



**Kentucky Department for Public Health**  
**KY17-089 - Acute Hepatitis A Outbreak Weekly Report**  
**Morbidity and Mortality Weekly Report (MMWR) Week 46, 2018**  
**November 11, 2018 – November 17, 2018**

**Brief Description of Outbreak:** In November 2017, the Kentucky Department for Public Health (DPH) identified an outbreak of acute hepatitis A. The increase in cases observed in Kentucky was well over the 10-year average of reported hepatitis A cases, and several cases have been infected with hepatitis A virus (HAV) strains genetically linked to outbreaks in California, Utah, and Michigan. Similar to hepatitis A outbreaks in other states, the primary risk factors have been illicit drug use and homelessness. A contaminated food source has not been identified, and HAV transmission is believed to have occurred through person-to-person contact. Below is a weekly and cumulative update on the outbreak. Please note that all data is preliminary and subject to change as additional reports are received.

In accordance with 902 KAR 2:020, cases of acute hepatitis A should be reported within 24 hours.

The case definition used for outbreak-associated acute hepatitis A cases is available upon request.

**Table 1: Summary of Outbreak-Associated Acute Hepatitis A Cases\***

Update for Week 46:		Total Case Counts: 8/1/2017 – 11/17/2018:	
<b>Number of new cases (n=87):</b>	<b>Confirmed<sup>^</sup> - 0 Probable - 66 Suspected - 21</b>	<b>Total number of cases (n=2769):</b>	<b>Confirmed<sup>^</sup> - 587 Probable - 1488 Suspected - 694</b>
<b>Number of counties with new cases:</b>	<b>36</b>	<b>Total number of counties with cases:</b>	<b>96 (80% of KY counties)</b>
<b>Number of individuals with specimens submitted for genotyping where results are available:</b>	<b>0</b>	<b>Number of individuals with specimens submitted for genotyping where results are available:</b>	<b>626 (23%)</b>
<b>Number of cases with genotype IB among those with genotype testing:</b>	<b>0</b>	<b>Total number of cases with genotype IB among those with genotype testing:</b>	<b>572 (91% of those tested)</b>
<b>Number of Hospitalizations:</b>	<b>30</b>	<b>Total Number of Hospitalizations:</b>	<b>1438 (52%)</b>
<b>Number of deaths Reported<sup>†</sup>:</b>	<b>0</b>	<b>Total number of deaths reported<sup>†</sup>:</b>	<b>17 (&lt;1%)</b>

\* Cases are reported based on date of specimen collection

<sup>^</sup> Cases are generally confirmed weeks after submission for testing, so will only be reflected in total case counts.

<sup>†</sup> Deaths are defined as any outbreak-associated acute hepatitis A case with documentation of hepatitis A as a contributing factor to the individual's death.

**Table 2: Cumulative Distribution of Cases by County**

<b>KY17-089 Distribution Of Outbreak-Associated Acute Hepatitis A Cases, by County, August 1, 2017 – November 17, 2018*^#</b>					
<b>County</b>	<b>Total number of cases reported</b>	<b>Number of confirmed cases</b>	<b>Number of probable cases</b>	<b>Number of suspected cases</b>	<b>Incident Rate per 100,000 population</b>
Adair	3	0	2	1	15.4
Allen	26	4	18	4	124.2
Anderson	13	0	10	3	57.7
Ballard	9	4	2	3	112.0
Barren	5	1	4	0	11.4
Bath	26	0	11	15	210.1
Bell	8	0	4	4	29.7
Boone	33	4	18	11	25.2
Bourbon	7	0	7	0	34.9
Boyd	165	98	40	27	343.9
Boyle	11	0	4	7	36.8
Breathitt	3	0	3	0	23.2
Bullitt	64	30	24	10	79.8
Butler	3	0	1	2	23.4
Campbell	46	2	39	5	49.7
Carlisle	1	0	1	0	20.6
Carroll	4	1	1	2	37.3
Carter	126	41	63	22	464.2
Casey	5	1	3	1	31.7
Christian	1	1	0	0	1.4
Clark	48	0	30	18	133.2
Clay	19	0	9	10	93.3

**KY17-089 Distribution Of Outbreak-Associated Acute Hepatitis A Cases,  
by County, August 1, 2017 – November 17, 2018\*^#**

<b>County</b>	<b>Total number of cases reported</b>	<b>Number of confirmed cases</b>	<b>Number of probable cases</b>	<b>Number of suspected cases</b>	<b>Incident Rate per 100,000 population</b>
Daviess	4	0	2	2	4.0
Edmonson	1	0	1	0	8.2
Elliott	23	4	4	15	305.7
Estill	6	0	5	1	42.0
Fayette	66	4	51	11	20.5
Fleming	4	0	0	4	27.7
Floyd	89	1	51	37	245.4
Franklin	36	0	29	7	71.3
Gallatin	3	0	2	1	34.2
Garrard	5	0	3	2	28.5
Grant	32	3	24	5	128.1
Grayson	27	2	22	3	102.4
Green	3	0	3	0	27.1
Greenup	59	28	19	12	166.1
Hardin	33	9	7	17	30.5
Harrison	6	0	5	1	31.9
Hart	2	0	2	0	10.7
Henry	10	3	5	2	62.5
Hickman	1	0	0	1	22.1
Hopkins	1	0	0	1	2.2
Jackson	7	0	4	3	52.1
Jefferson	639	292	235	112	82.9
Jessamine	8	0	5	3	15.0

**KY17-089 Distribution Of Outbreak-Associated Acute Hepatitis A Cases,  
by County, August 1, 2017 – November 17, 2018\*^#**

<b>County</b>	<b>Total number of cases reported</b>	<b>Number of confirmed cases</b>	<b>Number of probable cases</b>	<b>Number of suspected cases</b>	<b>Incident Rate per 100,000 population</b>
Johnson	52	0	27	25	230.1
Kenton	72	7	59	6	43.5
Knott	15	1	11	3	98.1
Knox	47	0	31	16	150.5
Larue	3	0	1	2	21.1
Laurel	76	0	62	14	126.3
Lawrence	22	3	13	6	140.0
Lee	9	0	9	0	137.0
Leslie	10	0	8	2	96.8
Letcher	2	0	1	1	9.0
Lewis	9	0	6	3	67.5
Lincoln	13	2	7	4	53.2
Logan	1	0	1	0	3.7
Madison	39	2	28	9	42.8
Magoffin	35	0	21	14	279.2
Marion	22	2	16	4	113.4
Marshall	2	0	1	1	6.4
Martin	34	0	24	10	296.9
Mason	4	0	3	1	23.3
McCracken	8	2	3	3	12.2
McCreary	3	0	3	0	17.2
Meade	12	1	1	10	42.6
Menifee	17	0	11	6	263.4

**KY17-089 Distribution Of Outbreak-Associated Acute Hepatitis A Cases,  
by County, August 1, 2017 – November 17, 2018\*^#**

<b>County</b>	<b>Total number of cases reported</b>	<b>Number of confirmed cases</b>	<b>Number of probable cases</b>	<b>Number of suspected cases</b>	<b>Incident Rate per 100,000 population</b>
Mercer	25	0	17	8	116.2
Metcalfe	2	0	1	1	19.8
Montgomery	79	5	58	16	282.9
Morgan	19	1	15	3	144.1
Nelson	17	4	6	7	37.2
Nicholas	2	0	0	2	28.1
Ohio	6	0	3	3	24.8
Oldham	13	3	7	3	19.6
Owen	5	0	5	0	46.4
Owsley	1	0	1	0	22.5
Pendleton	4	0	2	2	27.4
Perry	39	0	28	11	146.9
Pike	25	0	22	3	42.5
Powell	15	0	13	2	121.2
Pulaski	7	0	5	2	10.9
Rockcastle	3	0	3	0	18.0
Rowan	43	0	27	16	175.4
Russell	1	0	0	1	5.6
Scott	5	0	1	4	9.1
Shelby	20	5	11	4	42.2
Simpson	6	0	6	0	33.1
Spencer	5	3	1	1	27.0
Taylor	43	2	31	10	168.8

**KY17-089 Distribution Of Outbreak-Associated Acute Hepatitis A Cases,  
by County, August 1, 2017 – November 17, 2018\*^#**

<b>County</b>	<b>Total number of cases reported</b>	<b>Number of confirmed cases</b>	<b>Number of probable cases</b>	<b>Number of suspected cases</b>	<b>Incident Rate per 100,000 population</b>
Warren	29	8	16	5	22.5
Washington	5	0	3	2	41.2
Whitley	139	3	77	59	383.8
Wolfe	11	0	9	2	151.4
Woodford	2	0	0	2	7.6
<b>Total Number of Cases:</b>	<b>2769</b>	<b>587</b>	<b>1488</b>	<b>694</b>	<b>62.2</b>

