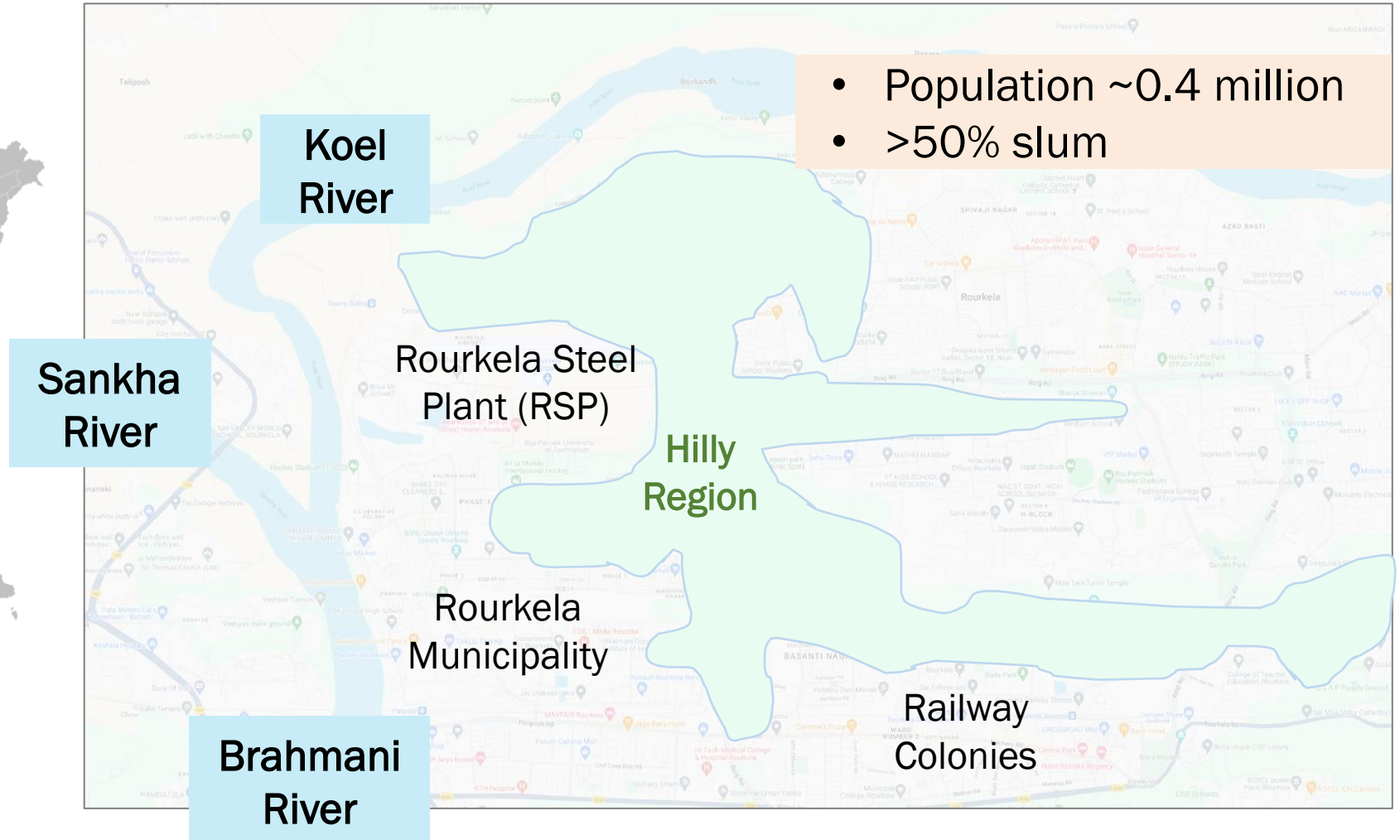
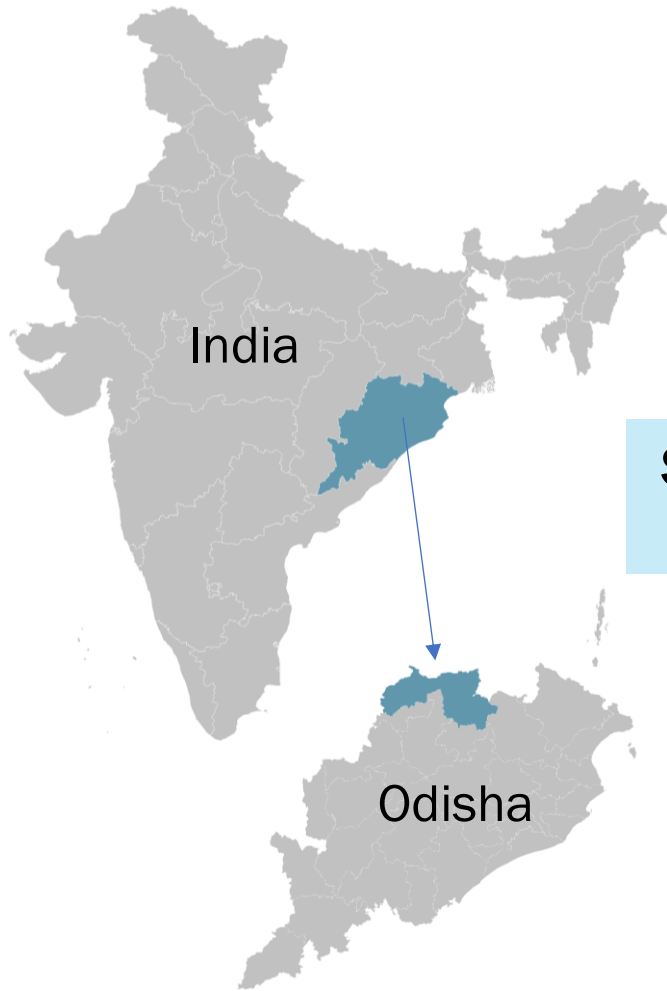




