

INTRODUCTORY COURSE TO EPIDEMIOLOGY AND DISEASE INVESTIGATION

RIVERSIDE COUNTY
EMERGENCY MANAGEMENT DEPARTMENT
TRAINING PROGRAM



Dear participants,

- Thank you for participating in this course covering epidemiology and disease investigation.
- This course will take about 60 minutes to complete, but can be stopped and restarted at any time.
- For additional information on epidemiology or disease investigation, visit: <http://www.rivcohealthdata.org/>

If you need additional information, please contact the Emergency Management Department at 951-358-7100



COURSE INTRODUCTION

- This course is part of the Emergency Management Department Competencies Program
- This course is required for the intermediate and advanced levels of the certificate program
- As part of the countywide preparedness efforts, and the State and National requirements, this course is a tool to enhance responders' knowledge and skills in public health preparedness and emergency response



COURSE OBJECTIVES:

Upon completion of this course, participants will:

- Become versed in the terminology used in epidemiology and disease investigation
- Acquire basic knowledge of epidemiology and disease investigation
- Understand how to complete a disease investigation form
- As potential surge capacity workers, be better prepared to conduct a field investigation under the direction of Disease Control



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- History of epidemiology
- What do epidemiologists do?
- What is disease investigation?
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WHAT IS EPIDEMIOLOGY?

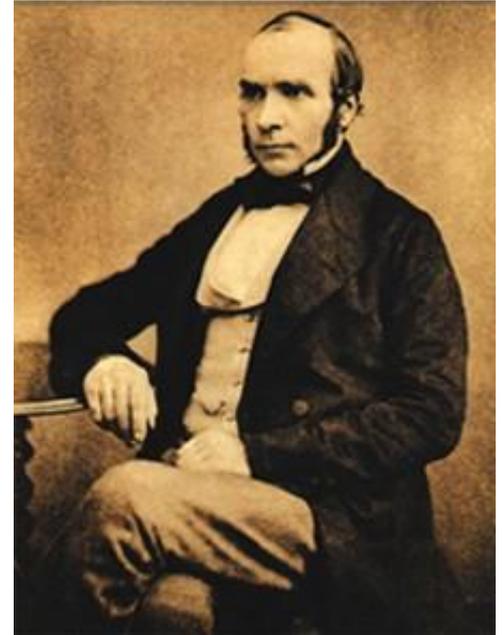
- Epidemiology is described as the study of the distribution and determinants of disease risk in human populations
- Epidemiologists study a diverse range of health conditions as well as the impact that various exposures have on the manifestation of disease



HISTORY OF EPIDEMIOLOGY

- The population-level study of death and disease started with the Scientific Revolution of 18th century Europe
- The origins of the observational study of disease occurrence began with Dr. John Snow's analysis of cholera epidemics in London
- From this achievement, epidemiology has become a comprehensive field that combines observational methods with analytic techniques to describe the risk of disease in qualitative and quantitative terms

John Snow 1813-1858



WHAT DO EPIDEMIOLOGISTS DO?

- Epidemiologists come from a variety of backgrounds e.g., physicians, nurses, or they may have a Masters or Doctorate in Public Health, specializing in many types of health research
- Within academic institutions, research topics include: infectious diseases, chronic diseases, cancer, cardiovascular disease, occupational, environmental, clinical, reproductive and perinatal epidemiology, genetics, and more



WHAT DO EPIDEMIOLOGISTS DO?

- State and local governments maintain departments of public health that perform surveillance and prevention work. The federal government, through the Centers for Disease Control and Prevention (CDC), performs surveillance and investigation- related activities in addition to health research
- Some of the roles of epidemiologists include to:
 - Conduct studies to examine the impact of various determinants of health
 - Conduct outbreak investigations
 - Examine the impact of diseases and conditions on populations



OUTBREAK INVESTIGATION

Steps to be taken



WHAT YOU MIGHT BE ASKED TO DO...

- **While the majority of tasks conducted during an outbreak investigation are carried out by Disease Control and County Epidemiologists, you too may have an important role to fill**
- **As a surge capacity worker you could be asked to help in conducting field investigations and may...**
 - Obtain specimens for laboratory examination
 - Interview case-patients or contacts to cases
 - Complete data collection forms



STEPS OF OUTBREAK INVESTIGATION

1. Prepare for field work
2. Establish the existence of an outbreak
3. Verify the diagnosis
4. Define and identify cases
5. Perform descriptive epidemiology
6. Develop theories
7. Evaluate theories
8. As necessary, reconsider/redefine hypotheses and execute additional studies
9. Implement control and prevention measures
10. Communicate findings

*These are the general steps for outbreak investigation, some of which will be completed prior to requesting assistance from surge capacity staff.



