Polio Endgame in India: Can Social Determinants be the 'Game Changer'?

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All genetic linkages circulating in India since 2003 derived from linkages circulating in UP (mostly). MMWR (2004)

Risk factors based on logistic regression analysis of data from 1997-2005

 # Population density,

 # High prevalence of diarrhea, and

 # Low routine coverage with three doses of trivalent oral polio vaccine (tOPV)

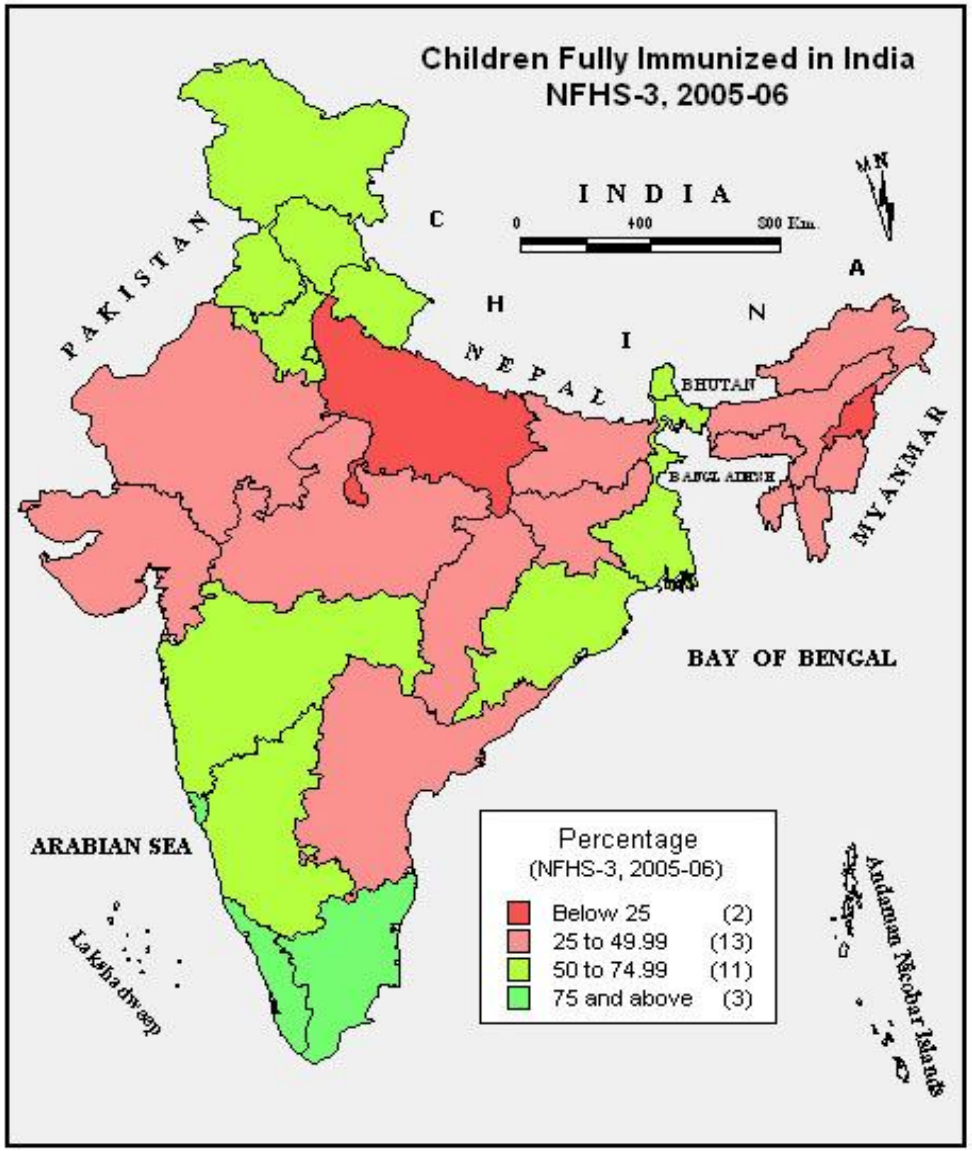
 # Invoked Sink-Source hypothesis – UP and Bihar – lacked in context and composition

***Grassly et al* (2006)**

Explanation for differences in incidence of WPV cases in eastern and western UP districts, despite similar ground conditions?

