

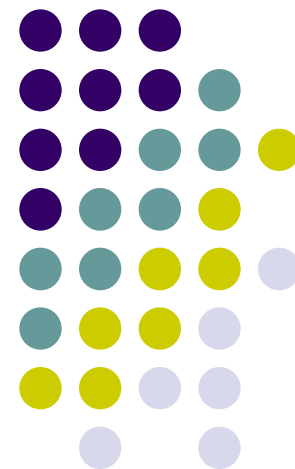
# Outbreak of probable foodborne ciguatera intoxication at a training center - Haiti, September 27<sup>th</sup>, 2013

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June 2014





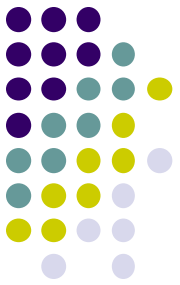
# BACKGROUND

# Foodborne Illness

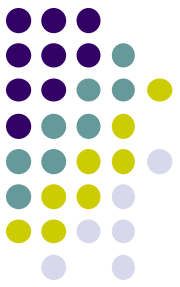


- Foodborne diseases are an important cause of morbidity and mortality worldwide
- In the United States, each year 76 million cases and 5,000 deaths are reported due to foodborne diseases
- In Haiti, foodborne diseases are typically not documented nor investigated

# Detection of the illness



- On September 27th 2013, the Haiti Ministry of Public Health was notified of many persons with gastrointestinal illness at a residential adult training center in Petion-ville
- The training center has:
  - approximately 1, 200 trainees
    - Entry-level: 1,150 trainees
    - Advanced-level: 50 trainees
  - a cafeteria that provides meals twice a day



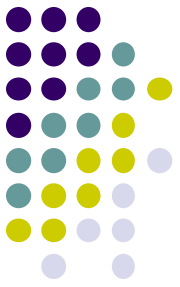
# Detection of the illness

- The illness was of sudden onset and characterized by stomach cramps, diarrhea, nausea, vomiting, itching and dizziness
- Many reported eating a buffet lunch on September 27
- FETP was invited to investigate the illness



# OBJECTIVES

# Objectives



- To characterize the illness in terms of time, place and person
- To identify the causative agent
- To identify risk factors associated with the illness
- To develop and implement prevention and control measures



# METHODS



# Data collection



- Review of medical records of the ill persons hospitalized
- Face-to-face administration of semi-structured questionnaire on paper to persons who ate the buffet lunch on September 27
  - hospitalized and non-hospitalized persons
  - food history, demographic and clinical data
  - prior verbal consent

# Case definition



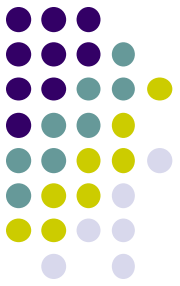
Trainees who, up to 48h after eating the buffet-lunch on September 27, developed one or more of the following signs

- stomach cramps
- nausea or vomiting
- diarrhea
- dizziness
- muscle pain or itching

# Laboratory



- Clinical samples: stools were collected from ill persons
  - *Shigella*
  - *Escherichia coli*
  - *Salmonella*
  - *Vibrio cholera 01 Ogawa*
- Environmental samples: water
  - residual chlorine test, ortholidine method
  - Bacteriologic – total coliforms E. Coli



# Inspection of facilities

- Hygienic conditions
  - Kitchen
  - Food storage area
  - Cafeteria
- Food storage and handling practices
- Cooking practices