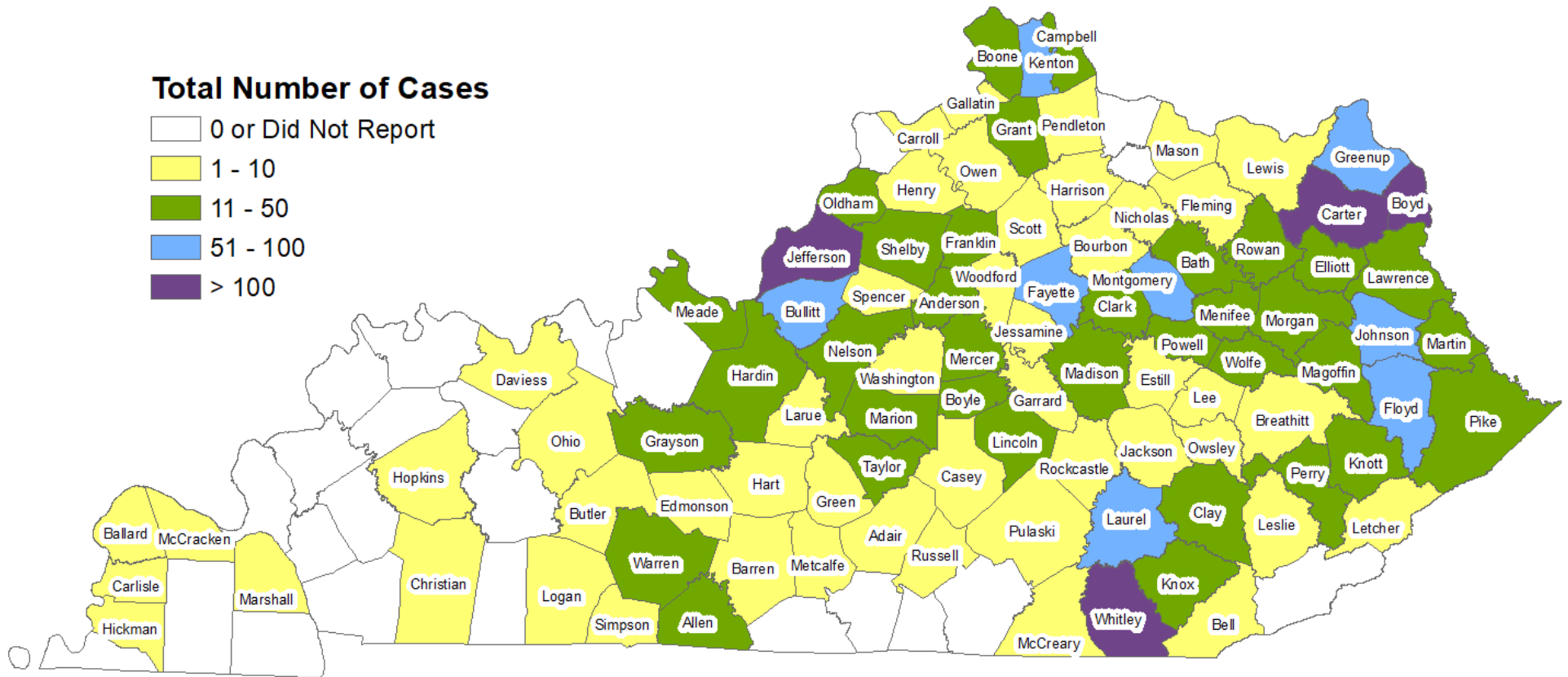
\* Cases are reported based on date of specimen collection.

^ Denotes a county where cases have not been previously identified.

# As genotyping results become available, cases may be excluded if they do not meet the outbreak case definition. Cases in the following counties have been excluded from the outbreak case count this week: None.

