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PREVENTION AND PROTECTION START HERE

# Streptococcal Infection Prevention and Control

30 July 2019

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Disease Surveillance Monthly Training

# Continuing Medical Education Course Handout

## **FY19 Epi-Tech Surveillance Training**

Friday, October 05, 2018 - Monday, September 30, 2019  
DCS, APG, MD

*Provided By*

U.S. Army Medical Command

| <u>Activity ID</u> | <u>Course Director</u> | <u>CME Planner</u> |
|--------------------|------------------------|--------------------|
| 2018-1656          | John Ambrose           | Mimi C. Eng        |

### **Accreditation Statement**

This activity has been planned and implemented in accordance with the accreditation requirements and policies of the Accreditation Council for Continuing Medical Education (ACCME) through the joint providership of U.S. Army Medical Command and ARMY PUBLIC HEALTH CENTER. The U.S. Army Medical Command is accredited by the ACCME to provide continuing medical education for physicians.

### **Credit Designation**

The U.S. Army Medical Command designates this Live Activity for a maximum of 5 AMA PRA Category 1 Credit(s)<sup>TM</sup>. Physicians should claim only the credit commensurate with the extent of their participation in the activity.

**This is a required handout. It must be disseminated to each learner prior to the start of the activity.**

# Continuing Medical Education Course Handout

## Statement of Need/Gap Analysis

**The purpose of this CME activity is to address the identified gap(s):**

1. Disease identification - verification of disease by established case definitions have been utilized by the local health departments, Centers for Disease Control and Prevention, World Health Organization, and the Department of Defense. With the every changing list of reportable medical events and new emerging infections, case definitions change rapidly. Army epidemiologist conduct verification studies that monitor the efficiency of reporting by local public health experts and have concluded that completeness percentages for reportable medical events range as low as 35% for select diseases.
2. Outbreak reporting - Recent evidence have demonstrated that outbreak reporting and communication between public health agencies is poor. In fact, the Army failed to report six outbreaks in the DRSi between June 2016 and September 2016.
3. Surveillance techniques - Surveillance of common communicable diseases continues to be a problem among local MTFs. In fact, cases of campylobacter were not investigated in 2015 for PACOM MTFs, while 2016 cases of salmonella were not investigated. Civilian public health agencies are required to conduct investigations into all reportable medical events. However, DoD facilities often do not take initiative to conduct this investigation.

## Learning Objectives

1. Based on case presentation, enhance your ability to improve case finding and surveillance practices within your local MTF.

## Target Audience / Scope of Practice

**Target Audience:** The intended audience for this educational activity includes preventive medicine physicians, community health nurses, public health nurses, and epidemiology technicians.

**Scope of Practice:** This activity will improve the performance of preventive medicine personnel who conduct surveillance activities in inpatient and outpatient settings.

# Continuing Medical Education Course Handout

## **Disclosure of Faculty/Committee Member Relationships**

It is the policy of the U.S. Army Medical Command that all CME planning committee/faculty/authors disclose relationships with commercial entities upon invitation of participation. Disclosure documents are reviewed for potential conflicts of interest and, if identified, they are resolved prior to confirmation of participation.

### **Faculty Members**

|                     |                                      |
|---------------------|--------------------------------------|
| Clemmons, Nakia     | - No information to disclose.        |
| Gilmore, Jessica    | - No information to disclose.        |
| Graham-Glover, Bria | - No information to disclose.        |
| Kebisek, Julianna   | - No information to disclose.        |
| Macdonald, Bob      | - No information to disclose.        |
| Riegodedios, Asha   | - No information to disclose.        |
| Ruiz, Stefani       | - No information to disclose.        |
| Russell, Jamaal     | - Employment/Salary: Abbvie (spouse) |
| Webber, Bryant      | - No information to disclose.        |
| White, Duvel        | - No information to disclose.        |

### **Committee Members**

|                       |                               |
|-----------------------|-------------------------------|
| Ambrose, John         | - No information to disclose. |
| Constantino, Joycelyn | - No information to disclose. |
| Eng, Mimi             | - No information to disclose. |
| Gibson, Kelly         | - No information to disclose. |
| Graham-Glover, Bria   | - No information to disclose. |
| Holbrook, Victoria    | - No information to disclose. |
| Kebisek, Julianna     | - No information to disclose. |
| Riegodedios, Asha     | - No information to disclose. |
| Rudiger, Courtney     | - No information to disclose. |

## **Acknowledgement of Commercial Support**

There is no commercial support associated with this educational activity.

