

Disaster Response
in
Small Island Countries:

Palau's Experience in Yap

"Isolated by Miles, Connected by Sea"

The Pacific Islands...Where?



The Micronesian Islands...where exactly?



About Yap...

- 100 square miles
- 22 of 134 islands inhabited
- 49.7 square miles – Yap Proper
- 11,000 people with 66% on the main island
- 34% of the population in the outer islands
- One hospital
- 50% live by subsistence farming and fishing activities

Super Typhoon Sudal...



On April 8, 2004



The Situation...

- Eight (8) shelters-mostly schools, gov't buildings
- 339 displaced pop. In shelters
- Pre-typhoon diarrhea outbreak
- Team Palau arrives Yap on April 18, 2004
- Incident Command Post established on April 19, 2004 in the Yap Memorial Conference Room.
- April 19-environmental assessment and interventions were developed
- April 19- interventions implemented in all shelters

The Team...Palau Public Health

1. Pearl L. Marumoto	Administrator Supervisor Incident Commander	Office of Emergency Planning & Response Vector Unit, Div. of Environmental Health Typhoon Sudal Public Health Response Operation
2. Bernard Sikyang	Sanitarian II Field Team Leader Env. Health Assessor	Food Safety, Div. of Environmental Health Typhoon Sudal Public Health Response Operation
3. Tmekei Ellis	Sanitarian I Field Team Leader	Consumer Protection, Div. of Env. Health Typhoon Sudal Public Health Response Operation
4. Burt Mobel	Sanitarian I Hazmat Medics	Vector Unit, Div. of Environmental Health Typhoon Sudal Public Health Response Operation
5. Basiano Kitalong	Technician III Equipment Tech	Community Health, Div. of Env. Health Typhoon Sudal Public Health Response Operation
6. Alex Sumor	Technician III Chemical Tech	Consumer Safety, Div. of Env. Health Typhoon Sudal Public Health Response Operation
7. Richard Tellames	Technician II Supplies/Materials	Vector Unit, Div. of Environmental Health Typhoon Sudal Public Health Response Operation

The Team...Yap Public Health

1. Dr. Victor Ngaden	Physician, Incident Commander	Yap Health Services Typhoon Sudal Public Health Response Operation
2. Lawrence Yug	Sanitarian III Field Team Leader	Field Team Leader Typhoon Sudal Public Health Response Operation
3. Alonsius Wag	Sanitarian II Field Team Leader	Environmental Health, Yap Health Services Environmental Health, Yap Health Services

Hospital Encounter

Table of Diarrhea & Vomiting:
Post Typhoon without Public Health Interventions for 8 days
April 9 to 17

Date	Number of Encounters	Total
April 9	1	
April 10	10	
April 11	7	
April 12	3	
April 13	12	
April 14	10	
April 15	20	
April 16	26	
April 17	11	
Total	100	100

Table of Diarrhea & Vomiting:
Post Typhoon with Public Health Interventions for 10 days

April 18 to 27

Date	Number of Encounters	Total
April 18	6	
April 19	6	
April 20	11	
April 21	8	
April 22	0	
April 23	3	
April 24	5	
April 25	1	
April 26	3	
April 27	3	
Total	46	46

Table of Injuries:
Post Typhoon without Public Health Interventions
for 8 days

No Interventions

Date	Number of Encounters	Total
April 9	0	
April 10	0	
April 11	3	
April 12	6	
April 13	4	
April 14	8	
April 15	4	
April 16	3	
April 17	0	
Total	28	28

Table of Injuries
Post Typhoon with Public Health Interventions:
for 10 days

With Interventions

Date	Number of Encounters	Total
April 18	1	
April 19	2	
April 20	3	
April 21	3	
April 22	5	
April 23	1	
April 24	2	
April 25	1	
April 26	4	
April 27	Not available	
Total	22	22

Learning Objectives:

- How 'low tech' environmental health services in small islands are effective mitigating tools.
- How cultural practices and traditional leadership are integrated in disaster planning and responses.
- Recognize the importance of mental response plans as part of public health emergency operational plans and responses.
- The importance of Emergency Operational Plans in small islands.

