

Pinal outbreak February 2013



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Student Aid For Epidemiology Response (SAFER)

OUTLINE

- Objectives
- Background
- Analysis
- Results
- Limitations
- Conclusions
- Importance

Objectives

- Describe socio-demographic characteristics
- Determine incubation period
- Determine risk factors
- Determine Point Source

Background

- 2/23/2013 more than 1000 people ate at two separate shows at a local theater in Pinal County.
- Later attendants began to develop symptoms including: nausea, vomiting, and fever.
- The SAFER team at the University of Arizona, worked with Pinal County Health Department to interview 106 attendees (cases and controls) within a 4 day span after the event
- Cases: people who ate at either one of the shows on 2/23/2013 and developed digestive symptoms.
- Controls: people who ate at either one of the shows but did not develop digestive symptoms.

Analysis

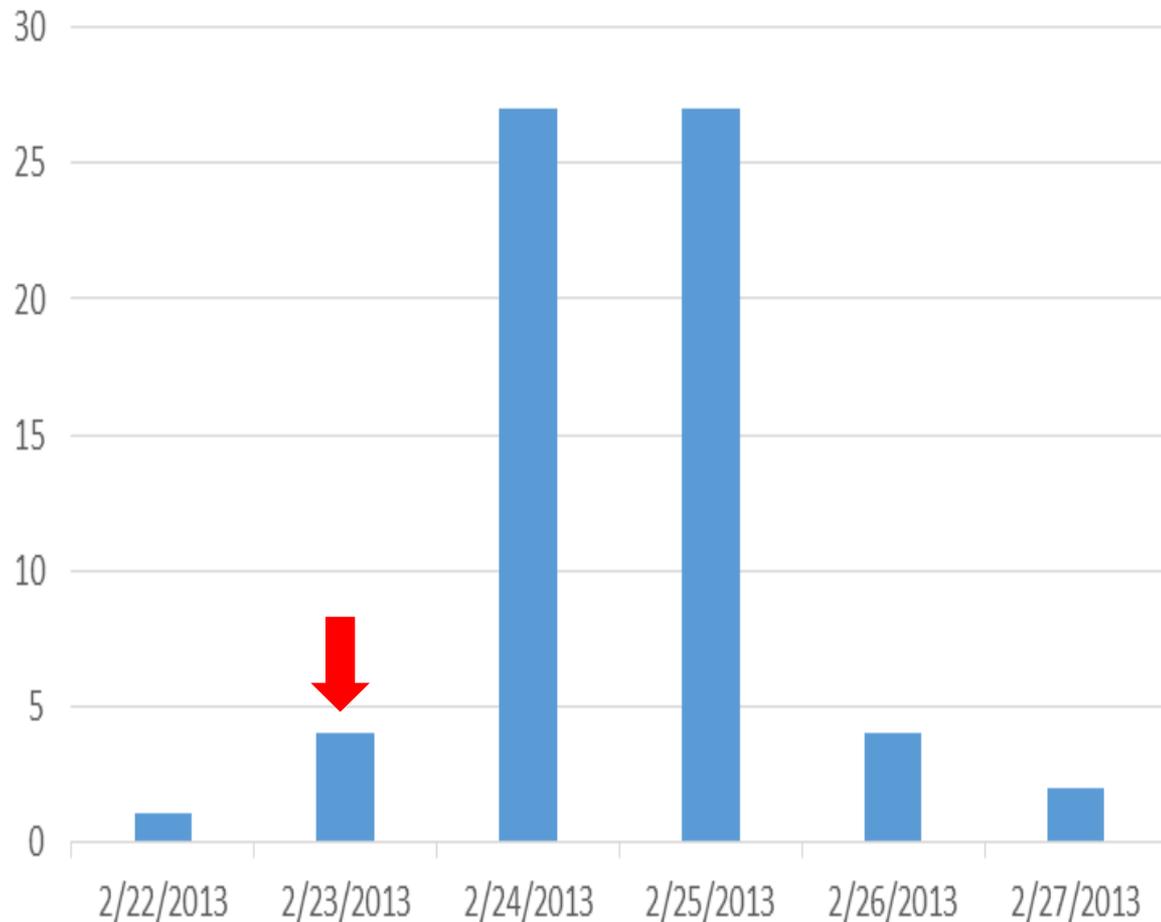
Time of show

	Matinee	Diner	Total
Cases	30	28	58
Controls	22	17	39
Total	52	45	97

The odds of showing symptoms (case) at Dinner compared to Matinee were 1.207 (95% CI: 0.49-2.96)

