January 2024

Varicella

Surveillance and Investigation Protocol

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Division of Infectious Disease Epidemiology
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I. ABOUT THE DISEASE

Varicella is an acute infectious disease caused by the varicella zoster virus (VZV). VZV is a DNA virus and is a member of the herpes virus group. Primary (first) infection with VZV results in chickenpox. VZV persists in the body as a latent infection that can reactivate resulting in herpes zoster (shingles). Outbreaks of varicella should be reported to the local health department immediately. Weekly aggregate numbers of varicella cases are to be reported from the local health department to the West Virginia Department of Health and Human Resources, Bureau for Public Health, Office of Epidemiology and Prevention Services, Division of Infectious Disease Epidemiology (DIDE) via the West Virginia Electronic Disease Surveillance System (WVEDSS).

A. Clinical Presentation

In unvaccinated people, the rash is usually generalized and pruritic and progresses rapidly (within 24 hours) from macules to papules to vesicular lesions before crusting. The rash usually appears first on the chest, back, and face, then spreads over the entire body. The lesions are usually concentrated mostly on the chest and back. Symptoms typically last four to seven days. Lesions can also occur on the mucous membranes of the oropharynx, respiratory tract, vagina, conjunctiva, and cornea.

In healthy children, the illness is usually milder, and a rash is often the first sign of chickenpox and usually has 250 to 500 lesions in two to four crops. After the rash, children may have a fever (up to 102°F) and other systemic symptoms (e.g., malaise, headache) that may resolve in two to four days after rash onset.

Adults may have one to two days of fever and malaise prior to rash onset. Adults, infants, pregnant women, adolescents, and immunocompromised individuals (adults and children) are at more risk for severe disease and complications. Complications can include bacterial superinfection of skin lesions, bacterial sepsis, pneumonia, central nervous system involvement, thrombocytopenia, other rare complications, hospitalization, and even death. Infants born to a mother who had maternal varicella infection in the first 20 weeks of gestation are occasionally associated with abnormalities in the newborn. These abnormalities include low birth weight, hypoplasia of extremity, skin scarring, eye, and neurologic abnormalities.

As vaccination coverage has increased, the majority of cases now occur in vaccinated persons (i.e., breakthrough cases). A breakthrough infection tends to be milder, with

fewer than 50 skin lesions, fewer vesicles, atypical rash appearance, and shorter illness duration. Due to modified clinical presentation, breakthrough infections can be clinically challenging to diagnose and has increased the need for laboratory confirmation.

B. Etiologic Agent

Varicella-zoster virus (VZV) is a DNA virus that is a member of the herpesvirus group. VZV (also known as human herpesvirus 3) is a member of the *Herpesviridae* family, the subfamily *Alphaherpersvirinae*, and the genus *Varicellovirus*. After the primary infection, VZV stays in the body (in the sensory nerve ganglia) as a latent infection. Primary infection with VZV causes varicella.

C. Reservoir

Humans are the only source of infection for this virus.

D. Incubation Period

The incubation period is 10 to 21 days with an average of 14 to 16 days after exposure to the rash. The period can be as long as 28 days after receipt of Varicella-Zoster Immune Globulin or Immune Globulin Intravenous and may be shortened in immunocompromised patients. Varicella can develop after birth in infants born to mothers with active varicella around the time of delivery; the usual interval from onset of rash in a mother to onset in her neonate is nine to 15 days, but it can be as short as two days.

E. Mode of Transmission

Transmission occurs person-to-person primarily by direct contact with either varicella or herpes zoster lesions. Varicella is also transmitted by the airborne route by inhalation of aerosols from vesicular fluid from the lesions, and less commonly, infected respiratory secretions. There is currently no evidence that varicella is transmitted by fomites as the virus is unable to survive for long in the environment.

