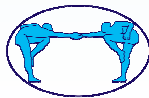


## Duration of ruptured membranes and vertical transmission of HIV: data from national surveillance in the UK and Ireland



National Study of HIV in Pregnancy and Childhood

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### Background

- Rupture of membranes (ROM) identified as risk factor for MTCT in the 1990s
  - Longer duration of ROM increased MTCT risk<sup>1,2</sup>
  - Elective CS without ROM reduced MTCT risk<sup>3</sup>
- Most studies were before HAART widely available

1. Minkoff et al. *Am J Obs Gyne* 1995; 173:585-89

2. International Perinatal HIV Group. *AIDS* 2001; 15:357-68

3. European Mode of Delivery Collaboration. *Lancet* 1999; 353:1035-37

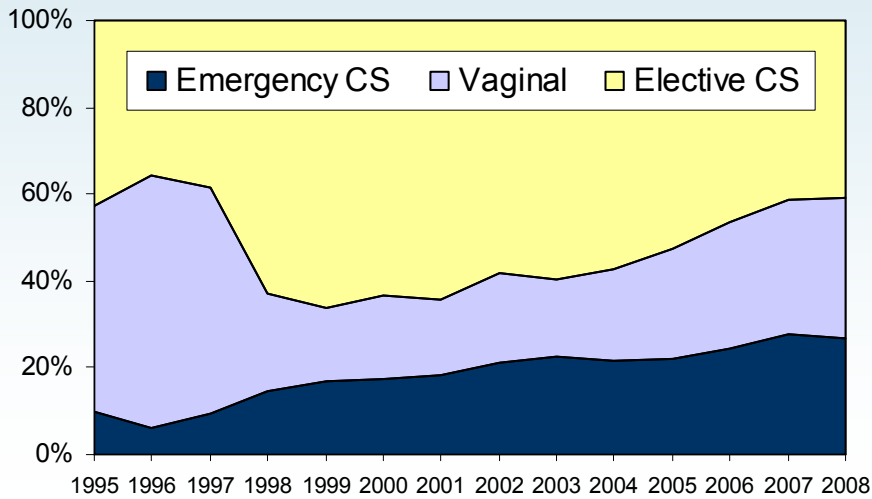
## Low rates of MTCT of HIV in the UK and Ireland, 2000-2006 Townsend *et al.* AIDS 2008;22:973-81

- Overall MTCT 1.2% (95% CI: 0.9-1.5%, 61/5151)
  - 0.8% in women with 14+ days of ART (40/4864)
- 464 women on ZDV mono with planned CS
  - No transmissions
- Minimal transmission from women on HAART delivering as planned
  - MTCT rate 0.7% (2286 women with planned CS)
  - MTCT rate 0.7% (559 women with planned VD)

## Background

- BHIVA guidelines support planned vaginal delivery for women on HAART with undetectable viral load
- Lack of evidence about relevance of duration of ROM for women on effective treatment
- Increasing proportion deliver by emergency CS
  - Obstetric factors in planned vaginal deliveries
  - Concern about duration of ROM?

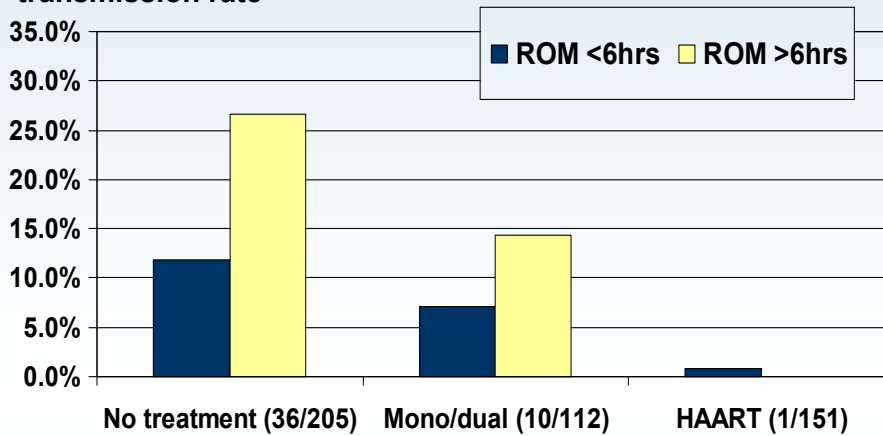
### All births to diagnosed women 1995-2008 Mode of delivery (UK and Ireland)