Investigation of an **Outbreak of Cholera** in Rourkela, Odisha, Dec 2023 - Jan 2024

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Advanced FETP Scholar – India FETP

Rourkela City – Third Largest City in Odisha, India



Rise in ADD* cases being reported → Positive for Cholera

ADD outbreak, Rourkela, Odisha, Dec 23 – Jan 24

08
DEC

ADD: **28 - 30 cases per day**
Usual: 8 – 10 cases per day



Confirming the existence
of the outbreak

18
DEC

Stool samples from admitted patients
18/39 = **46% samples** were
Positive for Vibrio cholerae



Confirming the
Diagnosis

22
DEC

Intake pump from the Brahmani River
Positive for Vibrio cholerae

Investigation Team
Describe the outbreak
Potential Sources & Risk Factors

Definitions & Methods

ADD outbreak, Rourkela, Odisha, Dec 23 – Jan 24



Case Definitions

Suspect: **Occurrence of ≥ 3 episodes of loose stool within 24 hours** from 1 Dec 2023 to 26 Jan 2024

Confirmed: A suspect case with **Vibrio cholerae O1 or O139 confirmed** by culture or PCR



Descriptive Epidemiology

Systematic **door-to-door case search**
Five highly affected areas
Epidemiological Curve & Spot Map
Attack rate per 1000 population (AR)



Environmental Investigation

Visit affected areas, pumping stations
Interviewed case patients & staff
Samples from Water Supply System