# Data Analysis

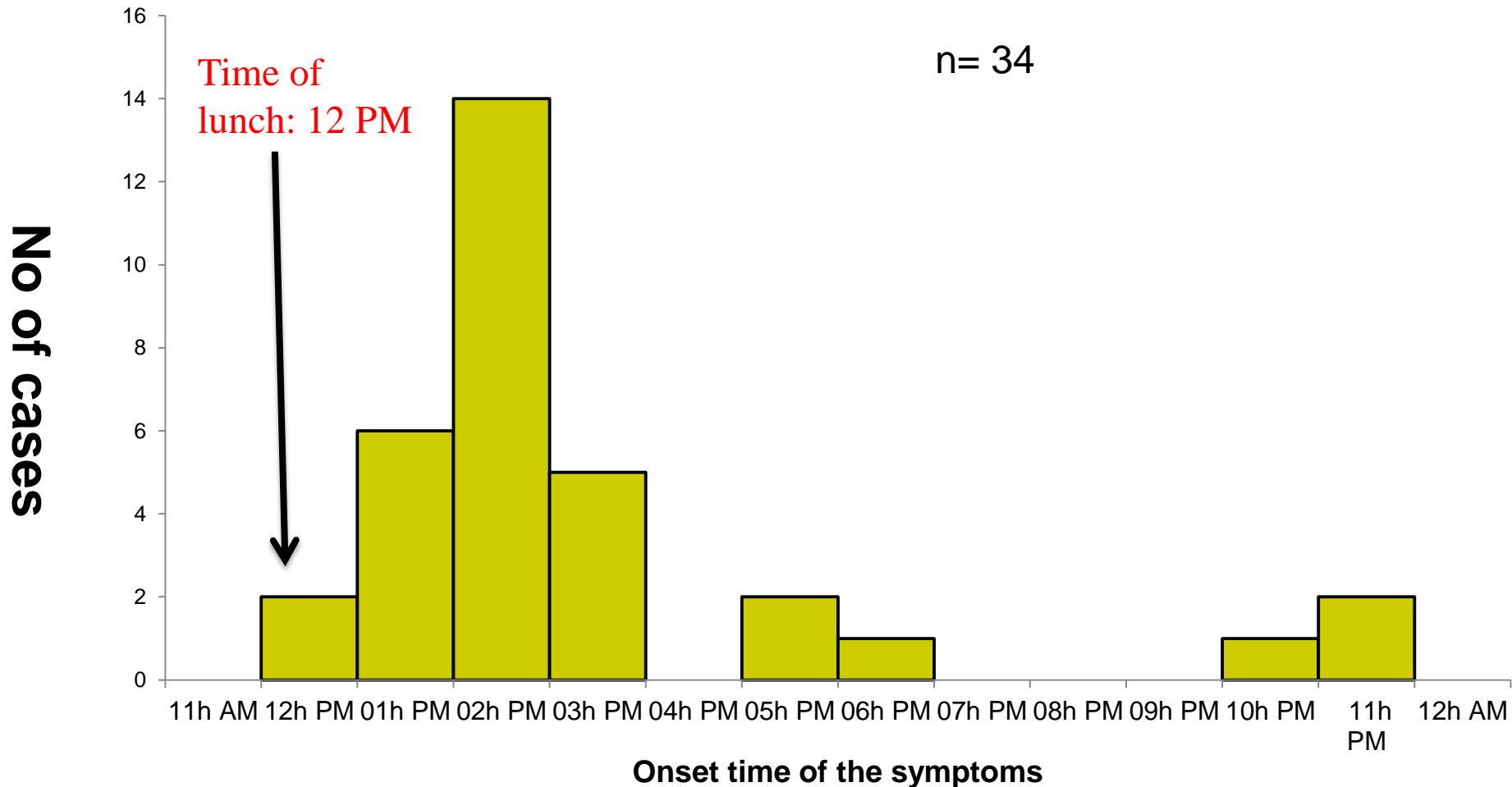
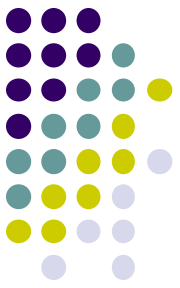


- Data compiled in Excel database
- Analysis: using Epi Info™7
- Calculations
  - Means, range
  - Frequencies, Chi-square, Fisher's exact
  - Rates of attack
  - Hospitalization and fatality rates
  - Relative risk with 95% confidence intervals

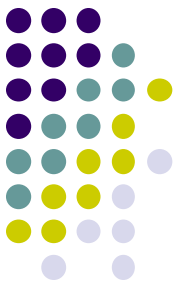


# RESULTS

# Temporal Distribution of Onset of Symptoms Among Cases - Petionville, Haiti, September 27<sup>th</sup>, 2013



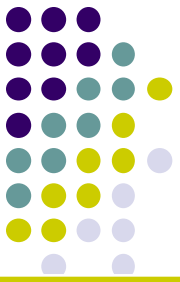
# Sociodemographic characteristics of the cohort (n=44)