F. Period of Communicability

A person with varicella is considered contagious beginning one to two days before rash onset until all the chickenpox lesions have crusted. Vaccinated people may develop lesions that do not crust. These people are considered contagious until no new lesions have appeared for 24 hours.

II. DISEASE CONTROL AND PREVENTION

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A. Disease Control Objectives

1. Isolate individuals with varicella.
2. Offer vaccination following varicella exposure.
3. Exclude exposed susceptible individuals who may be in contact with persons at high risk of serious complications.

B. Disease Prevention Objectives

1. The best way to prevent chickenpox is to get the chickenpox vaccine. Children, adolescents, and adults should get two doses of the chickenpox vaccine. Two doses of the vaccine are about 92 percent effective at preventing chickenpox.
2. Administration of varicella VZIG to high-risk individuals for whom varicella vaccine is contraindicated.
3. Affected children should be excluded from school until the lesions have crusted; however, this may not prevent the spread of varicella because the child is infectious before rash appears.

C. Disease Prevention and Control Intervention

After a case of chickenpox is identified in a setting, reduce further transmission by educating providers to:

1. Isolate (exclude) or cohort individuals with varicella until all lesions have crusted and no new lesions appear within a 24-hour period.
2. Offer chickenpox vaccine within 72 hours (three days) and possibly up to 120 hours (five days) following varicella exposure. Encourage vaccination even if exposure is greater than five days.
3. Offer VariZIG or IGIV as soon as possible, ideally within 96 hours (but up to 10 days) to susceptible persons who are at high risk for developing severe disease and when varicella vaccine is contraindicated.
4. Prophylactic administration of oral acyclovir beginning seven days after exposure may also prevent or attenuate varicella in healthy children.
5. Exclude exposed susceptible individuals who may be in contact with persons at high risk of serious complications (e.g., health care workers, family members of immunocompromised persons) for the duration of the period of communicability (i.e., from the eighth until the 21st day post-exposure).

D. Treatment

1. Nonspecific therapies for varicella include:
    a. Use non-aspirin medications, such as acetaminophen, to relieve fever from chickenpox.

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b. Calamine lotion and colloidal oatmeal baths may help relieve some of the itching.
c. Keep fingernails trimmed and short to help prevent skin infections caused by scratching the blisters.
d. Children with varicella **should not** receive salicylates or salicylate-containing products. This increases the risk of Reye syndrome.

2. The decision to use antiviral therapy should be determined by specific host factors, the extent of infection, and the initial response to therapy. Antiviral drugs have a limited window of opportunity to affect the outcome of varicella infection.
    a. Oral acyclovir or valacyclovir are not recommended for routine use in otherwise healthy children.
    b. Oral acyclovir or valacyclovir should be considered for otherwise healthy people at increased risk of moderate to severe varicella; unvaccinated people older than 12 years, people with chronic cutaneous or pulmonary disorders, people receiving long-term salicylate therapy, and people receiving short, intermittent, or aerosolized courses of corticosteroids.
    c. Intravenous acyclovir therapy is recommended for immunocompromised patients including patients being treated with high-dose corticosteroid therapy for more than 14 days. The acyclovir should be initiated within 24 hours of rash onset.
3. Oral acyclovir **should not** be used to treat immunocompromised children.
4. Valacyclovir (20mg/kg per dose, with maximum dose of 1000mg, administered three times a day for five days) was licensed in 2008 for treatment of varicella in children two to 17 years of age.
5. Some experts have used valacyclovir in selected immunocompromised patients perceived to be at low to moderate risk of developing severe varicella, such as HIV-infected patients with relatively normal concentrations of CD4+ T-lymphocytes and children with leukemia in whom careful follow-up is ensured.
6. IGIV given shortly after exposure can prevent or modify the course of disease, Immune Globulin preparations are not effective in treatment once disease is established.

