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Characteristics of Patients Hospitalized with Measles During an Outbreak — West Texas, January–March 2025

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Abstract

Measles is a highly infectious respiratory virus with the potential to cause severe illness resulting in hospitalization or death. On January 29, 2025, the Texas Department of State Health Services Public Health Region 1 was notified by the South Plains Public Health District of a case of measles in an unvaccinated school-aged child. During January 20–March 18, 2025, a total of 325 confirmed measles cases were reported; 60 (18.5%) patients were hospitalized. Available medical records for 54 hospitalized patients were reviewed; 49 (90.7%) were aged <18 years, and 48 (88.9%) had no underlying medical conditions. All 54 were unvaccinated or had unknown vaccination status. Hospitalized patients were admitted for a median of 2 days (range = 0–20 days) and many experienced complications, including pneumonia (39; 72.2%), dehydration (25; 46.3%), hepatitis (one; 1.9%), and febrile seizures (one; 1.9%). Thirty-eight (70.4%) hospitalized patients required supplemental oxygen, four (7.4%) were admitted to an intensive care unit, two (3.7%) required intubation and mechanical ventilation, and one (1.9%) died. Although most persons with confirmed measles were not hospitalized, approximately one in five required hospitalization, consistent with previously reported rates. Vaccination remains a critical tool for the prevention of measles infection and severe disease.

Introduction

Measles is a highly transmissible, vaccine-preventable febrile rash illness that can cause serious complications, especially in children aged <5 years (*1*). In 2000, measles was declared eliminated in the United States, but the country has continued to experience prolonged measles outbreaks, primarily resulting from repeated international importations followed by spread within communities with low measles vaccination coverage (*2*,*3*). On January 29, 2025, the Texas Department of State Health Services (DSHS) Public Health Region 1 (PHR1), which serves the panhandle and South Plains, was alerted by the South Plains Public Health District of a confirmed case of measles in an unvaccinated school-aged child living in Gaines County. By the end of the 2025 west Texas measles outbreak on August 18, 2025, PHR1 cases (569) accounted for three fourths of all 762 outbreak-associated cases. This report covers the period from the beginning of the outbreak through March 18, 2025, during which time CDC provided epidemic assistance to Texas DSHS as part of a rapid emergency response. During the investigation, 325 confirmed measles cases were reported in the South Plains region of west Texas, with rash or symptom onset dating to January 20, 2025, including 60 (18.5%) patients who were hospitalized. This analysis describes the demographic and clinical characteristics of 54 (90.0%) of those hospitalized patients derived from case report forms and available medical records.

INSIDE

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Methods

Data Source

Data for hospitalized patients were extracted from case report forms and medical records. This activity was reviewed by CDC, deemed not research, and conducted consistent with applicable federal law and CDC policy.*

Case Definition and Inclusion Criteria

A confirmed measles case was defined by Texas DSHS as an acute, febrile rash illness with either laboratory confirmation (i.e., serology, viral culture, or polymerase chain reaction [PCR] testing) or epidemiologic linkage to a laboratory-confirmed measles case. On February 28, 2025, DSHS adopted an outbreak case definition that broadened epidemiologic criteria to include having lived in or visited any of six designated counties experiencing active measles transmission. Cases were included if they were reported to PHR1 by March 18, 2025; this included five of the six counties first designated by DSHS as experiencing active measles transmission.

Data Collection and Analysis

Patients admitted to a hospital as inpatients or for observation for any length of time during January 20–March 18, 2025, were included; those who were evaluated in an emergency department (ED) and discharged were excluded. Available medical records as of March 28, 2025, including ED and inpatient notes and discharge summaries, were retrospectively abstracted and cross-matched with health department case report forms. Abstracted data included patient characteristics (e.g., age, sex, measles vaccination status, and underlying medical conditions), clinical features (e.g., signs and symptoms and complications), hospital course (e.g., length of stay, intensive care unit [ICU] admission, severity indicators, and treatments administered), and outcome. Descriptive statistics were calculated using R software (version 4.4.3; R Foundation).

