

# An overview of the CSTE cCMV position statement's impact on Utah's case classification

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# Learning objectives

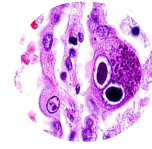
1. Describe how Utah's cCMV case classification has changed since participating in the CSTE cCMV case definition process.
  2. Provide a breakdown of how Utah's cases align with the new CSTE cCMV position statement.
  3. Compare CMV disease/infection vs. CMV symptomatic/asymptomatic case classifications.
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# Overview: Utah EHDI programs

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Early Hearing Detection and Intervention (EHDI)



**Congenital  
Cytomegalovirus (CMV)  
Public Health Initiative**



Children's Hearing Aid Program (CHAP)

# Utah's CMV screening

- Hearing targeted



- High-risk targeted



# Hearing targeted

## Utah CMV legislation

- 26-10-10 UCA, “Cytomegalovirus (CMV) Public Education and Testing” (Into effect 7/1/2013)
  - If a newborn **fails the newborn hearing screening test(s)**... Medical practitioner shall test the infant for **CMV before 21 days of age**
- R398-4, “Cytomegalovirus Public Health Initiative”
  - CMV testing if... infant fails **both** initial and follow-up hearing screen
  - Or, initial screen is failed after **14 days** of age
  - Practitioners must report results to DHHS within **10 days** of receiving them
- R386-702, “Communicable Disease Rule” (Into effect in 2015)
  - **All laboratory results** for... CMV in infants less than or equal to **12 months of age**

# High-risk targeted

- Intermountain Health birthing hospitals adopted high-risk testing protocol in 2019

## If any of the following present:

- 1) Mother positive for CMV infection during pregnancy
- 2) Abnormal head size (OFC <10<sup>th</sup> %ile OR >90<sup>th</sup> %ile at birth)
- 3) Intrauterine growth restriction (weight <10<sup>th</sup> %ile for gestational age)
- 4) Unexplained hydrops
- 5) Intracranial OR intraabdominal calcifications on first imaging exam
- 6) Unexplained hepatomegaly OR splenomegaly (>1 cm below the right or left costal margin)
- 7) AST or ALT >100 U/L OR unexplained direct bilirubin >1.0 mg/dL
- 8) Petechial rash or blueberry muffin rash at any time
- 9) Leukomalacia, polymicrogyria, lissencephaly, pachygyria, schizencephaly
- 10) Unexplained persistent thrombocytopenia (platelets < 100k/mm<sup>3</sup>)
- 11) Failed hearing screen

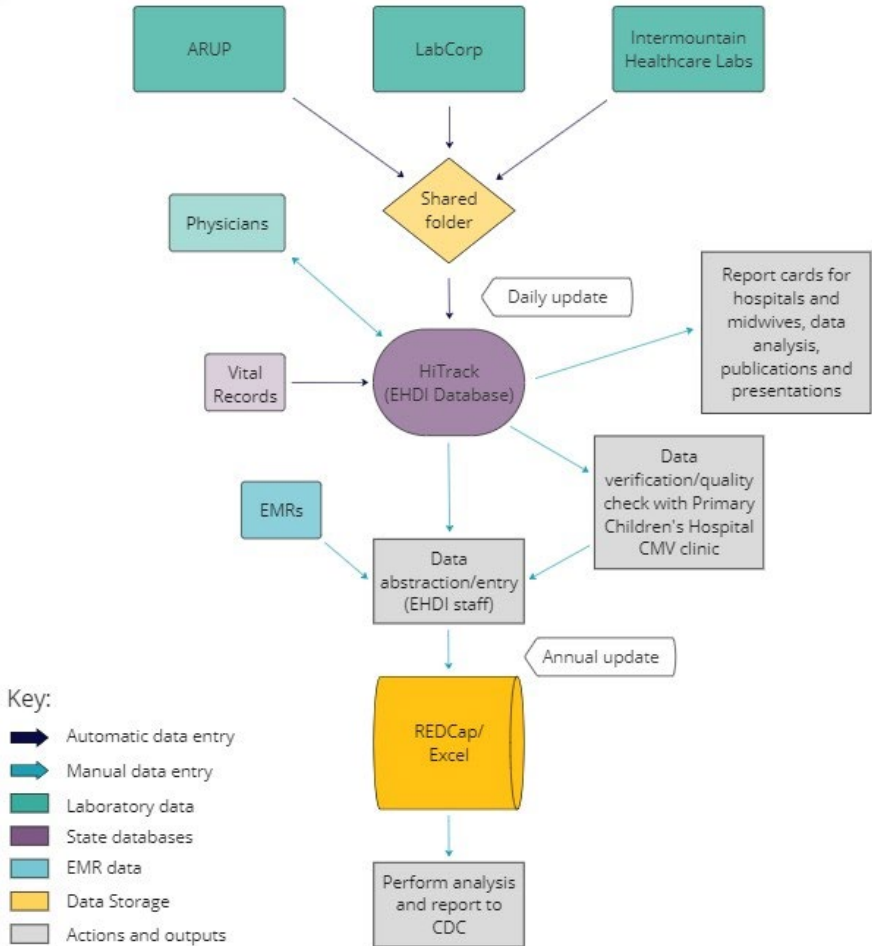
## Send urine CMV PCR

(obtain by 21 days of life when possible)

