Announcements

- All participants must register for the Monthly Disease Surveillance Trainings in order for us to provide CMEs:
  1. Log-on or Request log-on ID/password: https://tiny.army.mil/r/zB8A/CME
  2. Register for FY18 Epi-Tech Surveillance Training: https://tiny.army.mil/r/MEHsS/EpiTechFY18
- Confirm attendance for today's training:
  - Enter your full name/email address in the chat box; enter each individual's information if attending with a group
  - You will receive a confirmation email within 48 hours
  - Contact your Service Hub if you do not receive this email
- Please put your phones on mute when not speaking. Press *6 to mute/unmute your phone.

Overview of Outbreak Methodology

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2018

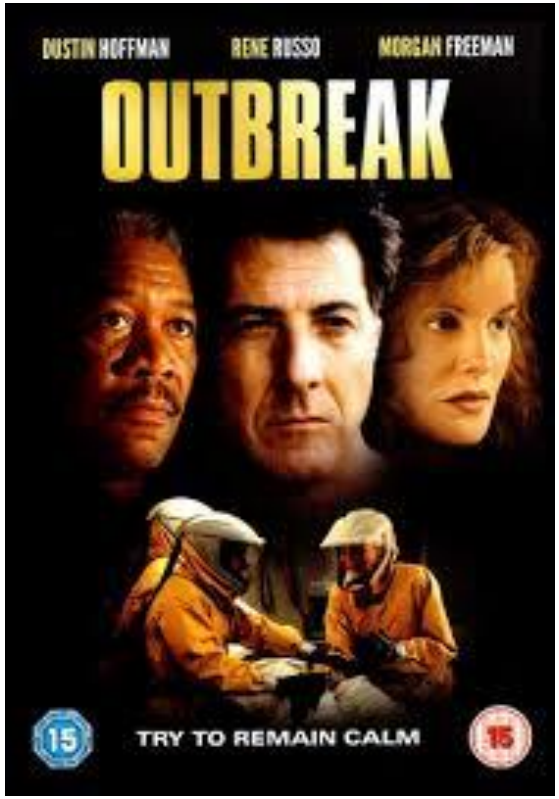
Objectives

1. Describe what an outbreak is and its significance/impact

2. Describe investigation and prevention strategies

3. List reporting requirements and who to contact for assistance

What is an outbreak?



Outbreak: an increase in occurrences of a disease in a particular place and time.

Important considerations:

- It may affect a small and localized group or impact thousands of people across an entire continent
- Any cases of a rare infectious disease may be sufficient to constitute an outbreak
  - Ex: One case of anthrax would warrant a full outbreak investigation.

What's the difference?

Epidemic:

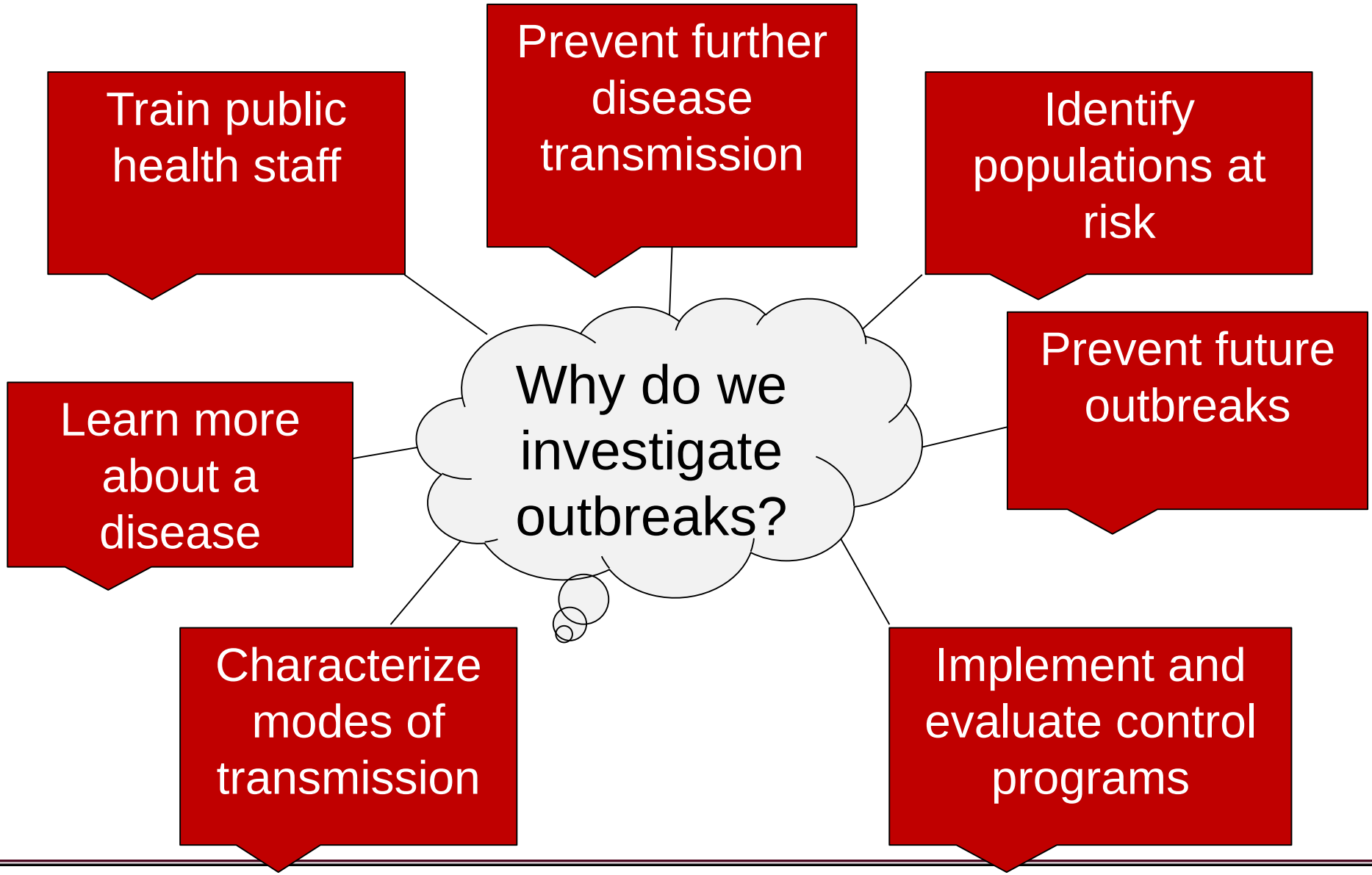
An increase in cases of a disease above what is normally expected in that population in that area at that time

