



Outbreak Investigation of Acute Diarrhoeal Disease in Village X, Uttarakhand, India, July 2024

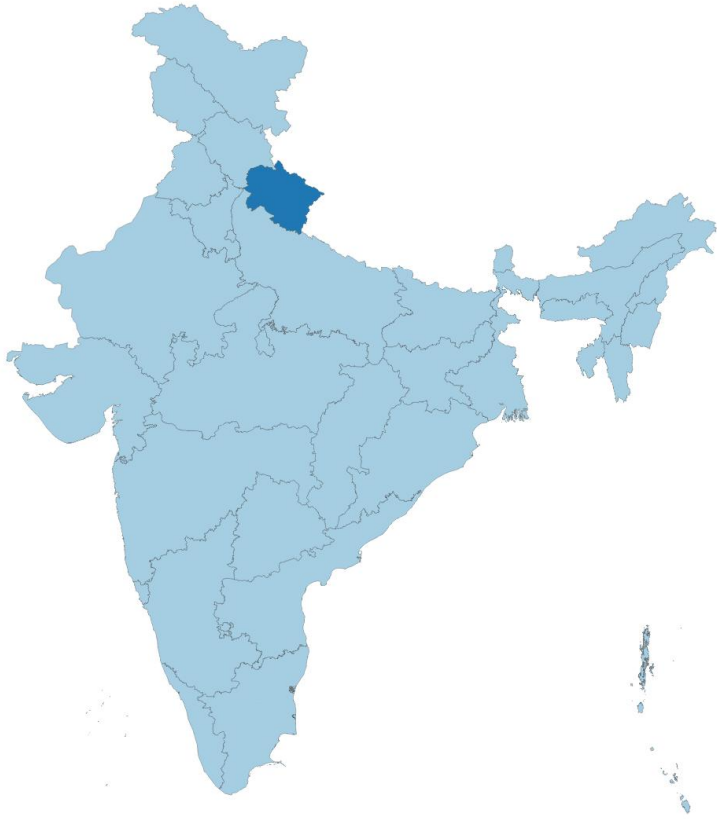
Gopi Kumbha¹, Farida Khatoon², Sushma Choudhary³, Mohan Kumar⁴, Archana Ramalingam⁵

¹India Epidemic Intelligence Service Officer-Cohort 4, ICMR NIE

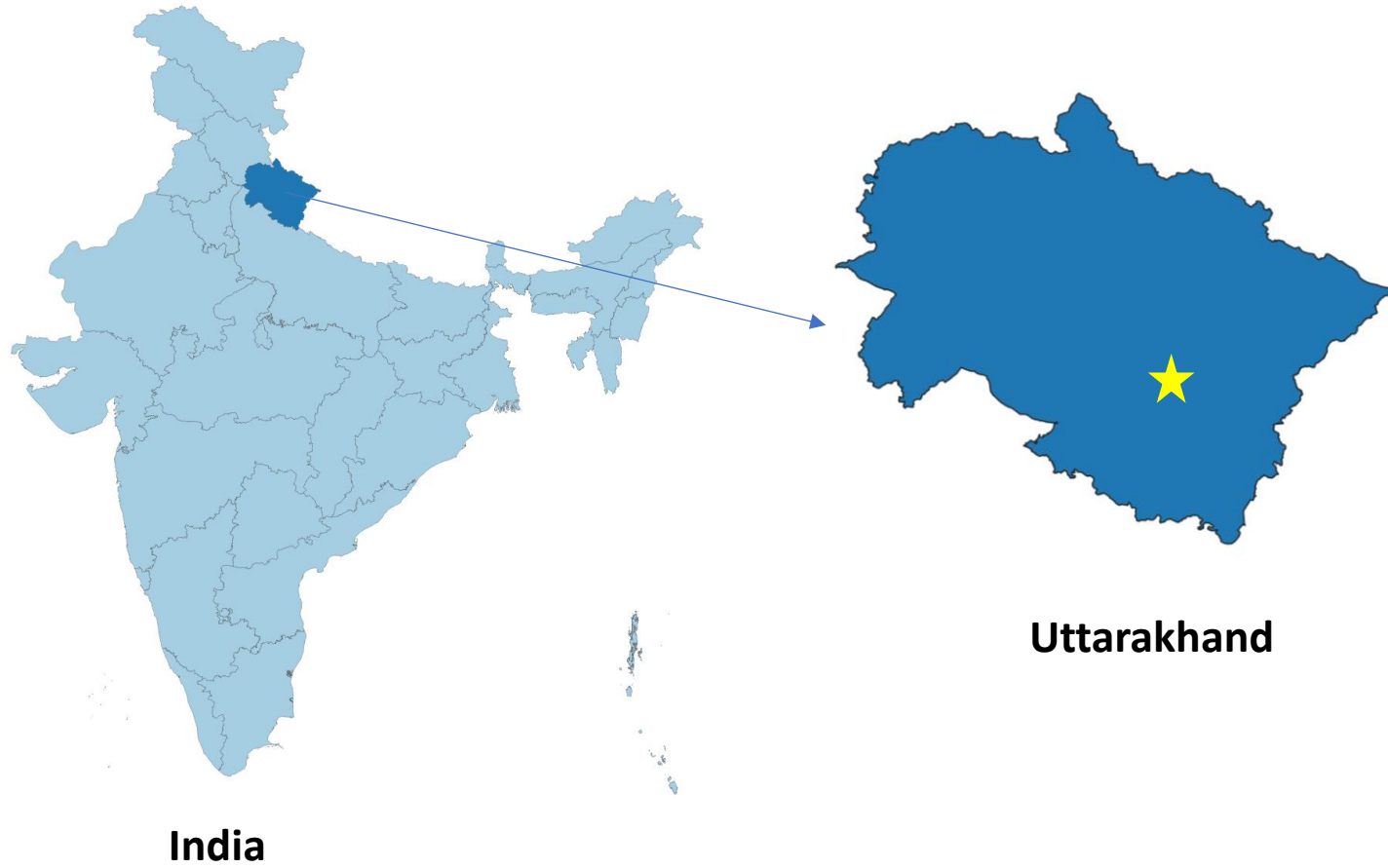
²EIS, National Centre for Disease Control, Delhi