Onset of symptoms

Epicurve by onset date



The mean incubation period is 35.7 hrs with a range of 5.5 to 84.4

Demographic characteristics

STATE	Frequency	Percent
Arizona	69	81.2
Colorado	8	9.4
Canada	3	3.4
Arkansas	2	2.4
Indiana	1	1.2
Maine	1	1.2
Washington	1	1.2
Total	85	100

Most common symptoms

Symptoms	Count/population	Percentage
Nausea	53/63	84
Diarrhea	53/63	84
Weakness	51/61	83.6
Fever	13/57	22.8
Vomiting	38/62	61.3
Bloating	29/60	48.3
Dehydration	40/59	67.8

Analysis of risk factors

- Univariate analysis was performed to analyze the association between the consumption of food and the risk of developing the symptoms.

Gender

	GENDER		
	Female	Male	Total
Controls	18	24	42
Cases	24(38%)	39 (57%)	63
Total	42	63	105

This is not an error , it's just a weird coincidence.

Chicken

	chicken		
Case	Yes	No	Total
Yes	62	1	63
No	37	4	41
Total	99	5	104

OR= 6.7 (95%CI: 0.62 - 335.23) The Odds of having eaten chicken was 6.7 among cases

Gravy

	Gravy		
Case	Yes	No	Total
Yes	62	2	64
No	36	5	41
Total	98	7	105

OR= 4.3 (95%CI: 0.65 - 46.7)

Food

Variable	OR	95% CI
Chicken	6.7	0.62 - 335.23
Other main dish	2.1	0.45 - 13.26
Vegetables	2.72	0.59 - 13.96
Mashed potatoes	2.9	0.52 - 19.6
Gravy	4.3	0.65 - 46.7
Cake	1.12	0.33 - 3.64