Outbreak:

Similar to an epidemic but could be in a more limited geographic area. Also used interchangeably with epidemic.

Cluster:

An aggregation of cases grouped in place and time, may or may not be more than expected


Why do we investigate outbreaks?
Train public health staff
Prevent further disease transmission
Identify populations at risk
Learn more about a disease
Prevent future outbreaks
Characterize modes of transmission
Implement and evaluate control programs

Summary of Investigation Steps:

(Not necessarily in this order!)

1. Prepare for field work
2. Establish the existence of an outbreak
3. Verify the diagnosis
4. Establish case definition
5. Define and identify cases
6. Perform descriptive epidemiology
7. Develop hypothesis
8. Evaluate hypothesis
9. Implement control and prevention measures
10. Communicate findings

Considerations *before* beginning an investigation:

Has there been a(n)…..

- Change in reporting procedures?
- Change in case definition?
- Increased awareness in medical community and/or public?
- Improvement to diagnostics?
- New clinician or reporter?
- Population change?
- True outbreak of disease?

Step 1: Prepare for Field Work

(This may not necessarily be the *first* step)

- Know your mission, role, boundaries
- Reach out to your services' public health center
- Establish call-back capabilities, lab consultation
- Select and prepare the team – communication!
- Gather equipment, supplies
- Establish reporting requirements

Step 2: Establish the existence of a true outbreak

Do some research and see if the disease incidence is higher than expected in this population. Use the following tools:

- Surveillance tools (DRSi, ESSENCE, AHLTA, etc)
- Historical documents
- Medical literature
- After Action Reports
- Communication with your team! PM, laboratory staff, and POC at Service hub
- **Enter an outbreak report in DRSi**

Step 3: Verify the diagnosis

(This step is often done at the same time as step 2)

Goals for this step are to:

1. Ensure that the disease has been properly identified, since control measures are often disease-specific
2. Rule out laboratory error as the basis for the increase in reported cases
3. Get a better understanding of the clinical features. This may involve interviewing patients.

Step 4: Establish case definition

A case definition is a standard set of criteria for deciding whether an individual should be classified as having the health condition of interest.

The purpose of a case definition is to include most if not all of the actual cases, with very few or no false-positive cases. This is not always possible. You may miss infected people who have mild or no symptoms, because they have little or no reason to be tested.

Case definition criteria

Should include criteria for person, place, time, and clinical features. These should be specific to the outbreak under investigation.

Person: describes key characteristics the patients share in common.

Place: describes a specific geographic location or facility associated with the outbreak

Time: used to delineate a period of time associated with illness onset for the cases under investigation.

Clinical features: use established case definitions for clinical features if available

Laboratory criteria: May not be included until later on in the investigation, or may not be available. Used to identify agent.