# Announcements

- All participants MUST register for the Monthly Disease Surveillance Trainings:
  - Log-on or request log-on ID/password: <https://tiny.army.mil/r/zB8A/CME>
  - Register at: <https://tiny.army.mil/r/EQk1/EpiTechFY19>
- Confirm attendance:
  - Enter your full name/location/email into the DCS chat box
  - If you are attending as a group, please list all attendees
  - You will receive a confirmation email within 48 hours with your attendance record; if you do not receive this email, please contact your service hub
- Reminder: Mute your phones by pressing the mute button or pressing \*6
  - DO NOT press the “hold” button as the rest of the conference will hear the hold music
- Contact your service hub if you have any questions, to ensure you get information on future trainings, and to get access to past recordings/slides

# Outline

- Public Health Significance of Streptococcal Infection
- Service Streptococcal infection prevention and control program elements
- Outbreak experiences
- Program challenges of note

# Background

- Bacteria: *Streptococcus pyogenes*, Group A beta-hemolytic streptococcus, GAS, GABHS
- Commonly found on skin
- Causes strep throat
- Strep and rheumatic fever were the cause of significant morbidity and mortality in early 1900s
- With antibiotics came the ability to control strep
- Seasonal: October-March
- Spreads rapidly via large respiratory droplets, causes high peaks in epi curve

# Background

- Recruit environment is ideal for strep spread
- Combination of strep surveillance and antibiotic prophylaxis has been effective at controlling strep
- Sequela from strep infections (e.g. invasive infection) can be a significant cause of lost training days
  - Toxic shock-like syndrome
  - Rheumatic fever
  - Peritonsillar abscesses
  - Pneumonia, empyema
  - Necrotizing fasciitis



# Background

- Ongoing discussions through the years:
  - AFEB/DHB discussions
  - Multiple published papers
    - Most recent Weber *et al*, Preventive Medicine 119 (2019), 142-149
- Service level Streptococcal Infection policies => to prevent lost duty time
  - Favorable risk-benefit ratio: with prophylaxis both outbreaks and invasive disease are minimized with minimal adverse events

# Service Policies - Navy

- BUMED INST 6220.8B
  - Recruit Streptococcal Infection Prevention Program
  - 20 July 2014
- Applies to
  - Great Lakes Naval Recruit Training Center
  - Marine Corps Recruit Depot Parris Island
  - Marine Corps Recruit Depot San Diego
- Provides guidance on strep surveillance and prophylaxis use

# Service Policies - Navy

- Prophylaxis
  - All incoming recruits receive benzathine penicillin G (Bicillin-LAR, aka BPG) or alternate non-penicillin antibiotic year round
  - Non-pen antibiotics should be administered under Directly Observed Therapy; verified by Drill Instructors and Division Commanders
  - The decision to prophylax with second dose guided by surveillance
- Additional Prophylaxis ACTION POINTS:
  - Baseline rate
  - Hospitalized infection may trigger additional prophylaxis even if rates are below baseline.
  - Prophylaxis should continue for 12 weeks after rates go below baseline (at discretion of MTF CO or NEPMU)

# Service Policies - Navy

- Surveillance
  - MTFs shall monitor incident cases and rates of clinical lab-confirmed pharyngeal strep weekly
  - Lab-confirmed = culture or rapid test
  - Given that Navy and MC settings differ, surveillance should be tailored to best monitor the local population at risk
- Monitor colony morphology
  - If morphology increases above baseline, regional NEPMU shall coordinate investigation
- If Azithromycin is being used at times when BPG is in short supply, emerging antibiotic resistance should be monitored