February 23, 2013

Matinee

Stage

Saturday

- = Control
- = Case
- = possible case

Left Wing

LC

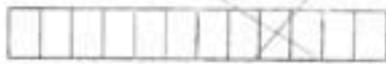
Left of Center

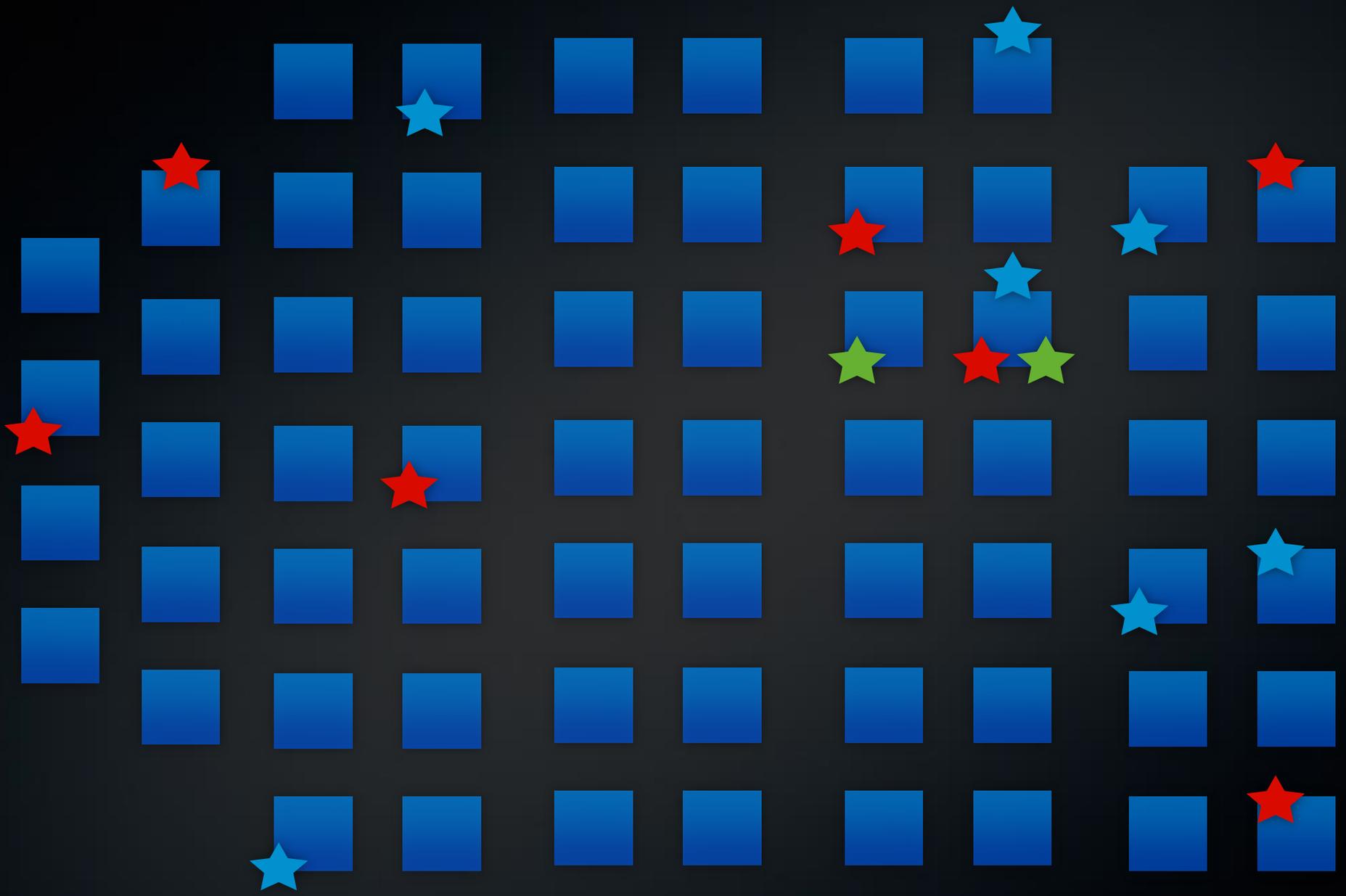