I A. ESTABLISH THE EXISTENCE OF AN OUTBREAK

- Outbreak or Epidemic
 - The occurrence of more cases of disease than expected in a given area or among a specific group of people over a particular period of time
 - Usually cases are related or there is a common cause
- Cluster
 - A grouping of cases in a given area over a particular period of time without regard to whether the number of cases is more than expected

How Department of Public Health staff would be notified of a possible outbreak

- Regular analysis of surveillance data
- More commonly, calls from health care providers or citizens about “cases”
- Confidential Morbidity Reports
- Laboratory Reporting



I B. MORE ON ESTABLISHING THE EXISTENCE OF AN OUTBREAK...

- Determine if the observed number of cases is greater than the expected number of cases
 - Compare with the number of cases from the previous few weeks or months or from a comparable period during the previous few years
- Where do you get the comparable data:
 - Health department surveillance records
 - Hospital discharge records, mortality statistics, cancer or birth defect registries
 - Apply rates from neighboring states or national data or conduct a telephone survey of physicians to determine case increases
 - Conduct a community survey to establish background or historical levels of disease



IC. IS THE EXCESS REALLY AN OUTBREAK?

- Excess may not necessarily indicate an outbreak
 - What else can contribute to an increased number of reported cases?
 - Reporting procedure changes
 - Changes in case definition
 - Improvements in diagnostic procedures
 - Increased interest because of media awareness
 - Increased awareness of health practitioners often leads to increased reporting



2. PREPARE FOR FIELD WORK

- Investigation
 - Assemble appropriate supplies and personal protective equipment (PPE), if needed
 - Familiarize yourself with the suspect disease
 - Assemble useful references and investigation forms which may be created for the outbreak, or it may be the California Department of Health Services (CDHS)/ CDC forms
 - Know who you will be interviewing and where they will be
- Administration
 - Arrange for a car or other transportation if needed
 - Keep track of your time including the preparation time, the County cannot be reimbursed unless this is done
- Consultation
 - Know your expected role in the field
 - Know who if anyone to report to when you arrive at your destination
 - Know who to call if you have questions



3. VERIFY THE DIAGNOSIS

- **Confirm that the problem has been properly diagnosed**
 - Rule out laboratory error as basis for increase in diagnosed cases
- **Review clinical findings**
- **Summarize clinical findings with frequency distributions**
 - Visit/interview several patients with the disease, using a standardized questionnaire
 - Gain better understanding of clinical features of the disease and patients affected by it
 - Gather critical information from patient
 - Helpful in generating theories about the origin and the spread of the disease

****** Most of these steps will be completed prior to requesting assistance from surge capacity staff.



4A. DEFINE AND IDENTIFY CASES

- **Establish a case definition**

- Case definition is a standard set of criteria for deciding whether an individual should be classified as having the health condition of interest
 - Includes clinical criteria and restrictions by time, place and person
 - Case definitions are based on criteria from the CDC or California Department of Health Services (CDHS)
- Case classifications
 - **Confirmed case:** A case that is classified as confirmed for reporting purposes. May also be epidemiologically linked case or laboratory-confirmed as a case
 - **Probable case:** A case that is classified as probable for reporting purposes. There may be supportive laboratory results or inconclusive laboratory results
 - **Suspected case:** A case that is classified as suspected for reporting purposes. Some diseases require laboratory confirmation for diagnosis regardless of clinical symptoms, others are diagnosed based on epidemiologic data
 - Suspect cases may be dropped when case definition is tightened over the course of the investigation



4B. DEFINE AND IDENTIFY CASES

- Identify and count cases
 - “Cast the net wide”
 - Use as many sources as you can
 - Enhanced passive surveillance
 - Sending out letters asking for reports
 - Active surveillance
 - Telephone or visit facilities to collect case information
 - Alert the public directly through local media
 - Conduct a survey if outbreak is in a restricted population
 - Cruise ship, school, work site, etc...
 - Ask case-patients if they know of anyone with same condition

*Most of the activities listed above are completed by Disease Control or Epidemiology and Program Evaluation (or other impacted programs)



4C. TYPES OF INFORMATION COLLECTED ON POTENTIAL CASES

- Standard case reporting forms should be used for data collection. Consult with Disease Control for the appropriate communicable disease investigation form to use for the specific disease being investigated
 - Information collected includes
 - Identifying
 - Name, address, phone
 - Demographics
 - Age, sex, race, occupation
 - Clinical
 - Date of onset, additional clinical info
 - Risk Factor
 - Tailored to specific disease being investigated
 - Reporter
 - Identifying who provided case report will allow you to seek advice and report back results of your inquiry