Characteristics Assessed

The number of documented measles, mumps, and rubella (MMR) vaccine doses received >14 days before symptom onset was ascertained through the Texas Immunization Registry or verification of vaccination documentation.† The interval from rash onset to hospital admission was calculated for patients with known rash onset date. Fever and rash were self-reported or noted by clinicians in the hospital record. Pneumonia was defined as a description of findings consistent with pneumonia on a radiology

* 45 C.F.R. part 46, 21 C.F.R. part 56; 42 U.S.C. Sect. 241(d); 5 U.S.C. Sect. 552a; 44 U.S.C. Sect. 3501 et seq.

† Unknown vaccination status includes patients who reported having received MMR vaccine but whose vaccination status could not be verified and those who could not recall if they had received MMR vaccine. Unvaccinated status includes patients with no documented doses of MMR vaccine >14 days before symptom onset. Disaggregating unvaccinated patients from those with unknown vaccination status is not possible because the Texas Immunization Registry requires explicit consent by law (i.e., is an opt-in registry) to enroll.

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report or clinician documentation of pneumonia in the medical record. Dehydration was defined as any documentation of dry, cracked, or chapped lips or tacky mucous membranes; decreased urine output; or mention of dehydration in the medical record. Hospital length of stay was right-censored on March 25, 2025. Patients still hospitalized ended their follow-up on that date to allow 1) a 1-week period from rash onset by March 18, 2025, to hospitalization and 2) an additional 3-day period after hospitalization for medical record availability by March 28, 2025. ICU admission excluded admission to intermediate care or step-down units. Any application of oxygen for any duration was considered receipt of supplemental oxygen. Hypoxia was defined as any mention of hypoxia or hypoxemia or as any recorded oxygen saturation of <90%.

Results

During January 20–March 18, 2025, a total of 325 laboratory-confirmed measles cases were reported in the South Plains region, including 60 (18.5%) cases among patients who were hospitalized. Among hospitalized patients, 54 (90.0%) had medical records available for abstraction (Figure) (Table).

Characteristics of Hospitalized Measles Patients

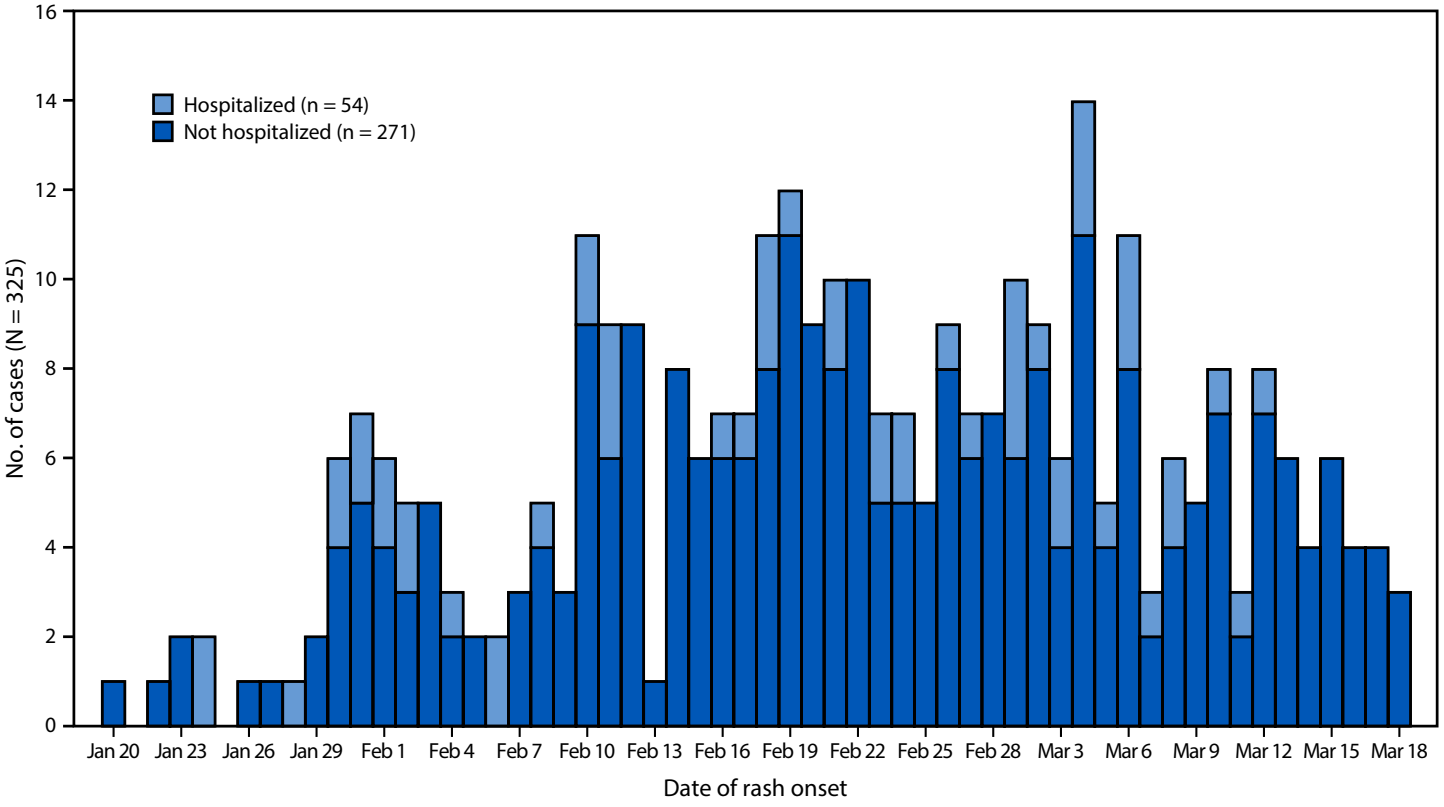
Overall, 34 (63.0%) hospitalized patients were female, and 49 (90.7%) were aged <18 years, including 30 (55.6%) aged 0–4 years and 19 (35.2%) aged 5–17 years. All had received no documented MMR doses or had unknown vaccination status. Six (11.1%) patients had one or more underlying medical conditions, including asthma, diabetes, malignancy, genetic disorders, or significant congenital anomalies; no patient was severely immunocompromised.[§] By definition, all patients had fever and rash that were either self-reported or documented in the hospital record, and the majority had cough (51; 94.4%), coryza (42; 77.8%), or conjunctivitis (32; 59.3%).

