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# **Ellis County Measles Outbreak, 2018**

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**Texas Department of State Health Services, PHR 2/3**



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# Measles Trends in Texas

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# Measles in Texas

- 56 cases reported with onset of illness on or after 2008\*
  - Cases have been identified in 8 counties
- Ages range from <1 years old – 50 years old
  - Median age: 15 years old
  - 24 (43%) are 18 years of age or younger
- 4 outbreaks, largest occurring in Tarrant County 2013

# Measles Trends 2008-2018\*

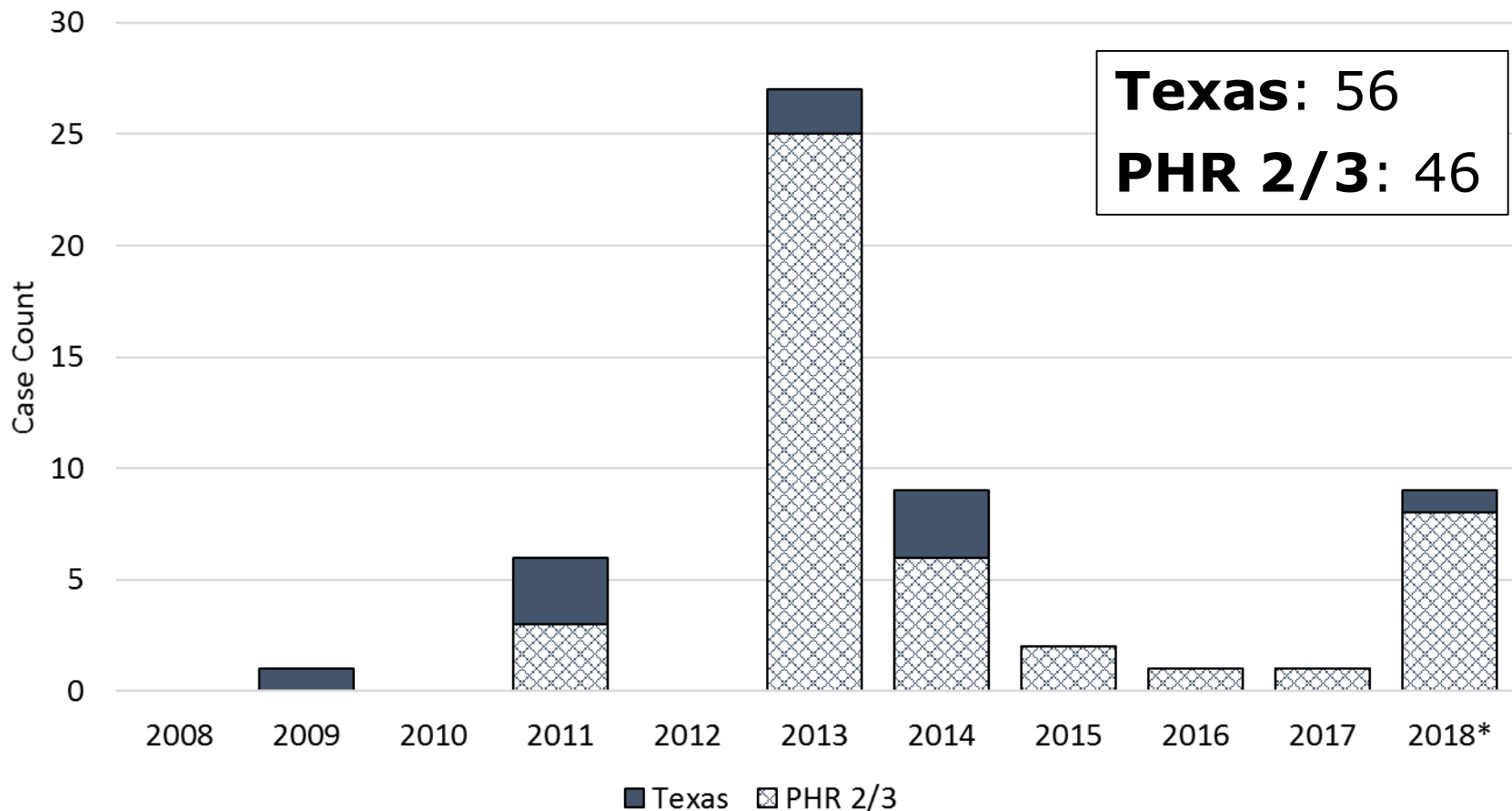


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## Texas/Regional Measles

\*as of Sept 2018





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# Measles Virus Overview

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# Measles Virus

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## Virus Characteristics

- single-stranded, enveloped RNA paramyxovirus

## Transmission

- Person-person, droplet or airborne transmission
- Attack rate >90%

## Incubation Period, Infectious Period

- Incubation: 7-21 days
- Infectious: 4 days before rash onset, 4 days after



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# Clinical Illness

## Prodrome:

- Mild-moderate fever
- Cough, coryza (runny nose)
- Conjunctivitis
- Koplik's spots

