



**Kentucky Department for Public Health**  
**KY17-089 - Acute Hepatitis A Outbreak Weekly Report**  
**Morbidity and Mortality Weekly Report (MMWR) Week 42, 2018**  
**October 14, 2018 – October 20, 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 42:		Total Case Counts: 8/1/2017 – 10/20/2018:	
<b>Number of new cases (n=82):</b>	<b>Confirmed<sup>^</sup> - 0 Probable - 57 Suspected - 25</b>	<b>Total number of cases (n=2275):</b>	<b>Confirmed<sup>^</sup> - 565 Probable - 1134 Suspected - 576</b>
<b>Number of counties with new cases:</b>	<b>34</b>	<b>Total number of counties with cases:</b>	<b>94 (78% 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>605 (27%)</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>551 (91% of those tested)</b>
<b>Number of Hospitalizations:</b>	<b>28</b>	<b>Total Number of Hospitalizations:</b>	<b>1209 (53%)</b>
<b>Number of deaths Reported<sup>†</sup>:</b>	<b>0</b>	<b>Total number of deaths reported<sup>†</sup>:</b>	<b>14 (&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 – October 20, 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	2	0	1	1	10.3
Allen	20	3	13	4	95.5
Anderson	11	0	8	3	48.8
Ballard	9	4	2	3	112.0
Barren	4	1	3	0	9.1
Bath	20	0	7	13	161.6
Bell	4	0	1	3	14.9
Boone	25	1	15	9	19.1
Bourbon	3	0	3	0	15.0
Boyd	159	98	35	26	331.4
Boyle	6	0	1	5	20.1
Breathitt	1	0	1	0	7.7
Bullitt	63	30	23	10	78.5
Butler	3	0	1	2	23.4
Campbell	36	1	31	4	38.9
Carlisle	1	0	1	0	20.6
Carroll	3	0	0	3	28.0
Carter	126	41	63	22	464.2
Casey	5	1	3	1	31.7
Christian	1	1	0	0	1.4
Clark	18	0	12	6	49.9
Clay	9	0	5	4	44.2

**KY17-089 Distribution Of Outbreak-Associated Acute Hepatitis A Cases,  
by County, August 1, 2017 – October 20, 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	3	0	2	1	3.0
Edmonson	1	0	1	0	8.2
Elliott	19	1	4	14	252.6
Estill	4	0	3	1	28.0
Fayette	29	2	20	7	9.0
Fleming	3	0	0	3	20.8
Floyd	59	0	34	25	162.7
Franklin	28	0	22	6	55.5
Gallatin	2	0	1	1	22.8
Garrard	4	0	2	2	22.8
Grant	29	3	21	5	116.1
Grayson	24	2	19	3	91.1
Green	3	0	3	0	27.1
Greenup	57	28	18	11	160.5
Hardin	30	7	6	17	27.8
Harrison	2	0	2	0	10.6
Hart	1	0	1	0	5.3
Henry	10	3	5	2	62.5
Hickman	1	0	0	1	22.1
Hopkins	1	0	0	1	2.2
Jackson	4	0	3	1	29.8
Jefferson	629	292	227	110	81.6
Jessamine	3	0	1	2	5.6

**KY17-089 Distribution Of Outbreak-Associated Acute Hepatitis A Cases,  
by County, August 1, 2017 – October 20, 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	30	0	15	15	141.6
Kenton	44	2	39	3	29.0
Knott	13	1	9	3	85.0
Knox	26	0	16	10	102.5
Larue	3	0	1	2	21.1
Laurel	44	0	36	8	73.1
Lawrence	19	3	11	5	120.9
Lee	7	0	7	0	106.5
Leslie	6	0	4	2	58.1
Letcher	2	0	1	1	9.0
Lewis	5	0	3	2	37.5
Lincoln	6	2	2	2	24.5
Logan	1	0	1	0	3.7
Madison	23	1	17	5	25.2
Magoffin	30	0	19	11	239.3
Marion	19	2	13	4	98.0
Marshall	2	0	1	1	6.4
Martin	31	0	21	10	270.7
Mason	2	0	2	0	11.6
McCracken	8	2	3	3	12.2
Meade	12	1	1	10	42.6
Menifee	15	0	10	5	232.4
Mercer	9	0	6	3	41.8

**KY17-089 Distribution Of Outbreak-Associated Acute Hepatitis A Cases,  
by County, August 1, 2017 – October 20, 2018\*<sup>^</sup>#**

<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>
Metcalfe	1	0	1	0	9.9
Montgomery	67	5	47	15	239.9
Morgan	13	0	10	3	98.6
Nelson	14	4	5	5	30.7
Nicholas <sup>^</sup>	1	0	0	1	14.0
Ohio	6	0	3	3	24.8
Oldham	9	3	3	3	13.6
Owen	4	0	4	0	37.2
Owsley	1	0	1	0	22.5
Pendleton	4	0	2	2	27.4
Perry	25	0	15	10	94.2
Pike	11	0	10	1	18.7
Powell	9	0	7	2	72.7
Pulaski	4	0	2	2	6.2
Rowan	42	0	26	16	171.3
Russell	1	0	0	1	5.6
Scott	3	0	0	3	5.5
Shelby	20	5	11	4	42.2
Simpson	6	0	6	0	33.1
Spencer	5	3	1	1	27.0
Taylor	37	2	27	8	145.3
Warren	25	7	14	4	19.4
Washington	5	0	3	2	41.2

**KY17-089 Distribution Of Outbreak-Associated Acute Hepatitis A Cases,  
by County, August 1, 2017 – October 20, 2018\*<sup>^</sup>#**

<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>
Whitley	109	3	59	47	301.0
Wolfe	8	0	6	2	110.1
Woodford <sup>^</sup>	1	0	0	1	3.8
<b>Total Number of Cases:</b>	<b>2275</b>	<b>565</b>	<b>1134</b>	<b>576</b>	<b>51.1</b>

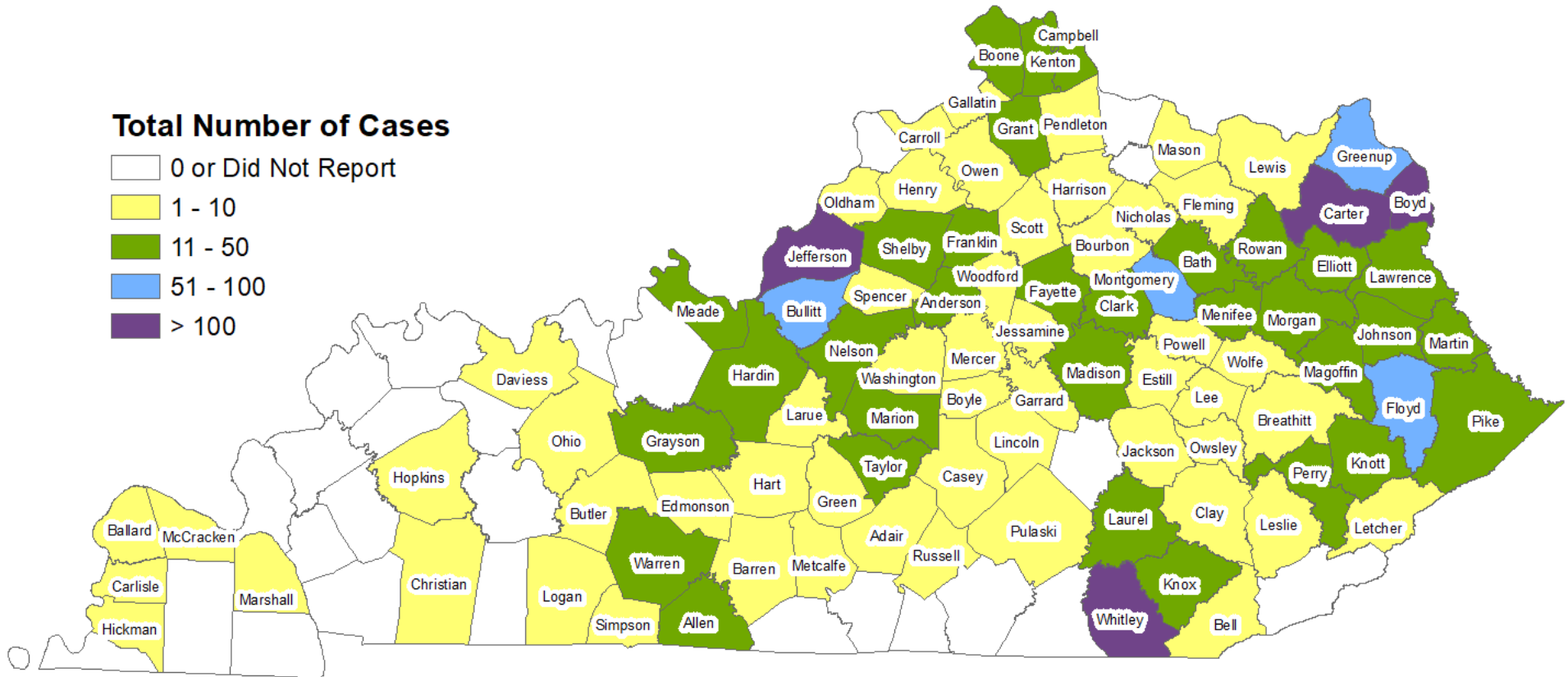
\* Cases are reported based on date of specimen collection.

