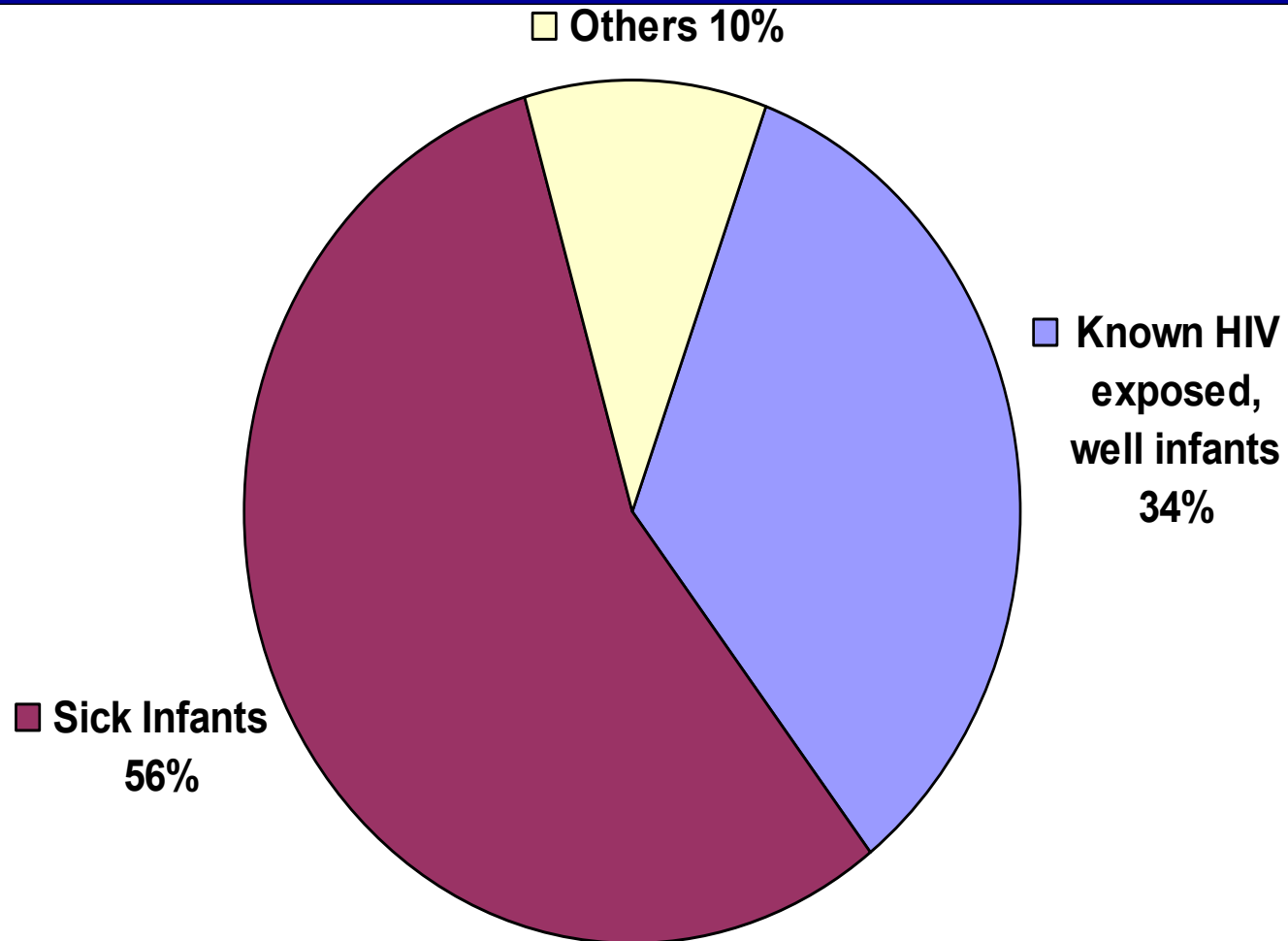
Facility Name	HIV Tested Total No.	Neg. PCR	Pos. PCR
		No. (%)	No. (%)
LIMH	123	115 (94)	8 (6)
NIMR	161	141 (86)	20 (14)
IGH	41	35 (85)	6 (15)
SGH	16	12 (75)	4 (25)
MSCH	166	108 (65)	58 (35)
LASUTH	95	61 (64)	34 (36)
Total	602*	472 (77)	130 (21)

* The actual total was 610 but 8 infants' test results were excluded because they returned as indeterminate and are being investigated.

