

Paralytic Shellfish Poisoning: Implications of Absent Red Tide Monitoring in a Mussel Farm- Visayas, Philippines, 2013

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Integrity and Excellence in Field Epidemiology



Introduction

- July 2, 2013- report on PSP* among 21 residents of Gallego & Bahay Village in Tarangan, West Samar
- July 3, 2013- coordinated with CHD** Eastern Visayas
- July 8, 2013 - team was sent to investigate

National Epidemiology Center
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Verification Report
July 2, 2013
Code: 2013-07-002

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| Document Status | INTERNAL |
|-------------------------------|---|
| 1. Report date and time | 7/2/2013 1:40 PM |
| 2. Verification date and time | 7/2/2013 1:55 PM |
| 3. Health event | Suspect Paralytic Shellfish Poisoning (Tahong) Cases |
| 4. Location | Brgy. Gallego and Brgy. Bahay, Tarangan, Samar |
| 5. Start date | 7/1/2013 |
| 6. Number of cases | 21 |
| 7. Description of cases | - Cases were rushed to Eastern Visayas Regional Medical Center (EVRMC) - Other information still on verification |
| 8. Number of deaths | 2 |
| 9. Description of deaths | - Cases died at Tarangan Community Hospital on the evening of July 1, 2013. |

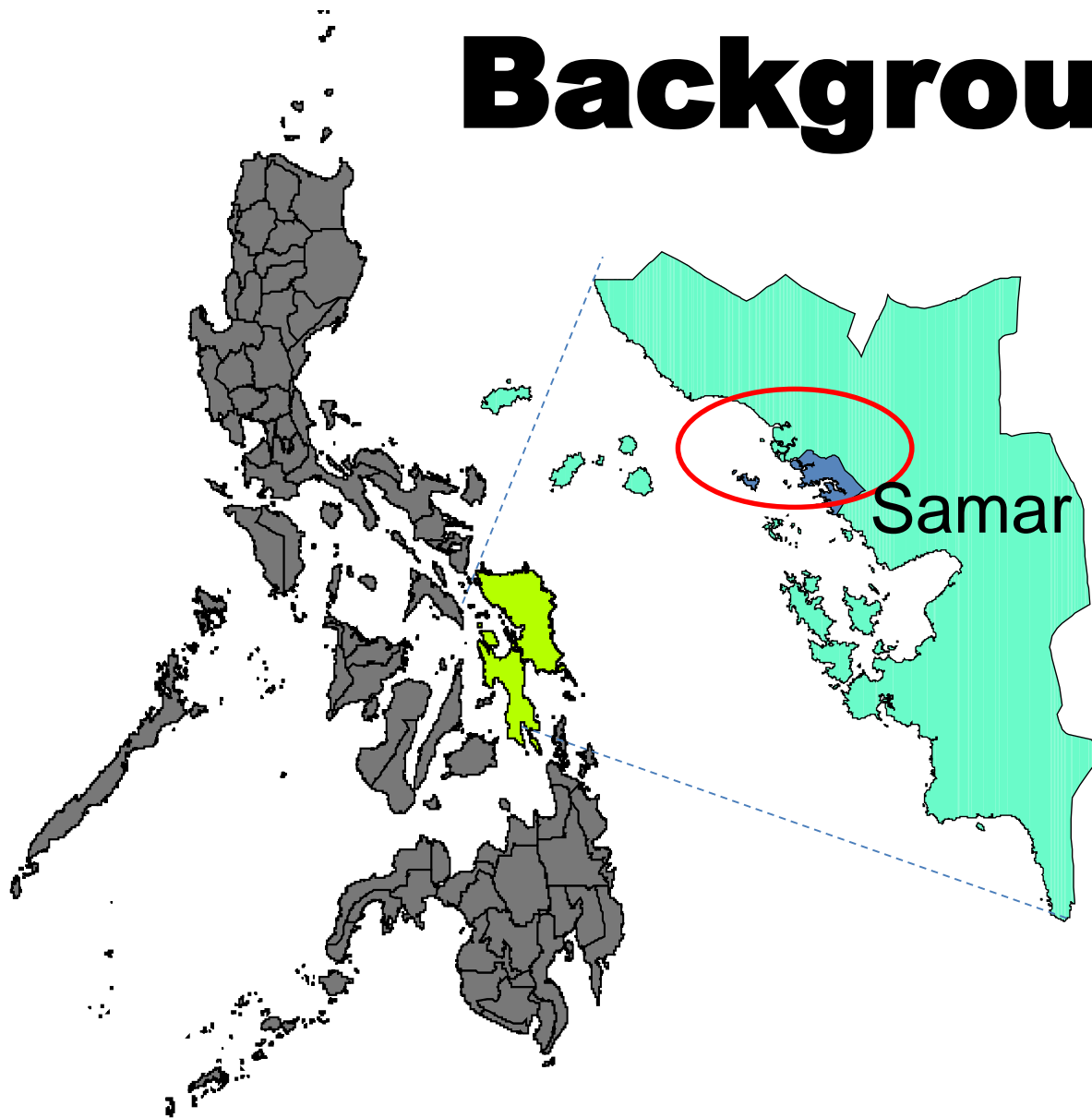


Objectives

1. To confirm the diagnosis
2. To determine source & mode of transmission
3. To identify risk factors
4. To recommend control and preventive measures



Background



Tarangnan

Villages: 41

Population: 25, 703

Bay: Cambatutay

Industry:

Agriculture,

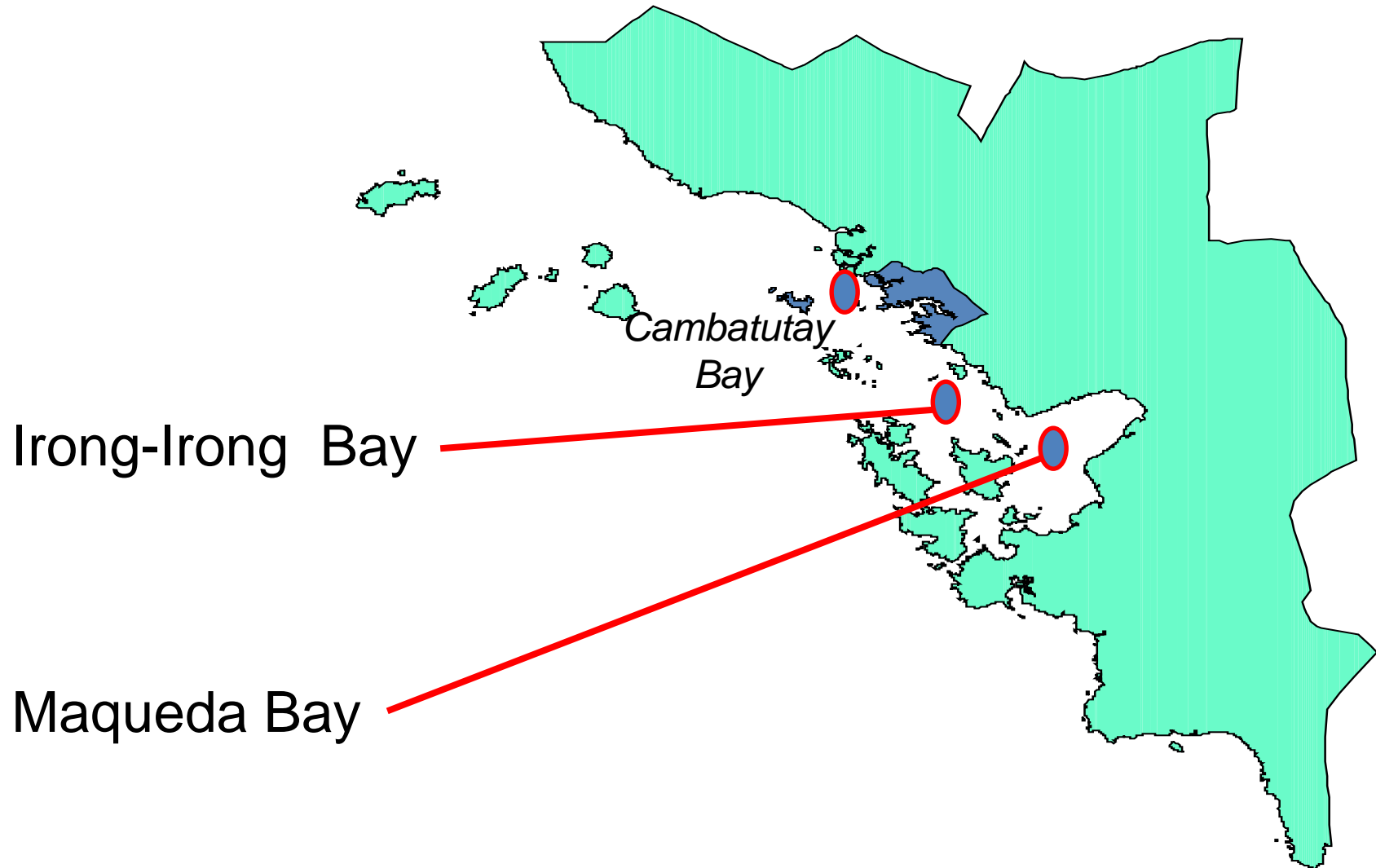
Fishing

Mussel Farm

5,000 metric tons
shellfish production/yr



Red Tide Monitoring Stations West Samar



Methods

I. Descriptive Study

- Review of Records
- Face to face Interview
- Key Informant Interview
- Environmental Survey
- Laboratory Examination
Mussel
Human (Urine & Blood)
Seawater



II. Case-Control Study

1:3 unmatched



Case Definition

Suspect Case

Previously well individual from Gallego & Bahay Village in Tarangan, Samar who developed any motor, and/or sensory with gastrointestinal symptoms after a meal from June 29 to July 4, 2013.