<sup>^</sup> 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 - October 20, 2018**

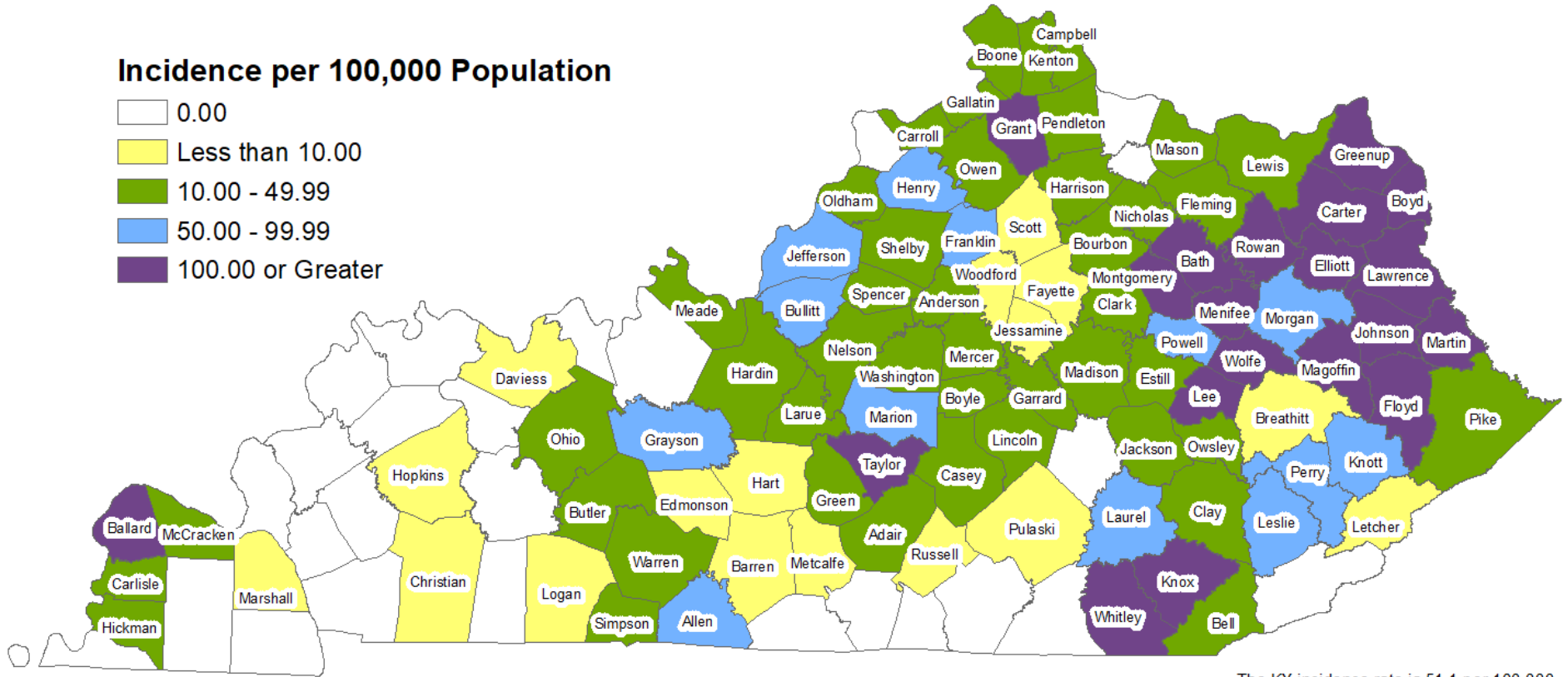


**n = 94 counties with outbreak-associated cases**

**Counties where cases have not previously been identified: Nicholas, Woodford.**

Figure 2: Incidence of Outbreak-Associated Cases by County

### KY17-089 Incidence of Outbreak-Associated Acute Hepatitis A Cases by County, August 1, 2017 - October 20, 2018

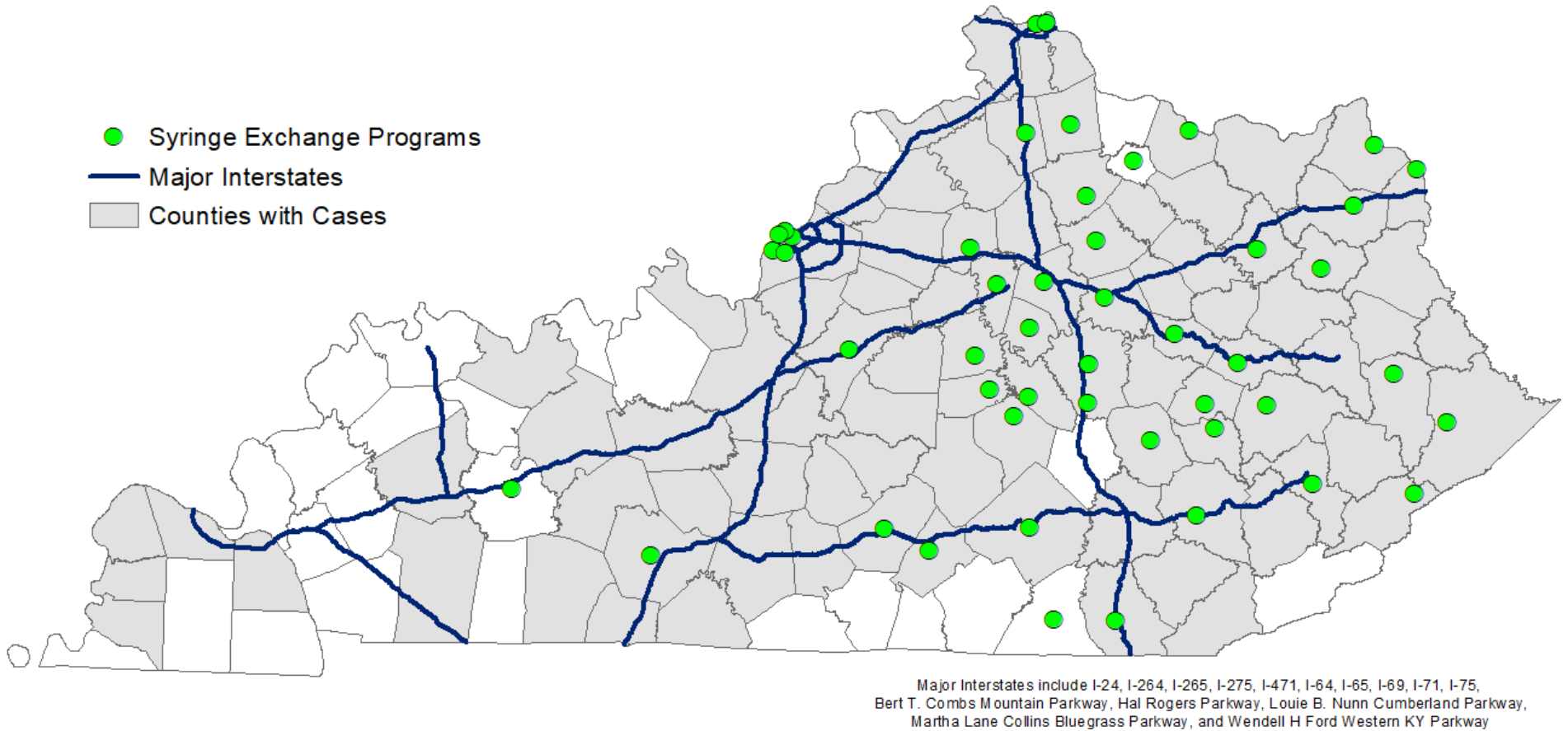


The KY incidence rate is 51.1 per 100,000.  
Note: Rates calculated from numerators less than 20 may not be reliably used to determine trends.

