



Healthy Kansans living in safe and sustainable environments.



# Measles:

## No Passport Required

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Bureau of Epidemiology and Public Health Informatics

# Measles

- Transmission: airborne and droplet
  - Breathing, coughing, sneezing
  - Survives up to 2 hours on environmental surfaces
  - Contagious 4 days before until 4 days after rash onset
- 90% of susceptible contacts infected
- Complications: <5 and >20 years
  - Ear infections
  - Diarrhea
  - Pneumonia
  - Encephalitis



# Signs and Symptoms

- Prodrome: fever, cough, coryza, conjunctivitis
- Maculopapular rash that begins on face at the hairline, spreads downward and outward
  - 3-5 days after prodrome
  - Fades in same order it appears



# Timeline

Notified of  
measles patient #1



# Measles #1 – Notification

- Travel to Europe
  - Landed in Wichita, KS
- Unvaccinated child
- Butler County resident
- Fever, runny nose, cough → 5 days
- Rash → 3 days
- Conjunctivitis



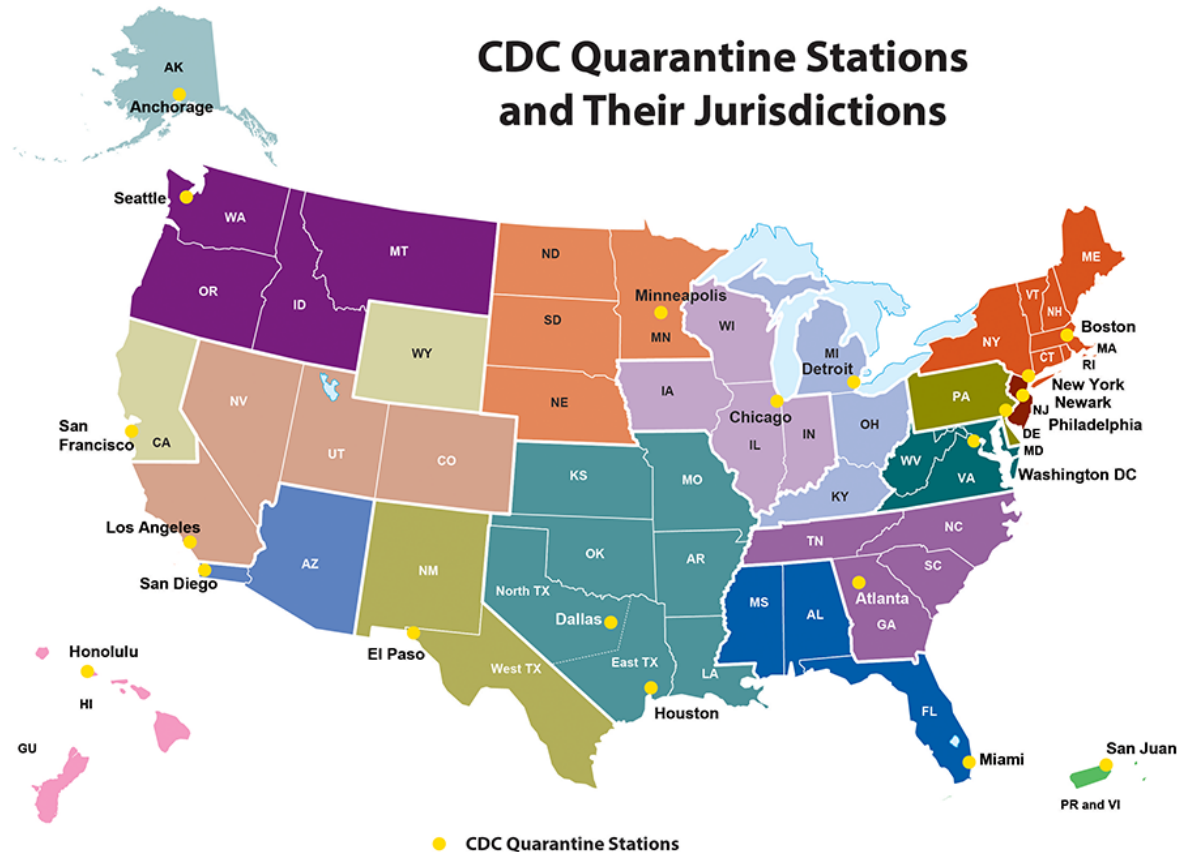
# Measles #1 – Notification

- Hospital A collected blood for IgM testing
- Hospital A began line list of ER contacts
- Patient transferred to hospital B in Sedgwick County
  - Respiratory isolation
- Butler County Health Department (BCHD) notified
  - Followed up with family to determine exposure and get flight information

# Measles #1 – Notification

- Sedgwick County Division of Health (SCDH)

- CDC EOC and CDC DGMQ



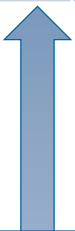


# Timeline

Notified of  
measles patient #1



Throat swab  
collected:  
PCR (+)



# Measles #1 – Investigation

- 4 separate flights from Europe to Wichita
  - BCHD having difficult time obtaining accurate flight information from patient's family
- Family and travel companion contacts
  - 9 contacts → 3 unvaccinated, received MMR on 6/30
- Hospital contacts
  - 18 contacts → 3 unsure of vax status, titers pulled
    - 1 with negative titer → 21 day quarantine
- Patient discharged from hospital B on 7/1, isolated at home

# Timeline

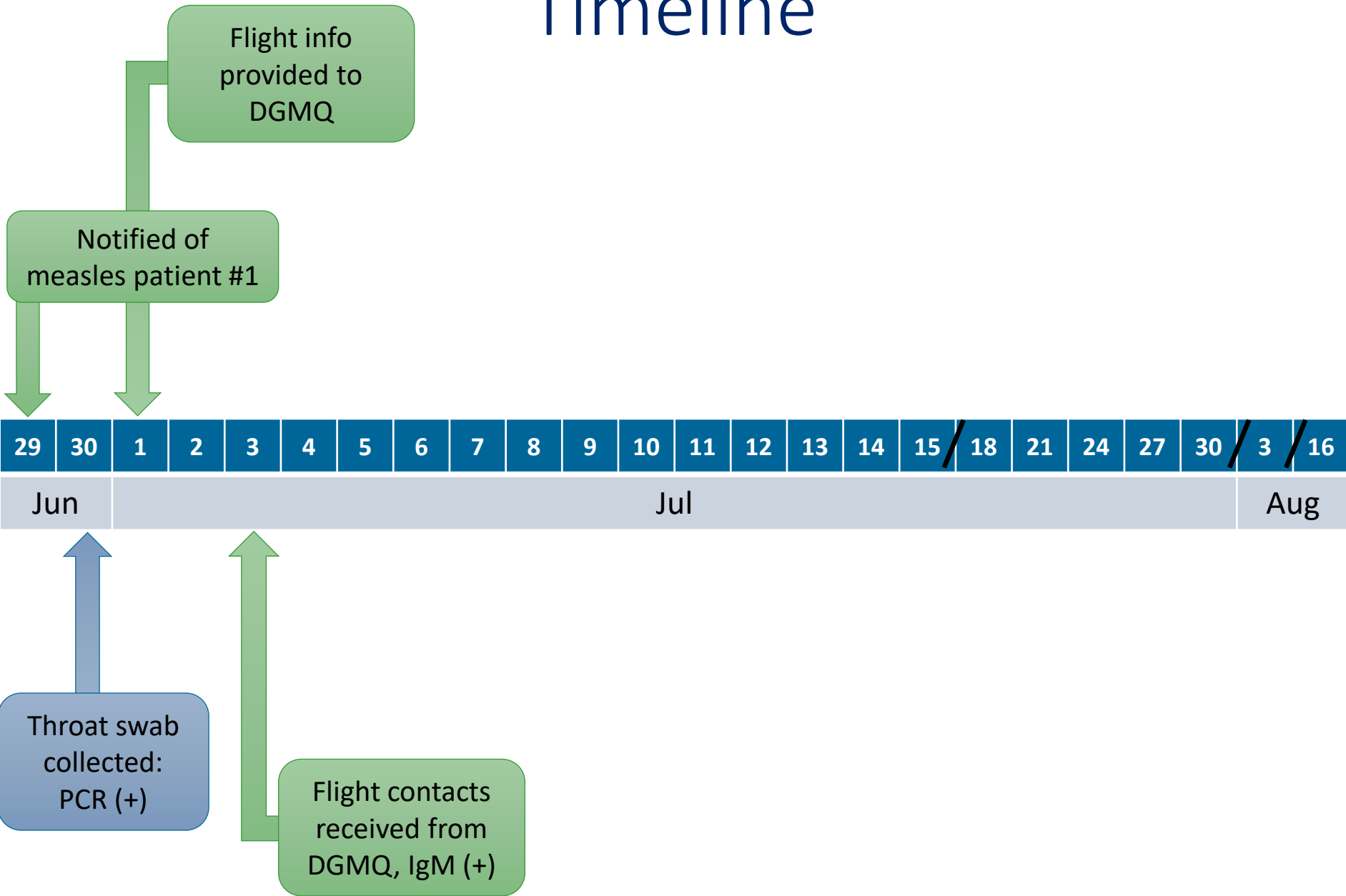
Flight info  
provided to  
DGMQ

Notified of  
measles patient #1

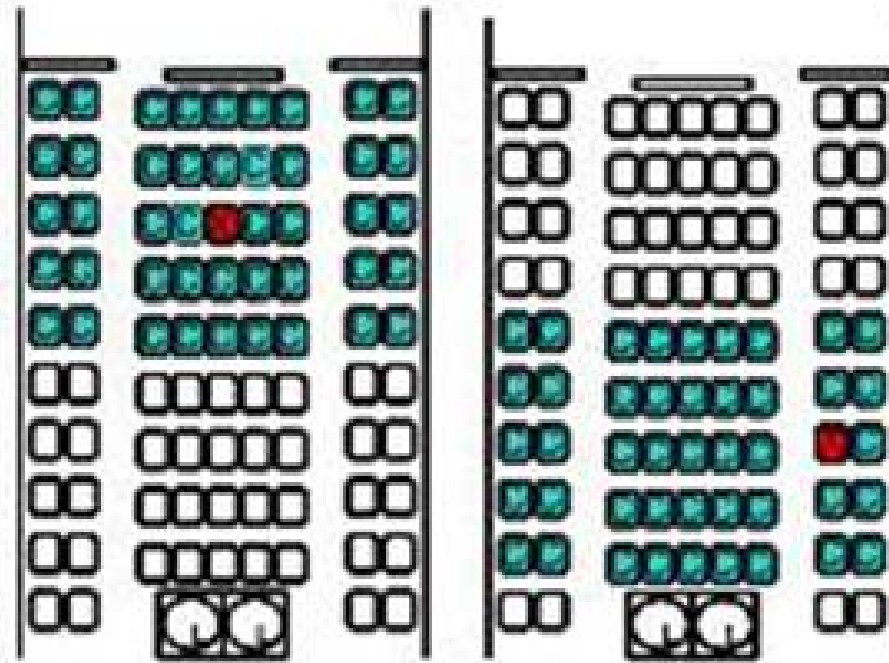


Throat swab  
collected:  
PCR (+)

# Timeline



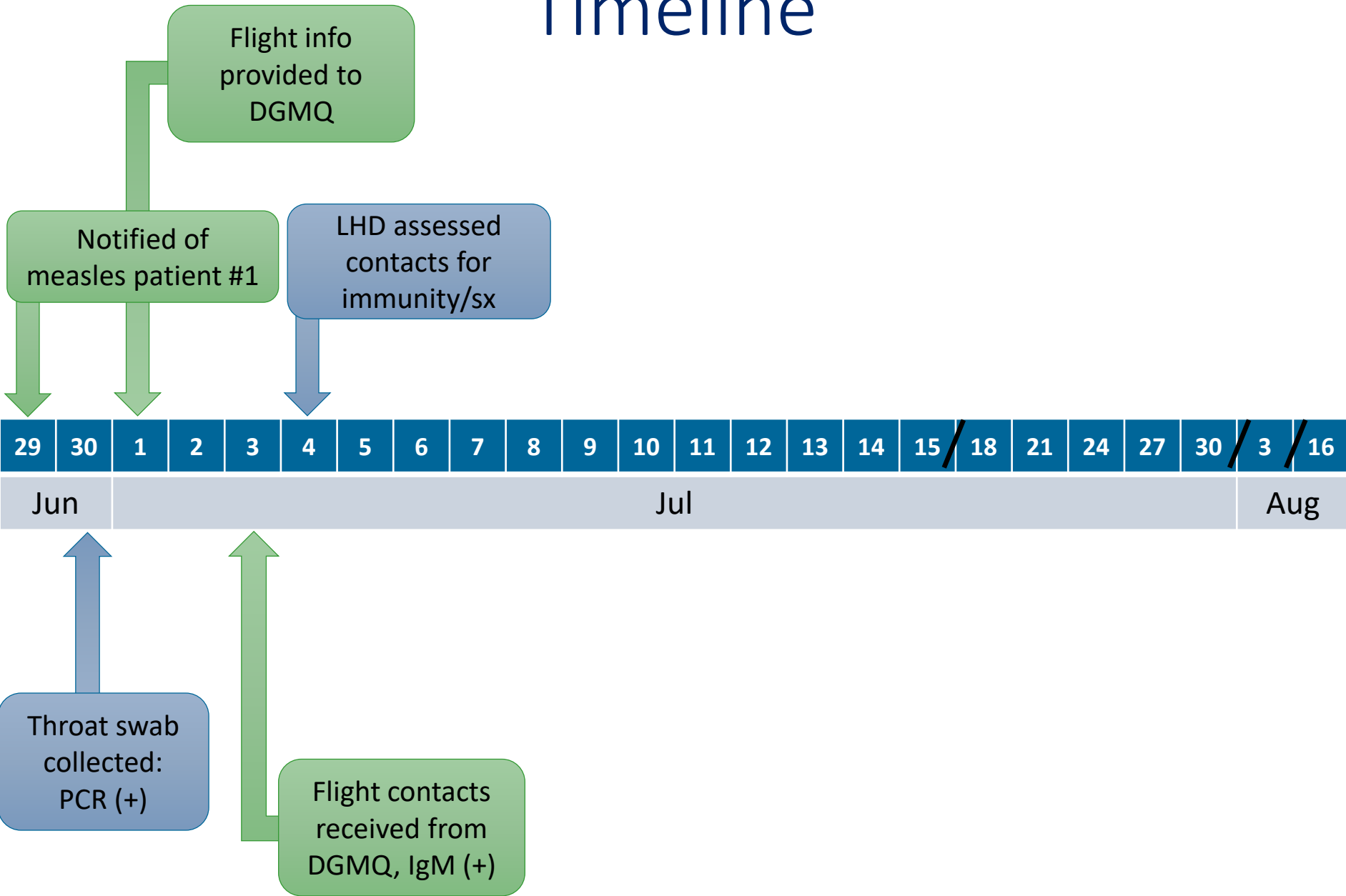
# Flight Exposure Determination by CDC



# Measles #1 – Flight Contacts

- Counties
  - Sedgwick – 22 contacts
  - Butler – 2 contacts
  - Harvey – 2 contacts
  - McPherson – 1 contact
  - Pawnee – 1 contact
- KDHE provided recommendations to LHDs on contact investigation

# Timeline

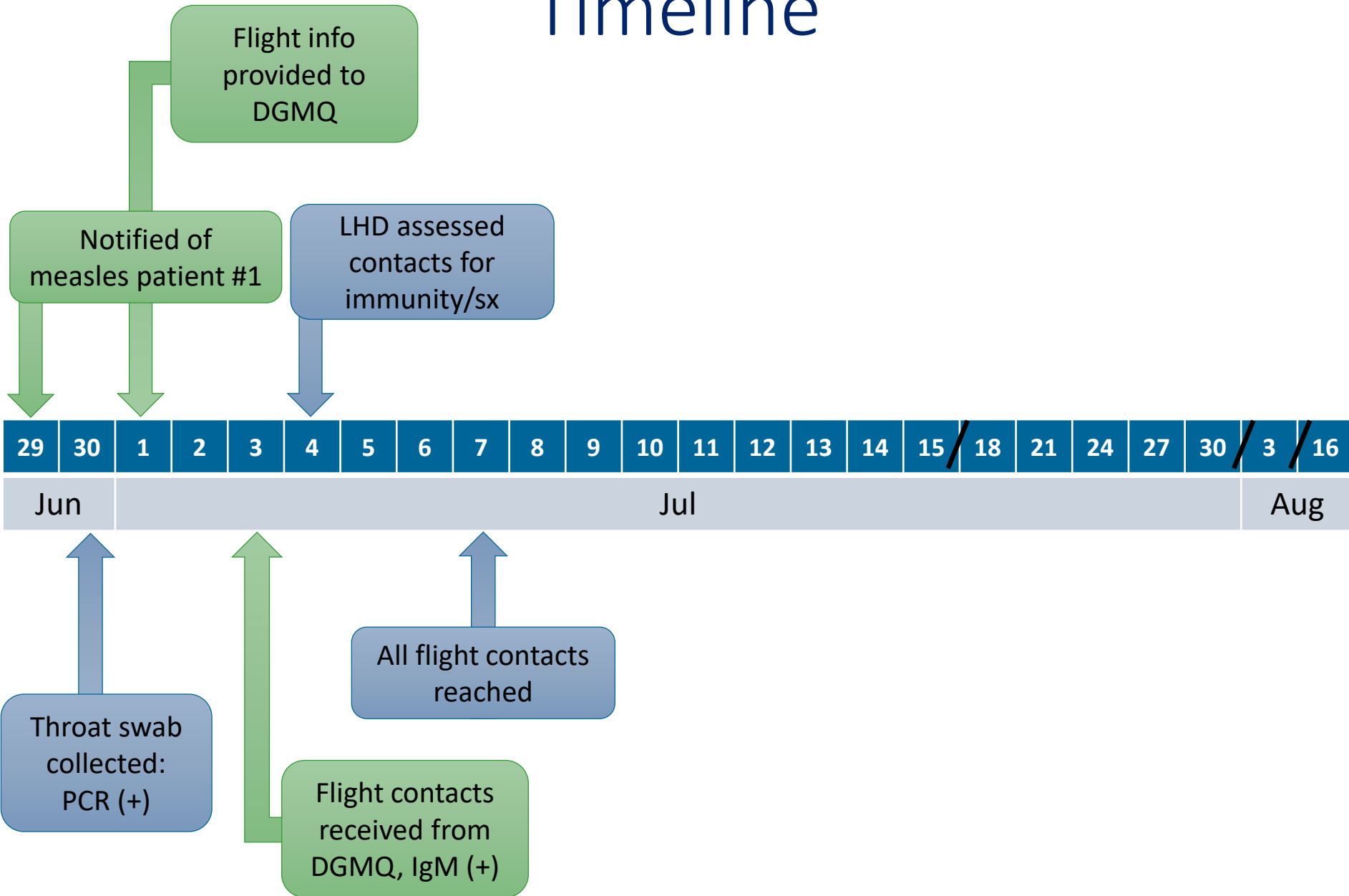


# Measles #1 – Flight Contact Follow Up

- Outside 72 hour window for MMR
- Immune globulin (IG) effective if given within 6 days
  - IGIM located, but discussion with CDC revealed not effective in persons >30 kg (66 lbs)
  - IGIV recommended for high risk persons
- 20/28 flight contacts reached → all immune