**Figure 1: Geographic Distribution of Outbreak-Associated Cases by County**

**KY17-089 Distribution of Outbreak-Associated Acute Hepatitis A Cases by County, August 1, 2017 - November 17, 2018**

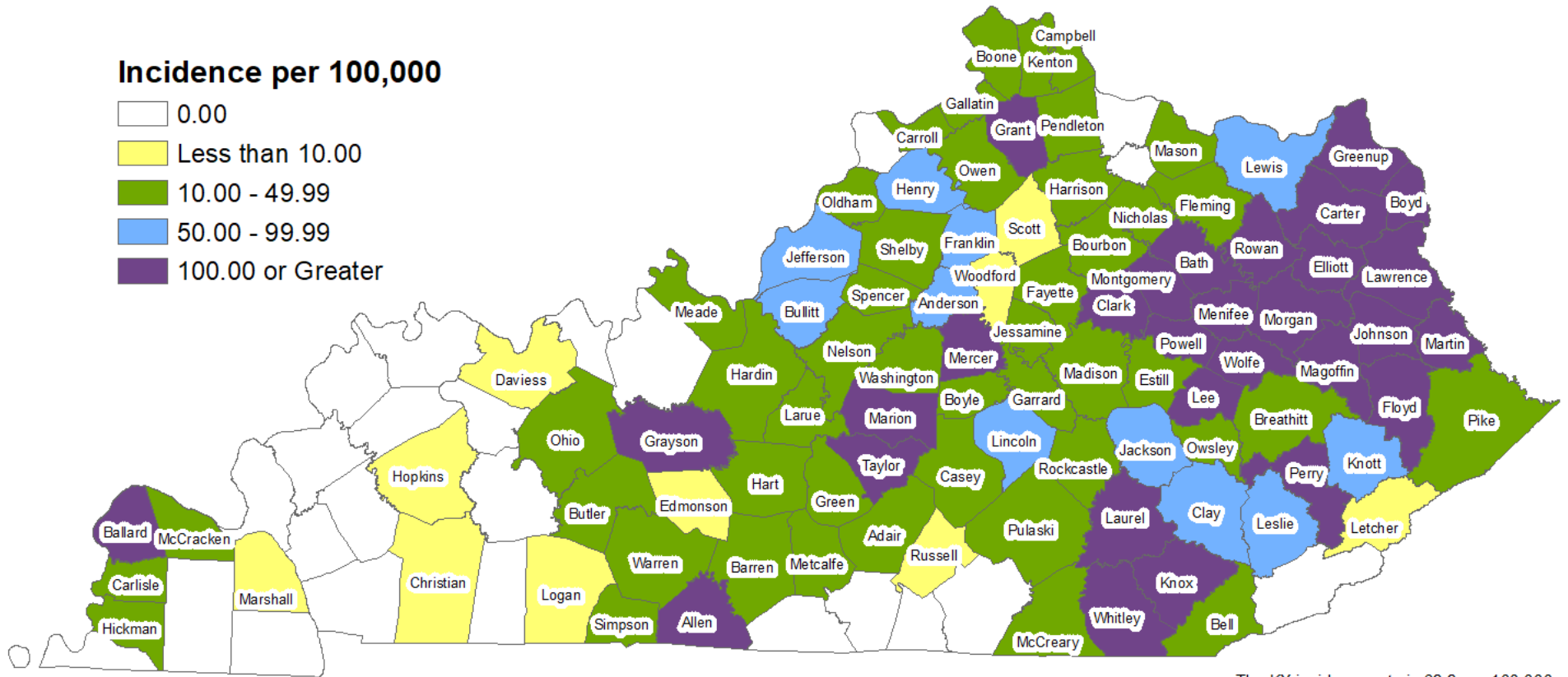


**n = 96 counties with outbreak-associated cases**

**Counties where cases have not previously been identified: None.**

Figure 2: Incidence of Outbreak-Associated Cases by County

### KY17-089 Incidence of Outbreak-Associated Acute Hepatitis A Cases by County, August 1, 2017 - November 17, 2018

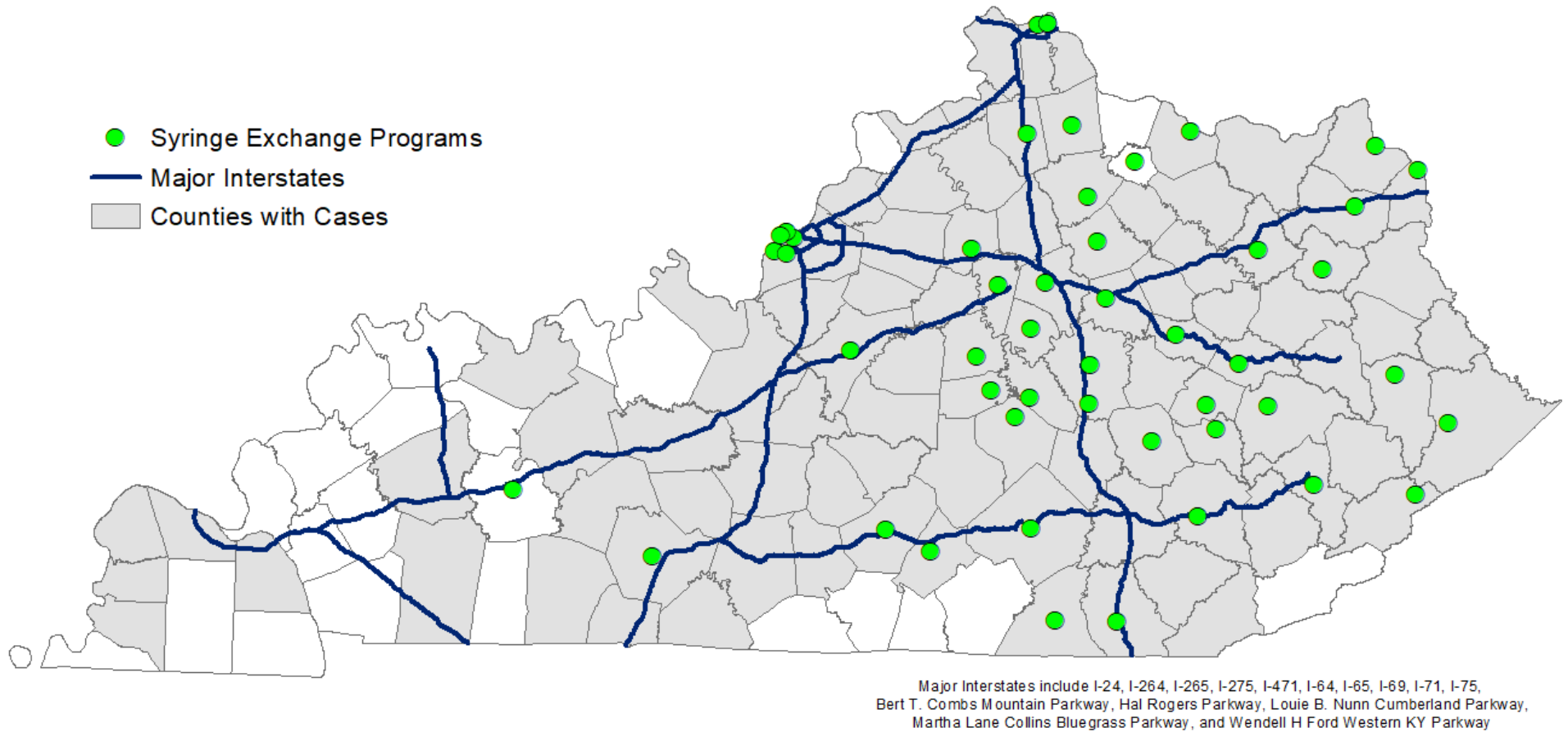


The KY incidence rate is 62.2 per 100,000.  
Note: Rates calculated from numerators less than 20 may not be reliably used to determine trends.

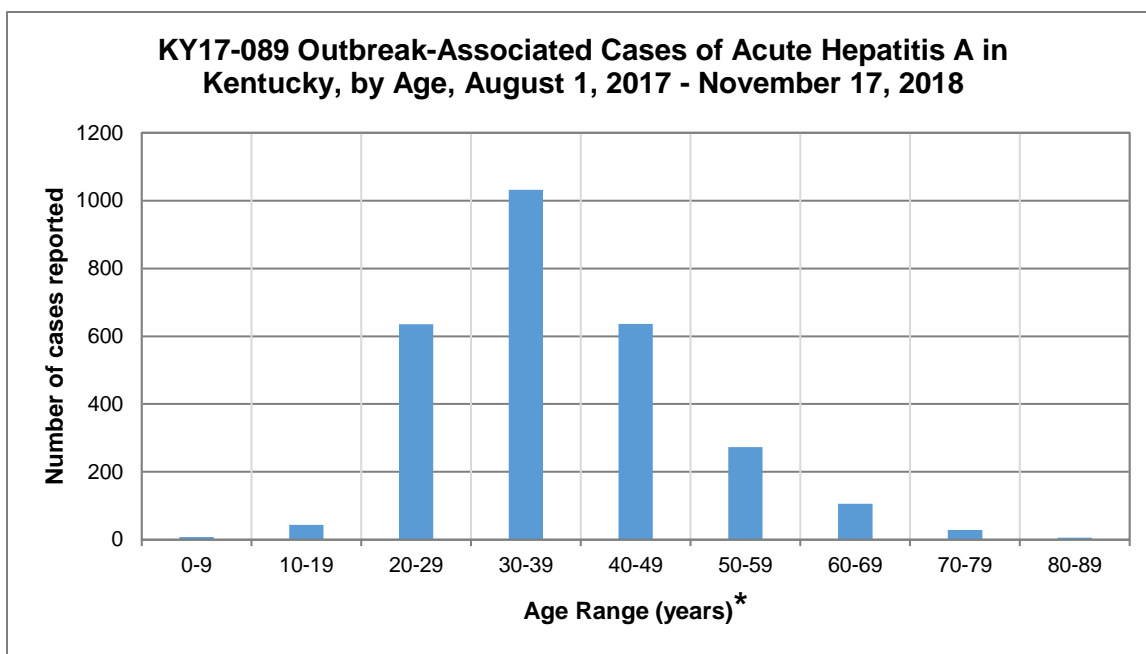


Figure 3: Major Interstates and Syringe Exchange Programs in Counties Reporting Outbreak-Associated Cases

# KY17-089 Major Interstates and Syringe Exchange Programs in Counties Reporting Outbreak-Associated Acute Hepatitis A Cases, August 1, 2017 - November 17, 2018



**Figure 4: Outbreak-Associated Cases by Age**



\* The mean age of cases is 37.7 years, and the median age is 36.0 years.

**Table 3: Frequent Risk Factors of Outbreak-associated Cases**

KY17-089 Risk Factors of Outbreak-Associated Acute Hepatitis A Cases, August 1, 2017 – November 17, 2018 <sup>#^</sup>	
Risk Factor	Number of Cases Reporting Risk Factor (n=2275) <sup>* †</sup>
Homelessness + No/Unk Illicit Drug Use	45 (2.0%)
Illicit Drug Use + No/Unk Homelessness	1538 (68%)
Homelessness + Illicit drug use	236 (10%)
No Outbreak-Related Risk Factors	456 (20%)