Confirmed Case

Suspect case with a positive Saxitoxin in blood or urine.

Control

Any resident of Gallego Village & Bahay Village in Tarangan, Samar who did not develop any sensory, motor & gastrointestinal symptoms after a meal.



Fig. 1: PSP Cases by Onset of Illness (N=31)

Tarangnan, West Samar, June 29-July 4, 2013

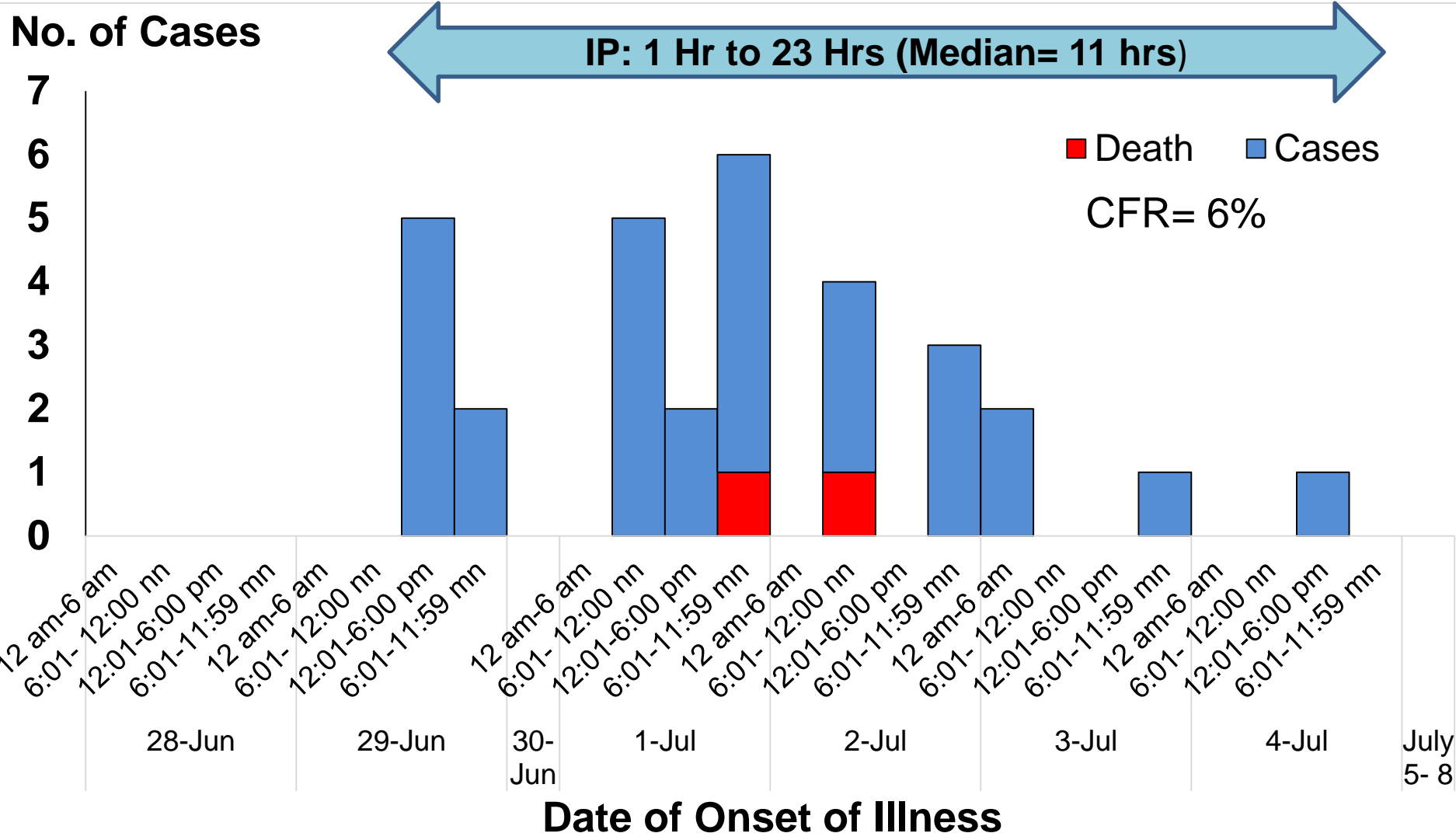


Fig 2. PSP Attack Rate per Village, Tarangnan, West Samar, June 29-July 4, 2013

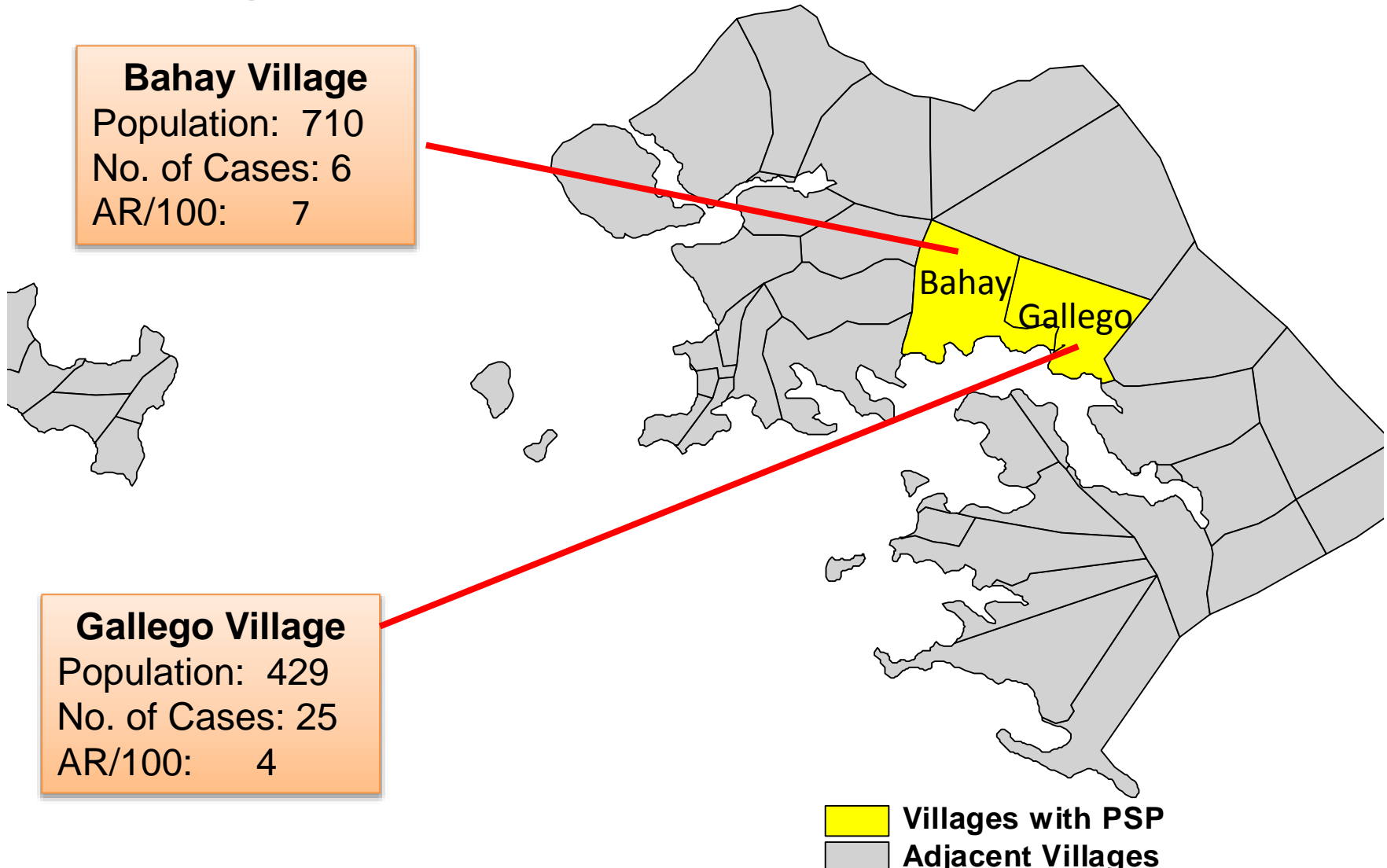


Fig 3. PSP Cases by Age Group & Sex (N=31) Tarangnan, West Samar, June 29-July 4, 2013

