



FBI WEBINAR

Management of Food-Borne Illnesses Outbreaks

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Outline



- What is food-borne illness (FBI)
- What is FBI outbreak
- FBI detection
- FBI notification
- Outbreak management principles
- FBI investigation



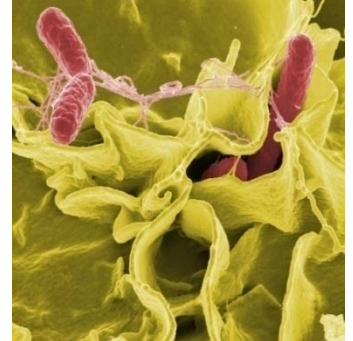
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3 What is a foodborne illness (FBI)



- Results from ingestion of contaminated food with disease causing agents
- There is a total of 250 illnesses that have been characterised
- Often recognised by the typical clinical features and incubation period
- Often have an enormous public health and economic implications



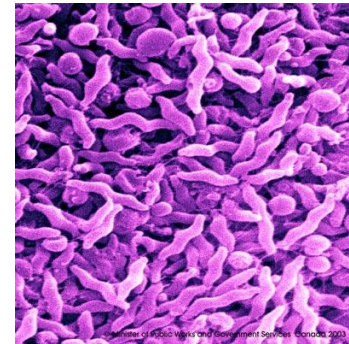
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What is an FBI outbreak? -1



- Two or more linked patients presenting with acute gastrointestinal, neurological, hepatic or hemorrhagic manifestation after having a shared common meal/beverage
- **Note:** *A food-borne illness is defined according to the specific agent causing the disease (for example, cholera, hepatitis A, salmonellosis, shigellosis).*
- A notifiable medical condition in South Africa



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What is an FBI outbreak? -2



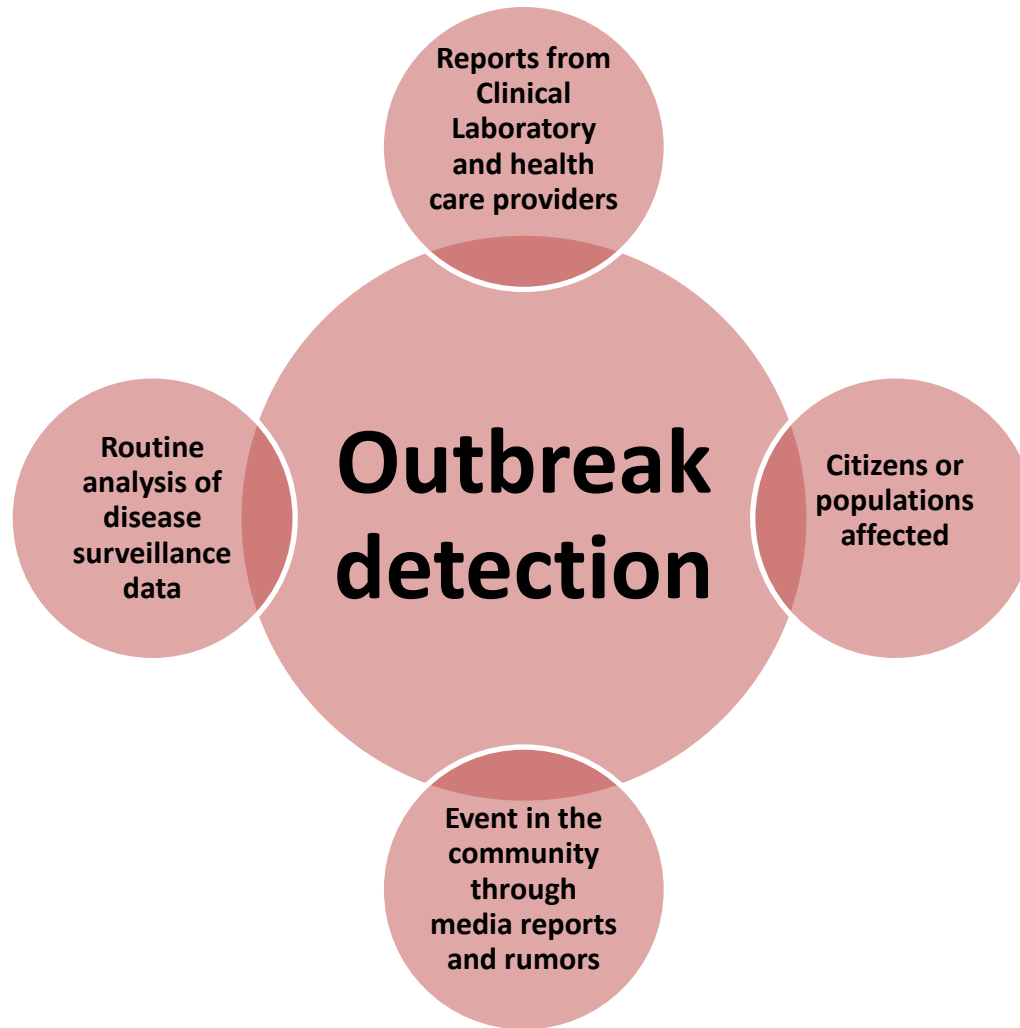
- Outbreaks may be localised to a few people who ate a common meal or product
- May also be geographically widespread, e.g. if food is contaminated prior to distribution and is widely consumed by many people in many different areas
 - Product recall have significant economic implications