Hospital Course

Patients were initially admitted to the hospital a median of 2 days after reported rash onset (range = –2 to 10 days) and

[§] Severe immunocompromise was defined as immunosuppression resulting from conditions such as congenital immunodeficiency, AIDS, hematologic or other malignancy receiving active treatment, receipt of solid organ or hematopoietic stem cell transplant, or use of certain immunosuppressive therapies (e.g., chemotherapy, radiation, or high-dose corticosteroids).

FIGURE. Hospitalization status of patients with measles,* by month and day of rash onset† — west Texas, January 20–March 18, 2025§



* Fifty-four of 60 total hospitalized patients for whom medical records were available.
† If date of rash onset was not available, the following hierarchy was used: symptom onset date, specimen collection date, hospital admission date, or date of report to the local health department or to the Texas Department of State Health Services.
§ The outbreak continued through August 18, 2025, 42 days after rash onset in the last case.

TABLE. Demographic and clinical characteristics of patients hospitalized with measles — west Texas, January 20–March 18, 2025*

Characteristic (no. with available information)†	No. (%)
Sex (54)	
Female	34 (63.0)
Male	20 (37.0)
Age group, yrs (54)	
0–4	30 (55.6)
5–17	19 (35.2)
18–44	5 (9.3)
No. of verified measles vaccine doses received (54)	
None/Unknown	54 (100.0)
≥1	0 (—)
Underlying medical condition§ (54)	
No	48 (88.9)
Yes	6 (11.1)
Pregnant (women aged 18–44 years) (5)	
No	1 (20.0)
Yes	4 (80.0)
Days from rash onset to hospital admission, median (range)¶ (51)	2 (−2 to 10)
Measles signs and symptoms (54)	
Fever**	54 (100.0)
Rash**	54 (100.0)
Cough	51 (94.4)
Coryza	42 (77.8)
Conjunctivitis	32 (59.3)
Dyspnea	30 (55.6)
Malaise/Fatigue	30 (55.6)
Vomiting	14 (25.9)
Koplik spots	11 (20.4)
Measles complications (54)	47 (87.0)
Pneumonia	39 (72.2)
Dehydration	25 (46.3)
Diarrhea	21 (38.9)
Otitis media	8 (14.8)
Hepatitis	1 (1.9)
Thrombocytopenia	1 (1.9)
Seizures	1 (1.9)
Encephalitis	0 (—)
Hospitalization (54)	
Length of stay, days, median (range)††	2 (0 to 20)
Intensive care unit admission	4 (7.4)
Severity indicators (54)	41 (75.9)
Receipt of supplemental oxygen	38 (70.4)
Hypoxia	37 (68.5)
Endotracheal intubation	2 (3.7)
Death	1 (1.9)
Co-infections (54)§§	17 (31.5)
Respiratory viruses¶¶	8 (14.8)
Mycoplasma pneumoniae	5 (9.3)
Group A *Streptococcus*	3 (5.6)
Blood cultures positive for other pathogens	2 (3.7)
Sputum cultures positive for other pathogens	1 (1.9)
Hospital treatments (54)	
Antibiotics***	28 (51.9)
Vitamin A	13 (24.1)
Immune globulin	2 (3.7)