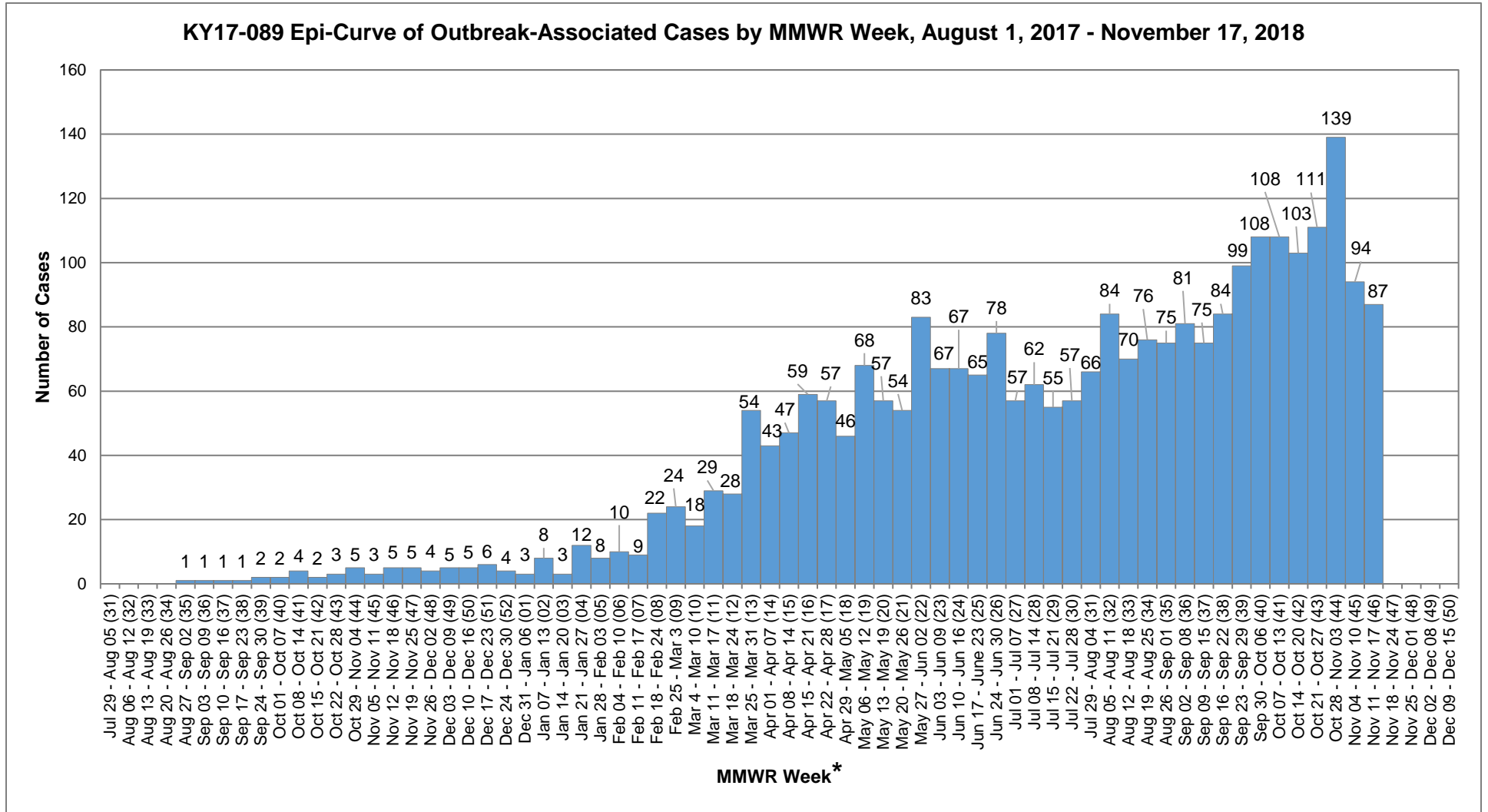
\* Risk factor information is unavailable for 494 (17.8%) of all outbreak-associated cases.

† The categories below do not add up to the total number in this count due to other possible risk factor combinations not shown in the table.

# At this point in the outbreak, MSM is no longer considered an outbreak-related risk factor. Percentages in this table may have changed due to removing MSM from risk factor combinations.

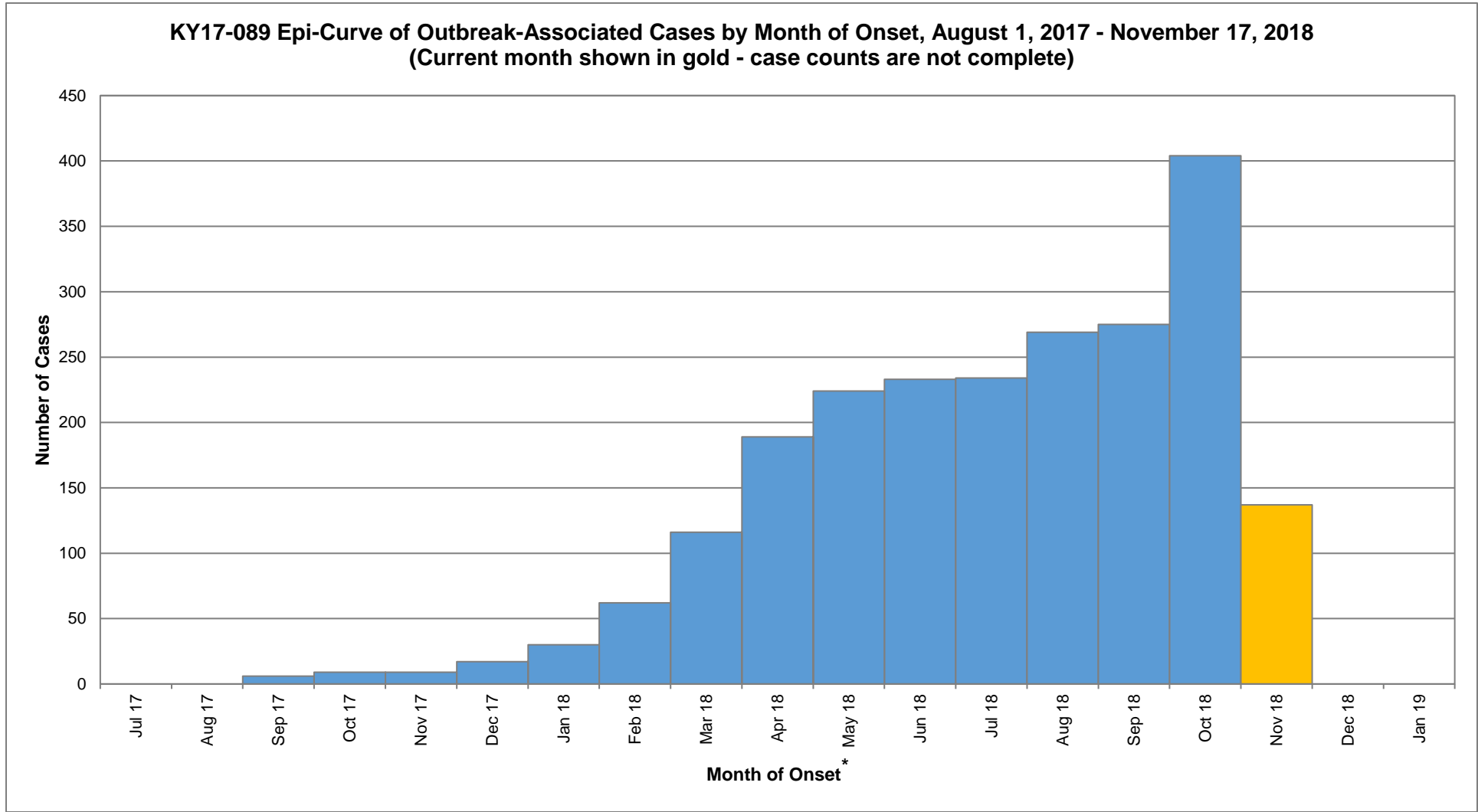
^ 32 MSM cases have been reported. Of those, 10 have reported no other risk factors.

Figure 5: Epidemic-curve (Epi-Curve) of Outbreak-Associated Cases



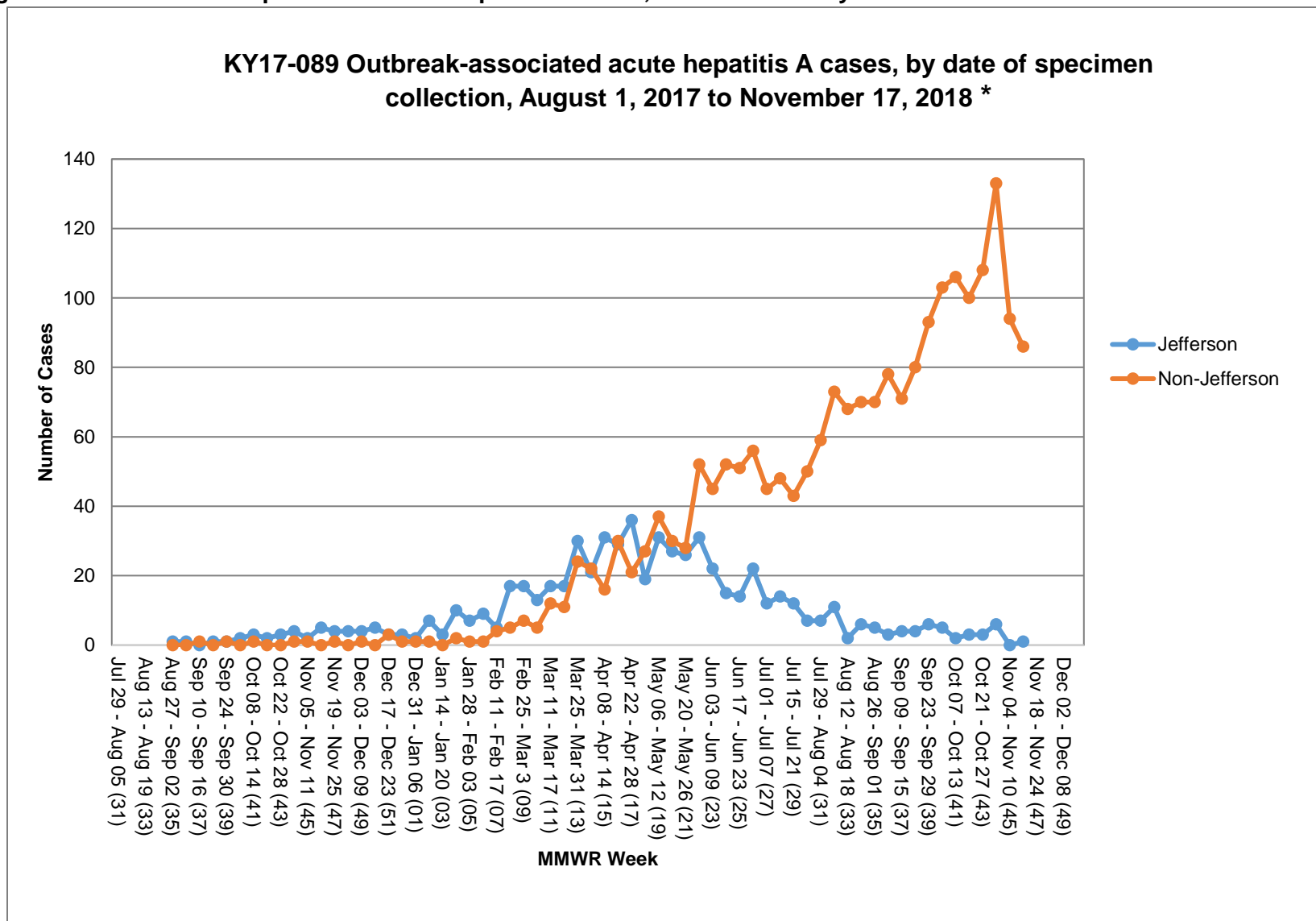
\* MMWR weeks are based on date of specimen collection.