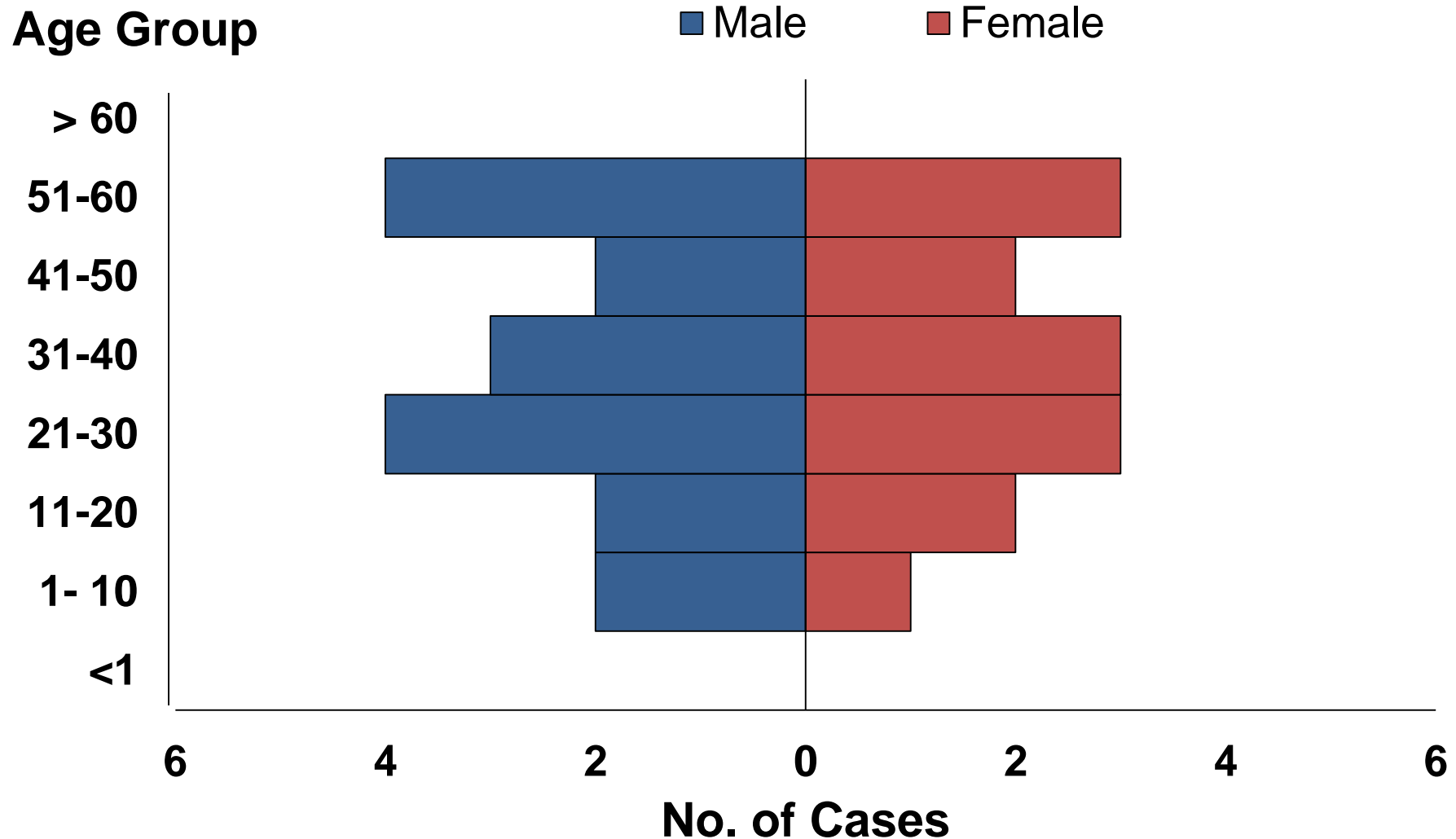


Fig 4. Signs & Symptoms of PSP Cases (N=31)* Tarangnan, West Samar, June 29-July 4, 2013

Signs & Symptoms

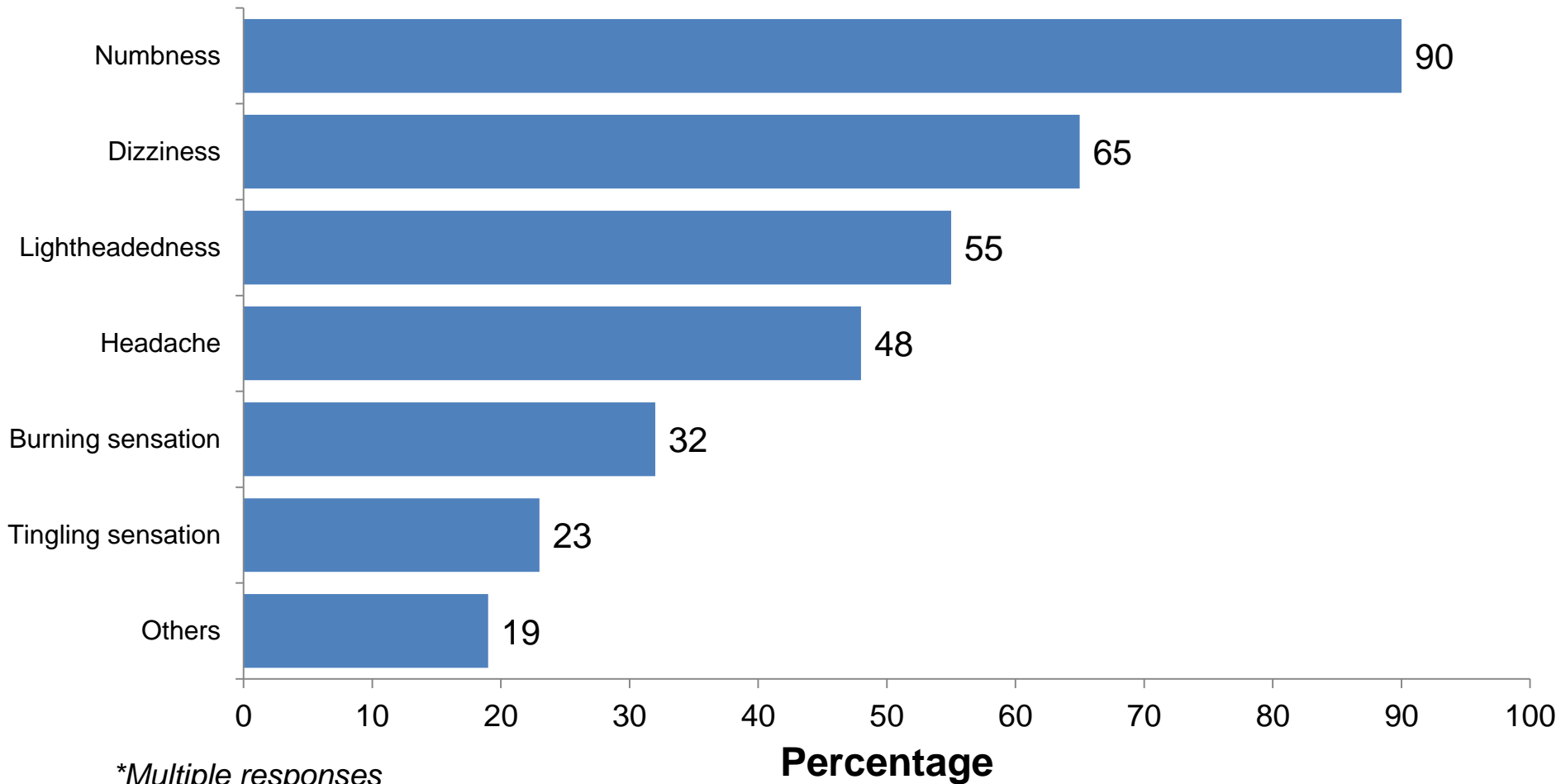
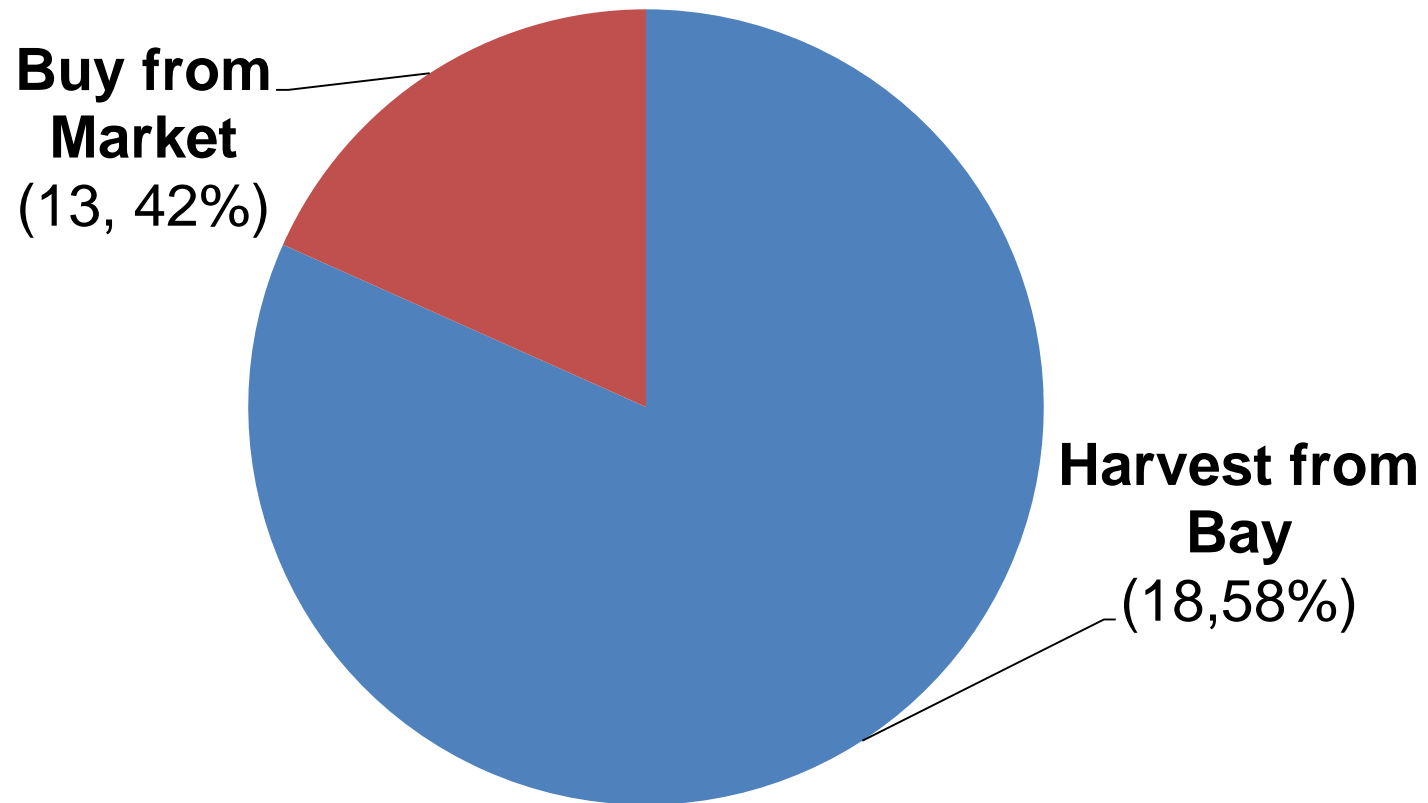