**cCMV cases**

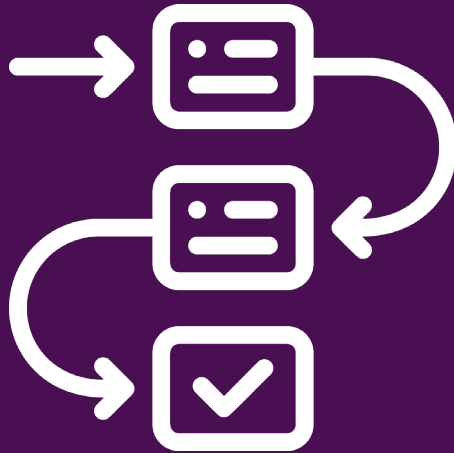


# Case ascertainment/ abstraction process





# Changes in classification



# Previous classification

- Confirmed congenital infection
  - Confirmatory test **within** 21 days
- Probable infection (symptomatic)
  - Confirmatory test **after** 21 days with clinical symptoms of disease
- Suspect infection (asymptomatic)
  - Confirmatory test **after** 21 days without clinical symptoms of disease

# CSTE position statement



Council of State and Territorial Epidemiologists

**23-ID-02**

**Committee:** Infectious Disease

**Title:** Standardized Surveillance Case Definitions for Congenital Cytomegalovirus (cCMV) Infection and Disease

Check this box if this position statement is an update to an existing standardized surveillance case definition and include the most recent position statement number here: N/A.

**Synopsis:**

- This position statement creates standardized case definitions for cCMV infection and disease.
- Standardized case definitions for cCMV infection and disease are needed because multiple jurisdictions in the United States are conducting cCMV screening and surveillance activities but are using various methods and inclusion criteria for case ascertainment, reporting, and classification. As more jurisdictions pass legislation for newborn screening for cCMV, standardized case definitions for cCMV infection and disease can be used to understand the epidemiology of cCMV and compare trends across the United States.
- Case ascertainment criteria include laboratory criteria (the detection of CMV in neonatal urine, saliva, whole blood, or cerebrospinal fluid specimens, in amniotic fluid specimens, or umbilical cord or autopsy specimens), vital records criteria (infant death certificates), and healthcare records criteria (e.g., using ICD-10 diagnostic codes).
- Case classification criteria include clinical and laboratory criteria.
- Case classifications include confirmed cCMV infection, confirmed cCMV disease, and probable cCMV disease.

- Establish standardized classifications for surveillance purposes
- Worked together with authors and Subject Matter Experts
- Passed June 2023

# CSTE cCMV classification

- Confirmed congenital infection
  - Confirmatory test **within** 21 days
- Probable infection (symptomatic)
  - Confirmatory test **after** 21 days with clinical symptoms of disease
- Suspect infection (asymptomatic)
  - Confirmatory test **after** 21 days without clinical symptoms of disease
- Confirmed cCMV infection
  - Confirmatory laboratory evidence **without** clinical evidence
- Confirmed cCMV disease
  - Confirmatory laboratory evidence **with** clinical evidence
- Probable cCMV disease
  - Presumptive laboratory evidence **with** clinical evidence

# Comparing classifications



# Comparing classifications

- Clinical evidence in new classification is more specific to cCMV



# Evidence in previous vs. CSTE classification

## Symptoms:

- Hepatomegaly
- Splenomegaly
- Microcephaly
- Brain imaging abnormalities
- Petechiae
- Sensorineural hearing loss
- Seizures
- Cerebral palsy
- Chorioretinitis
- Vision impairment
- SGAI/UGR
- Unexplained persistent thrombocytopenia
- Unexplained hyperbilirubinemia
- Hydrops

## Clinical evidence:

- Hepatomegaly
- Splenomegaly
- Microcephaly
- Brain imaging abnormalities
- Petechiae
- Sensorineural hearing loss
- Seizures
- Cerebral palsy
- Chorioretinitis
- Vision impairment



# Comparing classifications

- Clinical evidence in new classification is more specific to cCMV
- Clarification on testing time frame





### Old classification:

- Confirmed congenital infection: within 21 days
- Probable/suspect infection: after 21 days

### CSTE classification:

- Confirmed disease/infection: within 21 days
- Probable disease: 22-42 days



# Comparing classifications

- Clinical evidence in new classification is more specific to cCMV
- Clarification on testing time frame
- Types of tests

## 2. CMV Qualitative PCR Lab Testing Order

CPT code 87496\*

Diagnosis Code H91.90 (neonatal hearing loss)

\*if unavailable, 87497 would be acceptable.

**\*\*Urine is the preferred method; if unable obtain then use Saliva\*\* (Blood is NOT acceptable)**

### Urine (bagged specimen)

Test name: Cytomegalovirus by Qualitative PCR (CMVPCR)

Specimen Collection: collect and submit 1 ml

Urine in sterile container, no preservative.

Stability of specimen: Ambient: 24 hrs; Refrigerated: 24 hrs; Frozen: 3 months

Reported: 1-3 days

### Saliva (cheek swab with ORACollect OC-100 kits) **\*\*Should be obtained 2 hours after breastfeeding\*\***

Test name: Cytomegalovirus by Qualitative PCR, Saliva (CMVPCR SAL)

ARUP Test Code: 2008555 Intermountain Test Code: CMVSLV

Specimen Collection: Collect and submit saliva in ORACollect OC-100 kit

To obtain ORACollect OC-100 kits: **ARUP Client Services: 801-583-2787** **Intermountain Client Services: 801-507-2110**