# Service Policies - Army

- Army Acute Respiratory Disease Surveillance Program memo 12 June 2006
- Surveillance
  - Weekly tracking of strep cases down to the unit level
  - Tracking includes week of training, barracks type, BPG doses administered provided to the unit
- Prophylaxis
  - Tandem and mass BPG given to trainees at training sites (Ft Leonard Wood, Ft Sill, and Ft Benning)
  - Used conservatively at other sites

# Service Policies - Army

- Recommended ACTION LEVELS
  - Prophylax all incoming trainees if strep rate > 15 per 1,000 trainees for two weeks or if 1 hospitalized case of resp failure
  - Prophylax with second dose four weeks later IF resp failure cases continue to occur despite prophylaxis

# Service Policies - Army

## ACUTE RESPIRATORY DISEASE SURVEILLANCE REPORT

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| To: Army Medical Surveillance Activity<br>BLDG T-20 Room 213 (MCHB-TS-EDM)<br>6900 Georgia Ave., N.W.<br>Washington, DC 20307-5001 |     |      |      | FROM:<br><br>Preventive Medicine<br>Ft Benning, GA 31905<br>SGT Snuffy DSN XXX-XXXX |                  |                  |                             | Week ending date:<br>4-Mar-06 |           |                            |                                | Date submitted:<br>8-Mar-06 |           |                            |                                |
|--|-----|------|------|---|------------------|------------------|-----------------------------|-------------------------------|-----------|----------------------------|--------------------------------|-----------------------------|-----------|----------------------------|--------------------------------|
| UNIT DESIGNATION   |     |      |      | WEEK OF TRAINING  | TYPE OF TRAINING | TYPE OF BARRACKS | BICILLIN DOSES <sup>1</sup> | MALE TRAINEES                 |           |                            |                                | FEMALE TRAINEES             |           |                            |                                |
| UIC  | CO  | BN   | BDE  |   |                  |                  |                             | Unit Strength                 | ARD Cases | Cultures Done <sup>2</sup> | Cultures Positive <sup>3</sup> | Unit Strength               | ARD Cases | Cultures Done <sup>2</sup> | Cultures Positive <sup>3</sup> |
| W2L5K1   | A   | 1-19 | ITB  | 3   | OSUT             | SSP              | 1                           | 397                           |           |                            |                                | 0                           |           |                            |                                |
| W2L5K2   | B   | 1-19 | ITB  | 7   | OSUT             | SSP              | 1                           | 316                           | 1         | 1                          | 1                              | 100                         | 2         | 2                          | 0                              |
| W2L5K3   | C   | 1-19 | ITB  | 3   | OSUT             | SSP              | 1                           | 209                           |           |                            |                                | 109                         |           |                            |                                |
| W2L5K4   | D   | 1-19 | ITB  | 4   | OSUT             | SSP              | 1                           | 303                           |           |                            |                                | 0                           |           |                            |                                |
| W2L5K5   | E   | 1-19 | ITB  | n/a   | OSUT             | SSP              | 1                           | 80                            |           |                            |                                | 0                           |           |                            |                                |
| W2L5K7   | F   | 1-19 | ITB  | 4   | OSUT             | SSP              | 1                           | 173                           |           |                            |                                | 0                           |           |                            |                                |
| W2L5K9   | G   | 1-19 | ITB  | 3   | OSUT             | SSP              | 1                           | 98                            |           |                            |                                | 0                           |           |                            |                                |
| W2L5E1   | A   | 2-54 | ITB  | n/a   | OSUT             | SSP              | 1                           | 256                           |           |                            |                                | 0                           |           |                            |                                |
| W2L5E2   | B   | 2-54 | ITB  | n/a   | OSUT             | SSP              | 1                           | 62                            |           |                            |                                | 55                          |           |                            |                                |
| W2L5E3   | C   | 2-54 | ITB  | 13  | OSUT             | SSP              | 1                           | 220                           | 1         | 1                          | 0                              | 45                          | 1         | 1                          | 1                              |
| W2L5E4   | D   | 2-54 | ITB  | 5   | OSUT             | SSP              | 1                           | 207                           |           |                            |                                | 41                          |           |                            |                                |
| W2L5E5   | E   | 2-54 | ITB  | n/a   | OSUT             | SSP              | 1                           | 126                           |           |                            |                                | 0                           |           |                            |                                |
| W2L5E7   | F   | 2-54 | ITB  | n/a   | OSUT             | SSP              | 1                           | 78                            |           |                            |                                | 0                           |           |                            |                                |
| W2L5C1   | A   | 2-58 | ITB  | 6   | OSUT             | SSP              | 1                           | 227                           | 2         | 2                          | 1                              | 0                           |           |                            |                                |
| W2L5C2   | B   | 2-58 | ITB  | 7   | OSUT             | SSP              | 1                           | 256                           |           |                            |                                | 0                           |           |                            |                                |
| W2L5C3   | C   | 2-58 | ITB  | 11  | OSUT             | SSP              | 1                           | 222                           |           |                            |                                | 0                           |           |                            |                                |
| W2L5C4   | D   | 2-58 | ITB  | n/a   | OSUT             | SSP              | 1                           | 225                           |           |                            |                                | 0                           |           |                            |                                |
| W2L5C5   | E   | 2-58 | ITB  | n/a   | OSUT             | SSP              | 1                           | 82                            |           |                            |                                | 0                           |           |                            |                                |
| W2L5C6   | F   | 2-58 | ITB  | 13  | OSUT             | SSP              | 1                           | 190                           |           |                            |                                | 0                           |           |                            |                                |
| W2L5H2   | A   | 30AG | BCTB | PRE   | n/a              | SSP              | 0                           | 665                           |           |                            |                                | 0                           |           |                            |                                |
| W2L5H3   | B   | 30AG | BCTB | PRE   | n/a              | SSP              | 0                           | 0                             |           |                            |                                | 0                           |           |                            |                                |
| W2L5B1   | C   | 30AG | BCTB | PRE   | n/a              | SSP              | 0                           | 1                             |           |                            |                                | 0                           |           |                            |                                |
| W2L5B2   | D   | 30AG | BCTB | PRE   | n/a              | SSP              | 0                           | 0                             |           |                            |                                | 0                           |           |                            |                                |
| W2L5H4   | FTU | 30AG | BCTB | PRE   | BCT/OSUT         | SSP              | 1                           | 123                           |           |                            |                                | 6                           |           |                            |                                |
| W2L5K6   | A   | 2-19 | ITB  | 10  | OSUT             | SSP              | 1                           | 231                           | 1         | 1                          | 0                              | 22                          |           |                            |                                |