# Timeline

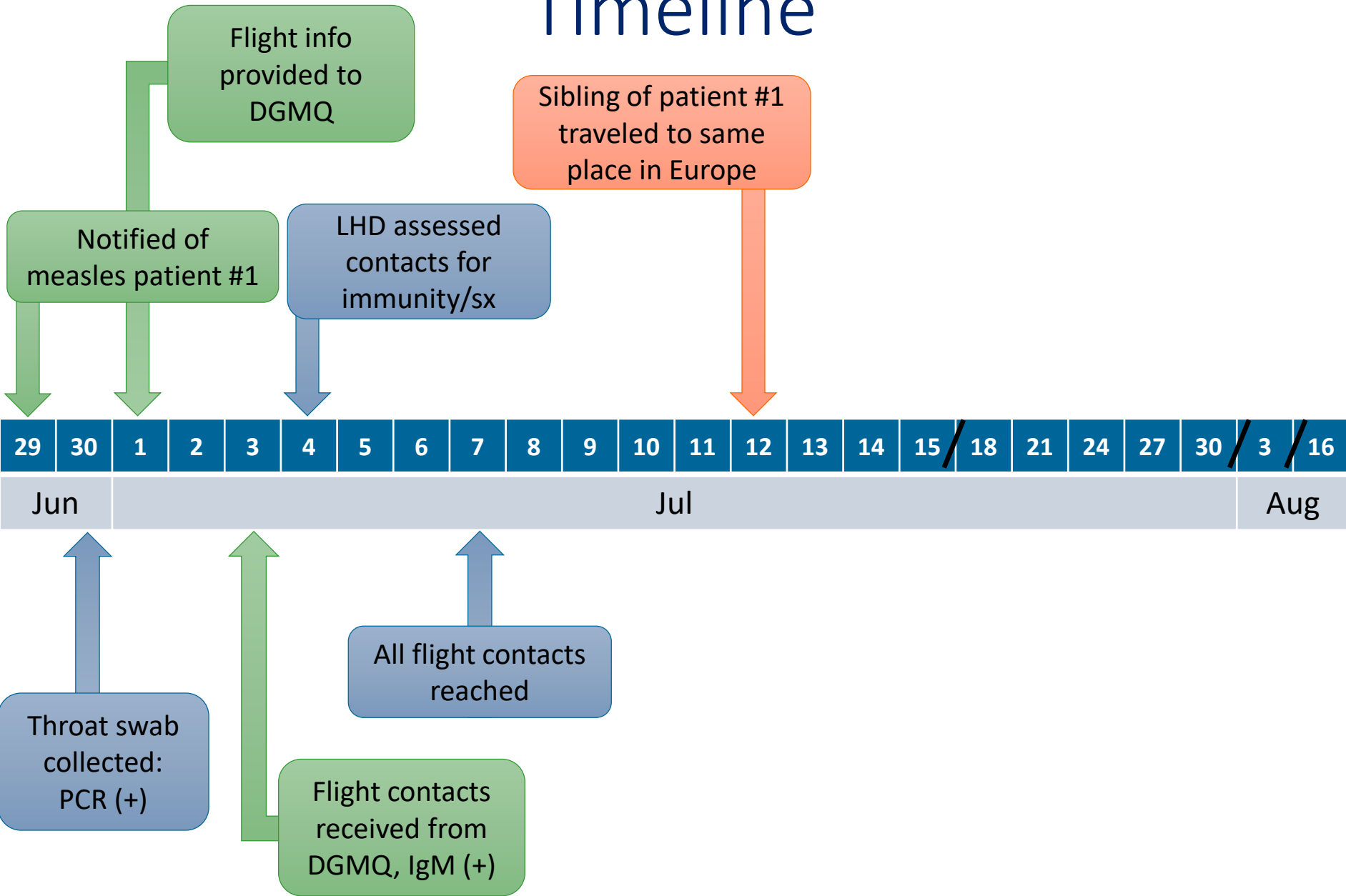


# Back to Europe?

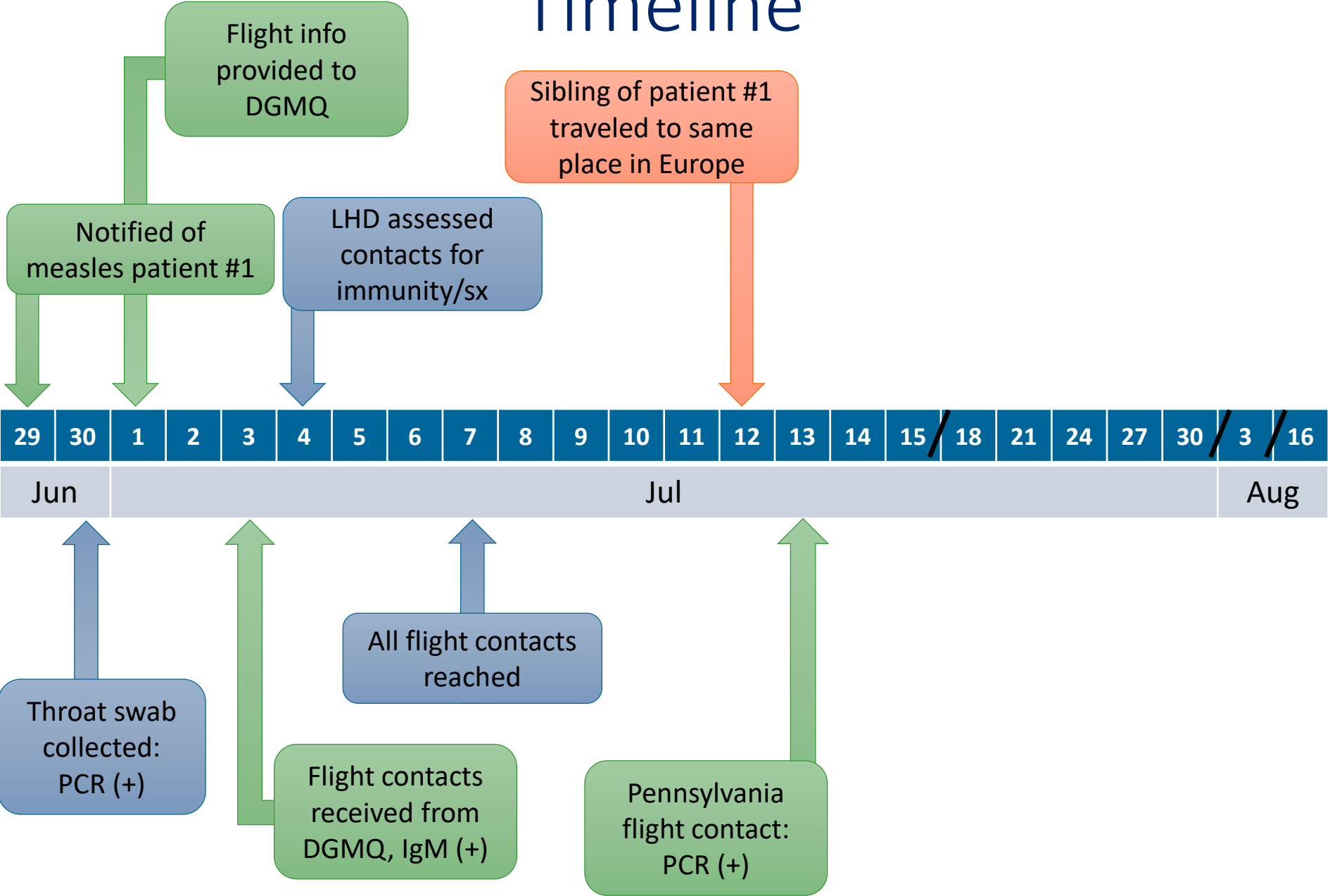
- Older sibling of measles patient planned to go to Europe on 7/12
- Received MMR on 6/30 (12 days prior to planned trip)
- Public health repeatedly discouraged travel

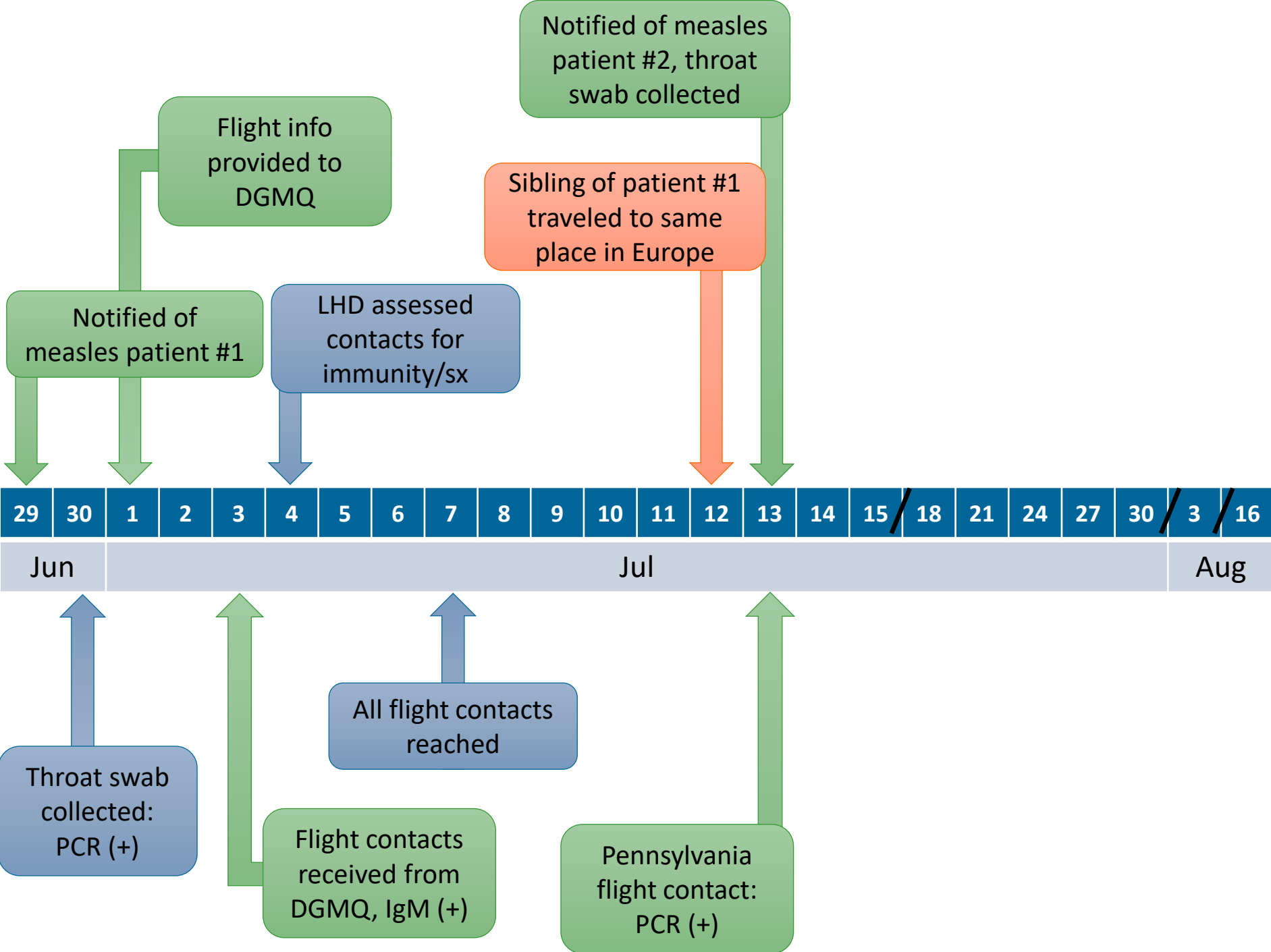


# Timeline



# Timeline





Notified of measles patient #2, throat swab collected

Flight info provided to DGMQ

Sibling of patient #1 traveled to same place in Europe

Notified of measles patient #1

LHD assessed contacts for immunity/sx

29 30 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 / 18 21 24 27 30 / 3 / 16

Jun Jul Aug

Throat swab collected: PCR (+)

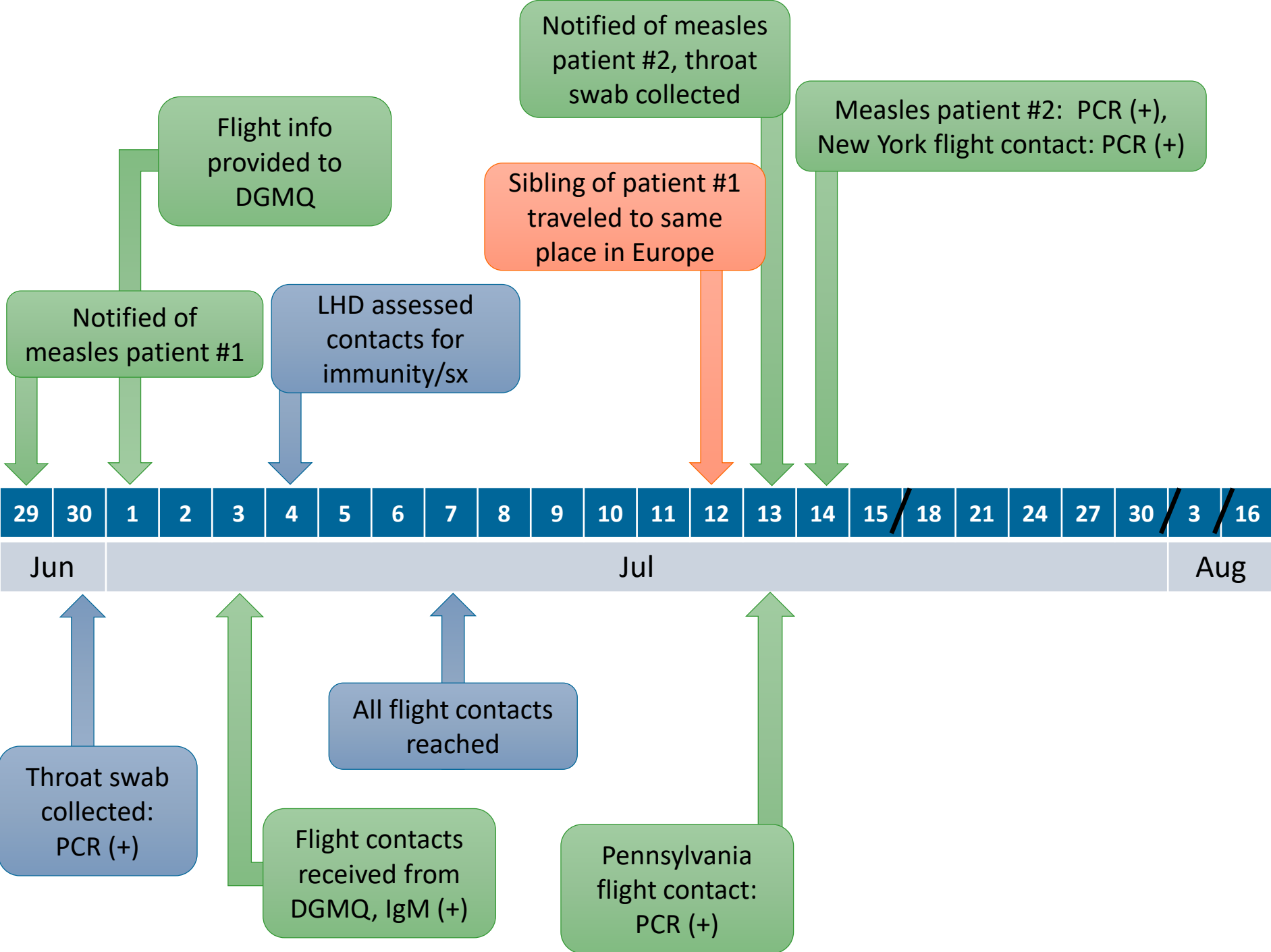
Flight contacts received from DGMQ, IgM (+)

All flight contacts reached

Pennsylvania flight contact: PCR (+)

# Measles #2 - Notification

- Flight contact to 1<sup>st</sup> measles patient
- Vaccinated with autoimmune disorder
- Had oral surgery performed 7/7
- Fever
- Koplick spots
- Rash (neck behind ear, progressed to thighs and chest)



Flight info provided to DGMQ

Notified of measles patient #1

LHD assessed contacts for immunity/sx

Sibling of patient #1 traveled to same place in Europe

Notified of measles patient #2, throat swab collected

Measles patient #2: PCR (+), New York flight contact: PCR (+)

29 30 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 / 18 21 24 27 30 / 3 / 16

Jun Jul Aug

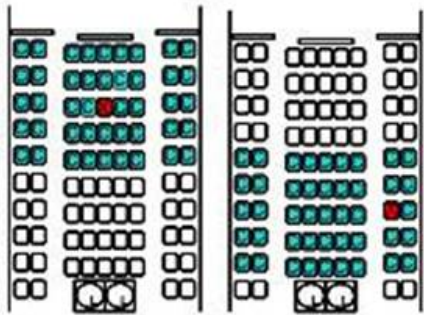
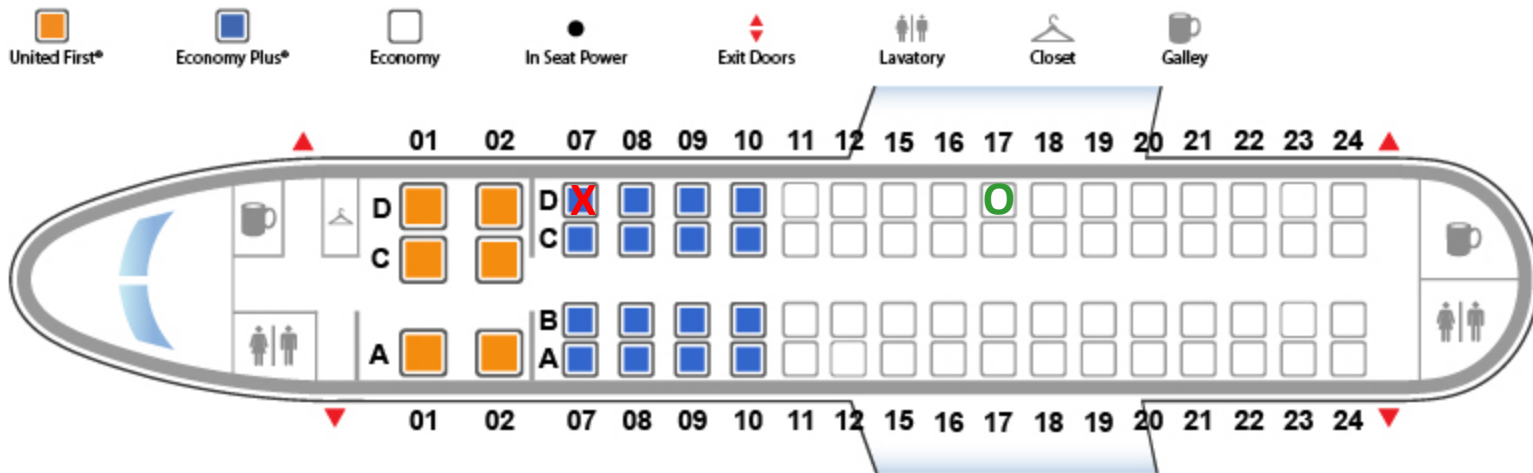
Throat swab collected: PCR (+)

Flight contacts received from DGMQ, IgM (+)

All flight contacts reached

Pennsylvania flight contact: PCR (+)

# Flight Exposure of Measles #2

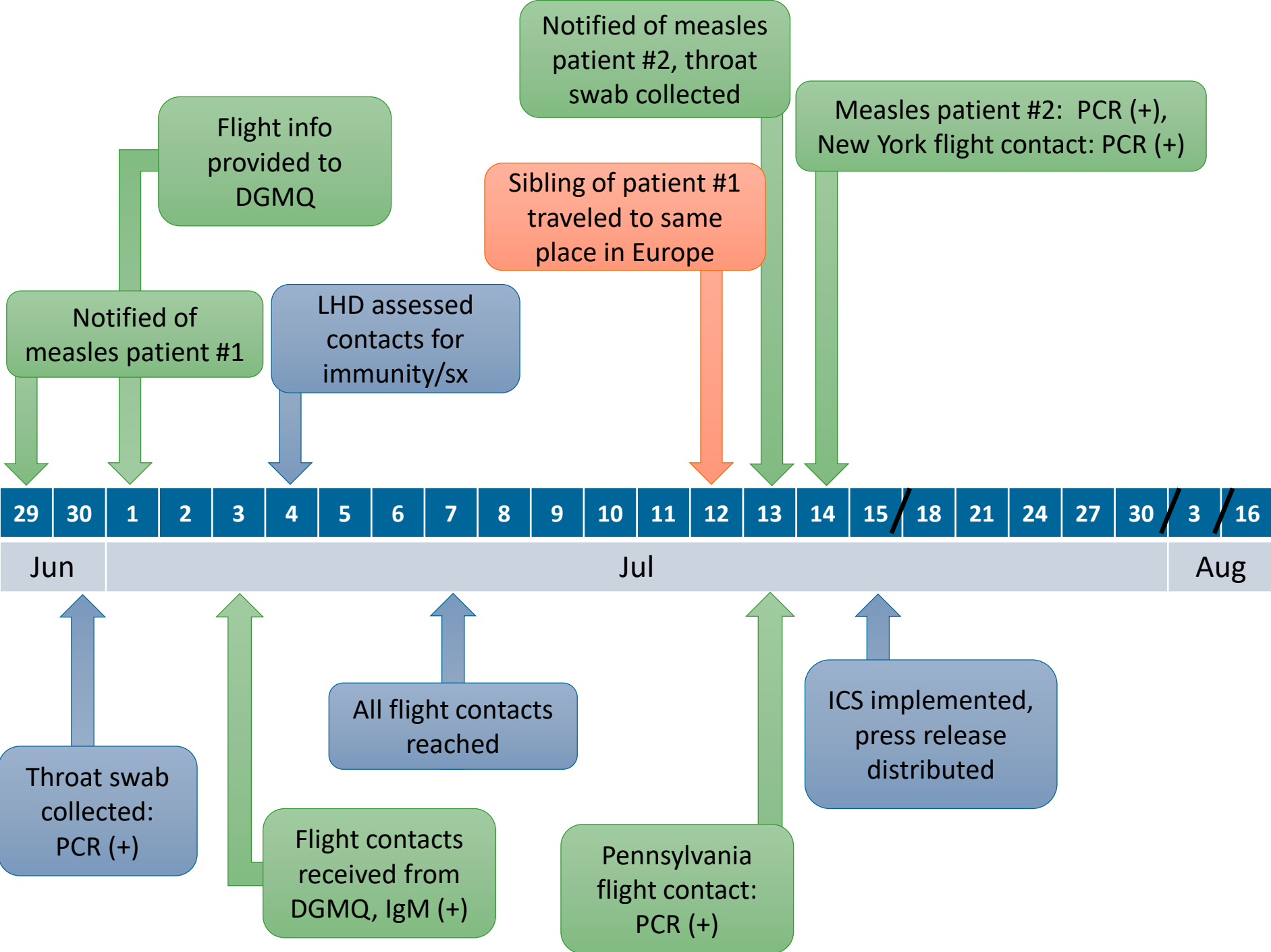




# Measles #2 - Investigation

- Lamar's Donuts
- Pathway Church
- Walmart
- Kwik Shop
- Jason's Deli
- Jiffy Lube
- Academy Sports
- Michael's
- Family Video
- Moxley and Wagle Periodontics
- Vermillion Elementary



