Dengue
Investigative Guidelines

July 2026

REPORT WITHIN 1 WORKING DAY

1. DISEASE REPORTING

1.1 Purpose of Reporting and Surveillance

1. To characterize the epidemiology and clinical aspects of the disease.
2. To monitor disease trends and recognize outbreaks.
3. To identify potential local transmission within Oregon.
4. To identify cases during their infectious period and to prevent transmission to local mosquito vectors and other humans.
5. To provide education and resources on disease profile and prevention measures.
6. To identify communities and populations at elevated risk for disease or severe illness to inform equity-centered prevention efforts.

1.2 Laboratory and Clinician Reporting Requirements

Laboratories, clinicians, and other persons providing health care are required to report positive lab results and confirmed or suspect dengue cases to the Local Health Department (LHD) **within one working day** following identification or diagnosis. See *§3* for case definitions.

1.3 Local Health Department Reporting and Follow-Up Responsibilities

1. Begin case investigation within one working day and record information in Orpheus as the investigation progresses. Interview all confirmed and presumptive cases.
2. Report all confirmed and presumptive (but not suspect) cases to the Oregon Health Authority (OHA) Acute and Communicable Disease Prevention (ACDP) Section as soon as possible, and no later than the end of the calendar week of initial physician or laboratory report.
3. Attempt to identify the time of infection, patient travel history in the two weeks prior to symptom onset, and whether the case traveled as part of a larger group. If so, discuss the advantages of testing symptomatic travel companions.
4. Provide education on disease transmission and recommend that case avoid mosquito bites during their infectious period (1st week of illness). Provide education on preventative measures to

avoid mosquito-borne diseases in the future (using insect repellents, draining standing water, repairing broken screens, etc.).

2. THE DISEASE AND ITS EPIDEMIOLOGY

2.1 Etiologic Agent

Dengue fever and severe dengue (dengue hemorrhagic fever [DHF] and dengue shock syndrome [DSS]) are caused by any of four closely related dengue virus (DENV) serotypes (DENV 1–4) belonging to the family Flaviviridae.[1]

2.2 Description of Illness

Symptoms generally last 3–10 days, although the febrile stage usually ranges 2–7 days. This infection is characterized by fever, myalgia, arthralgia, and retro-orbital pain. Up to 75% of infected individuals may be asymptomatic but still infectious to mosquitoes.[2] Others may experience a non-specific febrile illness rather than the classic break-bone fever. Severe dengue, which can present as dengue hemorrhagic fever (DHF) and dengue shock syndrome (DSS), occurs in a small proportion of those infected, about one in 20 people. Symptoms may include abnormal vascular permeability, hypovolemia, and abnormal blood clotting mechanisms. Signs of shock or severe bleeding typically begin immediately after the febrile period ends. In those with severe disease, shock is the predominant sign. Acute hepatitis or encephalitis occurs rarely; however, the DHF case fatality rate can be 10% or higher if untreated but is typically drastically lowered (<1%) with timely and appropriate fluid therapy. Individuals at greater risk for DHF and DSS include persons with previous dengue infection, pregnant women, infants, the elderly, and those with co-morbidities. However, severe dengue can occur without any of these risk factors.

2.3 Reservoirs

Humans serve as the primary reservoir for dengue virus; however, other vertebrates such as non-human primates may also serve as potential hosts.

Dengue fever is currently considered endemic in over 100 countries, primarily in tropical and subtropical regions. See the following CDC map which provides dengue risk classification by country: https://www.cdc.gov/yellow-book/hcp/travel-associated-infections-diseases/dengue.html

2.4 Sources and Routes of Transmission

Transmission is through the bite of an infected mosquito, most commonly the *Aedes aegypti* or *Aedes albopictus* species of mosquito. It is possible for dengue to be transmitted by organ transplants or blood transfusions, and there is evidence of transmission from an infected pregnant mother to her fetus. It is also possible for a mother to transmit the virus to her newborn through breastmilk; however, the risk of this transmission is considered low.

In August of 2024 *Aedes aegypti* mosquitoes were found for the first time in Oregon.[3] This species was discovered during routine mosquito surveillance in Jackson County. In 2025, Jackson County Vector Control identified additional *Aedes aegypti* mosquitoes in surveillance traps indicating that there is a population of this species in southern Oregon.[3] Therefore, there is a potential risk of local transmission within Oregon.