Inequities in U.I.P. Coverage

- **Decline in coverage rates –Tamil Nadu, Kerala, Delhi, Karnataka and Andhra Pradesh**
- **The Planning Commission attributed the decline as an adverse impact of the polio eradication campaign**
- **Immunization rates among Scheduled Tribes and Scheduled Castes – 26.4% and 40.2% respectively**



tOPV Efficacy (1997-2005)*

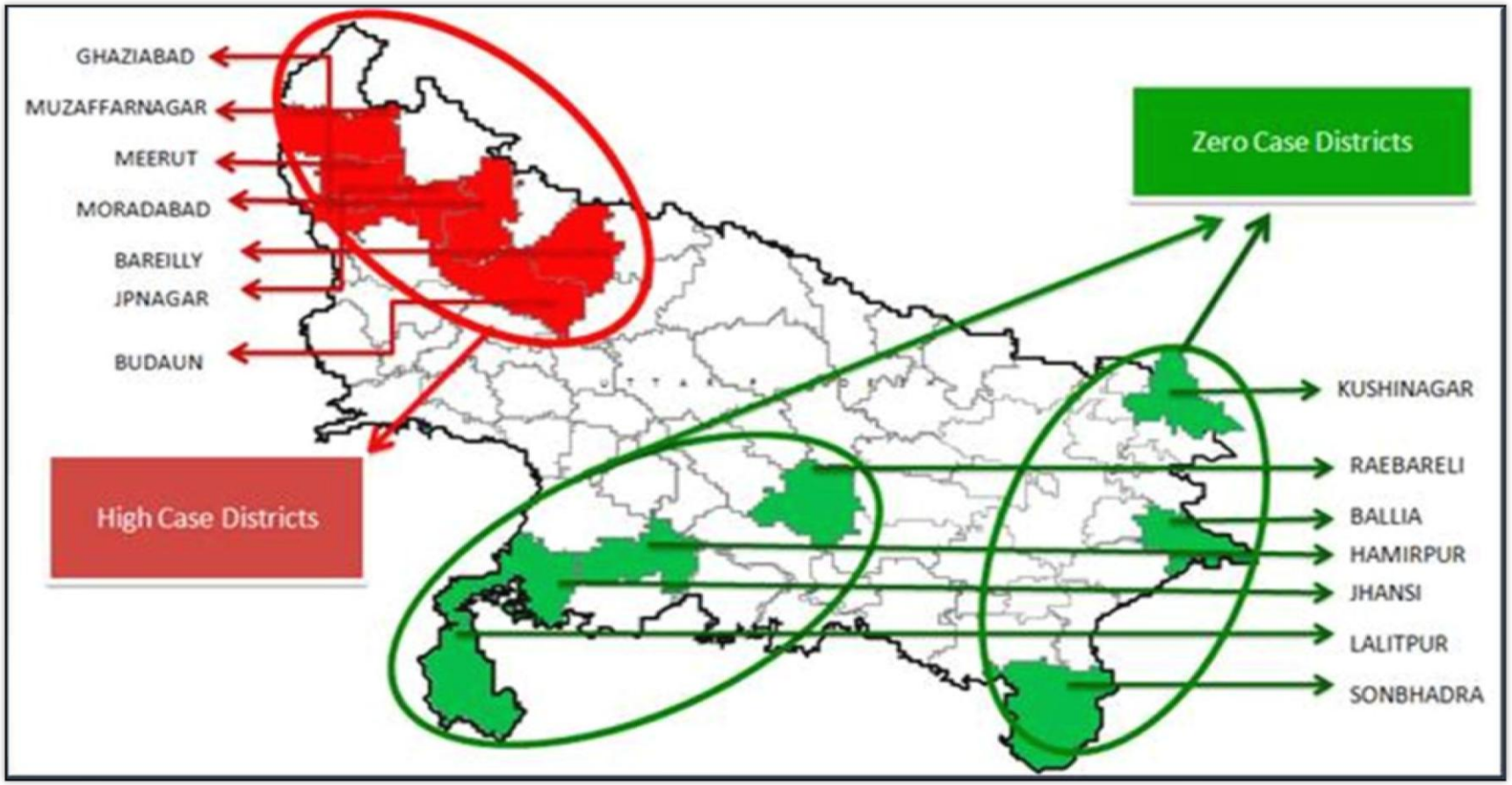
Polio Virus	Regression	Location	Cases	Matches	Vaccine efficiency (%) (95%CI)
Type I	Model 1	All India	4421	1627	13 (10-16)
	Model 2	Rest of India	1512	361	21 (15-27)
		Bihar	387	158	18 (9-26)
		Uttar Pradesh	2522	1108	9 (6-13)@
Type 3	Model 1	All India	1204	474	13 (7-18)
	Model 2	Rest of India	221	79	21 (8-33)
		Bihar	136	53	22 (4-36)
		Uttar Pradesh	847	342	9 (3-15)

