

An outbreak of Hepatitis caused by contaminated Tamarind water served in a mobile food kiosk in an affluent urban school of Mayurbhanj, Orissa, India, September 2010

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# Hepatitis outbreak: India and Orissa

- Public health problem in India
  - Large outbreaks, 2.2 million cases annually
- Orissa, Eastern India, 2010
  - 8 outbreaks: 456 cases, 3 deaths (IDSP 2010)
- Mayurbhanj, Orissa
  - 1 outbreak reported 2004 (538 cases, 5 deaths)
  - 342 cases in 2010
  - Mostly due to contaminated water

# Hepatitis outbreak in a school

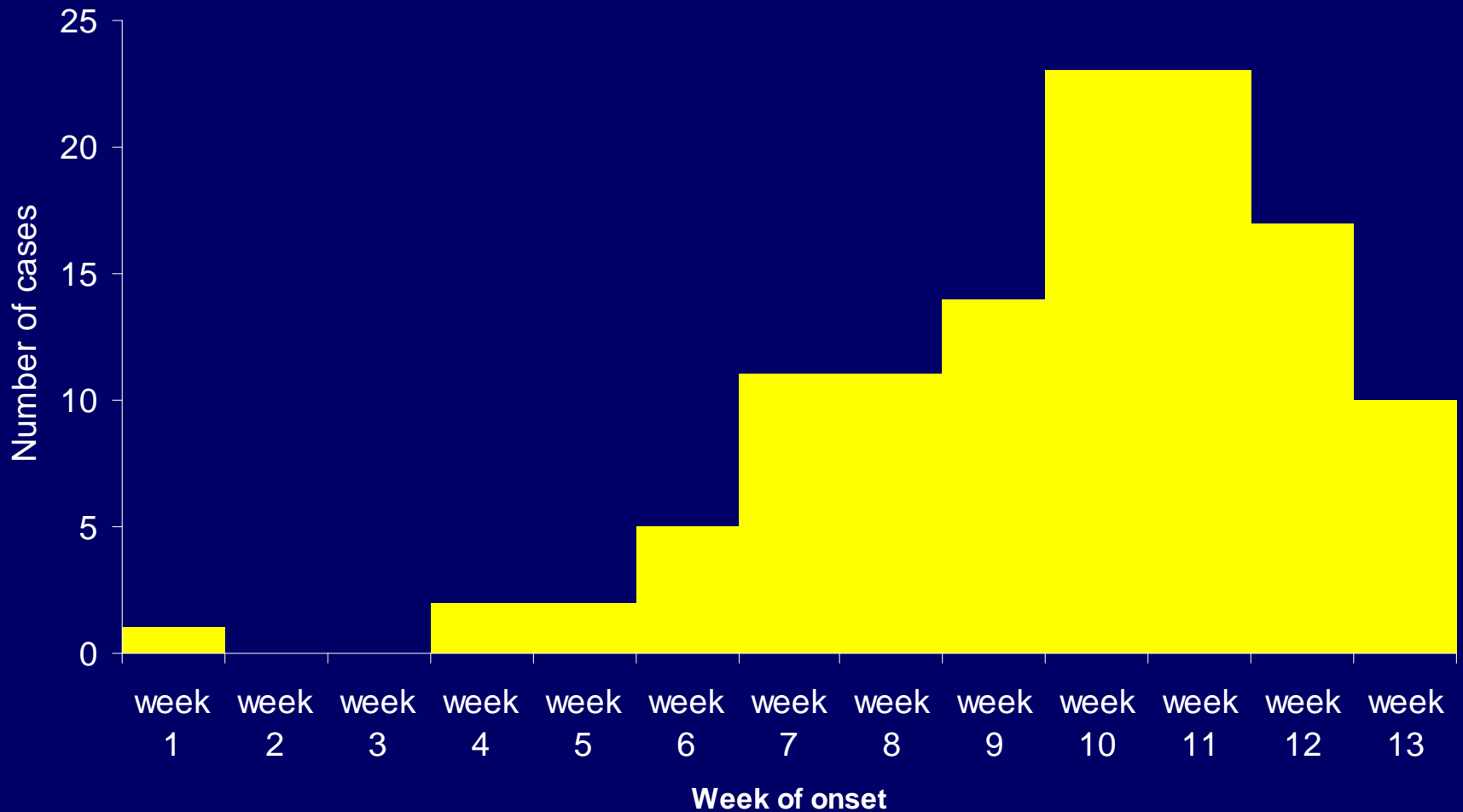
## Baripada, Orissa, Eastern India, 2010

- 14 September 2010
  - Private practitioner reported treating a cluster of school students suffering from jaundice
  - Parents complained about school authorities
- 15 September 2010
  - Started outbreak investigation
- Objectives
  - Identify the agent and source
  - Propose control measures