Center

Right of Center

RC

Right Wing





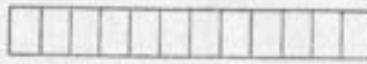
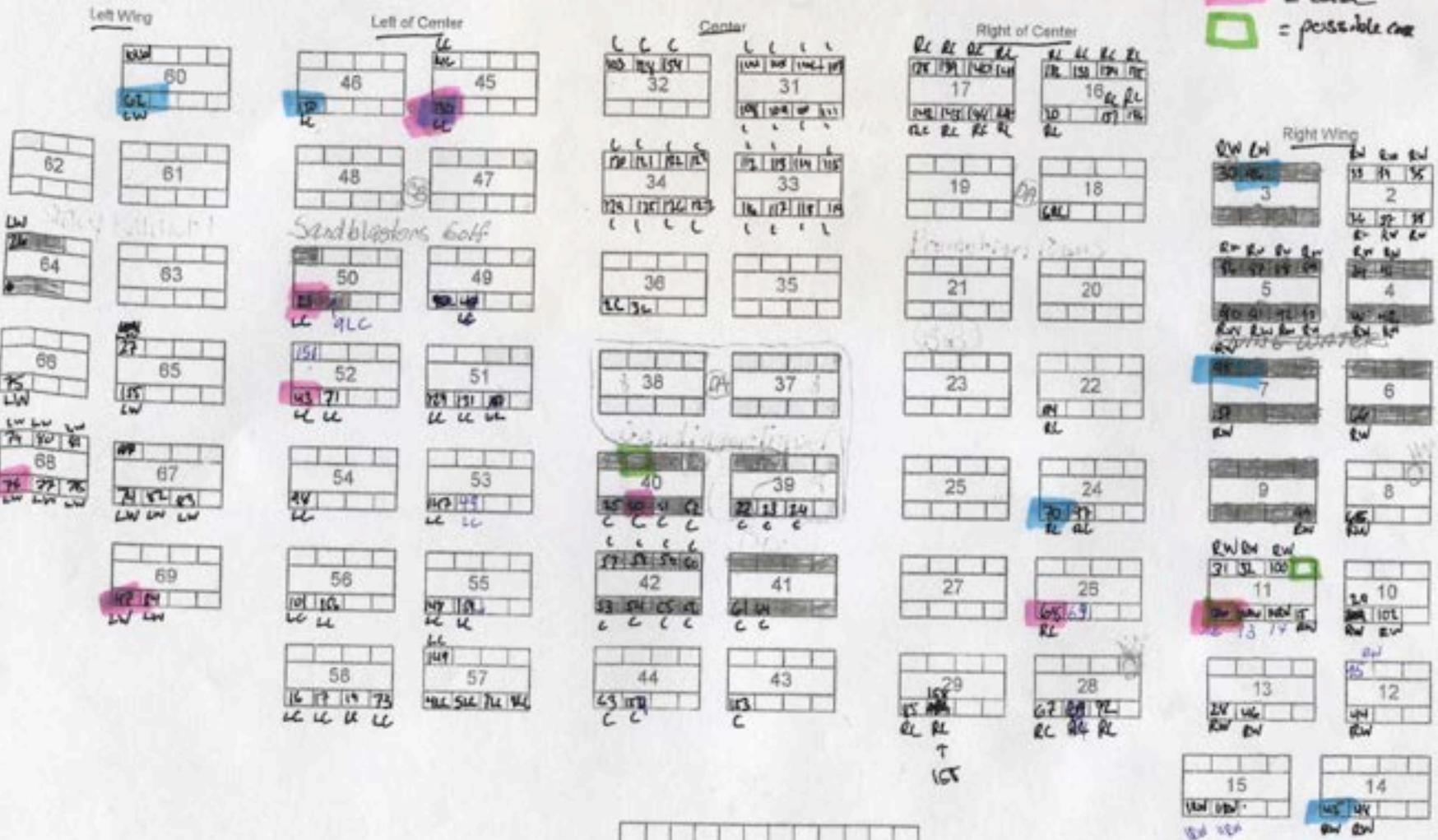
Key:  = Case  = Control  = Possible Case  