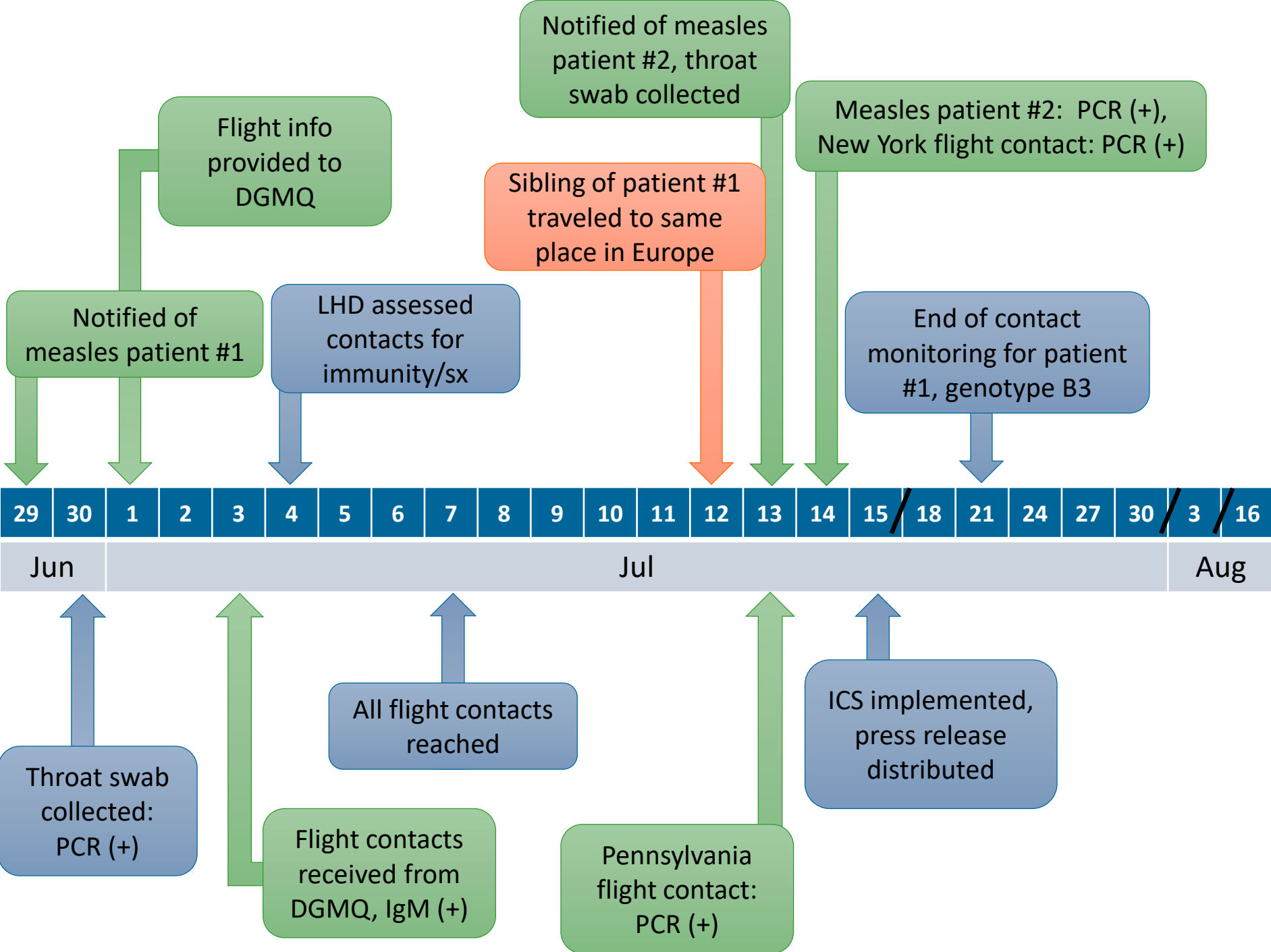


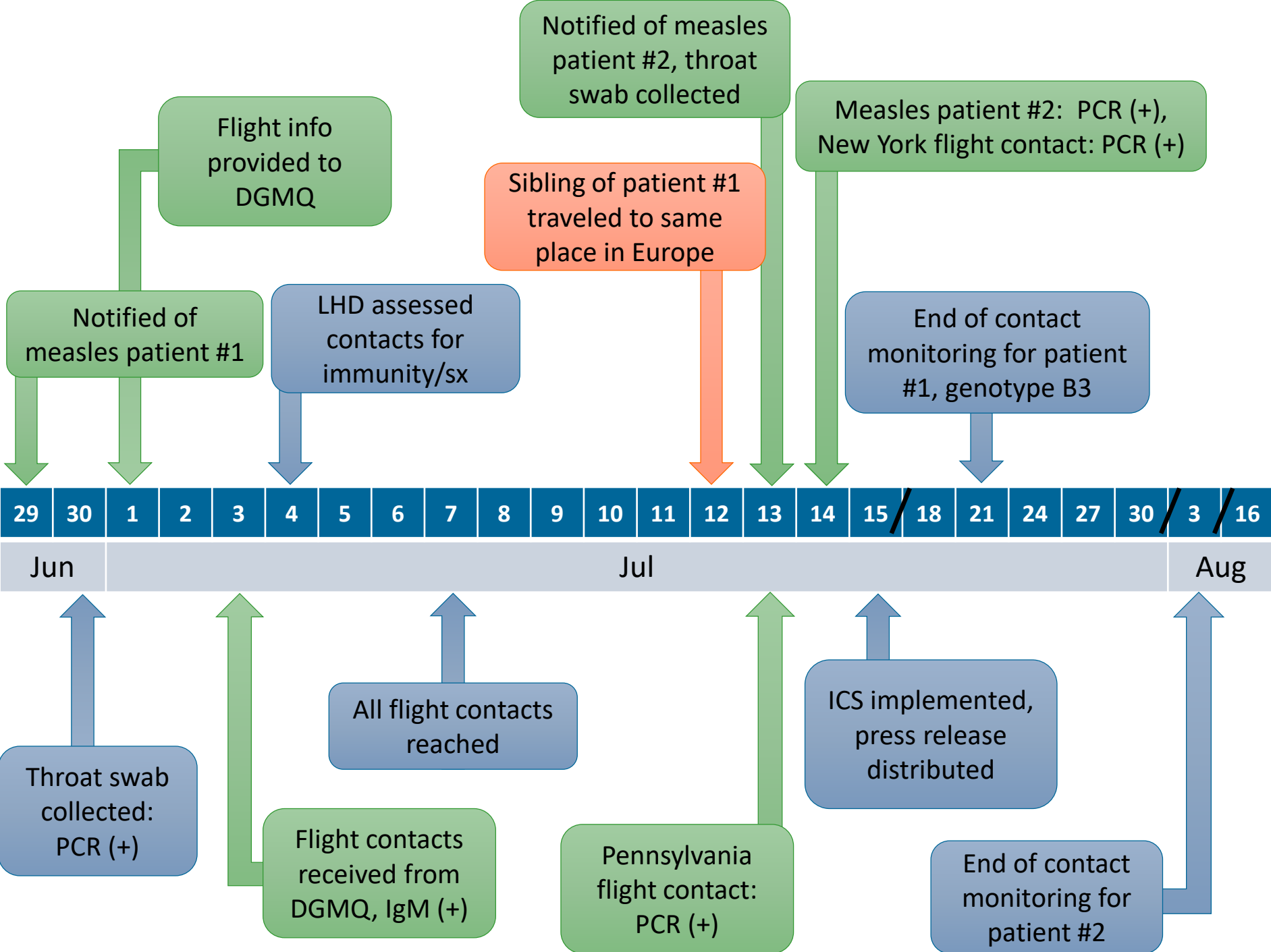
# Goals of Incident Command Structure

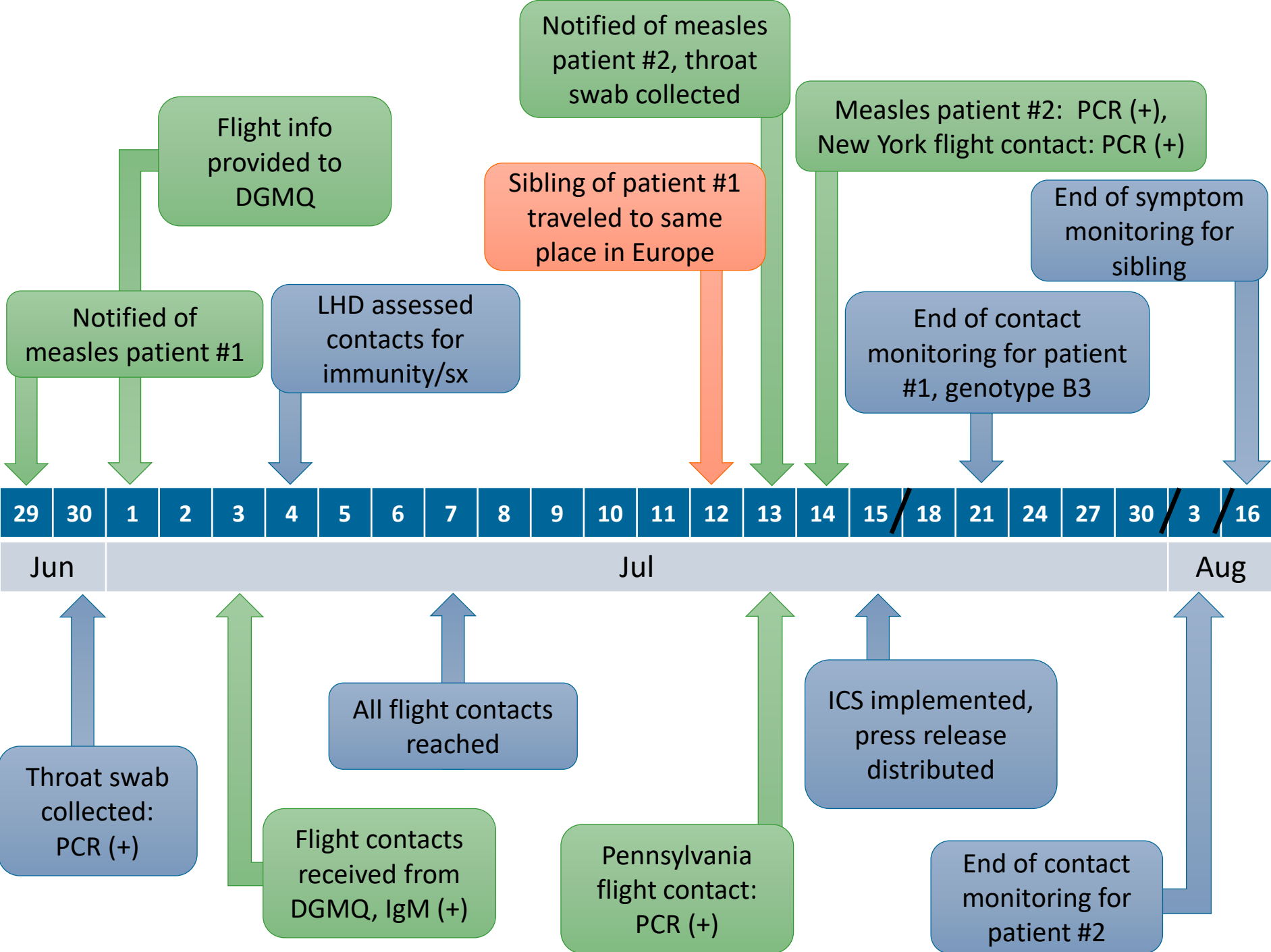
- Create and maintain surge capacity
- Provide consistent prevention recommendations
  - Susceptible
    - Out of 72 hour time frame for MMR for most
    - Recommended to get IG, but consult with PCP
    - Mandatory quarantine vs voluntary quarantine
  - Immune
    - Monitor for symptoms for 21 days

# Measles #2 – ICS

- Received ~900 calls in July
  - On average, receive <200 calls/month
- >400 persons considered potentially exposed
  - 19 recommended IG → 7 received
  - 10 tested for measles → all negative
- Concluded on 7/17







# Measles #1 – Summary

- Unvaccinated child traveled to Europe
- Exposed 55 persons in Kansas
  - 9 family → 3 unvaccinated received MMR
  - 18 hospital → 1 staff in quarantine
  - 28 flight → all immune
- 3 exposed flight contacts developed measles
  - Kansas
  - Pennsylvania
  - New York
- Vaccinated sibling traveled to Europe
  - Did not develop measles



# Measles #2 – Summary

- Vaccinated, autoimmune disorder exposed on flight
  - 10 rows away
- ICS implemented
- Exposed >400 persons in Sedgwick County
  - 19 recommended IG → 7 received
- 0 developed measles

# Questions



# The Lumps and Bumps of Mumps

Kansas 2017

Chelsea Raybern, MPH

Senior Epidemiologist

Bureau of Epidemiology and Public Health Informatics

# Mumps

- Transmission: droplet, direct and indirect contact
  - Coughing, sneezing, talking, sharing utensils
  - Contagious 2 days before until 5 days after parotitis onset
- Complications:
  - Testicular inflammation
  - Ovarian inflammation
  - Meningitis
  - Encephalitis
  - Deafness



# Signs and Symptoms

- Prodrome: fever, headache, muscle aches, fatigue, loss of appetite
- Parotitis (swelling of salivary glands)
  - Develops several days after prodrome
  - Unilateral or bilateral



# December 2016 – July 2017

- 168 cases in 27 counties

# Characteristics of Mumps Cases

Gender	# of Cases	% of Cases
Female	73	43%
Male	95	57%

# Characteristics of Mumps Cases

Gender	# of Cases	% of Cases
Female	73	43%
Male	95	57%
Symptoms/Complications		
Parotitis	165	98%
Fever	74	44%
Meningitis	1	0.6%
Orchitis	13	8%



# Characteristics of Mumps Cases

Gender	# of Cases	% of Cases
Female	73	43%
Male	95	57%
Symptoms/Complications		
Parotitis	165	98%
Fever	74	44%
Meningitis	1	0.6%
Orchitis	13	8%
Vaccination Status		
Vaccinated	143	85%
2 doses	(89)	(62%)
1 dose	(10)	(7%)
No documented doses	(44)	(31%)
Not Vaccinated	9	5%
Unknown	16	10%

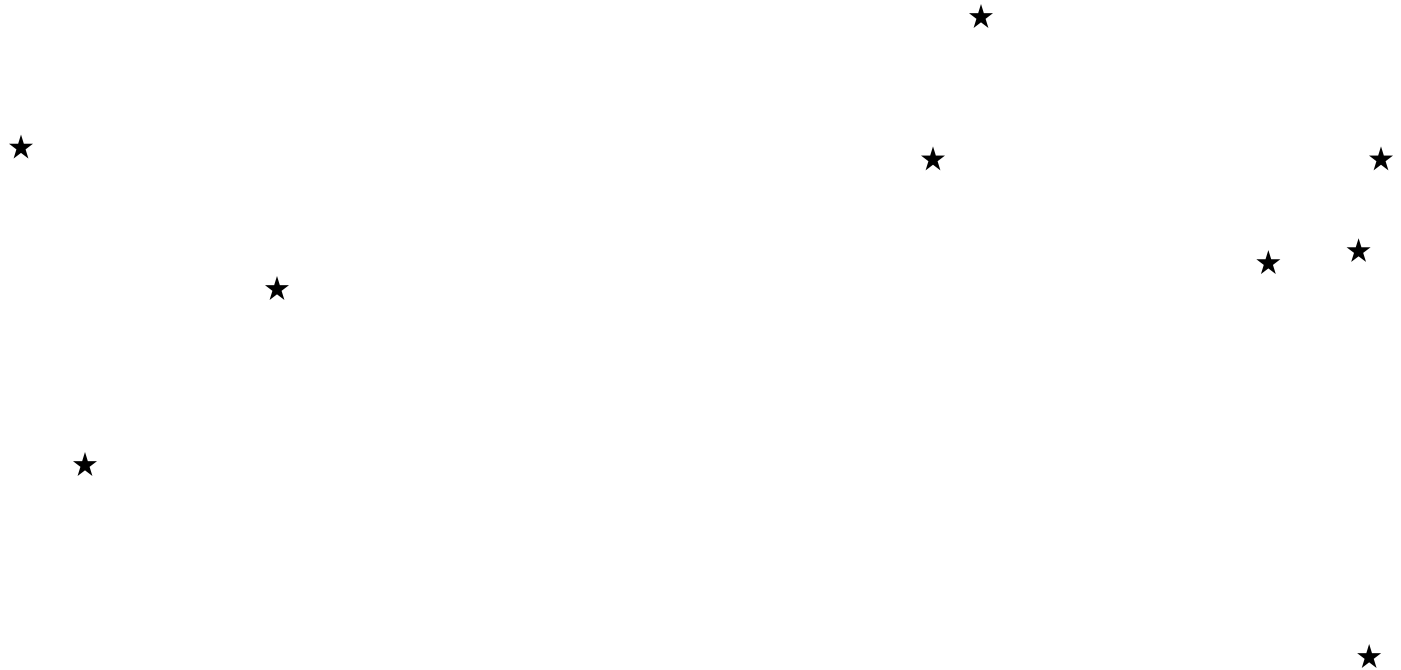
# Test Results

- 430 specimens for mumps testing at KHEL
  - 82 (19%) PCR positive
  - 25 forwarded to CDC → genotype G
- 155 specimens for RP testing at KHEL
  - 43 (28%) PCR positive
    - 21 influenza A
    - 14 rhinovirus/enterovirus
    - 7 coronavirus
    - 1 influenza B
- 4 co-infections

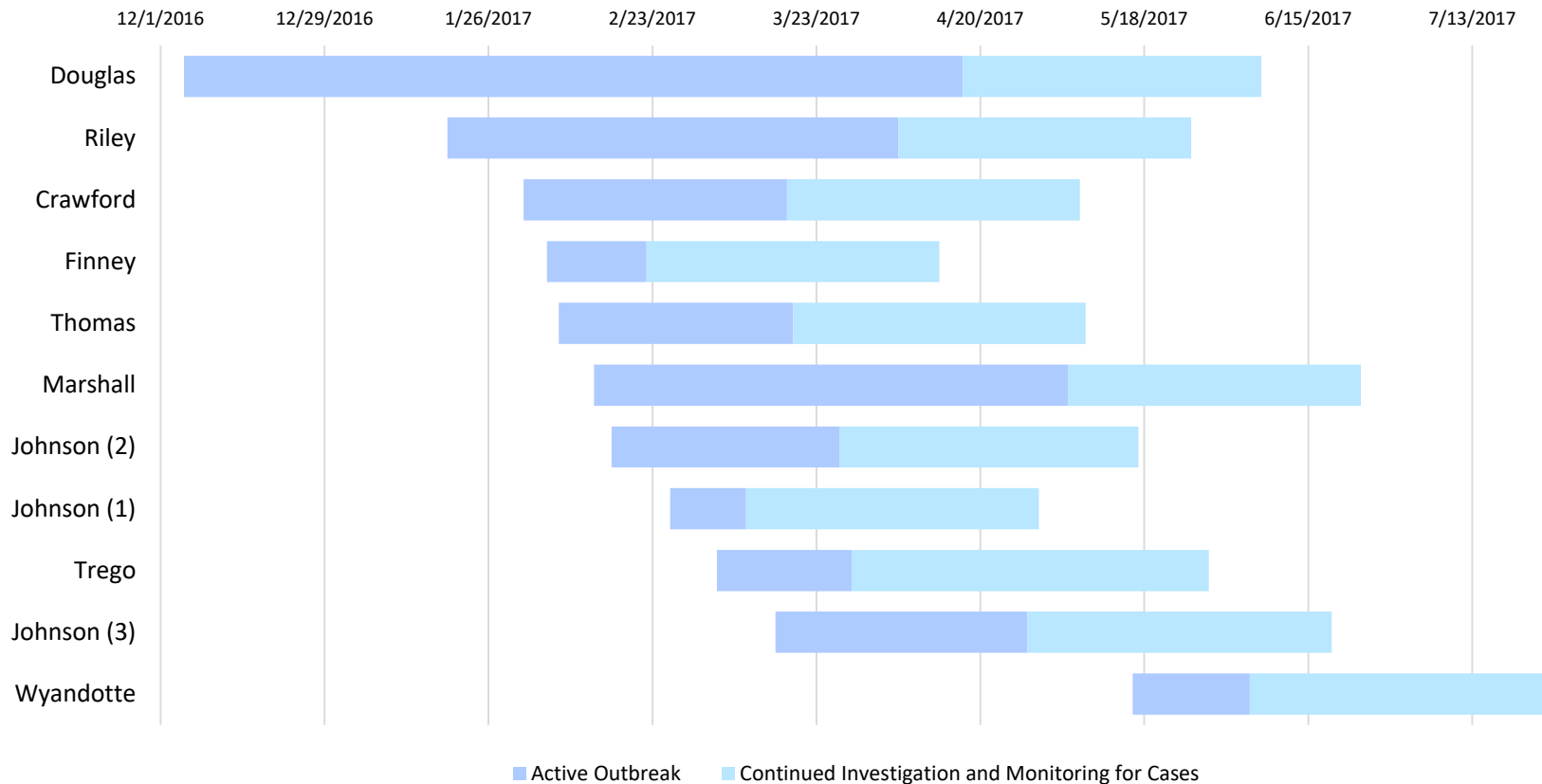


# Mumps Outbreaks

- 133 (79%) associated with an outbreak



# Timeline of Outbreak Investigations



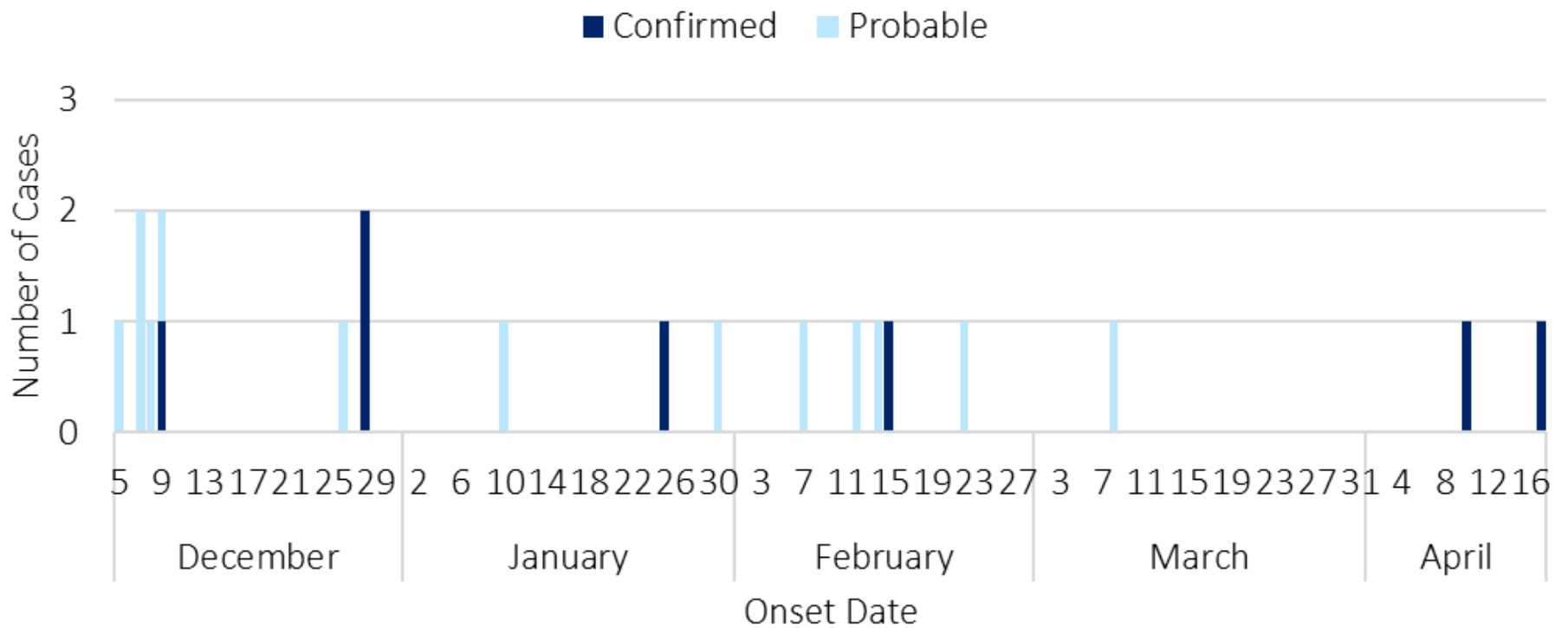
# KU Outbreak – December 12, 2016

- 20 cases
  - 16 students
  - 3 staff
  - 1 contact to student
- 10 (50%) male
- 18 (90%) fully immunized
- Parotitis duration: 2 – 6 days
- 2 complications (1 hospitalization)
  - Orchitis
  - Meningitis



# KU Outbreak

Number of Cases by Onset Date (n=20)



# KU Outbreak

## After-Action Meeting

- Strengths
  - Communication
  - Existing vaccination policy
- Weaknesses
  - Educating healthcare providers
  - Specimen collection