Stability of specimen: Ambient: 7 days; Refrigerated: 7 days; Frozen: 3 months

Reported: 1-3 days

**RESULTS MUST BE FAXED TO:** PRIMARY CARE PROVIDER listed above & EHDI PROGRAM listed below.

**FAX# 801-536-0492**

ORDERING PHYSICIAN: Michelle Hofmann, MD, MPH, MHCDS, FAAP, EHDI Medical Director

  
Michelle Hofmann (Jan 7, 2019 10:48 WDT)

NPI#1760550628 LIC# 282612-1205

**\*\*QUESTIONS?? Please call 801-273-6600\*\***

Revised 6.7.23

## Old classification:

- Subjectivity in how to classify different test types due to differing specificities and sensitivities

### Specimen Provided for CMV Test

\* must provide value

- Urine
- Saliva
- Whole Blood
- Cerebrospinal Fluid
- Dried Blood Spot
- IgG/IgM
- Unknown

## CSTE classification:

- Provides guidance on classifying various test types:
  - Urine, whole blood, CSF, DBS within 21 days are confirmed, 22-42 days are presumptive
  - Saliva at any point up to 42 days is presumptive

# Comparing classifications

- Clinical evidence in new classification is more specific to cCMV
- Clarification on testing time frame
- Types of tests
- Symptomatic/asymptomatic vs. disease/infection



## Old classification:

- Asymptomatic vs. symptomatic
  - Differing opinions on if hearing loss was symptom or not

## CSTE classification:

- Disease vs. infection
  - Simplifies classification process
  - Provides consistency among jurisdictions



# Utah's cCMV cases



234 cases



135 cases



False positives,  
outside 42 day  
time frame,  
presumptive lab  
results with no  
clinical evidence