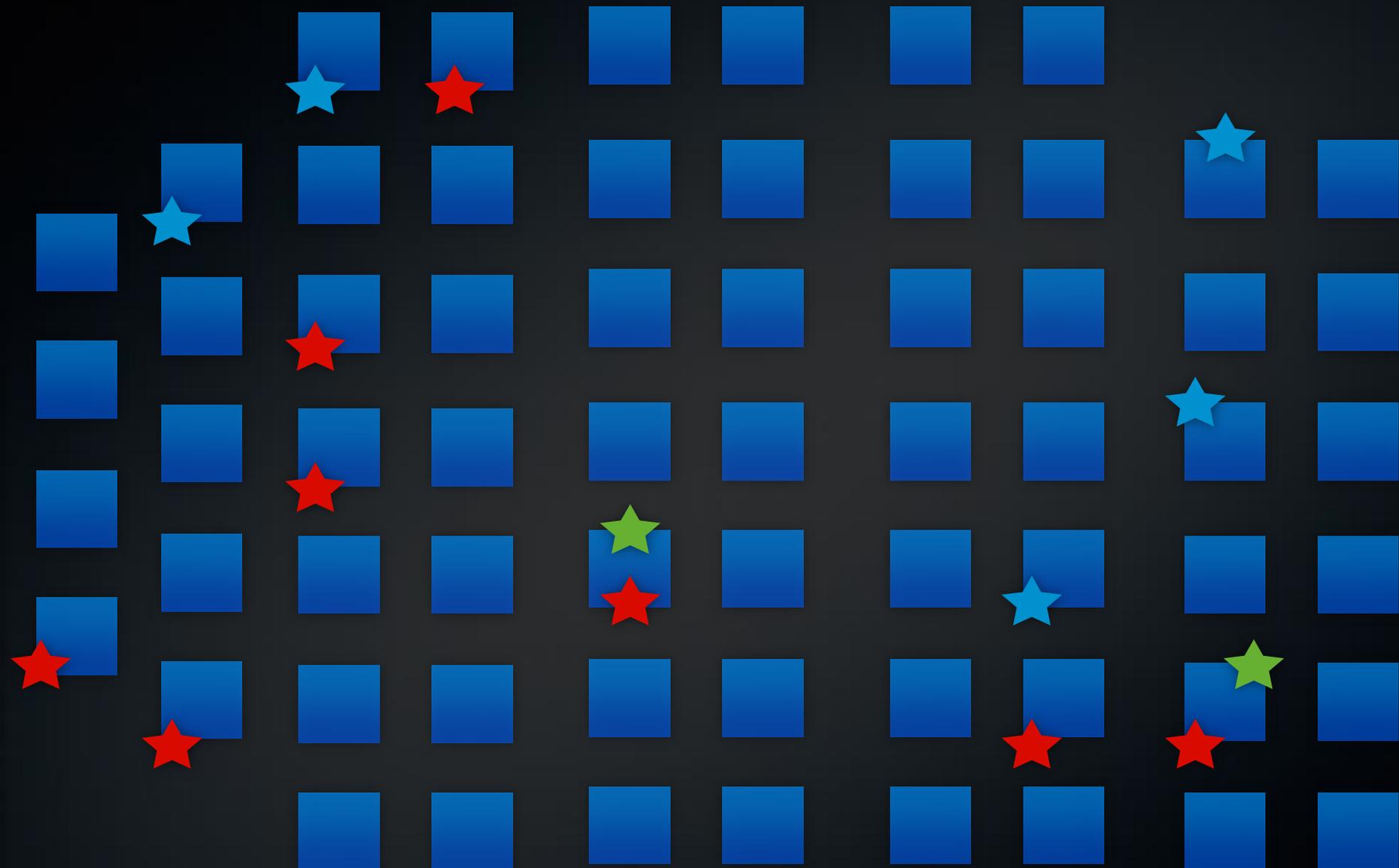
January 23, 2013

Stage Evening Show

Saturday

- = Control
- = case
- = possible case





Key: ★ = Case ★ = Control ★ = Possible Case



Results

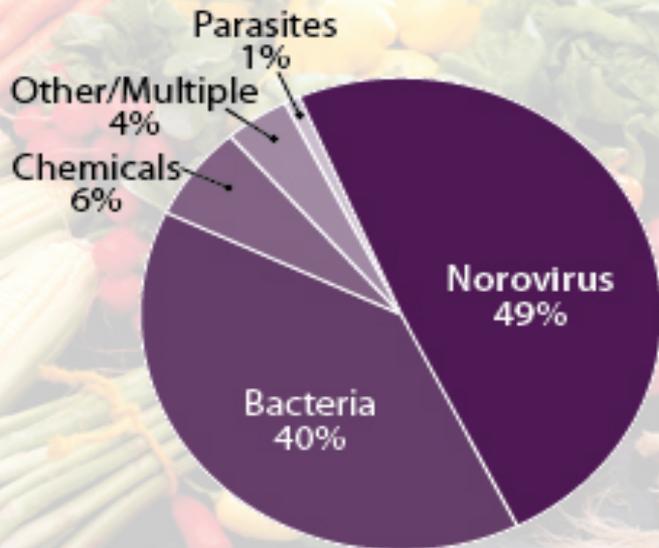
- 64 (60.4%) cases and 42 (39.6%) controls.
- The cases were later laboratory confirmed as Norovirus (type G2)