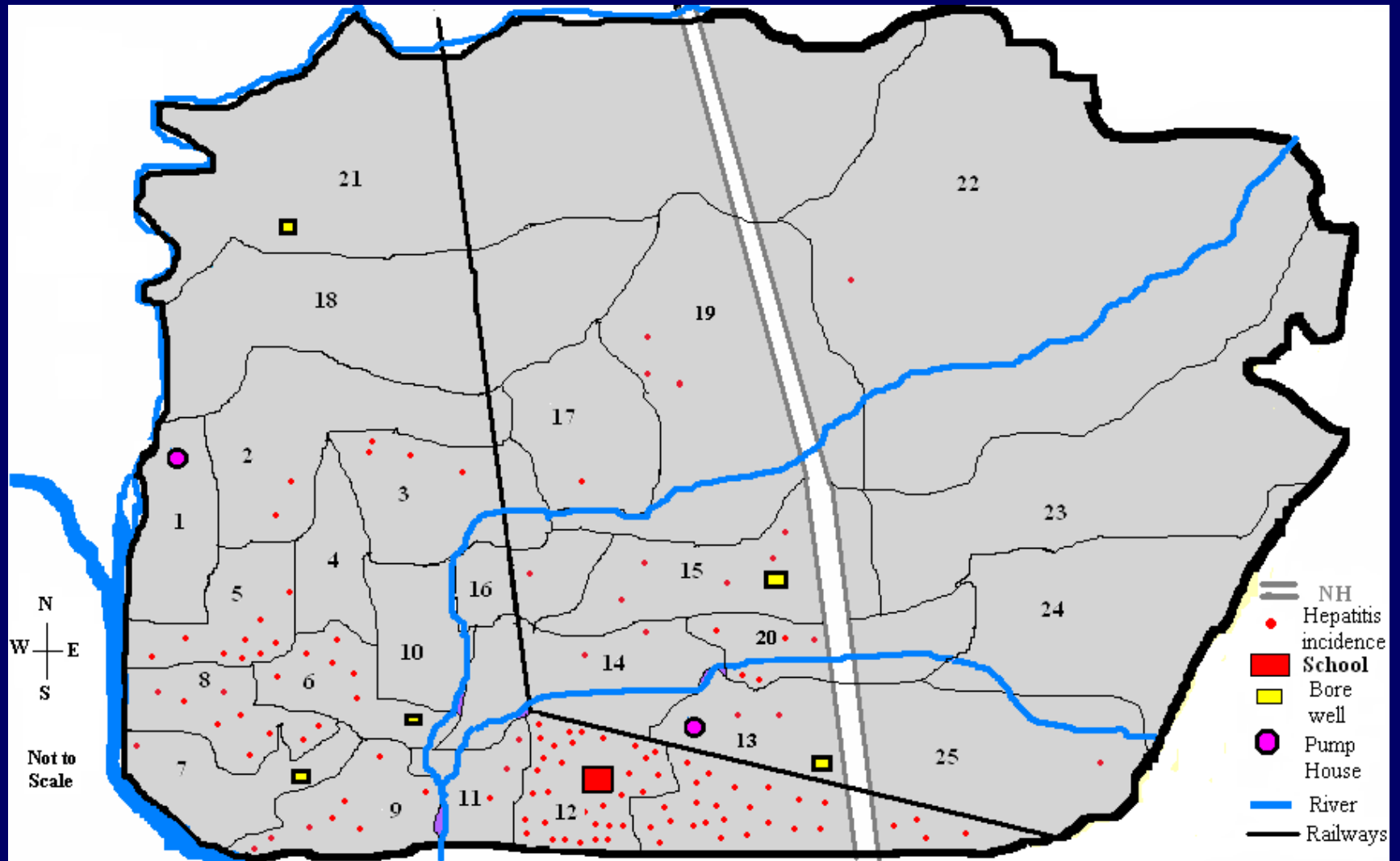
# Initial investigations, outbreak of Hepatitis, Baripada, Orissa, Eastern India, 2010

- Review of district surveillance data and clinical profile
- Interview patients, parents, school teachers
- Actively searched for cases in school and neighborhoods
  - Occurrence of loss of appetite and yellow coloration of conjunctiva or colored urine since 20 July 2010 among anyone in the School
- Collected blood specimen for anti-HEV antibody
- Describe the outbreak by time, place and person

# Incidence of hepatitis by week of onset, Baripada, Orissa, Eastern India, 2010



# Spot map of hepatitis cases, Baripada, Orissa, Eastern India, 2010



# Incidence of hepatitis by age and gender, Baripada, Orissa, Eastern India, 2010

Characteristics		# Cases	Population	Attack rate per 100
Age	< 5	1	120	0.8
	5 – 10	28	620	4.5
	11 – 15	76	515	14.8
	16 – 18	6	65	9.2
	> 18	8	20	40
Gender	Male	76	724	5.7
	Female	43	616	3.2
Over all		119	1340	8.9

# Environmental investigations, Hepatitis outbreak, Baripada, Orissa, Eastern India, 2010





# Generation and testing of hypothesis, hepatitis outbreak, Baripada, Orissa, Eastern India, 2010

- Hypothesis generation from descriptive epidemiology
  - All cases from school (students / staff)
  - Clustering of cases around the school
  - Mobile food kiosks probable source
- Three of seven serum samples tested positive for HEV
- Case control study
  - 119 cases and 119 controls

# Frequency of exposure (%) among Hepatitis E cases and controls, Baripada, Orissa, Eastern India, 2010

	Cases (n=119)	Controls (n=119)	Odds ratio (95% CI)
Ate " <i>Gupchup</i> "	81	33	8.6 (4.5 -16.3)
Did not eat " <i>Gupchup</i> "	19	67	

Population attributable fraction -96%

# Limitations

- Information bias
  - Self reporting regarding the consumption of *gupchup* from the mobile food kiosk

# Conclusions

- An outbreak of hepatitis E affected the school in Baripada
- May have been caused by consumption of contaminated tamarind water

# Recommendations

- Short term
  - Close food kiosks near all schools
  - Chlorinate water sources in the municipality
  - Educate school students, teachers, food vendors
- Long term
  - Train food vendors on food hygiene
  - Supervise kiosks by sanitary inspectors

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Thank you