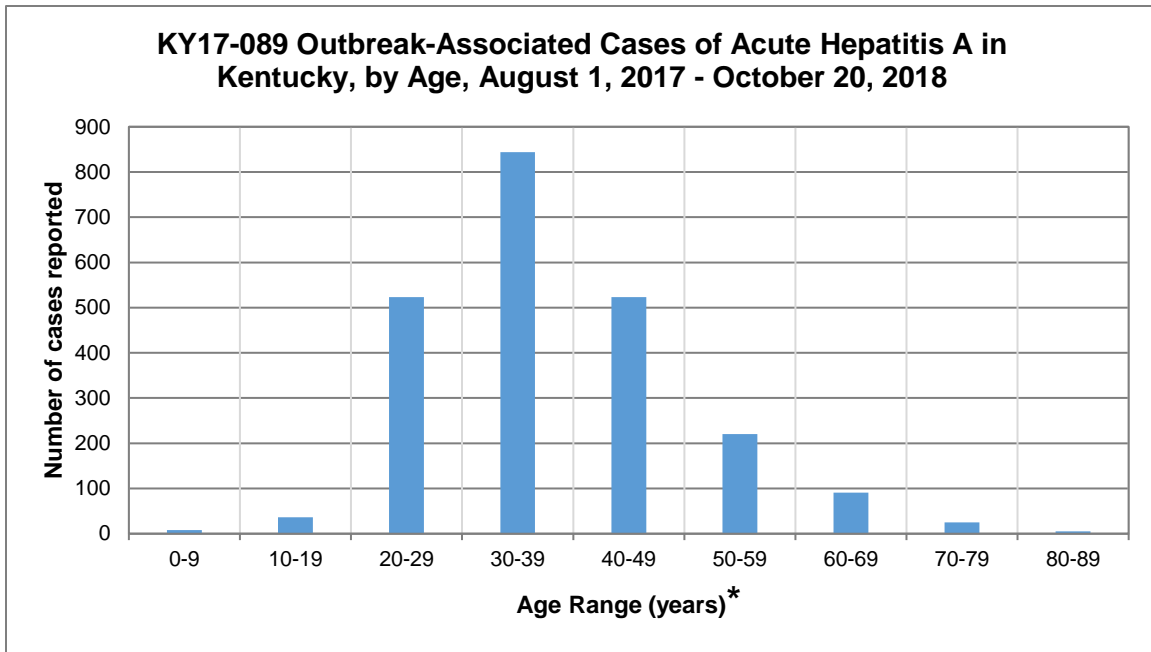


Figure 3: Major Interstates and Syringe Exchange Programs in Counties Reporting Outbreak-Associated Cases

# KY17-089 Major Interstates and Syringe Exchange Programs in Counties Reporting Outbreak-Associated Acute Hepatitis A Cases, August 1, 2017 - October 20, 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 – October 20, 2018 <sup>#^</sup>	
Risk Factor	Number of Cases Reporting Risk Factor (n=1867) <sup>* †</sup>
Homelessness + No/Unk Illicit Drug Use	40 (2%)
Illicit Drug Use + No/Unk Homelessness	1209 (65%)
Homelessness + Illicit drug use	213 (11%)
No Outbreak-Related Risk Factors	405 (22%)

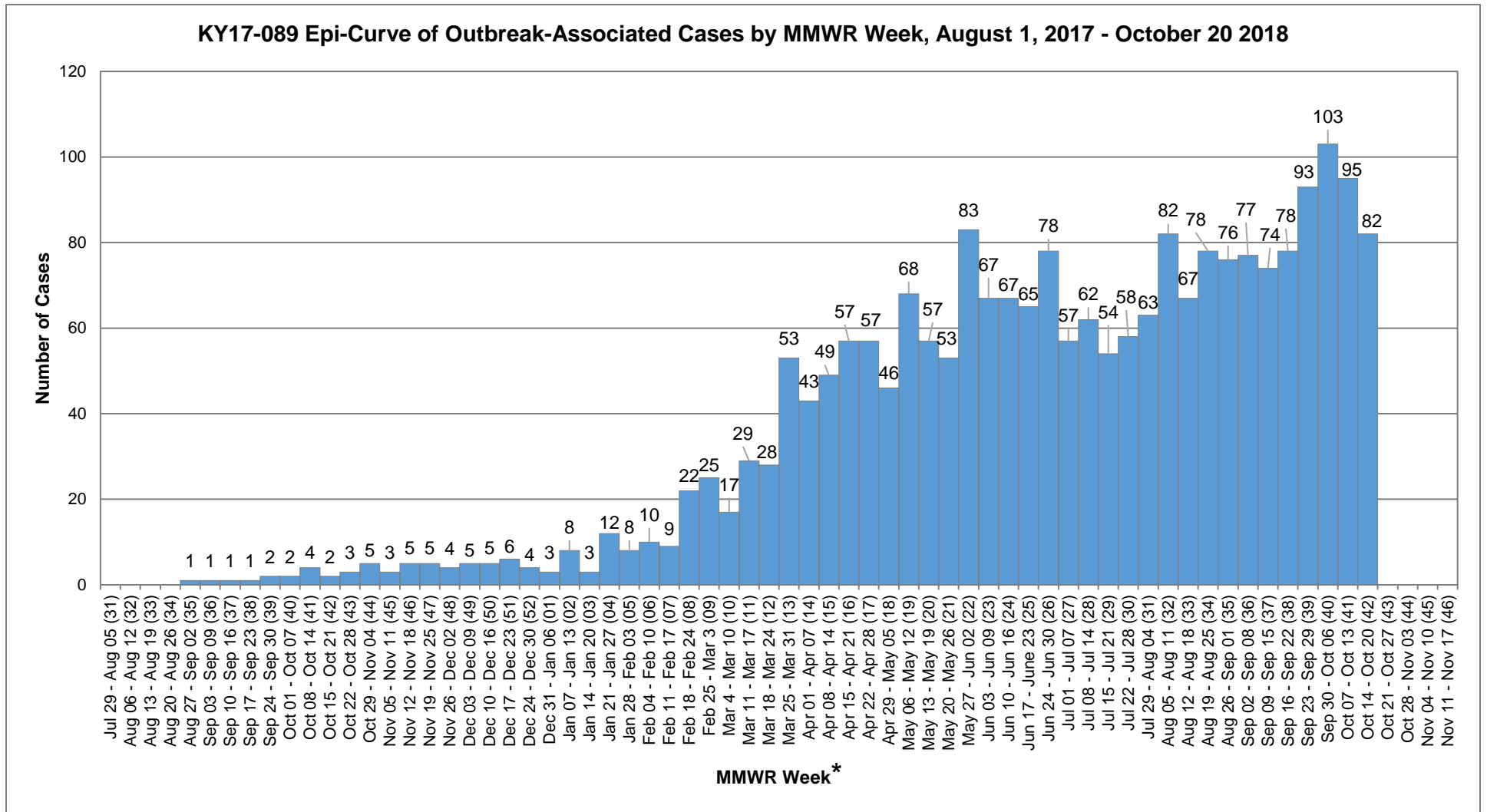
\* Risk factor information is unavailable for 408 (17.9%) of all outbreak-associated cases.