### ARV regimes, duration of ROM and MTCT

Data based on 489 births in one Spanish centre 1984-2006  
Garcia-Tejedor et al. Acta Obs Gyne 2009;88:882-87

transmission rate



## Aim

- To explore the association between duration of rupture of membranes and vertical transmission of HIV in the era of HAART
- Using routinely collected surveillance data from the UK and Ireland

## Methods

- **National Study of HIV in Pregnancy and Childhood (NSHPC) UK and Ireland**
  - Confidential, comprehensive, active reporting
  - Information collected includes
    - Demographic, clinical and management details
    - Data on rupture of membranes and duration collected from 2007 onwards
    - Infection status of children

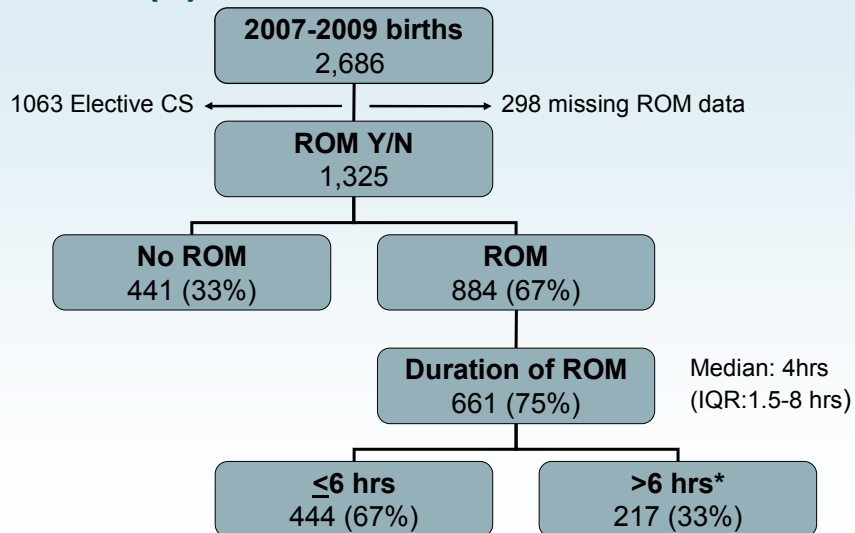
## Study population

**2,686 live singleton births reported 2007-2009**  
available for this analysis

- **Ethnic origin** 83% black African, 12% white
- **Antenatal ART** 95% HAART
- **Viral load at delivery** 74% undetectable\*
- **Mode of delivery** 40% elective CS, 34% vaginal, 26% emergency CS
- **MTCT rate** 0.9% (15/1,697)

\*<50 copies/ml

## Results (1)



\*Includes 16 mother/child pairs with ROM >48hrs

## Results (2)

### Mother-to-child-transmission

- Infection status confirmed for 421/661 infants (63.7%)
  - Reported for similar % regardless of duration of ROM
- **Overall MTCT**                    **1.4%** (6/421)
  - ROM  $\leq$  6 hrs:                    **1.4%** (4/284)
  - ROM > 6 hrs:                    **1.5%** (2/137)

**Odds ratio 1.0    95% C.I. 0.2-5.7                     $p = 1.00$**

## Results (3)

### Mother-to-child-transmission

- 253 women with **vaginal delivery**
  - ROM  $\leq$  6 hrs:                    **1.0%** (2/192)
  - ROM > 6 hrs:                    **0.0%** (0/61)                     **$p = 1.00$**
- 168 women with emergency CS
  - ROM  $\leq$  6 hrs:                    2.2% (2/92)
  - ROM > 6 hrs:                    2.6% (2/76)                     $p = 1.00$