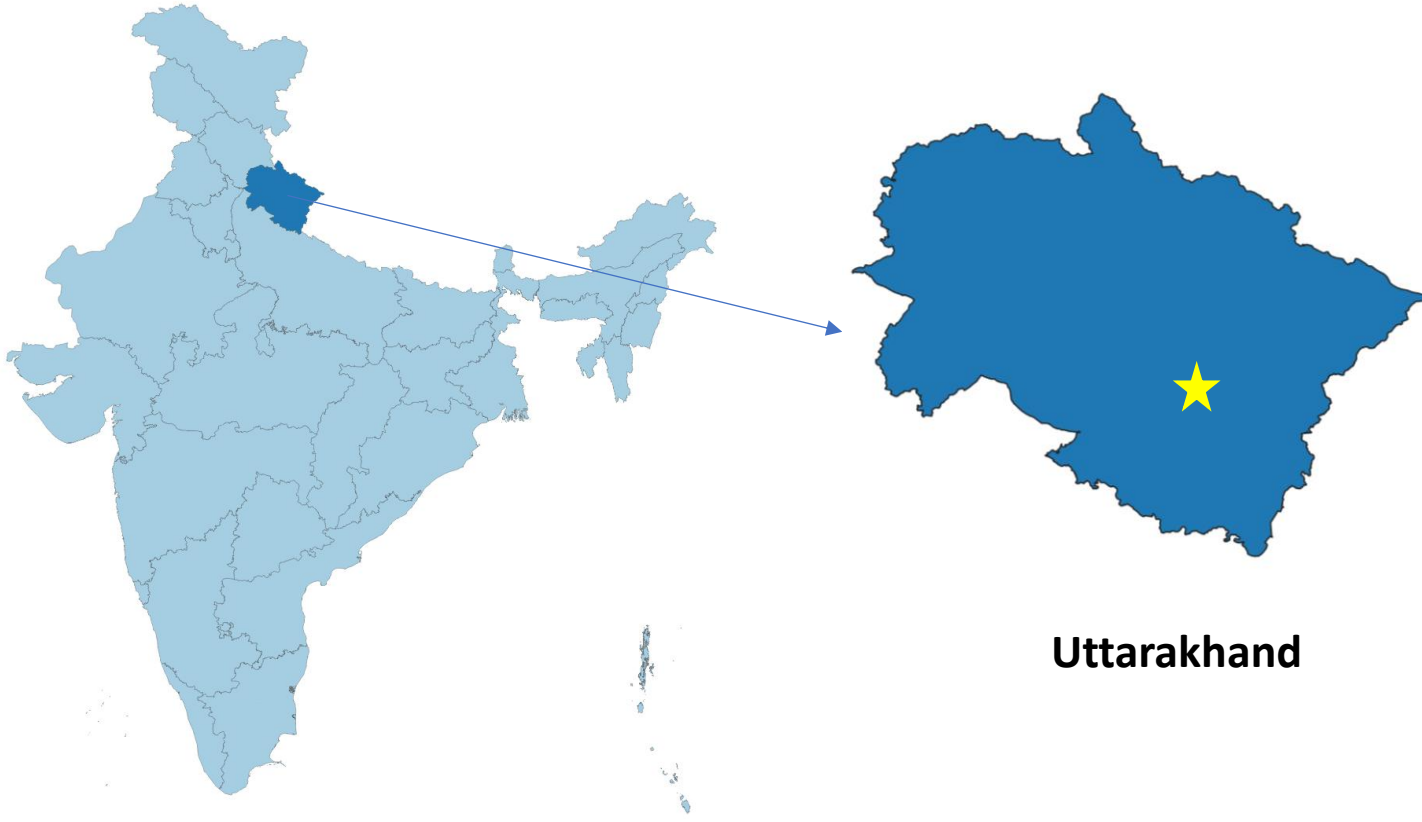
^{3,4}South Asia Field Epidemiology and Technology Network, Inc, India

⁵Indian Council of Medical Research National Institute of Epidemiology, Chennai



India





India

Uttarakhand



Acute diarrrheal disease cases Village X (Hilly)