**Figure 6: Epidemic-curve (Epi-Curve) of Outbreak-Associated Cases by Month of Onset**



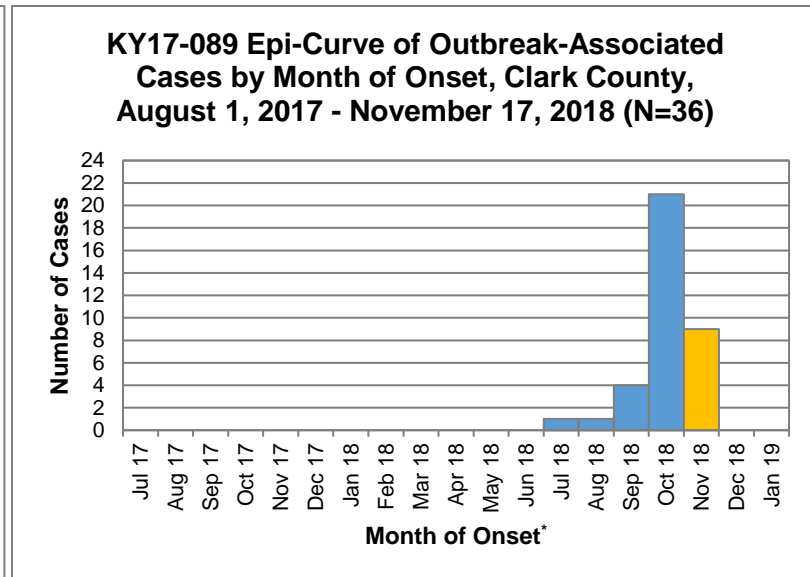
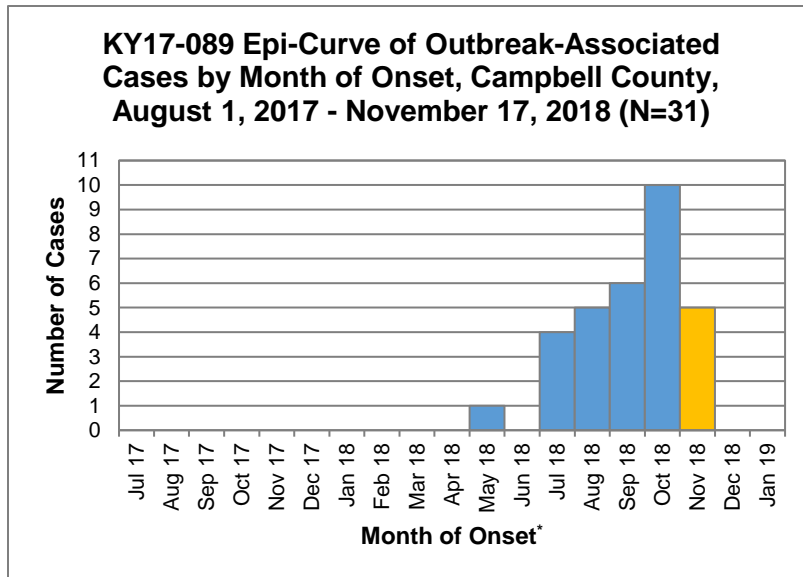
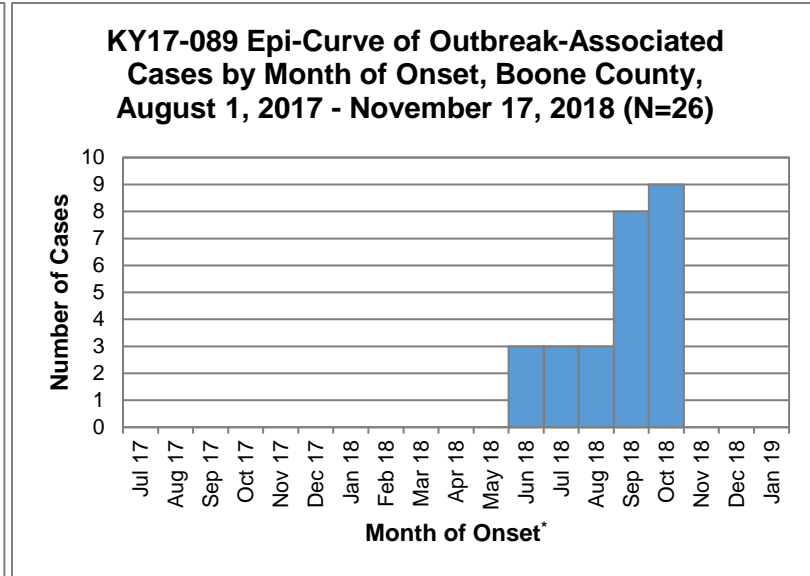
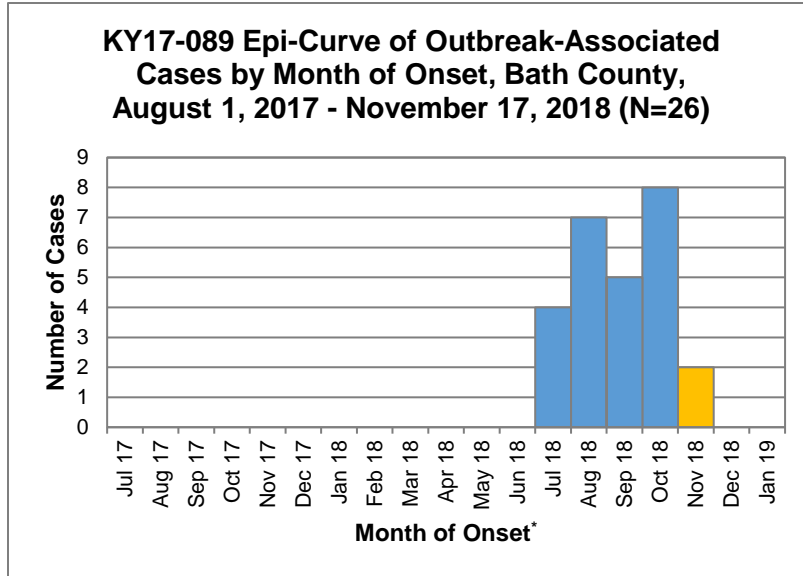
\* Date of onset has been reported for 80.0% (or 2214/2769) of cases.