Examples of Case Definitions for Outbreaks

For respiratory illness: "Student attending Smith High School who has an onset of fever and cough between January 4 and 24, 2018"

For Pertussis: A clinical case was defined as an acute cough illness lasting > 2 weeks with onset during September 2018 – January 2018 and without other apparent cause in a person living at Ft. Smith. A confirmed case was defined as a clinical case of pertussis that 1) was laboratory confirmed by polymerase chain reaction (PCR) for *Bordetella pertussis* DNA or 2) had a direct epidemiologic link to a laboratory-confirmed case through a common household residence. All other clinical cases were considered probable."

For a gastrointestinal illness (aka "foodborne illness"): "An incident in which two or more persons experience diarrhea, abdominal pain, and/or nausea after ingestion apples from Smith Farms and have a positive culture for Salmonellosis. All cases that meet the clinical criteria but without a positive culture are considered probable."

Case Definitions May Change Over Time

Early case definition for GI outbreak:

"A case of illness is defined as any diarrhea, vomiting, abdominal cramps, headache, or fever that developed after attending the potluck".

- Makes no assumptions about symptoms, risk factors..
- Greater emphasis on sensitivity (false positives) than specificity (false negatives), and so captures more cases initially

Evolved case definition:

"A case of illness is defined as diarrhea of vomiting with onset within 96 hours of consuming food served at the potluck"

- More specific, will exclude unrelated cases

Step 5: Find cases and record information

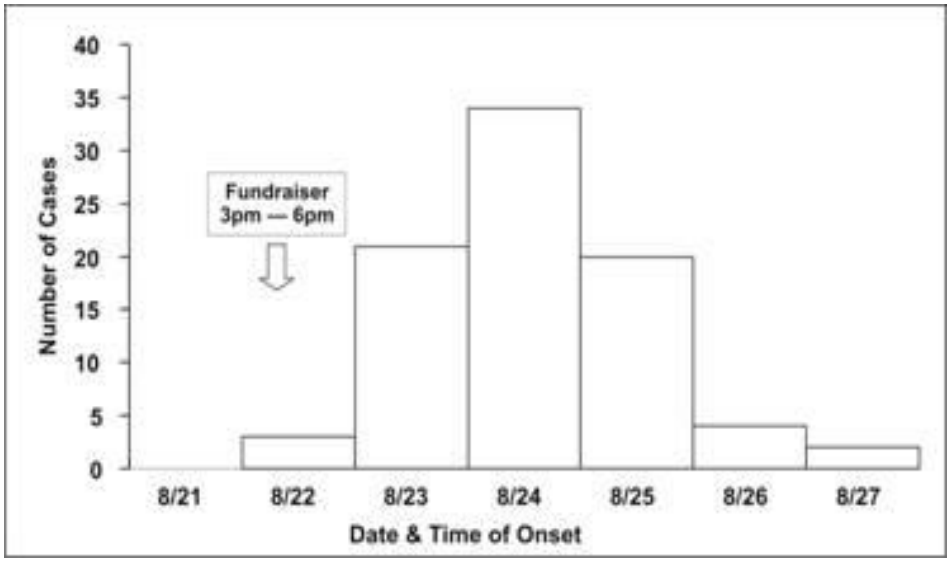
- Find additional cases:
  - Passive surveillance vs active surveillance to find additional cases
    - Utilize Case Finding module in DRSi
  - Interview case-patients
- Record information systematically, either by using established case report form or creating your own
  - Should include identifying information, clinical information, and risks/exposures
- Enter information into a line list of demographic, clinical and exposure characteristics
- Epidemiologists at your respective Service hub are able to provide investigation forms, fact sheets, and reporting criteria if needed

Step 6: Perform Descriptive Epidemiology

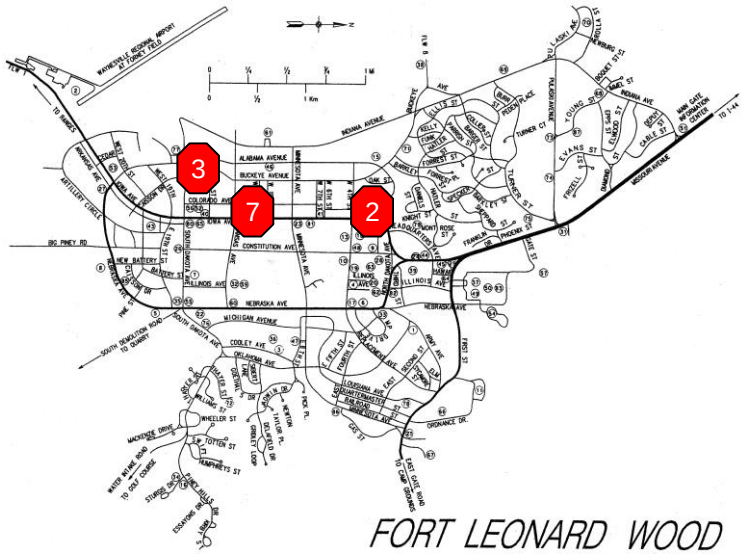
This step describes the where and whom of the disease, allowing you to identify intervention and prevention measures.