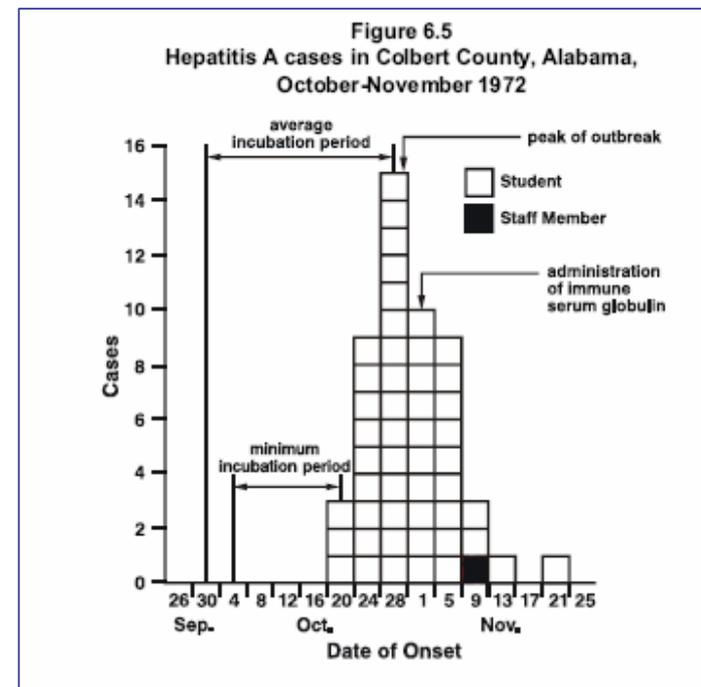
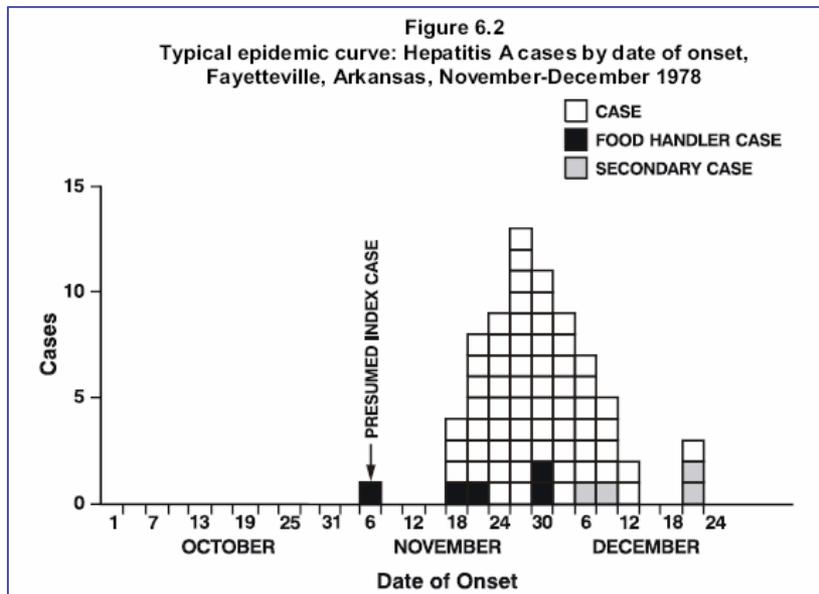
5A. DESCRIPTIVE EPIDEMIOLOGY

- The following 3 slides demonstrate what is done with information that you have collected in the field
- These analyses are typically done by County epidemiologists back in the office
- In the case of a multi-jurisdictional outbreak the analysis may be done by another county or CDHS



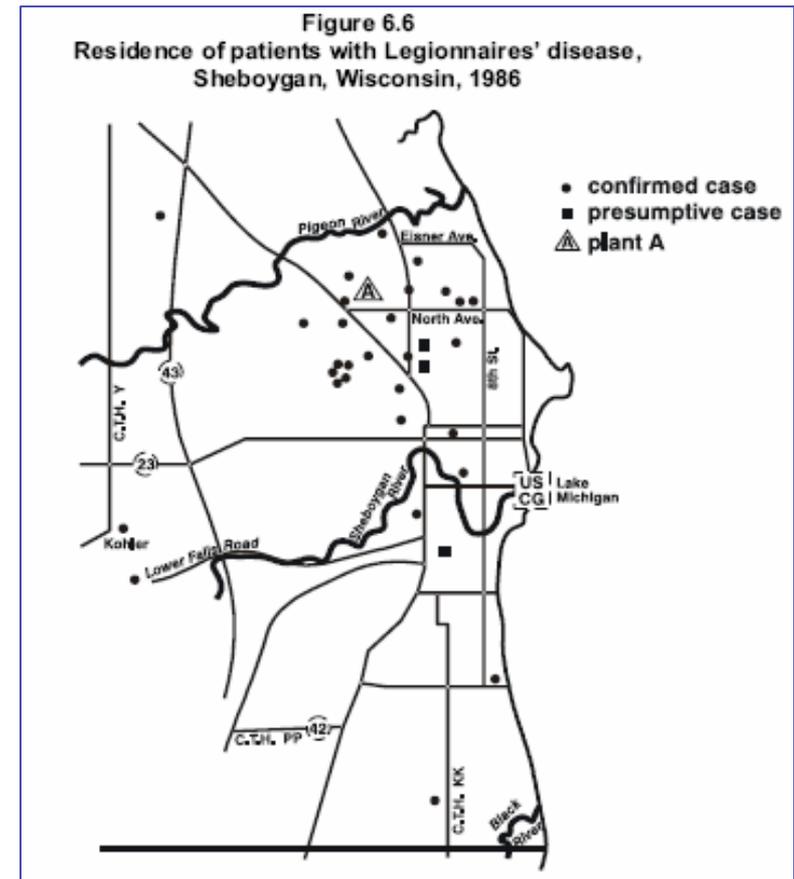
5B.TIME

- Epidemic curve
 - Depicts time course of the outbreak by drawing a histogram of number of cases by their date of onset