# Service Policies – Air Force

- 59MDWI 48-110
  - Recruit Streptococcal Infection Prevention Program
  - 25 Dec 2010 Draft
- Applies to:
  - Lackland Air Force Base 737 Training Group (Basic Trainees)



# Service Policies – Air Force

- Provides guidance on strep prophylaxis and surveillance
- Prophylaxis
  - All incoming recruits shall receive BPG or alternate non-penicillin antibiotic (Azithromycin, 500 mg weekly for 5 weeks) year round
  - Non-pen antibiotics should be administered under Directly Observed Therapy; verified by Military Training Instructors (MTI)
  - The decision to prophylax after the first four week with a second dose shall be guided by surveillance

# Service Policies – Air Force

- Surveillance
  - Preventive Medicine shall monitor incident cases and rates of *clinical lab-confirmed pharyngeal strep* weekly (Lab-confirmed = culture or rapid test)
  - Preventive Medicine will monitor hospitalized respiratory cases and assure that cultures for strep species are ordered (including Strep A and Strep pneumoniae)
  - Hospitalized infection triggers additional unit level (Flight) prophylaxis if in week 4-8 of training
  - Prophylaxis will usually continue until graduation
- Emerging Strep Resistance is monitored if Azithromycin is being used at times when BPG is in short supply.