@Significant different from rest of India, P<0.01

* Per dose protective efficacy of vaccine estimated from the REPORTED number of OPV doses received by Polio AFP cases and non-polio AFP cases

Source: Grassly NC, Fraser C, Wenger J, Deshpande JM, Sutter RW, Heymann DL, et al., et al. New strategies for the elimination of polio from India. *Science* 2006; 314: 1150-3 doi: 10.1126/science.1130388 pmid: 17110580.

Study Districts



Variables:

- Socio-demographic characteristics
- Infrastructure
- Health services
- NRHM communitization processes
- Supplementary Immunization Activities
- Cold Chain capacities
- Program indicators

Data sources:

- District Level Household Survey (DLHS3)
- National Polio Surveillance Project (NPSP)
- Government of India Census (GOI- Census 2001)
- International Institute for Population Sciences
- Jansankhya Sthirata Kosh (National Population Stabilization Fund)
- Immunization and Vaccine Development (IVD) Unit, SEARO, WHO

Possible explanations for differences among eastern and western UP districts

Vaccine efficacy
- Unlikely to be a factor

No differences in cold chain infrastructure and performance

Socio-demographic , poverty and infrastructure indictors better in western UP

Immunization delivery, communitization process better in eastern UP

Urbanization rates and proportion of Muslim populations higher in western UP

Persistent failure to vaccinate
- Community resistance
- Reaching hard to reach sub-populations.

Social Determinants of Program Implementation

- Overall robust coverage at district level – a false sense of security
  - Less visible clusters of unimmunized children
  - Such clusters, however minuscule, sustain circulation of WPV
- High urbanization rates with relatively poor development indicators imply large populations of urban poor
  - poor marginalized communities in peri-urban slums
- Moradabad District – largest Muslim population in UP, 5th largest in the country

Children not Receiving OPV During SIA

- 'Missed'
  - Children accompanying parents to their workplace, mostly agricultural fields
  - Complacent : waiting someone to come home and deliver
  - Visiting relatives and social functions
  - Adverse past experience
- 'Reluctant' -- due to (acute and chronic) illness and the newborns
- 'Resistant'

Source: Dasgupta R, Chaturvedi S, Dasgupta R, Adhish V, Ganguly KK, Rai S, Sushant L. Arora NK. Towards polio 'endgame': need to focus on social determinants. *Indian Pediatrics* 2009; 46: 963-74.