2024

9 July



**Cluster of acute diarrhoeal disease
(n=15 cases)
Symptoms: Loose stools**

2024

9 July

11 July



Multidisciplinary team FETP officers, clinician and Microbiologist

- Interview with clinician & cases

Objectives



**Confirm the outbreak of ADD cases, Village X,
July 2025**

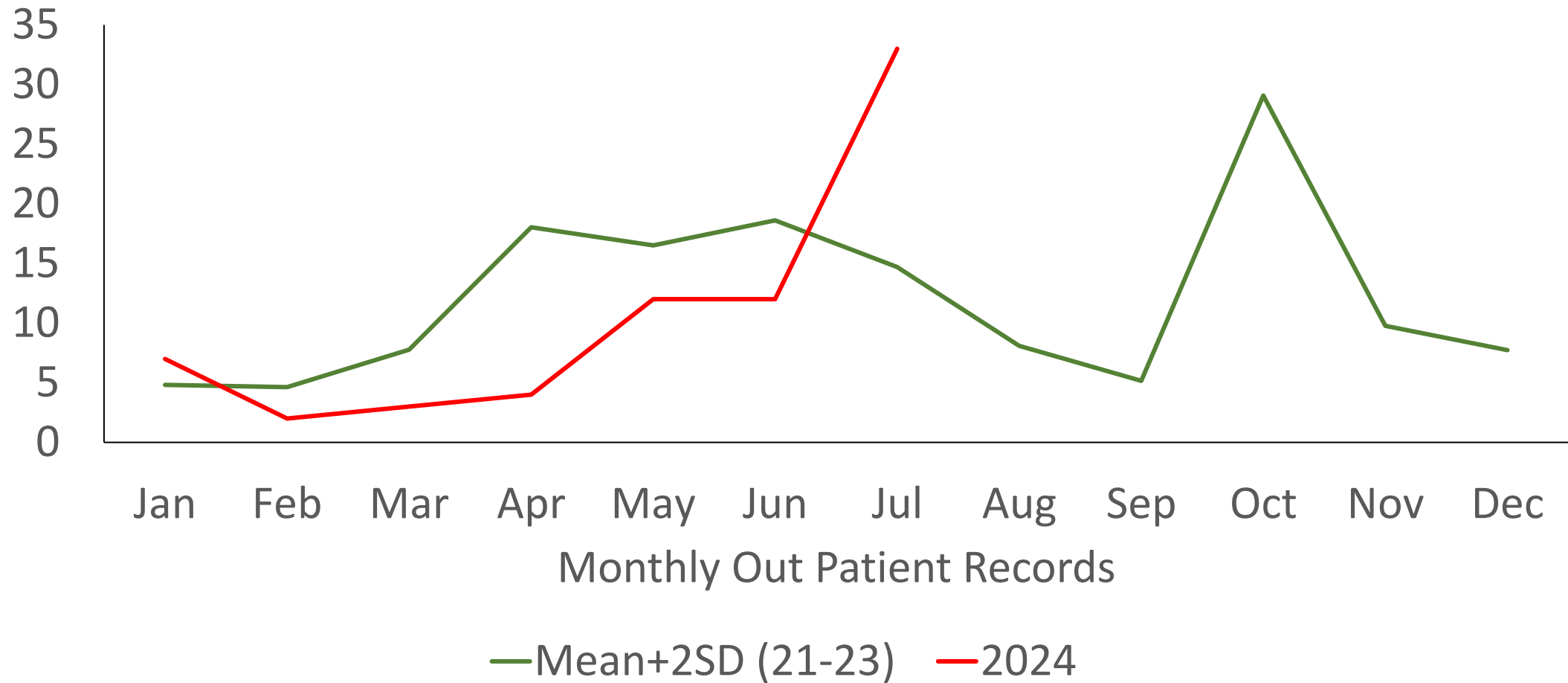
Describe the epidemiology

Identify the risk factors

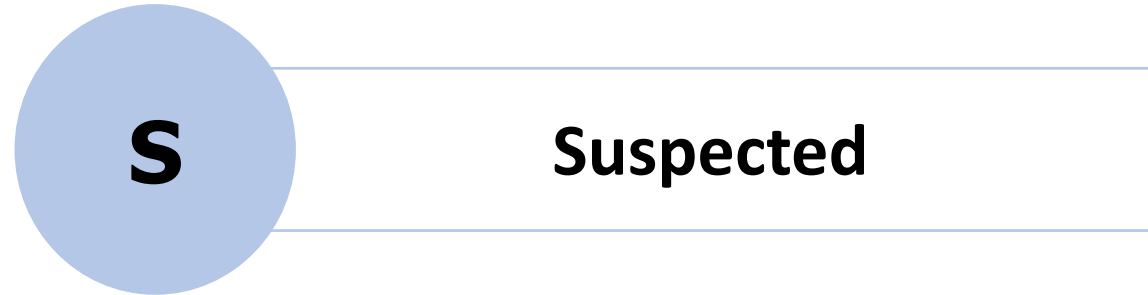
July 2024 ADD cases exceeded outbreak threshold



No of ADD cases



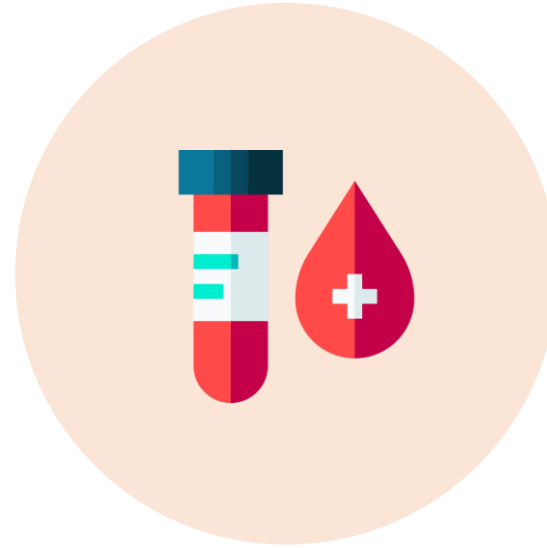
Case definition



- **≥ 3 episodes of loose stools within 24 hours**
- **Resident of Village X**
- **June 25 to July 19, 2024**



Active case search



Sample collection



Record Review

6.5% Attack rate



107

Total households

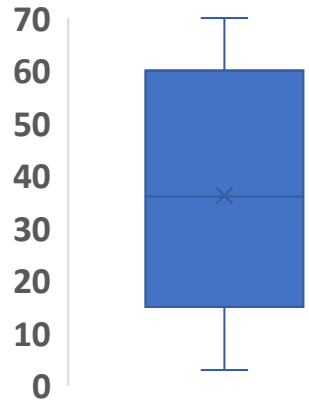
33

Suspected cases

6.5%
(33/505)

Attack rate

61% cases belonged to the female sex



Median Age

33 years

Range (3-70)



Female

61%
(20/33)