† 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.

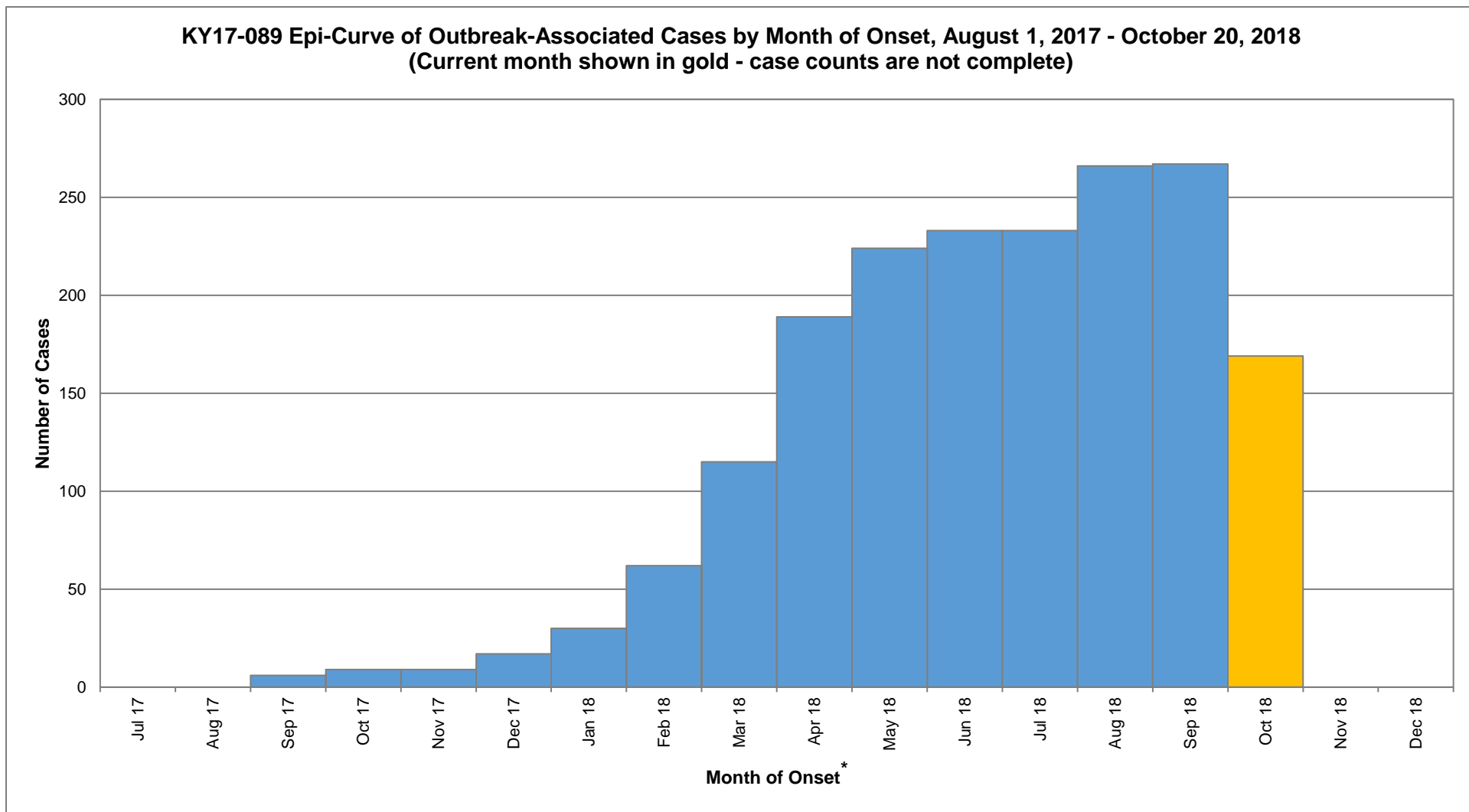
^ 31 MSM cases have been reported. Of those, 9 have reported no other risk factors.

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



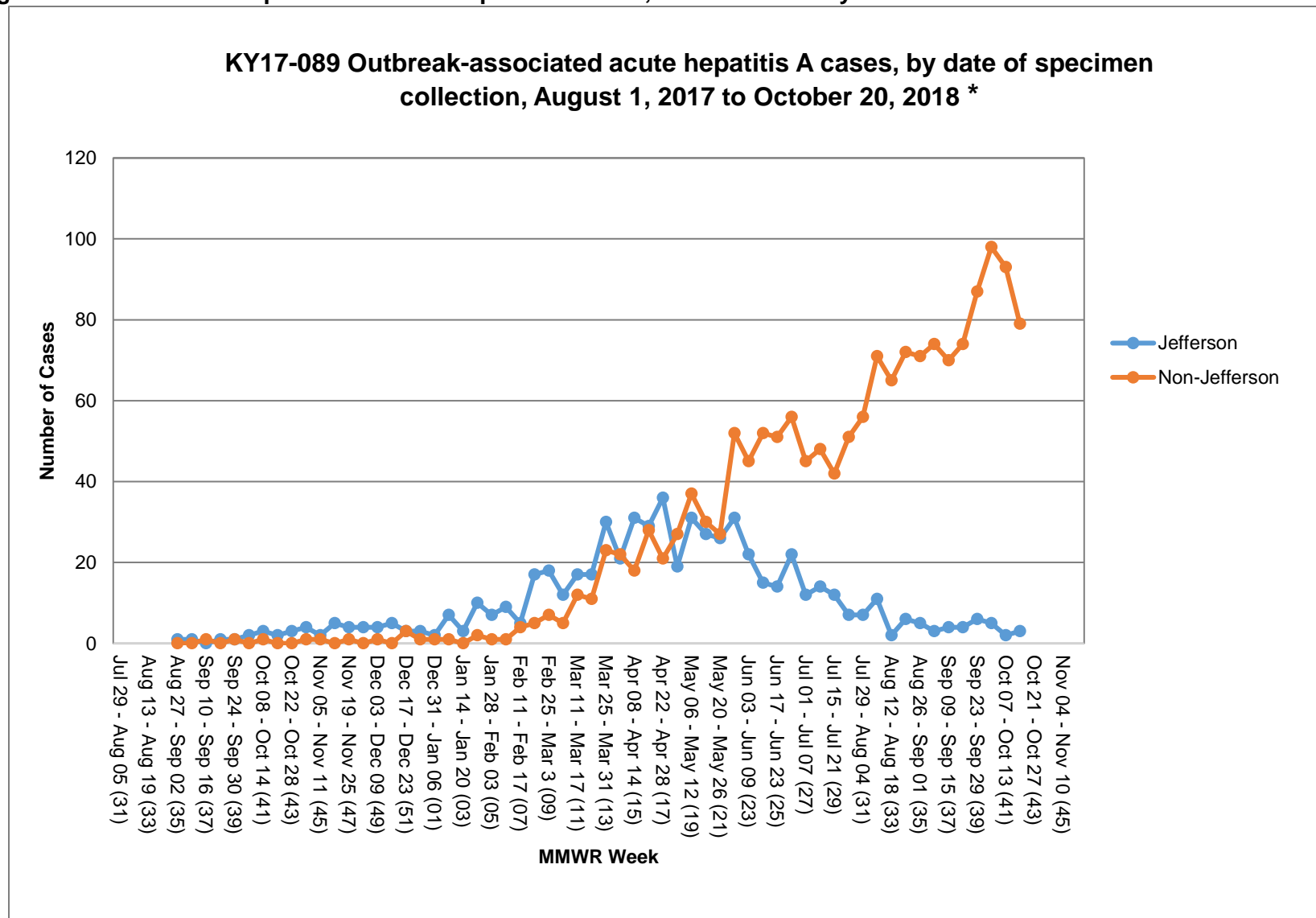
\* MMWR weeks are based on date of specimen collection.

