LOS ANGELES COUNTY HEPATITIS A OUTBREAK AMONG PERSONS EXPERIENCING HOMELESS OR USING ILLICIT DRUG

BACKGROUND

In 2017, Los Angeles County (LAC) experienced an outbreak of hepatitis A virus (HAV) occurring primarily among persons experiencing homelessness or with illicit drug use (IDU). This outbreak occurred in the context of several other large outbreaks in California[1] and nationally.[2] The largest hepatitis A outbreak in California occurred in San Diego County, where the outbreak began in March of 2017 and resulted in 582 confirmed cases by the time the local health emergency ended in January 2018 and mostly involved persons experiencing homelessness or IDU.

Given the proximity to San Diego County and the extensive travel between LAC and San Diego, the LAC Department of Public Health (DPH) closely monitored for potential HAV introduction and spread in LAC. In July 2017, hepatitis A illness was identified in two homeless persons in LAC who had lived in San Diego at the time of acquiring the virus. A health advisory was released to inform healthcare professionals.[3] In September 2017, HAV also was identified in two LAC residents experiencing homelessness who did not have any links to an outbreak-associated region. Because this possibly indicated local HAV transmission LAC DPH declared a local outbreak of hepatitis A and a health alert was issued.[4] Subsequently, LAC DPH held a webinar[5] in November and issued a health alert update in March 2018.[6]

The Incident Command System (ICS) was activated to coordinate the LAC DPH hepatitis A outbreak response. The ICS leadership identified 4 strategies for controlling the outbreak:

1. Enhancing surveillance and case containment
2. Increasing vaccination
3. Improving sanitation
4. Educating community and stakeholders

The primary objective of this report is to describe the epidemiology of the hepatitis A outbreak cases identified through enhanced surveillance in LAC in 2017. Secondarily, the report will briefly summarize results of the activities to increase vaccination, sanitation, and education.

METHODS

Enhanced Surveillance

The Acute Communicable Disease Control Program of LAC DPH initiated enhanced surveillance to identify acute HAV cases among the homeless and drug using populations from June through December 2017.

[1] https://www.cdph.ca.gov/Programs/CID/DCDC/Pages/Immunization/Hepatitis-A-Outbreak.aspx
[2] https://www.cdc.gov/hepatitis/outbreaks/2017March-HepatitisA.htm
[3] http://publichealth.lacounty.gov/eprp/Health%20Alerts/DPH%20HAN%20Hep%20A%207.31.17%20LAHAN%20revised.pdf
[4] http://publichealth.lacounty.gov/eprp/Health%20Alerts/DPH%20HAN%20Hep%20A%20Outbreak%20091917.pdf
[5] http://publichealth.lacounty.gov/eprp/Health%20Alerts/Hep%20A%20enduring%20webinar%20flyer%20111417.pdf
[6] http://publichealth.lacounty.gov/eprp/Health%20Alerts/HAV%20outbreak%20update%203.15.18%20final.pdf

Case Definitions

- **Minimal Criteria**: Confirmed acute hepatitis A virus (HAV) infection meets the Counsel of State and Territorial Epidemiologists (CSTE) case definitions for an acute case of hepatitis A:[7] (1) discrete onset of any sign or symptom consistent with acute viral hepatitis (fever, headache, malaise, anorexia, nausea, vomiting, diarrhea, and abdominal pain), and (2) jaundice and/or elevated serum aminotransferase levels, and (3) immunoglobulin M (IgM) antibody to hepatitis A virus (anti-HAV) positive.
- **Confirmed Outbreak Case**: A person who meets the CSTE clinical case definition and is laboratory confirmed, OR, a case that meets the clinical case definition and occurs in a person who has an epidemiologic link with a person who has laboratory-confirmed hepatitis A. Cases were either identified as homeless, homeless and using illicit drugs, men who have sex with men (MSM) and using illicit drugs, using illicit drugs or homeless secondary cases. Cases were counted if they were exposed in another county but had onset in LAC.

Case Identification

The California Code of Regulations (Title 17, Section 2500) requires healthcare providers to report acute hepatitis A cases within one working day of identification.[8] In addition, most LAC clinical laboratories automatically report positive hepatitis A IgM antibody tests via the electronic laboratory reporting (ELR) system.

In response to the outbreak, providers were requested to immediately report suspected/confirmed hepatitis A in a person experiencing homeless to facilitate:

- timely interview by LAC DPH staff before cases are discharged to the street and potentially lost to follow-up,
- identification of contacts who could benefit from preventive therapy, and
- case placement in a recuperative care facility during the infectious period to prevent further disease transmission.

Case Investigation

A supplemental form was created for interviewing persons experiencing homelessness or using illicit drugs. It was expected that data from the supplemental forms could guide the ICS leadership response to the outbreak by better defining the epidemiology of outbreak-associated cases and characterizing risk factors for disease.

