Good immune restitution but unsatisfactory viral suppression in children on ART in a remote Western Kenyan area

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Context

In 2007, 33.2 million persons with HIV-AIDS

=> 2.5 million (7.5%) children aged under 15 years

=> 90% in Sub-Saharan Africa

Only 10% of children in need receiving ART (UNICEF)

Need of simplification of ART f/u in areas with limited laboratory facilities (WHO, 2006)

Few data on long term outcomes in children followed on ART in a simplified manner

ART program of MSF-F in Homa-Bay

Homa-Bay district
- 350,000 inhabitants
- 35% of HIV prevalence in district hospital

(Oyieke 2002,Int Conf AIDS 2002)

Prescription of ART

- Every day, in **Homa-Bay district hospital**
- Once per week **in mobile clinics located in 3 peripheral HC**

From 2001 to 28 March 2007,
- 5138 patients had initiated ART
- 3755 patients still followed on ART

Strategy of care for children on ART in Homa-Bay (1)

1. **Criteria for initiating ART**
   - ➢ WHO stage 3 or 4 and/or according to age specific CD4 cut-off:
   - 2001 criteria: 20% (0-17 months), 15% (18-59 months), 200 cells/mm^3 (> 5 years)
   - 2006 criteria: 25% (0-11 months), 20% (12-35 months), 15% (36-59 months), 200 cells/mm^3 (> 5 years)
2. **First line regimens recommended by WHO**
3. **Fixed Dose Combination** (FDC) were prescribed whenever possible:
   - >25kg : Adult Triviro tablet
   - 10-25kg : Half adult Triviro tablet
   - < 10kg : Syrup formulation

Strategy of care for children on ART in Homa-Bay (2)

4. **Clinic attendance** :
   - Consultation once per month during the first 6 months
   - Consultation every 2-3 months when stabilized on ART
5. **Adherence support:**
   - Designation of a caregiver
   - Counseling sessions pre-ART initiation (minimum 2)
   - Adherence sessions after ART initiation (4 in the first 6m, then every 6m)
   - Other sessions when needed
6. **Biological monitoring:** CD4 count every 12 months
7. **Daily cotrimoxazole prophylaxis**
8. **Nutritional support for acute malnutrition**

Objectives

Main objective :

To assess the long-term outcomes in children followed in a remote sub-Saharan area

Specific objectives :

To describe the outcomes at 24 and 36 months on ART in children followed in Homa-Bay program in terms of :