Characteristics	No	%
<b>Gender</b>		
Male	32	72.7
Female	12	27.3
<b>Age group (Mean, Range)</b>		(41 years, 23-58)
20-29	3	6.8
30-39	8	18.2
40-49	32	72.7
≥ 50	1	2.3



# Sociodemographic characteristics of cases (n=34)



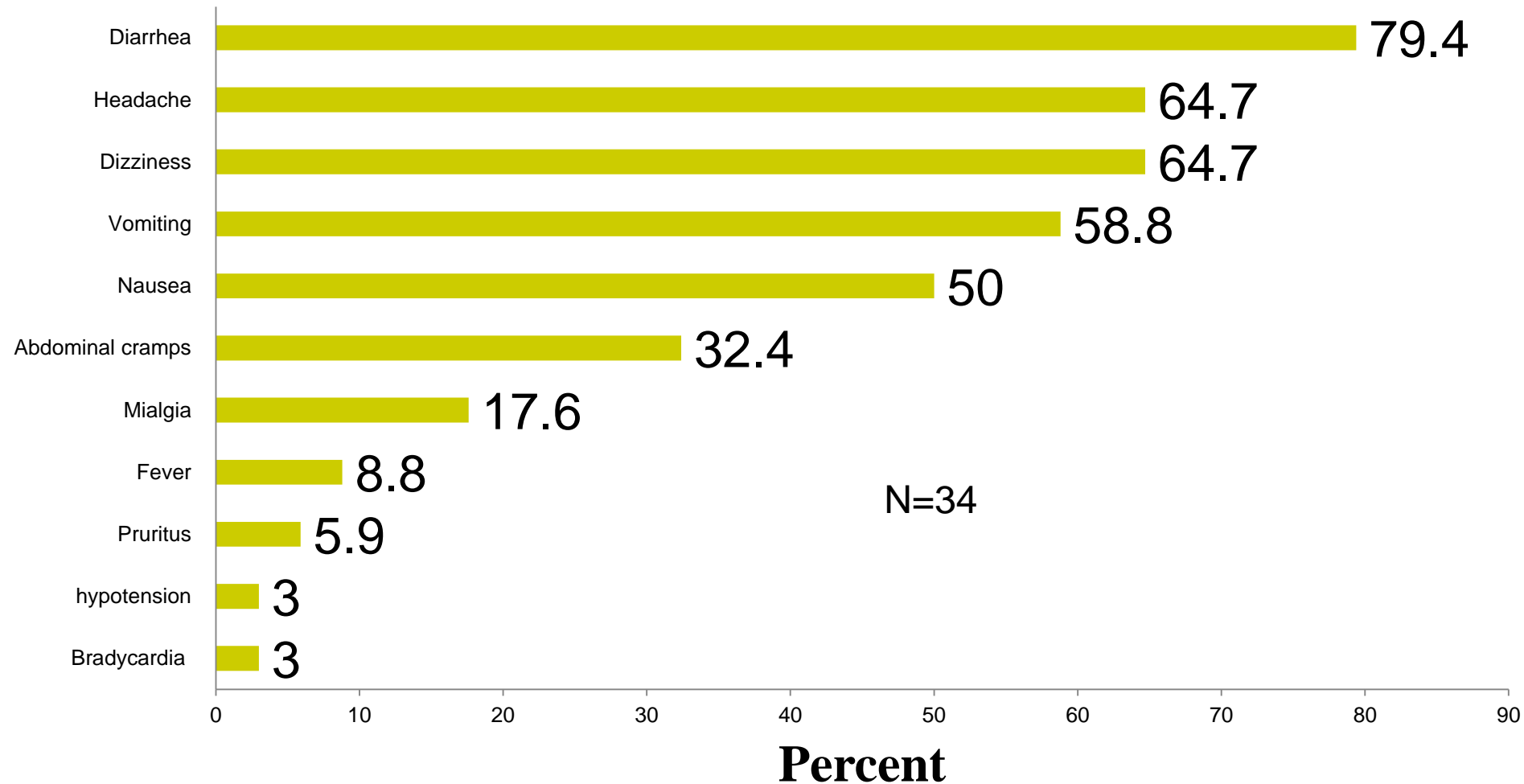
Characteristic	No	%	Attack rate (%)
<b>Gender</b>			
Male	25	73.3	78.1
Female	9	26.5	75.0
<b>Age group (Mean, Range)</b>	(42 years, 26-49)		
20-29	1	3.0	33.3
30-39	5	14.7	62.5
40-49	28	82.3	87.5