Limitations

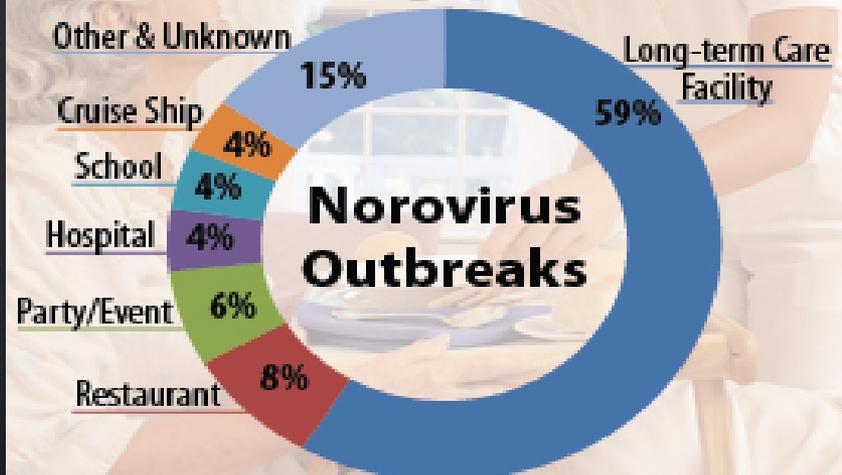
- ❖ Small sample size of unexposed limited the power and validity of the analysis.
- ❖ Not randomly sampled
- ❖ All personnel were not interviewed.

About Norovirus

Known Causes of Foodborne Illness Outbreaks, U.S., 2006–2010

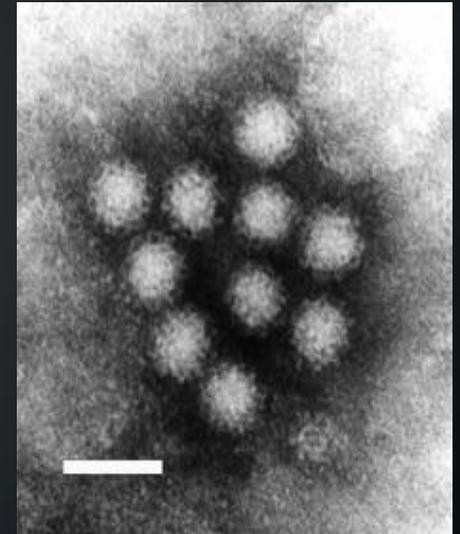


Setting of 1,518 Confirmed Norovirus Outbreaks, U.S., 2010–2011



About Norovirus (?)

- ~ Virus transmitted by fecally contaminated food or water; person to person contact
- ~ People of all ages affected
- ~ Rapidly inactivated by sufficient heating or chlorine-based disinfectants
- ~ Contamination by infected food handlers (people who prepare or serve foods at a restaurant or other place) causes most foodborne Norovirus infections
- ~ Norovirus is the most common cause of acute gastroenteritis in the United States. Each year, it causes about 21 million illnesses and contributes to about 70,000 hospitalizations and 800 deaths.*



• *CDC

Foods commonly involved in outbreaks

- leafy greens (such as lettuce)
- fresh fruits
- shellfish (such as oysters)
- But, any food served raw or handled after being cooked can get contaminated.

Conclusions

- 90% of cases became ill within 48 hr of the event(s)
- Cases predominately older citizens
- Common symptoms were nausea, diarrhea, weakness, and vomiting
- Chicken and gravy OR was high, but the difference was not statistically significant

Importance

- A graduate driven epidemiology response team allowed for "quick" questioning and analysis
- Thus highlighting the importance of cross-collaboration with other health departments at the local and state level.



Thank you!