Outbreak? – Don’t Panic!
Tips for Effectively Managing Outbreaks in School Settings

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Indiana Association of School Nurses
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Overview

• What happens during an outbreak?
  • Investigation, response, and key players

• Common causes of school-based outbreaks

• Other infectious diseases of concern
Outbreak Definition

Cases of disease occurring in a defined community, region, or particular population at a rate in excess of that which is normally expected.

Outbreak declaration, investigation, and control governed by Indiana Communicable Disease Rule (410 IAC 1-2.5)
Public Health Outbreak Response

- Verifying disease and outbreak
- Case Finding/Confirmation and Documentation
- Control Measures, Messaging, Vaccine Clinic*

Outbreak Declaration → Investigation → Mitigation
Public Health Outbreak Response

Outbreak Declaration
- Verify disease
- Verify outbreak

Investigation
- Case Finding/Confirmation
- Documentation

Mitigation
- Control Measures
- Messaging
- Vaccine Clinic*

Were the cases diagnosed by a provider? Do they meet clinical case definition? Are the cases lab-confirmed?
Public Health Outbreak Response

Does the number of cases meet the outbreak threshold?

- Verify disease
- Verify outbreak

**Outbreak Declaration**

- Case Finding/Confirmation
- Documentation

**Investigation**

- Control Measures
- Messaging
- Vaccine Clinic*

**Mitigation**

*Does the number of cases meet the outbreak threshold?
At this point will usually host a conference call with school officials, local and state health department, and IDOE to discuss next steps.
Public Health Outbreak Response

Outbreak Declaration
- Verify disease
- Verify outbreak

Are there additional cases? How many?

Investigation
- Case Finding/Confirmation
- Documentation

Mitigation
- Control Measures
- Messaging
- Vaccine Clinic*

Are there additional cases? How many?
Public Health Outbreak Response

- Verify disease
- Verify outbreak

Outbreak Declaration

Case Finding/Confirmation
- Documentation

Investigation

Control Measures
- Messaging
- Vaccine Clinic*

Mitigation

- Line list cases
- Identify common risk factors/transmission mechanism
- Documentation of immunity for students and staff
Public Health Outbreak Response

- Verify disease
- Verify outbreak

Outbreak Declaration

- Case Finding/Confirmation
- Documentation

Investigation

- Control Measures
  - Exclusions
  - Prophylaxis
  - Environmental action

- Messaging
- Vaccine Clinic*

Mitigation
Public Health Outbreak Response

- Verify disease
- Verify outbreak

Outbreak Declaration

- Case Finding/Confirmation
- Documentation

Investigation

- Control Measures
- Messaging
- Vaccine Clinic*

Mitigation

- Notification of contacts
- Letters
- Media communications
Public Health Outbreak Response

- Verify disease
- Verify outbreak

**Outbreak Declaration**

**Investigation**
- Case Finding/Confirmation
- Documentation

**Mitigation**
- Control Measures
- Messaging
- Vaccine Clinic*

*If applicable
Public Health Outbreak Response

- Verify disease
- Verify outbreak

Outbreak Declaration

- Case Finding/Confirmation
- Documentation

Investigation

- Control Measures
- Messaging
- Vaccine Clinic*

Mitigation

Ongoing communication between school, LHD, ISDH, and IDOE
Key Players and Responsibilities

- Local Health Department (LHD)
- Indiana Department of Education (IDOE)
- Indiana State Department of Health (ISDH)
- School
Key Players and Responsibilities

- Public health authority
- Investigates cases/outbreaks
- Declares outbreak
- Sends letters (if applicable)
- Determines and implements control measures

Local Health Department (LHD)

Indiana Department of Education (IDOE)

School

Indiana State Department of Health (ISDH)
Key Players and Responsibilities

- Public health authority
- Investigates cases/outbreaks
- Declares outbreak
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- Determines and implements control measures

Local Health Department (LHD)

Indiana Department of Education (IDOE)

School

Indiana State Department of Health (ISDH)

- Report suspected outbreaks
- Document vaccination history/evidence of immunity of students and staff
- Assist with control measures
- Work with IDOE to ensure educational requirements met
Key Players and Responsibilities

- **Public health authority**
- **Investigates cases/outbreaks**
- **Declares outbreak**
- **Sends letters (if applicable)**
- **Determines and implements control measures**

