Updates on COVID-19 and RSV Surveillance in the United States

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Respiratory Virus Activity Reported to the National Respiratory and Enteric Virus Surveillance System (NREVSS)

Laboratory Surveillance
Passive, laboratory-based surveillance system developed in the early 1980s

~600 participating laboratories report tests

Monitors real-time circulation and trends in seasonality of respiratory and enteric viruses

Data sources:
- State and local public health laboratories
- Commercial labs, hospitals, universities

Diagnostic Method Categories:
- Antigen
- Virus isolation
- PCR

Weekly reporting of total tested and # positive

\[
\text{Circulation} = \frac{\# \text{ positive detections}}{\# \text{ tests performed}}
\]
National weekly respiratory virus percent positive reported to NREVSS, December 10, 2022 through December 2, 2023

- Adenovirus
- HCOV
- HMPV
- Influenza
- PIV
- RV/EV
- RSV
- SARS-COV-2

Report was last updated on 11/29/2023. All results presented are from nucleic acid amplification tests which represent >90% of the diagnostic tests reported to NREVSS. The last three weeks of data may be less complete. NREVSS is an abbreviation for the National Respiratory and Enteric Virus Surveillance System. For more information on NREVSS, please visit National Respiratory and Enteric Virus Surveillance System (NREVSS).
National trends in PCR test percent positivity for SARS-CoV-2 reported to NREVSS, May 21, 2022 – December 2, 2023
Regional trends in PCR test percent positivity for SARS-CoV-2 reported to NREVSS, December 2, 2023

The data represent SARS-CoV-2 Nucleic Acid Amplification Test (NAAT) results, which include reverse transcriptase-polymerase chain reaction (RT-PCR) tests from a sentinel network of NREVSS-reporting laboratories in the United States, including clinical, public health and commercial laboratories (https://www.cdc.gov/surveillance/nrevss/labs/index.html). These data exclude antigen, antibody, and at-home test results. Test positivity data are displayed at the HHS Region level. All data are provisional and subject to change. Reporting is less complete for the past 1 week, and more complete for data reported for the period 2 weeks earlier (>90%). Because the data are from a sentinel network of laboratories, results may vary geographically. The data do not include test results within a jurisdiction and therefore may not reflect all COVID-19 NAATs in the United States. There are data from all 50 states, including the District of Columbia, Puerto Rico and the U.S. Virgin Islands, across the 10 HHS regions. Test results from Puerto Rico and the U.S. Virgin Islands are reported as part of HHS Region 2. Data from other U.S. territories are not reported to NREVSS.

Percent positivity is one of the metrics used to monitor COVID-19 transmission over time and by area. Percent positivity is calculated by dividing the number of positive NAATs by the total number of NAATs administered, then multiplying by 100 \[\left(\frac{\text{# of positive NAAT tests}}{\text{total NAAT tests}}\right) \times 100\]. The data represent laboratory tests performed, not individual people. In the table and upon hovering on the map, the total test counts in the data reflect the latest reported data from NREVSS laboratories and may not match the data presented by various jurisdictions. On May 11, 2023 CDC discontinued utilizing the COVID electronic laboratory reporting (CELR) platform as the primary laboratory source of COVID-19 results. These data are archived at health.data.gov. For more information about NREVSS, please see: https://www.cdc.gov/surveillance/nrevss/index.html. For downloading the NREVSS COVID-19 testing data displayed here: https://data.cdc.gov/Laboratory-Surveillance/Percent-Positivity-of-COVID-19-Nucleic-Acid-Amplification-Tests.

** An increase or decrease defined as +/- 1.0% difference between the previous and current weeks.

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<th>HHS Region</th>
<th>Difference in weekly percent positivity (Week 46 to Week 47)**</th>
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The trend graphs displays the average number of RSV tests that were performed, and the average percent of those that were positive from three adjacent weeks: the specified week, and the weeks preceding and following it. This is also known as a centered, moving average. All results presented are from nucleic acid amplification tests. Less than 5% of most respiratory virus tests reported to NREVSS are from antigen diagnostic methods. The last three weeks of data may be less complete.
National Syndromic Surveillance Program (NSSP)

Emergency Department Visits
National Syndromic Surveillance Program (NSSP)

- >6,000 healthcare facilities covering 49 states and DC
  - >90% of ED in US participating

Objective:
- Near-real time influenza-like illness, COVID-19-like illness and inpatient status

Data Source:
- 6 million EHR messages, including chief complaint, diagnosis codes, patient demographics

*Image courtesy of NSSP How We Conduct Syndromic Surveillance | CDC*
National Weekly Percentage of U.S. Emergency Department (ED) Visits with Respiratory Illness Discharge Diagnosis Codes by Age Group, November 27, 2022 – December 2, 2023

Report was last updated on: 12/6/2023. Data Source: Discharge diagnosis (DD) codes from ED visits, National Syndromic Surveillance Program (NSSP). Fewer than 50% of facilities in CA, HI, IA, MN, OK, and OH report to NSSP. Limited to facilities that have consistently reported high-quality visit data over the entire period as emergency departments that consistently reported ≤40 in visit counts and discharge diagnoses averaging ≥75% completed per week over the past year. Additional details on inclusion criterion and specific diagnostic codes included for the definitions are listed in the Companion Guide for NSSP here: https://www.cdc.gov/ncird/surveillance/respiratory-illnesses/index.html#companion-guide
Respiratory Virus Laboratory Emergency Department Network Surveillance (RESP-LENS)