Laboratory Testing

Clinical laboratories were contacted to determine if serum samples were available for all confirmed cases identified as homeless and/or using illicit drugs. If available, specimens were submitted to the LAC Public Health Laboratory (PHL) for shipment to the California Viral and Rickettsial Disease Laboratory (VRDL) for confirmation and genetic sequencing of HAV.

[7] https://wwwn.cdc.gov/nndss/conditions/hepatitis-a-acute/case-definition/2012/
[8] http://publichealth.lacounty.gov/acd/docs/ReportableDiseaseListSept2018.pdf

Vaccination Outreach

Increasing the proportion of the at-risk population immune to hepatitis A through vaccination was identified as the best tool for preventing hepatitis A illness and decreasing HAV transmission. Vaccinations were included as a service provided by LAC DPH supported street outreach teams targeting homeless persons. Vaccination was also promoted to persons who had close frequent contact with homeless people including first responders, persons who serve food to the homeless, and sanitation personnel. The LAC jail systems offered vaccine to new inmates. LAC DPH community clinics offered vaccines at no charge to those at risk. Health insurance plans and community providers were engaged in the campaign, with the larger health plans offering hepatitis A vaccine to at-risk members at no charge through walk-in clinics. Vaccines were also distributed by LAC DPH to community providers that serve at-risk populations.

Hygiene and Sanitation Outreach

LAC includes 88 cities as well as large unincorporated areas. LAC DPH coordinated with all cities and other county departments such as the Departments of Public Works, Parks and Recreation, and the Sheriff to improve sanitation conditions for persons experiencing homelessness.

Many homeless persons in LAC have created makeshift structures and dwellings which serve as their homes, often creating these in clusters in a small area which is then recognized as a homeless encampment. Due to poor access to hygiene facilities, living in a homeless encampment can serve as a major risk factor to acquire and transmit HAV. LAC DPH, in partnership with Los Angeles Homeless Services Authority (LAHSA) and Department of Public Works, conducted surveys of homeless encampments throughout LAC to assess where additional toilets, showers, and hand washing facilities were most needed, and developed plans with cities to increase toilet, shower and hand washing facilities in these areas.

In close partnership with the LAHSA, LAC DPH Environmental Health (EH), inspected and provided educational materials to homeless shelters across LAC. The educational materials provided guidance on the proper cleaning of facilities and laundering of bedding to protect homeless residents from acquiring and transmitting HAV. A toolkit was developed with template resources and policies for staff at homeless shelters to support their efforts to improve sanitation conditions in their shelters. Additionally, teleconference calls were held to address real life questions and concerns among shelter providers.

Finally, since transmission of HAV among food handlers is of heightened concern, there was a concerted effort to assure that restaurants across LAC were aware of the outbreak and taking measures to reduce the risk of transmission among their workers.

Educational Outreach

The educational outreach efforts aimed to educate key community groups and stakeholders as quickly as possible. The outreaches consisted of holding in-person group meetings, sending informational letters, stakeholder targeted teleconferences, and targeted education of healthcare professionals. A major public awareness campaign was launched, including strategic engagement with the media to support broad dissemination of information, and print media advertisement throughout various public transportation

bus and rail lines to promote awareness, hand-washing and vaccination. The countywide 211 information line staff were trained, and the 211-line was used as a primary source for answering questions from the public. The engagement with media included various press briefings, teleconferences, and press releases. Educational materials targeting specific at-risk populations were prepared in English, Spanish, and other threshold languages. Examples of health education materials developed include those targeting first responders, employees with direct contact with homeless people, food handlers, and men who have sex with men. Our educational outreach materials were posted on our webpages.[9]

RESULTS

Epidemiology of Outbreak Cases

From May 1 to December 31, 2017, 17 total outbreak cases were identified that met the confirmed case definition (**Table 1**). The first identified outbreak-associated case had symptom onset during the week of May 28 and the last case had symptom onset during the week of December 17. Of the 17 outbreak-associated cases that developed symptoms while in LAC, 13 were LAC residents with three being secondary cases identified as part of outbreak at a mental health hospital (**Table 1**). Three IDU cases also identified as men who have sex with men (MSM). The median age of all cases was 36 years (minimum-maximum: 24-64 years); 15 (88%) were male; 14 (82%) cases were white (**Table 2**). Most cases were from SPA 4 (n=7, 41%) and SPA 7 (n=5, 29%), 11 (65%) cases were hospitalized, and there were no deaths.