III. DISEASE INVESTIGATION

A. Criteria for Case Ascertainment

Laboratory/Imaging Criteria for Reporting

1. Varicella is reportable as an aggregate total in West Virginia. A positive laboratory test result of varicella, including patient demographic information, may be

reported to the appropriate local health department and the local health department will file a report into WVEDSS within one week of receiving the report. Contact your local health department on how to report. For a list of local health departments, please visit https://dhhr.wv.gov/localhealth/pages/map.aspx.

2. The infection control practitioner or the healthcare provider who ordered the test should be notified of a positive result immediately.

B. Case Definition and Case Classification

Clinical Criteria

In the absence of a more likely alternative diagnosis:

- An acute illness with a generalized rash with vesicles (maculopapulovesicular rash), **OR**
- An acute illness with a generalized rash without vesicles (maculopapular rash).

Laboratory Criteria[*a]

Confirmatory Laboratory Evidence:

- Positive polymerase chain reaction (PCR) for varicella-zoster virus (VZV) DNA, [b,c] **OR**
- Positive direct fluorescent antibody (DFA) for VZV DNA, **OR**
- Isolation of VZV, **OR**
- Significant rise (i.e., at least a 4-fold rise or seroconversion[c,d]) in paired acute and convalescent serum VZV immunoglobulin G (IgG) antibody. [c,e]

[a] A negative laboratory result in a person with generalized rash with vesicles does not rule out varicella as a diagnosis.

[b] PCR of scabs or vesicular fluid is the preferred method for laboratory confirmation of varicella. In the absence of vesicles or scabs, scrapings of maculopapular lesions can be collected for testing.

[c] Not explained by varicella vaccination during the previous 6-45 days.

[d] Seroconversion is defined as a negative serum VZV IgG followed by a positive serum VZV IgG.

[e] In vaccinated persons, a 4-fold rise may not occur.

[f] IgM serology has limited value as a diagnostic method for VZV infection and is not recommended for laboratory confirmation of varicella. However, an IgM positive result in the presence of varicella-like symptoms can indicate a likely acute VZV infection. A positive IgM result in the absence of clinical disease is not considered indicative of active varicella.

Supportive Laboratory Evidence:

- Positive test for serum VZV immunoglobulin M (IgM) antibody. [c,f]

Diagnostic Tests for Varicella-Zoster Virus (VZV Infection)

Test	Specimen	Comments
PCR	Vesicular swabs or scrapings, scabs from crusted lesions, biopsy tissue, CSF	Very sensitive method. Specific for VZV. Methods have been designed that distinguish vaccine strain from wild type.
DFA	Vesicle scraping, swab of lesion base (must include cells)	Specific for VZV. More rapid and more sensitive than culture; less sensitive than PCR.
Viral Culture	Vesicular fluid, CSF, biopsy tissue	Distinguishes VZV from HSV. Least sensitive method. Limited availability and requires up to a week for results.
Serology (IgG)	Acute and convalescent serum specimens for IgG	Specific for VZV. Commercial assays generally have low sensitivity to reliably detect vaccine-induced immunity.
Serology (IgM)	Acute serum specimens for IgM	Less specific than IgG. IgM inconsistently detected. Not reliable method for routine confirmation, especially in vaccinated persons, but positive result in the presence of varicella-like symptoms indicates current/recent VZV infection.

Epidemiologic Linkage

Confirmatory Epidemiologic Linkage Evidence:

- Exposure to or contact with a laboratory-confirmed varicella case, **OR**
- Can be linked to a varicella cluster or outbreak containing ≥1 laboratory-confirmed case, **OR**
- Exposure to or contact with a person with herpes zoster (regardless of laboratory confirmation)

Presumptive Epidemiologic Linkage Evidence:

- Exposure to or contact with a probable varicella case that had a generalized rash with vesicles.

Healthcare Record criteria

- Provider diagnosis of varicella or chickenpox but no rash description.