**53.3%**

72 cases

Confirmed  
disease

- Confirmatory laboratory evidence
- Clinical evidence

**31.9%**

43 cases

Confirmed  
infection

- Confirmatory laboratory evidence

**14.8%**

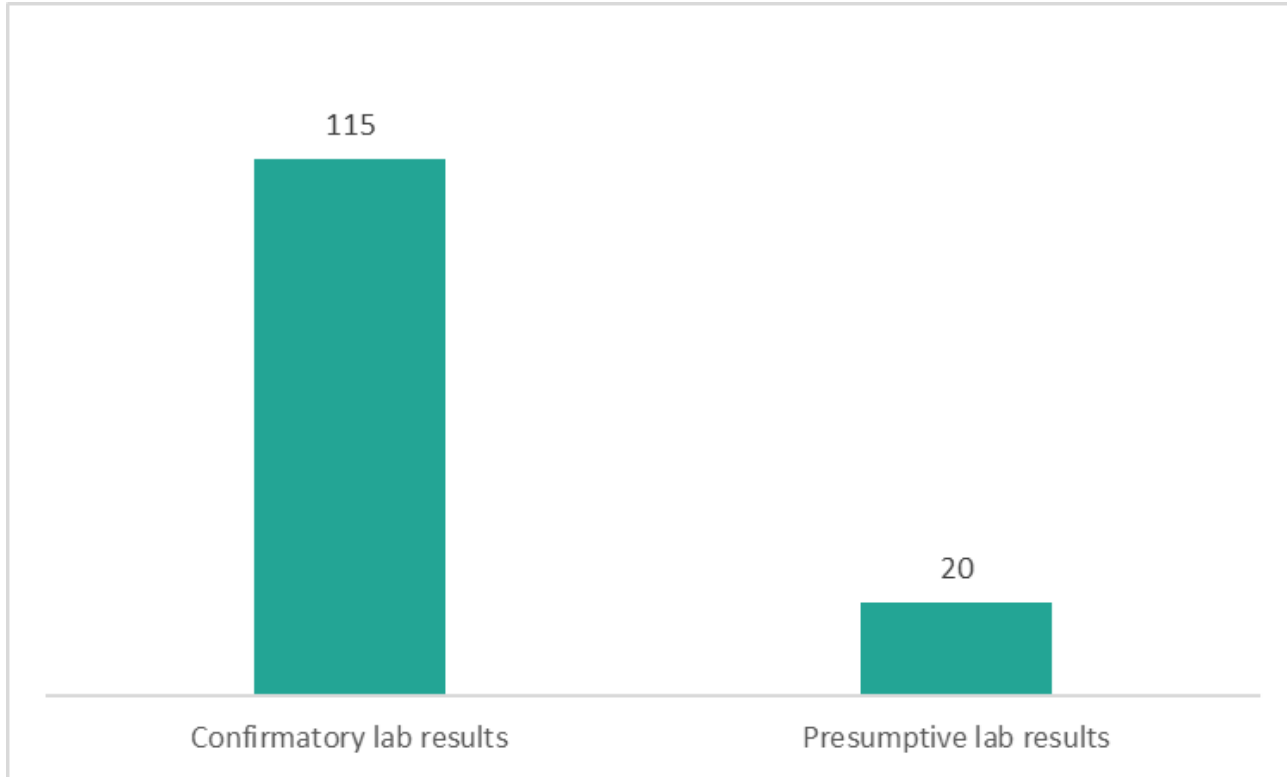
20 cases

Probable disease

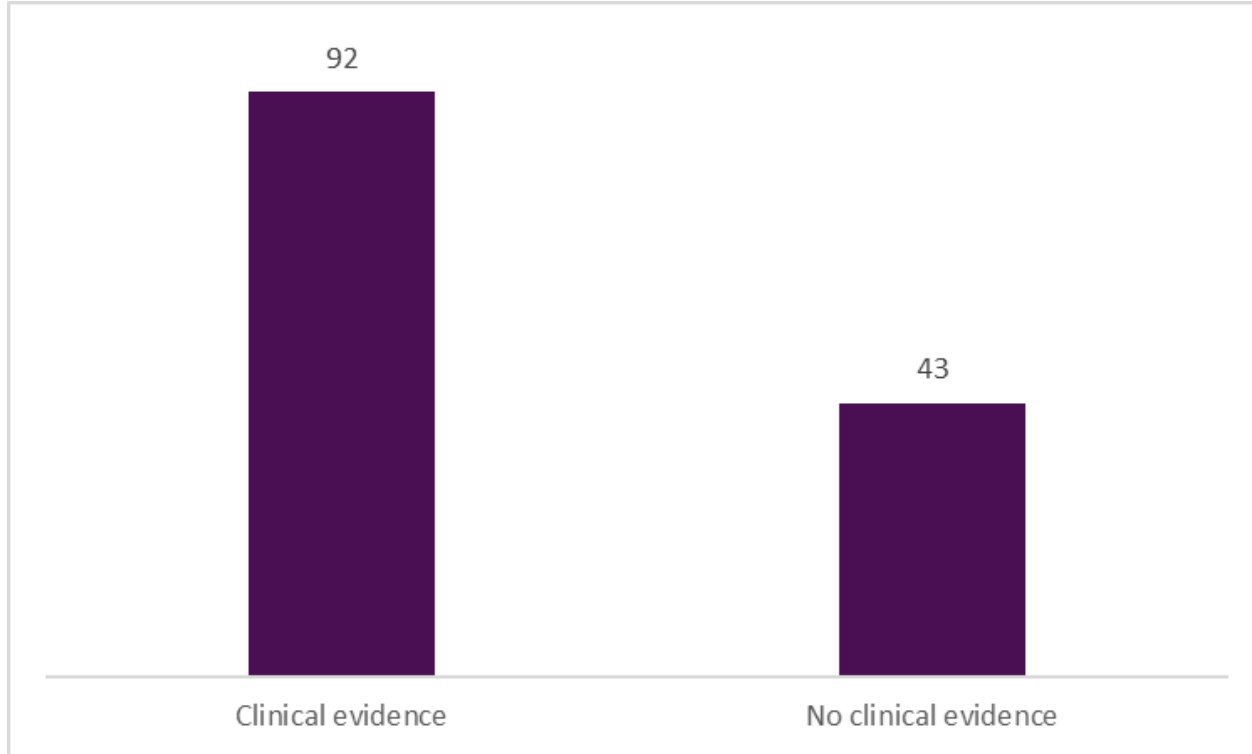
- Presumptive laboratory evidence
- Clinical evidence



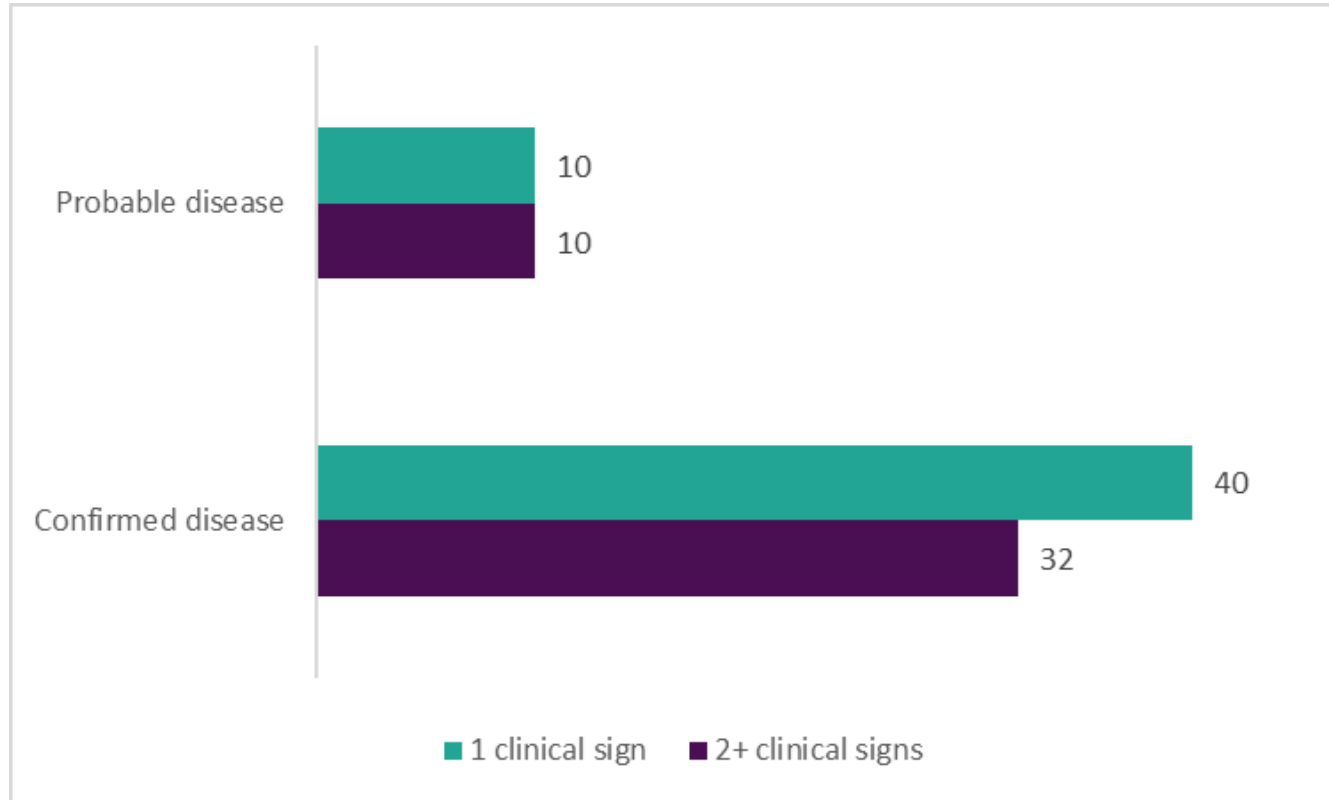
## cCMV cases with confirmed vs. presumptive laboratory evidence