HIV PCR Results Stratified by Knowledge of Exposure & Clinical Setting

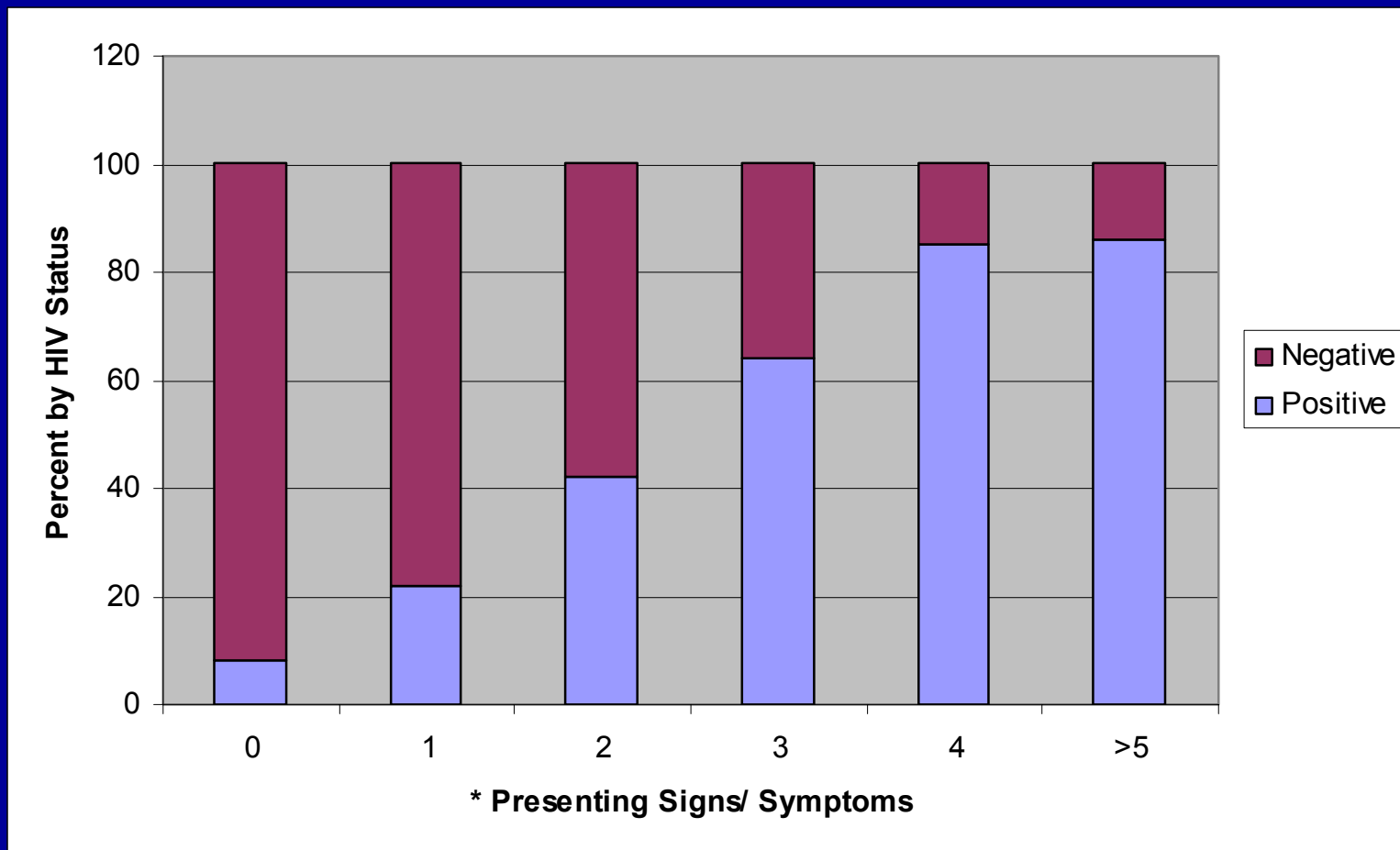
Known HIV Exposed Infants From	Total No.	Positive	Negative
		No. %	No. %
PMTCT program	370	41 (11)	329 (89)
Immunization clinic	35	3 (9)	32 (92)
Sick, inpatient and Outpatient	49	14 (29)	35 (71)
Other clinical settings	38	3 (8)	35 (92)
Total	492	61 (12)	431(88)
Unknown HIV Exposed Infants From			
Sick, inpatient and outpatient	80	54 (68)	26 (32)
Sick, immunization clinic	8	5 (63)	3 (37)
Other clinical settings	22	10 (45)	12 (55)
Total	110	69 (63)	41 (37)
Grand Total	602	130	472