2.5 Risk Dynamics

Dengue virus has four serotypes (DENV1-DENV4) and infection results with each individual serotype. Long-lasting immunity to a specific DENV serotype does occur with each symptomatic infection; however, it is possible to be re-infected with any of the remaining dengue serotypes. Subsequent reinfections with a different serotype can cause more severe illness and increase risk of hospitalization.[2] The Centers for Disease Control and Prevention (CDC) estimates approximately 20% of dengue cases who have been previously exposed to another dengue virus may have transient or no significant elevation in dengue IgM titers, making identification of such cases extremely difficult without polymerase chain reaction (PCR) testing on the acute specimen.

2.6 Incubation Period

The incubation period can range from 3–14 days, with an average of 4–7 days.

2.7 Period of Communicability

The viremic stage may begin a day or two before symptom onset and typically lasts about 7 days. Both symptomatic and asymptomatic persons are viremic and can transmit the virus to mosquitoes that bite them during this period.

2.8 Treatment

There is no specific treatment for dengue, treatment is supportive and aimed at decreasing the severity of symptoms.

3. CASE DEFINITIONS, DIAGNOSIS, AND LABORATORY SERVICES

3.1 Clinical Criteria

In the absence of a more likely alternative diagnosis:

- Clinical evidence of **dengue** includes fever **OR** chills as reported by the patient or healthcare provider* **AND** the presence of one or more of the following symptoms:
    - Nausea or vomiting, which may be persistent (e.g., ≥3 episodes in 1 hour or ≥4 episodes in 6 hours)
    - Rash
    - Headache
    - Retro-orbital pain
    - Arthralgia (joint pain)
    - Myalgia (muscle aches)
    - Positive tourniquet test
    - Leukopenia (e.g., a total white blood cell count of <5,000/mm3)
    - Thrombocytopenia (e.g., platelet count <150,000/mm3)
    - Abdominal pain or tenderness
    - Extravascular fluid accumulation (e.g., pleural or pericardial effusion, ascites) without respiratory distress
    - Mucosal bleeding** (e.g., gums, nose, vagina, kidney or mild GI bleeding)
    - Liver enlargement >2 centimeters
    - Increasing hematocrit (>20% in 2 measurements taken 6 hours apart)

**Most dengue cases are characterized by fever or chills. If fever or chills are not present, careful consideration of patient's clinical course, exposure history, and environmental risk are recommended.*

*** If bleeding is severe (see below), consider severe dengue.*

Severe dengue is characterized by **one or more** of the following scenarios:

- Severe plasma leakage (shock **OR** extravascular fluid accumulation (e.g., pleural or pericardial effusion, ascites) **AND** respiratory distress)

- Severe bleeding is defined as one or more of the following:
    - Bleeding (most commonly gastrointestinal, e.g., hematemesis, melena) that results in hemodynamic instability or blood transfusion (except platelets), **OR**
    - Bleeding that results in permanent disability (e.g., CNS bleed or intraocular bleed), **OR**
    - Bleeding classified as severe by a clinical provider
- Severe organ involvement is defined as one or more of the following:
    - Elevated liver transaminases: aspartate aminotransferase (AST) or alanine aminotransferase (ALT) >1,000 units per liter (U/L), **OR**
    - Impaired level of consciousness or diagnosis of encephalitis, encephalopathy, or meningitis, **OR**
    - Heart or other organ involvement including myocarditis, cholecystitis, and pancreatitis

3.2 Epidemiologic Criteria

- A person who resides in or has visited dengue endemic areas or areas with a risk of dengue transmission within 14 days prior to symptom onset; **OR**
- Association in time and place before symptom onset (e.g., household member, family member, classmate, coworker, or neighbor) with a confirmed or presumptive dengue case; **OR**
- Laboratory exposure to DENV within 14 days of symptom onset; **OR**
- Receipt of blood, blood products, organ transplant, or other tissue transplant within 30 days of symptom onset from a person who has either been diagnosed with dengue infection or returned from traveling to an area with risk of dengue transmission in the 14 days before donation.

3.3 Laboratory Criteria

Confirmatory Laboratory Evidence:

- Detection of dengue virus (e.g., growth in cell culture), viral antigen (e.g., NS1 antigen-capture ELISA, immunohistochemistry), or viral RNA

(e.g., PCR) in a serum, plasma, blood, cerebral spinal fluid (CSF), other body fluid, or tissue specimen, OR

- Detection of virus-specific IgM antibodies in a serum or CSF specimen AND
    - Detectable DENV-specific neutralizing antibody titers by plaque reduction neutralization (PRNT), AND
    - Negative neutralizing antibody titers against other flaviviruses endemic to the region where exposure occurred.

Presumptive Laboratory Evidence:

- Detection of virus-specific IgM antibodies in a serum or CSF specimen without any additional testing for arboviruses endemic to the region where exposure occurred, OR
- Demonstration of a ≥4-fold rise in DENV-specific neutralizing antibody titers in paired serum samples ideally acute and convalescent-phase specimens collected ≥2 weeks apart with a ≥4-fold higher end point titer as compared to other flaviviruses tested.