Illiterate

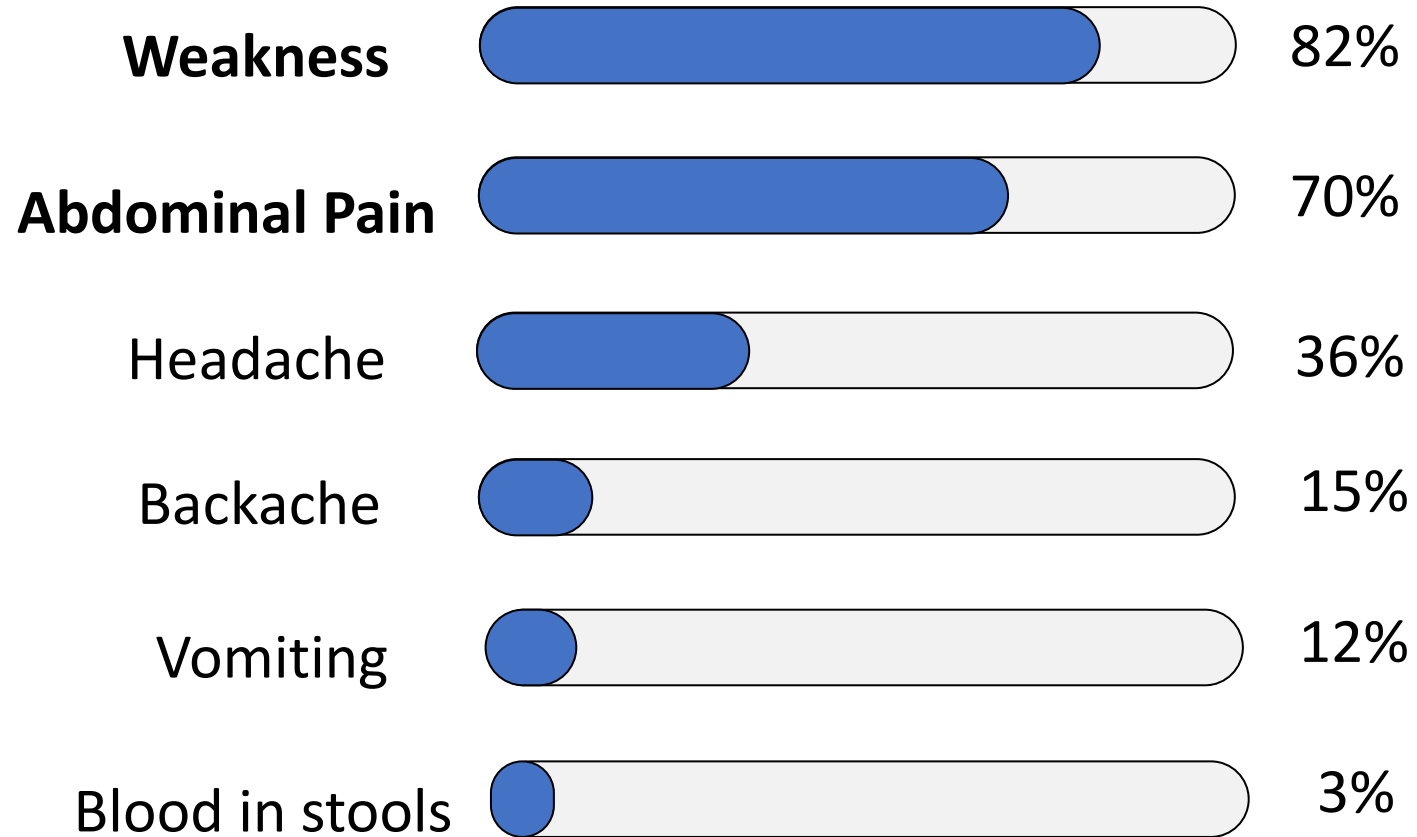
15%
(5/33)



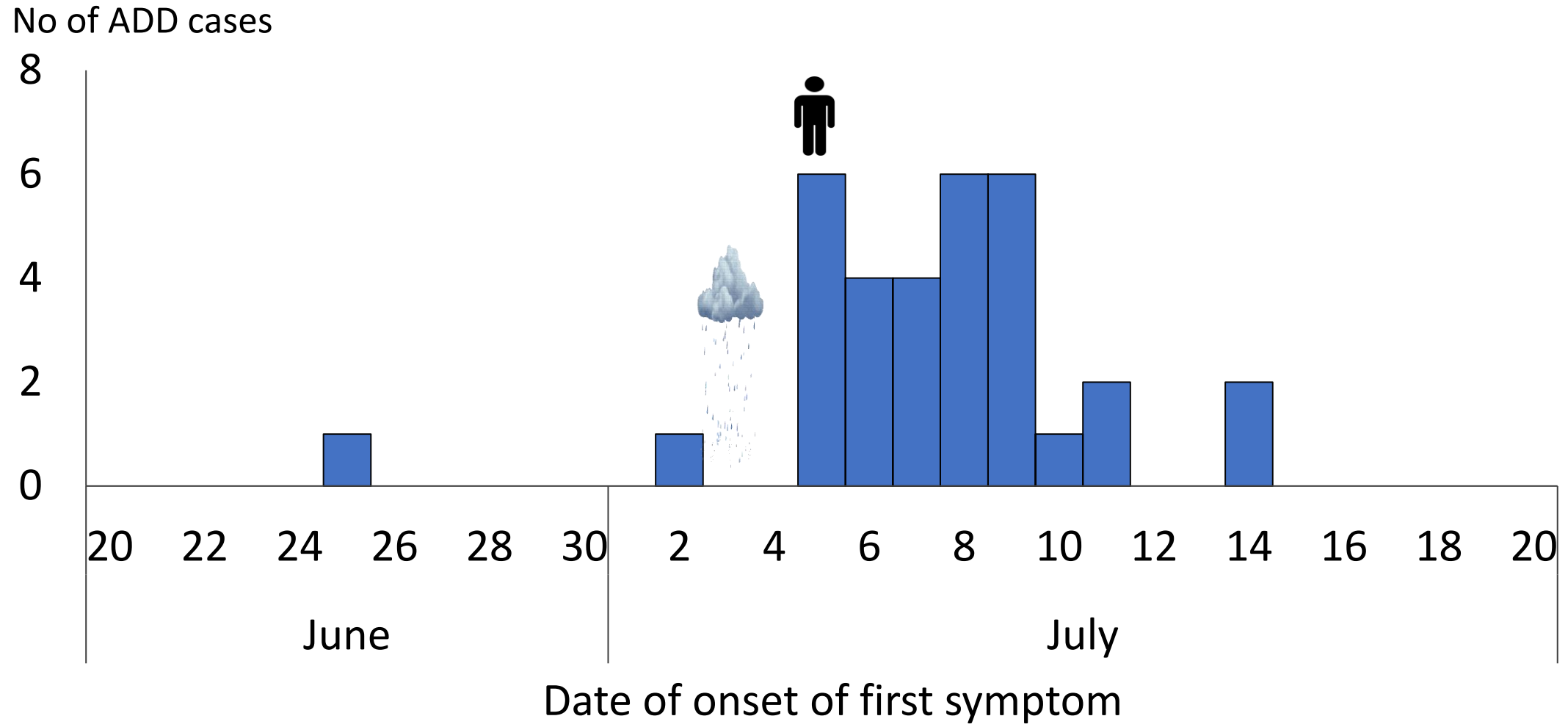
Students

36%
(12/33)