# KSU Outbreak – February 20, 2017

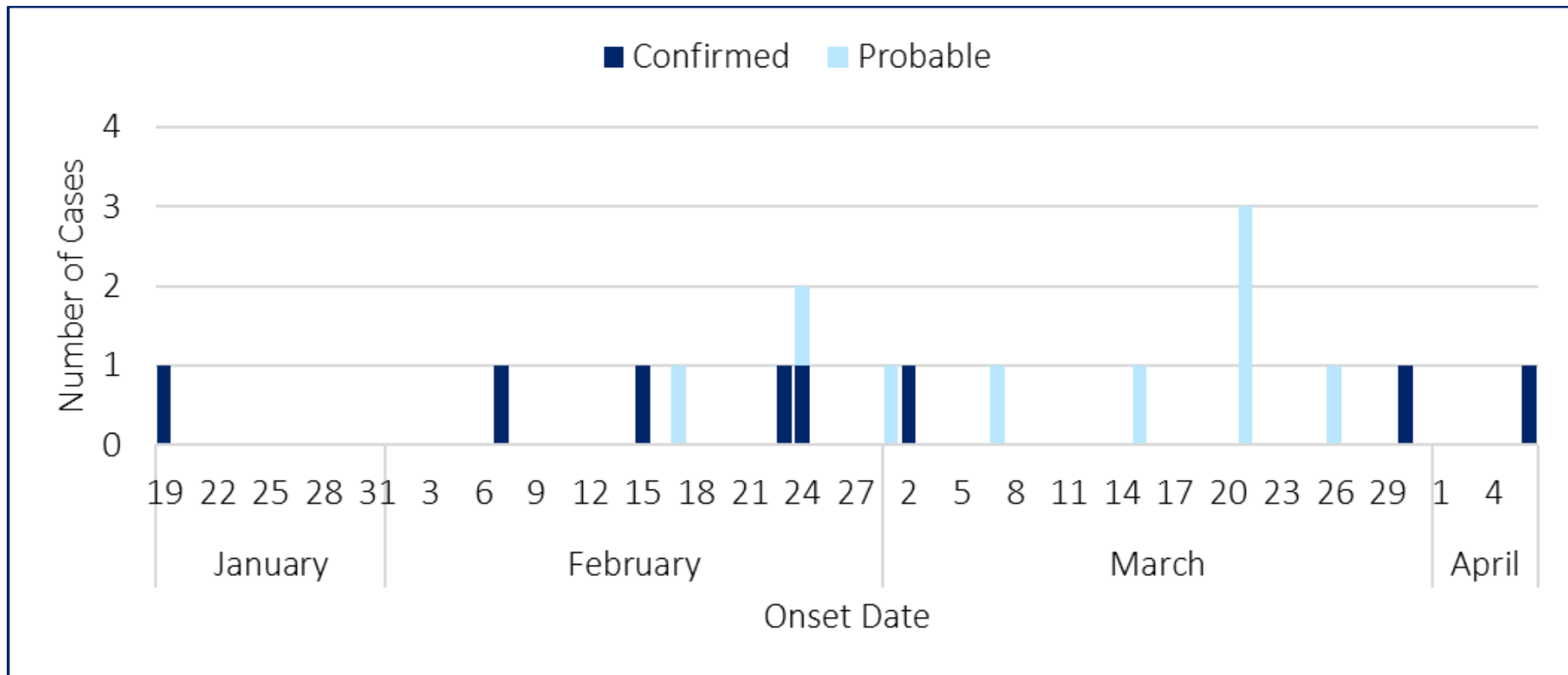
- 17 cases
  - 13 students
  - 2 staff
  - 2 contacts to student
- 8 (52%) male
- 17 (100%) fully immunized
- Parotitis duration: 3 – 7 days
- No complications or hospitalizations





# KSU Outbreak

Number of Cases by Onset Date (n=17)



# KSU Outbreak

## 3<sup>rd</sup> MMR Dose Recommendation

- 3 vaccination clinics
  - April 7
  - April 11
  - April 12
  
- 415 total MMR doses administered

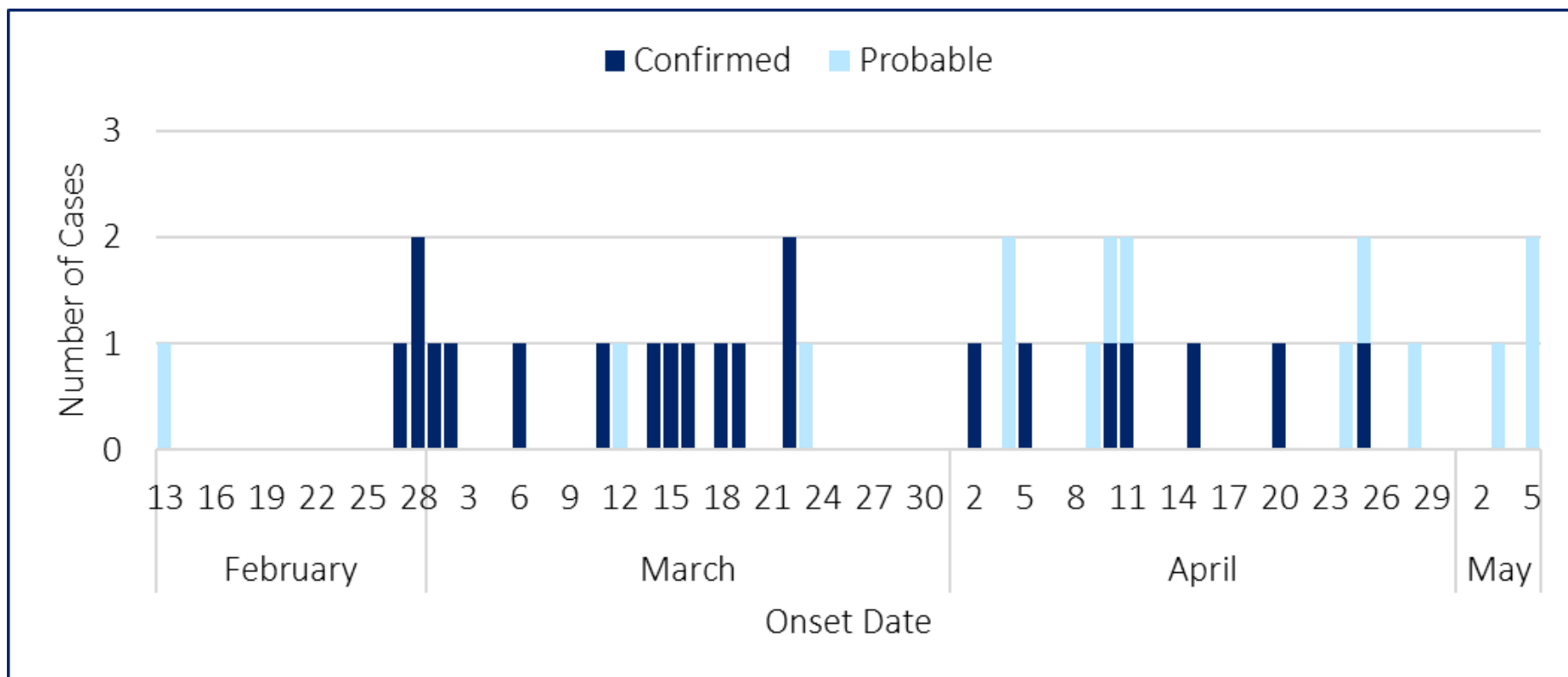
# Marshall County High School Outbreak – March 2, 2017

- 35 cases
  - 20 students
  - 3 staff
  - 12 contacts to student
- 20 (57%) male
- 25 (71%) fully immunized
- Parotitis duration: 2 – 8 days
- 2 complications (no hospitalizations)
  - Orchitis



# Marshall County High School Outbreak

## Number of Cases by Onset Date (n=35)



# Marshall County High School Outbreak

## 3<sup>rd</sup> MMR Dose Recommendation

- 3 vaccination clinics
  - May 1
  - May 8
  - May 10
  
- 197 total MMR doses administered

# Questions





[www.kdheks.gov](http://www.kdheks.gov)

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Healthy Kansans living in safe and sustainable environments.

# Outbreak of Shiga Toxin- Producing *E. coli* O157:H7 Associated with a Cider Festival — Kansas, 2016

Lindsey Martin Webb, MPH

Advanced Epidemiologist

Bureau of Epidemiology and Public Health Informatics



# It's always a Friday...

- Friday, October 21, 2016 at 4:56 pm KDHE received a call
- 6 persons with Shiga toxin-producing *Escherichia coli* (STEC) O157:H7 with indistinguishable pulsed-field gel electrophoresis (PFGE)

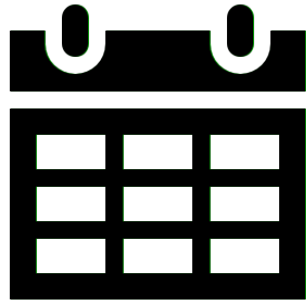
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10/21

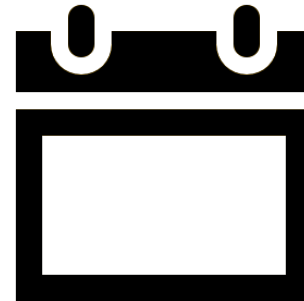
Cluster  
Notification

# Shiga toxin-producing *E. coli* (STEC)

Incubation  
1 to 10 days



Duration  
5 to 10 days



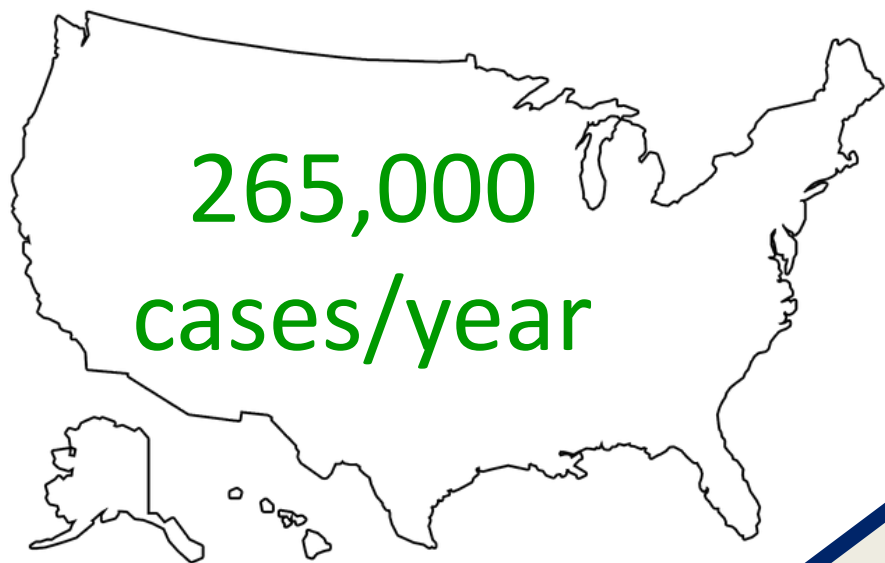
Diarrhea  
Bloody Stool  
Abdominal Pain



Hemolytic  
Uremic  
Syndrome  
(HUS)



# STEC



# STEC

- Common sources
  - Contaminated sprouts
  - Raw/undercooked ground beef
  - Animals (cattle, sheep, goats)
- Recent outbreaks
  - Soynut butter
  - Flour
  - Sprouts

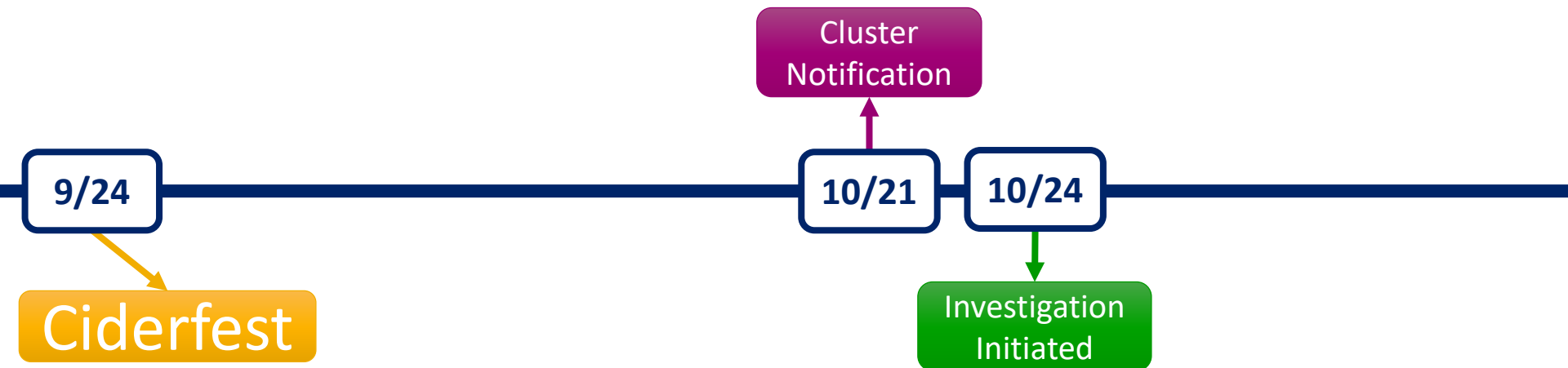


# STEC Outbreak Identification

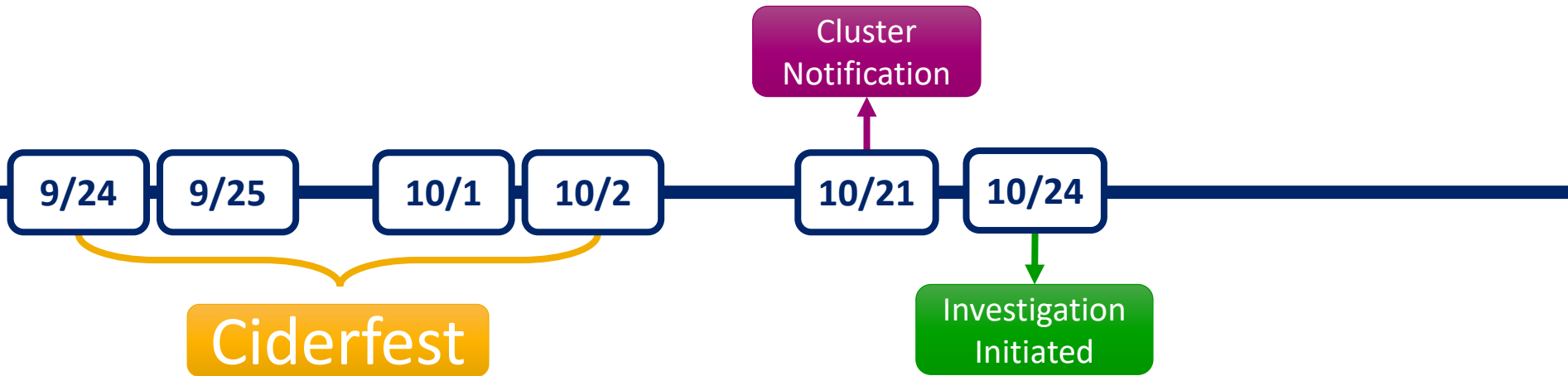
- Epidemiology: increase in the number of cases in a geographic area in a period of time, or identification of common exposures through case interviews
- PFGE: pulsed-field gel electrophoresis (DNA fingerprint)

# Investigation Initiation

- 5 of 6 persons attended Ciderfest at Louisburg Cider Mill in Louisburg, KS on September 24, 2016
- Outbreak investigation initiated October 24, 2016



# Ciderfest



# Ciderfest

## Pumpkin Patch & Corn Maze

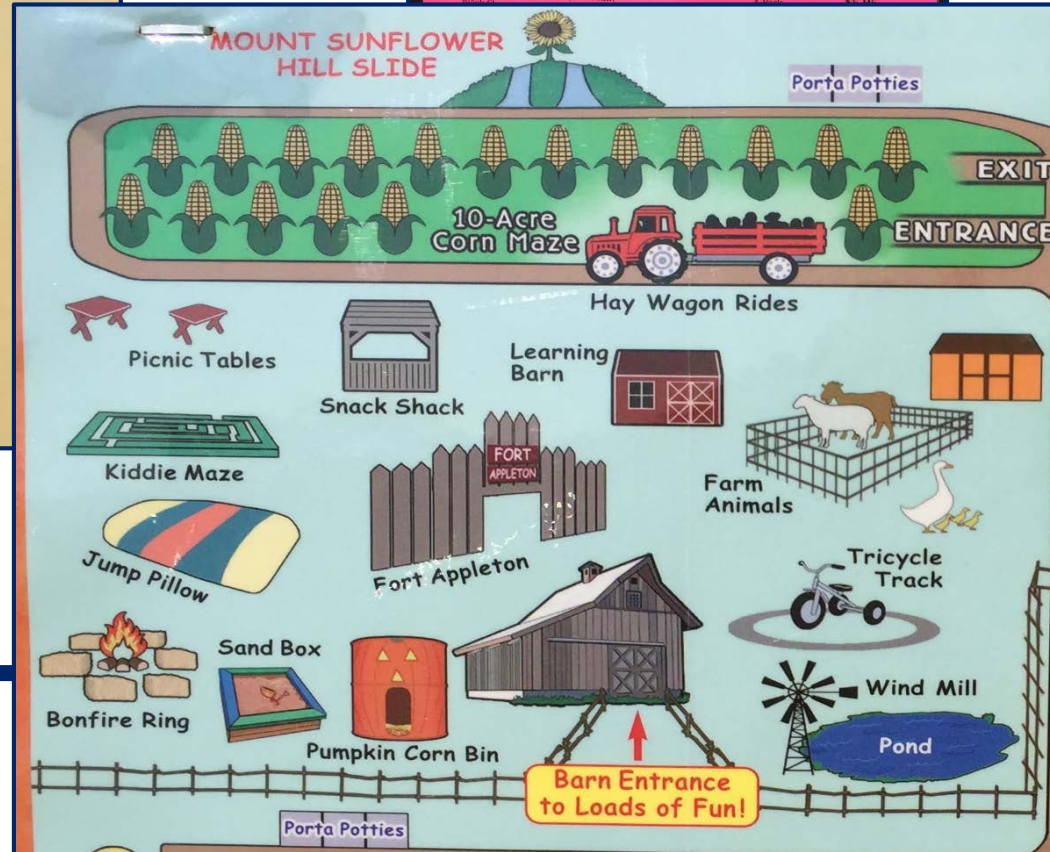
Admission \$9 (tax included)

3 yrs old and under FREE

**Admission includes:**

- 10 Acre Ghost of the Corn Maze
- Access to the Pumpkin Patch
- Wagon Rides
- Hill Slide
- Pallet Maze
- Play Areas
- Trike Track
- Farm Animals
- Corn Bin

MENU	
Cider Drinks-One Size Hot, Cold or Slush	\$2.25
Apple Sippers-Cold Cider Only	\$3.75
Lost Trail Soda- Root Beer, Diet Root Beer Cream Soda, Sarsaparilla Orange Cream, Strawberry & Cream	Single \$2.00 Large \$2.95



9/24

9/25

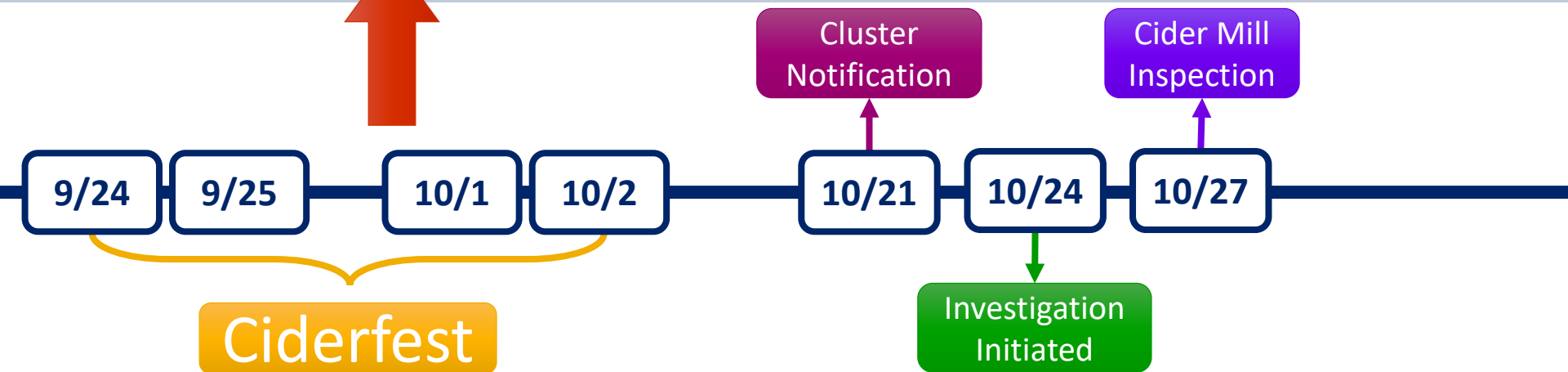
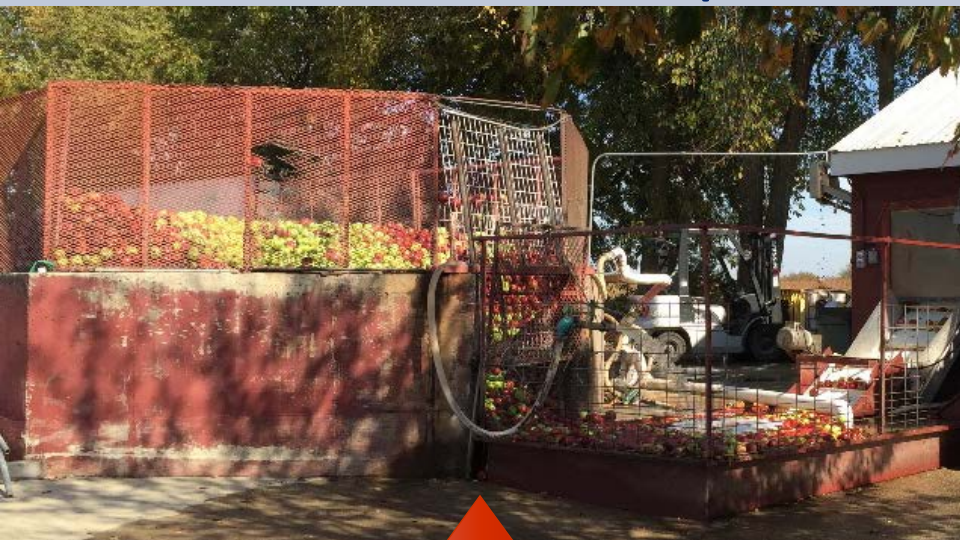
10/1