5C. PLACE

- Provides geographic extent of problem
- May demonstrate clusters or patterns that provide important etiologic clues
- Spot map useful for illustrating where cases live, work or may have been exposed

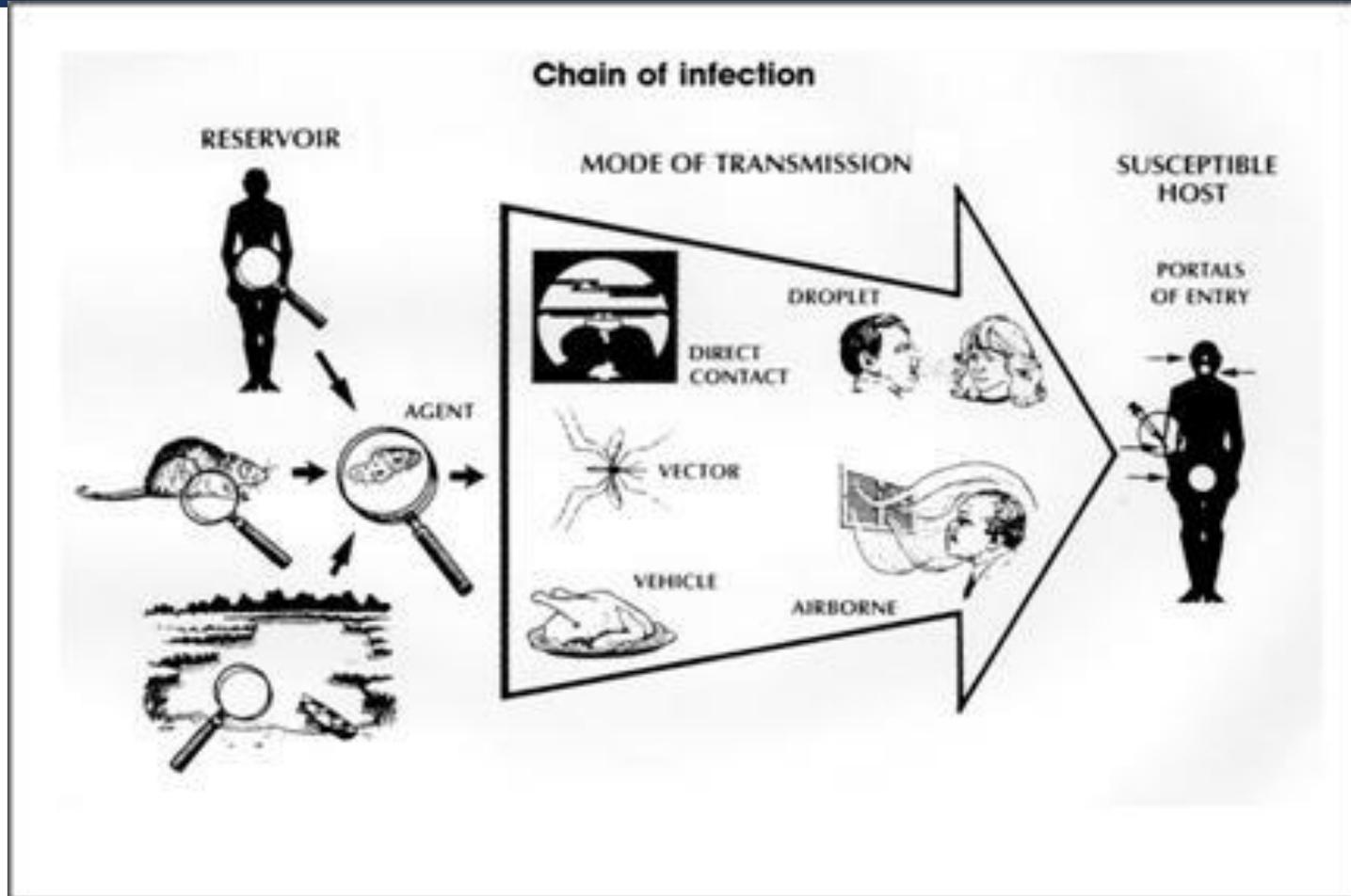


5D. PERSON

- Define populations by
 - Host characteristics
 - Age, race, sex, medical status
 - Age and sex assessed first as these are characteristics often strongly related to exposure and risk of disease
 - Exposures
 - Occupation, leisure activities, use of medications, tobacco, drugs