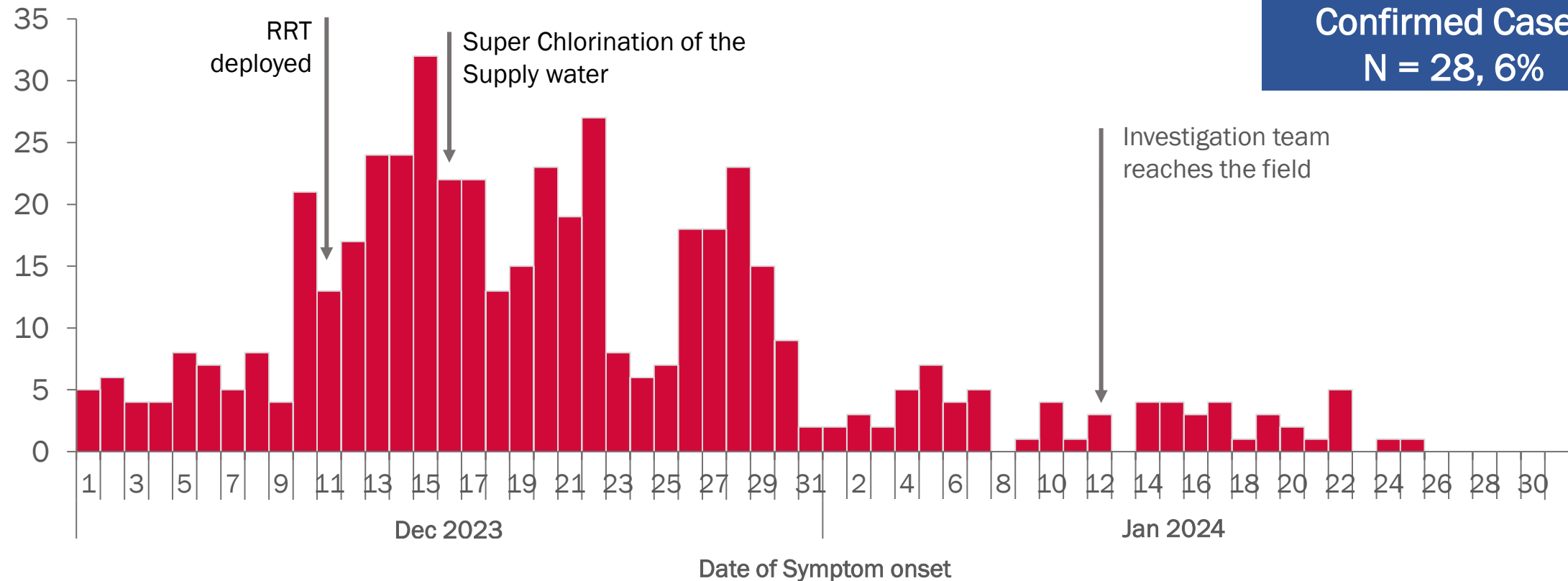
Multiple Peaks → Propagated outbreak?

Time distribution, Descriptive analysis, ADD outbreak, Rourkela, Odisha, Dec 23 – Jan 24 (N=19,679)