- **Report suspected outbreaks**
- **Document vaccination history/evidence of immunity of students and staff**
- **Assist with control measures**
- **Work with IDOE to ensure educational requirements met**

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- **Local Health Department (LHD)**
- **School**
- **Indiana Department of Education (IDOE)**
- **Indiana State Department of Health (ISDH)**

- **Advise on cases, outbreak declaration, and control measures**
- **Assist with lab testing**
- **Assist with vaccination clinics**
- **Assist with communication**
Key Players and Responsibilities

- Public health authority
- Investigates cases/outbreaks
- Declares outbreak
- Sends letters (if applicable)
- Determines and implements control measures

- Report suspected outbreaks
- Document vaccination history/evidence of immunity of students and staff
- Assist with control measures
- Work with IDOE to ensure educational requirements met

Local Health Department (LHD)

Indiana Department of Education (IDOE)

Indiana State Department of Health (ISDH)

School
Notes on Disease Reporting: Responsibilities

Physicians, hospitals and labs
• Required to report cases of reportable conditions and outbreaks to LHD or ISDH per Indiana Communicable Disease Rule

Schools
• Not required, but encouraged to report cases of reportable conditions
• Cases in excess of what is normally expected or with a common connection should be reported immediately.
• Early reporting ensures more time to prepare for outbreaks.
Notes on Disease Reporting: School Reporting

Reportable Conditions

• Inform parent that their child has a reportable disease, which should have been reported to the LHD by their health care provider.
• School just following up and will report to local health department.
  – Will provide child’s name, diagnosis, and parent contact information
• Parent will most likely receive a call from LHD personnel.

Non-reportable Conditions

• School may inform LHD of number of cases.
• School does not need to report personally identifiable information.
• School does not need to notify parent.

Reportable conditions list available at: https://www.in.gov/isdh/25366.htm
Notes on Disease Reporting: HIPAA and FERPA

HIPAA

- ISDH/LHDs fall under HIPAA public health exemption - may receive medical or epidemiological information without prior written consent

FERPA

- “Health or safety emergency exemption”
- Permits school officials to disclose personally identifiable information (PII) from education records without consent to appropriate parties only when there is an actual, impending, or imminent emergency
- Schools have discretion to determine what constitutes a health or safety emergency
- Exemption temporally limited to the emergency
- Consult IDOE with any concerns about sharing student PII
Vaccine-Preventable Disease Outbreaks in School Settings

- Varicella (chickenpox)
- Mumps
- Pertussis
- Measles
<table>
<thead>
<tr>
<th>Disease</th>
<th>Outbreak Threshold</th>
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</table>
| Varicella (Chickenpox) | Cases <13 years: 5 epi-linked cases  
Cases ≥13 years: 3 epi-linked cases  
*Must reside in two separate households. |
| Mumps              | 3 epi-linked cases  
(with at least 1 lab confirmed case)                                                  |
| Pertussis          | No specific threshold                                                              |
| Measles            | 1 case                                                                            |
Varicella (Chickenpox)

- 236 cases in 2017
- Three outbreaks declared in 2018 to date
- Transmission:
  - Airborne droplets, respiratory secretions, or lesion fluid
- Challenges:
  - “Breakthrough” disease in previously vaccinated individuals
  - Reporting gaps

Source: CDC Public Health Image Library
Indiana Varicella Cases

Confirmed and Probable Varicella Cases, Indiana, 2009-2017

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of Cases</th>
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<td>173</td>
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<td>2016</td>
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<td>2017</td>
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Unvaccinated Case vs. Breakthrough Case

Unvaccinated Case:
- 200-500 lesions
- Mostly vesicular
- 2-4 “crops” of lesions
- Fever, malaise

Breakthrough Case:
- <50 lesions
- Atypical appearance
- Few or no vesicles
- Less contagious

Source: CDC Public Health Image Library
Diagnosing Breakthrough Varicella

Source: CDC Public Health Image Library
Diagnosing Breakthrough Varicella

Poison Ivy

Herpes Simplex

Folliculitis

Insect Bites

Breakthrough Varicella

Scabies

Source: CDC Public Health Image Library
Varicella – Reporting Challenges

Outbreak-Associated Cases, April-May 2018

Date of Onset

Number of Cases

Confirmed Cases

Suspect Cases

First report to ISDH
Varicella – Control Measures

• Case Management:
  • Exclude cases from school until all lesions crust over OR
  • In the case of mild disease: exclude until lesions fade & no new lesions appear in a 24-hour period