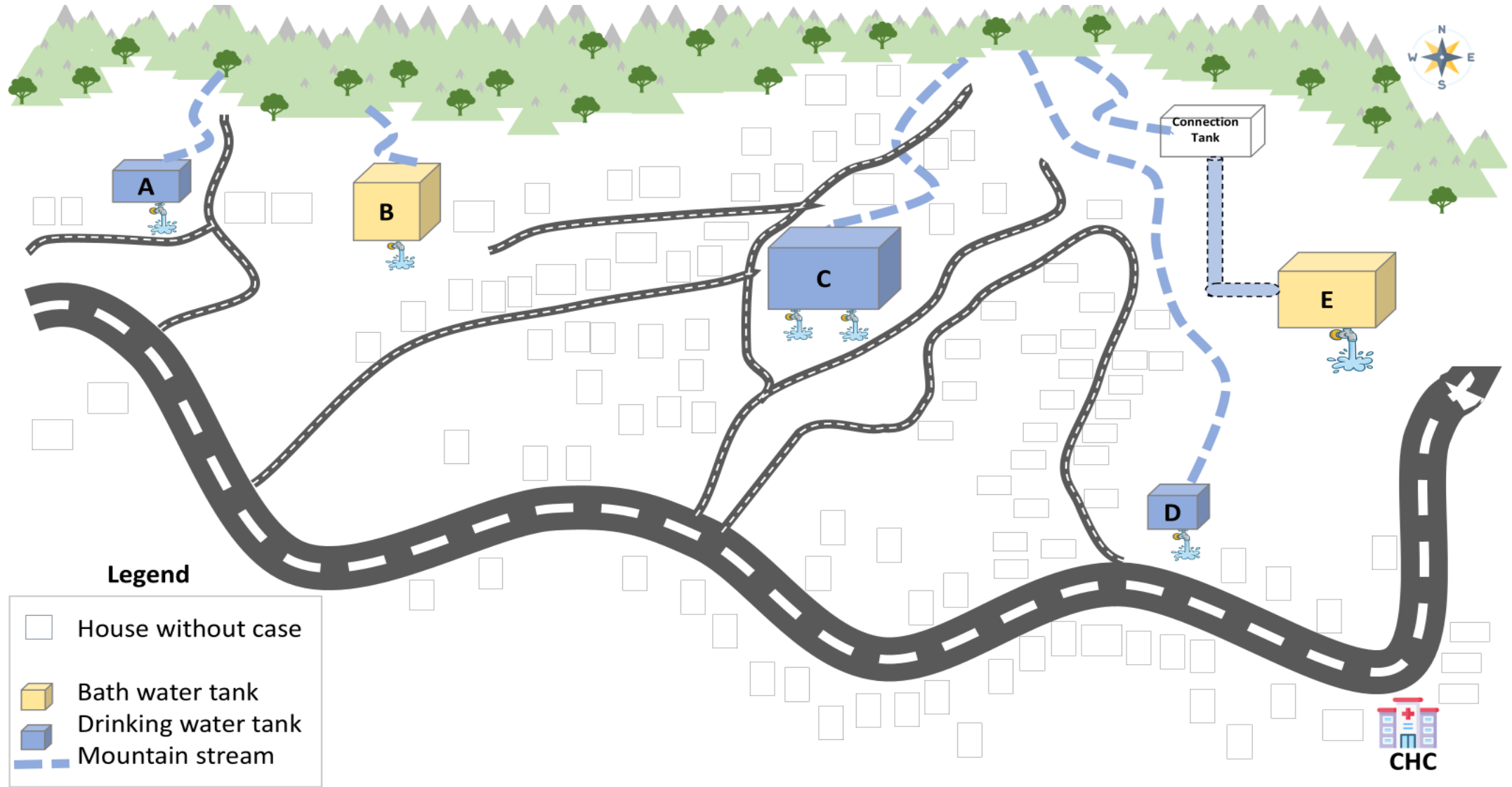
82% of cases had weakness



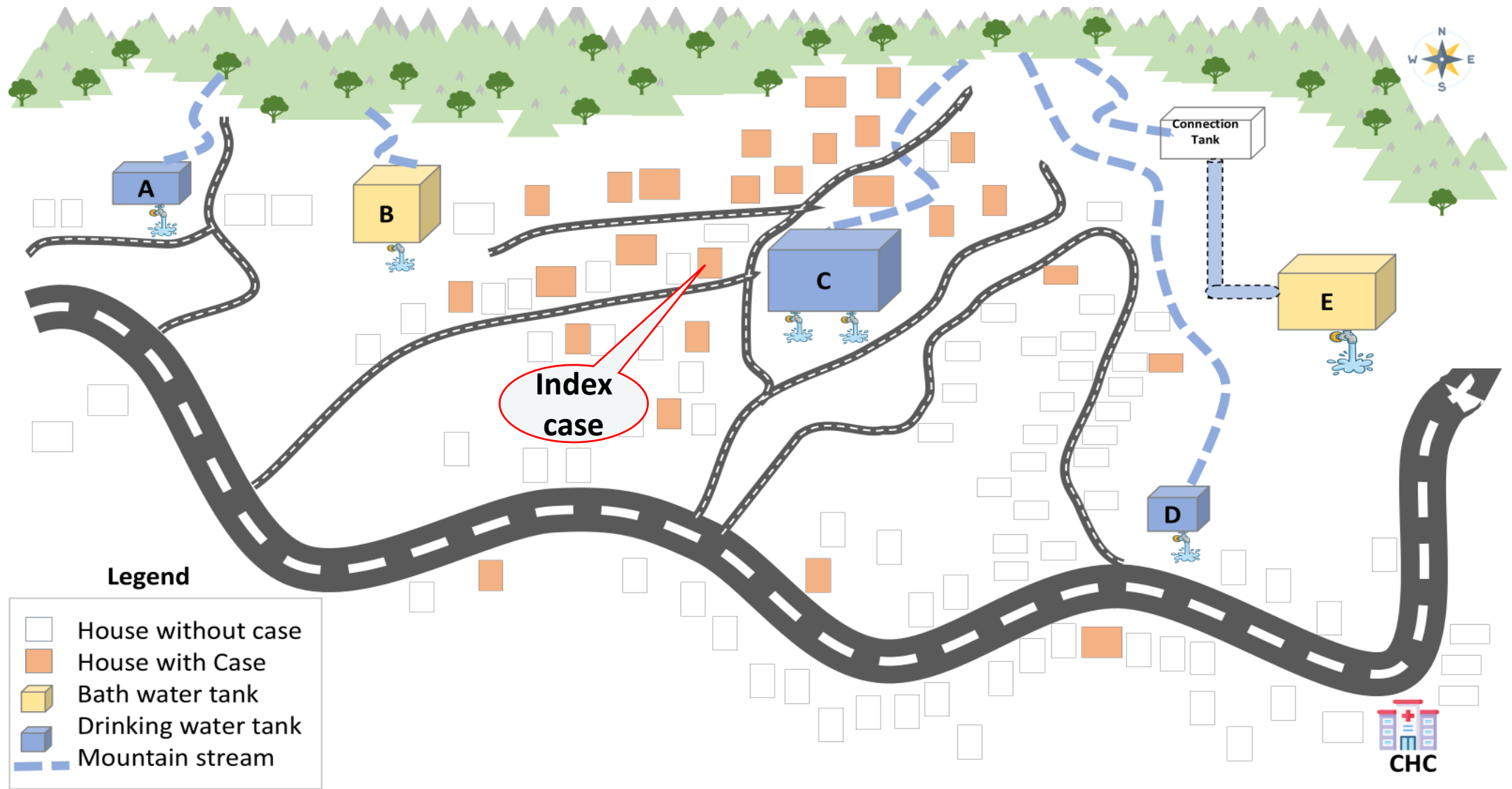