Case Classifications

Confirmed

- Meets clinical evidence **AND** confirmatory laboratory evidence, **OR**
- Meets clinical evidence with a generalized rash with vesicles **AND** confirmatory epidemiologic linkage evidence

Probable

- Meets clinical evidence with a generalized rash with vesicles, **OR**
- Meets clinical evidence with a generalized rash without vesicles **AND**:
  - Confirmatory or presumptive epidemiologic linkage evidence, **OR**
  - Supportive laboratory evidence. **OR**
- Meets healthcare record criteria AND:
  - Confirmatory or presumptive epidemiologic linkage evidence, **OR**
  - Confirmatory or supportive laboratory evidence.

The following should be enumerated as a new case:

- Person with a new onset of symptoms that meets the criteria for a confirmed or probable case, **OR**
- Person was previously enumerated as a case followed by a documented period of recovery **AND** newly meets the criteria for a confirmed or probable case**, **OR**
- Person was previously reported but not enumerated as a confirmed or probable case, then subsequently available information meets the criteria for a confirmed or probable case.

*** Varicella generally confers life-long protection. There have been reports of second episodes of varicella, but in most cases the first episode was not laboratory-confirmed.*

C. Reporting Timeframe to Public Health

Outbreaks of varicella should be reported immediately to local health departments and aggregate total varicella cases should be reported weekly to respective local health departments.

D. Outbreak Recognition

To facilitate disease prevention and control, health departments should encourage varicella outbreak reporting in the following situations: five or more cases that are epidemiologically linked from any given school, daycare facility, long-term care facility, or other congregate settings within one incubation period. Although individual cases of varicella are not reportable, if you become aware of one, a single case should trigger intervention measures because one case could lead to an outbreak in settings with low vaccination coverage.

Steps for Outbreak management:

1. Check to confirm that the reported cases meet the clinical criteria of varicella and outbreak case definition.
2. Immediately notify DIDE for assistance with outbreak investigation.
3. Initiate rapid case and contact identification to prevent the spread of disease, especially among susceptible persons at high risk for serious complications of varicella, such as immunocompromised persons and pregnant women. For identification of close contacts, see table 1.

Table 1- Types of Exposure to Varicella or Zoster

Type of Contact	Description
Household	Residing in the same household.
Playmate	Face-to-face indoor play ≥5 minutes (some experts use >1 hour).
Hospital Setting	Varicella: In the same two to four bedroom or adjacent beds in a large ward, face-to-face contact with an infectious staff member or patient, or visit by a person deemed contagious. Zoster: Intimate contact (e.g., touching or hugging) with a person deemed contagious.
Newborn Infant	Onset of varicella in the mother five days or less before, or within 48 hours after delivery; VariZig or IGIV is not indicated if the mother has zoster.

4. Rapidly triage (interview) all cases of chickenpox by completing the chickenpox outbreak Line List form: https://oeps.wv.gov/toolkits/Pages/toolkits_varicella.aspx
5. Determine vaccination status by checking WVSIIS, contacting the parent for vaccination records, or obtain the information through their healthcare provider.
6. Issue a healthcare provider alert and parent/guardian notification letter in settings where exposed persons may seek post exposure prophylaxis with vaccine or immune globulin or antiviral from their providers in the community. Sample healthcare providers and parent/guardian letters are available at https://oeps.wv.gov/toolkits/Pages/toolkits_varicella.aspx.
7. Isolate (exclude) or cohort individuals with varicella until all their lesions have formed scabs or crusts (usually five days after rash onset). In immunized people without crusts, isolate (exclude) until no new lesions appear within a 24-hour period.
8. Offer the varicella vaccine even if the outbreak is identified late. Outbreaks in some settings can last months if vaccination coverage is low. Thus, offering varicella vaccine during an outbreak may provide protection to people not yet exposed.
9. Post exposure immunization: Varicella vaccine should be administered to healthy people without evidence of immunity (see Table 2) who are 12 months or older, including adults, as soon as possible, preferably within three days and possibly up to five days after varicella or herpes zoster exposure, if there are no contraindications to vaccine use. If more than five days have passed since first exposure to the disease, the Advisory Committee of Immunization Practices (ACIP) recommends that all persons without evidence of immunity still be offered the vaccine. During a varicella outbreak, persons who do not have adequate evidence of immunity should receive their first or second dose as appropriate. Additionally, in outbreaks among preschool-aged children (one to four years), a two-dose vaccination is recommended for optimal protection, and children vaccinated with one dose should receive their second dose provided three months have elapsed since the first dose. DHHR's West Virginia Division of Immunization Services may provide varicella-containing vaccines for outbreak control when resources are available. Please contact DIDE immediately after verifying the varicella outbreak to initiate control measures.