3.4 Case Classifications

3.4.1 Confirmed Case

A confirmed case is defined as a person who meets the clinical criteria for dengue or severe dengue AND meets the confirmatory laboratory evidence,

OR

Meets non-antibody based confirmatory laboratory evidence AND meets epidemiologic linkage criteria AND

- Has clinical evidence of fever or chills only, OR
- Has other clinical evidence compatible with dengue in the absence of fever or chills.[4]

3.4.2 Presumptive Case

A presumptive case is defined as a person who meets the clinical criteria for dengue or severe dengue **AND** meets presumptive laboratory evidence **AND** meets epidemiological linkage criteria.[4]

3.4.3 Suspect Case (*not* reportable to Oregon Health Authority)

A suspect case is defined as a person who meets clinical criteria for dengue **AND** meets epidemiological linkage criteria **AND** has no laboratory testing performed, **OR**

Meets clinical criteria for dengue **AND** meets epidemiological linkage criteria **AND** has negative IgM results with no PCR/NS1 testing on a specimen collected <5 days after symptom onset.[4]

3.5 Services Available at the Oregon State Public Health Laboratory

The Oregon State Public Health Laboratory (OSPHL) does not perform testing for dengue virus. Serological testing (IgM, IgG) is available at commercial laboratories such as ARUP, LabCorp, or Quest. Providers pursuing DENV testing should consult with the laboratory that will perform testing for guidance on specimen collection and transport.

The CDC provides confirmatory testing following serologic results by plaque reduction neutralization test (PRNT) with the Arbovirus Neutralization Antibody test, when needed. Pre-approval by the OHA on-call epidemiologist is required.

After obtaining approval, all specimens should be sent to the OSPHL for forwarding on to the CDC. Specimens must be accompanied by the OSPHL Virology/Immunology Test Request form and the CDC Specimen Submission Form Template. Visit OSPHL's CDC Referral Testing Test Menu Page for detailed specimen submission instructions.

Table 1: Guidance for Interpretation of Laboratory Results

Laboratory test*	Interpretation of result	Comments
PCR or NS1 antigen	Confirmatory	Positive results do not require further confirmatory testing. Negative results do not rule out infection.
IgM specimen confirmed by PRNT	Confirmatory	Positive IgM specimen with confirmatory PRNT and negative IgM antibodies against other flaviviruses endemic to the region where exposure occurred. Confirmatory PRNT testing is only available at the CDC.
Paired IgM or IgG specimens	Presumptive	A ≥4-fold rise in IgM or IgG titers in paired serum specimens ideally collected ≥2 weeks apart.
Single IgM specimen	Presumptive	Positive IgM specimen without additional testing.
Single IgG specimen	Not a case	Positive IgG specimen without additional testing for dengue.

*Note: Only PCR, NS1 antigen, or IgM ELISA-based antibody test can be used for diagnosis of dengue in single serum specimens. For patients tested within 7 days of symptom onset, serum samples for either PCR with IgM, or NS1 antigen with IgM, are recommended. For patients tested more than 7 days after symptom onset, IgM antibody testing is preferred.

4. ROUTINE CASE INVESTIGATION

4.1 Identify Source of Infection

Routine case investigation should include the documentation of case demographics, laboratory and clinical data, risk factor information, and travel history. Personal information should be collected based on people's self-reported identities and should include "REAL-D" and "SOGI" information.

Interview the case (or primary caregivers) and any additional persons who may be able to provide pertinent information.

Promptly enter data into Orpheus. Always be sure that you are using the most recent case report form from the ACDP website. Though we try to keep the form up to date, Orpheus has the most updated risk and exposure questions.

Obtain travel history for the 14 days prior to illness onset. Note any bites from mosquitoes and be sure to include:

- Name, diagnosis, and phone number of any household members, or travel companions with a similar illness or dengue-like symptoms.

4.2 Identify Potentially Exposed Persons

Person to person transmission has not occurred in Oregon but there is the possibility for local transmission considering the mosquito vectors have been recently identified in Southern Oregon. If any household members present with similar illness or dengue-like symptoms, consider recommending testing.

4.3 Environmental Evaluation

See §5.4 Environmental Measures for more information.

5. CONTROLLING FURTHER SPREAD

5.1 Education

Education messages should be targeted to at-risk populations (e.g. immigrant populations, outdoor workers) in languages appropriate to the at-risk populations.

1. Provide education on mosquito-borne diseases
2. Cases should protect themselves from further mosquito exposure for at least 7 days after the start of fever to prevent ongoing transmission of the virus.