Fig. 5. PSP Cases Most Sources of Food (N=31) Tarangnan, West Samar, June 29-July 4, 2013



**Fig. 6. Types of Food Consumed by PSP Cases (N=31)*
Tarangnan, West Samar, June 29-July 4, 2013**

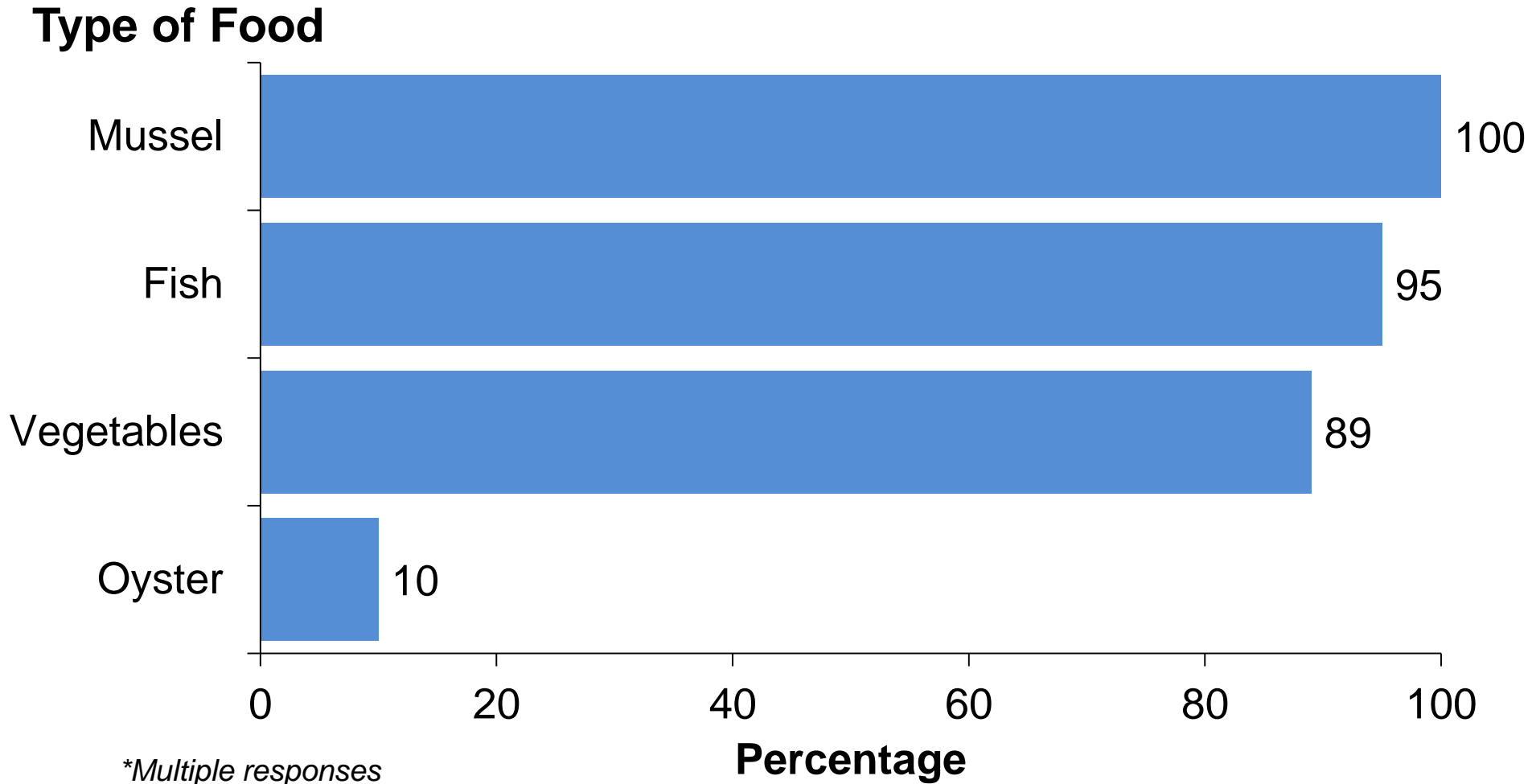


Fig. 7. Types of Shellfish Preparation by PSP Cases (N=31), Tarangnan, West Samar, June 29-July 4, 2013