1. Documentation of age-appropriate vaccination with a varicella vaccine:
    a. Preschool-aged children 12 months of age or older: one dose
    b. School-aged children, adolescents, and adults: two doses
2. Laboratory evidence of immunity or laboratory confirmation of prior disease.
3. Born in the United States before 1980

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a. Exception: For healthcare workers, pregnant women, and immunocompromised persons, or persons born outside of the United States, birth before 1980 should not be considered evidence of immunity. These individuals need to meet one of the other criteria.

4. A healthcare provider diagnosis of varicella or verification of history of varicella disease
    a. For people reporting a history of or presenting with atypical and/or mild case, assessment by a physician or their designee is recommended and one of the following should be sought:
        i. An epidemiologic link to a typical varicella case or
        ii. Evidence of laboratory confirmation.

    When such documentation is lacking, people should not be considered as having a valid history of disease because other diseases may mimic mild atypical varicella.
5. A healthcare provider diagnosis of herpes zoster or verification of history of herpes zoster

Table 2 - Criteria for Evidence of Immunity to Varicella

10. People who get their first or second dose of varicella vaccine as part of outbreak control measures may be immediately readmitted to school.
11. For individuals for whom varicella vaccine is contraindicated and history of Varicella is unknown or negative serologic test, offer Varicella-Zoster Immune Globulin (VariZIG) as soon as possible within 10 days of varicella exposure. IGIV can be considered an alternative if VariZIG is not available. The recommendation for administration is based on the “best judgment of experts.” No clinical data demonstrating effectiveness of IGIV for postexposure prophylaxis is available. For detailed information about VariZIG refer to: https://www.cdc.gov/mmwr/preview/mmwrhtml/mm6228a4.htm.
12. Chemoprophylaxis: If VariZIG or IGIV are not available, some experts recommend prophylaxis with acyclovir or valacyclovir beginning seven to 10 days after exposure and continuing for seven days for immunocompromised patients without evidence of immunity who have been exposed to varicella or herpes zoster.
13. Exclude exposed susceptible individuals who may be in contact with persons at high risk of serious complications (e.g., healthcare workers, family members of

immunocompromised persons) for the duration of the period of communicability (i.e., eight to twenty-one days after exposure).

14. Assess the status of the outbreak control within the outbreak setting. Complete the outbreak line list and fax it to DIDE at 304-558-8736.
15. To prevent disease and spread of varicella in healthcare institutions, the institutions should ensure that all healthcare personnel have evidence of immunity to varicella. If there is no evidence of immunity, staff should be offered two doses of varicella vaccine administered four to eight weeks apart when they begin employment. In healthcare institutions, serologic screening before vaccination of personnel who have no history or an uncertain history of varicella and who are unvaccinated is likely to be cost effective.
16. Patients with diagnosed varicella should be cared for by staff with evidence of immunity.
17. For healthcare exposure, refer to: https://www.cdc.gov/chickenpox/hcp/index.html.
18. In outbreaks where there is childcare or school requirements, proof of immunity should be provided. For those without proof of immunity, a two-dose vaccination is recommended for optimal protection. Children who are vaccinated with one dose should receive their second dose provided three months have elapsed since the first dose. Unvaccinated children with no history of varicella should be excluded from school until 21 days after the onset of rash in the last case of varicella.
19. No cases of Reye syndrome have been reported in children who receive the varicella vaccine while receiving salicylates; however, because of the association with Reye syndrome, natural varicella infection, and salicylates, the vaccine manufacturer recommends that salicylates be avoided for six weeks after administration of varicella vaccine.