- Survival
- Immuno-restitution
- Viral failure

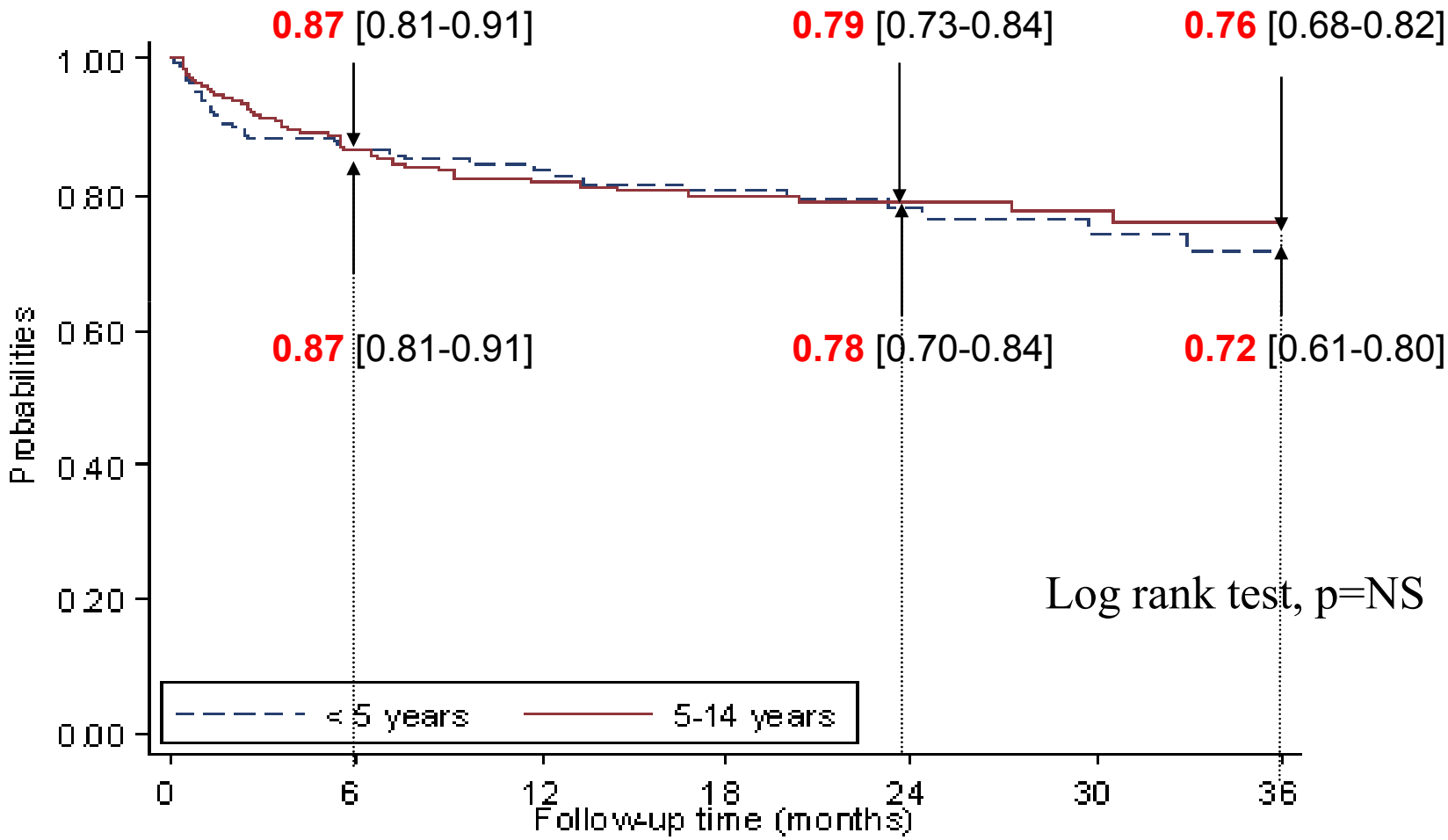
Methods (1)- Retrospective analysis

- *Recall period:* 19 Dec 2001- 28 Mar 2007
- *Target population :* All children under 15 years starting ART in the Homa-Bay program
- Data collected in the Fuchia software (Epicentre, Paris, France)
- Probabilities of remaining in care: death and loss to follow-up as combined endpoint

Results – Retrospective analysis
Baseline characteristics of children on ART

Population		**432 children**	
Age :	< 5 years	204	(47%)
	5-14 years	228	(53%)
WHO	**Stage 3**:	173	(40%)
	Stage 4:	89	(21%)
ART regimen at initiation			
d4T-3TC-NVP		**213**	**(49%)**
AZT-3TC-NVP		**120**	**(28%)**
d4T-3TC-EFV		71	(16%)
Other		28	(7%)

