

# Epidemiology of Pediatric HIV in India

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# Overview

- Timeline of the Indian HIV Epidemic
- Scope of the Indian HIV Epidemic
- Molecular Epidemiology of Pediatric HIV
- Modes of HIV Transmission
- HIV Antenatal Statistics
- Clinical Manifestations
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- Acknowledgements
- References

# Timeline of the Indian HIV Epidemic

- 1986 First case of HIV patient in Chennai <sup>2</sup>
- 1987 First case of AIDS in infant <sup>8</sup>
- 1993 Mandatory blood screening <sup>12</sup>
- 1994 Introduction of PMTCT: long course AZT <sup>7</sup>
- 1998 Introduction of PMTCT: short course AZT <sup>7</sup>
- 1999 Introduction of PMTCT: NVP <sup>7</sup>

# Scope of the Indian HIV Epidemic

2001	Pediatric percentage of HIV epidemic	4 % <sup>7</sup>
2003	Perinatal cases	~ 30,000 <sup>7</sup>
2005	Percent of children receiving ART	4 % <sup>7</sup>
2006	AIDS cases, all ages	2283 males, 3313 females <sup>1</sup>
2006	Current % of pregnant women on ART	1.6-2.14 % <sup>2,3,7</sup>

# Molecular Epidemiology of Pediatric HIV in India

- HIV-1 Subtype C 91% Total Infections <sup>7</sup>  
(Subtype A and B reported)
- HIV-2 Unknown Prevalence

# Modes of HIV Transmission among Children in India

	Percentage
■ Vertical Transmission	82 <sup>7</sup>
■ Horizontal Transmission	
■ Sexual Behavioral	8.5 <sup>7</sup>
■ Blood Transfusion	9.5 <sup>7</sup>

# Comparisons of HIV Epidemic by Percentage of Infected Children

	INDIA	USA
Vertical Transmission	82 % <sup>7</sup>	92 % of Under age 13 <sub>10</sub>
Horizontal Transmission		
Sexual Behavior	8.5 % <sup>7</sup>	Unknown prevalence
Transfusion	9.5 % <sup>7</sup>	1 % <sup>11</sup>

# Rates of Horizontal Transmission among Children in India

Cases Percentage

## ■ Sexual Behaviors

■ Heterosexual

2

3.1<sup>12</sup>

■ Sexual Abuse

2

1.6<sup>13, 14</sup>

## ■ Medical Services

■ Dirty Needles

4

6.2<sup>12</sup>

■ Blood Transfusion

93

4.8-39.1<sup>12-21</sup>

# Comparisons of HIV Epidemic by Vertical Transmission

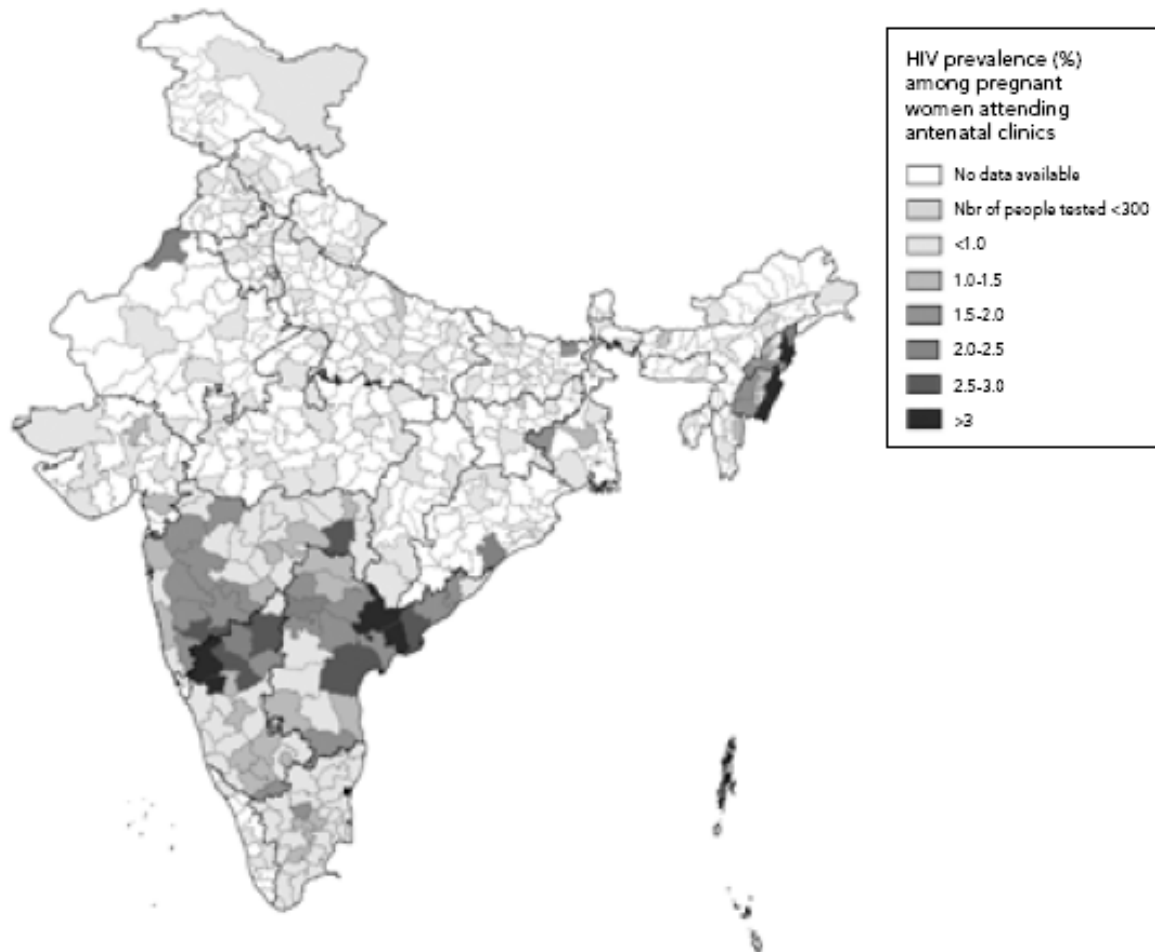
	INDIA	USA
Vertical Transmission Rate	25-30 % <sup>7</sup>	<2 % <sup>10</sup>
Percent of Women on ART	1-2 % <sup>7</sup>	Unknown prevalence