# Descriptive Epidemiology

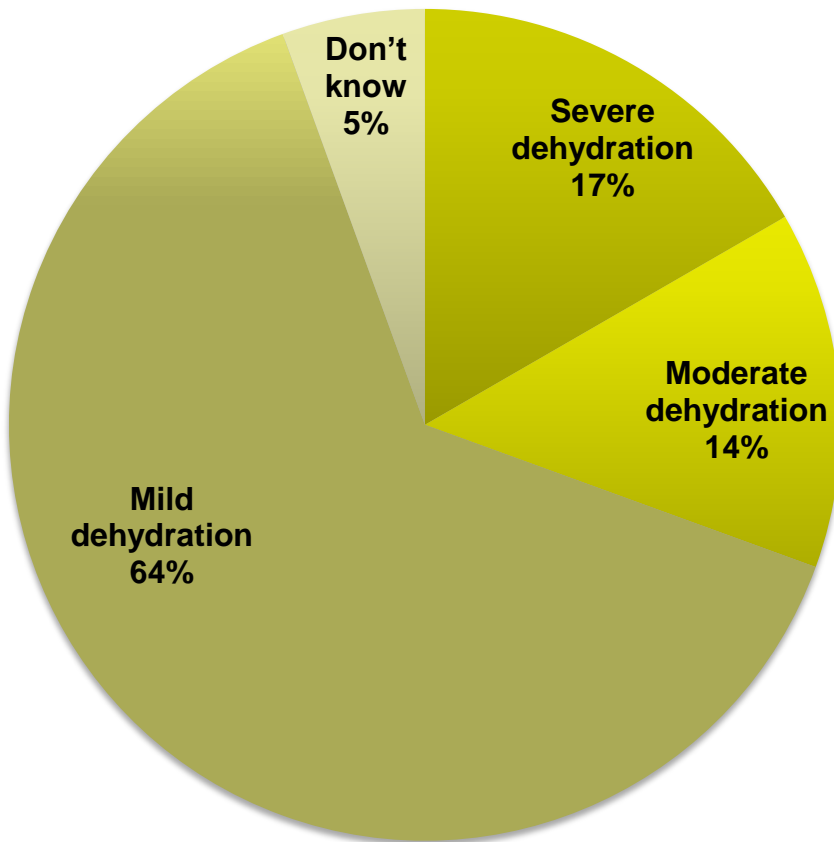


- 34 (77.3 %) trainees of the 44 who ate the buffet lunch became sick
- The median of duration between eating and onset of symptoms was 2 hours (range:15 minutes to 12 hours)

# Distribution of signs and symptoms among cases in a training center, Petion-ville, Haiti, September 2013



# Severity of illness (n=34)



- Hospitalisation rate: 49.0 %
- Fatality rate : 0%

# Hospital management



- The median between onset of symptoms and management of patients was 2 hours
- Main treatment was: rehydration
- Some patients had antibiotic



# Relative risk of food consumed by the trainees, Petion-Ville, Haiti, September 2013

Risks factors	Number of persons consumed and sick	Number of persons who didn't consumed and became sick	RR	CI 95%
Rice	12	21	0.6	0.4-1.0
Wheat	21	11	1.5	0.9-2.2
Fish**	34	0	7.0	1.1-43.9
Salad	21	12	1.2	0.8-1.8
Mashed Potatoes	17	15	1.4	0.9-1.9
Grenadia juice	14	18	1.3	0.9-1.4
Orange juice	14	18	1.3	0.9-1.4