Type of Preparation

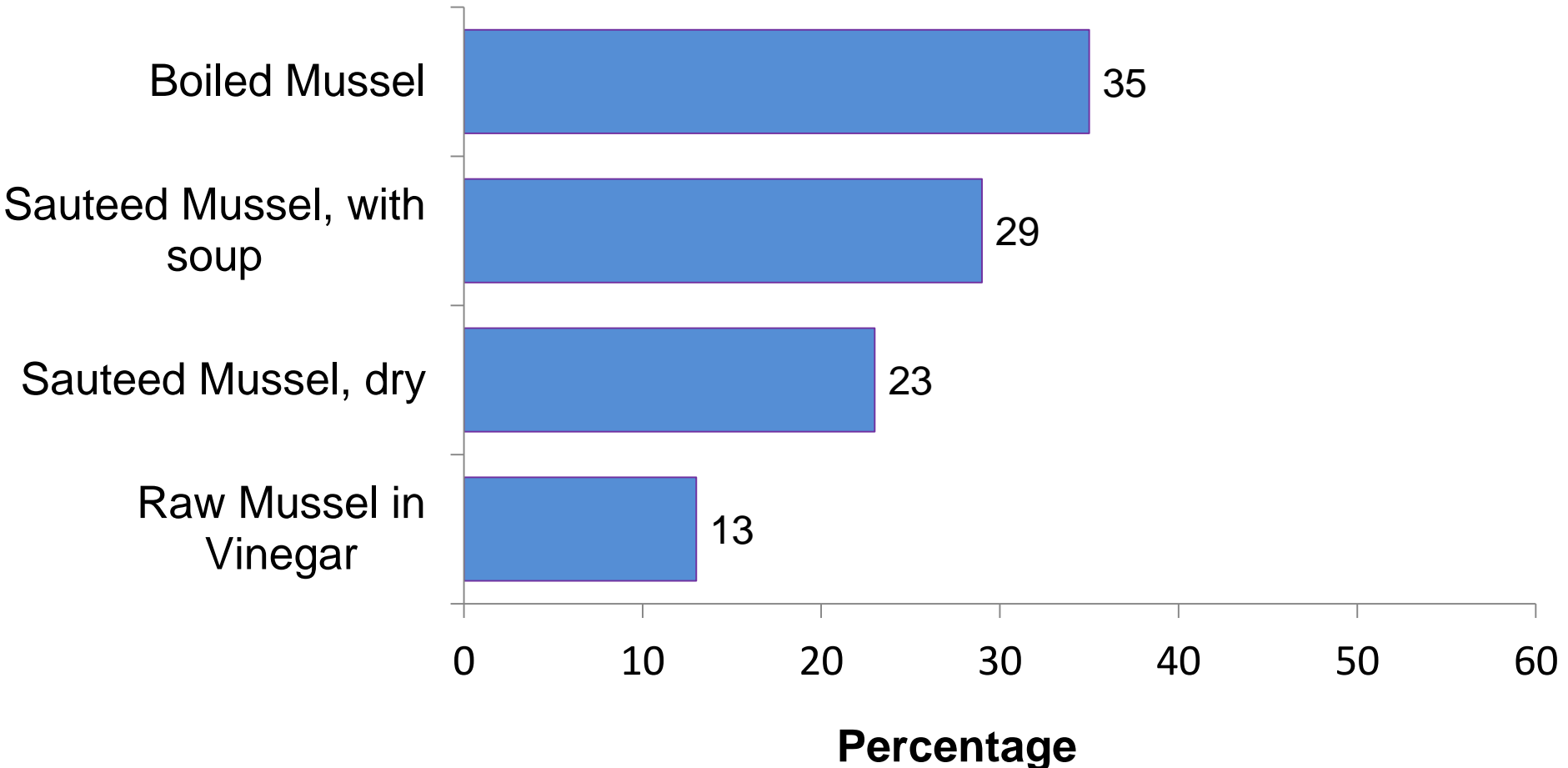
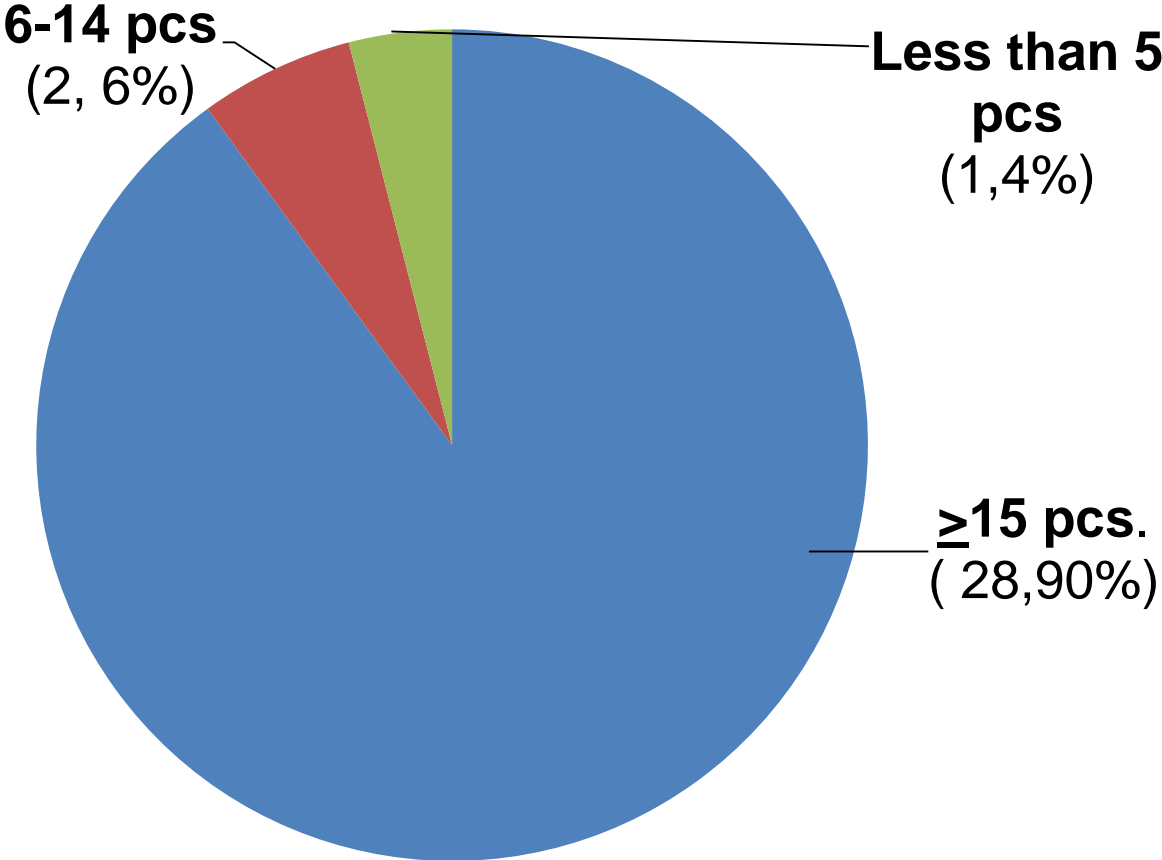


Fig 9. No. of Pieces of Green Mussel Meat Eaten by PSP Cases (N=31)

Tarangnan, West Samar, June 29-July 4, 2013



Laboratory Result

I. Food Samples

Sample Site: Cambatutay Bay,
Gallego Village

Samples: Green Mussel
(*Perna virides*)

Result: 225 ugSTXeq/100 g
shellfish meat

(Normal: ≤ 80 ugSTXeq)

CONFIRMATORY TEST RESULTS OF CENTRAL MARINE BIOTOXIN MONITORING SECTION

Food Fish Monitoring
Water Quality Examination Results

Examination: Analytical Methods Processing (PAC) Team
Methodology: Water Analysis
Reference: Association of Official Agricultural Chemists

| Date Collected (YYYY-MM-DD) | Source | Site/Location | Type of Sample | Collected by | Result (ugSTXeq/100g) |
|-----------------------------|-----------------------------------|-----------------|-------------------------------------|--------------|---------------------------------|
| 07-03-2011 | MSD - Malaga, Zamboanga, W. Samar | Cambatutay Bay | Filter shell (Green mussel "Perna") | MSD | 225 ugSTXeq/100g shellfish meat |
| 07-03-2011 | MSD - Malaga, Zamboanga, W. Samar | Gallego Village | Filter shell (Green mussel "Perna") | MSD | 225 ugSTXeq/100g shellfish meat |
| 07-03-2011 | MSD - Malaga, Zamboanga, W. Samar | Malaga Bay | Filter shell (Green mussel "Perna") | MSD | ND (Not Detectable) |

Source: Bureau of Fisheries & Aquatic Resources



Laboratory Result

II. Human Serum & Urine Samples

- No Saxitoxin detected

III. Water Samples

- Positive for *Pyrodinium bahamense* var *compressum*



Key Informant Interview

- 1983 & 2009- reported PSP Case
- Contaminated bay because of a landfill
- No succeeding monitoring
- June 2013- red discoloration of seawater
- Loss of income for 11 villages



Environmental Survey



Coastal areas



Wastes directly disposed in the shore



**Table 5. Risk Factors on Multivariate Analysis,
Tarangnan, West Samar, June 29-July 4, 2013**

| Factors | Odds Ratio | 95% Confidence Interval | p-value |
|--|-------------------|--|----------------|
| Consumed at least 1 cup Broth | 12 | 2.14-63.15 | 0.0045 |
| Ate Green Mussel more than one meal | 6 | 1.08-29.45 | 0.0406 |