Table 1. Confirmed Outbreak-Associated Hepatitis A Cases in LA County, May 1 to December 31, 2017 (N=17)

	LAC Residents, n	Non-LAC Residents, n	Total, n (%)
Homeless	4	1	5 (29%)
Homeless_IDU	2	3	5 (29%)
IDU	1	0	1 (6%)
IDU_MSM	3	0	3 (18%)
Secondary cases[a]	3	0	3 (18%)

Abbreviations: IDU, illicit drug use; MSM, men who have sex with men

[a] Associated with an outbreak-associated homeless case

[9] http://publichealth.lacounty.gov/acd/Diseases/HepA/Materials.htm

Table 2.
Demographics of Confirmed
Outbreak-Associated Hepatitis A Cases
LAC, May 1–December 31, 2017
(N=17)

Demographics	No.	%
Age group (years)		
15-34	6	35%
35-44	6	35%
45-54	3	18%
55-64	2	12%
Gender		
Female	15	88%
Male	2	12%
Race/Ethnicity		
Asian	0	0%
Black	0	0%
Hispanic	2	12%
White	14	82%
Unknown	1	6%

Laboratory Results

Of the 17 outbreak-associated cases, serologic specimens were available for 13 cases to send to VDRL for serologic confirmation and viral sequencing. Of the 13 cases with specimens provided to VDRL for testing, 10 cases had genotype 1b (the genotype associated with the San Diego outbreak), two cases were 1a, and virus was not detected for one case (specimen was drawn more than 4 weeks after onset). All ten genotype 1b genotype cases were homeless (**Table 3**).

Table 3.
Hepatitis A Outbreak Cases Among Homeless and Illicit Drug Users Genotype Results
LAC 2017
(N=17)

	Genotype Test Results			
Risk Group	Genotype 1b No.	Genotype 1A No.	Negative No.	No Specimen No.
Homeless	2	0	1	2
Homeless and IDU	5	0	0	0
IDU	0	1	0	0
IDU and MSM	0	1	0	2
Secondary Cases*	3	0	0	0
TOTAL	**10**	**2**	**1**	**4**

*Linked to an outbreak-associated homeless case.

Vaccination Outreach

LAC DPH conducted 486 vaccination outreaches, including 297 that targeted homeless populations, 28 at substance use treatment centers, 82 for first responders, and 14 at the jails. A total of 33,866 hepatitis A vaccine doses were either administered by LAC DPH (12,393 doses) or distributed to community partners (14,800 doses) to administer to at-risk persons. During the outbreak response, hepatitis A doses were administered for 7,395 for homeless persons, 777 for persons at substance use treatment centers, 10,964 for jail inmates and parolees, and 6,160 for first responders.

Hygiene and Sanitation Outreach

As part of the outbreak response, EH distributed hepatitis A educational flyers to over 37,000 food facilities. All homeless shelters are regularly inspected through the EH Housing and Institutions Program. A total of 52 homeless shelters were inspected during the outbreak and provided with information on hepatitis A including the importance of proper hand washing by food handlers.

Education Outreach

Immediately after declaring a local outbreak, LAC DPH engaged 17 distinct stakeholder groups, including city leaders, homeless service providers, healthcare providers, substance user disorder treatment providers, first responders including police and fire agencies, veteran's affairs agencies, schools and colleges, mental health service providers, and LGBTQ providers. Over 100,000 individual stakeholders received letters and educational information and were invited to participate in targeted teleconference calls. Additionally, over the course of the next 4 months, over 500 in-person educational training outreach sessions were conducted at various community settings, including with homeless service providers, substance use disorder providers, jails, and first responder agencies. Within the first two weeks of the response efforts, there were over 80 news print articles and 14 televised segments covering the Hepatitis A outbreak and response efforts in LAC.

DISCUSSION

The number of hepatitis A cases in persons experiencing homeless or using illicit drugs in LAC was substantially lower than the number of cases observed in San Diego. It is unclear why the hepatitis A outbreak remained contained in LAC, despite having a larger population of persons experiencing homelessness and a lower number of vaccines distributed compared with San Diego. One possible reason for the successful containment of the outbreak in LAC could be the activation of ICS early in the outbreak. The ICS structure facilitated improved coordination of the outbreak response across all relevant LAC DPH Programs, and it assisted with recruiting and targeting additional resources towards the outbreak control activities.

According to CDC, the incidence of hepatitis A among adults in the United States has increased since 2014. Paradoxically, the increased hepatitis A incidence might be a consequence of the US childhood vaccination policy. According to the National Health and Nutrition Examination Survey, the percentage of U.S. adults immune to hepatitis A infection has declined from 1999–2006 to 2009–2012. Prior to the licensure of the hepatitis A vaccine in 1995, there were regular large hepatitis A outbreaks that resulted in immunity among exposed adults. Those outbreaks ceased with universal vaccination of children for hepatitis A. As

a result, there is now a large population of adults who are not immune to hepatitis A because they were too old to benefit from the changes in childhood hepatitis A vaccine policy, but they are not old enough to have been exposed to the historic hepatitis A epidemics. The growing population of adults not immune to hepatitis A represents a population susceptible to future hepatitis A outbreaks.

Although the hepatitis A outbreak of 2017 appears to have ended, the conditions that predisposed the outbreak persist in LAC, such as the large population of persons experiencing homelessness who are not immune to hepatitis A and who do not have access adequate hygiene and sanitation services. Therefore, LAC DPH will remain vigilant for acute HAV cases and respond immediately to control potential outbreaks.