Figure 7: Case count comparison of acute hepatitis A cases, Jefferson County versus Non-Jefferson Counties

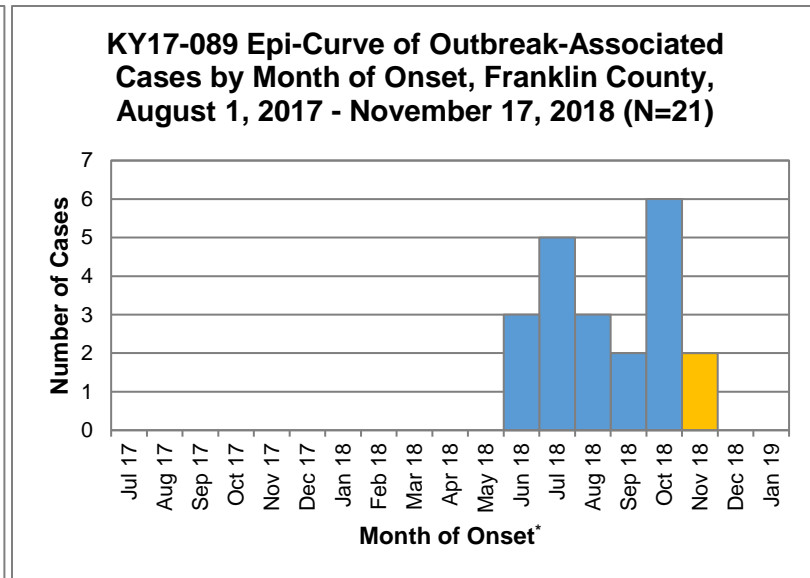
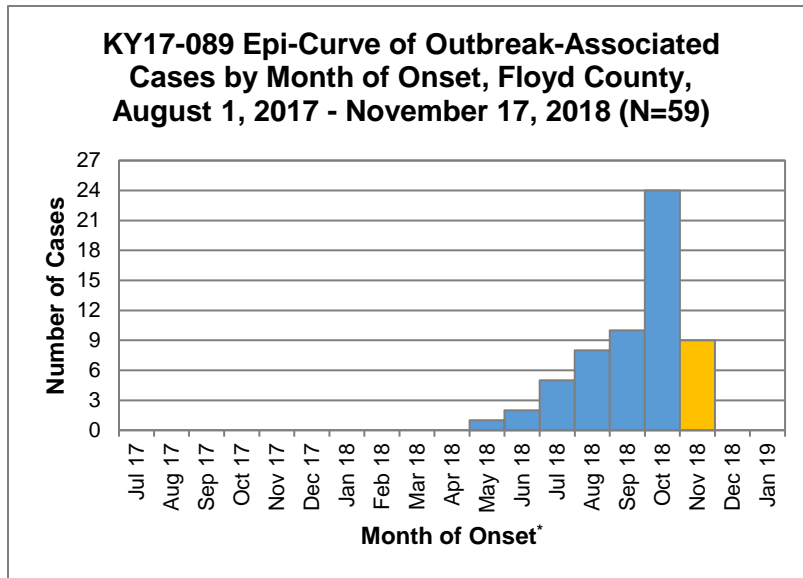
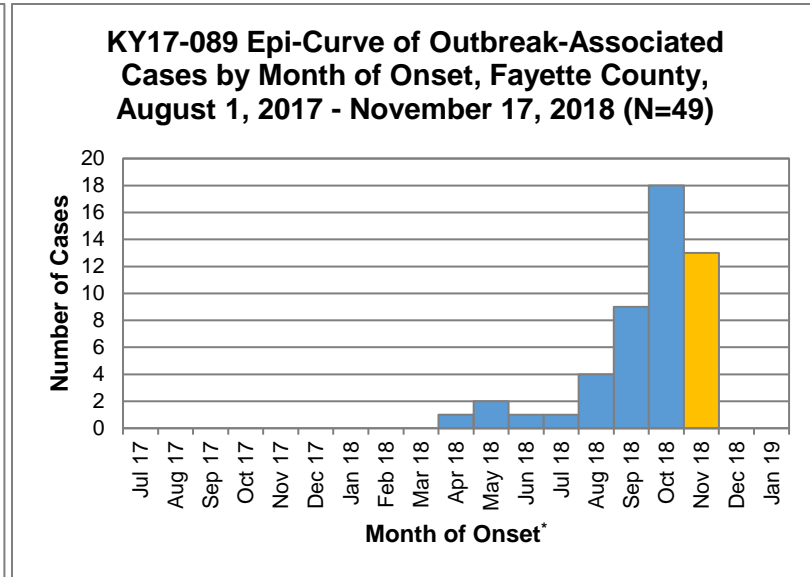
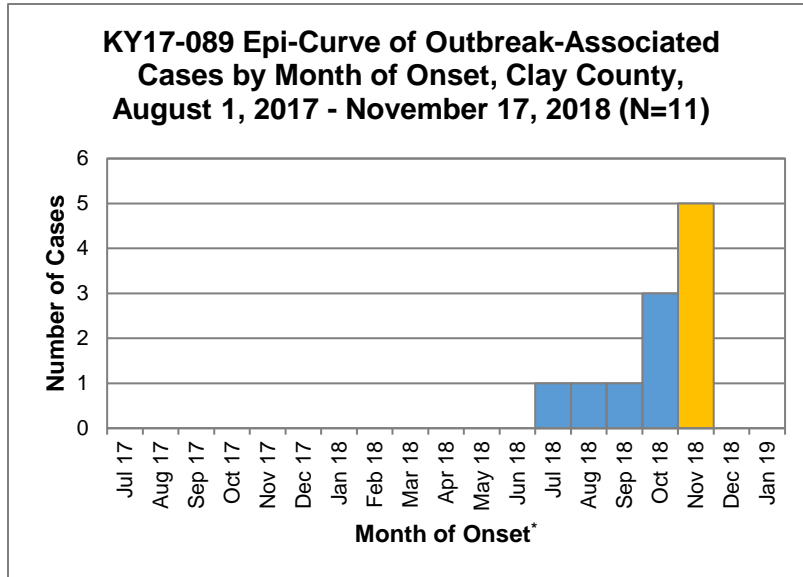


\* MMWR weeks are based on date of specimen collection.