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



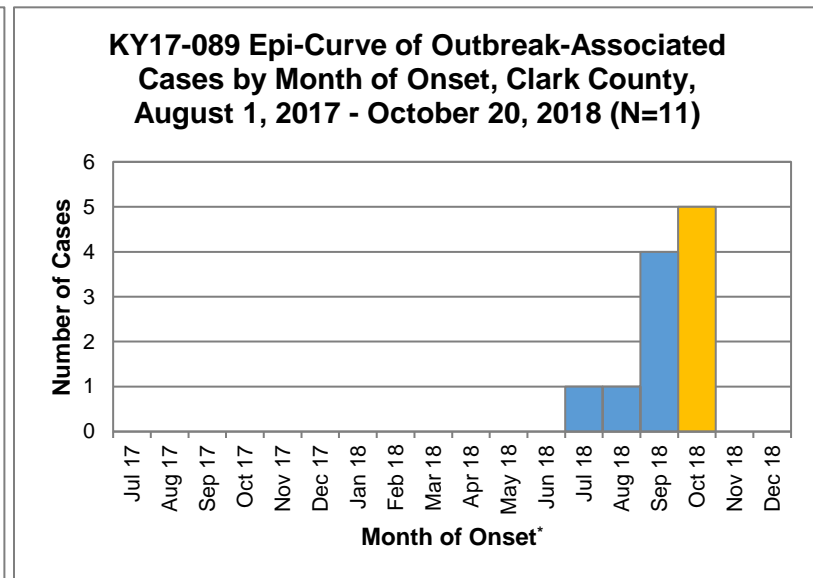
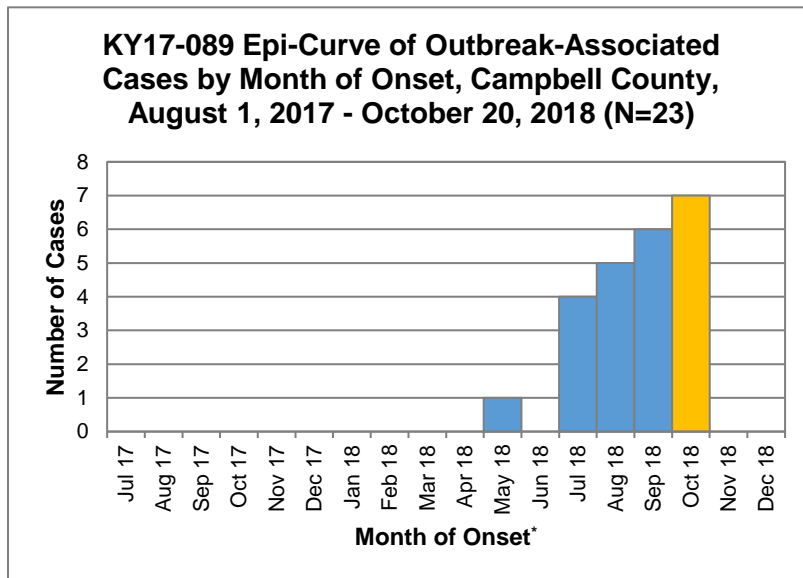
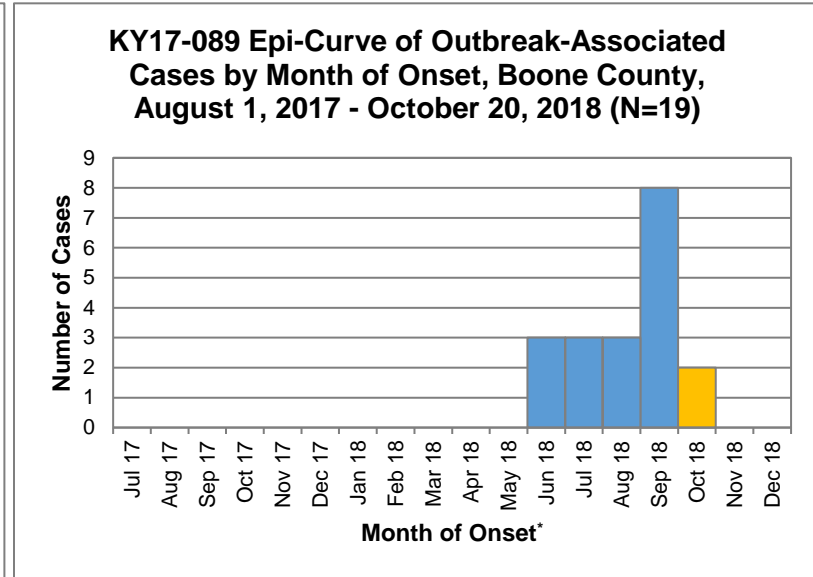
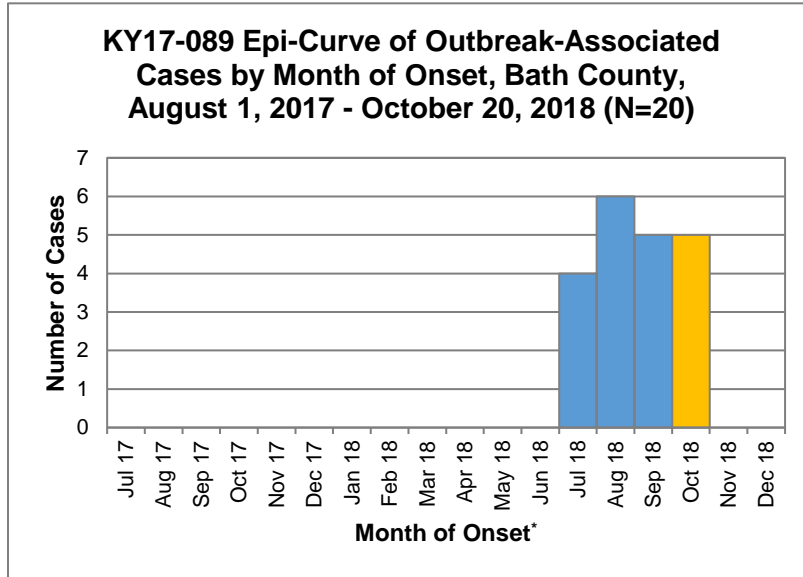
\* Date of onset has been reported for 80.4% (or 1829/2275) of cases.