E. Healthcare Provider Responsibilities

1. Manage patients with varicella and their close contacts in accordance with physician's guidance available at: https://www.cdc.gov/chickenpox/hcp/index.html.
2. Educate the patient with varicella on the prevention, transmission, and treatment.
3. Reporting varicella:
    a. Immediately report all outbreaks of varicella in any setting to your local health department by phone. You may also report to DIDE at 304-558-5358 (option two).
    b. Weekly report the total number of cases of varicella to your local health department. Contact your local health department on how to report. For a

list of local health departments please go to https://dhhr.wv.gov/localhealth/pages/map.aspx.

4. Educate patients who do not have evidence of immunity on the importance of receiving the vaccine.
5. Educate patients who are aged 50 and older on the importance of receiving the shingles vaccine.

F. Laboratory Responsibilities

1. Varicella is reportable as an aggregate total in West Virginia. You may report a positive laboratory test result of varicella, including patient demographic information to the appropriate local health department and the local health department will file a report into WVEDSS within one week of receiving the report. Contact your local health department on how to report. For a list of local health departments please go to https://dhhr.wv.gov/localhealth/pages/map.aspx.
2. The infection control practitioner or the healthcare provider who ordered the test should be notified of a positive result immediately.

G. Local Health Responsibilities

1. Educate healthcare providers to report outbreak(s) of varicella immediately and report aggregate total varicella cases weekly to their respective local health department.
2. Reporting:
   a. Report weekly aggregate totals of chickenpox to DIDE via WVEDSS. The aggregate report should be submitted every Monday for the previous week's total. For more information, please refer to this video on a step-by-step guide on how to report the aggregate total in WVEDSS (https://vimeo.com/153267456). If WVEDSS is not accessible, please use this form to report https://oeps.wv.gov/varicella/documents/lhd/aggregate-chickenpox-form.pdf.
   b. Immediately report varicella outbreaks in any setting to your regional epidemiologist and DIDE via phone at 304-558-5358 (option two).
3. Educate the public, such as parents and guardians of infants, children, adolescents, adults, and pregnant women about the disease and the importance of varicella vaccine. Adults aged 50 and older should be offered the shingles vaccine according to the ACIP recommendations.
4. Educate healthcare providers to track immune status of staff in healthcare settings. Offer vaccines to non-immune staff that has no contraindications.

5. Varicella infection is significantly milder in those who have been immunized with the varicella vaccine. It can be difficult to make a diagnosis on presentation alone. Laboratory testing is increasingly important for confirming varicella and appropriately managing cases and their contacts. Ensure the proper specimen is collected. Additional specimen collection resources are located here: https://www.cdc.gov/chickenpox/lab-testing/collecting-specimens.html.
6. If varicella testing is needed, DIDE will coordinate testing through DHHR's WV Office of Laboratory Services (WV OLS). Guidance on varicella testing through WV OLS is available at https://oeps.wv.gov/varicella/documents/testing /vpd_reference_testing_guidance.pdf. Specimens approved for testing must be correctly labeled and accompanied by the Referral Testing Specimen Submission (RTSS) Form https://oeps.wv.gov/varicella/documents/testing/vpd_submission_form.pdf. Mail the completed RTSS Form and the specimen to WV OLS. WV OLS will send the specimen to a referral testing laboratory. Please notify WV OLS at 304- 558-3530 prior to shipping specimens.
7. Work collaboratively with school nurses.
8. Educate partners on reporting.