10/2

Ciderfest



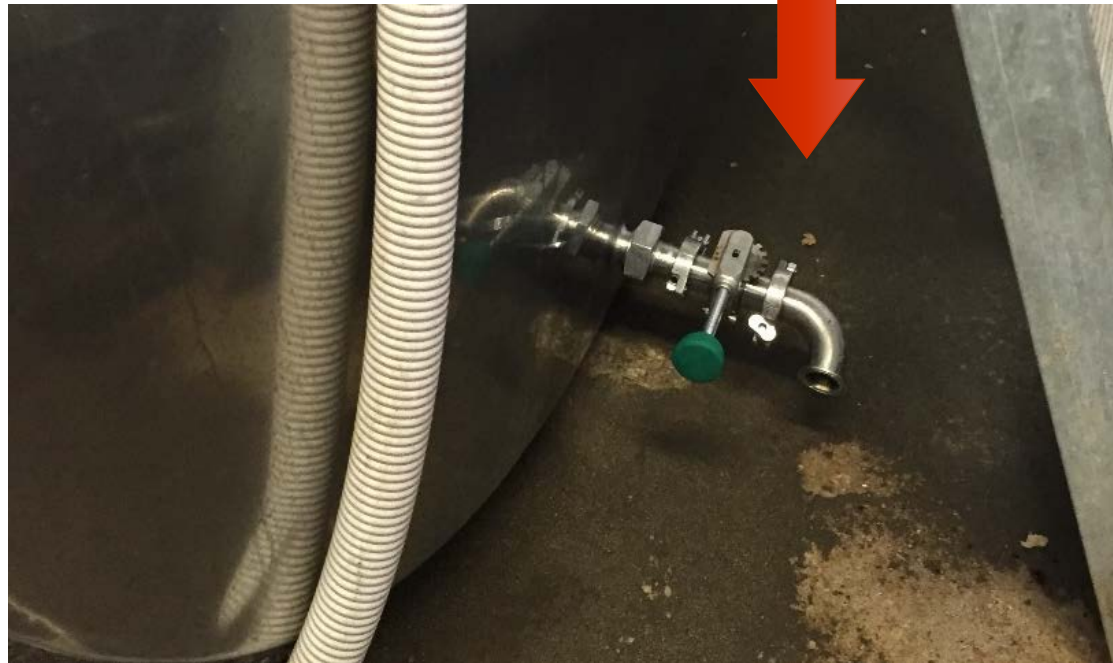
# Cider Mill Inspection



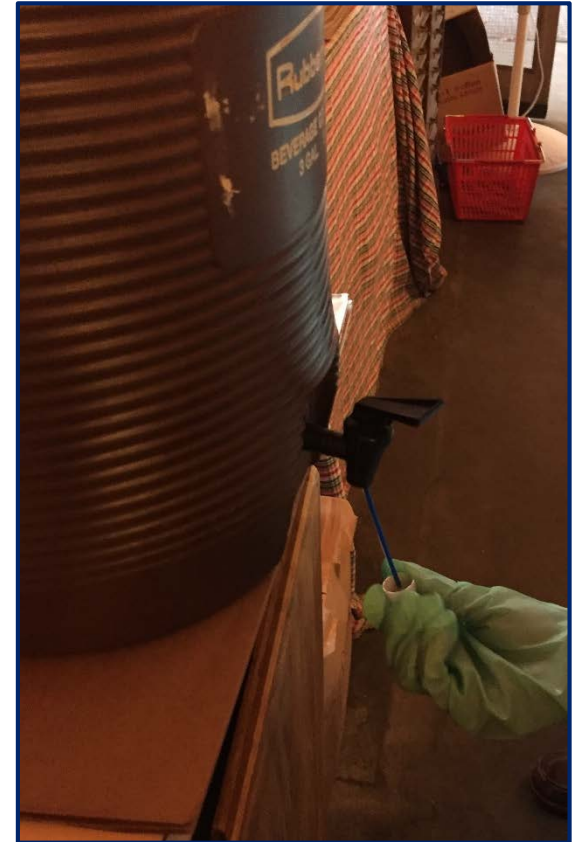
# Cider Mill Inspection



# Cider Mill Inspection



# Environmental Sampling Results



# Case finding

## Experts investigate E. coli cases linked to Louisburg Cider Mill Ciderfest

People who felt ill after attending event asked to call officials

KMBC NEWS | Updated: 9:23 PM CDT Nov 2, 2016

Archive for Wednesday, November 2, 2016

## State investigating E. coli outbreak connected to festival at Louisburg Cider Mill

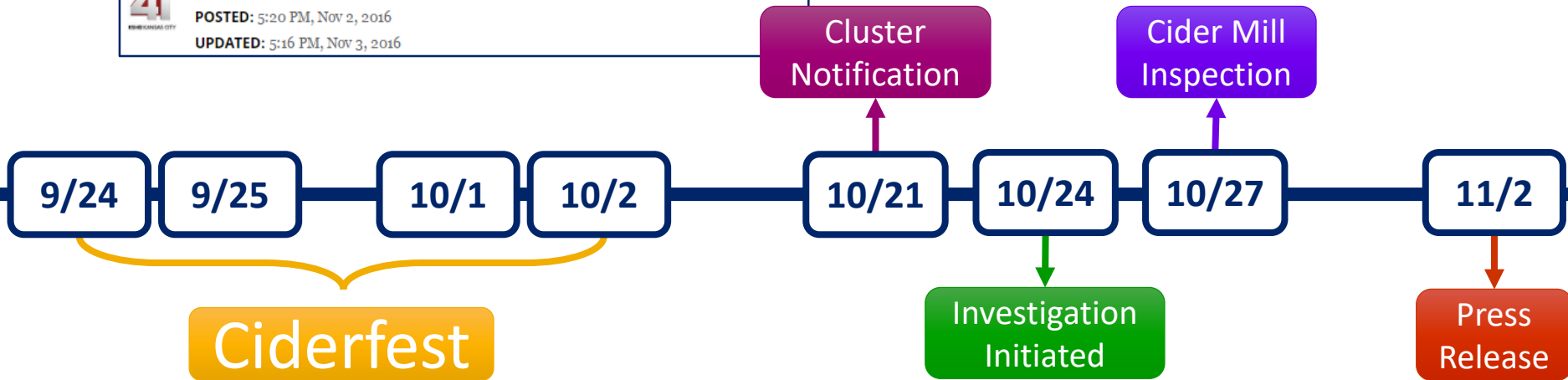
## Kansas Department of Health investigating E. coli outbreak at Louisburg Cider Mill Ciderfest



BY: 41 Action News Staff

POSTED: 5:20 PM, Nov 2, 2016

UPDATED: 5:16 PM, Nov 3, 2016



# Methods

- Case definition: diarrhea in a person beginning  $\geq 1$  day after attending Ciderfest and lasting  $\geq 2$  days
- Matched case-control study
  - Friend-and-family group controls
  - Interviewed with outbreak-specific questionnaire
- Calculated matched odds ratios and 95% confidence intervals
  - Conditional logistic regression with exact estimates

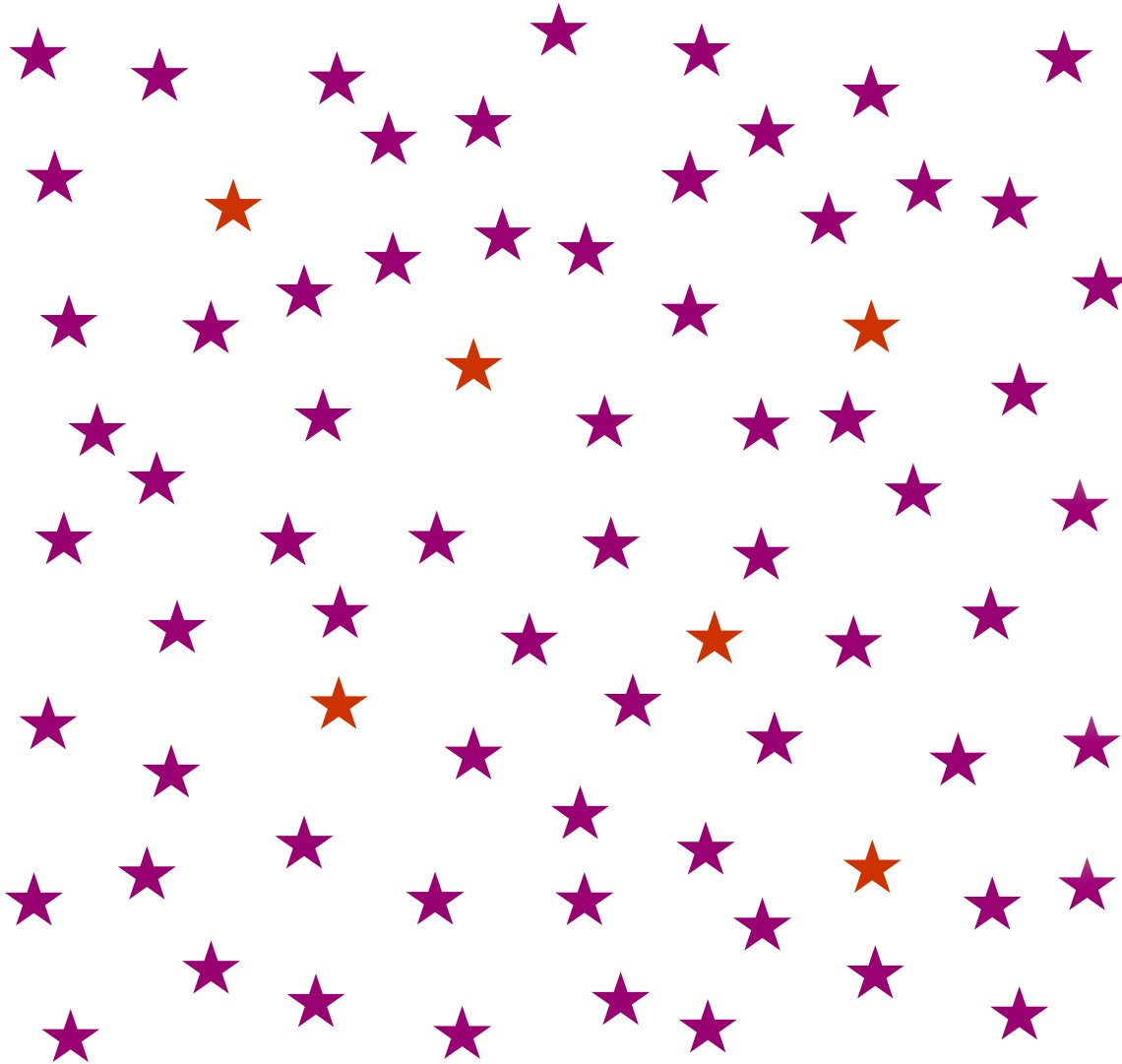
# Matched Case-Control Study

# Matched Case-Control Study

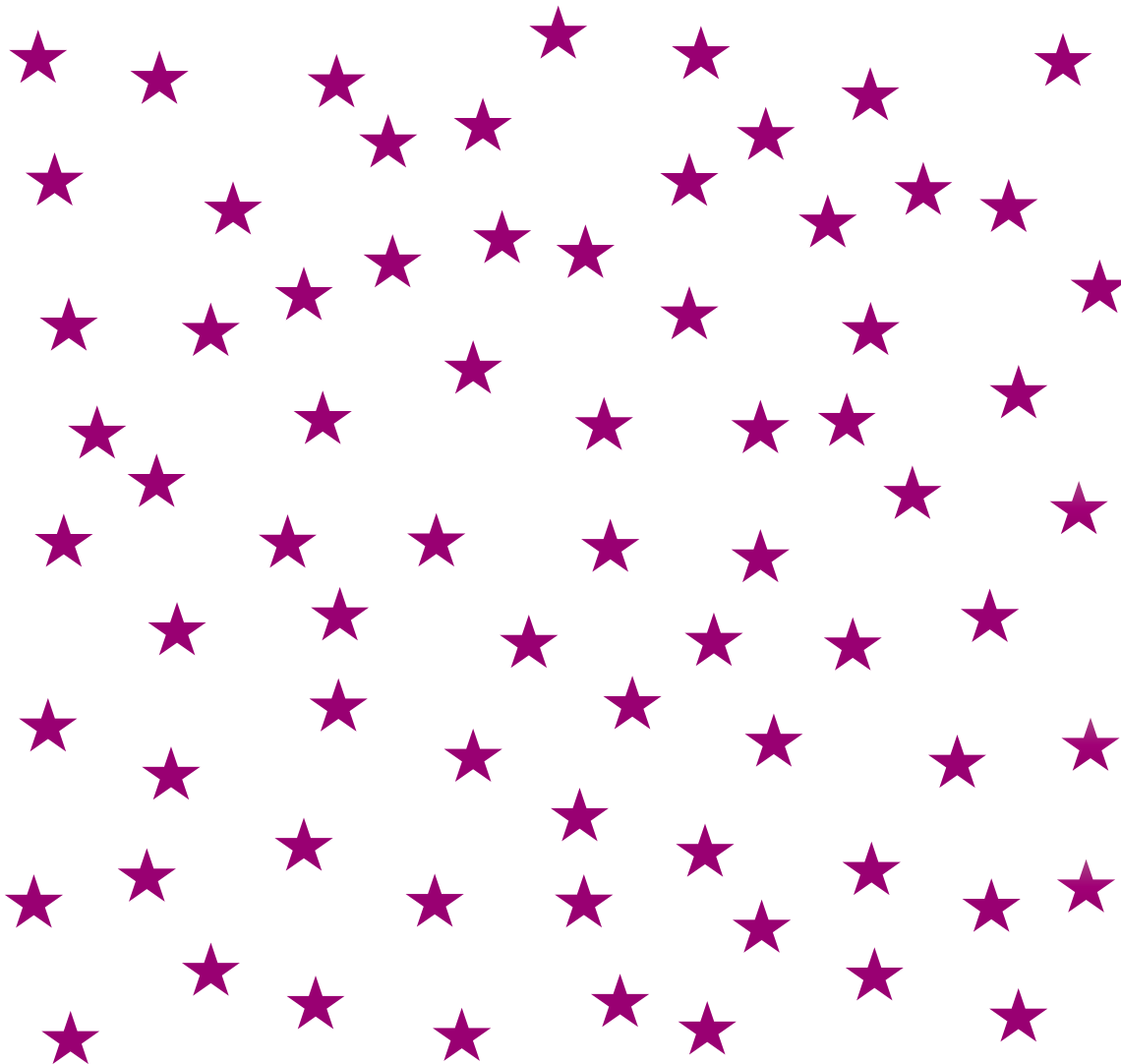




# Matched Case-Control Study

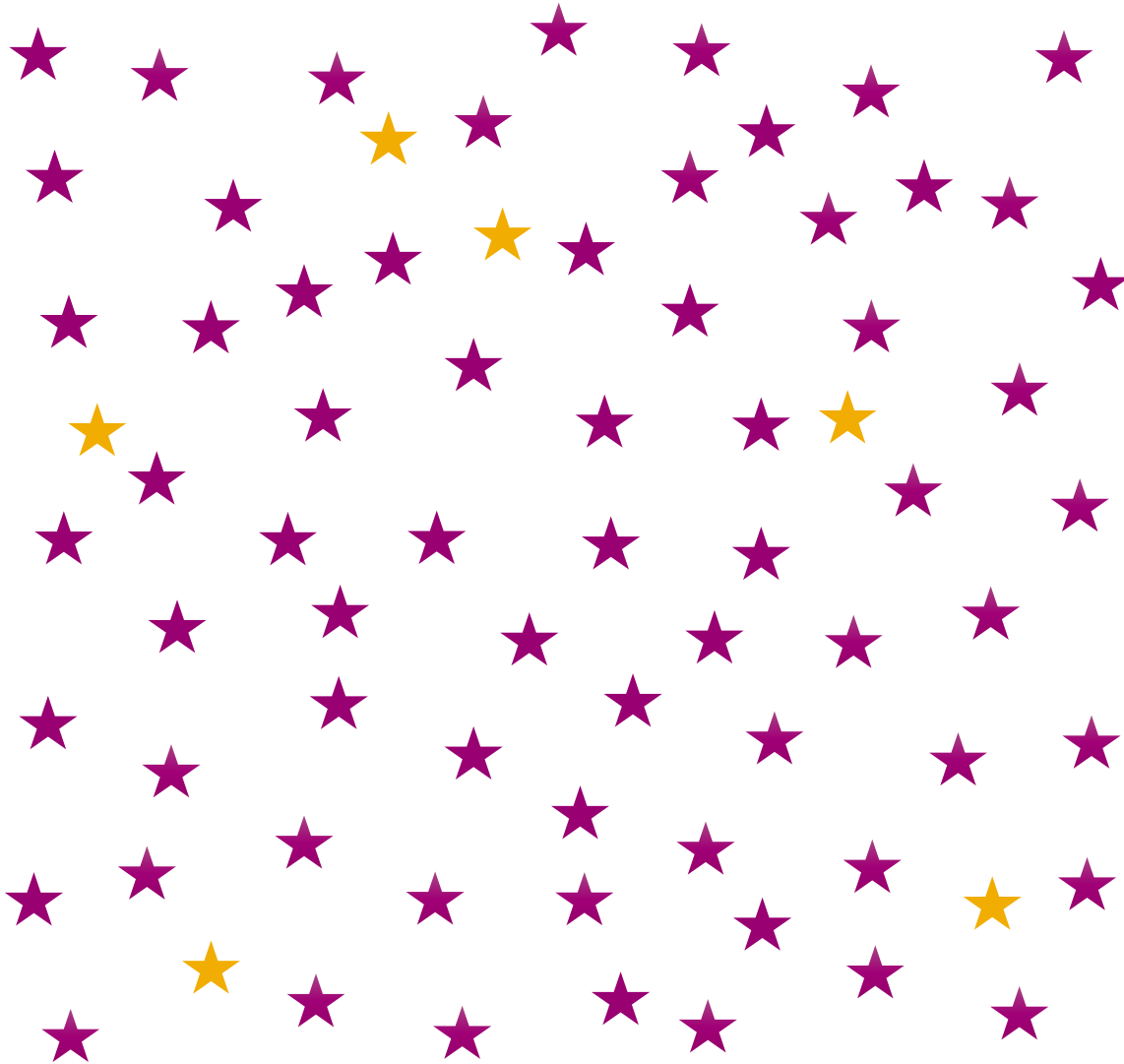


# Matched Case-Control Study



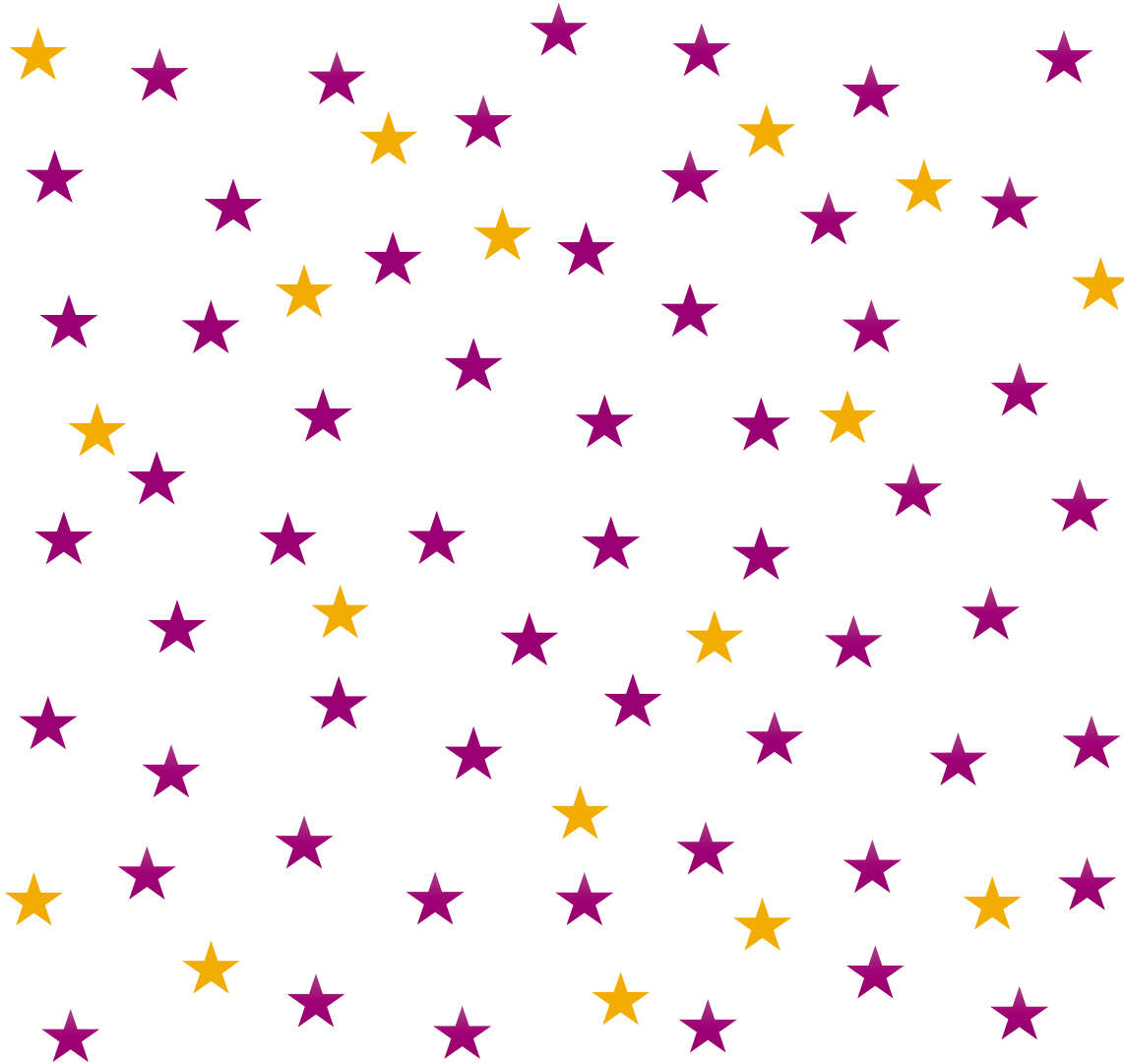
73  
persons  
reported  
illness

# Matched Case-Control Study



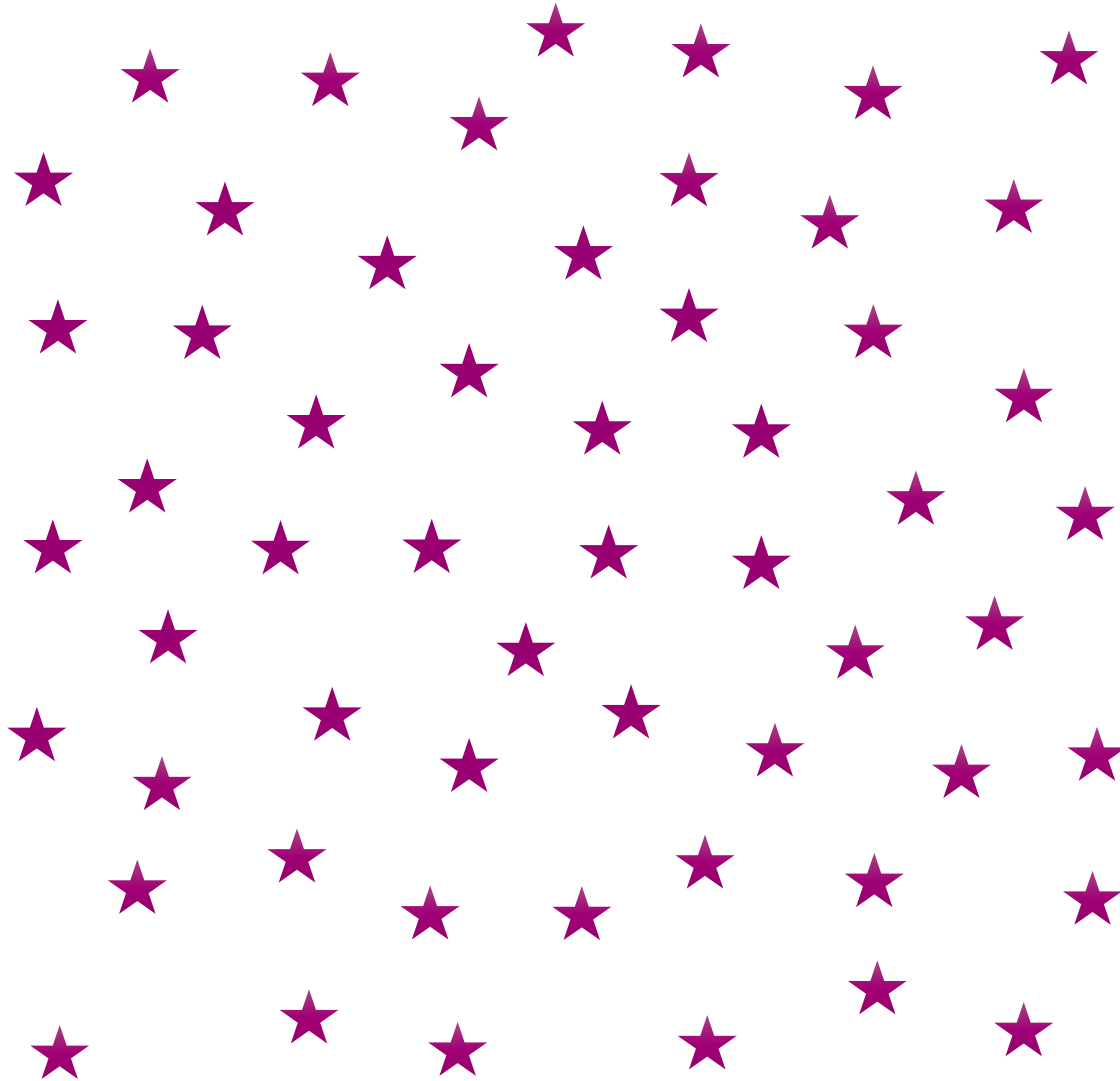
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# Matched Case-Control Study