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

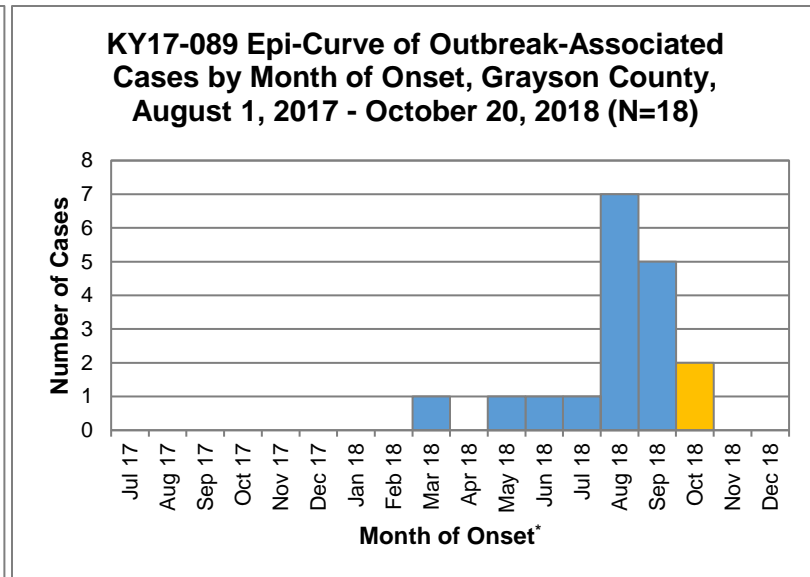
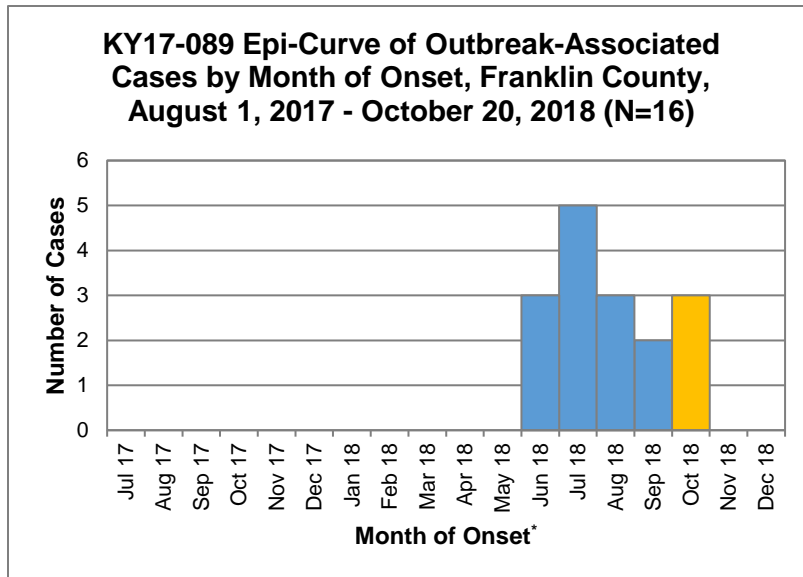
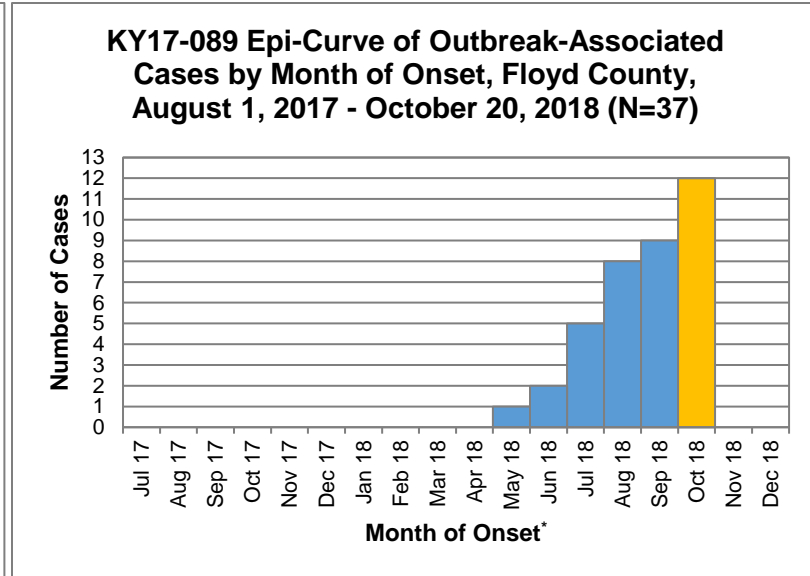
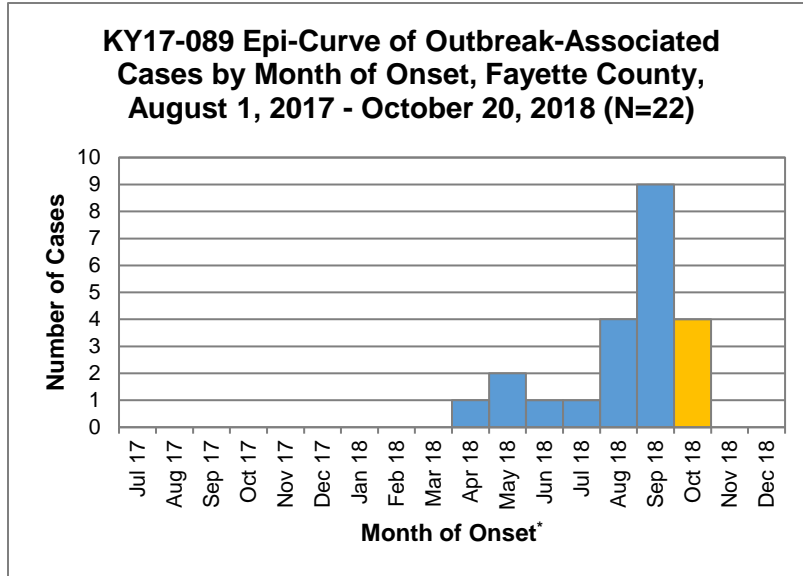


\* MMWR weeks are based on date of specimen collection.

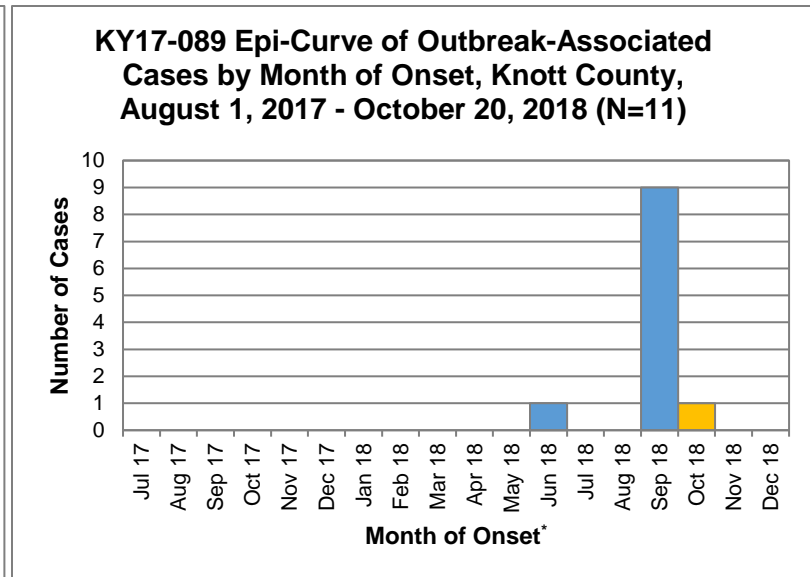
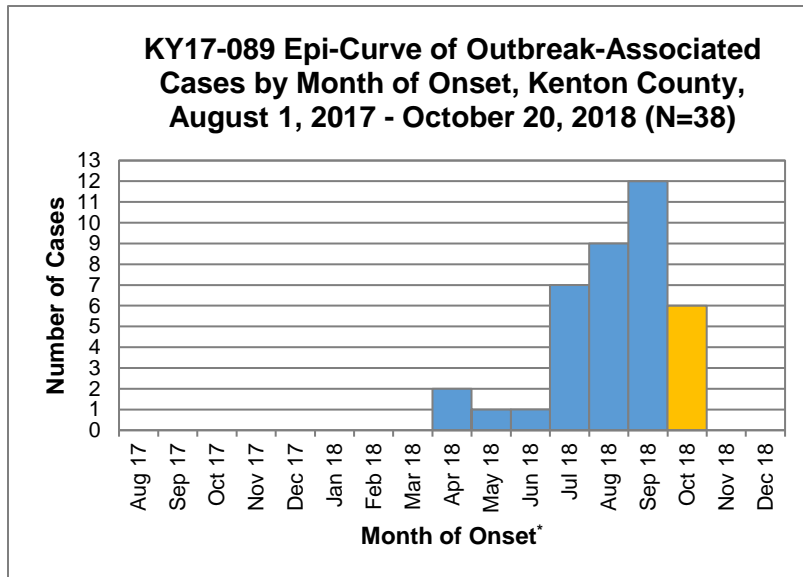
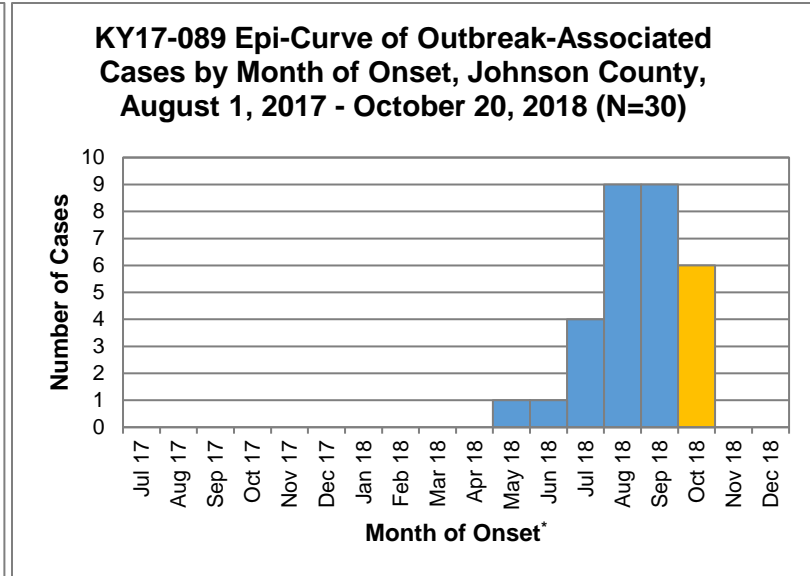
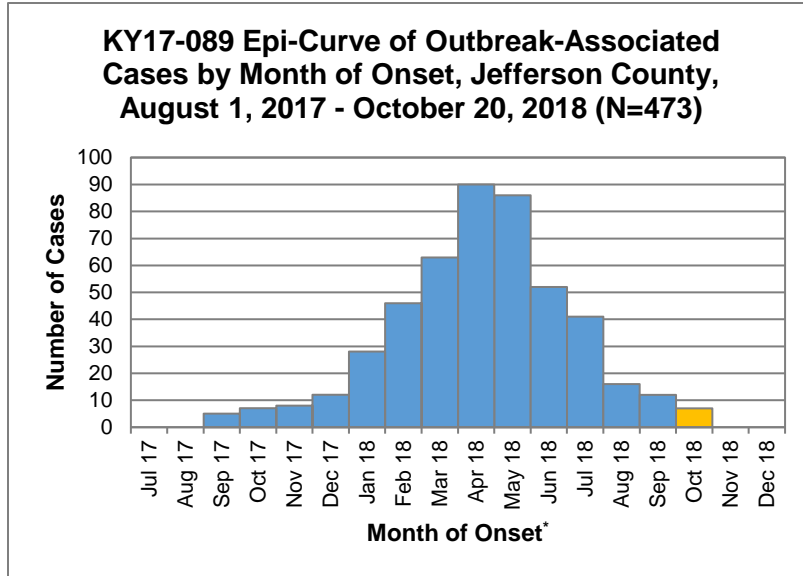
**Figures 8-11: Epidemic-curves (Epi-Curves) of Outbreak-Associated Cases in Counties with at least 10 reported cases in the last 50 days, by Month of Onset (Bath, Boone, Campbell, and Clark Counties)**