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Outbreak Detection



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Notification of foodborne illnesses



Although food-borne illnesses can be severe or even fatal, milder cases are often not detected through the notification system

Because many food-borne illnesses are self-limiting many patients never see a doctor

As a result, many food poisoning cases and, at times resulting deaths, are not notified

It is essential that a **full epidemiological investigation** is conducted AND appropriate **environmental and clinical specimens** are obtained as a matter of **urgency**

Act quickly - patients frequently recover rapidly following illness onset and food samples are only available for sampling during a small window of opportunity



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Good outbreak management principles -1



Anticipation/prediction

so that epidemics be prevented



Preparedness

so there is readiness to respond



Early detection

to know when there is a problem



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Good outbreak management principles -2



Rapid Investigation

to describe the event and identify interventions



Effective Response

to implement appropriate control measures



Evaluation

to identify what went right and wrong before and during the outbreak



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Steps involved in outbreak investigation -1



There are several steps involved in an outbreak investigation.

- Don't necessarily occur sequentially,
- Not all the steps are involved in every investigation.
- Several steps are typically implemented simultaneously and may be ongoing throughout the investigation.

Provides a systematic way of approaching an outbreak

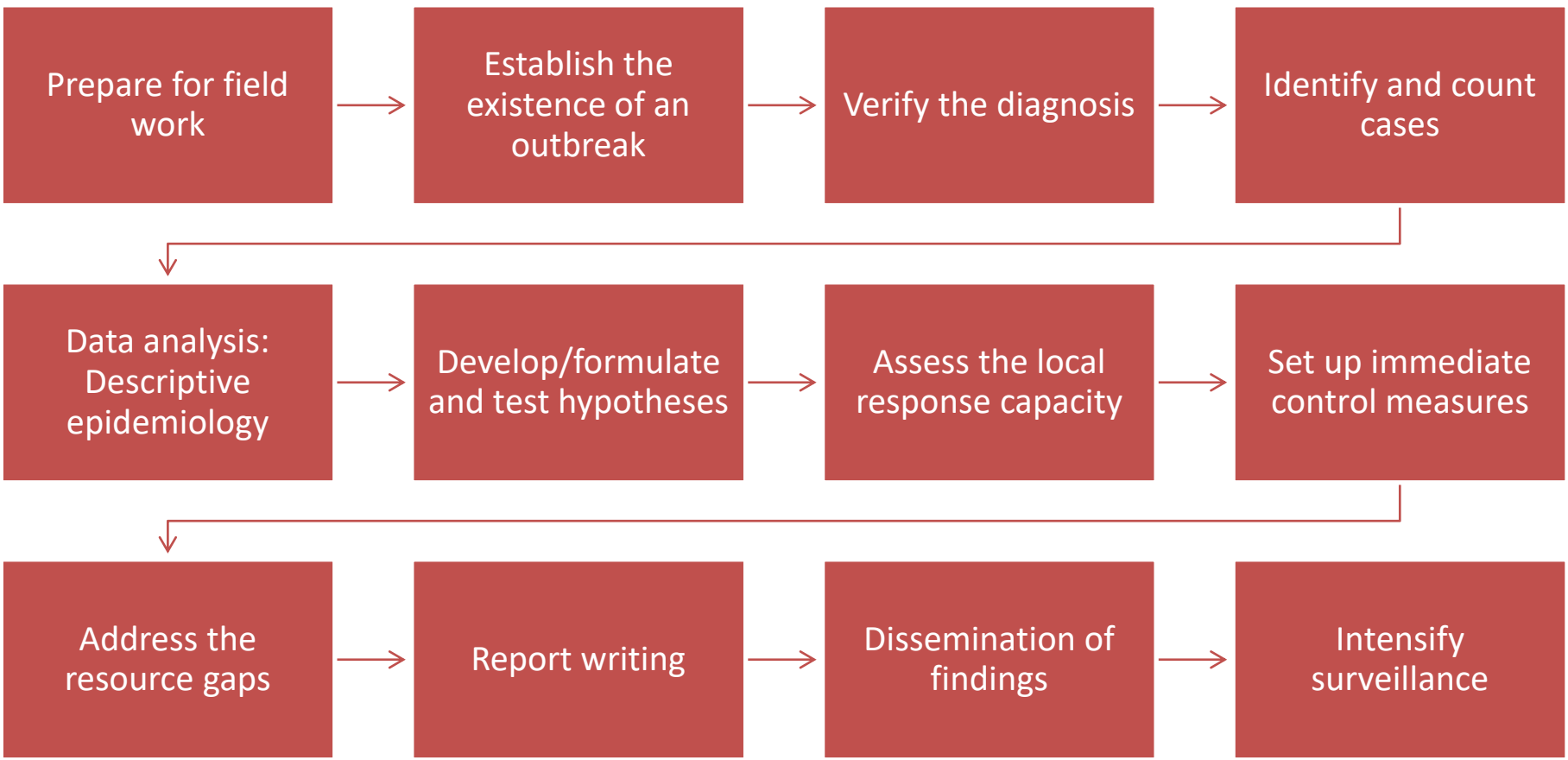
- Helps to collect sufficient and relevant information
- Allows accurate diagnosis of outbreak
- Implement appropriate control measures



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Steps involved in outbreak investigation -2



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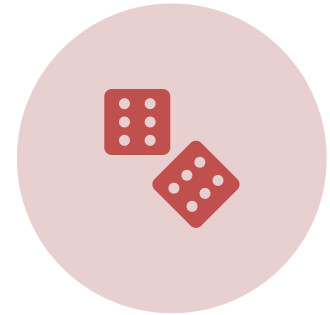
Identifying exposures: measures of association



ATTACK RATES



RELATIVE RISKS
(RR)



ODDS RATIOS (OR)



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Measures of association



Cohort design

- Use relative risk to measure association (calculate and compare attack rates)
- Group of people who share a common characteristic e.g shared a meal

Case control design

- Use odds ratio
- Cases compared to the controls (from the same population e.g shared a meal)



Odds Ratio



The ratio of two odds: the odds of exposure to a factor among cases and the odds of exposure to the factor among controls. An odds ratio tells us how many times higher the odds of exposure is among cases compared to controls.

OR = Odds of exposure in cases / odds of exposure in controls (non-disease)

Number of cases with the exposure ÷ number of cases without the exposure /
number of controls with the exposure ÷ number of controls without the exposure

$$= a \div c / b \div d$$

$$= ad / bc \text{ (2 by 2 table)}$$

	Ill	Well	TOTAL
Exposed	a	b	(a+b)
Unexposed	c	d	(c+d)
TOTAL	(a+c)	(b+d)	t

OR = Odds of exposure in cases / odds of exposure in controls (non-disease) = ad / bc



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Odds Ratio



Identify food/beverage consumed



Categorize and count the participants into

Those who consumed food/beverage

- Got Ill=?
- Well=?