Distribution of HIV Infection by Reason For Test



- 56% of the infected infants received HIV testing because they were sick

HIV Status by Presenting Signs/ Symptoms



*Signs and symptoms included: poor growth, cough/pneumonia, fever, skin rash, oral thrush, diarrhea/ vomiting, others

Factors Associated with HIV Infection

Factors	Total No.	Positive No. (%)	RR	P-Value
Age				
< 9 months	472	79 (16)	Ref	<0.001
> 9 months	130	51 (40)	2.3 (1.8-3.1)	
Reasons for test				
Well Infant from PMTCT Program	370	41 (11)	Ref	<0.001
Immunization visit	43	8 (16)	1.6 (0.7-3.2)	
Others	60	13 (21)	1.8 (1.0-3.2)	
All sick Infants	129	67 (52)	3.4 (2.4-4.9)	
Facility				
LIMH	123	8 (7)	Ref	<0.001
IGH	41	6 (12)	2.1 (0.8-5.7)	
NIMR	161	20 (14)	1.5 (0.7-3.2)	
SUGH	16	4 (25)	3.2 (1.1-9.8)	
MSCH	166	58 (34)	4.1 (2.0-8.5)	
LASUTH	95	34 (35)	4.2 (2.1-8.9)	
Signs / symptoms				
No	335	26 (8)	Ref	<0.001
Yes	267	104 (39)		
1-2	204	54 (26)	3.5 (2.2-5.4)	
≥ 3	63	50 (79)	9.9 (6.6-14.6)	

Summary

Infants who tested HIV-positive were more likely to be:

- Aged > 9 months.
- Presenting as sick infants compared with infants referred from PMTCT programs specifically for the HIV test.
- Presenting with at least one or more signs and / or symptoms of HIV.
- From facilities that instituted routine testing of sick children.

Clinical Follow-up:

- Over 90% of all infants identified for PCR testing were placed on cotrimoxazole by the time of DBS collection.
- About 50% of the infected infants have now been enrolled into treatment and care.
- The remaining are being followed up or expected to return for their test result.

Conclusions & Recommendations

- We found higher rates of HIV infection among sick infants presenting with signs/ symptoms of HIV who were not necessarily seeking follow-up PMTCT services.
- Nearly 50% of HIV-infected children were from one health facility (MSCH) which offers routine HIV testing to all sick children.
- Even in relatively low prevalence settings, sick children with symptoms consistent with HIV should have diagnostic HIV testing.
- A policy of routinely offering HIV screening to determine HIV exposure and subsequent HIV PCR testing for all sick children is an effective means of identifying children who would benefit from on-going:
 - Follow-up and interventions including cotrimoxazole prophylaxis, infant feeding support and ARV treatment and care
- However, efforts should be made to ensure that all HIV exposed infants are referred early for PCR testing before they become sick.

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