- **Time:** Make an epidemic curve of onset times to provide a simple visual display of the magnitude and time trend.
- **Place:** Assess the outbreak by place to visualize the geographic extent of the problem, which may also demonstrate clusters or patterns that provide important etiologic clues
- **Person:** Host characteristics (age, race, sex, medical status, etc) and possible exposures (occupation, leisure activities, medications, etc).

Time – Epi Curve



Place – Map of Outbreak



Person – Descriptive Epidemiology

CaseID	Name	Age	Sex	Occupation	Address	Onset Date	Classification	Epi links?	Lab Results	Underlying Conditions
8892021	Smith, John	32	M	Nurse	123 Main St	1/2/2018	Confirmed	No	(+) PCR	No
8892022	Jones, Jane	29	F	Nurse	321 S. St	1/1/2018	Probable	Yes	(-) PCR	Asthma

Step 7: Develop Hypothesis

When formulating the hypothesis, ask:

- What is the agent's usual reservoir?
- How is it usually transmitted?
- What vectors are commonly implicated?
- What are the known risk factors?

Speak with case-patients, local health department staff, and/or epidemiologists at your respective Service hub for insight.

Step 8: Evaluate hypothesis

1. Comparing the hypothesis with established facts
   - Used when there is overwhelming evidence to support the hypothesis and no additional analytic epidemiology was needed
   - Ex: Hypervitaminosis D outbreak
2. Using analytic epidemiology to quantify relationships and assess the role of chance
   - Required: comparison group
   - Studies look at association between exposure and disease
   - Quantify relationships and assess the role of chance
   - Study types:
     - cohort study (relative risk)
     - case-control study (odds ratio)

Step 9: Implement control and prevention measures

Eliminate the source: dispose contaminated water or recall food, trap rodents, etc.

Interrupt transmission: vector control (ex: spray for mosquitos), personal protective measures (PPE), hand washing, relocation

Reduce host susceptibility: immunizations, chemoprophylaxis, nutrition

Notes on Control Programs

- Proper control measures can only be implemented if the outbreak investigation has scientifically sound and relevant conclusions (see Step 8).
- Learn from the experience of similar outbreaks.
- Involve all of the key players in a community.
- Use effective risk communication early and often throughout the investigation.