Results – Retrospective analysis
Probabilities of remaining in care by age group



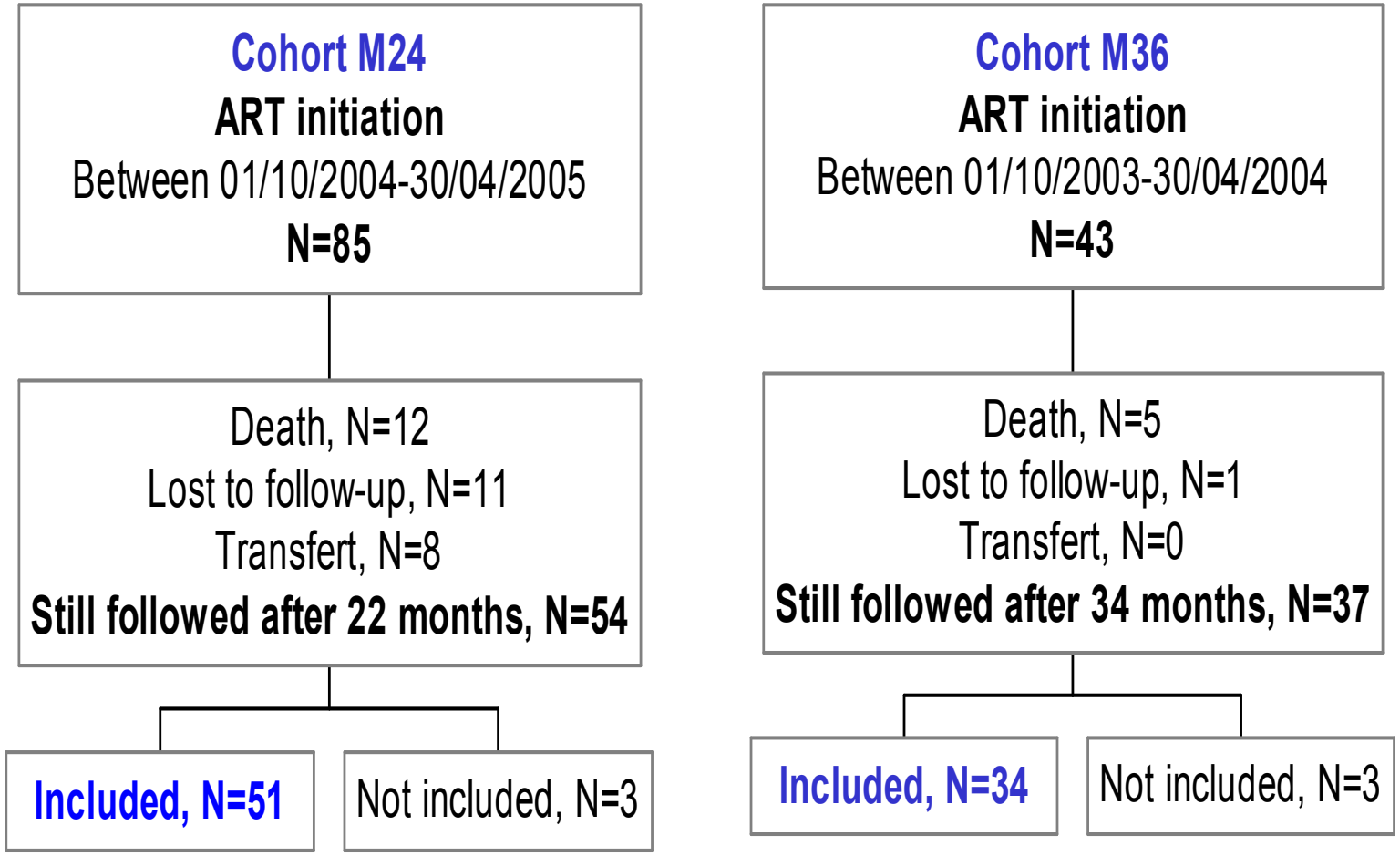
Total children N=317 N=137 N=47

Methods (2)- Second Analysis
Cross-sectional evaluation

Cross sectional evaluation of viral load at 24 and 36 months on ART

- *Study period* : 01 Oct 2006 – 30 April 2007
- *Target population :* All children under 15 years receiving ART for 24 or 36 months +/- 2 months
- Clinical and biological evaluation including HIV viral load (VL) (detection threshold: 300 copies/ml)
- Factors associated with a VL$\geq$ 10 000 copies/ml studied by logistic regression