• Prophylaxis of exposed contacts may provide some protection against disease:
  • Vaccination within 5 days of exposure OR
  • Varicella immune globulin within 96 hours of exposure (for individuals who can’t receive vaccine)

• Outbreak Threshold:
  • Cases <13 years old: 5 or more
  • Cases ≥13 years old: 3 or more
  • Cases must be epi-linked and reside in at least two separate households
Varicella – Control Measures

Single Cases vs. Outbreak

**Single Cases**
- Typically, just notify high-risk individuals of exposure:
  - Pregnant women
  - Immunocompromised individuals
- Letters or school-wide notification usually not necessary
- Vaccination as needed

**Outbreak**
- Identify contacts without acceptable documentation of immunity:
  - 2 documented doses of vaccine
  - Lab evidence of immunity
  - Provider-verified history of disease
  - Birth in the U.S. before 1980
- Exclude susceptible contacts for 21 days following rash onset of last case
- Vaccination as needed

Determined by Local Health Department
Mumps

• 42 cases in 2017
• Transmission:
  • Contact with saliva or respiratory secretions
• Outbreak Threshold:
  • 3 epi-linked cases
  • At least one case must be lab-confirmed
• Case Management:
  • Exclude cases for 5 days after onset of swelling

Source: CDC Public Health Image Library
Indiana Mumps Cases

Confirmed and Probable Mumps Cases, Indiana, 2009-2017
Mumps – Control Measures

**Single Cases vs. Outbreak**

**Determined by Local Health Department**

**Typically, just notify high-risk individuals of exposure:**
- Pregnant women
- Immunocompromised individuals

Prophylaxis not applicable, but vaccination may protect against future exposure.

**Identify contacts without acceptable documentation of immunity:**
- Documentation of mumps vaccine
- Lab evidence of immunity
- Birth in the U.S. before 1957

Exclude susceptible contacts from days 9-25 following exposure.

Vaccination as needed.
Pertussis (Whooping Cough)

- 382 cases in 2017
- Transmission:
  - Respiratory droplets
- Outbreak Threshold:
  - Cases in excess of what is expected
  - Determined on case-by-case basis
- Case Management:
  - Exclude infected persons until:
    - 5 days of effective antibiotic treatment completed
    OR
    - 21 days if not treated

Source: CDC Public Health Image Library
Indiana Pertussis Cases

Confirmed and Probable Pertussis Cases, Indiana, 2009-2017

Year
Number of Cases
0 100 200 300 400 500 600 700 800
392 744 367 441 617 492 223 178 382
Pertussis Control Measures

• No specific outbreak measures in CD rule
• Vaccination clinic if needed
• No exclusion of healthy, susceptible individuals required

• Prevention for contacts:
  • Antibiotic prophylaxis for all household contacts
  • Vaccinate unvaccinated/incompletely vaccinated contacts (for protection against future exposure)
Measles

• Rare:
  • Usually 1-2 cases per year in Indiana

• Transmission
  • Airborne Droplets

• No endemic transmission in US, but outbreaks still occur

Source: CDC Public Health Image Library
Notable Measles Outbreaks Nationwide

- **2014**: 667 Cases
- **2015**: 188 Cases
- **2016**: 86 Cases
- **2017**: 120 Cases*
- **2018**: 142 Cases*

*Case counts for 2017 are as of Dec. 30, 2017. Case counts for 2018 are as of Oct. 6, 2018.

Source: CDC. Data are preliminary and subject to change.
Measles Control Measures

• A single case is treated as an outbreak.
• Exclude infected individual for 4 days after appearance of rash.
• Vaccination/post-exposure prophylaxis as needed
  • Vaccination within 72 hours of exposure OR
  • Immune globulin with 6 days
• Exclude susceptible contacts from outbreak setting until 21 days after onset of last case.
• Acceptable proof of immunity:
  • Birth before 1957
  • Two documented doses of measles vaccine
  • Lab confirmation of previous measles infection
  • Lab evidence of immunity
VPD Outbreaks in School Settings: General Notes