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 (Fayette, Floyd, Franklin, and Grayson Counties)

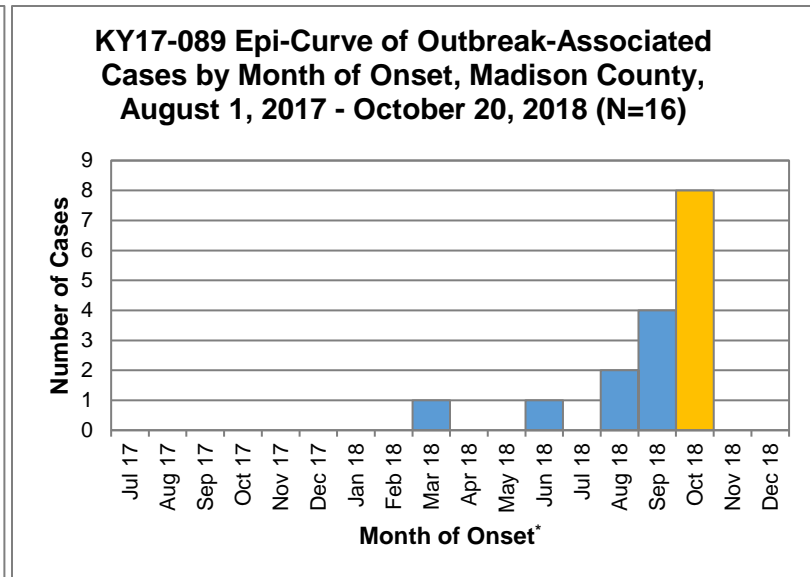
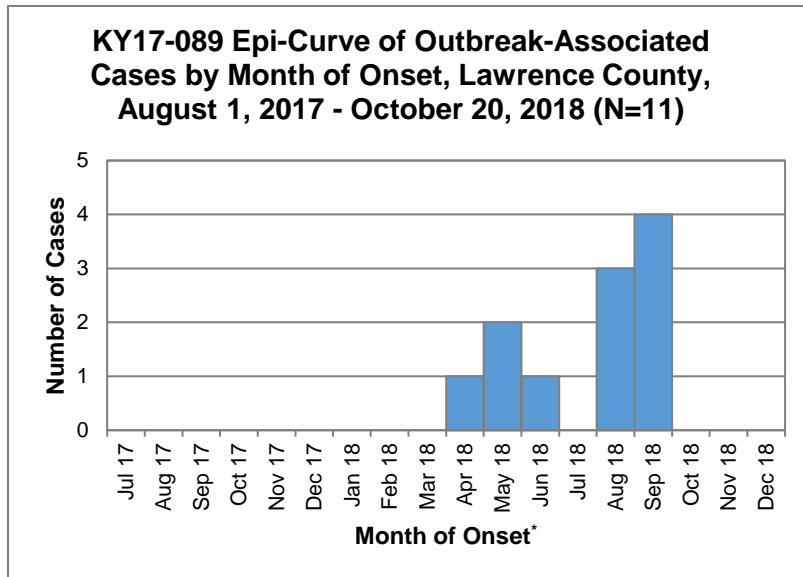
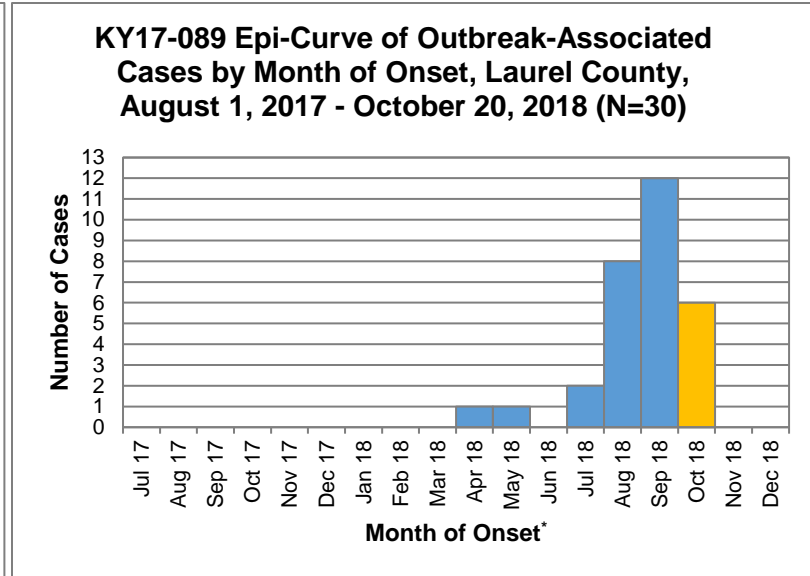
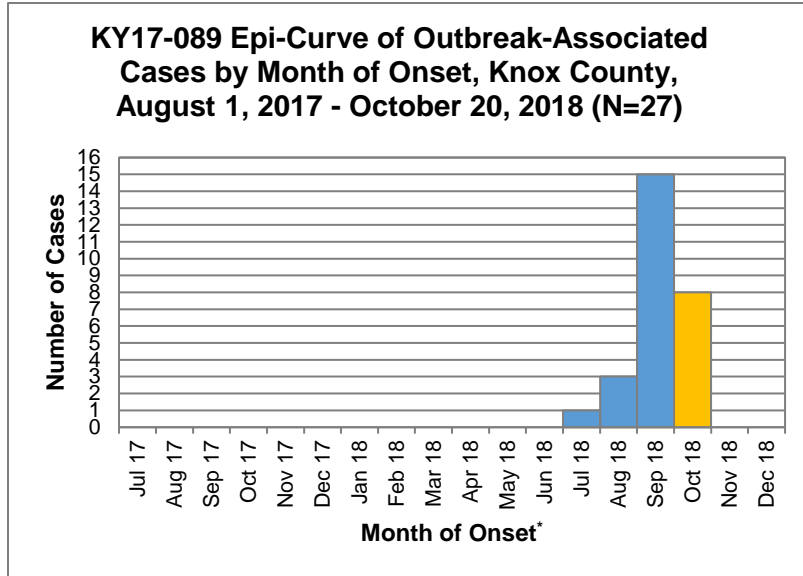