73  
persons  
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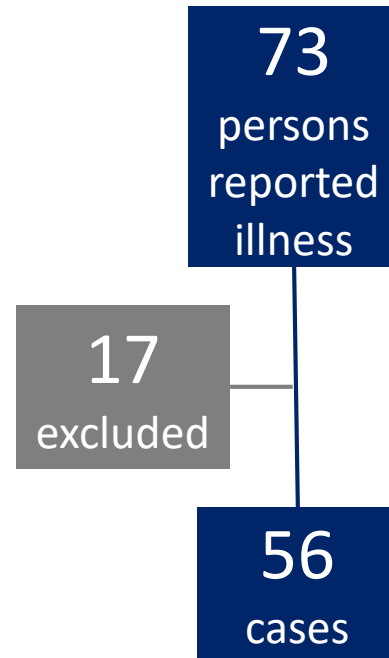
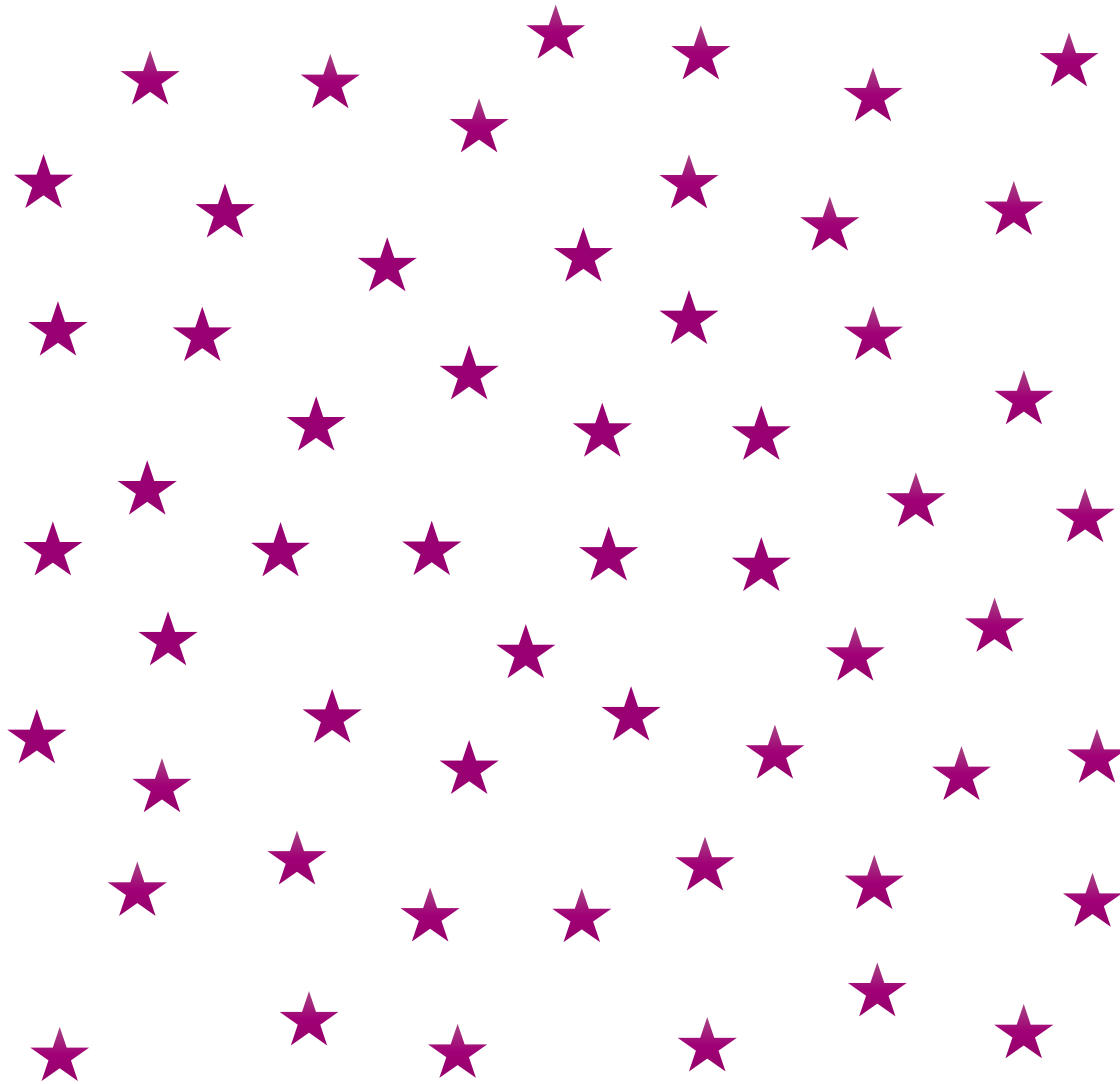
# Matched Case-Control Study



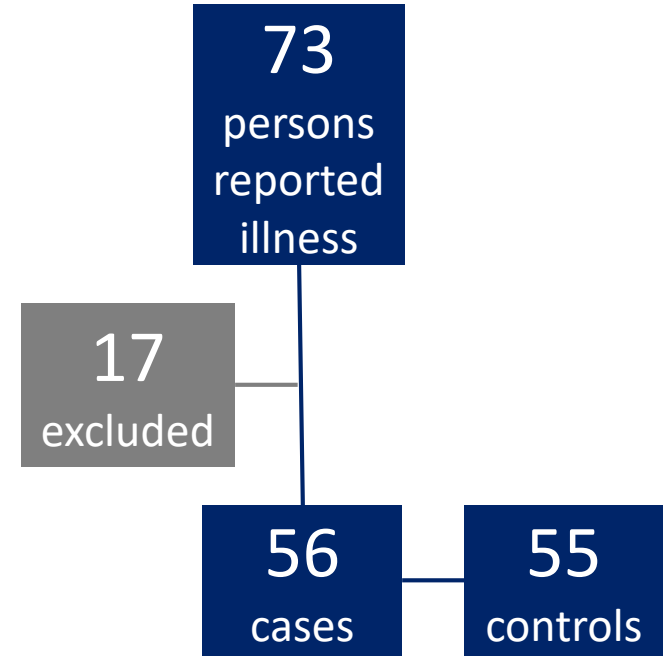
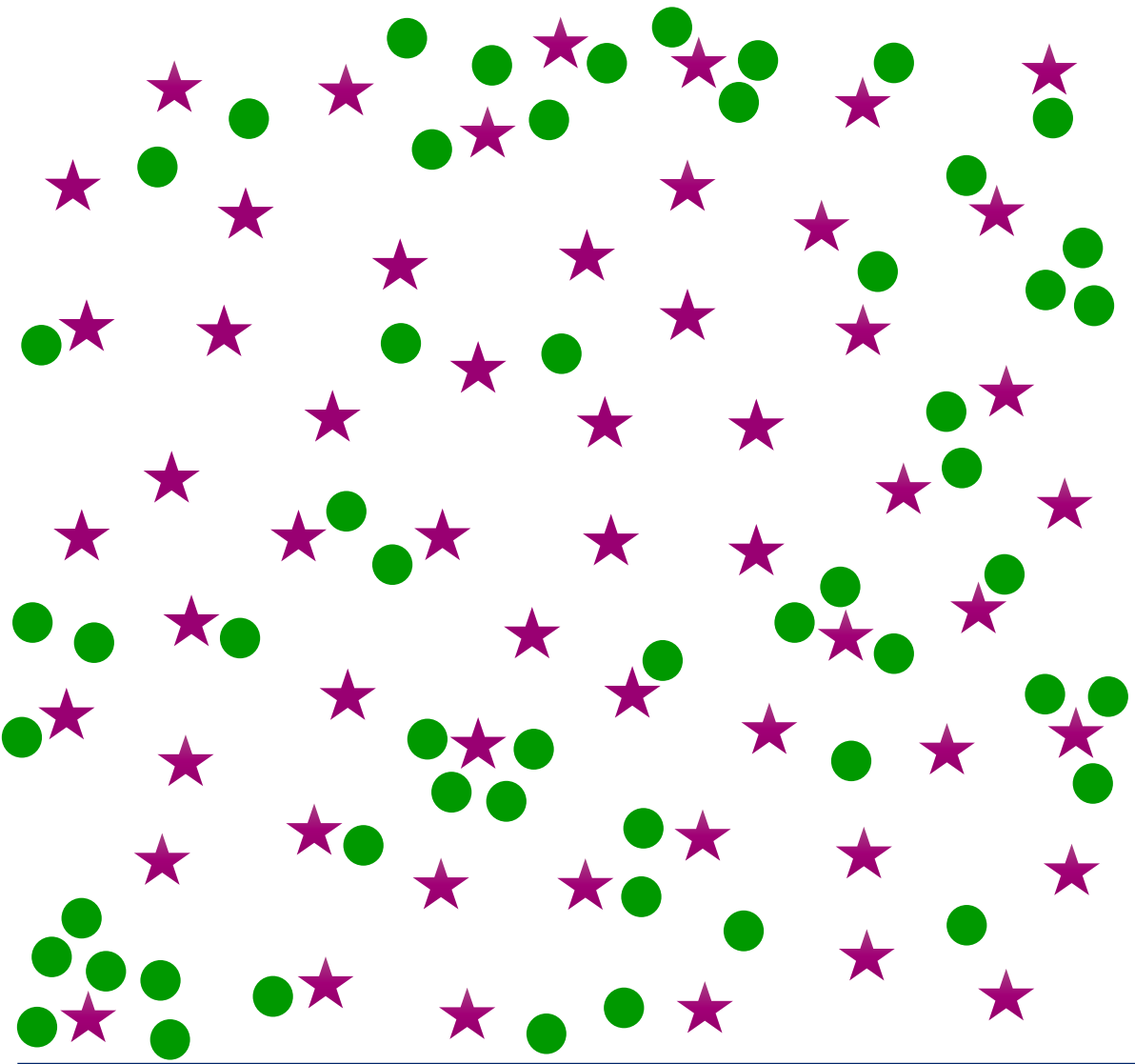
73  
persons  
reported  
illness

17  
excluded

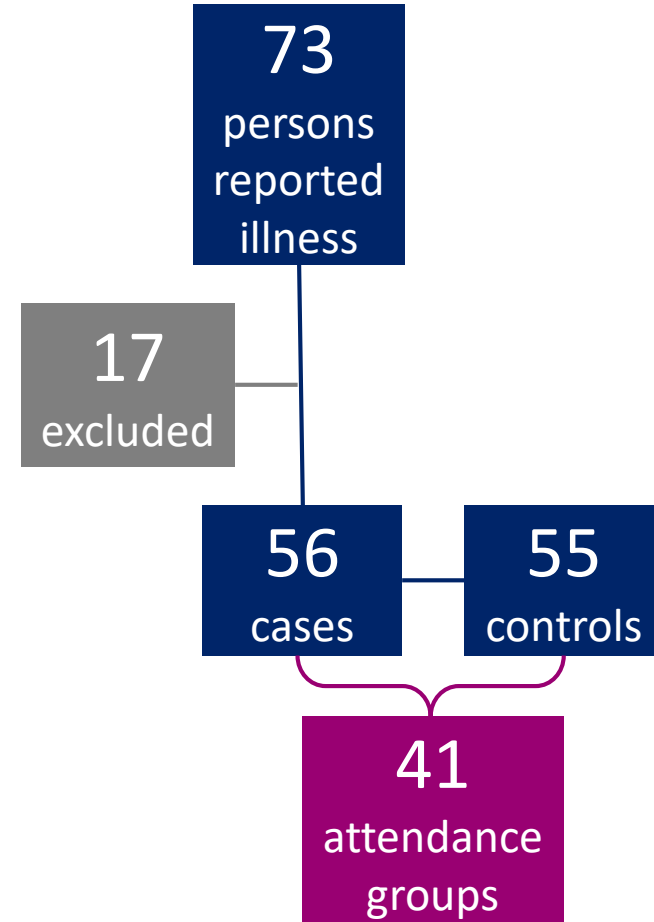
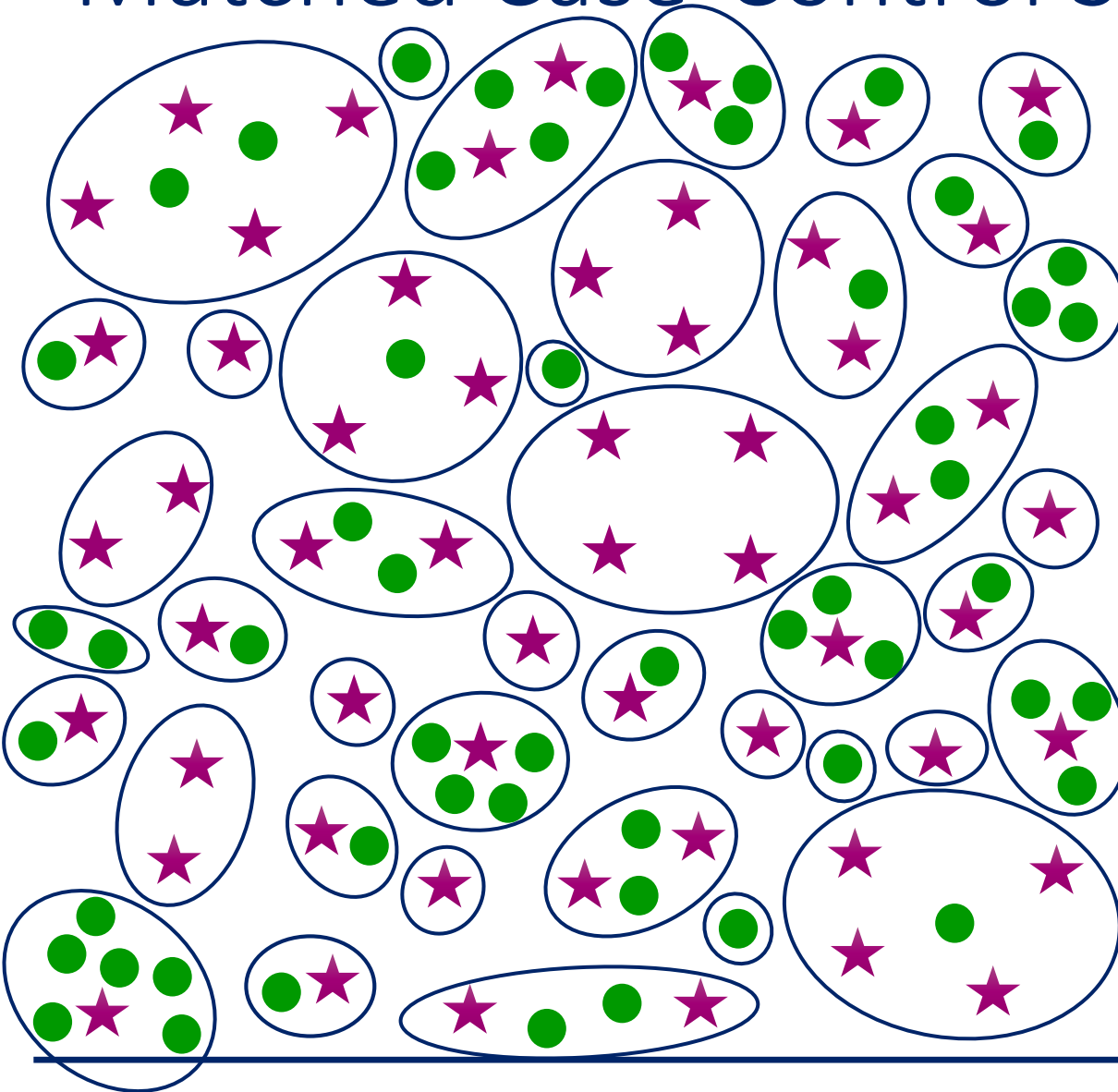
# Matched Case-Control Study



# Matched Case-Control Study



# Matched Case-Control Study

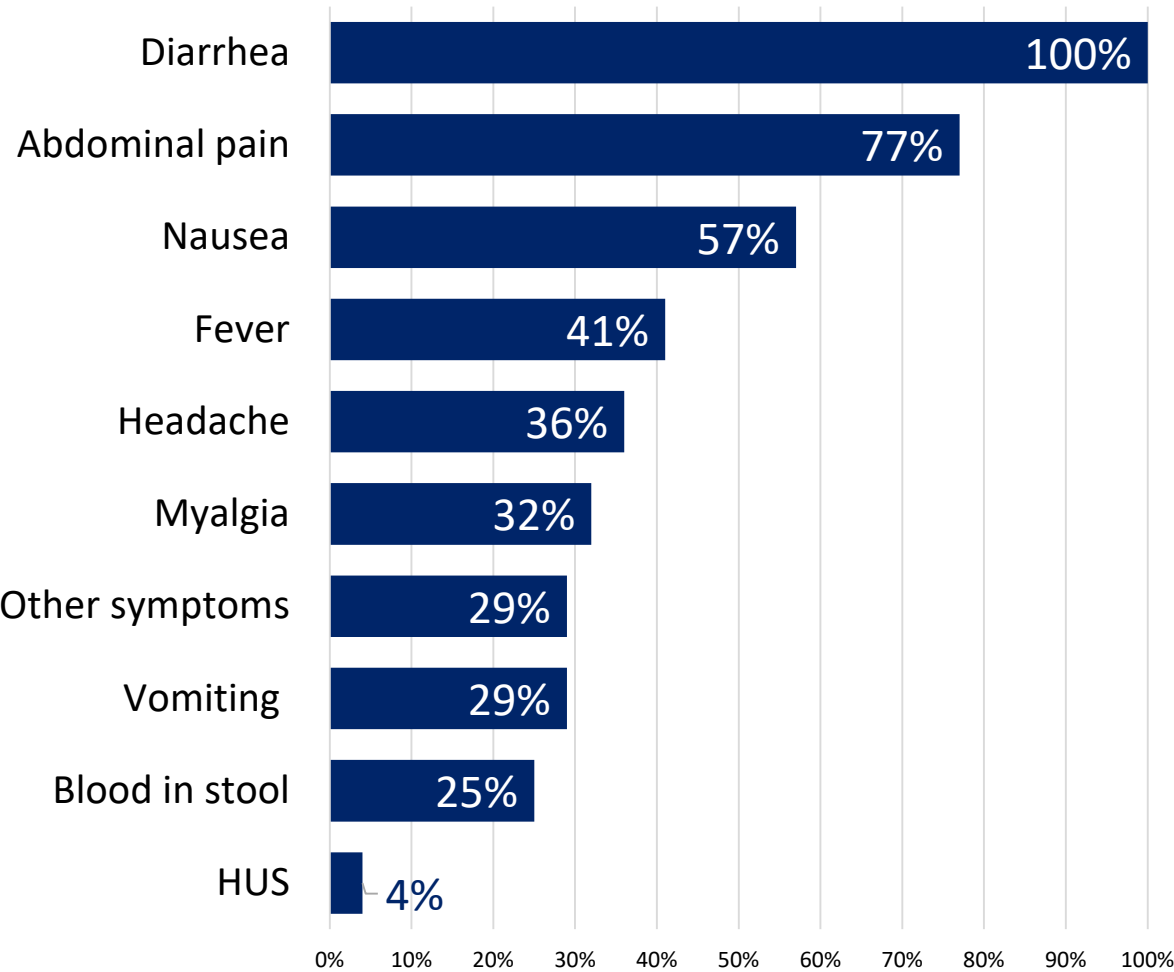




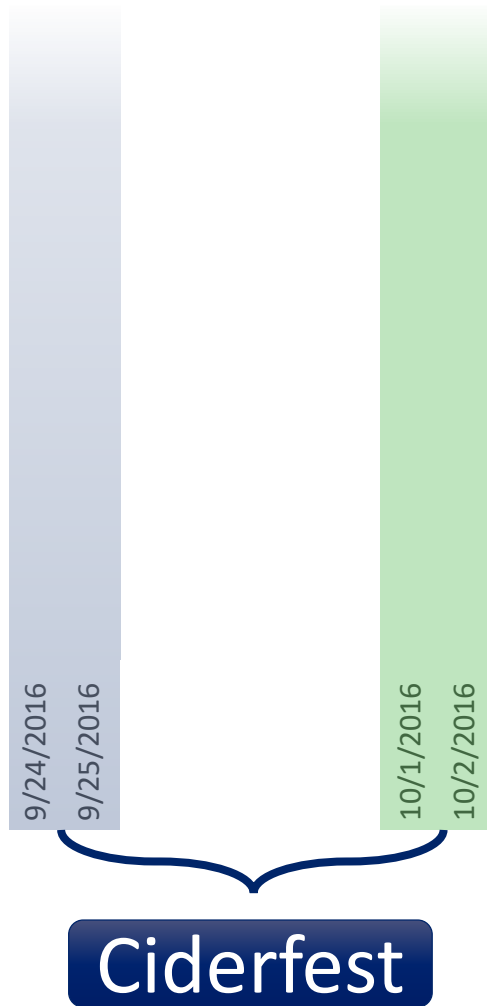
# Study Population Characteristics

	Case-Patients, n=56 n (%)	Control Subjects, n=55 n (%)
Median age	22	29
Sex		
Male	18 (32%)	26 (47%)
Female	38 (68%)	29 (53%)
State of residence		
Kansas	37 (66%)	37 (67%)
Missouri	19 (34%)	18 (34%)
Date of attendance		
September 24, 2016	32 (57%)	36 (65%)
September 25, 2016	3 (5%)	2 (4%)
October 1, 2016	5 (9%)	4 (7%)
October 2, 2016	16 (29%)	12 (24%)