- Rules regarding documentation of immunity and exclusions apply to students and staff.
- Students/staff without evidence of immunity may return to school immediately after receipt of vaccine.
- Exclusion periods may be extended as new cases are identified.
- Vaccination clinics may be offered by the LHD in coordination with ISDH if deemed necessary.
Preparing for an Outbreak

• Compile documentation of vaccination/immunity on all students and staff

• Review immunization records to identify susceptible students and staff who would need to be excluded in the event of an outbreak

• Build a relationship with your local health department

• Promptly report cases of reportable diseases and suspected outbreaks to your local health department and/or ISDH
Other Conditions of Concern

• Meningitis
• Influenza
• Common non-reportable illnesses
Causes of Meningitis

- Bacterial
- Viral
- Parasitic
- Fungal
- Non-infectious
Meningococcal Disease

- Caused by *N. meningitidis*
- Severe illness
  - Fatal in 10-15% of cases, even with treatment
- Spread by direct contact with saliva or respiratory droplets
- Prophylaxis required for close contacts:
  - Household contacts
  - Contacts with direct exposure to saliva/respiratory droplets

Image source: National Meningitis Association
Indiana Meningococcal Disease Cases

Confirmed and Probable Meningococcal Disease Cases, Indiana 2009-2017

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</table>
# Meningococcal Disease Control

## Prophylaxis
- Most school contacts are **not** considered high-risk
- Local health department will advise on need for prophylaxis

## Communication
- Important for addressing concerns among parents, staff, and community
- Consult public health regarding communication needs

## Outbreaks
- Outbreaks are rare.
- Only ≈2% of cases are outbreak-related.
- May consider mass vaccination in outbreak situations
- Mass prophylaxis not routinely recommended
Other Bacterial Meningitis

• Other common causes:
  • Streptococcus pneumoniae
  • Haemophilus influenzae
  • Listeria monocytogenes

• Usually do **not** require prophylaxis of contacts

• Public health can assist with communication needs

Source: CDC Public Health Image Library
Aseptic/Viral Meningitis

- Multiple potential causes:
  - Enteroviruses
  - Herpes viruses (including varicella-zoster virus)
  - Mumps virus
  - Arboviruses
- Prophylaxis generally not applicable
- Public health can assist with communication, if needed
Influenza

Encourage basic prevention:

• Vaccination

• 3 C’s:
  • **Clean**: Frequent, proper handwashing
  • **Cover**: coughs and sneezes with elbow, upper sleeve, or tissue
  • **Contain**: Ill students and staff should stay home
Influenza

• Report excessive absenteeism (≥20%) to IDOE and local health department
  • Reporting of ≥20% absenteeism to IDOE is mandatory
  • Does not require automatic closure of school
  • Once report is received, IDOE will call to advise school on next steps
Influenza

• Consult local health department in situations of excessive absenteeism or suspected outbreaks.

• ISDH may offer to test nasal/NP swabs for ill students during suspected outbreaks.
Common Non-Reportable Illnesses

• Examples:
  • Enterovirus (hand, foot, and mouth disease)
  • Parvovirus (fifth disease)
  • Strep throat or scarlet fever

• Single cases not reportable

• Good practice to notify public health if:
  • Observing more cases than expected OR
  • Cases have a common connection
    (e.g. same sports team)
Key Takeaways

• The local health department is the public health decision-making authority
  • Declares outbreaks
  • Determines what control measures are needed
• Exclusions for healthy susceptible individuals apply only in outbreak situations.
• Early reporting from schools can allow for more timely response.
Key Takeaways

• Public health is here to help!
• ISDH and local health departments can:
  • Advise on prevention and control measures
  • Assist with communication needs
  • Assist with outbreak control measures (e.g. vaccination clinics)
Resources

ISDH Communicable Disease Reference Guide for Schools:
https://www.in.gov/isdh/23291.htm

ISDH Epidemiology Resource Center (ERC):
https://www.in.gov/isdh/25154.htm
• Fact sheets
• Disease-specific information
QUESTIONS?
Contact Information

ISDH Epidemiology Resource Center
Phone: 317-233-7125

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Vaccine-Preventable Disease Epidemiologist
lmilroy@isdh.in.gov
Phone: 317-234-2807

- Varicella (chickenpox), shingles, meningococcal disease, aseptic/viral meningitis, enterovirus/HFMD, fifth disease, *Haemophilus influenzae*, Group A *Streptococcus*
Contact Information

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