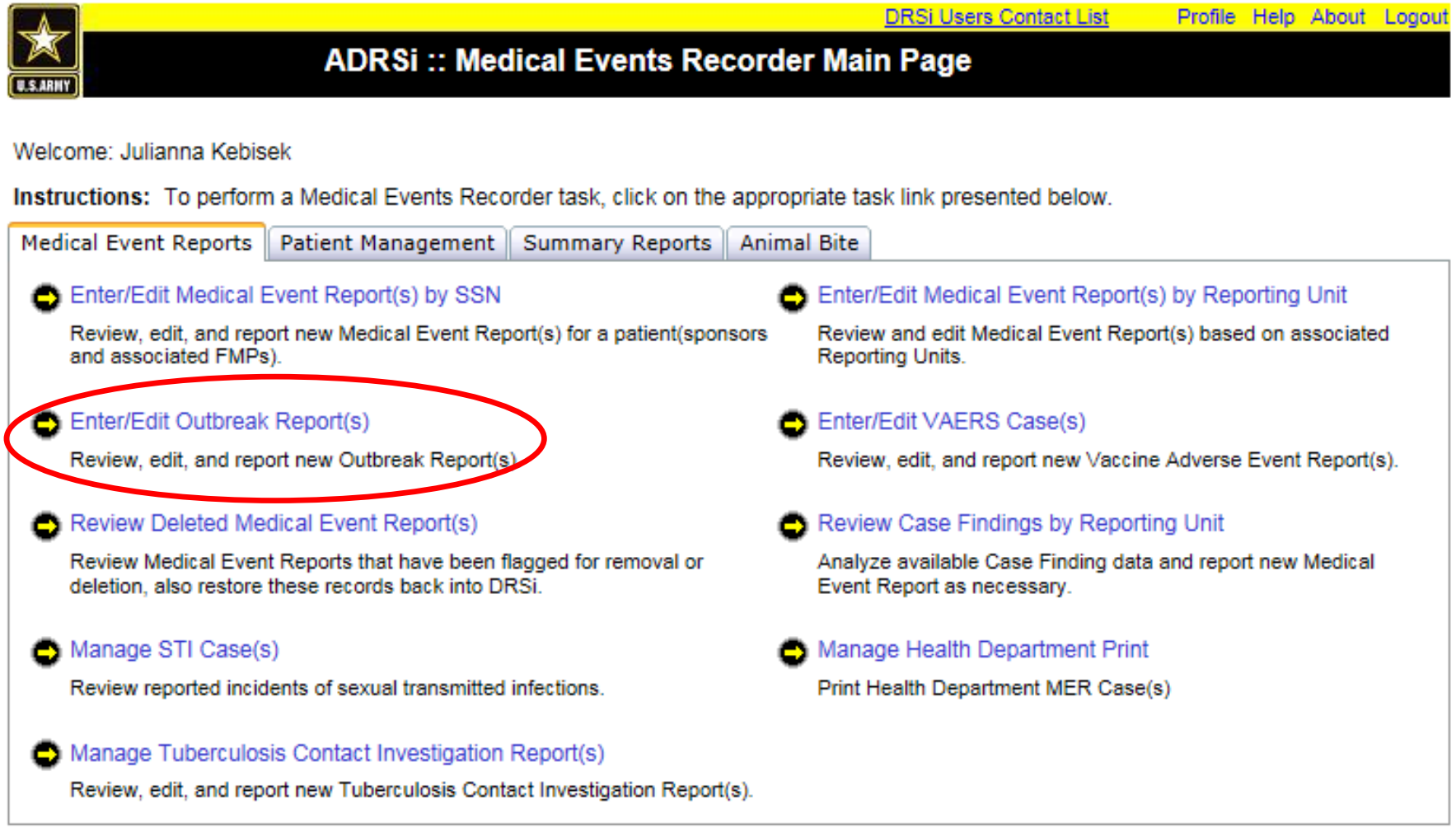
Approach to Risk Communication

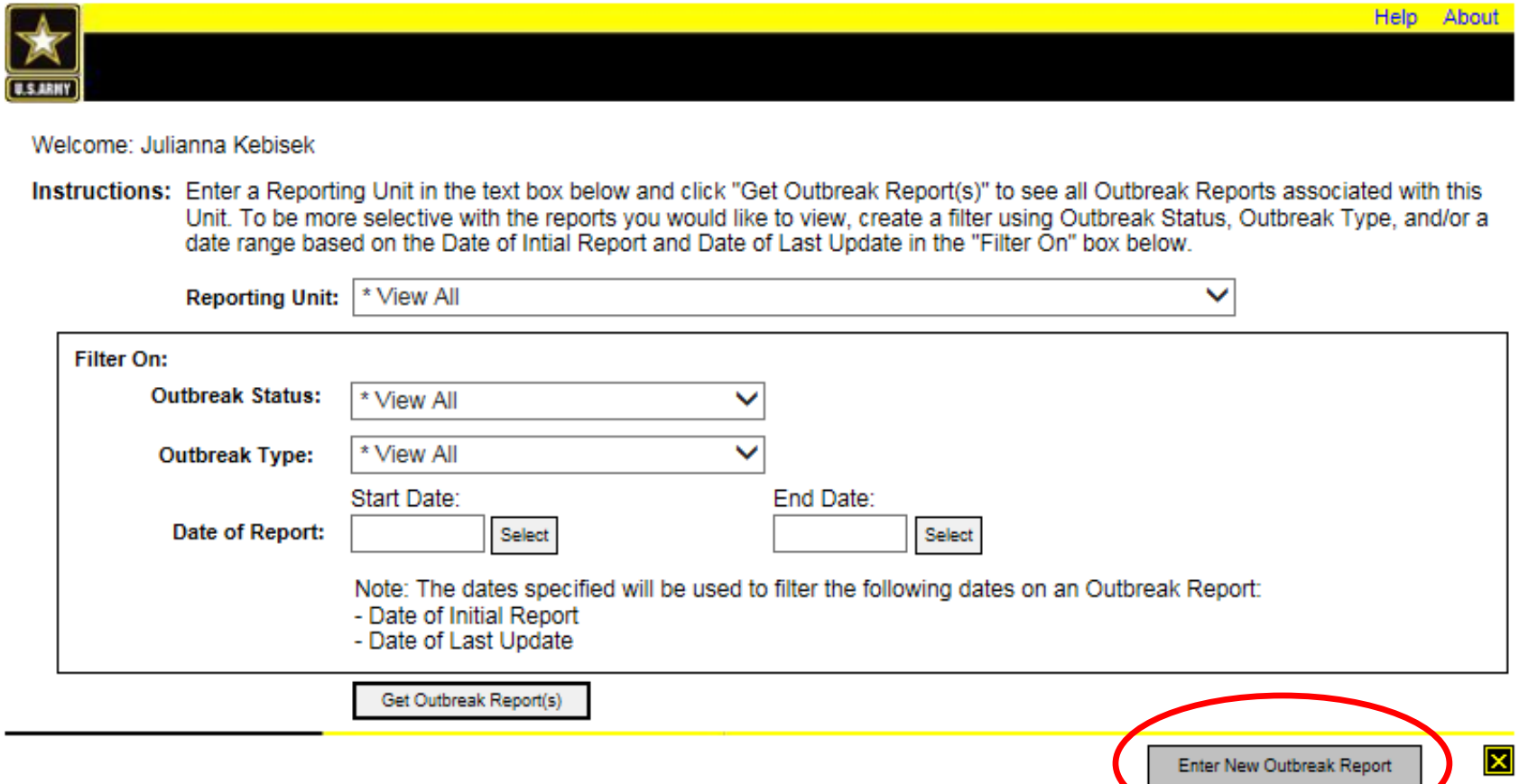
"Be first; Be right; Be credible"