# Reporting Streptococcal Infections

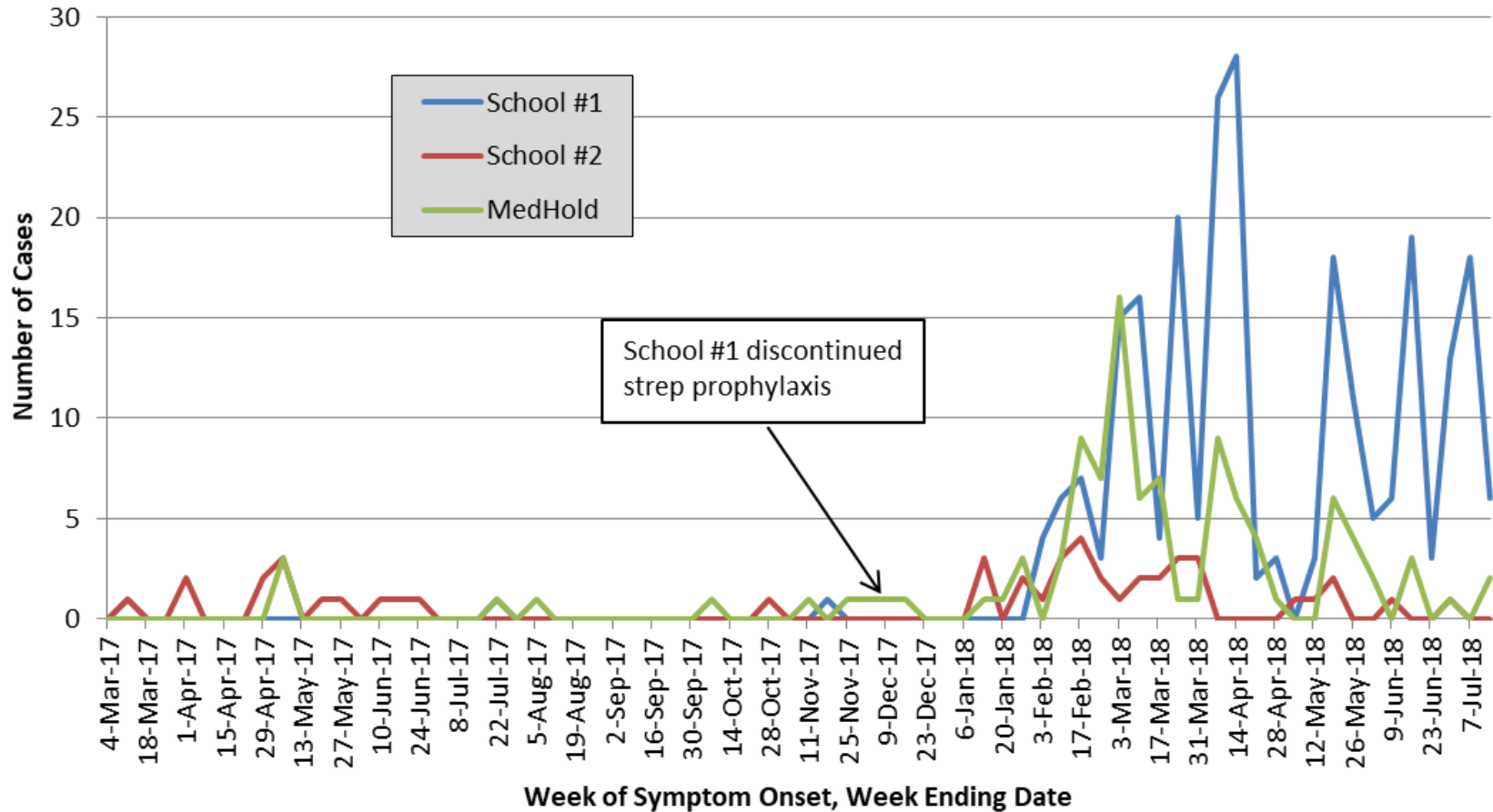
- Streptococcus, invasive
  - No longer reportable in DRSi as of July 2017
- Toxic Shock Syndrome
  - Reportable in DRSi
  - Case definition includes streptococcal TS and non-streptococcal TS
- Outbreaks of Group A Strep
  - Reportable, use the DRSi outbreak module
  - Contact your Service Public Health Center or regional NEPMU (Navy) with questions