Cases

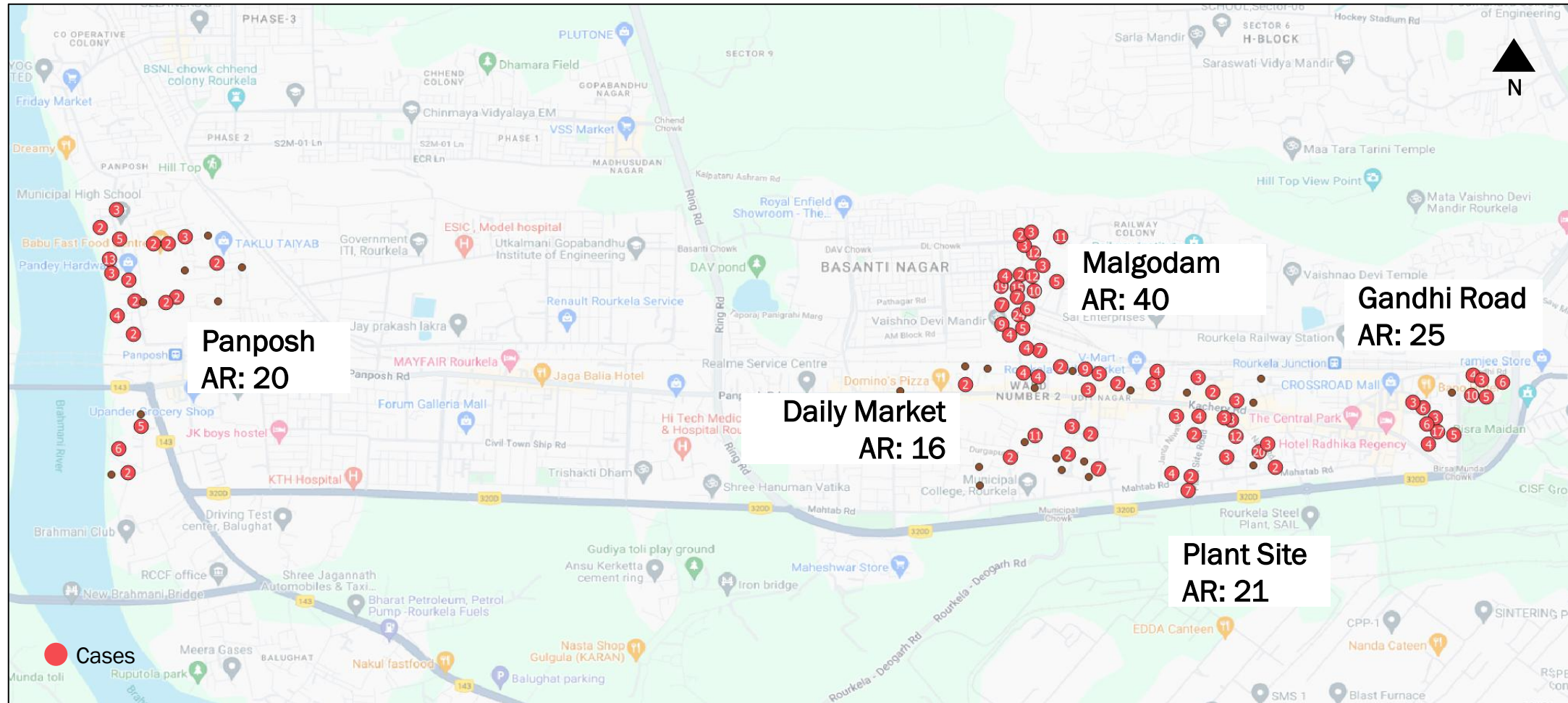
Suspect Cases
N=497, AR: 25

Confirmed Cases
N = 28, 6%



No clustering of cases based on location

Place Distribution, Descriptive analysis, ADD outbreak, Rourkela, Odisha, Dec 23 – Jan 24 (N=497)



All sections affected | Delay in seeking care

Descriptive analysis, ADD outbreak, Rourkela, Odisha, Dec 23 – Jan 24 (N=497)



Highest AR: **60+ years** → 29



Females (30) > Males (20)



Most common symptoms (>65%)
Abdominal Pain & Myalgia



84% (n=416) → Sought treatment
63% (n= 267) → Pharmacy



>80% (n=407) cases used
Municipality water supply



56% (n=278)
No purification techniques



>60% (n=318) reported
color & smell in Municipality water



40% (n=199)
No Soap for hand washing

Possible lack of adequate chlorination

Environmental Investigation, ADD outbreak, Rourkela, Odisha, Dec 23 – Jan 24



Heavy rainfall - 5-8 Dec 2023
Muddy water supply

Open drainages with
water supply pipes - Leakage

Intermittent water supply →
possibility of negative suction

18 /28 (64%) Samples
Positive for *Vibrio cholera*

**Irregularities in “Chlorine
gas stock register”**
30 Nov – 20 Dec 2023

Municipal Water Supply & Lack of drinking water purification could be the cause of the outbreak → Hypothesis