## Results (3)

### Mother-to-child-transmission

- 253 women with **vaginal delivery**
  - ROM  $\leq$  6 hrs: **1.0%** (2/192)
  - ROM > 6 hrs: **0.0%** (0/61) ***p* = 1.00**
- 168 women with **emergency CS**
  - ROM  $\leq$  6 hrs: **2.2%** (2/92)
  - ROM > 6 hrs: **2.6%** (2/76) ***p* = 1.00**

## Results (4)

### Mother-to-child-transmission

- 341 women with **undetectable VL\***
  - ROM  $\leq$  6 hrs: **0.4%** (1/229)
  - ROM > 6 hrs: **0.0%** (0/112) ***p* = 1.00**
- 203 women with **undetectable VL\* + planned VD**
  - ROM  $\leq$  6 hrs: **0.7%** (1/151)
  - ROM > 6 hrs: **0.0%** (0/52) ***p* = 1.00**

\*<50 copies/ml close to delivery

## Results (4)

### Mother-to-child-transmission

- 341 women with **undetectable VL\***
  - ROM  $\leq$  6 hrs: **0.4%** (1/229)
  - ROM > 6 hrs: **0.0%** (0/112) ***p* = 1.00**
- 203 women with **undetectable VL\* + planned VD**
  - ROM  $\leq$  6 hrs: **0.7%** (1/151)
  - ROM > 6 hrs: **0.0%** (0/52) ***p* = 1.00**

\*<50 copies/ml close to delivery

## Results (5)

### Mother-to-child-transmission

- 62 women with **VL 50-999 copies/ml**
  - ROM  $\leq$  6 hrs: **0.0%** (0/40)
  - ROM > 6 hrs: **4.6%** (1/22) ***p* = 0.36**
- 15 women with **VL  $\geq$  1000 copies/ml**
  - ROM  $\leq$  6 hrs: **23.1%** (3/13)
  - ROM > 6 hrs: **50.0%** (1/2) ***p* = 0.45**



## Results (5)

### Mother-to-child-transmission

- 62 women with VL 50-999 copies/ml
  - ROM  $\leq$  6 hrs: 0.0% (0/40)
  - ROM  $>$  6 hrs: 4.6% (1/22)  **$p = 0.36$**
  
- 15 women with VL  $\geq$  1000 copies/ml
  - ROM  $\leq$  6 hrs: 23.1% (3/13)
  - ROM  $>$  6 hrs: 50.0% (1/2)  **$p = 0.48$**

## Results (6)

### 6 mother/child pairs

	Case 1	Case 2	Case 3	Case 4	Case 5	Case 6
ROM (hrs:mins)	3:30	4:00	4:40	5:50	6:50	12:45
Mode of delivery	EM CS	Planned vaginal	BBA vaginal	EM CS	EM CS	EM CS
Gestation	36	40	37	39	40	38
HAART start wk	17	17	32	22	21	33
Maternal VL (copies/ml)*	48,230	<40	23,460	71,500	122,040	330
Infant age at 1st positive PCR	Day 1	16 wks	Day 1	6 wks	Day 4	Day 1

\*Closest to delivery

Likely *in utero* transmissions

## Summary

- No evidence of increased MTCT risk with longer duration of ROM, but limited data
- Need to continue to collect comprehensive data on
  - Mode of delivery
  - ROM and duration of ROM
  - Viral load close to delivery
- Plan to update this analysis with later 2009 births and infection status reports

## Acknowledgments

- All NSHPC respondents
- NSHPC team and steering group
- Royal College of Obstetricians and Gynaecologists
- British Paediatric Surveillance Unit
- Ethics approval MREC/04/2/009
- Funding The NSHPC receives core funding from the Health Protection Agency

*Any views expressed are those of the authors and not necessarily those of the HPA*

- Further information available at [www.nshpc.ich.ucl.ac.uk](http://www.nshpc.ich.ucl.ac.uk)

## Results (for 4 hr cut off)

- **MTCT rate by duration of ROM with 4 hr cut off**
- **Overall MTCT** 1.4% (6/421)
  - ROM  $\leq$  4 hrs: 0.9% (2/227)
  - ROM > 4 hrs: 2.1% (4/194)

**Odds ratio 2.4 95% C.I. 0.4-13.1  $p = 0.31$**

- Infection status reported for ~63% in all groups, regardless of duration of ROM