

Outbreak of Influenza & Streptococcal Pharyngitis in a School Setting



Session Objectives

1. Describe the purpose and methods of influenza surveillance
2. Review the steps of investigating an influenza outbreak in a school
3. Understand and apply case definitions related to influenza outbreaks in schools
4. Review roles and responsibilities when investigating an influenza outbreak in a school
5. Describe the methods to increase public health awareness during an influenza outbreak in a school
6. Apply principles to draft an influenza outbreak report

You are Judy, the nurse in the Washington County Local Health Department (LHD) Region 8 and you get a call on Tuesday January 31st at 2:37pm from a parent that reports that there are a lot of students absent at Bumblebee Elementary School. She says they all have the flu and she wants to know what is being done!!!



Question 1

What should your first step be?

Call the school nurse for Bumblebee Elementary

Question 2

What questions should you ask during your initial call with the school nurse?

1. Have you seen any sick students at the school? Anything unusual?
2. Symptoms: If so, what are their predominant symptoms?
3. Absenteeism: How many students are absent today? Yesterday (Monday)?
4. Denominator: What is the total student population in the school? Grades?

Why are absentee rates important data in school outbreaks

- Absentee rates used as proxy for flu activity
- Limited laboratory testing utilized
- Schools average 10% absentee or less
- Other factors influence absenteeism
- Data allows schools to determine what is normal activity and when an outbreak is over

Purposes of Influenza Surveillance

- Epidemiology
- Vaccine planning
- Trends
- Impact
- Control measures
- Need to know



Influenza Surveillance in US

- **Virological Surveillance**
 - World Health Organization Collaborating Laboratories
 - National Respiratory and Enteric Virus Surveillance System
 - Surveillance for Novel Influenza A Viruses
- **Outpatient Illness Surveillance**
 - Influenza-like illness surveillance network
 - ILI Activity Indicator map

Influenza Surveillance in US

- **Mortality Surveillance**
 - Mortality Reporting System
 - Influenza associated pediatric mortality surveillance system
- **Hospitalization Surveillance**
 - Influenza Hospitalization Surveillance Network
- **Geographic Spread of Influenza**
 - Epidemiologist reports (outbreaks, ILI, respiratory specimens)

Why Influenza Surveillance Important

- Flu constantly changes
- Rapid genetic changes can lead to pandemics
- Vaccine administration
- Treatment
- Targeted interventions

Nancy, the school nurse at Bumblebee Elementary, reports that she has seen some sick kids, but you know, it's that time of year. Nancy does know that a lot of people weren't at church on Sunday because everyone has the flu. She thinks there were about 50 kids out on Monday, which is a little high, but she isn't sure about today. She reports that there are 500 kids in the school, and she will get the absentee data tomorrow. She reminds you that she is only at Bumblebee on Mondays and Wednesdays. She thinks some of the students have been congested, coughing, and some complained of sore throats the day before.

Question 3

What should you recommend while you still have Nancy on the phone?

Do a call down of 15-20 absent students tomorrow morning. Find out:

1. Predominant signs and symptoms
2. Has anyone taken their sick kid to the doctor?
3. If so, were they given a diagnosis/any lab testing performed?

Are any staff sick?

You (Judy) get off the phone
suspecting there is an influenza
outbreak at the school...

Question 4

What should you do next?

1. Report to the regional epidemiologist or state (Division of Infectious Disease Epidemiology, DIDE)-even if the outbreak isn't confirmed yet
2. Designate herself or regional epidemiologist as local lead outbreak investigator
3. Send influenza outbreak guidelines to school nurse
4. Check to see how many influenza kits you have at the Washington County Health Department, and order more if needed

Nancy calls you back the next morning (Wednesday, February 1). She reports there are 75 kids absent today, including 3 who have gone home with cough and fever, and one who went home with a sore throat. Normally there are about 25 kids out. One of the first grade teachers is out with ILI.

Case Definition: Influenza-like Illness (ILI)

- Fever $\geq 100^{\circ}\text{F}$ oral or equivalent
- AND
- Cough and/or sore throat
- In the absence of a known cause other than influenza

→ Probable case of influenza

Confirmed Case Definition: Influenza

- Meets case definition for ILI
- AND
- Laboratory confirmed

Nancy sends you the
call down data...



Call down results

- *4 flu – parent reports (2 rapid test positive, 1 physician diagnosis, 1 did not see a physician)*
- *4 cough and fever*
- *3 sore throat and fever*
- *2 strep throat – parent reports*
- *1 dentist appointment*
- *1 upset stomach*

Question 5

Looking at the information Nancy collected from her call down, what illness is the most prevalent?