ADD outbreak, Rourkela, Odisha, Dec 23 – Jan 24

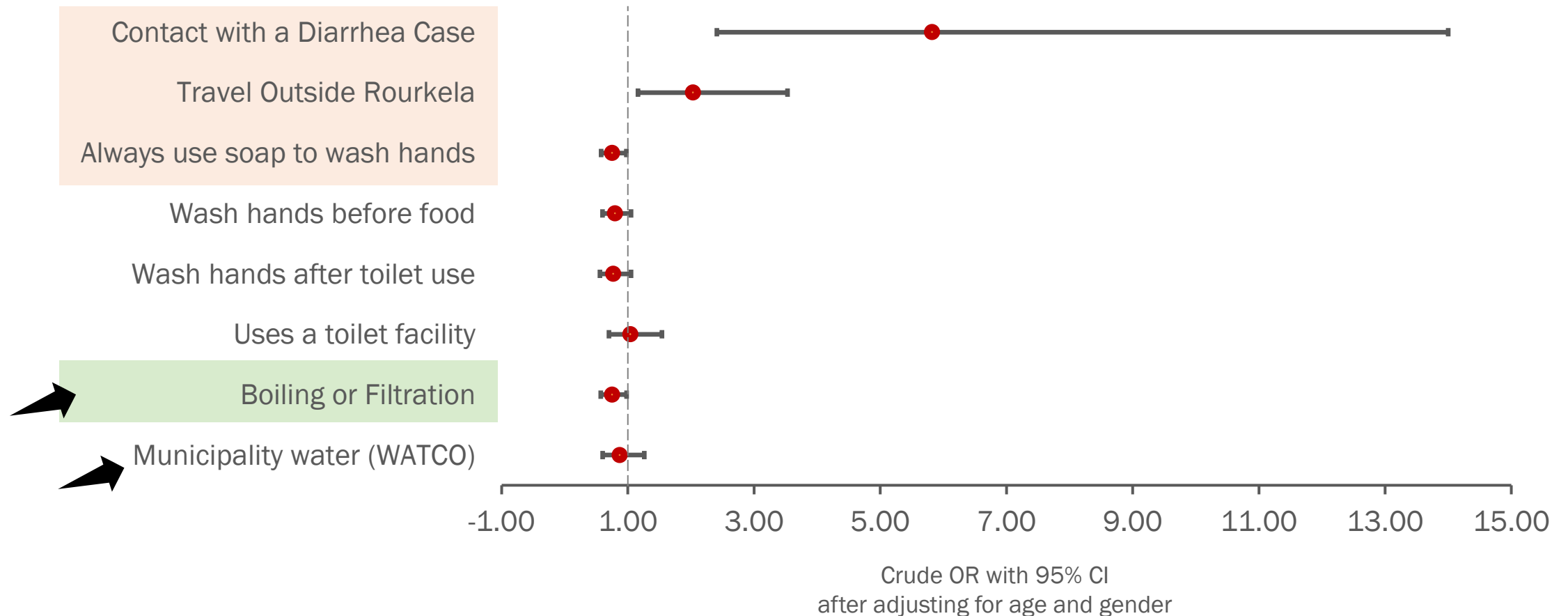
Case-Control Study

- Unmatched, 1:1
- Min. Sample Size: 109
- Logistic regression adjusted for age & gender
- Adjusted Odds ratio (aOR) with 95% CI

- **Case:** An occurrence of **at least three episodes of loose stool within 24 hours** among the residents of Urban Rourkela, Odisha, from Dec 01, 2023, to Jan 26, 2024
- **Control:** Individuals from the **neighborhood of a case** who didn't qualify as a suspect case

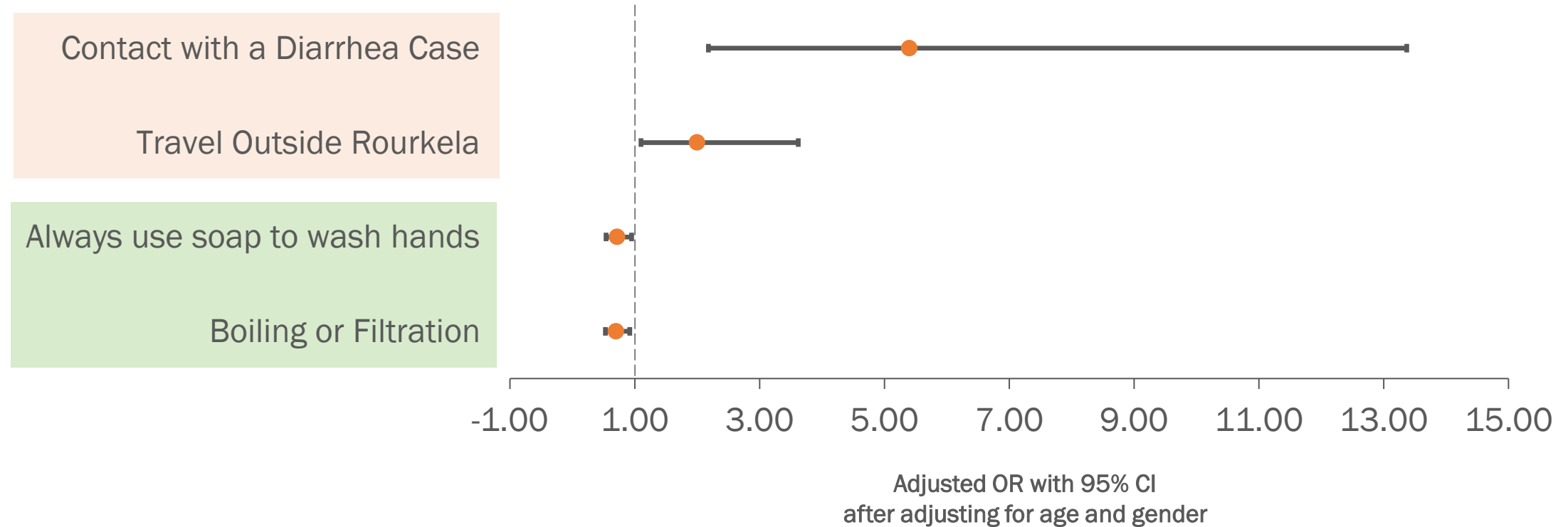
Boiling / Filtration was protective | Contact & travel could lead to disease

Association between ADD & exposures, ADD outbreak, Rourkela, Odisha, Dec 23 – Jan 24 (n=980)