79% of cases had symptom onset between July 5th-9th



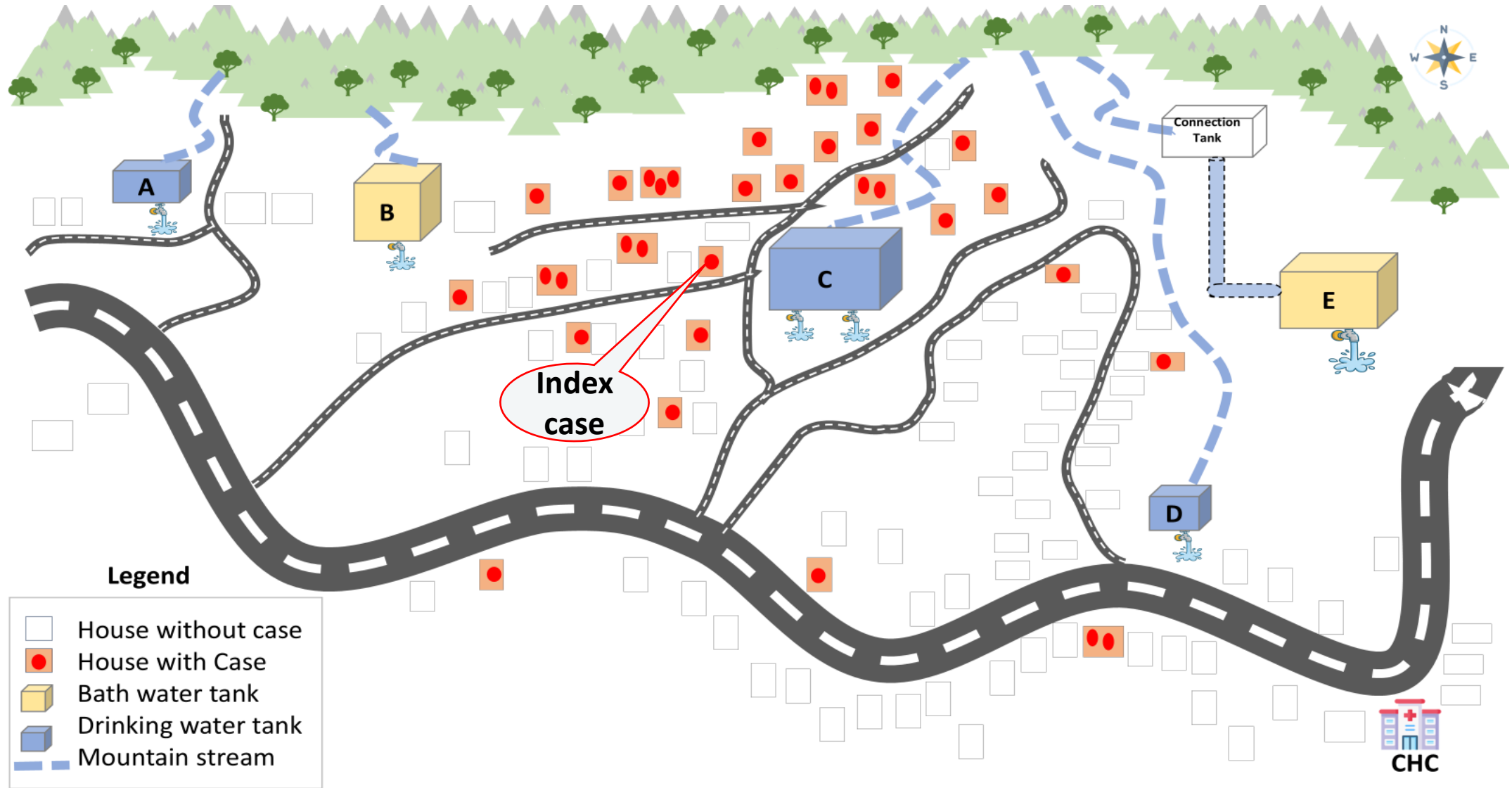
Unsafe mountain stream water tributaries