# Navy Outbreak #1

- Advanced training center
  - Made up of multiple schools
  - Two schools fed directly from recruit training center
  - Mainly served by one single clinic
  - In May 2018, local PM alerted to increase in suspect strep
- Clinic sick call log indicated strep increase mid-February
  - No clear indication of serious sequella
- Strep burden mainly in one school and Med Hold company
  - Med Hold possibly contributing to continued transmission
- Interviews: School #1 commander decided to discontinue BPG ~ December 2017

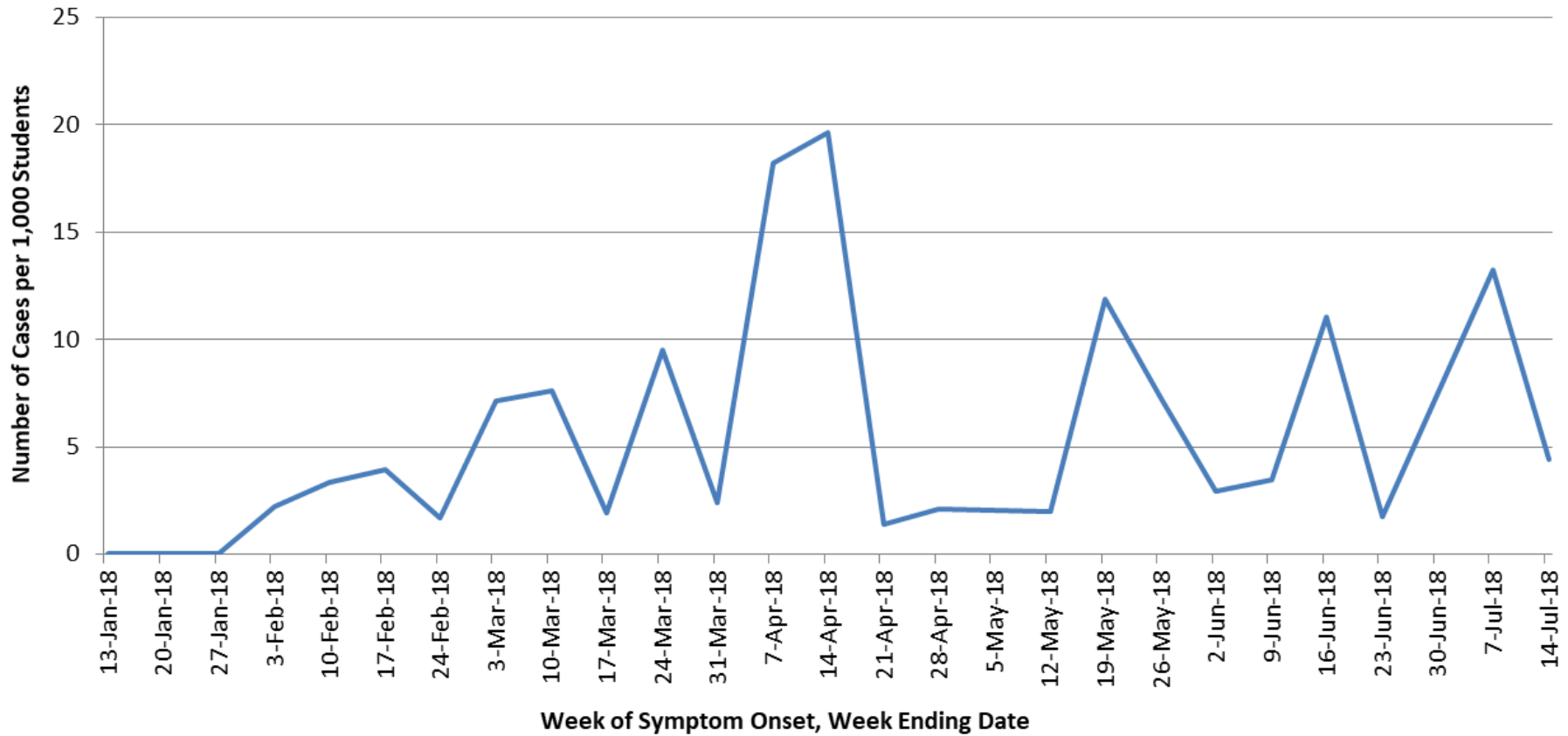