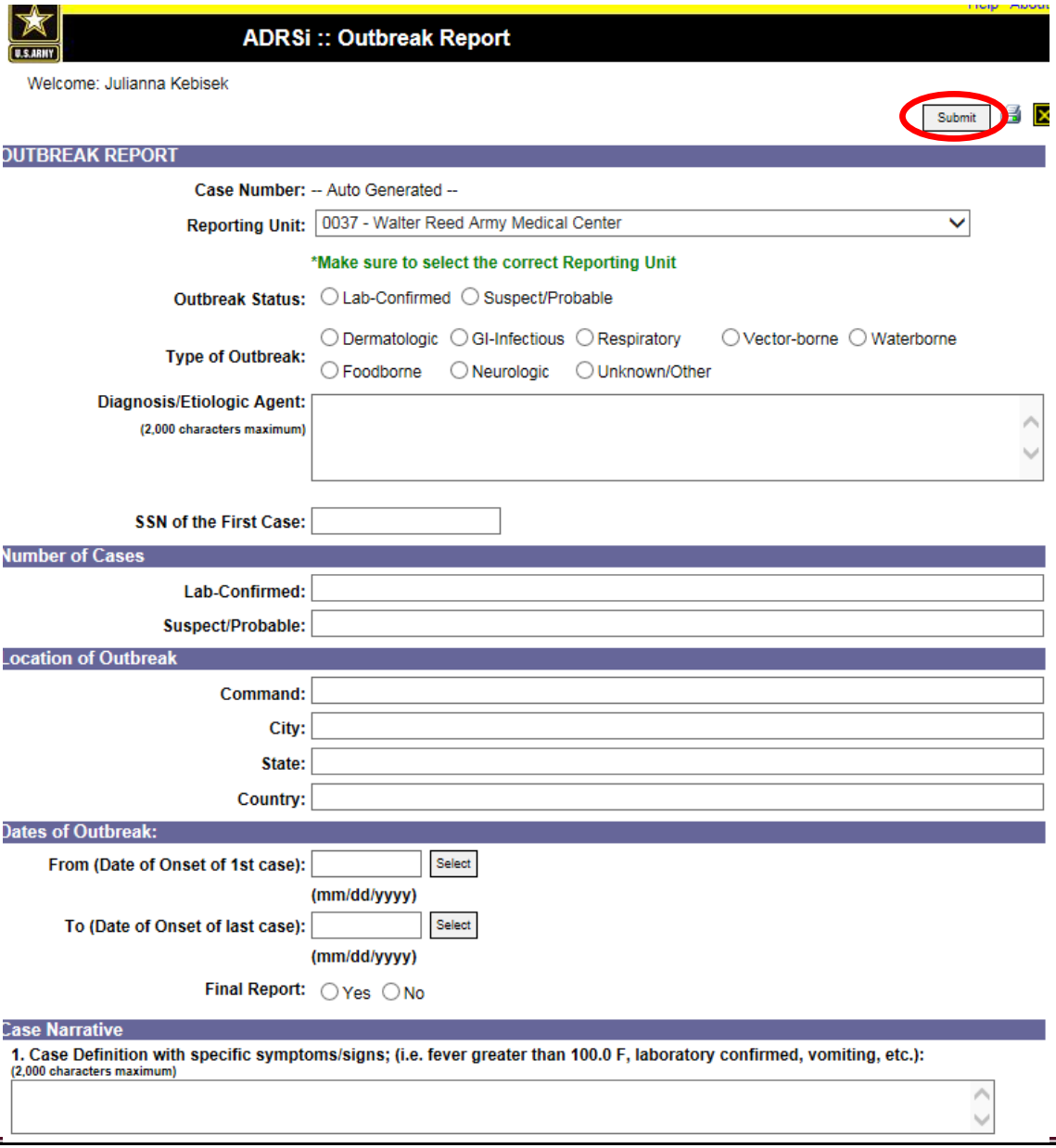
- Tell what you know
  - Stick to confirmed facts
  - Goal is to maintain credibility
- Tell what you don't know
  - Be up front
  - Don't speculate
- Tell them when you will speak again