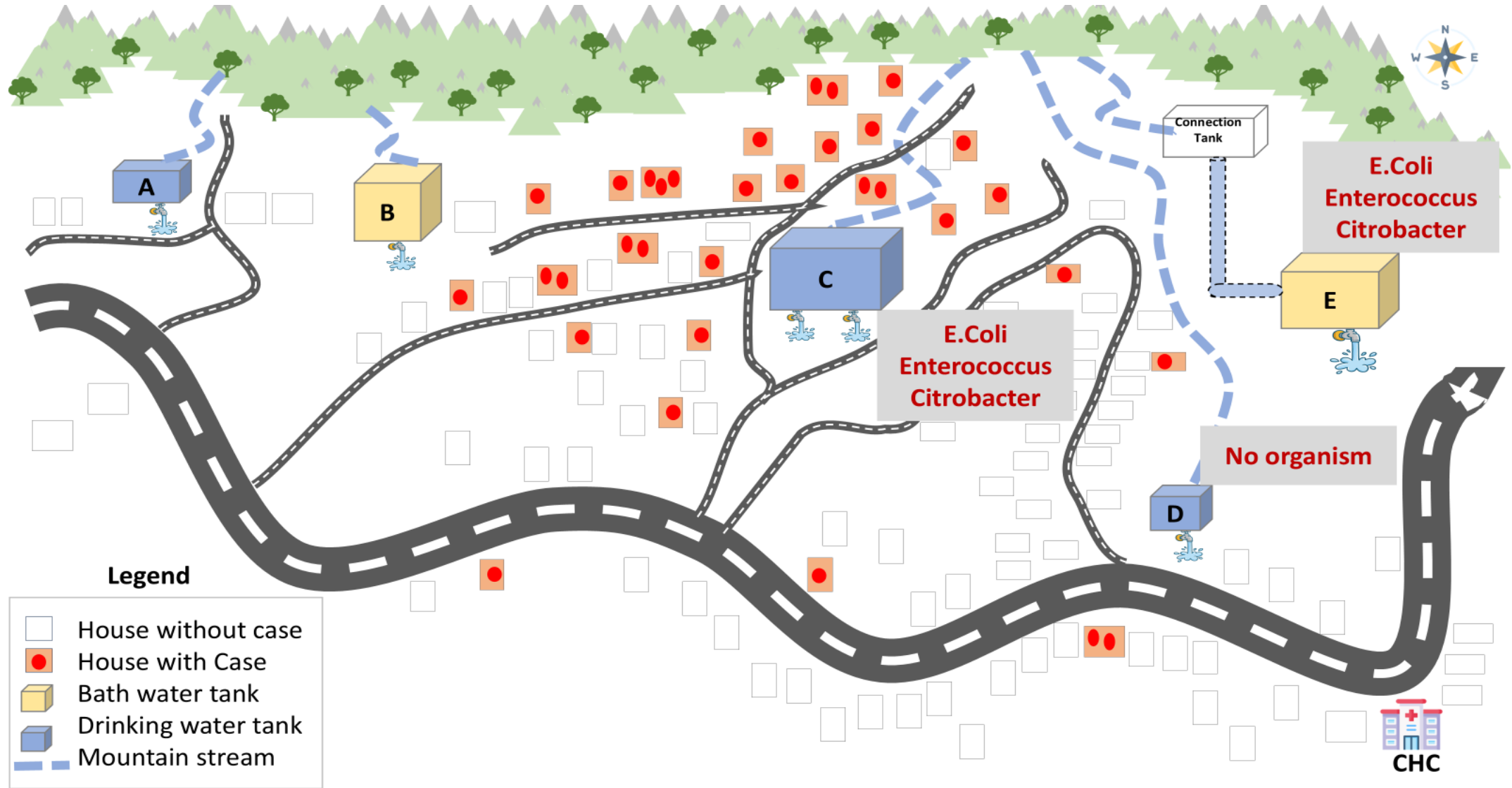
26% (28/107) Households affected



94% (31/33) Cases drank water from tank C



2/3 Water tanks showed faecal contamination



88% of cases consumed **untreated water**



Sanitation

94%
(31/33)



**No
Handwash**

45%
(12/33)



**Untreated
water**

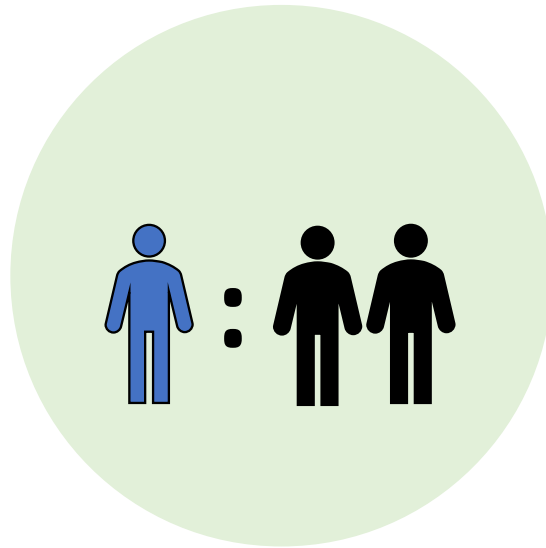
88%
(29/33)