H. State Health Responsibilities

1. Ensure local health departments are reporting varicella counts on a weekly basis.
2. Ensure local health departments are reporting varicella outbreaks immediately.
3. Feedback data is collected and analyzed in relation to varicella.
4. Report data elements to CDC for varicella cases related to outbreaks.
5. Facilitate specimen collection and coordinate testing with WV OLS.
6. Coordinate with the immunization program to be sure that vaccines are available when needed.
7. Provided guidance and technical support to local health departments and providers.
8. Work collaboratively with school nurses.
9. Educate partners on reporting.
10. Update protocols and monitor surveillance indicators.
11. Assist with outbreak response.

I. Occupational Health

Employees who will conduct interviews or who will have face-to-face contact with infectious persons, should be immune to varicella. If there is no contraindication, employees without evidence of immunity should be immunized with varicella vaccine

based on current ACIP recommendations. Patients with varicella should be managed as follows:

1. Follow standard precautions plus airborne precautions (negative air-flow rooms) and contact precautions until lesions are dry and crusted.
2. If negative air-flow rooms are not available, patients with varicella should be isolated in closed rooms with no contact with persons without evidence of immunity.
3. Patients with varicella should be cared for by staff with evidence of immunity.
4. If an exposure in a healthcare personnel who are not immune/vaccinated occurs, please manage healthcare personnel in accordance with this guidance: https://www.cdc.gov/chickenpox/hcp/index.html.

IV. DISEASE SURVEILLANCE

A. Public Health Significance

Varicella (chickenpox) is a febrile rash illness resulting from primary infection with the varicella-zoster virus (VZV). Varicella is highly infectious with secondary infection occurring in 61 to 100 percent of susceptible household contacts. While mostly a mild disorder in childhood, varicella tends to be more severe in adults and may be fatal, especially in neonates and in immunocompromised persons. VZV causes a systemic infection that usually results in lifetime immunity. According to CDC, approximately 10,000 hospitalizations and 100 deaths occurred before the introduction of live attenuated varicella vaccine in 1995. In the prevaccine era, varicella affected mainly children with approximately 90 percent of cases occurring before the age of 15 years.

Increased varicella vaccination among children has lowered the overall burden of disease in all age groups. In 2017, 91 percent of children 19 to 35 months old in the United States had received one dose of varicella vaccine. As vaccination coverage has increased, the majority of cases now occur in vaccinated persons (i.e., breakthrough case).

B. Disease Surveillance Objectives

1. To develop or improve outbreak detection and investigation.
2. To monitor effectiveness of two-dose varicella vaccination in the context of an outbreak.
3. Assess the proportion of cases related to outbreaks.

C. Surveillance Indicators

1. Proportion of MMWR weeks for which county-level reporting of chickenpox is available.

V. REFERENCES

1. CDC Chickenpox (Varicella) - https://www.cdc.gov/chickenpox/index.html
2. Prevention of Varicella, 2007- Recommendations of the Advisory Committee on Immunization Practices (ACIP), Division of Viral Diseases, National Center for Immunization and Respiratory Diseases, CDC - https://www.cdc.gov/Mmwr/Preview/Mmwrhtml/rr5604a1.htm
3. Varicella, page 329-348, Epidemiology and Prevention of Vaccine-Preventable Diseases (14th edition) - 2021 U.S. Department of Health and Human Services, Centers for Disease Control and Prevention.
4. Varicella-Zoster Virus Infections, page 831-843, Red Book (32nd edition) - 2021-2024 Report of the Committee on Infectious Diseases, American Academy of Pediatrics.
5. Update to Public Health Reporting and National Notification for Varicella. CSTE position statement: 23-ID-09. Atlanta, GA: CSTE; 2023. https://cdn.ymaws.com/www.cste.org/resource/resmgr/ps/ps_2023/23-ID-09_Varicella.pdf
6. Varicella Death Reporting (NNDSS) https://ndc.services.cdc.gov/conditions/varicella-deaths/

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