Step 10: Communicate findings

- Sitreps, executive summaries (EXSUM), after action reports (AARs), Reports, publications, presentations.
- Be concise and objective.
- Include methods and descriptive epidemiology.
- **Submit an outbreak report in DRSi within 24 hours of a suspected outbreak.**
  - **Do not wait until end of outbreak to submit a report in DRSi.**
- **Submit individual cases in DRSi for each case if the disease responsible is also a reportable medical event, unless given different guidance by your service POC.**

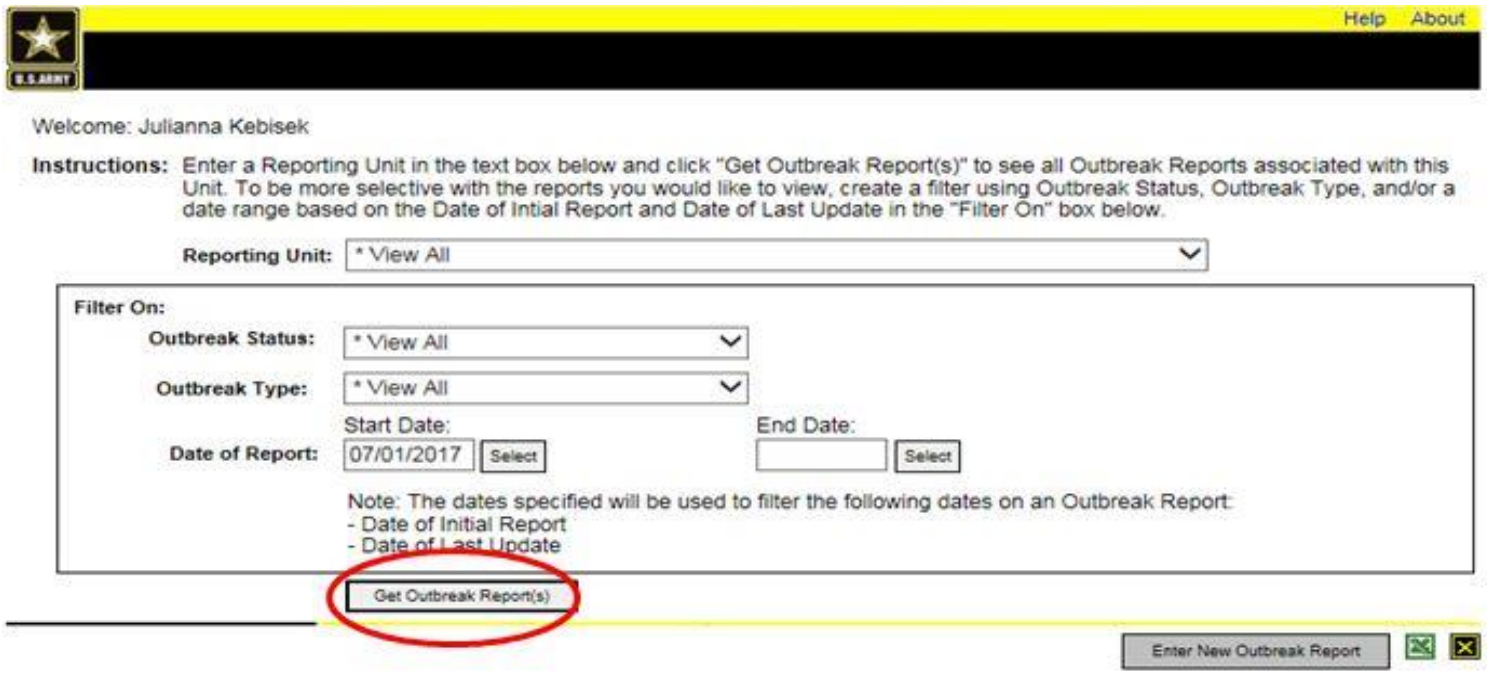

DRSi Users Contact List
Profile
Help
About
Logout
ADRSi :: Medical Events Recorder Main Page
Welcome: Julianna Kebisek
Instructions: To perform a Medical Events Recorder task, click on the appropriate task link presented below.
Medical Event Reports
Patient Management
Summary Reports
Animal Bite
Enter/Edit Medical Event Report(s) by SSN
Review, edit, and report new Medical Event Report(s) for a patient(sponsors and associated FMPs).
Enter/Edit Medical Event Report(s) by Reporting Unit
Review and edit Medical Event Report(s) based on associated Reporting Units.
Enter/Edit Outbreak Report(s)
Review, edit, and report new Outbreak Report(s).
Enter/Edit VAERS Case(s)
Review, edit, and report new Vaccine Adverse Event Report(s).
Review Deleted Medical Event Report(s)
Review Medical Event Reports that have been flagged for removal or deletion, also restore these records back into DRSi.
Review Case Findings by Reporting Unit
Analyze available Case Finding data and report new Medical Event Report as necessary.
Manage STI Case(s)
Review reported incidents of sexual transmitted infections.
Manage Health Department Print
Print Health Department MER Case(s)
Manage Tuberculosis Contact Investigation Report(s)
Review, edit, and report new Tuberculosis Contact Investigation Report(s).
DRSi Items Requiring Additional Actions


Help About
U.S.ARMY
Welcome: Julianna Kebisek
Instructions: Enter a Reporting Unit in the text box below and click "Get Outbreak Report(s)" to see all Outbreak Reports associated with this Unit. To be more selective with the reports you would like to view, create a filter using Outbreak Status, Outbreak Type, and/or a date range based on the Date of Intial Report and Date of Last Update in the "Filter On" box below.
Reporting Unit: * View All