## Rash:

- 1-7 days after onset of prodrome symptoms
- Generalized maculopapular (red, flat, blotchy)
- Originates upper neck, behind the ears, along the hairline







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# Definitions

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## Clinical Case Definition:

- Generalized maculopapular rash  $\geq 3$  days, **AND**
- A temperature  $> 101.0^{\circ}\text{F}$  ( $> 38.3^{\circ}\text{C}$ ), **AND**
- Cough, coryza, or conjunctivitis

## Laboratory Criteria for Diagnosis:

- IgG seroconversion or significant rise in measles IgG\*, **OR**
- Isolation of measles virus from a clinical specimen\*, **OR**
- **Detection of measles virus by PCR\***, **OR**
- Positive measles IgM\* not ruled out by other confirmatory testing or more specific measles testing in a public health laboratory





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# Case Classification

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## Confirmed

An acute febrile rash illness (temperature can be lower than 101°F and rash < 3 days) that is:

- Laboratory confirmed, OR
- Epidemiologically linked to a laboratory confirmed measles case

Probable: No probable case definition



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# Vaccine

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## MMR

- Measles, mumps, rubella components

## Schedule

- 1<sup>st</sup> dose at 12-15 months
- 2<sup>nd</sup> dose 4-6 years old (however may be given as soon as 4 weeks after the first dose)

## Efficacy (measles)

- 1<sup>st</sup> dose: 93% effective
- 2<sup>nd</sup> dose: 97% effective



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# Ellis County Measles Outbreak: --- Detection

# Outbreak in Ellis County?

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- 1/15 call received from an on-call epi with a LHD
- Possible measles:
  - 8 m.o. (no immunizations)
  - From Uganda
  - Rash preceded by fever, cough and coryza



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**Monday 1/15/2018:  
Initial Case Reported**

# Outbreak in Ellis County?

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- Case #1
  - 8 m.o., female
  - Born in Uganda, arrived at the DFW International Airport on 12/24/17 to spend time with mom's family during the holiday season.
  - Cough, runny nose, fever (102F) 1/6/18.
  - Rash on 1/9/18, originating on the hairline, and parent described seeing white spots on the inside of the cheeks, as well as the tongue.



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# Outbreak in Ellis County?

- **Hospital ER visit 1/13-1/14**
  - Serology collected 1/14
  - IgM positive on 1/18
- **Field nurse visit 1/17**
  - PCR collected 1/17, positive on 1/19
  - Field nurse offered immunizations to 4 of 6 household contacts – all accepted, 1 already vaccinated, 1 w/ history of measles



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Sunday  
1/14:  
Serology  
Collected

Monday  
1/15:  
Initial Case  
Reported

Wednesday  
1/17: PCR  
Collected

Thursday  
1/18:  
Serology  
(+)

Friday  
1/19: PCR  
(+)

# Outbreak in Ellis County?

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- Rash onset 1/9, Period of Communicability:
  - 1/5 – 1/13
- Possible Exposure Settings:
  1. Baby Shower (church) on 1/6
  2. Local movie theatre on 1/9
  3. Hospital ER on 1/13-1/14



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# Outbreak in Ellis County!!

- Case #2:
  - Index HH, 27 y.o. female, aunt of index case
  - Unvaccinated
  - 1/18 - Fever of 101F, cough and coryza
  - 1/19 - Rash onset
  - Taken to hospital on 1/22
  - Visiting from out of state – arrived on 1/8 for a medical procedure on 1/12



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**Monday 1/15: Initial  
Case Reported**

**Friday 1/19: 2<sup>nd</sup> case**

# Outbreak in Ellis County!!

- Case #3:
  - Index HH, 23 y.o. male, uncle of index case
  - Unvaccinated
  - 1/18 - Fever of 101F and conjunctivitis
  - Taken to hospital on 1/18
  - 1/19 - Rash onset
- Last day at work (local gym) was 1/16



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**Monday 1/15: Initial  
Case Reported**

