



# Gastroenteritis following a Barbecue in Northern Ireland

## Exercise

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- ❖ Occurrence of more cases of a disease than expected
  - In a specific area
  - In a specific population
  - Within a specific time period





1. Confirm outbreak
2. Confirm diagnosis
3. Make a case definition
4. Identify cases and obtain information
5. Describe data: time, place, person
6. Develop hypothesis
7. Test hypothesis: Analytical studies
8. Implement control measures
9. Communicate results



# PART I.3 INCUBATION PERIOD FOR COMMON GASTROENTERIC PATHOGENS/TOXINS

Pathogen		Incubation period
Bacteria	Campylobacter	2-5 days (range 1-10 days)
	Salmonella	12-36 hours (range 6-72 hours)
	Shigella	1-3 days (range 12-96 hours)
	VTEC	3-4 days (range 2-8 days)
Virus	Norovirus	24-48 hours (range 12-50 hours)
Parasites	Cryptosporidium	7 days (range 1-12 days)
Toxins	Staphylococcus aureus	2-4 hours (30 min-8 hours)
	Bacillus cereus	1-6 hours (range 1-24 hours)

❖ A **case** is defined as a person who attended a barbecue at Hotel X on 18 July 1995 and subsequently developed diarrhoea and/or vomiting

- *Who?*
- *Where?*
- *When?*



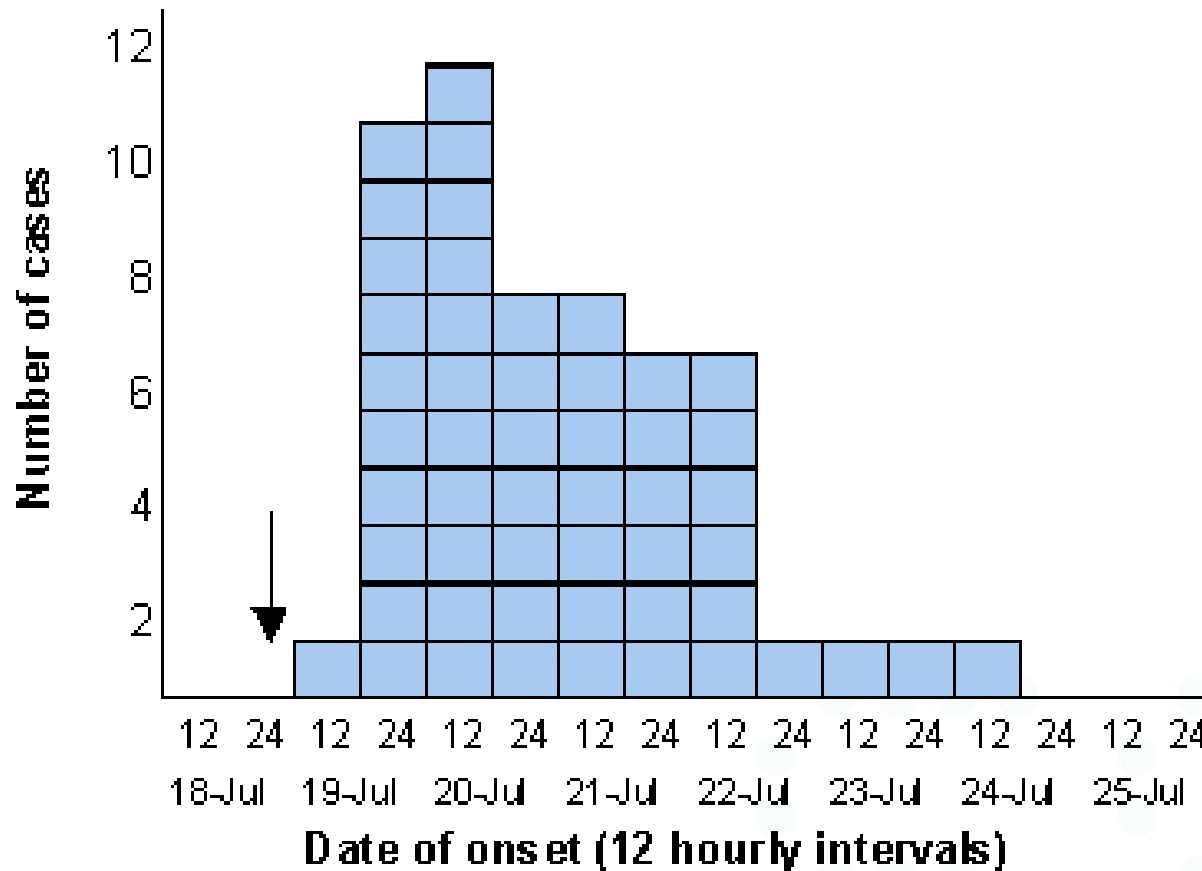


Figure 1. Gastroenteritis cases (n=52) by date of onset with 12 hourly intervals, barbecue, Northern Ireland 18 July 1995.

# PART III.12 ATTACK RATE AND RELATIVE RISK



FOOD	FOOD EATEN			FOOD NOT EATEN			RR
	Cases	Total	AR (%)	Cases	Total	AR (%)	
1. Rump steak	45	78	58	6	11	55	1.1
2. Beef burger	30	50	60	21	39	54	1.1
3. Pork chop	22	38	58	29	51	57	1.0
4. Pork sausage	26	48	54	25	41	61	0.9
5. Kipper	5	10	50	46	79	58	0.9
6. Baked potato	18	38	47	33	51	65	0.7
7. Potato Salad	22	29	76	29	60	48	1.6
8. Rice Salad	23	29	79	28	60	47	1.7
9. Mixed Salad	30	50	60	21	39	54	1.1
10. Egg Mayonnaise	21	28	75	30	61	49	1.5
11. Garlic Mayonnaise	4	5	80	47	84	56	1.4
12. Coleslaw	38	54	70	13	35	37	1.9
13. Bread	6	10	60	45	79	57	1.1
14. BBQ Sauce	2	4	50	49	85	58	0.9
15. Orange Juice	11	16	69	40	73	55	1.3



❖ Attack rate= AR

$$- AR_{\text{rump steak}+} = \frac{\text{Number of cases who ate rump steak}}{\text{total number of people who ate rump steak}}$$

❖ Relative risk = RR

$$- RR_{\text{rump steak}} = \frac{\text{Risk in individuals who ate rump steak}}{\text{Risk in individuals who did not eat rump steak}} = \frac{AR_{\text{rump steak}+}}{AR_{\text{rump steak}_-}}$$





# PART III.14 POOLED ANALYSIS



FOOD	FOOD EATEN			FOOD NOT EATEN			RR
	Cases	Total	AR (%)	Cases	Total	AR (%)	
Any food with mayonnaise	48	70	69	3	19	16	4.3

- ❖ Epicurve can tell us a lot about the nature of the outbreak
- ❖ Cohort studies are useful in buffet outbreaks (closed settings)
- ❖ Calculations of attack rate, odds ratio and relative risks are simple to calculate but can be difficult to interpret
- ❖ Statistical results can never stand alone (you have to hear what the patients/informants say)
- ❖ Study power is often difficult to achieve