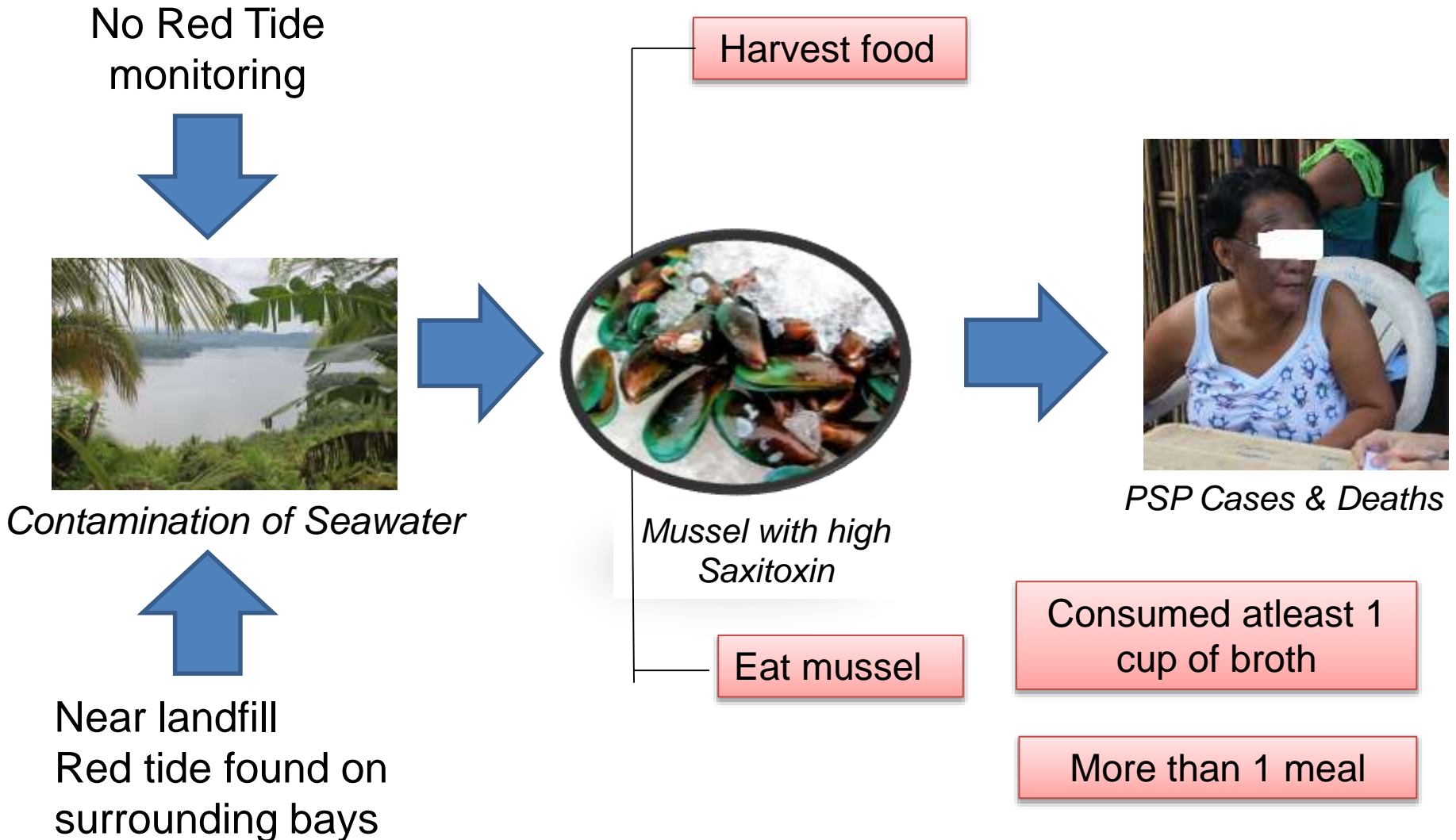


Conclusion

- Paralytic Shellfish Poisoning outbreak in Tarangnan, West Samar
- High number of cases
- Case Fatality Rate= 6%
- Cambatutay Bay-positive for *p. bahamense var compressum*.
- Green mussel, bivalve shellfish- positive for high *Saxitoxin* level
- Cases had eaten green mussel & its broth



Discussion



Recommendations

Bureau of Fisheries & Aquatic Resources

- To impose a total ban on the harvest, sale & consumption of shellfish
- To assign a permanent point person
- To include Cambatutay Bay as monitoring station



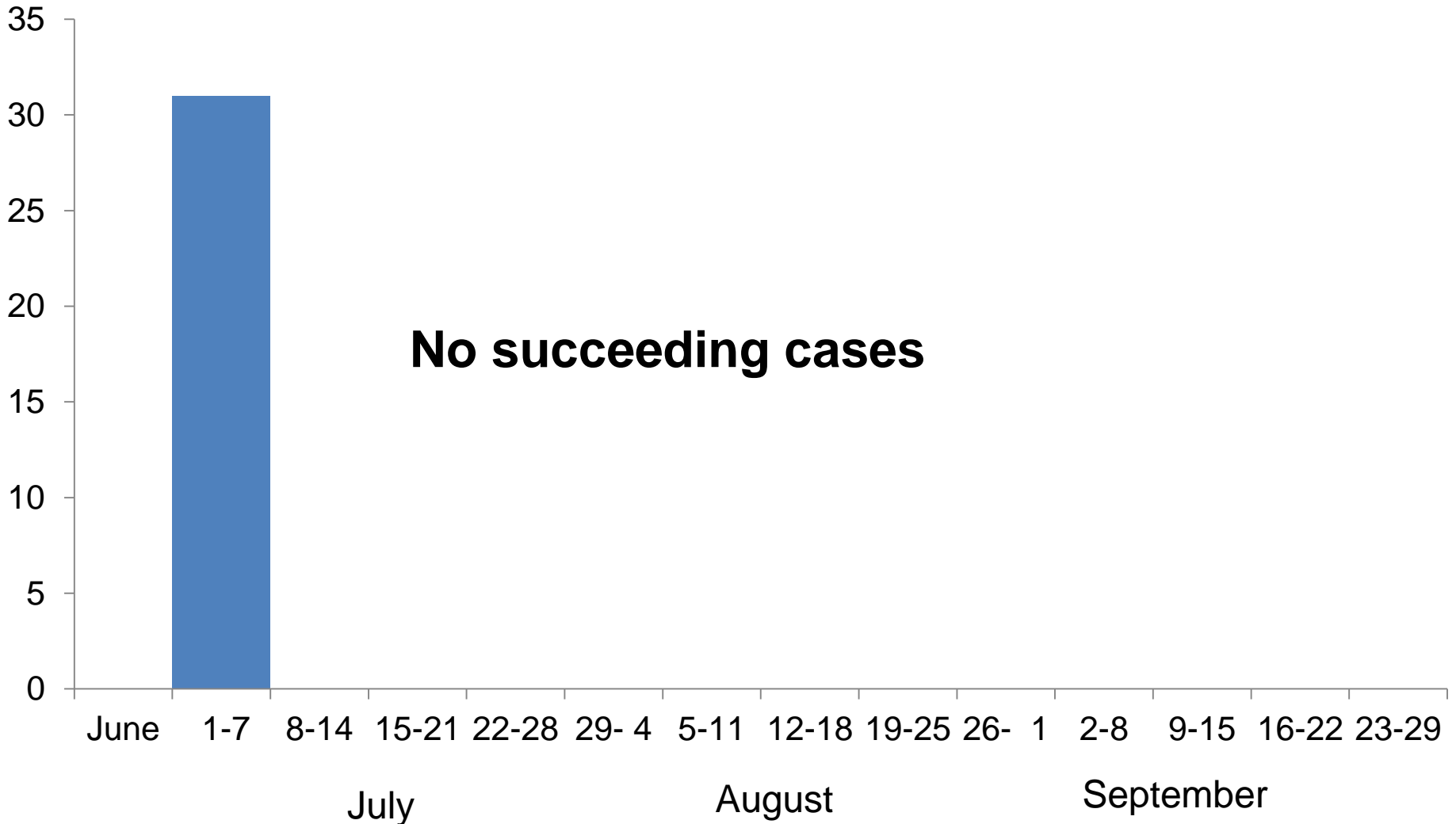
Recommendations

Local Government Unit of Tarangnan

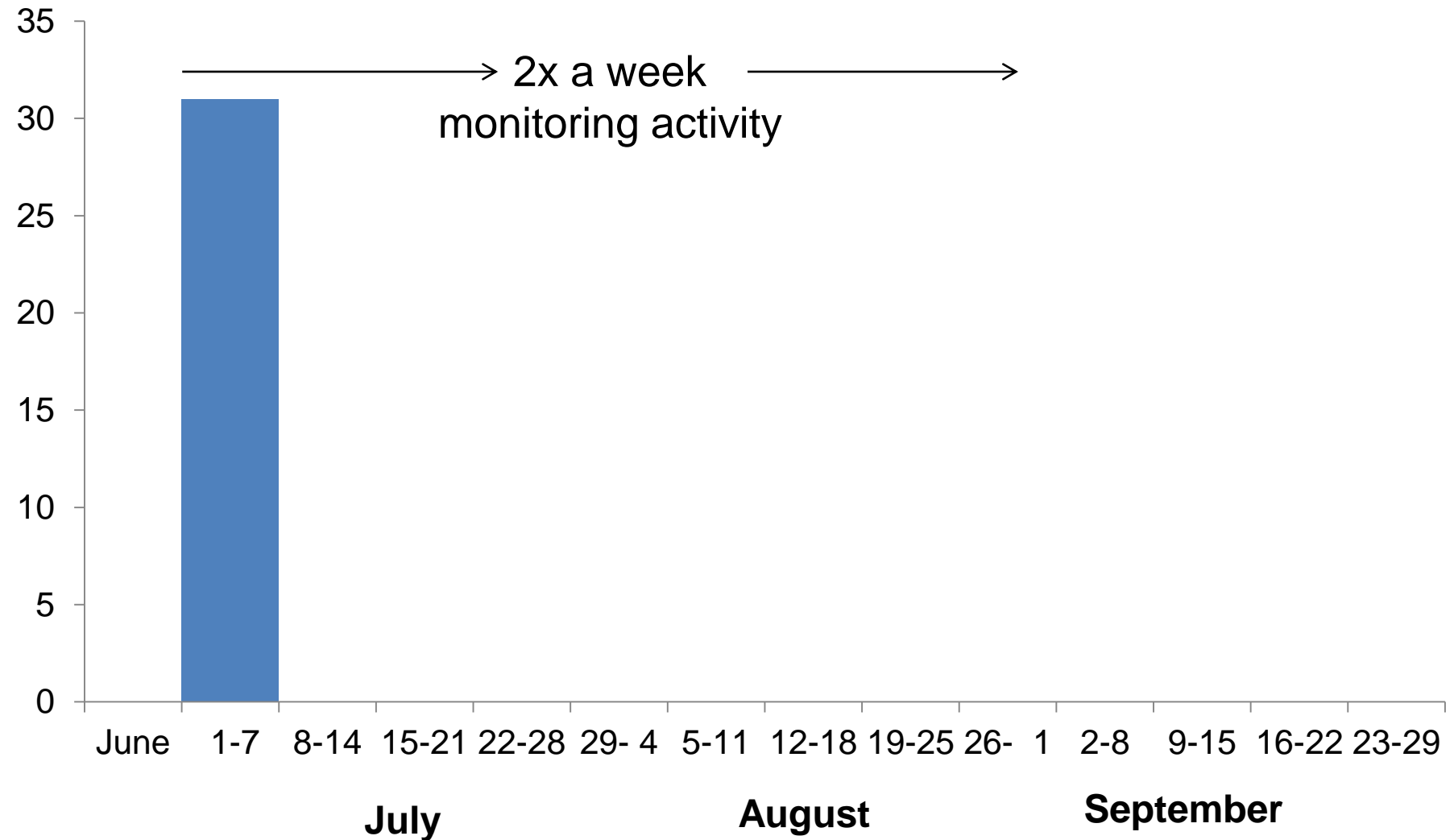
- To regulate the total ban of shellfish
- To create a local task force
- To conduct coastal clean-up.