# Navy Outbreak #1

## Distribution of Strep Cases by Week of Symptom Onset and School



# Navy Outbreak #1

## Distribution of Strep Case Rates by Week of Symptom Onset, 2018



# Navy Outbreak #2

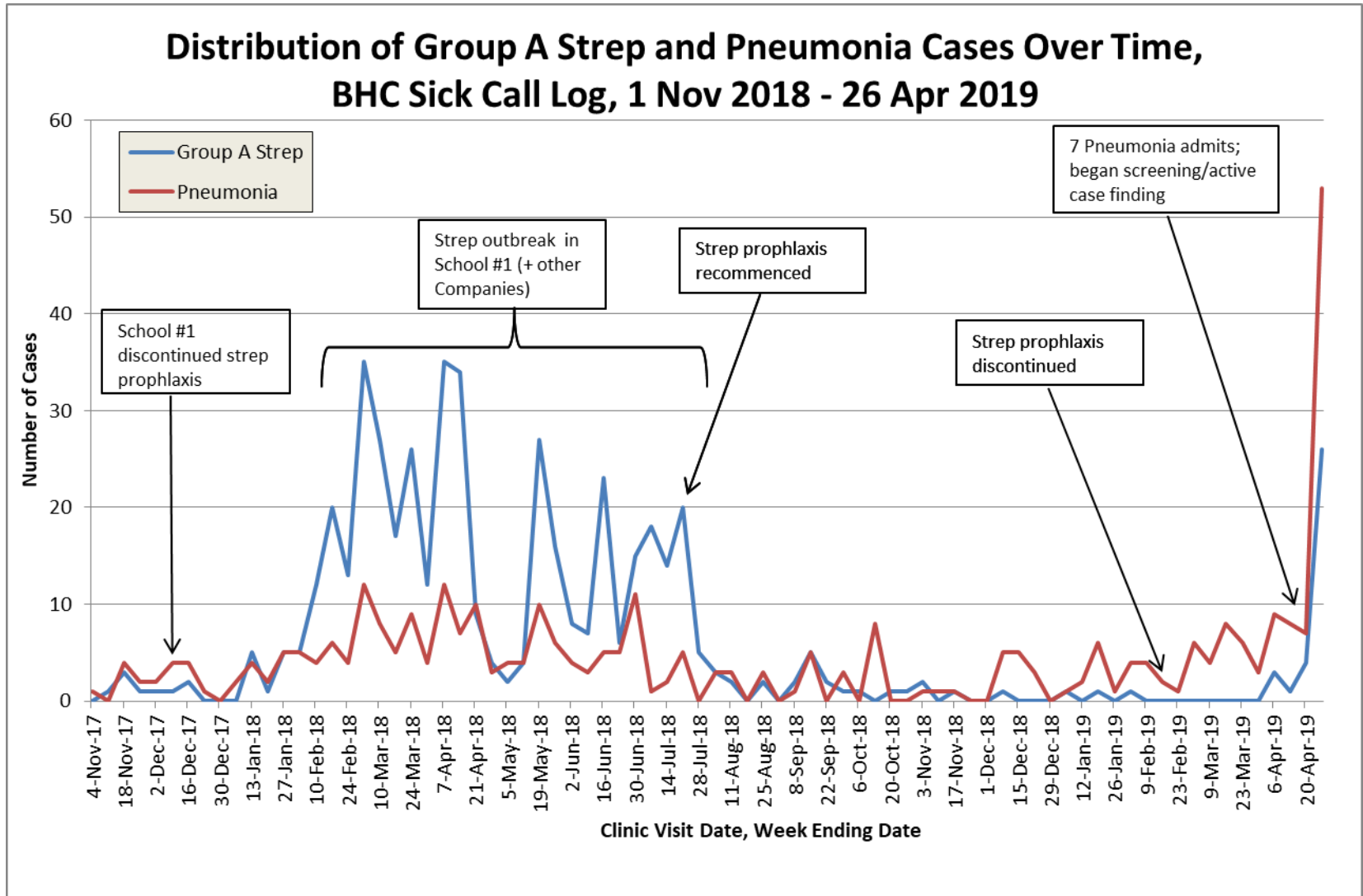
- Advanced training center
  - Made up of multiple schools
  - Two schools fed directly from recruit training center
  - Mainly served by one single clinic
  - In April 2019, local PM alerted to several hospitalized cases and possible pneumonia outbreak
- 8 hospitalizations
  - 1 confirmed Group A Strep
  - ~ 71 pneumonias with various etiologies, found due to active clinic screening