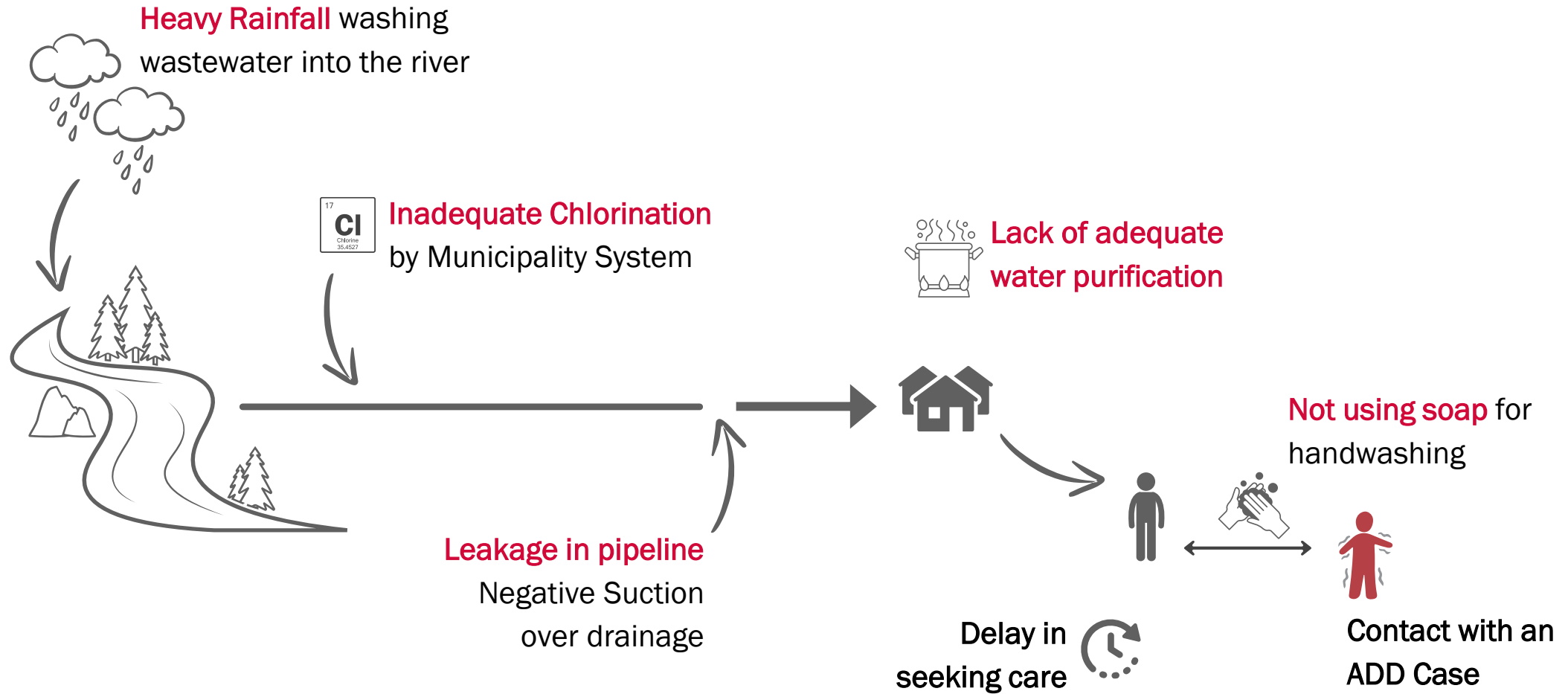
Urgent need to focus should be on WASH* practices

Association between ADD & exposures, ADD outbreak, Rourkela, Odisha, Dec 23 – Jan 24 (n=980)



*WASH – Water, Sanitation & Hygiene Practices

Conclusions – ADD Outbreak, Rourkela, Odisha, 2023-24



Recommendations

ADD outbreak, Rourkela, Odisha, Dec 23 – Jan 24

Short term

- **Adequate residual Chlorine** to neutralize sewage mixing
- **Boil water before drinking** in the communities



Long term

- System for **constant monitoring of the quality of water supply** at the user end
- Locate and replace the damaged pipelines
- Records and registers at the Municipality to be regularly audited

Acknowledgement



THANK YOU

- Directorate of Public Health, Odisha, Public Health System at Rourkela Municipality
- Nursing College Principal, Hitech Medical College, Rourkela → 44 Nursing Students
- Faculty, Mentors, and Administrative Staff of India FETP at ICMR NIE