The Island of Yap and its Traditions... Stood Still.



The Community access...



- Meeting with the traditional leaders to get permission to enter villages.

The Community participation...



- Meeting with village members to explain our purpose.

Environmental Health Response

- Water Quality Education
- Toilet Installation
- Environmental Sanitation
- Solid Waste Management
- Vector Control

Water Quality Education



- Simple water treatment for personal hygiene and food preparation.

Do-it-yourself water treatment



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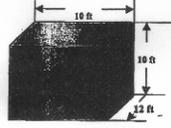


**DO IT YOURSELF
DISINFECTION OF DRINKING WATER FROM
MICROORGANISM**

1. **Boil your water to rapid boiling for a minimum of one minute. This will kill all known waterborne pathogens including coliform bacteria.**
2. **Using Clorox bleach to disinfect your drinking water. After addition of clorox the tank must be left overnight before consumption**

Water Volume	Regular Ultra Clorox
1 gallon water	3 drops
5 gallons water	10 drops or ¼ teaspoon
55 gallons water	2 teaspoons
845 gallons water	2/3 cup
1000 gallons water	3/4 cup

- **Calculation of Water Volume**
• A tank is 10ft wide and 12ft long and the depth of water is 10ft.



- $\text{Volume} = (\text{length})(\text{width})(\text{depth})$
- $= (12 \text{ ft})(10 \text{ ft})(10 \text{ ft})$
- $= 1200 \text{ cu ft} \times 7.48 \text{ gallons}$
- $= 8976 \text{ gallons}$

- **Calculation of Water Volume**
• The diameter (D) of a tank is 10ft and the depth of water is 12ft.



- $\text{Volume} = (0.785)(D)(D)(\text{depth})$
- $= (0.785)(10 \text{ ft})(10 \text{ ft})(12 \text{ ft})$
- $= 942 \text{ cu ft} \times 7.48 \text{ gallons}$
- $= 7046 \text{ gallons}$

- 1 cubic feet = 7.48 gallons
- 1 cubic feet = 7.48 gallons

Toilet Installation



- Use sphere standard of 1 toilet per 20 persons
- Multi-partnership toilet-hardware stores, public works, prisoners, villagers.

Environmental Sanitation



- Hand washing Campaign of “treated water” and 2% rubbing alcohol
- Emphasis of vector breeding sites

Solid Waste Management



- Control of solid wastes in shelters...

Vector Control



- Simple tasks of draining stagnant water
- Chemical Applications-backpack spray w/ Cislin

Coverage...

- 8 shelters with 339 occupants
- 4 village meetings conducted (combined districts)
- 43 villages w/ estimated pop. Of 4,890 received water treatment and environmental health education
- 12 Cislin Spray Applications in shelters, 4 in villages
- 72 Mortein canister sprays distributed to households
- 9 toilets installed in all shelters
- 100 drums prepared for village toilets
- 100 toilet locations marked in all 43 villages
- Altocid applications island wide in all ponding systems for mosquito control. **1 bucket (10 kg) of pellets & 100 bricks**
- Written Public Health Intervention Plan for follow up activities in all shelters and villages during recovery phase

Disruption of daily life...



- Destroyed by salt water:
 - 'Taro' patch-main starch staple
 - Coconut trees basic ingredient for cooking

Multi-partnership efforts...



- The heavy equipment from Public Works
- Red Cross volunteers...Kids as greatest assets

Lessons Learned...

- Mental Health Responders were not available, no crisis services
- Respect Cultural practices and traditions
- Palau's Public Health Emergency Operational Plan proved effective in Yap
- Island hospitality was high!

Thank you...

- Yap Memorial Hospital
- Yap Environmental Health Team
- Yap Council of Chiefs
- Yap Governor's Office
- Palau Environmental Health Team

The Awe...



The Beauty of Strength.

Questions????

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