CHAIN OF INFECTION



6. DEVELOP HYPOTHESES

Definition: a hypothesis is a conclusion drawn before all the facts are established and tentatively accepted as a basis for further investigation)

- To be addressed
 - Causative agent
 - Mode(s) of transmission
 - Exposure(s) that caused the disease
- Outlier cases (ones you think might not have anything to do with the others) can sometimes provide important clues
- *The development of a hypotheses is not the responsibility of surge capacity staff, but rather County epidemiologists



7. EVALUATE HYPOTHESES

- From the information gathered in an investigation, county epidemiologists can run analyses to test whether hypotheses about the source of the outbreak are true
 - We can compare hypotheses with established facts
 - Analytic epidemiology can be used to quantify relationships
 - Cohort studies*
 - Relative risk (ratio of attack rates) can be calculated
 - Case-control studies*
 - Odds ratio can be calculated

*see Glossary



8. RECONSIDER/REFINE HYPOTHESES

- Sometimes analytic studies are unrevealing
 - Consider new modes of transmission
- Execute additional epidemiologic studies
 - Laboratory
 - Environmental



9A. IMPLEMENT CONTROL AND PREVENTION MEASURES

- Aim control measures at the specific agent, source or reservoir
 - Some examples include:
 - To properly destroy contaminated foods (may require testing prior to destruction)
 - To sterilize contaminated water (may require testing prior to destruction)
 - To destroy mosquito breeding sites
 - Implement isolation and/or quarantine measures



9B. CONTROL MEASURES

- Direct control measures at interrupting transmission or exposure
 - Isolation of symptomatic individuals
 - Physically separate the infected individuals from the non-infected to prevent or limit the transmission of disease
 - Quarantine
 - Restriction of the activities of well persons or animals who have been exposed to a case of communicable disease during its period of communicability to prevent disease transmission
 - Instruct avoidance of exposure areas
- Direct control measures at reducing the susceptibility of the host
 - We want to reduce the number of people who could become ill and spread disease
 - Immunization
 - Chemoprophylaxis



9C. CONTROL MEASURES

- Universal Precautions
 - The assumption is that all bodily fluids are potentially infectious, and universal precautions must be used when exposure to these body fluids occurs
 - Prevent disease transmission by wearing the appropriate level of personal protective equipment (PPE) , such as:
 - Gloves
 - Gown
 - Eye protection
 - Mask
 - Washing hands frequently
 - Handle all specimens as if infectious



Universal Precautions

TREAT ALL BODY SUBSTANCES AS POTENTIALLY INFECTIOUS, AND HANDLE THEM ACCORDINGLY. THE USE OF PERSONAL PROTECTIVE EQUIPMENT (PPE) BY HEALTH CARE PROVIDERS IS NECESSARY TO PREVENT THE SPREAD OF DISEASE



Sneezing, coughing, and even talking can aerosolize germs. Covering your nose and mouth when you cough or sneeze helps prevent the spread of these germs.



10A. COMMUNICATION

❖❖❖ Your role in communication as a surge capacity worker:

- You will be asked to provide information to those individuals in charge of the investigation
- You will need to be able to describe what you did, what you found, and what you think should be done about a situation/case in a scientifically- objective fashion



10B. COMMUNICATION

- You may be required to provide briefings to local authorities, the media, and the public on the investigation findings
 - Outbreaks occur routinely in our County, and the Health Officer, Assistant Health Officer or Branch chief of the impacted/involved programs generally will provide information to local authorities and the media
 - In a case where the Department Operation Center (DOC) and/or the Emergency Operation Center (EOC) are activated, either the Health Officer, Assistant Health Officer or the County Public Information Officer (PIO) will be the ones to provide information to the public. Branch Chiefs will also speak in this situation.



10C. COMMUNICATION

- Written report
 - Blueprints serve as a guide for action
 - Should follow scientific format
 - Introduction, background, methods, results, discussion, recommendations
 - Will Serve as a record of performance and document for potential legal issues
 - Will be used as reference by health department for future outbreaks
 - Will Contribute to knowledge base of epidemiology and public health



CASE INVESTIGATION FORM

- Information is gathered on a variety of forms
- The following is an example of a measles case investigation form