* Date of rash onset. Available medical records as of March 28, 2025, were retrospectively abstracted and cross-matched with health department case report forms.
† For each characteristic, counts and percentages were calculated among patients with nonmissing data. Accordingly, denominators differ across characteristics.
§ Included asthma, diabetes, malignancy, genetic disorders, and significant congenital anomalies; no patient had severe immunosuppression resulting from conditions such as congenital immunodeficiency, AIDS, hematologic or other malignancy receiving active treatment, receipt of solid organ or hematopoietic stem cell transplant, or use of certain immunosuppressive therapies (e.g., chemotherapy, radiation, or high-dose corticosteroids). Pregnancy, prematurity, and eczema were not included as underlying medical conditions.
¶ Three patients had rash onset after hospitalization.
** All patients had fever and rash that were either self-reported or documented in the hospital record, as required by the case definition.
†† Hospital length of stay was right-censored on March 25, 2025, meaning that patients still hospitalized ended their follow-up on that date. March 25, 2025, was chosen to allow a 1-week period from rash onset by March 18, 2025, to the determination of hospitalization status, and to allow an additional 3-day period after hospitalization for medical record availability by March 28, 2025.
§§ Co-infections were not mutually exclusive; some patients had co-infections with more than one pathogen.
¶¶ Respiratory viruses detected included influenza (four), respiratory syncytial virus (three), human metapneumovirus (one), and rhinovirus/enterovirus (one).
*** The most commonly administered antibiotics were amoxicillin, azithromycin, ceftriaxone, clindamycin, and vancomycin.

were hospitalized for a median of 2 days (range = 0 to 20 days); three patients were admitted before rash onset. All patients had clinical indications for hospitalization; no patient was admitted for isolation alone. Complications included pneumonia (39; 72.2%), dehydration (25; 46.3%), diarrhea (21; 38.9%), hepatitis (one; 1.9%), and febrile seizures (one; 1.9%). Thirty-seven (68.5%) patients experienced hypoxia, and 38 (70.4%) required supplemental oxygen. Among all hospitalized patients with measles, four (7.4%) were admitted to an ICU, all of whom were children aged <18 years. All of these children had cough, coryza, conjunctivitis, dyspnea, pneumonia, and hypoxia that required supplemental oxygen; three had dehydration, two required intubation and mechanical ventilation (3.7%), and one child died (1.9% of all hospitalized patients.) A second measles-related death occurred in a child after March 18, 2025; that case is not included in this report.

Co-Infections and Prescribed Medications

Overall, 17 (31.5%) patients experienced co-infections. Co-infecting pathogens included *Mycoplasma pneumoniae* (five patients), influenza (four), respiratory syncytial virus (three), group A *Streptococcus* (three), human metapneumovirus (one), and rhinovirus/enterovirus (one), as well as sputum cultures (one) and blood cultures (two) that were positive for other pathogens. Twenty-eight (51.9%) patients received antibiotics during hospitalization. The most common indications for antibiotic treatment were community-acquired pneumonia, otitis

Summary

What is known about this topic?

Measles is a highly contagious respiratory virus that can cause serious illness. In the United States, approximately 20% of unvaccinated persons with measles require hospitalization.

What is added by this report?

During the first 3 months of a large measles outbreak in the South Plains region of west Texas (January 20–March 18, 2025), 325 measles cases were reported; 60 (18.5%) patients were hospitalized. Among 54 hospitalized patients with available medical records, all were unvaccinated or had unknown vaccination status, 91% were aged <18 years, approximately 70% had pneumonia and hypoxia, and one patient died.