Those who did not consume food/beverage

- Got Ill=?
- Well=?



Generate a table and calculate the odds of exposure and OR - for case control study/investigation method



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Interpreting Odds Ratio



Odds ratios are always between 0 and infinity.

An odds ratio of less than 1.0 means that the odds of exposure among cases is lower than the odds of exposure among controls. The exposure may be protective against the health problem.

An odds ratio of one (or close to 1.0) means that the odds of exposure among cases is the same as the odds of exposure among controls. The exposure is not associated with the health problem.

An odds ratio of greater than 1.0 means that the odds of exposure among cases is greater than the odds of exposure among controls. The exposure may be a risk factor for the health problem



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P-Value



Tests of statistical significance (e.g., chi-square, Fisher exact test) must be used to determine the probability that an observed relative risk / odds ratio could have occurred due to chance alone. This probability is called the p-value.



A very small p-value means that you would be unlikely to observe a particular outcome due to chance alone, if there were no association between the exposure and the disease.



If the p-value is less than some predetermined cut-off (usually 0.05 or a 5 in 100 chance), the association is then said to be statistically significant (real) and not due to chance.



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Preparedness



Education and training for both patients and staff

Systems to detect early, diagnose and treat patients

Availability of equipment and supplies

Protection of staff, non-epidemic patients and families

Communication with

Coordination with local and state public health authorities

Availability / recovery and reconstitution of the EPR teams.

Epidemic surveillance: case definitions

Actively monitoring alerts regarding potential natural or manmade epidemics

HCW should be vigilant and maintain a high index of suspicion when evaluating all patients (travel and exposure histories of suspected emerging pathogens)

Early identification and investigation very important in managing outbreaks



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Types of reports



REPORT	TIME FRAME
Notification report	Before any field investigation
Preliminary report	Within 24 hours after field work. Should include activities, findings and recommendations
Interim report	2-3 days after field work. Should include activities, findings and recommendations
Final report	Document the entire investigation. Done 14 days after investigation.



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How much details to include?



- Complexity of the report depends on
 - The type of investigation conducted
 - The extend of the outbreak
 - The audience of the report



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Basic structure of an outbreak report



Summary

Introduction and background

Objectives of investigation

Methods

Results

Description of response

Discussion, conclusion and lessons learned

Recommendations

Acknowledgements



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Role of CDC



Coordination

- Facilitate the development of guidelines for controlling, preventing, and managing epidemic-prone infectious diseases.
- Coordinate and offer technical support for preparedness and response efforts, including epidemiological investigations and outbreak response coordination.
- Ensure effective coordination of laboratory surveillance activities to promptly detect outbreaks and monitor circulating pathogenic strains.
- Coordinate stakeholders' efforts

Event monitoring

- Establish mechanisms for systematically monitoring events and implementing and evaluating emergency preparedness and response (EPR) strategic plans.

Inter-country participation

- Participate in inter-country epidemic preparedness and response initiatives, such as those led by WHO or SADC.

Resource mobilisation

- Facilitate resource mobilization (human, financial, infrastructure, etc.) for rapid response and timely preparedness.

Information disseminate

- Disseminate information on disease outbreaks to the public, health authorities, neighboring countries, and the World Health Organization.

Reporting

- Prepare and submit reports to strategic managers and political leaders, including Directors General, Ministers, parliament, and cabinet members.

The role of an Outbreak Response Team



Outbreak Response Teams are coordinating committees for immediate response to public health events.

Membership are technical & non-technical from health and other sectors

Committee should meet regularly.

Review investigation results and data analysis to select appropriate response activities

Develop & oversee the implementation of EPR strategies, plans & SOPs.

Develop communication strategy for sharing information

Mobilize resources for emergency prevention and control

Monitor the use of the resources before, during and after the emergency event.

Coordinate the post-emergency evaluation & dissemination of findings



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Roles and Responsibilities of the Local RRT



01

District rapid response teams are field-based response teams

02

Investigate rumors, reported outbreaks, and other public health emergencies

03

Propose appropriate strategies & control measures

04

Initiate the implementation of control measures

05

Prepare detailed investigation reports



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Thank you



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