Public Health Impact

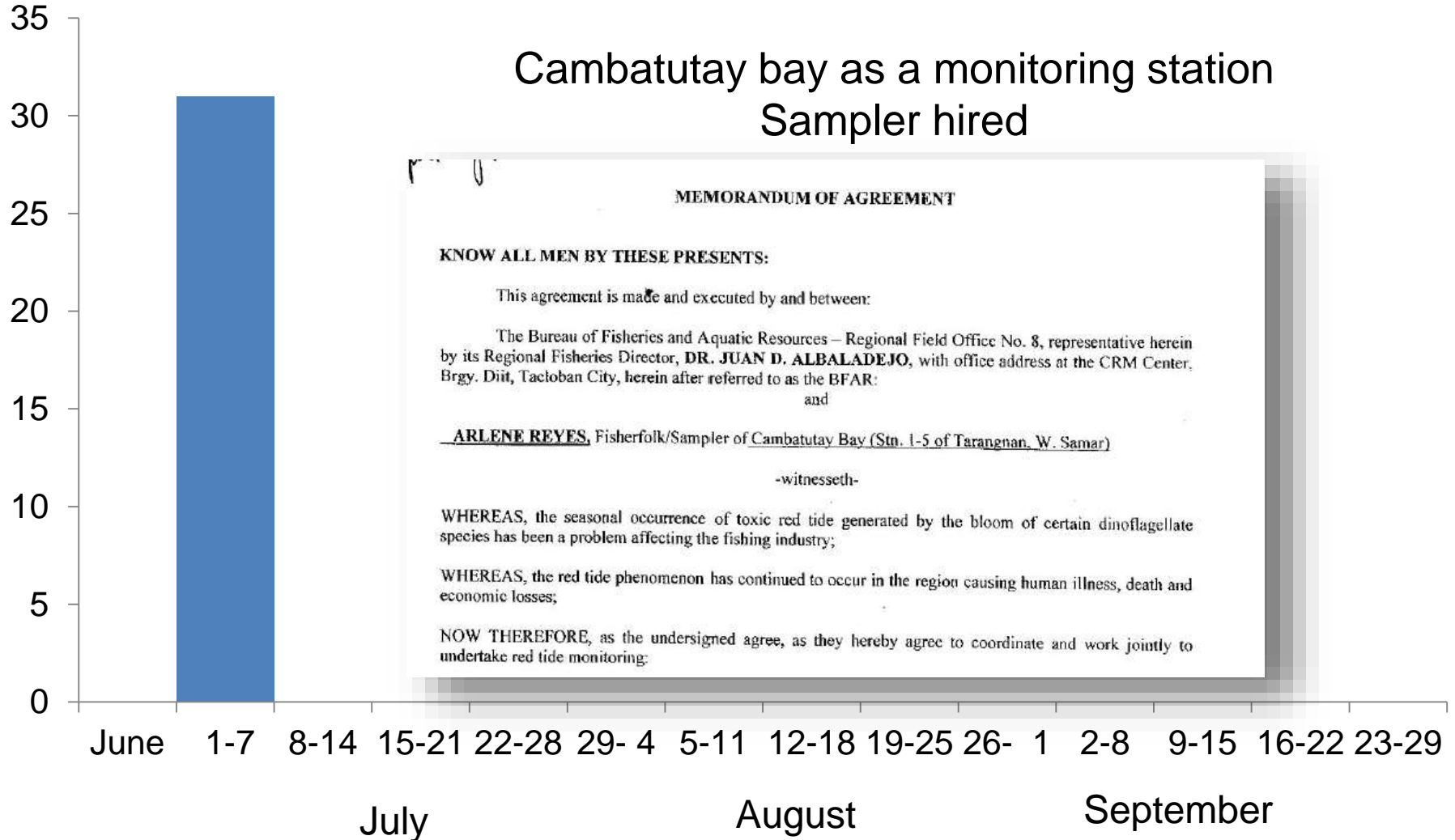
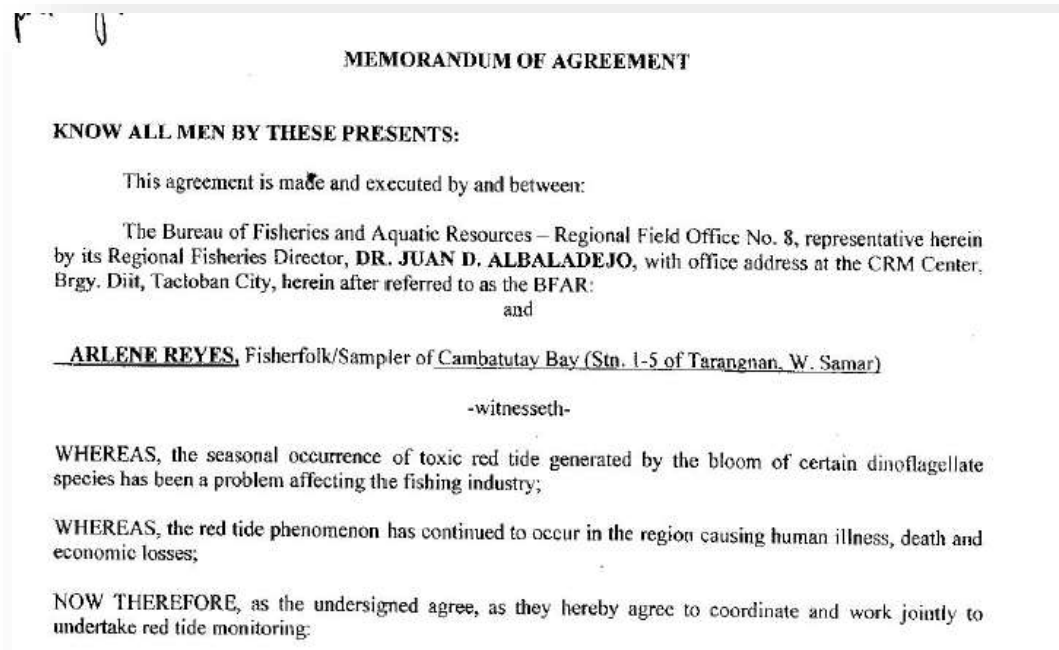