MEASLES (RUBEOLA) CASE REPORT

PATIENT DEMOGRAPHICS														
Patient name - last first middle initial Doe Jane E			Date of birth 10 / 26 / 1954		Age (enter age and check one) 51 <input type="checkbox"/> Days <input type="checkbox"/> Weeks <input type="checkbox"/> Months <input checked="" type="checkbox"/> Years		Gender <input type="checkbox"/> Male <input checked="" type="checkbox"/> Female							
Address (number, street) 4065 County Circle Dr.			City Riverside		State CA		ZIP code 92503		County Riverside					
ETHNICITY (check one)			<input type="checkbox"/> Hispanic or Latino		<input checked="" type="checkbox"/> Not Hispanic or Latino		<input type="checkbox"/> Unknown							
RACE (check all that apply)														
<input type="checkbox"/> Unknown			<input type="checkbox"/> Asian			<input type="checkbox"/> Native Hawaiian or Other Pacific Islander								
<input type="checkbox"/> African-American or Black			<input type="checkbox"/> Asian Indian			<input type="checkbox"/> Hmong		<input type="checkbox"/> Thai		<input type="checkbox"/> Asian Indian				
<input type="checkbox"/> American Indian or Alaska Native			<input type="checkbox"/> Cambodian			<input type="checkbox"/> Japanese		<input type="checkbox"/> Vietnamese		<input type="checkbox"/> Cambodian				
<input checked="" type="checkbox"/> White			<input type="checkbox"/> Chinese			<input type="checkbox"/> Korean		<input type="checkbox"/> Other Asian: _____		<input type="checkbox"/> Chinese				
<input type="checkbox"/> Other: _____			<input type="checkbox"/> Filipino			<input type="checkbox"/> Laotian		<input type="checkbox"/> Filipino						
Occupation (check all that apply)														
<input type="checkbox"/> Food service			<input checked="" type="checkbox"/> Health Care			<input type="checkbox"/> Day Care			<input type="checkbox"/> School		<input type="checkbox"/> Correctional facility		<input type="checkbox"/> Other: _____	
Country of birth USA						Country of residence USA								
COMMON LHD TRACKING DATA														
CMR ID number N/A				IZB Case ID number N/A				Web CMR ID number N/A						
Date reported to county 09 / 28 / 2006		Date investigation started 9 / 28 / 2006		Person/clinician reporting case Riverside Hospital				Reporter telephone (951) 358-5102						
Case investigator completing form Sharon Fortino, PHN				Investigator telephone (951) 358-5107				Investigator's LHD or jurisdiction Riverside County						

■ Patient demographics:

■ **An important part of an investigation.** The information in the section above identifies the patient and location where he/she can be found.

■ **Ethnicity and race:** Will provide information about disease trends.

■ **Occupation or school:** Allows investigator (s) to look at these locations where it is possible that an exposure may have occurred.

■ **Common LHD Tracking Data:** Is going to tell investigator (s) when first reports were given by the reporting source and who the reporting source is.

SIGNS AND SYMPTOMS					
Rash <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown	Rash onset date 9/25/2006	Rash duration 5 days	Generalized rash <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown	Origin on body face	Direction of spread down and outward
Fever <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown	Fever onset date 9/20/2006	Was temperature taken <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown	Was temperature $\geq 101^{\circ}\text{F}$ (38.3°C) <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown	If temperature not taken, skin was <input type="checkbox"/> Hot <input type="checkbox"/> Warm <input type="checkbox"/> Normal <input type="checkbox"/> Unknown	
Cough <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown	Runny nose (coryza) <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown	Conjunctivitis <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown	Koplik's spots <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown		
Other symptoms <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown	Describe other symptoms light sensitivity				Date of diagnosis 10/3/2006
Does case meet clinical criteria for further investigation <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown			CASE MEETS CDC/CSTE CLINICAL CRITERIA? (FOR STATE USE ONLY) <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown		
COMPLICATIONS AND OTHER SYMPTOMS					
Hospitalized <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown	Days hospitalized 6 days	Pneumonia <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Unknown	Encephalitis <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Unknown	Other complications <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Unknown	
Death <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Unknown	Date of death (mm/dd/yy) ____/____/____	Describe other complications N/A			

■ Signs and Symptoms:

- In this section, investigators establish the existence of a rash, temperature, and other symptoms such as koplik spots (these are small spots with white or bluish white centers on an erythematous base on the buccal mucosa).
- A measles rash spreads from the hairline to the face downward, and outward to the trunk and the extremities.
- Does the case meet the clinical criteria for measles? If it does, investigator (s) continue to investigate; if it doesn't, they may look for another cause and recommend to the health care provider that further screening is needed.

Complications and Other Symptoms:

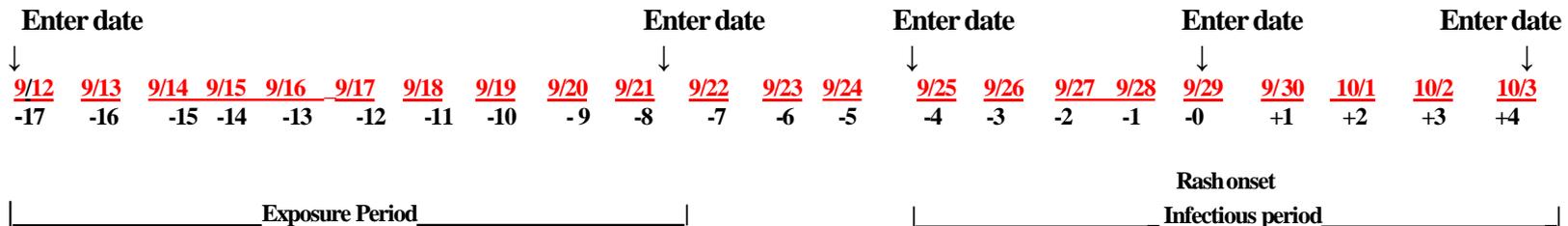
- Measles is a highly infectious disease that can have many severe complications.