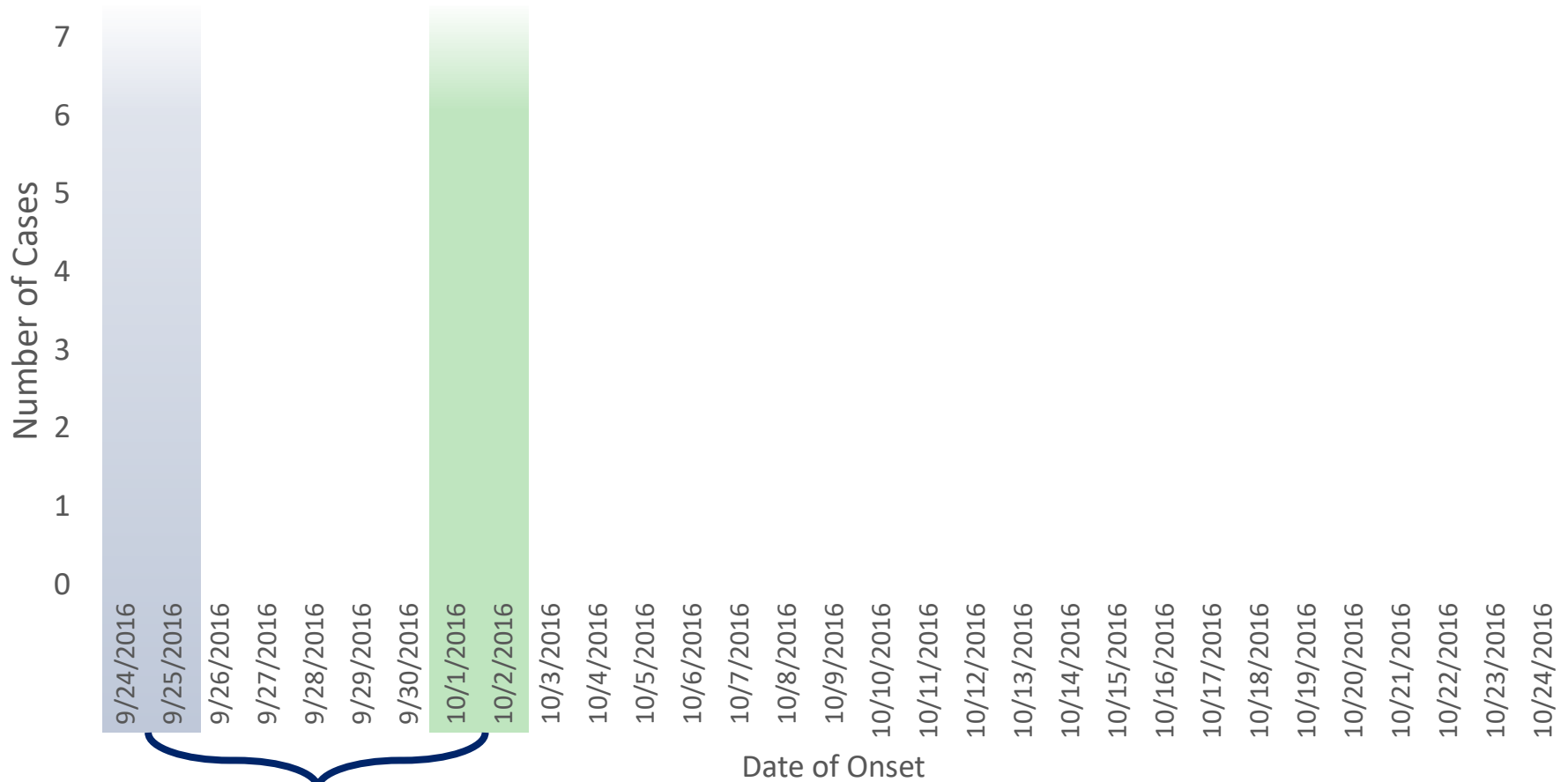
# Symptoms and Outcomes (n=56)



# Number of cases by onset date (n=56)

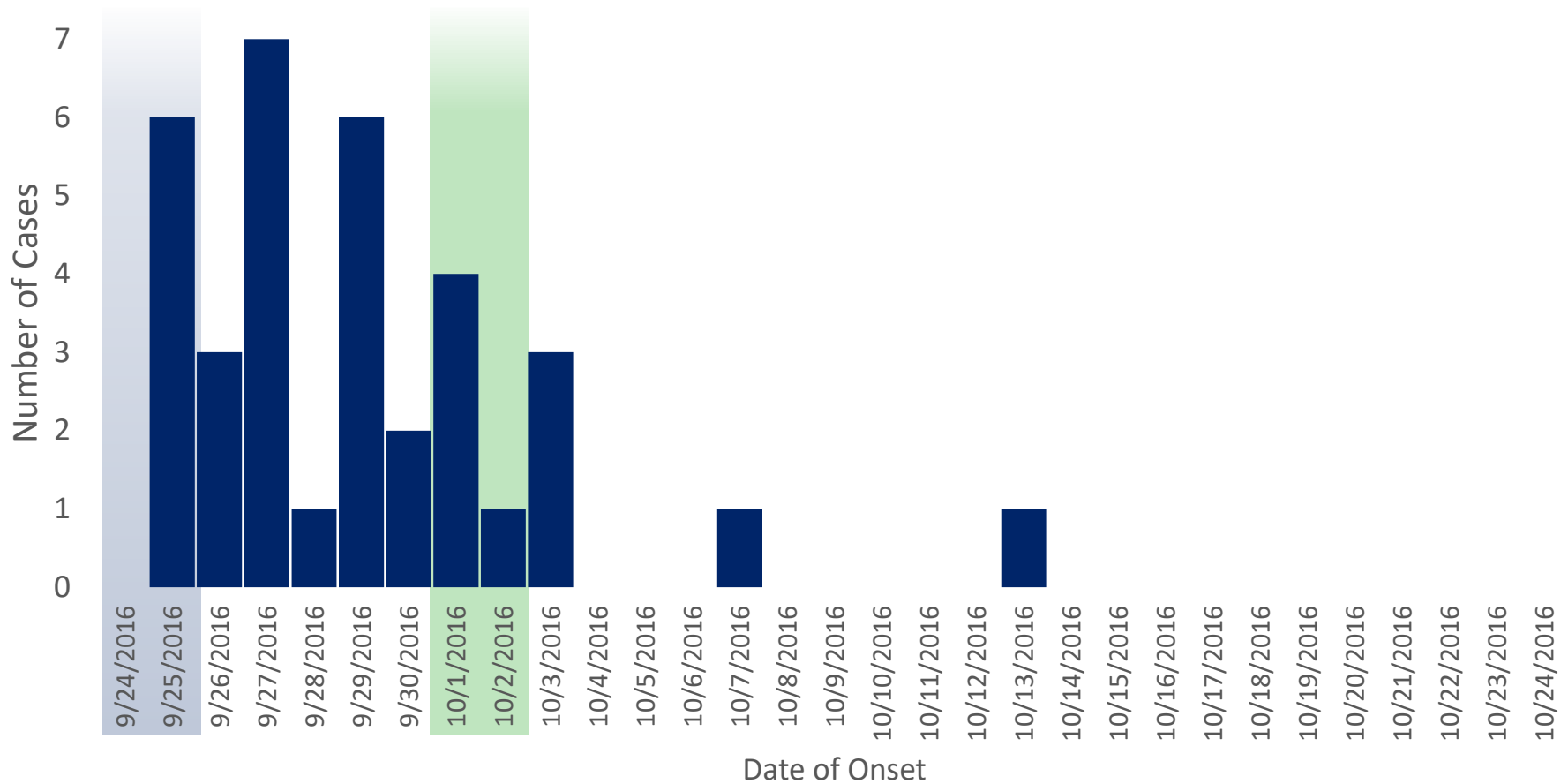


# Number of cases by onset date (n=56)



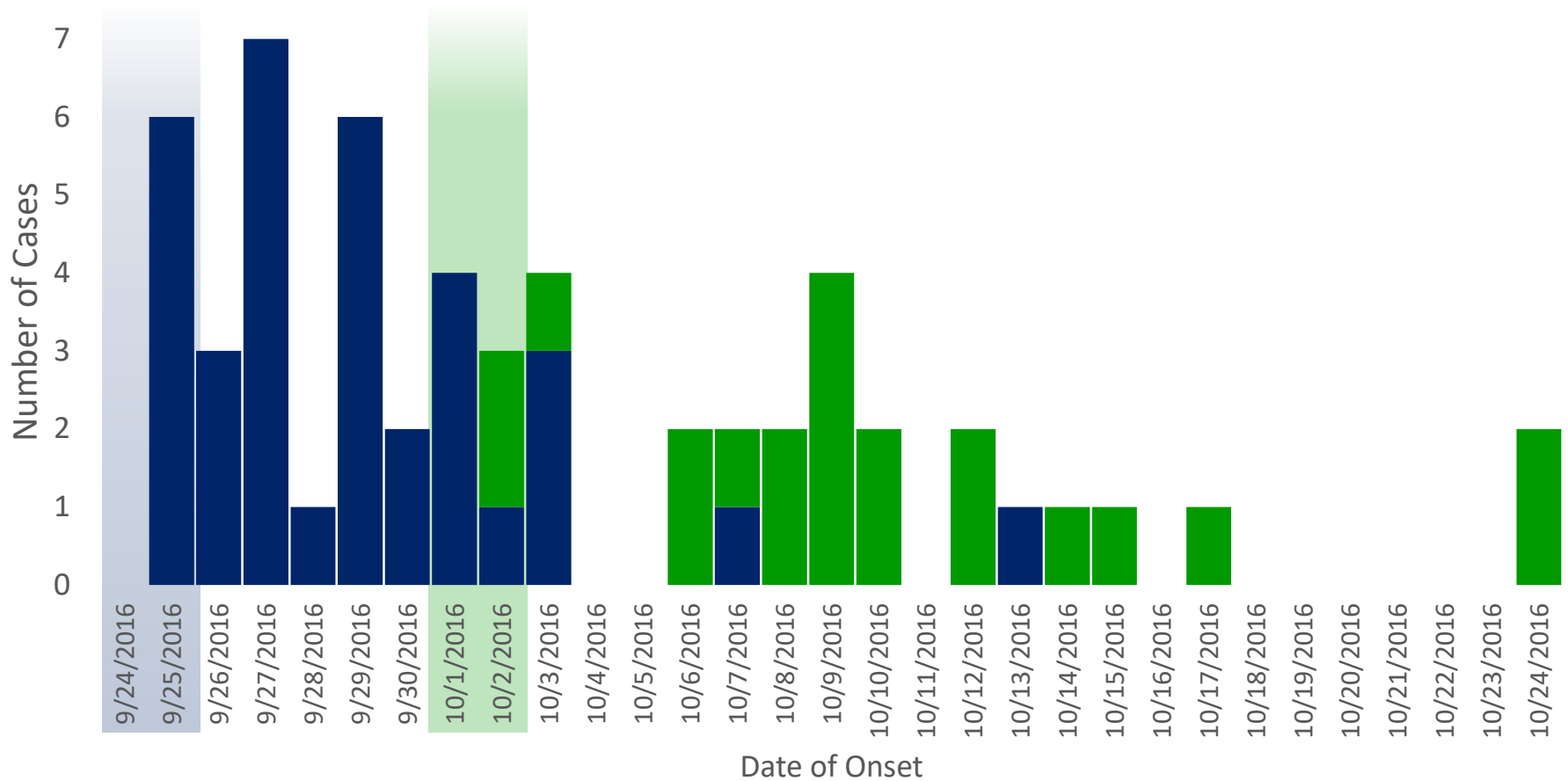
Ciderfest

# Number of cases by onset date (n=56)



■ Attended Ciderfest September 24-25, 2016

# Number of cases by onset date (n=56)



■ Attended Ciderfest September 24-25, 2016

■ Attended Ciderfest October 1-2, 2016

# Associations between Illness and Exposures

Exposure/Food Item	Matched Odds Ratio	95% CI
Any type of cold cider	6.6	1.2 - infinity
cup of cold cider	2.1	0.4 - 11.6
cider slush	4.5	0.7 - infinity
Hot cider	1.2	0.2 - 8.6
Pre-packaged bottle of cider	3.3	0.3 - 39.1
Cider doughnuts	10.3	1.1 - 94.8
Caramel apples	1.3	0.1 - 17.3
Pony ride	1.0	0 - 19
Contact with farm animals	4.7	0.5 - infinity
Pumpkin patch	2.2	0.1 - 157
Mobile food vendors	0.3	0.3 - 2.4

# Conclusions

- 56 persons with STEC O157 after Ciderfest
  - Cider and cider doughnuts were associated with illness
  - Onsite inspection was essential for identifying un-pasteurized cider was served during the cider festival
- 





# Recommendations

- All tanks holding unpasteurized cider should be labeled
- Employees should be cross-trained about all processes on site



# After-Action Review

- February 2017
- KDA
  - Food Safety and Lodging
  - Laboratory
- KDHE
  - Epidemiology
  - Laboratory



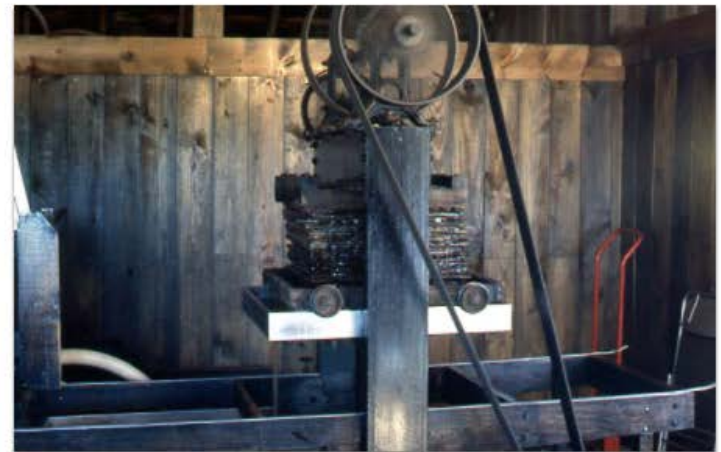
# Investigation Follow-up



This apple pulp is then pressed by a continuous belt press, and the juice is expressed.

After screening and filtering out the largest pulp particles from the juice, it is ready to be pasteurized and filled.

Most important to the whole process of pressing apples and bottling cider is doing so in a safe manner. The Louisburg Cider Mill has a thorough Food Safety Program and many experienced staff members that are employed to ensure that products manufactured are not only to a high standard of quality, but meet the requirements of Good Manufacturing Practice.



Key production staff are all trained in Cider HACCP (Hazard Analysis Critical Control Points) and through FSPCA (Food Safety Preventative Controls Alliance) as “preventative controls qualified individuals”.

# Investigation Follow-up

- No reports of illness were received following the 2017 cider festival
- No cases were found to be associated with the mill's nationally-distributed finished cider products



# Acknowledgments

- Kansas Department of Health and Environment
  - Charlie Hunt
  - Ingrid Trevino-Garrison
  - IDER Staff
- Kansas Department of Agriculture
  - Amber Barham\*
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  - Rashida Hassan
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  - CJon Hinkle
  - Mark Buxton
- United States Food and Drug Administration
  - Sam Gibbons
  - Jeffrey Moody
  - Erin Dugan

\*\*Lead Author

\*Co-Author



LOUISBURG  
CIDER MILL

1977-2017

# West Nile Virus Investigation Turon, Kansas

Sheri Tubach and Amie Worthington

Epidemiologist

Bureau of Epidemiology and Public Health Informatics

# West Nile Virus

- Leading cause of domestically acquired arboviral disease in the United States
- Arthropod-borne virus (arbovirus) spread by infected mosquitoes
- *Culex* species are the primary vector for West Nile virus (WNV)



# WNV Clinical Information

- Incubation period: 3-15 days
- 80% asymptomatic
- Symptoms include:
  - Fever
  - Headache
  - Weakness
  - Myalgia
  - Arthralgia
  - Rash
- Less than 1% develop neuroinvasive disease
  - Meningitis
  - Encephalitis
  - Acute flaccid paralysis
- Persons over 50 years are at greater risk for complications and death

# WNV Epidemiology

United States  
(1999-2016)

Kansas  
(2002-2016)

Cases

46,086

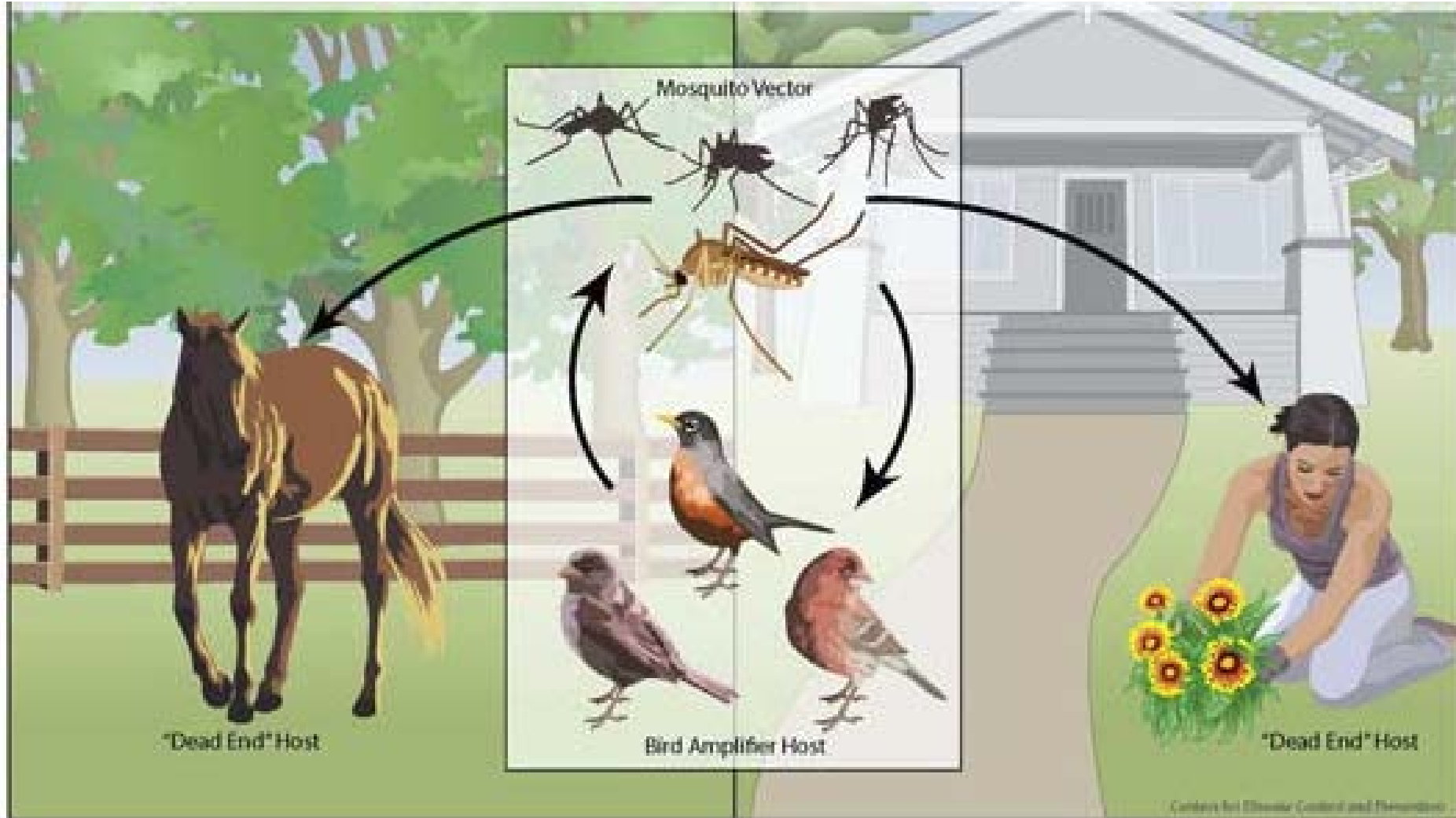
590

Deaths





2,017

30

# WNV Transmission



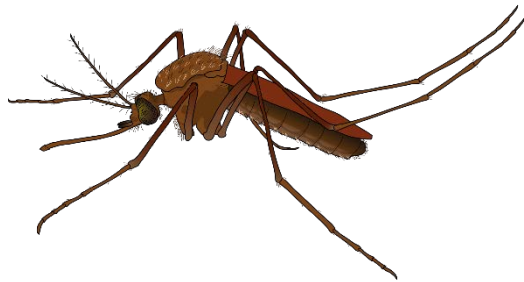
# Mosquito Life Cycle

<b>Egg</b>	Rafts float on surface of water and hatch into larvae within 48 hours	
<b>Larvae</b>	Live in water and float at surface of water to breathe oxygen	
<b>Pupae</b>	Resting non-feeding state of the life cycle	
<b>Adult</b>	Flying, biting mosquito	

# Mosquito Control and Prevention

## Personal Protection

- Insect repellent
- Wear long-sleeved shirts and long pants



## Property Protection

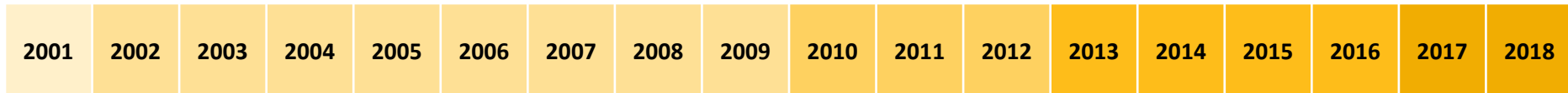
- Ensure screens are in good repair
- Empty items that can collect water once a week
- Larvicide can be used in standing water that cannot be dumped
- Adulticide can be used in outbreak situations

# Mosquito Control

- In Kansas mosquito control may be performed by the city or county
  - There is no state vector control program
- A 2015 survey of city and county mosquito control programs found
  - 53% cities performed mosquito control
  - 20% counties performed mosquito control
  - None of these entities used mosquito surveillance data to direct control efforts