What are the implications for public health practice?

Measles infection can result in serious complications, hospitalization, and death. Vaccination remains a critical tool for the prevention of measles infection and severe disease.

media, and pharyngitis. Thirteen (24.1%) patients (all children aged <18 years) received vitamin A during their hospitalization. Two (3.7%) patients, both infants aged <3 months, received immune globulin; information on the measles immunity status of their mothers was not available.

Measles Cases Among Pregnant Women

Among the five adults aged 18–44 years who were hospitalized with measles, four (80.0%) were pregnant women, all of whom were in their third trimester of pregnancy (range = 34–40 gestational weeks) and all of whom had measles confirmed by PCR testing. None developed pneumonia or hypoxia. Two of the pregnant women delivered live infants during their hospitalizations, and both infants received a diagnosis of active measles infection based on a positive measles PCR test result within 2 days of birth. One infant experienced symptoms compatible with acute measles meningoencephalitis and was hospitalized several weeks later, outside the period included in this report.

Discussion

The 2025 west Texas measles outbreak was declared over on August 18, 2025, 42 days after rash onset in the patient with the last case. As of that date, 762 confirmed cases, 99 hospitalizations, and two deaths had been reported. Of those 762 cases, 32.4% were among adults (persons aged ≥18 years), compared with 9.2% of the 325 cases described in this report. In addition, 5.8% of patients with confirmed cases by the end of the outbreak had received ≥1 MMR vaccine dose >14 days before symptom onset, compared with 0% of patients described in this report, reflecting a larger proportion of adults with measles later in the outbreak and more breakthrough measles cases in patients who had been vaccinated.

From the beginning of the outbreak on January 20, 2025, through March 18, 2025 (the period during which CDC provided epidemic assistance to DSHS as part of a rapid emergency response), 325 confirmed measles cases, 60 hospitalizations, and one measles-associated death occurred in the South Plains region of west Texas. During these early months of the outbreak, approximately 20% of patients required hospitalization, a similar percentage to that reported during previous measles outbreaks (*4*). In addition, the clinical characteristics, rates of complications (including pneumonia, dehydration, hypoxia, a need for supplemental oxygen, and ICU admission) and outcomes of these hospitalized patients are similar to those previously reported for hospitalized patients with measles (*5*). Approximately one third of patients hospitalized with measles in this outbreak during January–March had bacterial or viral co-infections, a recognized occurrence in measles infections (*6*); these coinfections might have contributed to hospitalization and disease severity.

The outcomes experienced by patients hospitalized during this outbreak underscore the seriousness of measles infection and highlight that measles can cause life-threatening complications affecting multiple organ systems and place significant stress on patients and health care systems (*7*). Clinicians caring for measles patients should be prepared to test for and manage potential complications and co-infections.

Age-appropriate vaccination against measles, according to recommended immunization schedules (*8*) and public health guidance during outbreaks, is the most effective way to prevent measles infection, severe disease, and hospitalization. Measles infection is uncommon in persons who have received ≥1 dose of measles vaccine: 1 dose is approximately 93% effective at preventing measles, and 2 doses are 97% effective. Measles cases that occur among vaccinated persons are typically mild and pose a lower risk for serious complications (*9*).

Limitations

The findings in this report are subject to at least four limitations. First, reports of hospitalized cases were obtained from health care facilities in the South Plains region. Persons who acquired measles in this region might have sought care elsewhere; therefore, the number of hospitalized cases and the hospitalization rate might be underreported. Second, mild cases were also likely underreported, which might have resulted in an overestimation of the hospitalization rate. Third, not all medical records were available for review at the time of chart abstraction, and no standardized assessment tool existed at the time of hospital admission to record the use of nonprescription drugs or outpatient treatments; therefore, signs and

symptoms, complications, severity indicators, co-infections, and treatments might have been underestimated. Finally, because the Texas Immunization Registry is an opt-in registry, some patients might have received measles vaccine doses that could not be verified.

Implications for Public Health Practice

Although many cases of measles are mild, approximately one in five persons with confirmed measles in this outbreak required hospitalization for pneumonia, dehydration, or other complications, including rare cases of serious illness or death. Measles vaccination remains a critical tool in both routine and outbreak settings for the prevention of measles infections, severe disease, and hospitalizations; community coverage of >95% is necessary to achieve herd immunity.

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