Filter On:
Outbreak Status: * View All
Outbreak Type: * View All
Start Date:
End Date:
Date of Report:
Select
Select
Note: The dates specified will be used to filter the following dates on an Outbreak Report:
- Date of Initial Report
- Date of Last Update
Get Outbreak Report(s)
Enter New Outbreak Report



You must enter an outbreak report within 24 hours of suspecting an outbreak. You should edit the report as more information comes in or as your case definition evolves.

Doing so will keep your services' public health authorities informed and able to help if needed.



Case ID	Reporting Unit	Command	Outbreak Status	Outbreak Type	Date of Report	Date of Initial Report	POC	Edit
826	[redacted]		Lab-Confirmed	Unknown/Other	8/21/2017	8/21/2017	[redacted]	
825			Suspect/Probable	Dermatologic	9/5/2017	8/18/2017		
827			Suspect/Probable	GI-Infectious	11/20/2017	10/27/2017		
835			Suspect/Probable	GI-Infectious	11/28/2017	11/28/2017		
833			Lab-Confirmed	Respiratory	1/8/2018	11/21/2017		
837			Lab-Confirmed	GI-Infectious	12/8/2017	12/8/2017		

In summary…

- Do not try to complete an outbreak investigation alone.
- Communication is crucial!
- Enter an outbreak report to DRSi within 24 hours of suspecting an outbreak.
- Do not contact CDC.

Questions?

Army: **APHC – Disease Epidemiology Division**

Aberdeen Proving Ground, MD
COMM: (410) 417-2377 DSN: 584-7605
Email: usarmy.apg.medcom-aphc.mbx.disease-epidemiologyprogram13@mail.mil

Navy: **NMCPHC Preventive Medicine Programs and Policy Support Department**

COMM: (757) 953-0700; DSN: (312) 377-0700
Email: usn.hampton-roads.navmcpubhlthcenpors.list.nmcphc-threatassess@mail.mil

Contact your cognizant NEPMU:

NEPMU2: COMM: (757) 950-6600; DSN: (312) 377-6600
Email: usn.hampton-roads.navhospporsva.list.nepmu2norfolk-threatassess@mail.mil

NEPMU5: COMM: (619) 556-7070; DSN (312) 526-7070
Email: usn.san-diego.navenpvntmedufive.list.nepmu5-health-surveillance@mail.mil

NEPMU6: COMM: (808) 471-0237; DSN: (315) 471-0237
Email: usn.jbphh.navenpvntmedusixhi.list.nepmu6@mail.mil

NEPMU7: COMM (int): 011-34-956-82-2230 (local): 727-2230; DSN: 94-314-727-2230
Email: NEPMU7@eu.navy.mil

Air Force: **Contact your MAJCOM PH or USAFSAM/PHR**

USAFSAM / PHR / Epidemiology Consult Service
Wright-Patterson AFB, Ohio
COMM: (937) 938-3207 DSN:798-3207
Email: usafsam.phrepiservic@us.af.mil