# Laboratory Results

- All (10) stools collected were negative for:
  - Salmonella
  - E. coli
  - Shigella
  - Vibrio cholerae 01 Ogawa
- Chlorine content of the water used for food preparation:
  - 0



# Inspection findings (I)

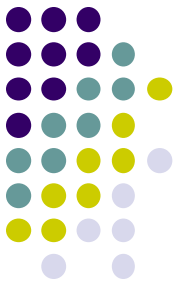
- Poor sanitation structures in the training center, including:  
kitchen, cafeteria, storage tank, storage
- Workers do not seem to master the techniques of food hygiene
- Food handlers had no medical clearance available





# Inspection findings(II)

- Food storage and conservation status does not meet the standards
- Products ready to be consumed are stored in the same place as other products such as semi cooked
- The labelling of food products is virtually absent and there were no leftovers for inspection



# DISCUSSION

# Ciguatera intoxication



- Occurs in persons within 24 hours after eating fish contaminated with ciguatoxin produced by dinoflagellates
- Incubation period: 1-48 hours
- Symptoms aren't specific and include digestive and neurological symptoms
- Generally, the digestive symptoms followed by neurological symptoms such as weakness in the extremities and cardiac symptoms such as bradycardia
- Most patients recover a few days after the intoxication



- Duration of symptoms
  - similar to the studies results of Arcila et al
    - the range of time for onset of symptoms is 20 minutes to 12 hours
- By the frequency of the symptoms
  - predominant symptoms were similar to the results obtain during the Yatsumoto study
    - gastrointestinal symptoms follow by neurological symptoms



## In this study

- A low percent of people had hypotension and bradycardia
  - It could be as a result of rapid medical intervention



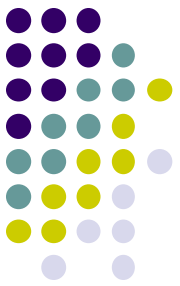
# Control measures

- Temporary closure of the cafeteria
- Decontamination of the site by chlorination
- Food handlers sanitary education (food preparation, hand washing)

# Limitations



- Inability to test leftovers foods for isolation of the toxin
- Failure to trace the source of the fish consumed in the buffet



# Conclusion

- First documented outbreak of ciguatera intoxication in Haiti

Table B-2. Guidelines for confirmation of foodborne-disease outbreaks (Chemical)

Etiologic Agent	Incubation Period	Clinical Syndrome	Confirmation
<b>Marine toxins - Ciguatoxin</b>	1-48 hrs; usually 2-8 hrs	Usually gastrointestinal symptoms followed by neurologic symptoms (including paresthesia of lips, tongue, throat, or extremities) and reversal of hot and cold sensation	Demonstration of ciguatoxin in epidemiologically implicated fish  OR  Clinical syndrome among persons who have eaten a type of fish previously associated with ciguatera fish poisoning (e.g., snapper, grouper, or barracuda)





# RECOMMENDATIONS



- Since ciguatera is typically caused by large tropical reef fish such as barracuda, amberjack, etc., the disease can be avoided by not eating them
- A surveillance system should be established to detect ciguatera outbreaks caused by eating fish which can cause ciguatera



- Also we recommend to:
  - Train supervisory personnel and food handlers
  - Hire 2 health technicians to control environmental health
  - Apply the relevant principles of hygiene in the food supplies
  - Provide a refrigerator for storage for 48h sample food (cooked or raw)
  - Chlorinated drinking water
  - Set the storage of foods

# Acknowledgment



## **MOH**

Adrien Paul, Director of DELR

## **Training center**

Director of the training center  
and Director of Haitian  
community hospital

## **FETP Haiti:**

Dely Patrick

## **CDC Haiti:**

Jean Charles Nadia Phaïmyr

## **CDC Atlanta:**

Fred Angulo

Victor Caceres

Ilanit Kateb

## **CDC Central America:**

Reina Turcios

## **UVG**

Silvia Sosa and Salvador

Gimenez, Tutors

## **Tephinet**

Gloria Suárez-Rangel,

Consultant



**Thank you**