MEASLES CASE REPORT PLOTTING GRAPH

Objective:

Assist the investigator in determining the patient's infectious periods.

Probable exposure and infectious periods



■ Plotting Graph:

- This graph, which is not currently part of the State Reporting Form is used to report measles, and is helpful in determining the exposure and infectious period. It remains as part of our County measles procedure.
- So, if you look at the dates you will see the patient under investigation on the measles form was infectious from the 9/25/06 to 10/03/06. She was exposed to the disease sometime between 9/12 and 9/21/06.

<input type="radio"/> Yes <input checked="" type="radio"/> No <input type="radio"/> Unknown	<input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Unknown	<input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Unknown	<input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Unknown
Death	Date of death (mm/dd/yy) / /	Describe other complications	
<input type="radio"/> Yes <input checked="" type="radio"/> No <input type="radio"/> Unknown			
LABORATORY TESTS			
Any lab tests done for measles <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown	CASE LAB CONFIRMED (FOR LHD USE) <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown		CASE LAB CONFIRMED (FOR STATE USE ONLY) <input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Unknown
Serology performed <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown	LAB RESULT CODES P = Positive--Evidence of recent or current infection N = Negative--Antibody not detected I = Indeterminate E = Pending X = Not done U = Unknown Z = Infection at undetermined time or immunization		
	Specimen Date	Titer Result	Test Reference Index
IgM	9/28/2006		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> P <input type="radio"/> N <input type="radio"/> I <input type="radio"/> E <input type="radio"/> X <input type="radio"/> U
IgG (acute)	9/28/2006		
IgG (convalescent)	pending	pending	pending
			<input type="radio"/> P <input type="radio"/> N <input type="radio"/> I <input type="radio"/> E <input type="radio"/> X <input type="radio"/> U <input type="radio"/> Z
Specimen taken for virus isolation <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown	Specimen source <input checked="" type="checkbox"/> Nasopharyngeal <input type="checkbox"/> Urine <input type="checkbox"/> Other <input type="checkbox"/> Unknown		Specimen date 10/1/2006
			Virus isolated <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown
Specimen sent to CDC for genotyping	Date sent	Virus genotype	

■ **Laboratory Tests:** This section is the area investigator (s) would document the laboratory tests that were done. The laboratory results will help to confirm or eliminate the case.

- Elevated IgM titer is indicative of current infection.
- IgG (acute) titer may suggest past disease.
- IgG (convalescent) titer (which is needed 2 weeks after the acute IgG is done) will help to confirm the case if there is a 4 fold rise in the titer level.

***The diagnosis of measles should always be based on detection of measles specific IgM in serum.

VACCINATION/MEDICAL HISTORY

Received one or more doses of measles containing vaccine (MCV) <input type="radio"/> Yes <input checked="" type="checkbox"/> No <input type="radio"/> Unknown		Number of doses
Vaccination dates—Dose 1 / /	Dose 2 / /	Dose 3 / /
Reasons not vaccinated (check only one)		
1 <input type="radio"/> Personal Beliefs Exemption (PBE)	4 <input type="radio"/> Lab confirmation of previous disease	7 <input type="radio"/> Delay in starting series or between doses
2 <input type="radio"/> Permanent Medical Exemption (PME)	5 <input type="radio"/> MD Diagnosis of previous disease	8 <input type="radio"/> Other
3 <input type="radio"/> Temporary Medical Exemption	6 <input type="radio"/> Under age for vaccination	<input checked="" type="checkbox"/> Unknown
Prior MD diagnosed measles (see reason 5) <input type="radio"/> Yes <input type="radio"/> No <input checked="" type="checkbox"/> Unknown	Pregnant <input type="radio"/> Yes <input checked="" type="checkbox"/> No <input type="radio"/> Unknown	Immunocompromised <input type="radio"/> Yes <input checked="" type="checkbox"/> No <input type="radio"/> Unknown

■ **Vaccination/Medical History:**

- This section provides the investigator (s) with the patient’s vaccination history. To review the recommended immunization schedule for children, adolescents and adults refer to www.rivco-diseasecontrol.org/
- In addition to the vaccination history this section this section will provide a brief risk assessment of the patient’s medical status in relation to a measles diagnosis.