Results – Cross-sectional evaluation
Study population

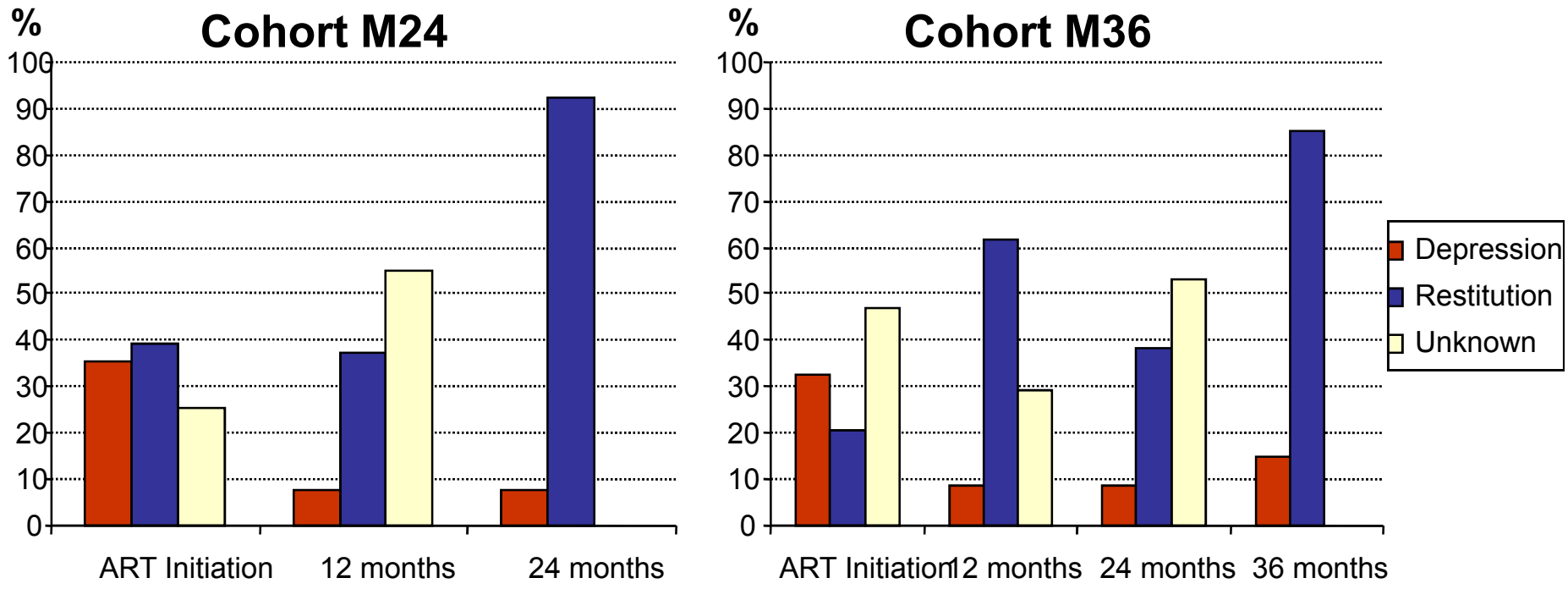


Results – Cross-sectional evaluation
Characteristics of children surveyed

	Cohort M24 n=51	Cohort M36 n=34
Median age at ART initiation [IQR]	4 years [3-4]	4 years [3-4]
Male, n (%)	26 (51.0)	17 (50.0)
d4T-3TC-NVP at initiation, n (%)	36 (70.6)	20 (58.8)
Orphans, n (%)	17 (33.3)	9 (26.5)
Compliance in last 4 days (%)	50 (98.0)	31 (91.2)