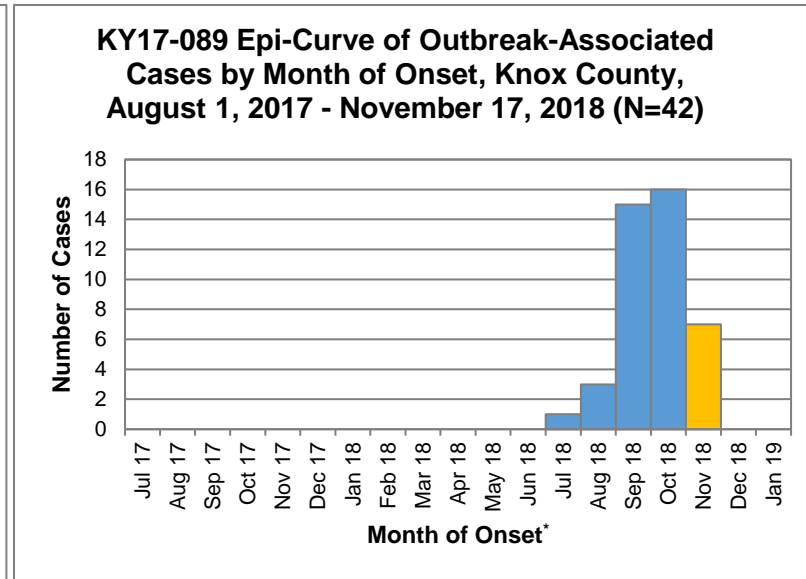
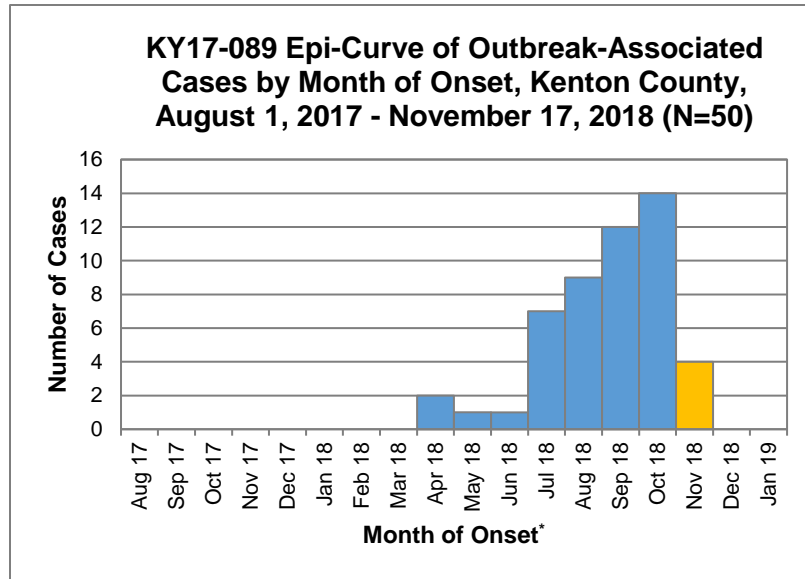
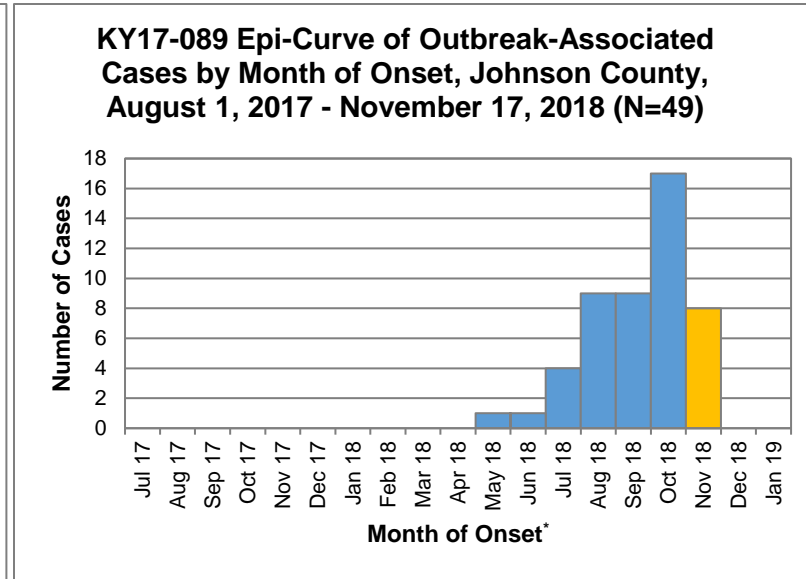
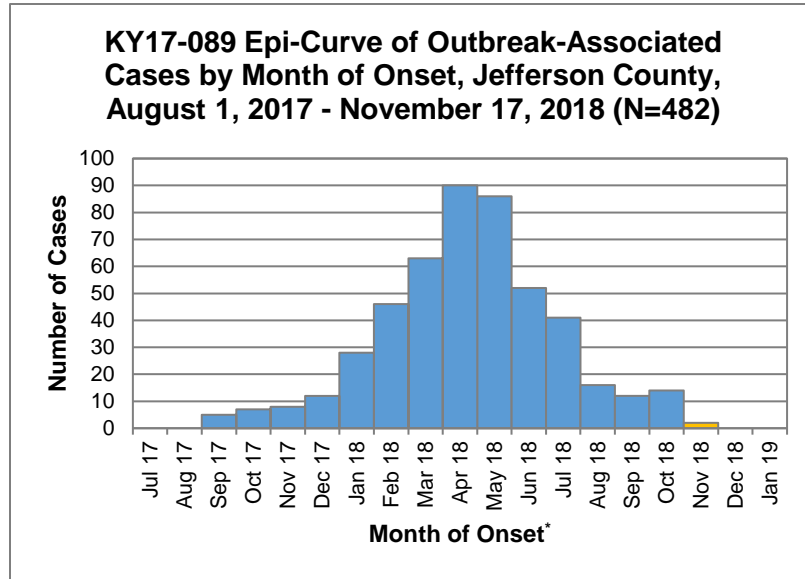
Figures 8-11: Epidemic-curves (Epi-Curves) of Outbreak-Associated Cases in Counties with at least 10 reported cases in the last 50 days, by Month of Onset (Bath, Boone, Campbell, and Clark Counties)



Figures 12-15: Epidemic-curves (Epi-Curves) of Outbreak-Associated Cases in Counties with at least 10 reported cases in the last 50 days, by Month of Onset (Clay, Fayette, Floyd, and Franklin Counties)

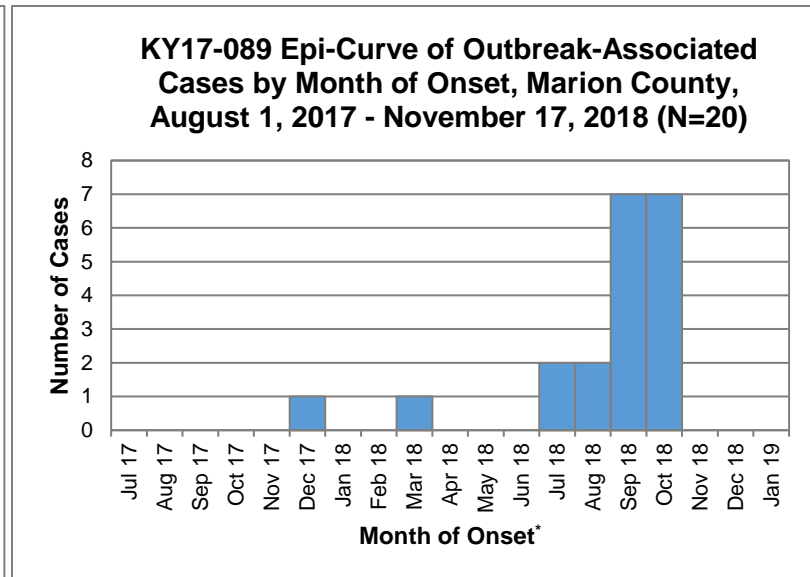
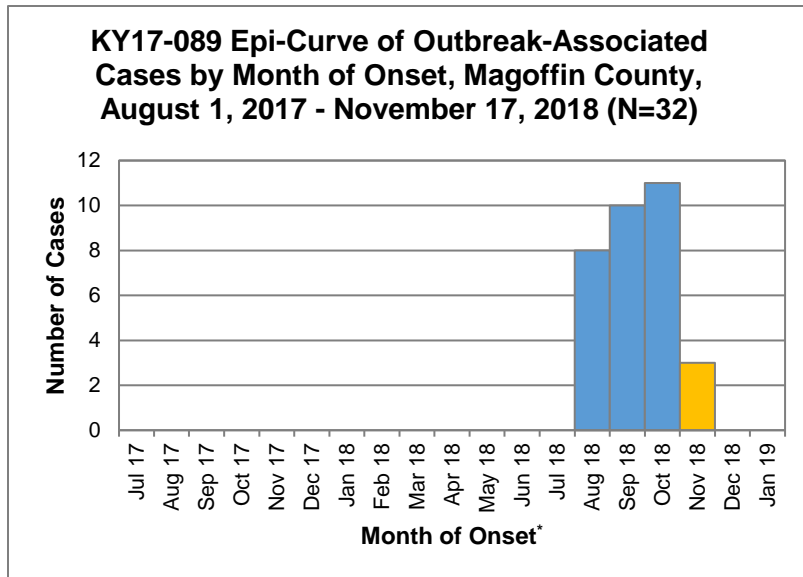
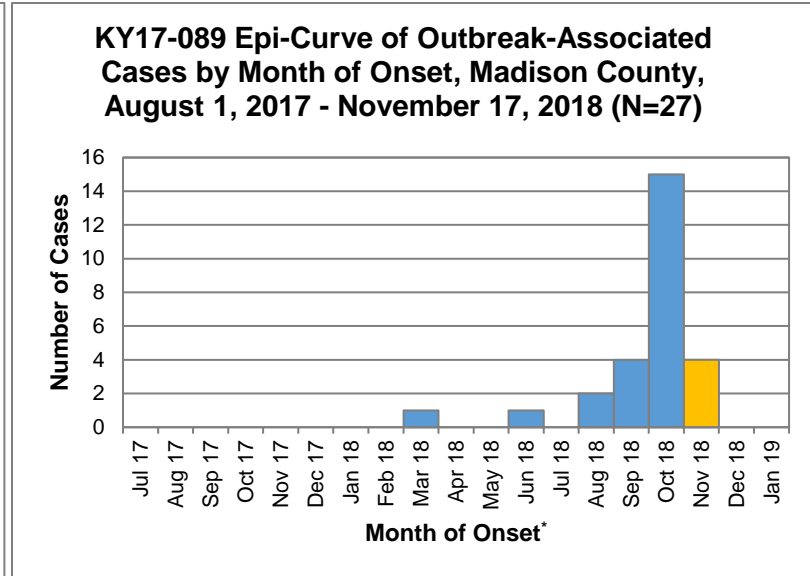
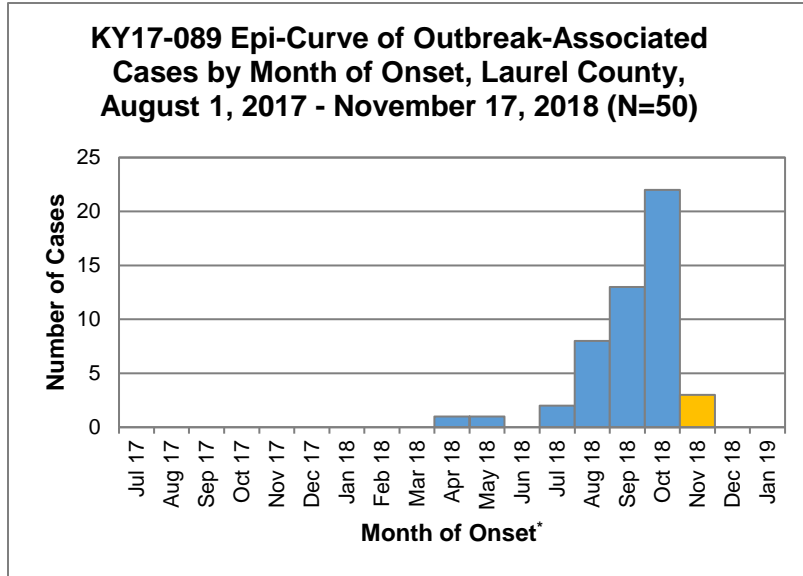