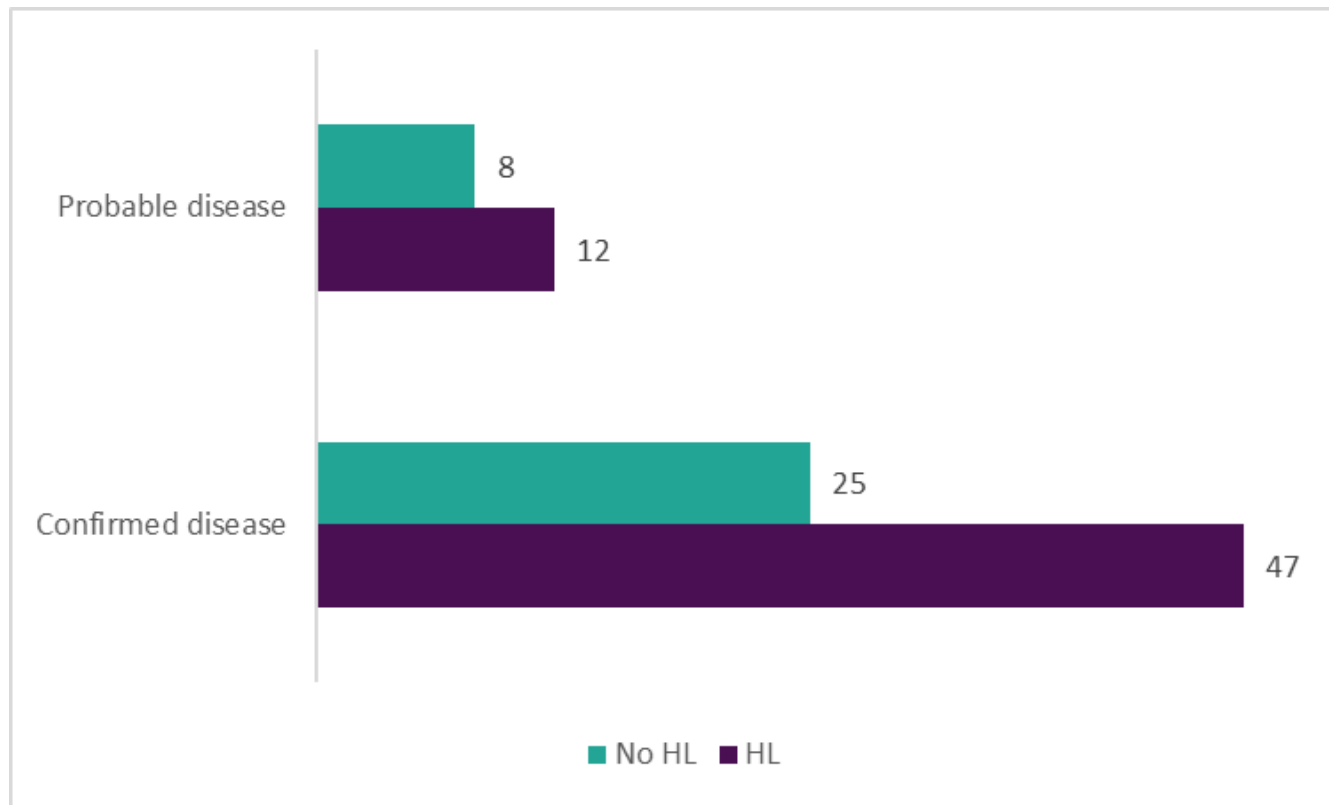
## cCMV cases with clinical evidence vs. cases without clinical evidence