# Mosquito Surveillance in Kansas

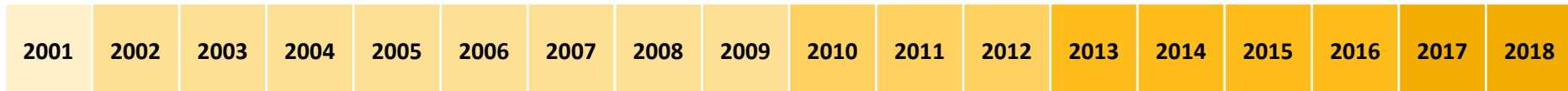
KDHE began surveillance



# Mosquito Surveillance in Kansas

KDHE began surveillance

1<sup>st</sup> WNV positive mosquito

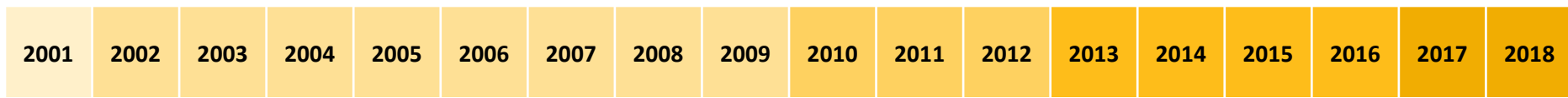




# Mosquito Surveillance in Kansas

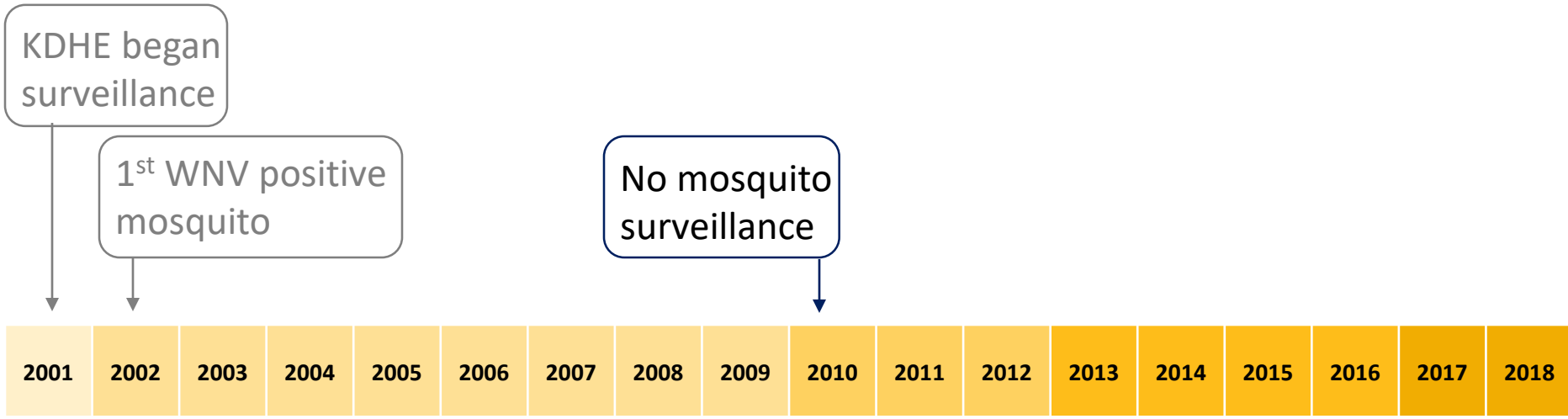
KDHE began surveillance

1<sup>st</sup> WNV positive mosquito



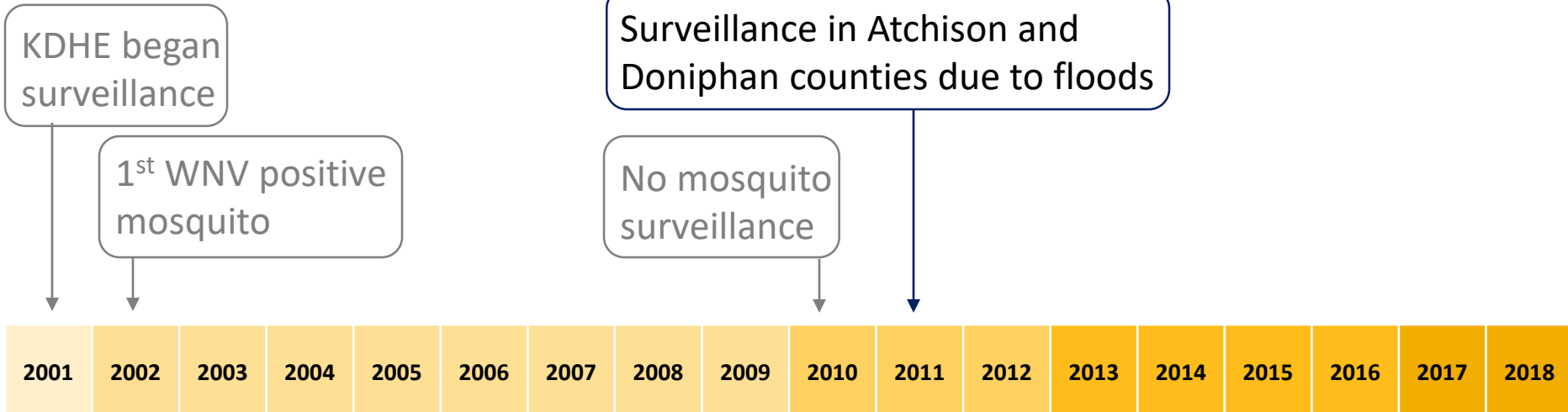
Mosquito surveillance performed in at least one county in each region by K-State, funded by KDHE through CDC grant. (Method used did not act as an 'early warning system')

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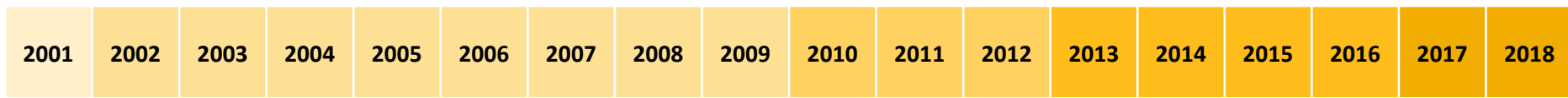
# Mosquito Surveillance in Kansas

KDHE began surveillance

1<sup>st</sup> WNV positive mosquito

Surveillance in Atchison and Doniphan counties due to floods

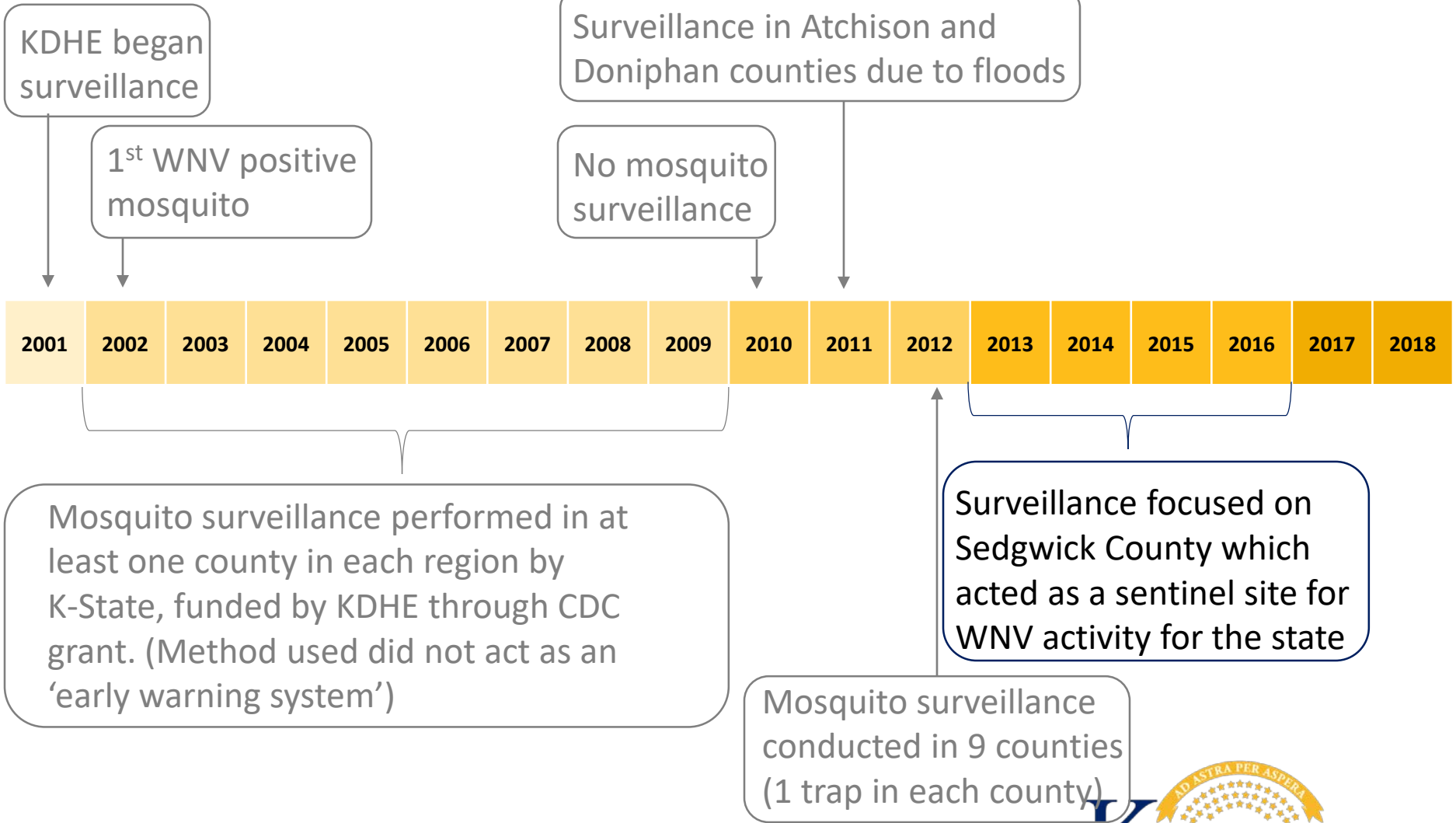
No mosquito surveillance



Mosquito surveillance performed in at least one county in each region by K-State, funded by KDHE through CDC grant. (Method used did not act as an 'early warning system')

Mosquito surveillance conducted in 9 counties (1 trap in each county)

# Mosquito Surveillance in Kansas



# Mosquito Surveillance in Kansas

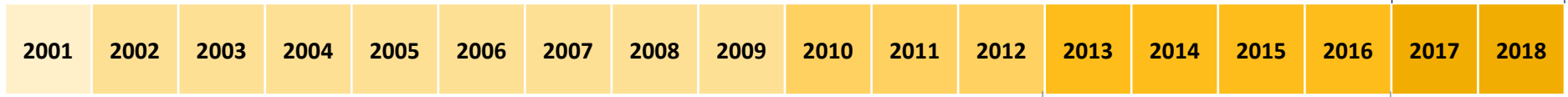
KDHE began surveillance

1<sup>st</sup> WNV positive mosquito

Surveillance in Atchison and Doniphan counties due to floods

No mosquito surveillance

Surveillance expanded to include Johnson (WNV mosquito testing only), Reno, and Shawnee counties



Mosquito surveillance performed in at least one county in each region by K-State, funded by KDHE through CDC grant. (Method used did not act as an 'early warning system')

Surveillance focused on Sedgwick County which acted as a sentinel site for WNV activity for the state

Mosquito surveillance conducted in 9 counties (1 trap in each county)

Home / Health / Article

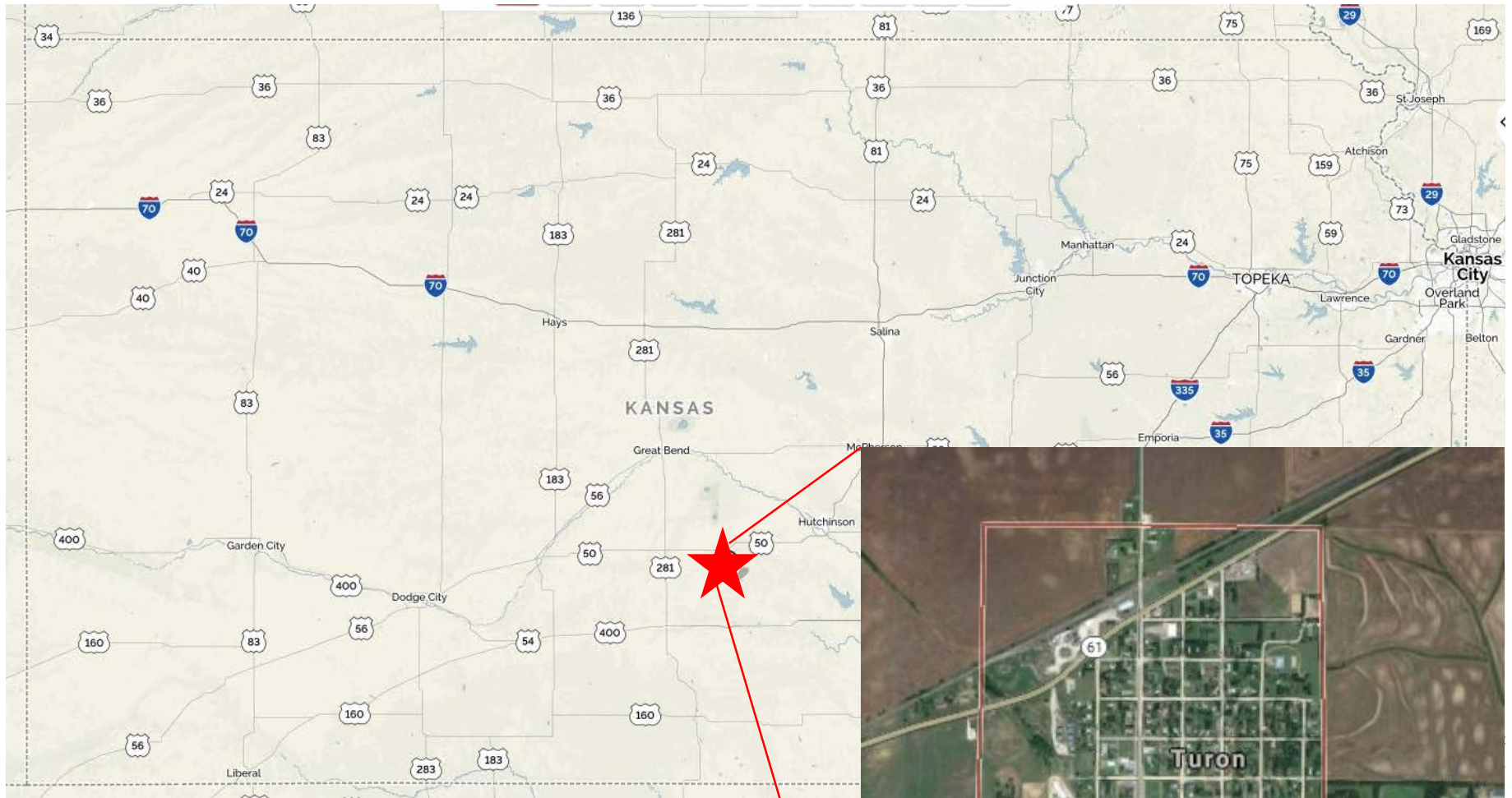
## Family: Turon man had West Nile Virus when he died last month



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### 2nd Reno resident who had virus dies





# Turon, KS

- City Area: 294 acres (0.46 sq mi)
- Population: 378
- 3 counties: Reno, Stafford, Pratt
- Median age: 39.6 years
  - 17.8% were 65 years of age or older
- Median household income: \$25,228

# WNV Turon Cases

Disease Type	Year	County	Hospitalization	Died
Neuroinvasive	2003	Reno	Yes	No
Non-neuroinvasive	2004	Reno	No	No
Non-neuroinvasive	2004	Pratt	Yes	No
Non-neuroinvasive	2013	Reno	No	No
Neuroinvasive	2013	Reno	Yes	Yes
Neuroinvasive	2016	Pratt	Yes	Yes
Neuroinvasive	2016	Stafford	Yes	Yes

# Turon, KS – Past Mosquito Control

- Adulticide sprayed once a week for ~6 weeks
  - Begin spraying once they receive complaints about mosquito bites from citizens
  - Same adulticide product used for numerous years
- Larvicide dunks used in areas of standing water



# Turon, KS – Mosquito Surveillance

- Mosquito surveillance last performed by KDHE in 2003 (Reno), 2005 (Stafford), 2009 (Pratt)
- In 2017, Reno county was added to the Kansas mosquito surveillance program
  - Due to the number of WNV neuroinvasive disease cases
  - Focused mosquito surveillance conducted by the Kansas Biological Survey (KBS) to evaluate ecological factors that may contribute to WNV transmission
  - 2/6 traps were set in Turon

# Turon, KS – Mosquito Surveillance

- Mosquito surveillance training on May 10, 2017 for Reno County Health Department staff
  
- Two traps placed overnight for the training in Turon
  - ~600 female *Culex* mosquitoes in each trap
    - Above treatment threshold for adult mosquitoes
    - Previous Kansas surveillance data evaluation showed increased risk of WNV transmission when female *Culex* mosquitoes  $\geq 40$  per trap

# Response

- May 17: Call with Reno County Health Department, KDHE, and KBS
- May 25: Call with CDC, Reno County Health Department and City of Turon
  - Recommendation to spray 2X per week based on surveillance data

# Response

- May 30 – June 2: Focused larval surveillance by RCHD
  - To try and identify primary source(s) of mosquito breeding habitat
- June 4 – June 6: Focused larval and adult surveillance by KBS
  - To try and identify primary source(s) of mosquito breeding habitat
    - Significant sources of larval *Culex* mosquitoes in Turon, south of Turon, and north of Turon
  - To determine if adulticide efforts were effective

# Community Outreach

- Door-to-door campaign by city officials
  - Educational materials
  - Larvicidal dunks
- Media
  - Local papers
  - Local TV channels
  - Social media
  - Website
  - Radio
- RCHD gave two presentations to their health department advisory group



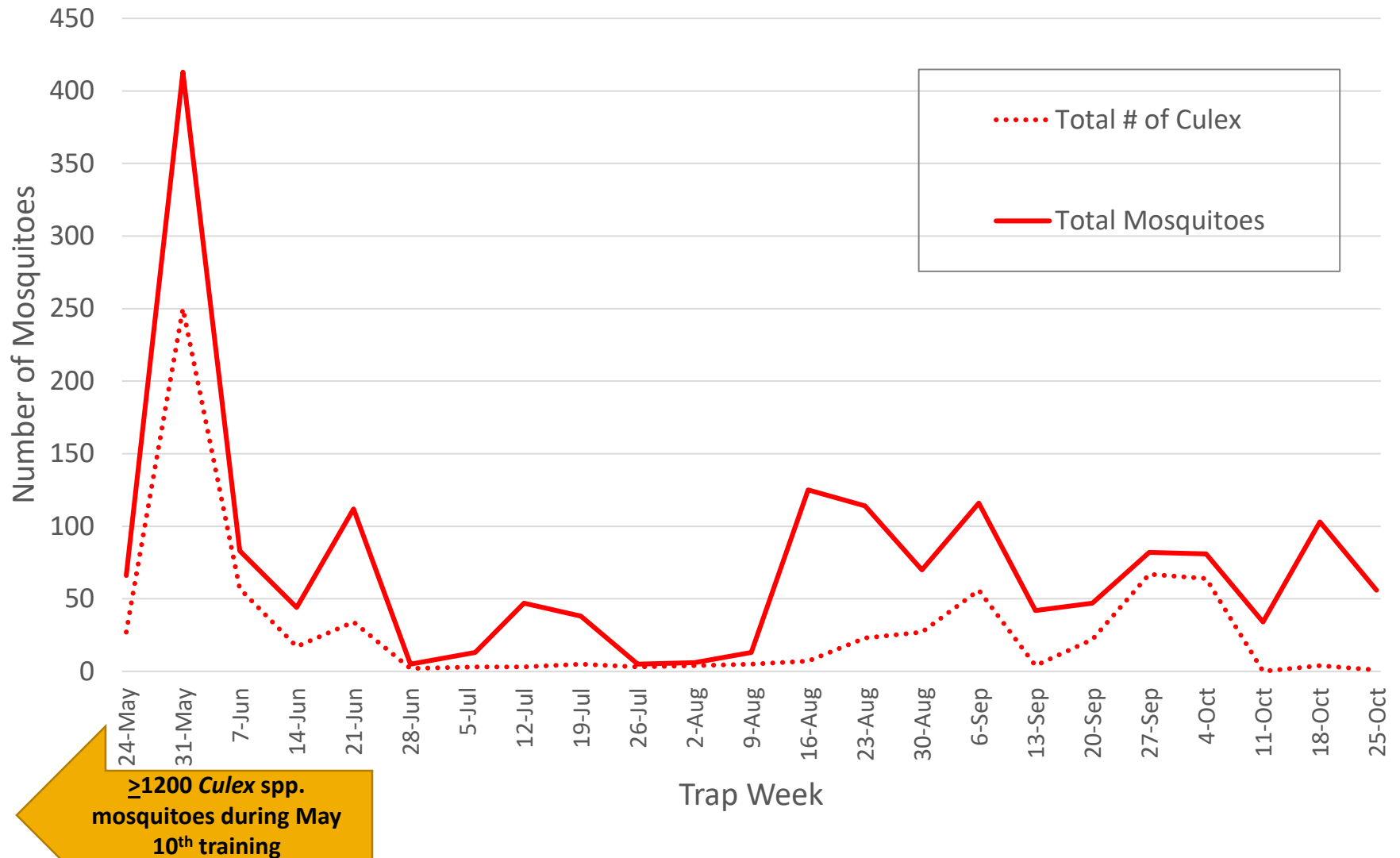


# Success

- Near real-time mosquito surveillance used to guide mosquito control efforts may have decreased human cases of WNV in 2017
  - No WNV cases reported in Turon
  - No WNV cases reported in Reno or Stafford county
- Active, engaged outreach to community and city officials on WNV prevention
  - Consistent, timely messaging

# Mosquito Surveillance in Turon, KS, 2017

## Weekly Results from Two Trap Locations



# Conclusions

- Mosquito surveillance is resource intensive but works when data is shared with partners
- Cities and counties should use surveillance data to guide control and outreach efforts
  - Adulticide spraying
  - Messaging to public

# Acknowledgements

- Kansas Department of Health and Environment
  - Ingrid Trevino-Garrison
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  - Megan Hammersmith
  - RCHD Environmental Staff
- Centers for Disease Control and Prevention
  - Janet McAllister
- City of Turon



[www.kdheks.gov](http://www.kdheks.gov)

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Healthy Kansans living in safe and sustainable environments.

# Questions

Measles

Mumps

STEC

WNV

... or anything else!

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