Figures 16-19: Epidemic-curves (Epi-Curves) of Outbreak-Associated Cases in Counties with at least 10 reported cases in the last 50 days, by Month of Onset (Jefferson, Johnson, Kenton, and Knox Counties)

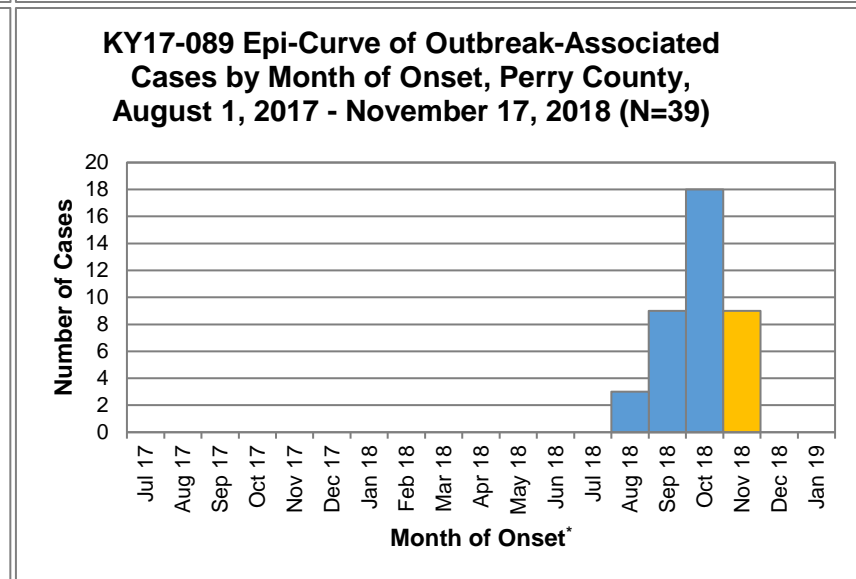
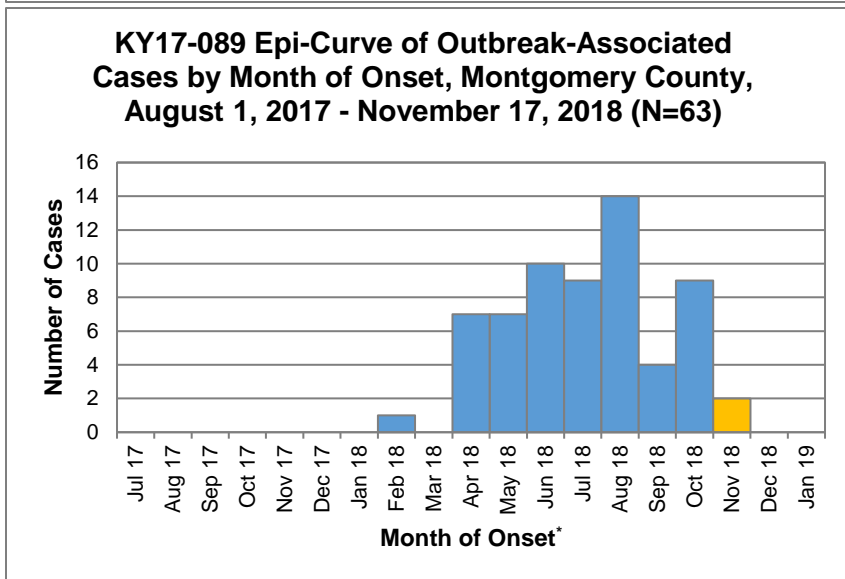
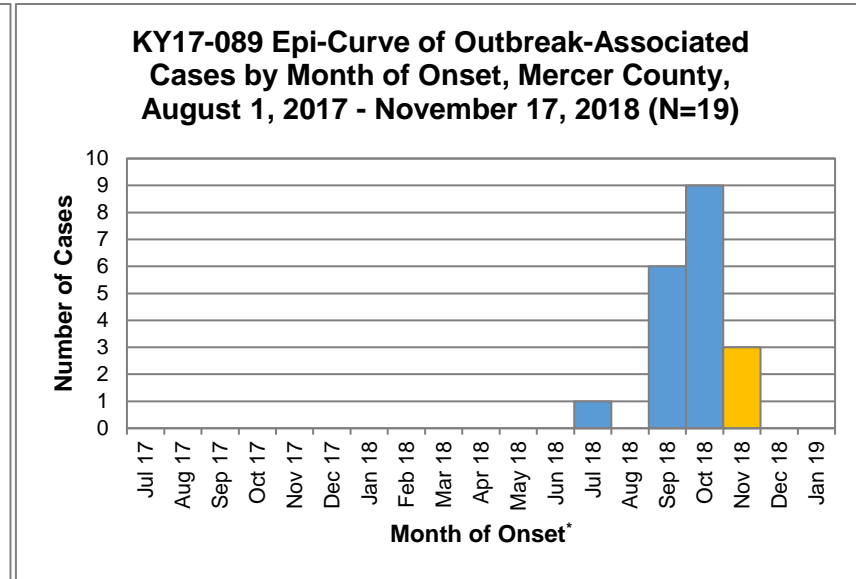
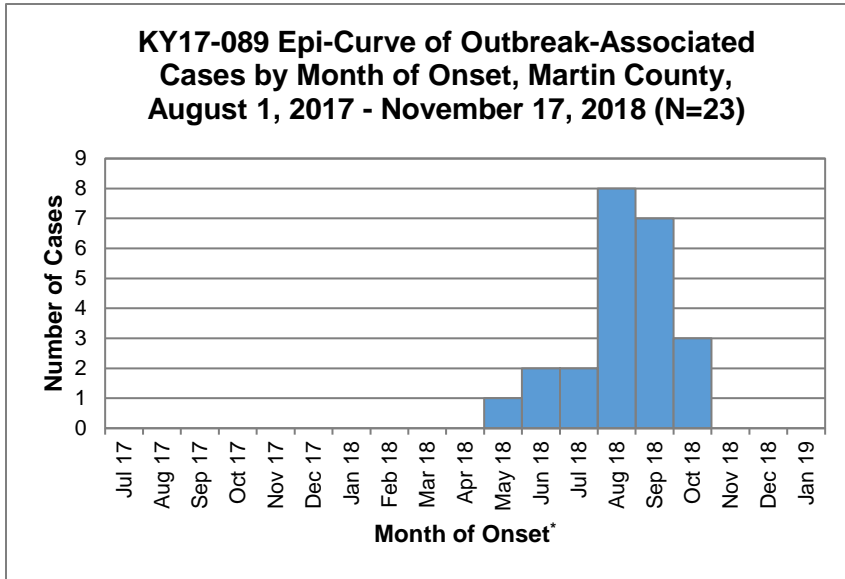




**Figures 20-23: Epidemic-curves (Epi-Curves) of Outbreak-Associated Cases in Counties with at least 10 reported cases in the last 50 days, by Month of Onset (Laurel, Madison, Magoffin, and Marion Counties)**



**Figures 24-27: Epidemic-curves (Epi-Curves) of Outbreak-Associated Cases in Counties with at least 10 reported cases in the last 50 days, by Month of Onset (Martin, Mercer, Montgomery, and Perry Counties)**



**Figures 28-30: Epidemic-curves (Epi-Curves) of Outbreak-Associated Cases in Counties with at least 10 reported cases in the last 50 days, by Month of Onset (Pike, Taylor, and Whitley Counties)**