Emergency Department Visits
Respiratory Virus Laboratory Emergency Department Network Surveillance (RESP-LENS)

- 24 health systems totaling >100 emergency departments across 20 states and DC

- Objective
  - Provide timely data on the primary viruses causing ARI and monitor trends in seasonality
  - Link demographics, virologic testing, and clinical info (symptoms at presentation, illness severity, past medical history), disposition (hospital admission, 30-day follow-up)

- Data Sources
  - Electronic medical record data from patients who visit a participating ED with ARI
    - ~11,000 ARI-associated ED visits per week, including ~4,000 visits associated with children <18 years
National weekly percent positive and number of tests by pathogen reported to RESP-LENS, week ending December 3, 2022 – December 2, 2023
Weekly SARS-CoV-2 percent positivity and number of tests by age group, reported to RESP-LENS, week ending June 17, 2023 – December 2, 2023

Note: RESP-LENS sites are in California, Colorado, Florida, Illinois, Indiana, Iowa, Louisiana, Massachusetts, Michigan, Minnesota, Mississippi, Missouri, New York, Ohio, Oregon, Pennsylvania, Texas, Utah, West Virginia, Wisconsin and the District of Columbia.

The number of sites vary by region, which may affect representativeness. The distribution of ED visits among age groups varies by site and could impact the percent of specimens testing positive for a particular virus.

Sites in regions 4, 7 and 9 report more than 50% of their reported ED visits for ARI occur among children less than 18 years, therefore the data from those regions are likely to be more heavily influenced by respiratory viruses circulating in pediatric populations.
Weekly RSV percent positivity and number of tests by age group, reported to RESP-LENS, week ending June 17, 2023 – December 2, 2023

Note: RESP-LENS sites are in California, Colorado, Florida, Illinois, Indiana, Iowa, Louisiana, Massachusetts, Michigan, Minnesota, Mississippi, Missouri, New York, Ohio, Oregon, Pennsylvania, Texas, Utah, West Virginia, Wisconsin and the District of Columbia.

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Respiratory Virus Hospitalization Surveillance Network (RESP-NET)

Hospitalizations
COVID-NET: A RESP-NET population-based hospitalization surveillance platform

- RESP-NET: COVID-NET, RSV-NET, FluSurv-NET
- Population-based rates of COVID-19-associated hospitalizations
- Positive SARS-CoV-2 test within 14 days of or during hospitalization
- Screening or clinician-driven testing
- >300 acute-care hospitals
- 98 counties in 13 states
- In 9 of 10 HHS regions
- ~10% of U.S. population
- Clinical data: representative sample of COVID-NET patients
RSV-NET: A RESP-NET population-based hospitalization surveillance platform

- Population-based rates of RSV-associated hospitalizations
- Positive RSV test within 14 days of or during hospitalization
- Screening or clinician-driven testing
- 58 counties in 12 states
- In 9 of 10 HHS regions
- ~10% of U.S. population
- Clinical data: representative sample of RSV-NET patients
Overall Rates of Hospitalizations associated with COVID-19, Influenza, and RSV — RESP-NET, October 2022–December 2, 2023

- Overall COVID-19 hospitalization rates remain elevated and stable
  - Driven largely by adults aged ≥65 years
- RSV hospitalization rates continue to increase
- Flu hospitalization rates are low but are increasing in most surveillance sites

Thin dashed lines for the most recent weeks of the current season indicate potential reporting delays and interpretation of trends should exclude data from recent weeks. RESP-NET Interactive
COVID-NET

COVID-19-Associated Hospitalizations
COVID-19-Associated Hospitalization Rates by Age Group – COVID-NET, January 1, 2023–December 2, 2023

- Hospitalization rates remain highest in adults aged ≥65 years.

Thin dashed lines for the most recent weeks of the current season indicate potential reporting delays and interpretation of trends should exclude data from recent weeks.
RSV-NET

RSV-Associated Hospitalizations
RSV-Associated Hospitalization Rates by Age Group – RSV-NET, January 1–December 2, 2023

- RSV hospitalization rates continue to increase
  - Remain highest and increasing among children 0–4 years
  - Rates increasing among adults ≥65 years

Thin dashed lines for the most recent weeks of the current season indicate potential reporting delays and interpretation of trends should exclude data from recent weeks.
Overall RSV-Associated Hospitalization Rates – RSV-NET, 2018–2019 through 2023–2024

• RSV hospitalization rates at this time in 2023–2024 season:
  o Lower than same time point during 2022–2023 season
  o Now higher compared to same time point during 2021–2022 season
  o Earlier increases compared to 2018–2019 and 2019–2020 seasons
Nowcast
Genomic Surveillance
Sampling

Sequencing Pathway 1: National SARS-CoV-2 Strain Surveillance (NS3)
CDC receives samples for sequencing from state/local public health laboratories

Sequencing Pathway 2: CDC Contract Sequencing Network
Private and academic sequencing institutions in the US

Sequencing Pathway 3: Repository Tagged Sequences
Surveillance sequences tagged in GISAID/GenBank by US public health, academic, clinical, & research laboratories

Figures: BioRender & CDC COVID Data Tracker
Nowcast Estimates in the United States through December 9th, 2023
The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.