Influenza-like Illness



Call down results

- *4 flu – parent reports (2 rapid test positive, 1 physician diagnosis, 1 did not see a physician)*
- *4 cough and fever*
- *3 sore throat and fever*
- *2 strep throat – parent reports*
- *1 dentist appointment - noise*
- *1 upset stomach - noise*

Influenza Outbreak Definitions

- Increased absenteeism in association with influenza-like illness and/or laboratory confirmed influenza
- Three or more cases of influenza-like illness in a congregate setting within a 3-day period
- Two or more laboratory-confirmed cases of influenza within a 3-day period in a congregate setting

Question 6

What recommendations should you make while still on the phone with Nancy the school nurse?

1. Recommend instituting control measures at the school
2. Provide education on hand hygiene and respiratory etiquette
3. Provide copy of template letter to Nancy to send home with students noting how soon children can return to school after illness
4. Advise increased cleaning of high touch areas
5. Recommend collecting samples from ill students and staff
6. Continue to monitor the daily absentee rate until it has returned to baseline

Question 7

What is Judy's (local health department) responsibility during the course of the outbreak?

1. Continue communication with DIDE on a regular basis over the course of the outbreak
2. Coordinate lab testing and shipping; communicate between OLS and school nurse, etc.

Roles and Responsibilities

- Local Health Department
- State Health Department
- School
- Regional Epidemiologist

On Thursday, February 2, Judy makes a site visit to the school to deliver flu kits. While she is there, she goes over environmental cleaning procedures. She discovers there are no standard operating procedures regarding cleaning a school during an outbreak, and the janitorial supervisor reports he has his own cleaning solution that works real well but there are no labels on any of the bottles in the janitorial closet.

Question 8

Judy is not sure how to handle the situation at this point. She calls her sanitarian back at the local health department and asks for some guidance. What recommendations does the sanitarian give her?

- Know the difference between cleaning, disinfecting, and sanitizing
- Review routine cleaning and disinfecting
- Clean and disinfect surfaces and objects that are touched often
- Clean and disinfect using the correct materials: EPA registered disinfectant or fresh chlorine bleach solution
- Use products safely
- Handle waste properly

CLEANING

1. **CLEANING** *removes visible soil and debris. Also removes invisible debris that interferes with disinfection.*
 - **Method:** scrub, wash, and rinse. Always clean before sanitizing or disinfecting.
 - **Cleaning Solution:** detergent and water

SANITIZING

2. **SANITIZING** kills 99.9% of germs on a surface. This makes it unlikely that someone touching the surface will contact germs and become ill. Reduces number of disease causing germs. Focus: food contact surfaces/mouthed toys or objects.
- **Method:** Cover the cleaned area with sanitizing solution. Leave the solution to air dry at least 2 minutes. Wipe dry, or let it air dry.
 - **Sanitizing Solution:** 4 teaspoons of bleach to 1 gallon (16 cups) of water

DISINFECTING

3. **DISINFECTING** *kills nearly 100% of the germs on a surface. This is the solution to use for body fluid spills and to eliminate the spread of blood borne illnesses. A stronger bleach solution is used for additional protection against communicable diseases.*
- **Method:** Cover the cleaned area with disinfecting solution; leave the solution to air dry at least 2 minutes. Wipe dry, or let it air dry completely.
 - **Disinfecting Solution:** ¼ cup of bleach to 1 gallon (16 cups) of water (targeted)

Absenteeism continues to increase...

The following Monday, February, 6, Nancy calls the Washington County Health Department to report that 90 students are absent for the day. Judy was able to coordinate with the county's sentinel provider to collect respiratory specimens from several students who were sent home early on Friday with a fever and cough. The sentinel provider mails out the specimens on Monday for 6 children from Bumblebee Elementary with ILI symptoms.

Lab results come in from the Office of Laboratory Services on Wednesday morning, February 8th. In addition, 3 of the ill students who were tested by the sentinel provider were rapid test positive for strep throat. Judy also hears from Nancy that a second grade teacher who is pregnant presented with a cough and sore throat this morning.

Lab report results

- 4 confirmed Influenza B (PCR)
- 2 negative

- multiple reports (3 + 2) of positive rapid tests strep/streptococcal pharyngitis

Strep Throat vs. Flu

Strep Throat	Influenza
Sore throat, fever, stomachache, headache, swollen lymph nodes in neck	Fever, headache, chills, muscle aches, cough, sore throat, runny nose, congestion
Bacterial/Antibiotics	Viral
24 hours after start of antibiotics	24 hours after fever free without fever reducing medications

Question 9

What populations are at higher risk for complications from the flu?

Anyone can get the flu and serious problems from the flu can happen at any age.

Those most at risk include:

- Children younger than 5, but especially children younger than 2 years old
- Adults 65 years of age and older
- Pregnant women
- American Indians and Alaskan Natives
- People who have underlying medical conditions

Question 10

Given the lab report information, what should Judy advise the school nurse to do?

Note: Nancy never got a chance to send out the letter to parents!