**Friday 1/19: 2<sup>nd</sup> and  
3<sup>rd</sup> case**

# Outbreak in Ellis County!!

- Case #4:
  - Index HH, 25 y.o. female, mother of index case
  - Unvaccinated
  - 1/18 - Fever of 102F, cough and coryza
  - 1/19 - Rash onset
  - Arrived with index case on 12/24 from Uganda



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**Monday 1/15: Initial  
Case Reported**

**Friday 1/19: 2<sup>nd</sup>, 3<sup>rd</sup>  
and 4<sup>th</sup> case**

# Outbreak in Ellis County!!

- Case #5:
  - Index HH, 17 y.o. female, aunt of index case
  - Unvaccinated
  - University student living in dorms, home on break during exposure
  - 1/18 - Fever 102F, cough and coryza
  - 1/20 - Rash, not similar to the other cases, different in texture
  - 1/22 - PCR collected
  - 1/23 - PCR positive



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Monday  
1/15: Initial  
Case  
Reported

Friday 1/19:  
2<sup>nd</sup>, 3<sup>rd</sup> and  
4<sup>th</sup> case

Monday  
1/22: PCR  
sample  
collected

Tuesday  
1/23: 5<sup>th</sup>  
case, PCR +

# Outbreak in Ellis County!!

- Case #6
  - HH #2, 22 y.o. male, contact of baby shower from 1/6
  - 1/16 – reported a fever (temperature not measured)
  - 1/19 – sore throat and cough
  - 1/20 – rash onset
  - 1/22 – PCR collected
  - 1/23 – PCR positive
  - Self employed – works from home



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Monday  
1/15: Initial  
Case  
Reported

Friday 1/19:  
2<sup>nd</sup>, 3<sup>rd</sup> and  
4<sup>th</sup> case

Monday  
1/22: 2 PCR  
samples  
collected

Tuesday  
1/23: 5<sup>th</sup>  
and 6<sup>th</sup> case,  
PCR's +

# Outbreak in Ellis County!!

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Household contacts for Case #6:

- Father – 54 y.o. with 2 MMR's
- Mother – 45 y.o. with 2 MMR's
- Sib 1 – 18 y.o. M, no Vx history, attends a local High School
- Sib 2 – 19 y.o. F, no Vx history, employed at a local daycare



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# Outbreak in Ellis County!!

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Other contacts for Case #6:

- Sib 3 – 24 y.o. F, no Vx history, not employed, lives with:
  - Husband (2 MMR's)
  - 15 m.o. daughter (no Vx history)
- Sib 4 – 26 y.o. F, no Vx, lives with:
  - Husband (2 MMR's)
  - Pregnant, baby is expected on 2/9 (baby shower held for her 1/6)
- Case's GF – 26 y.o. nursing student, 2 MMR's



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# Outbreak in Ellis County!!

Summary of cases:

Case	Fever	Rash	PCR	Vx History	HH
1	1/6	1/9	+ on 1/19	None	1
2	1/18	1/19	Not Done	None	1
3	1/18	1/19	Not Done	None	1
4	1/19	1/19	Not Done	None	1
5	1/18	1/20	+ on 1/22	None	1
6	1/16	1/20	+ on 1/22	None	2