Public Health Impact

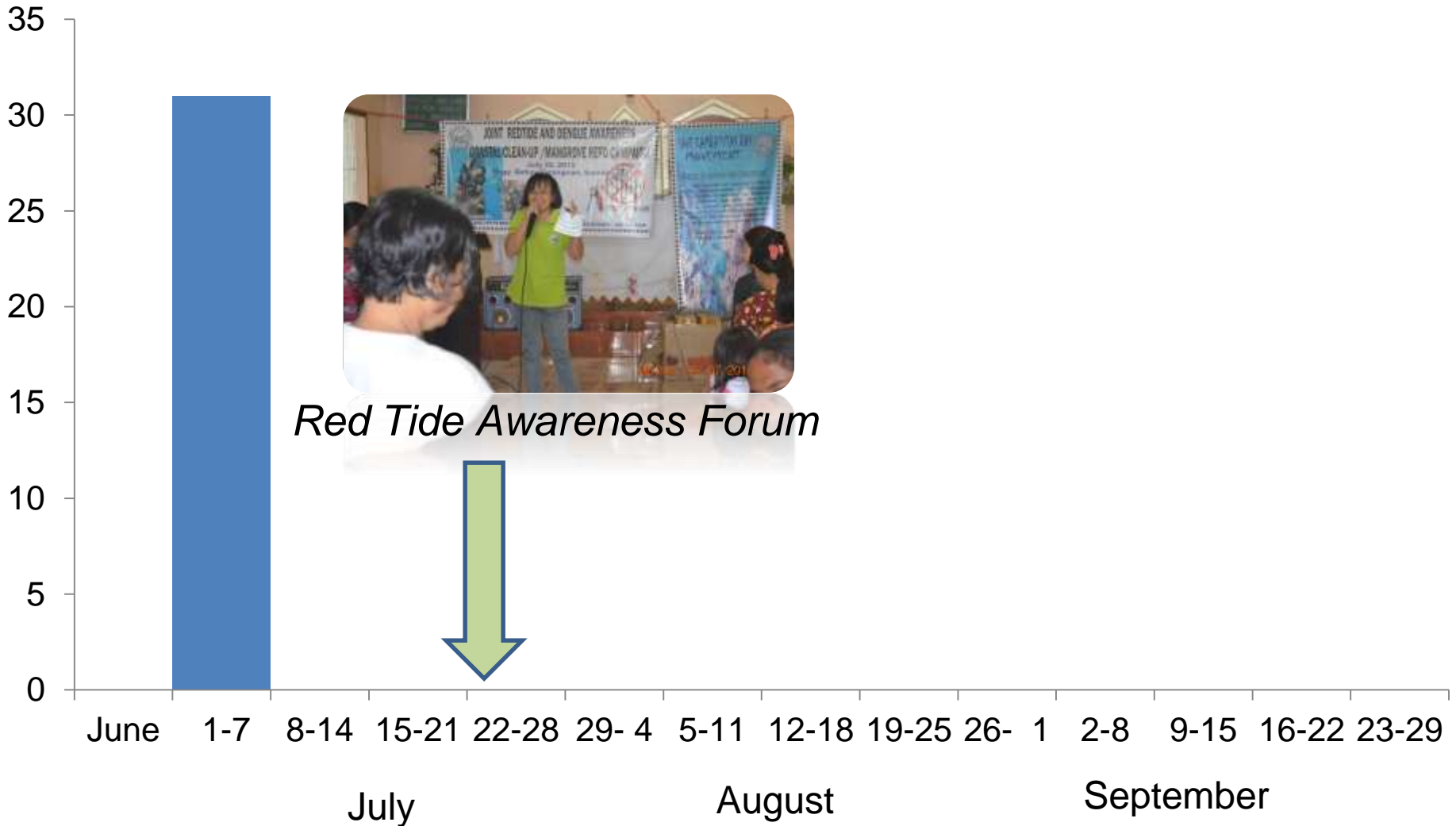


Public Health Impact

Cambatutay bay as a monitoring station
Sampler hired



Public Health Impact



Public Health Impact



Public Health Impact



Red Tide Awareness Forum



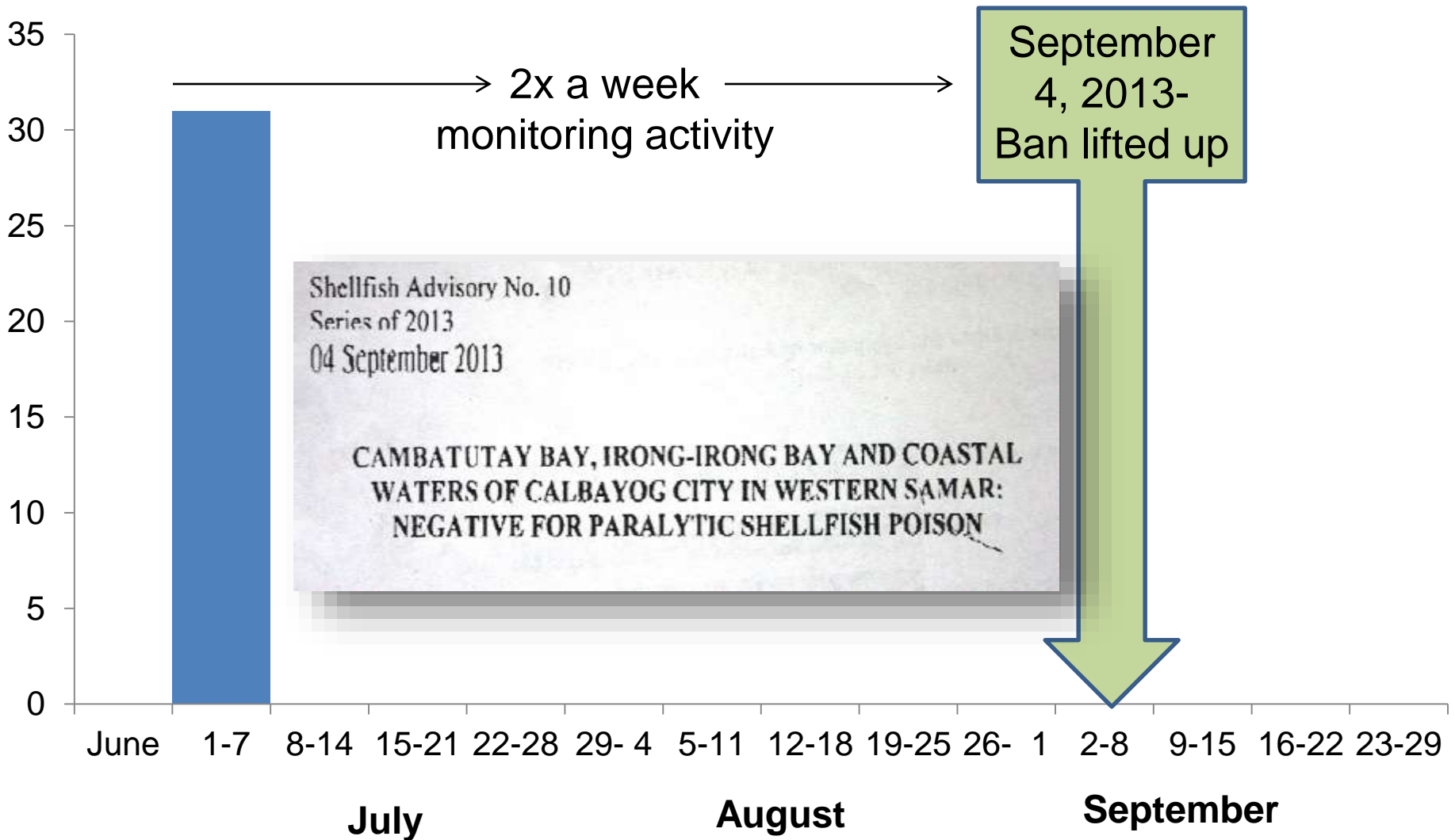
Save Cambatutay Bay Movement



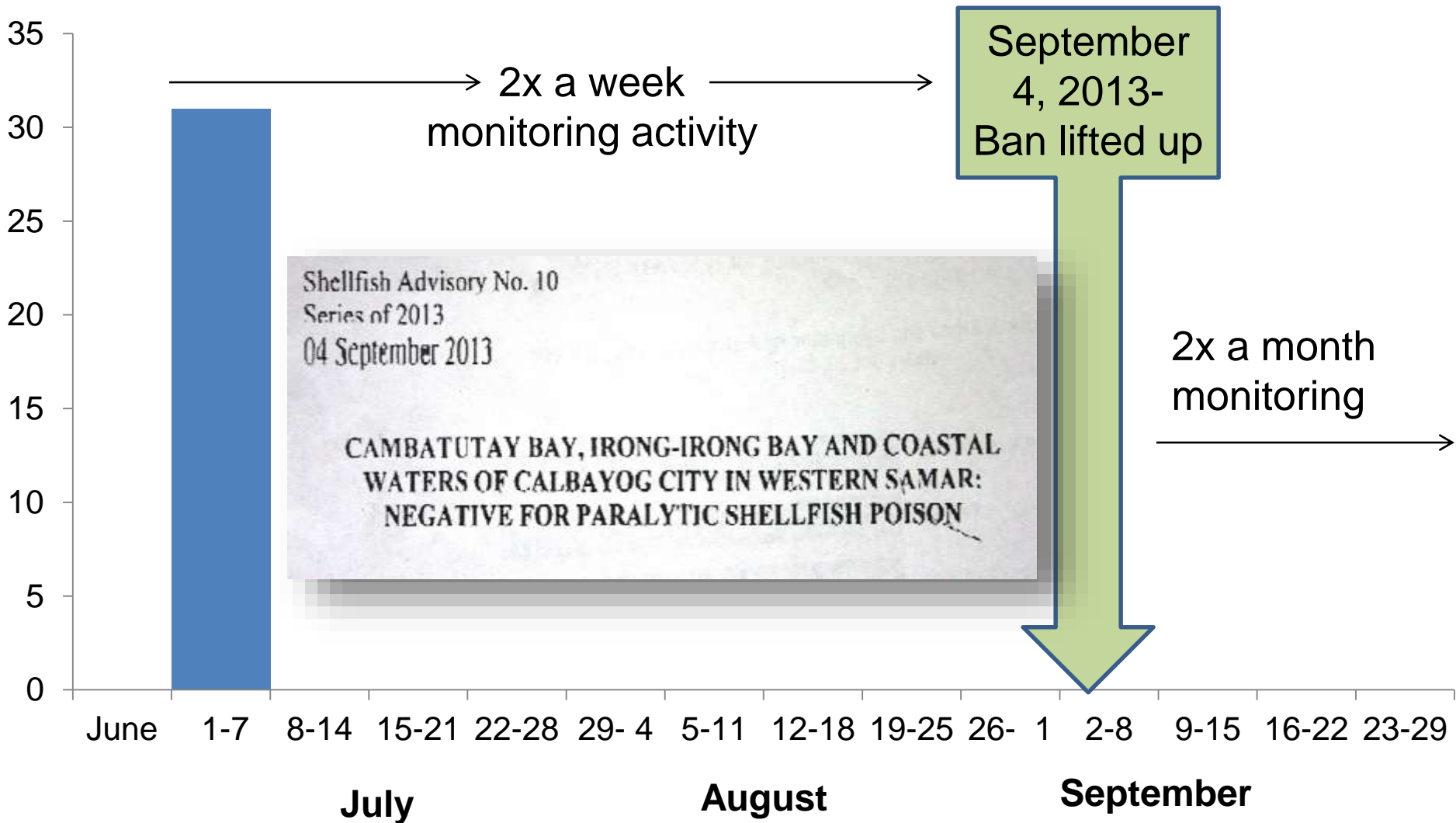
Coastal clean-up & Mangrove planting



Public Health Impact



Public Health Impact



ONE HEALTH



The One Health concept recognizes the interrelationship between animal, human and environmental health.