1. Infection control measures

- Practice good hand hygiene: students and staff should have easy access to tissues as well as running water and soap or alcohol-based hand cleaners
- Practice respiratory etiquette: provide reminders about covering coughs and sneezes
- Stay home when you're sick
- Move students and staff who become sick to a separate room, limit the number of staff who take care of the sick
- Have PPE available to school nurses or other staff caring for sick people at school

2. Send out parent letter about co-occurring outbreaks.
3. Increase environmental cleaning for high touch surfaces.
4. Pregnant women should speak to their doctor as soon as possible if they are exposed to cases or develop symptoms. Early treatment with antiviral flu medicines is recommended for pregnant women who have the flu.

Late Wednesday afternoon, Nancy sends the parent letter to the Washington County Superintendent of Schools for his approval. She is hoping to send it home with the students on Thursday, February 9th.



On Thursday, the Washington County Board of Education convinces the principal of Bumblebee Elementary that it is in the school's best interest to close the school in order to stop the transmission of influenza. The parent letter goes out, announcing that Bumblebee Elementary will be closed on Friday, February 10, to clean the school. The news media then picks up on the outbreak.

School Closures



- Local decision-Health Officer
- Recommended to be a collaborative decision with stakeholders
- Weigh benefits vs. risks
- CDC does not recommend school dismissal
- Seek alternative measures to decrease transmission

Bumblebee Elementary reopens on Monday, February 13. A parent calls the health department to ask what they are doing about the outbreak, and why did the school not stay closed?

Question 11

How should Judy respond? What additional information/resources can Judy provide to parents?

The decision to reopen the school was a collaborative decision that school officials made in close consultation with local and state public health officials.

Increase Public Awareness

1. Letter home to parents
2. Informational meeting
3. Influenza vaccine clinic
4. Education in school (hand hygiene, cough etiquette)
5. Text alert/pre-recorded message to parents

Judy has kept in touch with the school nurse for a few weeks following the initial parent report, and absenteeism has slowly decreased back to the average rate of less than 5%. Nancy thinks the outbreak is over and has heard of no additional cases of ILI.

Question 12

In general, how soon can an influenza outbreak be closed?

Once the absentee rate returns to
baseline.

Judy was well prepared for an influenza outbreak, and was able to offer expert guidance to the school nurse throughout the flu outbreak.



Question 13

How was Judy prepared for the influenza outbreak in her county?

- Communication – school nurses, sentinel providers, school based health centers
- Reporting
- Forms
- Flu kits

Steps of Investigating an Outbreak

1. Establish existence of outbreak
2. Verify diagnosis
3. Define and identify cases
4. Describe and organize the data
5. Develop hypothesis
6. Evaluate hypothesis
7. Refine hypothesis
8. Implement Control and Prevention Measures
9. Communicate Findings

Steps of Investigating an Outbreak

Remember:

- Outbreak investigations are neither linear nor orderly!
- Multiple steps happen at the same time.
- Steps often have to be repeated several times.

Question 14

What is Judy's final responsibility in regards to this influenza outbreak?

Complete Outbreak Report



Question 15

What are the purposes of reporting and submitting influenza outbreak data?

- State and Federal reporting requirements
- Statewide picture of influenza activity
- Systematic review of outbreak data

Question 16

Why is it important to feed surveillance and outbreak data back to stakeholders?

- Encourage reporting
- Maintain communication with stakeholders
- Threat Preparedness grant requirement

Question 17

Once the outbreak report is completed
who should the report be shared
with?

1. School
2. Health Officer
3. State Health Department
(required)
4. School Superintendent
5. Parents



China Reports New Cases of Bird Flu

By KEITH BRADSHER
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HONG KONG — Chinese and [World Health Organization](#) officials said Monday that they had still not yet found any human-to-human transmission of a [spreading form of avian influenza](#), after confirming five more infections among humans over the weekend and three more on Monday.

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[China Escalates Its Response to Outbreak of Avian Flu \(April 6, 2013\)](#)

[C.D.C. Begins Work on Vaccine for China Flu \(April 5, 2013\)](#)









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Public health officials around the world have been closely watching the emergence of the illness, H7N9 [influenza](#), in Shanghai and three nearby provinces in central-eastern [China](#) over the past week, and researchers at the Centers for Disease Control and Prevention in Atlanta have [begun work on a vaccine](#).

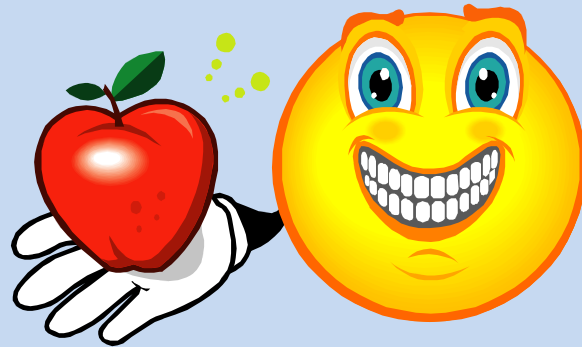
Chinese health officials have acknowledged 24 cases and 7 fatalities in the past week, counting the eight infections

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THE WAY BACK

WATCH TRAILER

The End



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15 minute break