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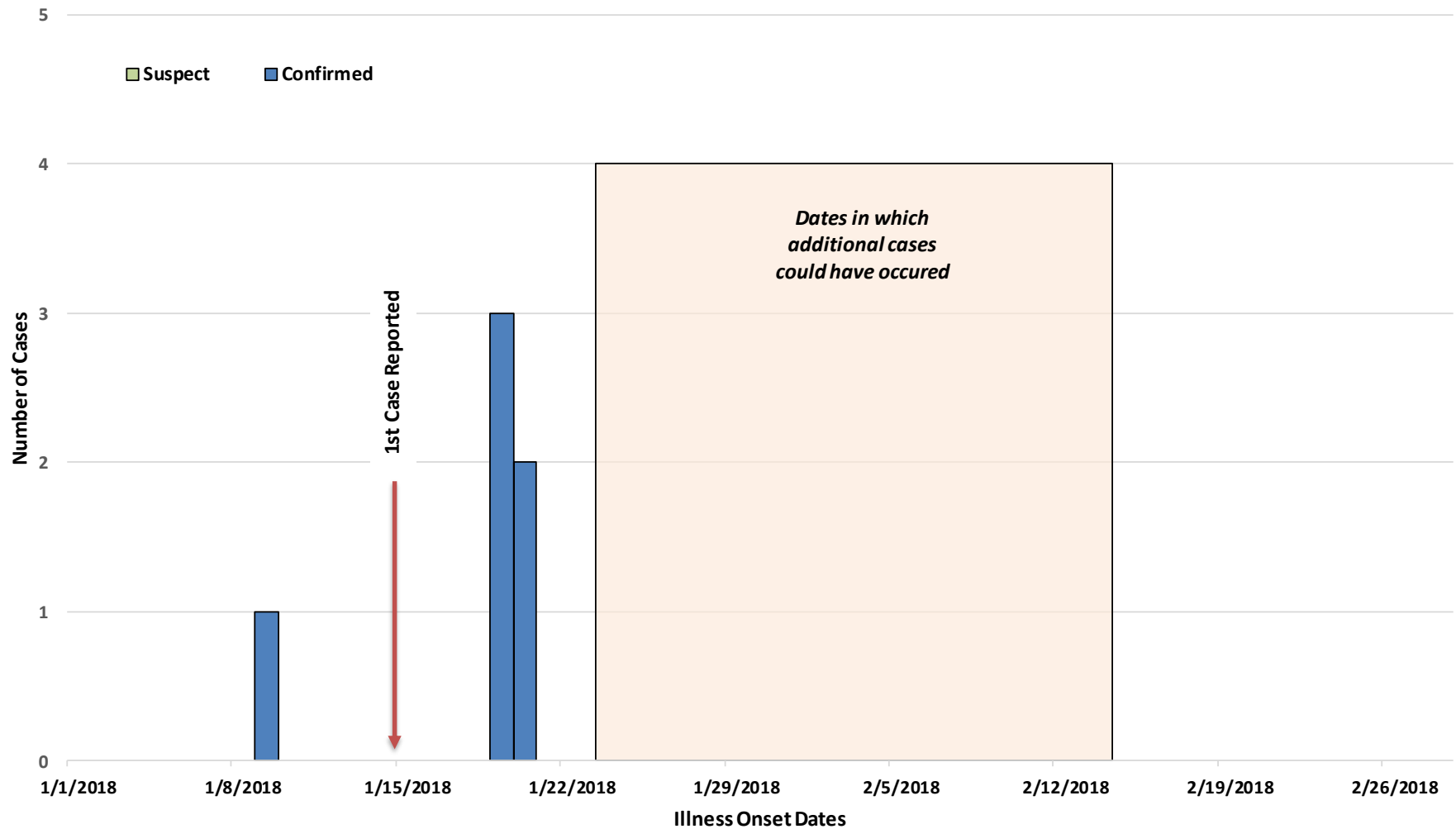
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# Ellis County Measles Outbreak: --- Data Summary