EXPOSURE/TRAVEL HISTORY

Acquisition setting (check all that apply):

- | | | | | |
|---|---|--|--|---|
| 1 <input type="radio"/> Day care | 40 <input type="radio"/> Hospital ward | 7 <input checked="" type="checkbox"/> Home | 10 <input type="radio"/> College | 13 <input type="radio"/> Church |
| 2 <input type="radio"/> School | 50 <input type="radio"/> Hospital ER | 8 <input checked="" type="checkbox"/> Work | 11 <input type="radio"/> Military | 14 <input type="radio"/> International travel |
| 3 <input type="radio"/> Doctor's Office | 60 <input type="radio"/> Outpatient hospital clinic | 9 <input type="radio"/> Unknown | 12 <input type="radio"/> Correctional Facility | 15 <input type="radio"/> Other |

Recent travel or arrival from other country or state within 18 days of rash onset Yes Unknown

Countries or states visited None	Dates in countries or states visited N/A	Date of arrival in California / /
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Close contact with person(s) with rash 8-17 days before rash onset Yes No Unknown

	Name	Rash Onset Date	Relationship	Age (Years)	Same Household
1	Mark Go	9/17/2006	nephew	1	<input type="radio"/> Yes <input checked="" type="checkbox"/> No <input type="radio"/> Unknown
2		/ /			<input type="checkbox"/> Yes <input type="radio"/> No <input type="radio"/> Unknown
3		/ /			<input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Unknown

Please list other contacts on a separate sheet or use the contact tracing worksheet.

Epi-linked to a confirmed case <input type="radio"/> Yes <input checked="" type="checkbox"/> No <input type="radio"/> Unknown	Case name or Case ID	Outbreak related <input type="radio"/> Yes <input type="radio"/> No <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> Unknown	Outbreak name or location
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Imports status (FOR LHD USE) <input type="radio"/> Indigenous <input type="radio"/> Out-of-state import <input type="radio"/> International import	Linked to imported case (FOR LHD USE) <input type="radio"/> Yes <input type="radio"/> No <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> Unknown
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Imports status (FOR STATE USE ONLY) <input type="radio"/> Indigenous <input type="radio"/> Out-of-state import <input type="radio"/> International import	Linked to imported case (FOR STATE USE ONLY) <input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Unknown
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Exposure/Travel History:

- This section will assist with determining where the case may have acquired their infection. Check all possible sources that may have exposed the patient to a possible case of measles. Identify any history of travel within 18 days of the onset of *rash*.

List the following rash contact information:

- Names of people the patient may have had close contact with, who had a rash 8-17 days before the patient's rash onset.
- If the case reports contact to a confirmed case (Epi-link), obtain the name of the case. If the case is identified as being part of a measles outbreak, document the outbreak information requested.
- The imported case information refers to where the case may have acquired their infection: locally (indigenous), another county, state or country.

CONTACT INVESTIGATION

Spread setting (check all that apply):

1 Day care 4 Hospital ward 7 Home 10 College Church
 2 School 5 Hospital ER 8 Work 11 Military International
 3 Doctor's Office 6 Outpatient hospital clinic 9 Unknown 12 Correctional Facility Other

Number of susceptible contacts

Close contacts who have rash 8-17 days after exposure to case

 Yes No Unknown

	Name of Case Contact	Rash Onset Date	Relationship	Age
1	Nancy Dre w	10/5/2006	co worker	
2		/ /		
3		/ /		

Please list other contacts on a separate sheet or use the contact tracing worksheet.

CASE CLASSIFICATION (FOR LHD USE)
 Confirmed Probable Suspect Not a case Unknown
CASE CLASSIFICATION (FOR STATE USE ONLY)
 Confirmed Probable Suspect Not a case
MEASLES CASE CLASSIFICATION

Clinical Case Definition: An illness characterized by all the following: a generalized rash lasting greater than or equal to 3 days; a temperature greater than or equal to 101.0°F (greater than or equal to 38.3°C); cough, coryza, or conjunctivitis

Laboratory criteria for diagnosis – positive serologic test for measles immunoglobulin M antibody, or significant rise in measles antibody level by standard serologic assay, or isolation of measles virus from a clinical specimen

Case Classification:

Suspected: any febrile illness accompanied by rash

Probable: a case that meets the clinical case definition, has noncontributory or not serologic or virologic testing, and is not epidemiologically linked to a confirmed case

Confirmed: a case that is laboratory confirmed or that meets the clinical case definition and is epidemiologically linked to a confirmed case. A laboratory-confirmed case does not need to meet the clinical case definition.

Contact Investigation Section

- This section provides the opportunity to identify where the case may have exposed others.
- Check all possible sources where the patient may have exposed others to measles
- Susceptible contacts are those individuals who have not been vaccinated against measles, have not had the measles in the past or cannot demonstrate antibody response to measles
- The case contact section will identify others who developed a rash within 8 to 17 days after contact with the patient

AS THE INVESTIGATION CONCLUDES

- The form is completed along with case investigation documents. Supporting data are sent to the state for case reporting
- For more information on measles you can go to the following websites

www.rivco-diseasecontrol.org/

www.CDC.gov