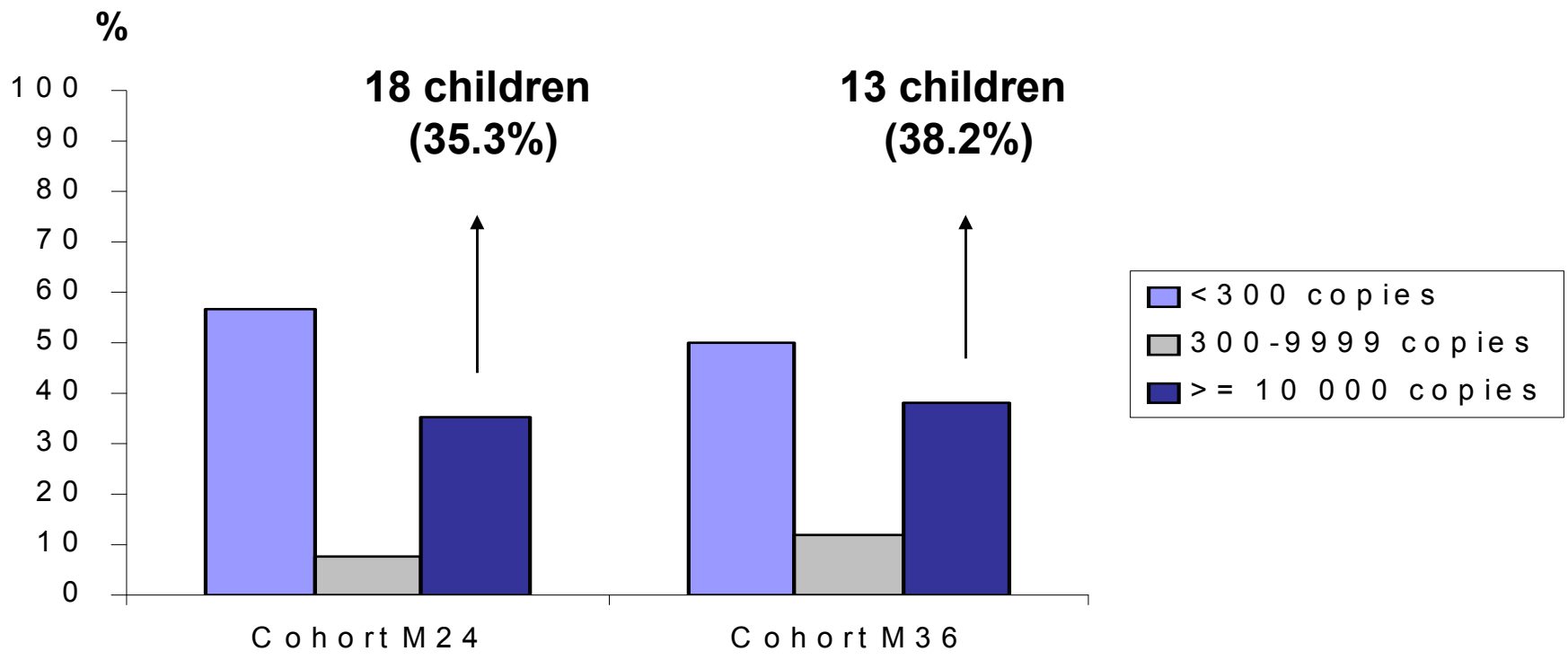
Results – Cross-sectional evaluation
Immune restitution at M24 and M36

Immuno-depression at different time on ART, by cohort



At the time of the study	M24, n=51	M36, n=34
Median CD4 count [IQR] (cells/mm3) :	992 [525-1413]	921 [604-1215]
Immuno-depression :	4 (7.8%)	3 (14.7%)

Results – Cross-sectional evaluation
Viral load at M24 and M36



Results – Cross-sectional evaluation
Associated factors to viral load > 10,000 copies

Cohorts M24 and M36 combined	VL<10 000 copies n=54	VL≥10 000 copies n=31	OR adjusted [IC95%]
Age <5 years at ART initiation	18 (33.3)	***15 (48.4)***	**3.2** [1.1-9.5]
CD4 < 700 cells/mm3	15 (27.8)	***15 (48.4)***	**4.0** [1.3-11.6]
Male	23 (42.3)	***20 (64.5)***	**2.9** [1.1-7.7]

Discussion and Conclusions

Retrospective analysis 2001-07:

1. Survival of children was similar to that reported in adults living in remote areas
2. The highest mortality was found in the first 6 months of treatment

Cross sectional analysis 24m and 36m:

1. Good immune restitution
2. Only 50% of children had an undetectable viral load
3. High viral load associated with age < 5 years at ART initiation

Discussion and Conclusions

1. It is possible to treat children well, but children-specific challenges need to be considered
2. Better context-adapted treatment and adherence strategy needed
3. Late access to the clinic for young children: need for better link between PMTCT/MCH programs and ART programs
4. Late diagnosis in absence of point-of-care testing: symptom based diagnosis difficult → increased morbidity and mortality
5. Pediatric formulations need to be:
   - Easy to take (FDC): adherence and under-overdosing issues
   - Easy to store (no syrups): stigmatization, adherence, practicalities

Thank you ..

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