# Antenatal Statistics

- 35 states
  - 6 have HIV antenatal prevalence  $>1\%$  <sup>7</sup>
    - Rate constant for last 3 years <sup>2</sup>
    - Andhra Pradesh, Tamil Nadu, Maharashtra, Karnataka, Manipur, and Nagaland

# Antenatal HIV Prevalence

HIV prevalence in India – by district, 2005



Source: NACO. Sentinel Surveillance data, ANC Sites (2005).

# Clinical Manifestations

- Pediatric HIV  $\neq$  Adult HIV
- Children - primary infections, opportunistic (OI) and other
- Adults - reactivation infections due to waning immunity
- Overall progression more rapid
- Immune system more immature with higher CD4 counts
- Prominent effects on growth and neurodevelopment

# Clinical Manifestations

- Most infants do not have abnormal findings at birth <sup>7</sup>
- Mean age of presentation is 17 months
- 3 groups based on presentation
  - Rapid progressors (20-30%):
    - Symptoms in the first few months
    - OI and neurological manifestations
  - Intermediate progressors:
    - Symptoms after 1 year of life
    - Failure to thrive, recurrent bacterial infections, lymphocytic interstitial pneumonitis
  - Slow progressors:
    - Minor manifestations later in childhood

# Clinical Manifestations: Review of the Indian Literature

	1 <sup>22</sup>	2 <sup>17</sup>	3 <sup>24</sup>	4 <sup>16</sup>	5 <sup>13</sup>	6 <sup>15</sup>	7 <sup>25</sup>	8 <sup>26</sup>	9 <sup>19</sup>	10 <sup>12</sup>	11 <sup>20</sup>	12 <sup>27</sup>	13 <sup>21</sup>
HIV-infected cases	28		218	27	51	10	24	58	317	64	50	10	109
Symptomatic cases		237		22*	38*					30	42		91*
Fever %				95		10			22	33	50	50	74
Anemia/ pancytopenia %				86/	32/					/ 13	52/	40/	
Hepato- splenomegaly %		29				10		14	51	57		40	
Lymph- adenopathy %		24			34			14	49	33	24	30	
Failure to thrive or Malnutrition %		45		100	50				36	88	90		81
Diarrhea: chronic or recurrent %	43			46	26	60	25	7	17	21	33		51
CNS involvement %		5		14						14	19		7

# Clinical Manifestations: Review of the Indian Literature

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HIV-infected cases	28		218	27	51	10	24	58	317	64	50	10	109
Symptomatic cases		237		22*	38*					30	42		91*
TB: pulmonary or disseminated %	29	45	43	27	68	20	46	35	45	33	19	50	
Oral candidiasis %	21	15		36	37	20	54	43			2		26
PJP %		4							2		10		
Respiratory tract Infections %	21	8			26	10		26	17	26		30	

# Mortality in HIV-infected Children in India

- Non HIV-infected 8.5 % <sup>4</sup>
  - WHO estimates of Indian children < age 5 in 2006
- HIV-infected 10-34.2 % 13,17,19, 20, 22, 23
  - 5 published Indian studies 1999-2004, all ages

# Mortality Comparisons of HIV-infected Children

	INDIA	USA	WORLD-WIDE
HIV-uninfected	8.5 % <sup>4</sup> By age 5	0.8 % <sup>4</sup> By age 5	7.9 % <sup>5</sup> By age 5
HIV-infected	10-34.2 % <sup>13,17,19,20,22,23</sup> All ages	0.7 % <sup>30</sup> All ages	25-30 % <sup>7</sup> By age 1

# Summary

- Epidemiology of pediatric HIV not well defined
- Age definitions vary
- Majority of HIV infection is HIV-1, subtype C
- Majority of transmission is vertical transmission
- High mortality and morbidity

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