Circulating Rumors and Misconceptions

Negative effects of vaccine	**Vaccine used in IPPI is:** ▫ causing sterility/impotence ▫ causes shortening of penile length even in children ▫ Common symptoms in children perceived as vaccine side effects like fever, diarrhea, cough, allergy, excessive crying, pain abdomen
Undesirable constituents of the vaccine	**Vaccine used in IPPI:** ▫ contains pigs fat/meat ▫ is pink in color because of pig's blood **is prohibited (*Haraam*) for Muslims**
Conspiracy/ Community under siege	▫ Different vaccines are being used for Muslim populations ▫ Muslims are being specifically targeted through an International (read American) conspiracy ▫ Vaccines have been manufactured by the enemy (Jews), and the US machinery is using them to finish Muslims
***Haj* vaccination policy**	▫ Saudi Govt. is interested in getting the <u>adults</u> vaccinated. Why the international authorities are specifically targeting our <u>children</u>?
Suspicion and cynicism	▫ Generally no one cares for us. Why are they so much interested in getting our children immunized by this vaccine? ▫ Sudden and intense involvement of WHO and other international agencies speaks for itself

Source: Chaturvedi S, Dasgupta R, Adhish V, Ganguly KK, Rai S, Sushant L. Srabasti, Arora NK. Deconstructing social resistance to pulse polio campaign in two North Indian Districts. *Indian Pediatrics* 2009; 46: 963-74.

A low-profile and highly local spate of rumors starts gathering right before an NID/SIA.

Nature and content of rumors keep on changing with time and locale.

Rumors often supported by one or more of the following:

- **Locally circulating religious leaflets and magazines, often disowned by the sources**
- **Locally restricted announcements through static and mobile (rickshaw bound) public address systems**
- **Address by a religious leader after a prayer ceremony**
- **Quasi-confirmed religious edicts, often disowned by the sources**

- **Rational constituents of the society try to reach for the source**
- **Sources go out of bounds or dissociate themselves from the episode**
- **Public retraction/contradiction never available**
- **At best, the sources adopt a neutral stand**
- **By this time, the damage is already done.**

- **Despite this, majority of the families in minority areas support SIAs**
- **A significant number of parents among them, mostly from extremely marginalized sections, get decisively influenced by the rumors and continue to defeat SIAs**
- **Though miniscule at the macro level, they may be able to sustain low level of transmission of WPV.**

- **Underlying generalized lack of trust , and,suspicion**

- **Through social osmosis, these rumors reach untargeted audience as well, and some economically and socially marginalized clusters from the majority community also get influenced**
- **However in this case, seldom translate into a significant and lasting resistance to SIAs**

Source: Chaturvedi S, Dasgupta R, Adhish V, Ganguly KK, Rai S, Sushant L. Srabasti, Arora NK. Deconstructing social resistance to pulse polio campaign in two North Indian Districts. *Indian Pediatrics* 2009; 46: 963-74.

Challenges and Riddles . . .

- bOPV – the new 'game changer'? [Sutter *et al*, Lancet 2010]
  - Declines in 2000-2001 and 2003-2005 not sustained
  - "the immunogenicity of these vaccines in northern India, especially Uttar Pradesh and Bihar States, could be lower "
- 55-70% WPV cases reported from among Muslims; 13% of India's population
- Bihar's non-polio AFP rate is 33.7/100,000 and UP's 22.4; Afghanistan – 9 and Nigeria – 7
- Operational target of non-polio AFP – 2/100,000

Challenges and Riddles . . .

- 18,000+ and 13,000+ AFP cases in UP and Bihar respectively in a year with lowest WPV ever
- 47,000+ AFP cases in country till date
- Bihar and UP account for 25% of India's population, but 70% of AFP cases
- China – <4,000 cases with a non-polio AFP rate of 1.8/100,000
- Definitional issues – Eradication/Elimination? [Dowdle, 1998]
- Resurgence in Congo after 2004; nearly 100 deaths
- Central Asian outbreak; 450+ WPV1 cases

Challenges and Riddles . . .

- Reaching newborns
- Trust and confidence, clarifying doubts and misconceptions
- Reliable and responsive primary healthcare services
- Community dialogue; complementary to social mobilization
    - SMNet – Gains; converting the converted?
- Peri-urban services
- Community fatigue and implementation fatigue
- Patterns of social resistance
    - Other states/contexts
    - Other programs

Challenges and Riddles . . .

- 'Why only polio?'
- Systematic social / cultural resistance
- Coercion and 'incentives'
- Muslim celebrities
- Engaging with 'otherness'
    - Making micro-planning meaningful
- Introducing IPV
- Dismal access to safe drinking water