Hypothesis



**Consumption of drinking water from Tank C
is associated with Acute Diarrheal Disease
(ADD) in the village X population**

Case-control study



1:2

Control

- No ADD case
- Resident of Village X
- June 25 to July 19, 2024

Consumption of water from tank C was significant



Variable	Cases	Controls	OR (95%CI)
Drinking water from tank C	31	40	6.2 (1.3-28.9)
Untreated drinking water	29	26	8.3 (2.5-26.9)
Availability of toilets	31	54	0.5 (0.1-3.01)
Hand Hygiene*	21	54	0.09 (0.02-0.37)

*Self-reported

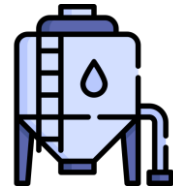
Field observations

- Chlorination details not maintained by field staff
- Water tanks not regularly cleaned
- No regular chlorination of the water supply
- Capacity of water tanks unknown
- Chlorination by field staff not based on chlorine demand

Conclusions



ADD outbreak at Village X



**Common water source contamination
Drank water from the tanks C**



**E. coli, Enterococcus and
Citrobacter found in tanks C, E**

Recommendations

- Training field staff
- Measurements of water tanks
- Cleaning and Chlorination of water tanks
- Boiling water, use chlorine tablets
- Regularly water test by field staff
- Maintain chlorination registers

Public Health Action: Training session on Chlorination for field staff at Health centre



18 July 2024

Total Participants: 31
field staff

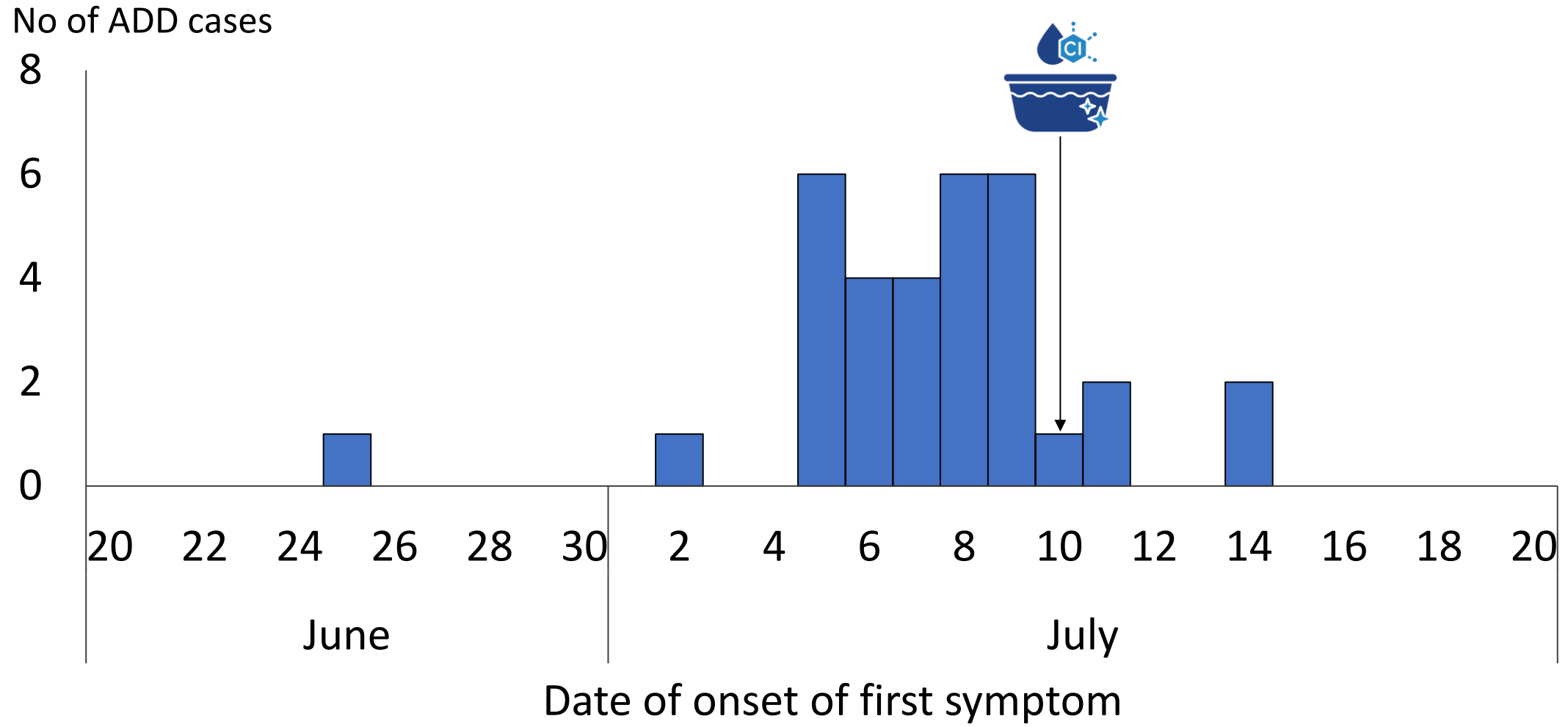
Consent was taken from the participants

Public health action: First-ever measured of village water tank capacity



Consent was taken from the participants

Public health action: Cases declined after chlorination



Public health action: Community health education on chlorination methods household level



Consent was taken from the participants

Follow up



**Continued passive
surveillance**



No ADD cases reported

Acknowledgments



स्वास्थ्य एवं परिवार कल्याण मंत्रालय
Ministry of Health and Family Welfare



icmr | **NIE**
INDIAN COUNCIL OF
MEDICAL RESEARCH | NATIONAL INSTITUTE OF
EPIDEMIOLOGY



राष्ट्रीय रोग नियंत्रण केंद्र
National Centre for Disease Control



Directorate of Health Services
Department of Health and Family Welfare,
Government of Uttarakhand



Centers for Disease Control and Prevention
Atlanta, USA



**South Asia Field Epidemiology and Technology
Network, Inc.**

Thank You