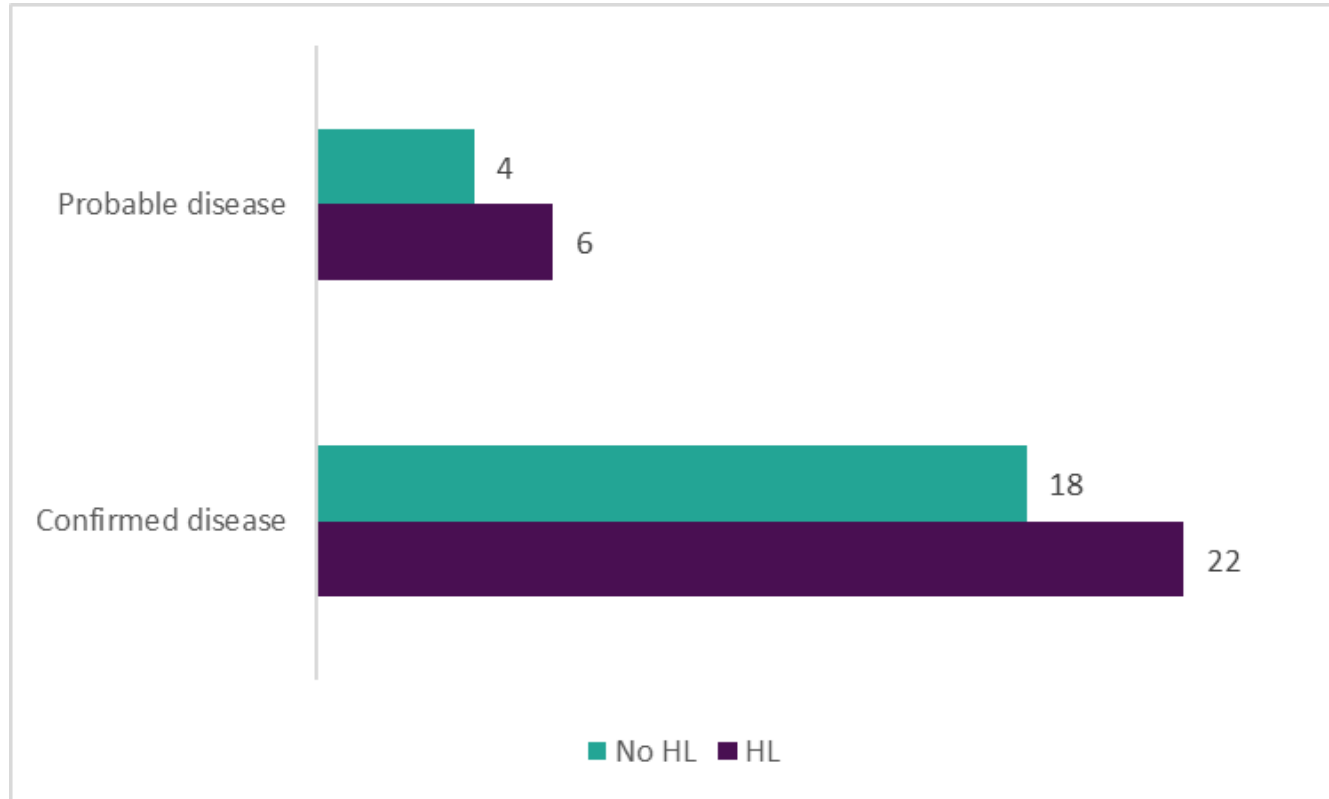
## Number of clinical signs among confirmed and probable disease cases



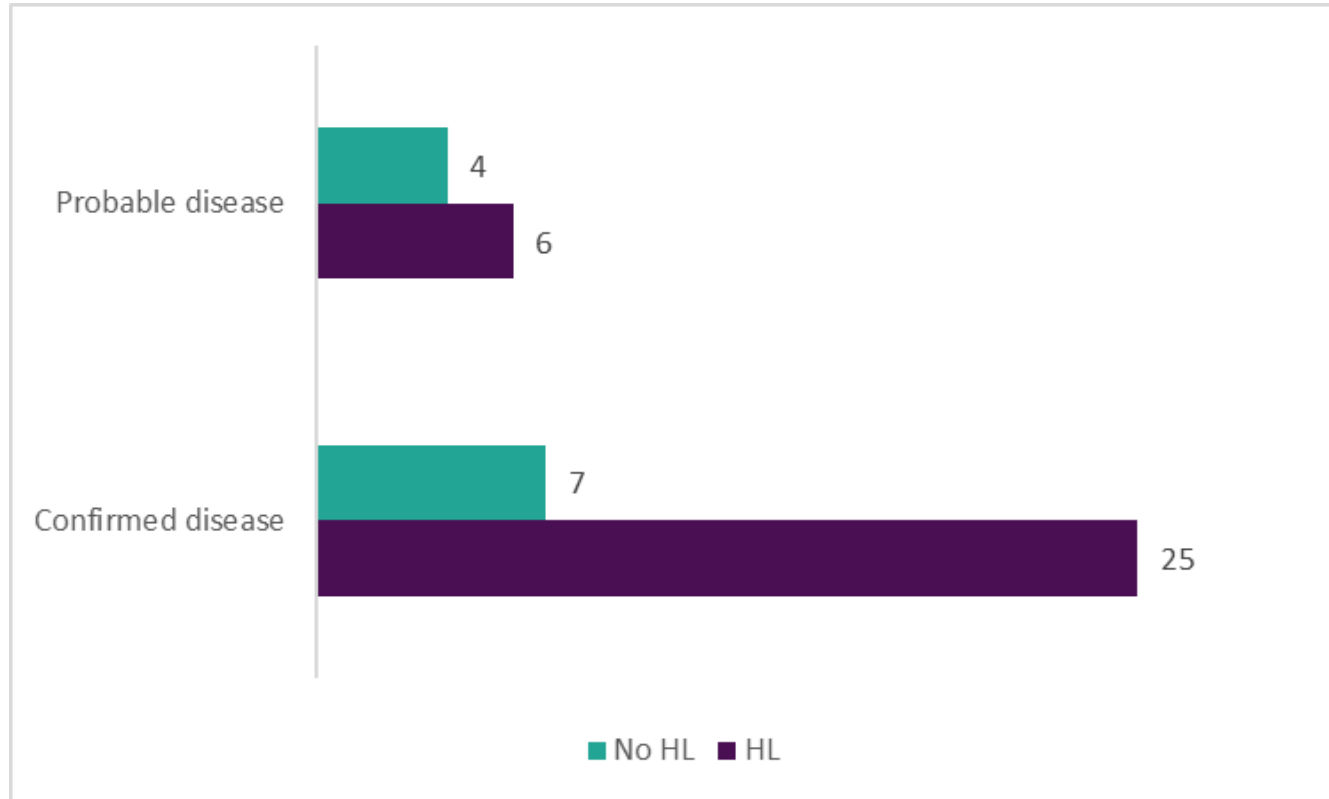
# Hearing loss among confirmed and probable disease cases