# Navy Outbreak #2

- One single company was having a small strep outbreak
- Another single company was having a small pneumonia outbreak (outpatient) of unknown etiology
- Multiple data streams show no increase in strep burden before the hospitalizations began end of April
  - Indicates particularly virulent strain
- Interviews: company having strep outbreak did not receive BPG due to short term supply issues (2 day delay)
  - Once BPG was missed in the routine schedule, it was not rescheduled
  - Additionally, follow-on BPG schedules for upcoming companies were no longer scheduled



# Navy Outbreak #2



# Army Outbreak Experience

- Army has historically experienced outbreaks in its basic trainee population
  - Usually tandem BPG prophylaxis has been interrupted
- Outbreaks have occurred at both Ft Benning and Ft Leonard Wood in 2019.
  - rapidly controlled with mass BPG prophylaxis and resumption of tandem BPG prophylaxis.

# Air Force Outbreak Experience

- No outbreaks in AF trainees since 1989
  - Chemoprophylaxis was stopped in the mid-1970s
  - Reinstated in 1989 after a 3-week outbreak among trainees at Lackland AFB ( $n = 186$ )
  - No discontinuation in prophylaxis since

# Challenges

- BPG shortages
  - One single manufacturer, limited manufacturing capacity for injectables, not much flexibility to ramp up supply if needed
  - National versus regional shortages, pharmacies must be prepared
    - National shortages are known to cause military outbreaks
    - Regional shortages can catch pharmacies off guard; order on demand versus maintaining adequate supply to initiate mass prophylaxis
- Administration burden
  - Medical resources: screening, prophylaxis preparation and administration, AHLTA input
  - Disruption to training

# Challenges

- BPG, significant cost burden
  - 2019 price increase from \$69 to \$95 per dose
  - leads to alternate prophylaxis discussions
    - No documented resistance
    - Azithromycin (alternative) has caused resistance
- Lack of perceived disease threat
  - Due to use of prophylaxis
  - May lead to inappropriate discontinuation of prophylaxis
- Alternate prophylaxis
  - Threat of emerging resistance
  - Non-compliance

# Challenges

- Numerous strains of GAS
  - Some more virulent than others
  - Virulent strains can lead to concurrent inpatient admissions and outpatient visits providing no advanced notice during an outbreak to prevent invasive infections

# Closing thoughts

- Key elements of a strong program
  - Surveillance
    - Must include outpatient and inpatient tracking
  - Prophylaxis
    - Year round tandem (for incoming accessions) prophylaxis for all trainees upon arrival
    - Maintain adequate supply of BPG to initiate mass prophylaxis for all trainees to suppress outbreaks in a timely manner
  - Reevaluation of prophylaxis protocols if not informed by history and surveillance data can lead to severe consequences
- Expect changes to Navy policy soon to address challenges

# Who to contact for more information

- Army: APHC – Disease Epidemiology Division  
Aberdeen Proving Ground – MD  
COMM: (410) 436-7605 DSN: 584-7605  
[usarmy.apg.medcom-aphc.mbx.disease-epidemiologyprogram13@mail.mil](mailto: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.navmcpublthcenpors.list.nmcphc-threatassess@mail.mil](mailto:usn.hampton-roads.navmcpublthcenpors.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](mailto: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](mailto: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](mailto:usn.jbphh.navenpvntmedusixhi.list.nepmu6@mail.mil)  
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