Figures 16-19: Epidemic-curves (Epi-Curves) of Outbreak-Associated Cases in Counties with at least 10 reported cases in the last 50 days, by Month of Onset (Jefferson, Johnson, Kenton, and Knott Counties)

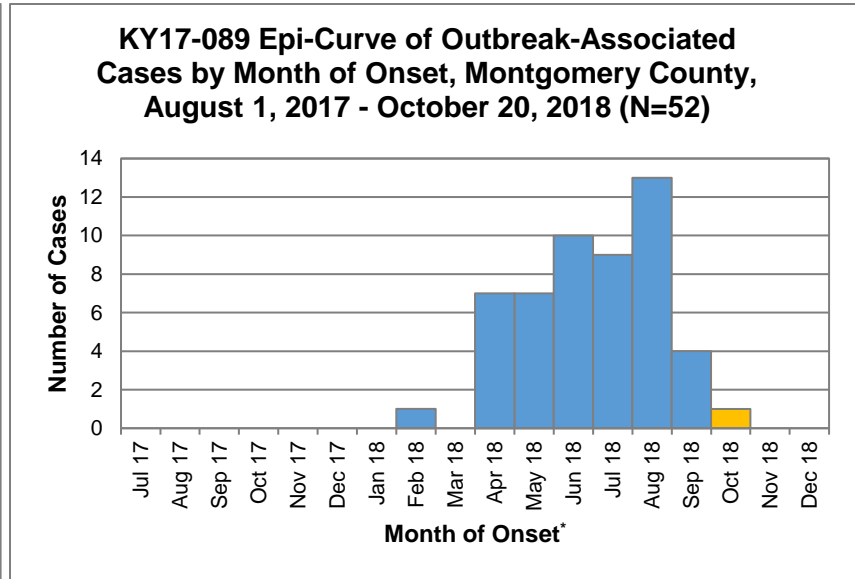
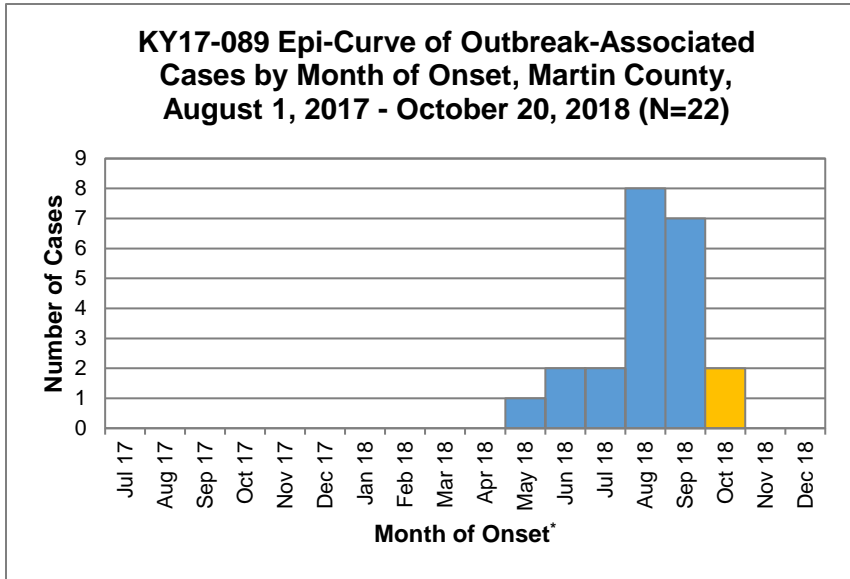
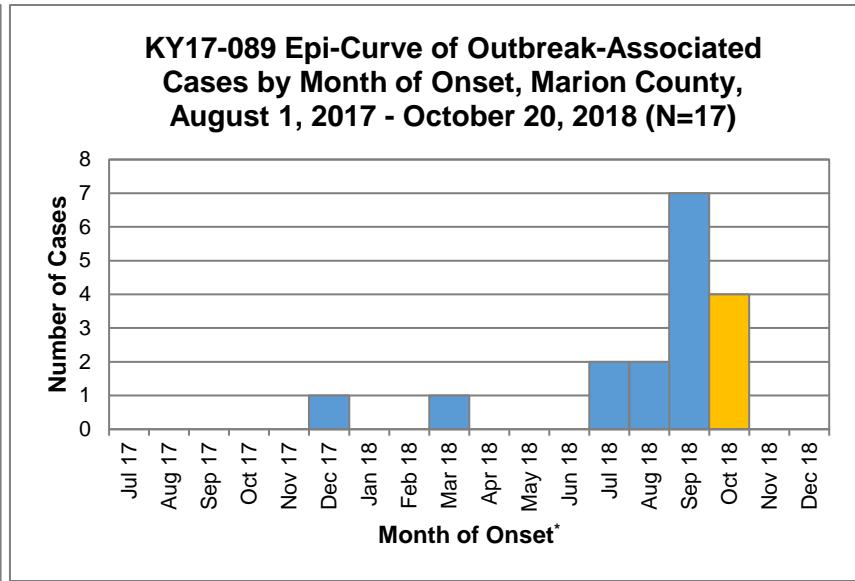
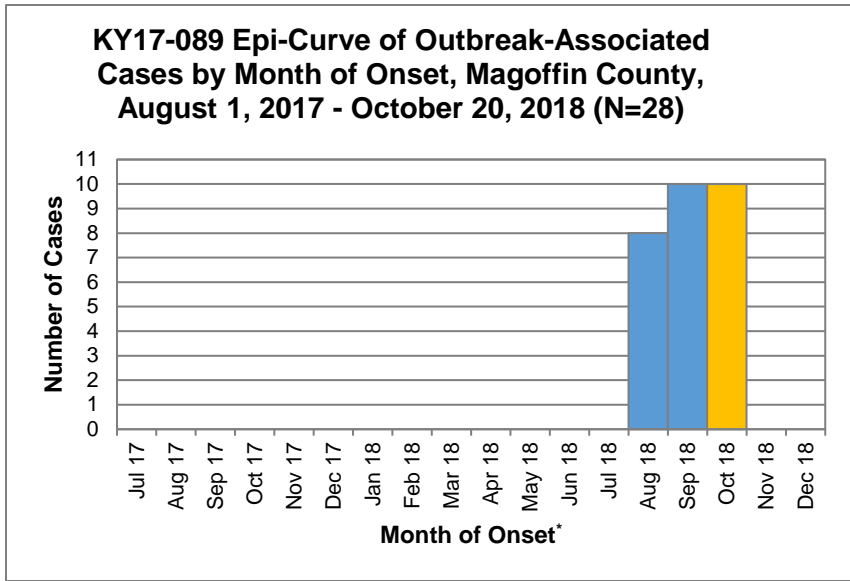




**Figures 20-23: Epidemic-curves (Epi-Curves) of Outbreak-Associated Cases in Counties with at least 10 reported cases in the last 50 days, by Month of Onset (Knox, Laurel, Lawrence, and Madison Counties)**



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 (Magoffin, Marion, Martin, and Montgomery Counties)



Figures 28-31: 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 (Perry, Rowan, Taylor, and Whitley Counties)