# Hearing loss present in cases as the only clinical sign



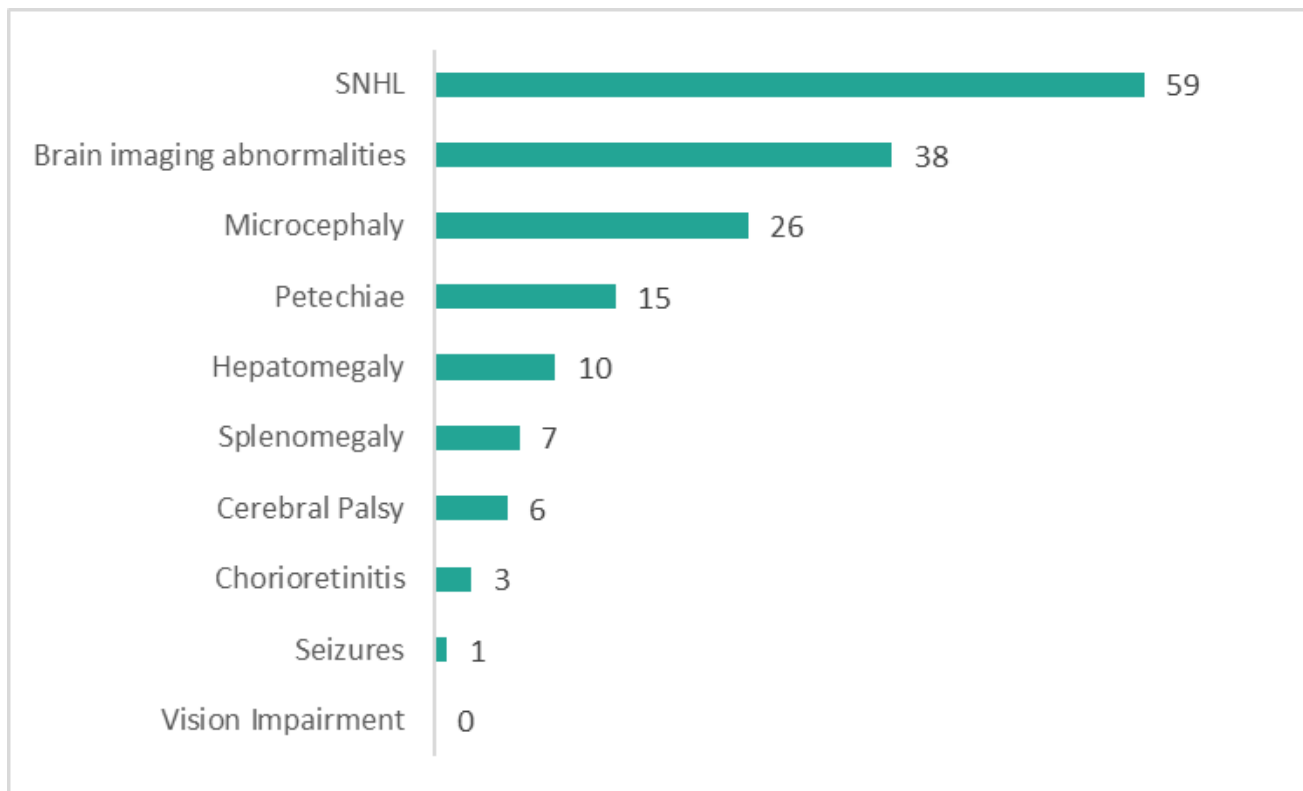
# Hearing loss present in cases with two or more clinical signs