# Ellis County Outbreak: Epi Curve



# Demographics (cases)

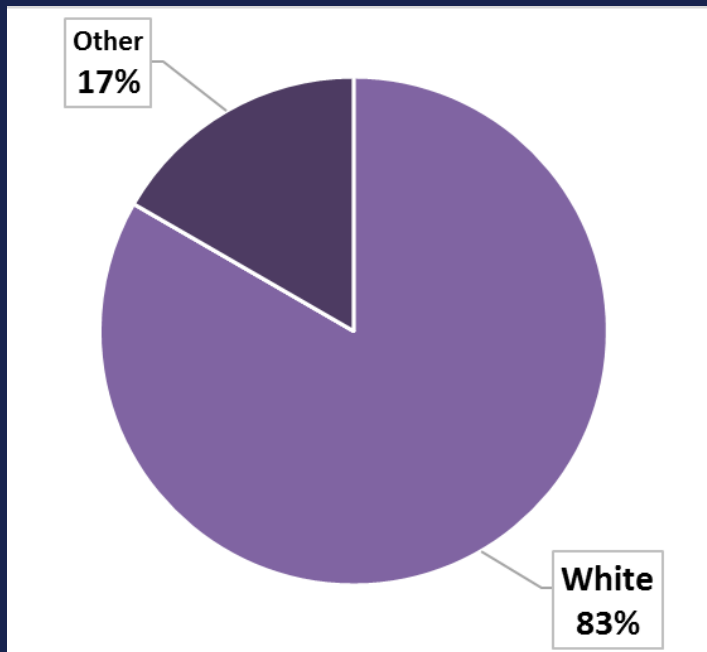


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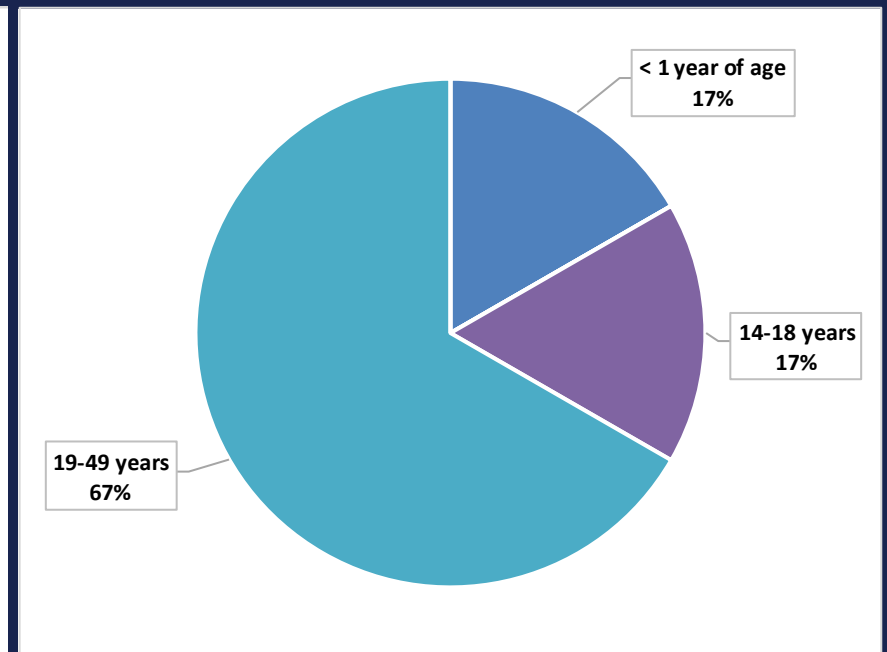
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- Total of 6 Cases

## Race/Ethnicity



## Age



# Vaccination Status



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## Cases

MMR Vaccine Doses		%
0 Doses	6	100%
1 Dose	0	0%
2 Doses	0	0%
Unknown	0	0%
<b>TOTAL</b>	<b>6</b>	<b>100%</b>

**Prior to illness**

## Contacts

MMR Vaccine Doses		%
0 Doses	6	43%
1 Dose	0	0%
2 Doses	8	57%
Unknown	0	0%
<b>TOTAL</b>	<b>14</b>	<b>100%</b>

**Prior to exposure**



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# Ellis County Measles Outbreak:

## Control and Prevention Measures

# Response: Internal Structure

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- Staff Meeting
  - Daily → Weekly
  - Regional Epis/administration/PH nurses/preparedness/VPD Epis
- Action Items
  - Case review/status/settings/jurisdictions
  - Lab Testing
  - Database/Line list
  - Communications
  - Other “non-measles” cases
- Daily Outbreak Summary



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# Response: Community Outreach

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- **Movie Theater**
  - Most recent setting from the time the index case had been confirmed
  - Press Release in regards to possible exposure to measles at a local movie theater on 1/19
- **Community Church**
  - Location of the baby shower
  - Important to have the pastor passing the same message to the community



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# Response: Community Outreach

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- **University**
  - Administration and health clinic contacted regarding the contact under Sx watch. Contacted again when (+).
  - They agreed to exclude until 4 days after the rash onset.
- **Gym**
  - Small gym, privately owned.
  - Understood to importance of the public health response.
  - Provided a list of members.
  - A Public Health Alert released on 1/22.
  - PHR 2/3 contacted gym members present on 1/16.



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# Response: Community Outreach

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- **Daycare Center**
  - Director contacted, agreed to exclude unvaccinated contact.
  - Employee may return on 2/15.
- **High School**
  - School nurse and administration contacted.
  - Agreed to exclude until 2/15.
  - 13 of 278 students without MMR.



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# Response: Community Outreach

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- **Health Care Facilities**
  - Our HAI epi played a major role in providing the outreach to these facilities.
  - Reviewed immunization and monitoring guidelines with staff and when a furlough was recommended.



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# Ellis County Measles Outbreak:

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## Lessons Learned

# Lessons Learned

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- We cannot control the weather!
  - Inclimate weather closed Central office for a couple of days.
- Situational awareness for surrounding jurisdictions need to be communicated ASAP.
- Include PIO in early communications to ensure they have an up-to-date report from the get go.
- Ensure communication with central staff regarding lab submissions



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# Thank You

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