   People who travel to risk areas should wear long sleeves, socks, and pants and use mosquito repellents with DEET to protect themselves from mosquito bites.

When providing health education, it is important to remember that Oregonians represent a diverse array of cultures and vary in their preferred languages, ideas about health, and health literacy. Best practices include:

- Make every effort to provide information in the case's preferred language. Provide translated health education materials and utilize professional interpreter services whenever possible.
- Consult with ACDP epidemiologists about accessing OHA Interpretation Services when preferred language materials and services are not available at the LPHA. Avoid using family members, community leaders, or "lay" interpreters. However, respect people's preference if they desire a lay interpreter instead of interpretation services.
- In all oral communication and written materials, use plain language and equity-centered communication to convey inclusive and easily understood health messages.
- Tailor communications to the specific cultures of the intended audiences, for example using locally preferred names for places, body parts etc.
- When relevant and possible, consult with relevant community leaders and organizations about how to conduct investigations in the most appropriate (culturally and scientifically) manner.

5.2 Case Follow-up

Generally, not indicated.

5.3 Prevention Measures

While traveling to or residing in areas with ongoing dengue transmission, please consider the recommendations below:

- Wear long sleeves, pants, socks, and shoes.
- Apply mosquito repellent to exposed skin. Repellents with DEET, picaridin, oil of lemon eucalyptus, para-menthane-diol, and IR3535 are effective.[5]
- Treat clothes with permethrin.
- Use screens on windows and doors, making sure the screens are in good condition without holes.
- Use insecticide-treated bed nets when traveling to endemic countries.

- Drain any standing water around backyards and residences as *Aedes aegypti* strongly prefer urban, man-made breeding sites.[5]
- Discard old tires, tin cans, plastic containers, ceramic pots or other containers that can hold water. [5]
- Drill holes in the bottom of recycling containers left outdoors.
- Keep grass cut short and shrubbery trimmed.
- Frequently replace the water in pet bowls.
- Flush ornamental fountains and birdbaths periodically.
- Aerate ornamental pools or stock them with predatory fish.

6. MANAGING SPECIAL SITUATIONS

6.1 Health Equity

OHA's strategic goal is to eliminate health inequities in Oregon by 2030. Health inequities are systematic, avoidable differences in health that are rooted in social and economic injustices, not simply differences in disease incidence, health outcomes and access to health care. When managing special situations, tailor interventions and communications based on individual circumstances and community history and culture, including intergenerational experiences that have contributed to inequities (eg, displacement, economic exploitation, racial segregation). As appropriate, consult with culturally rooted organizations, such as Indigenous/tribal agencies, Oregon Health Authority Regional Health Equity Coalitions (https://www.oregon.gov/oha/EI/Pages/RHEC.aspx), or culturally specific service providers to develop effective plans for conducting investigations, with an eye toward building trusting relationships.

6.2 Locally Acquired Cases

If there is no history of travel to an endemic region, this may be a locally acquired case; contact the ACDP Epi On-call immediately. If a large group of returning travelers with dengue-like symptoms is identified, contact the ACDP Epi On-call.

6.3 Differentiating between dengue and Zika virus infections in patients with positive flavivirus labs

Dengue and Zika viruses are closely related flaviviruses and both have similar distributions throughout the tropic and subtropic regions. Because of these

similarities cross-reactivity can occur, especially with IgM antibody testing. IgM antibodies may be detectable for months or longer after an infection making it difficult to determine whether these antibodies are from a current dengue or Zika infection or from a past one. These limitations are especially true for persons living in endemic areas or who travel frequently to endemic areas. An individual with both positive dengue and Zika virus IgM antibody tests should be interpreted as a "presumptive recent flavivirus infection." For nonpregnant patients who live in or who have recently returned from an endemic region, the recommendation is to only perform testing for the virus that is known to be circulating.[6] For symptomatic pregnant patients, the recommendation is to perform PCR and IgM antibody testing for both dengue and Zika virus infections. If PCR testing is not done, and both dengue and Zika virus IgM antibody testing is positive, the recommendation is to perform confirmatory PRNTs against dengue, Zika, and other flaviviruses endemic to the region where the exposure occurred.[6]

REFERENCES

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UPDATE LOG

July 2026 – New guidelines (Kristen Hollywood, Lisa Iguchi)

Oregon Health Authority
Public Health Division
Acute and Communicable Diseases Program

800 NE Oregon Street
Portland, OR 97232
Phone: 971-673-1111

Email: ohd.acdp@odhsoha.oregon.gov
Website: https://www.healthoregon.org/diseasereporting