## Hearing loss among confirmed and probable disease cases as the only clinical sign vs cases with 2+ clinical signs

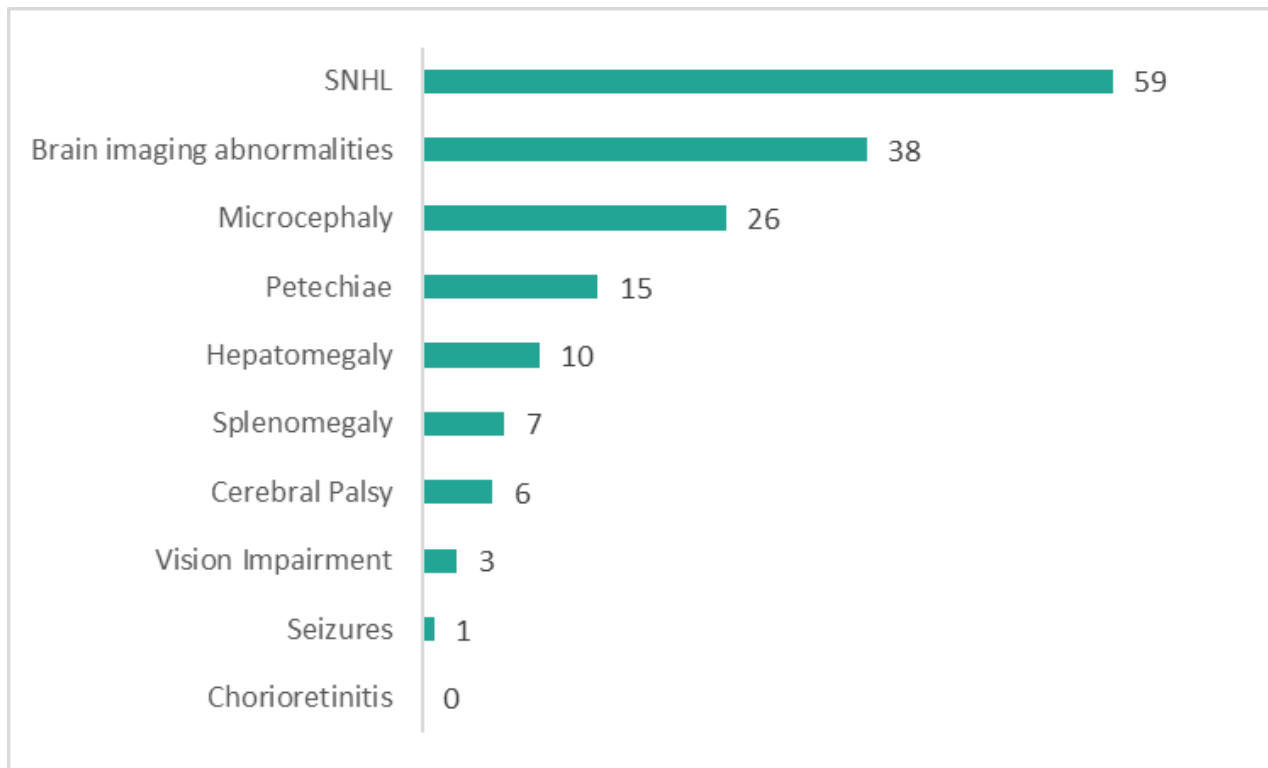
	Confirmed disease	Probable disease
1 sign + HL	55% (22/40)	60% (6/10)
1 sign + no HL	45% (18/40)	40% (4/10)
2+ signs + HL	78% (25/32)	60% (6/10)
2+ signs + no HL	22% (7/32)	40% (4/10)

# Clinical evidence present in disease cases





# Clinical evidence present in disease cases after clarification of vision impairment



# Lessons learned



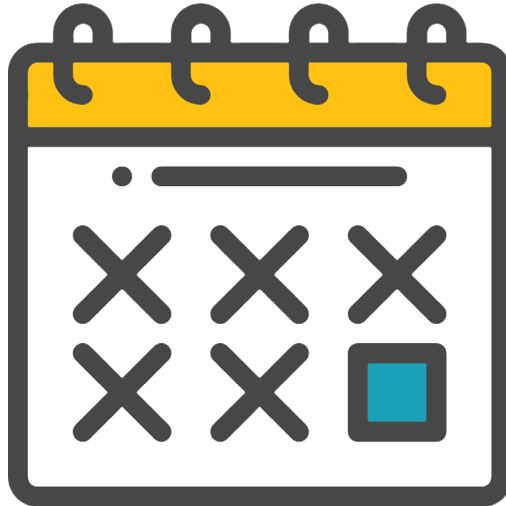
# Lessons learned

- Ongoing nature of manual data abstraction and the development of the position statement



# Lessons learned

- Ongoing nature of manual data abstraction and the development of the position statement
- CSTE classifications are less subjective
  - Probable category is easier to define due to 42 day cutoff



# Position statement (PS) authors

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# Questions?

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**CSTE**  
Council of State and Territorial Epidemiologists

**22.02**  
**Communicable Diseases**

**2201** **Unintentional Communicable Case Definitions for Congenital Cytomegalovirus (CMV) Infection and Disease**

**C** Check the box if the position statement is an update to an existing standardized surveillance case definition and include the most recent position statement number here: **2201**

**Keywords:**

- The position statement creates standardized case definitions for CMV infection and disease.
- The updated case definitions for CMV infection and disease are evidence-based, utilize published literature and include criteria for case ascertainment, reporting, and classification. As more surveillance data become available, these definitions may be updated.
- Case definitions are evidence-based, evidence-based, and evidence-based. As more surveillance data become available, these definitions may be updated.
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**1. Statement of the Problem**

Cytomegalovirus (CMV) infection during pregnancy can cause stillbirth, infant death, and a myriad of birth defects. In the United States, approximately 1 in 200 babies is born with congenital CMV (CMV) infection, one out of 4 of those babies will present with clinical signs of CMV disease in the neonatal period while having long-term health conditions. CMV is the top infectious etiological cause of developmental disabilities and hearing impairment among young children in the United States.

Surveillance of CMV in the U.S. is complicated by several factors. First, most countries with CMV infection have surveillance systems for CMV infection among CMV-infected, but not healthy, children. Second, national surveillance of CMV disease are fragmented and may not adhere to case definitions. Third, position CMV infection is evidence-based, evidence-based, and evidence-based. As more surveillance data become available, these definitions may be updated.

**2. Background and Justification**

CMV infection is responsible for an estimated 1-1.5% of cases of congenital hearing loss among children less than 2 years of age, with approximately 50% of childrens in congenital hearing loss among all U.S. children. The estimated proportion of CMV-related SNHL varies from 10% to 15% in children who do not have assessed hearing until birth, approximately three times more than for sensorineural hearing loss. Case definitions and surveillance systems for congenital hearing loss are fragmented and evidence-based. As more surveillance data become available, these definitions may be updated.

Additionally, the Joint Committee on Infant Hearing recommends that all infants who are born to CMV-infected mothers undergo hearing testing to help them more quickly if they are at the greatest or greatest risk for hearing loss. This recommendation is evidence-based, evidence-based, and evidence-based. As more surveillance data become available, these definitions may be updated.