

Epidemiologic Investigation E-Cigarette or Vaping Associated Lung Injury (EVALI), Nevada 2019

December 2019

Purpose

The purpose of this report is to:

- Describe the magnitude of the ongoing EVALI outbreak
- Summarize the epidemiological investigations conducted by the Division of Public and Behavioral Health

Background

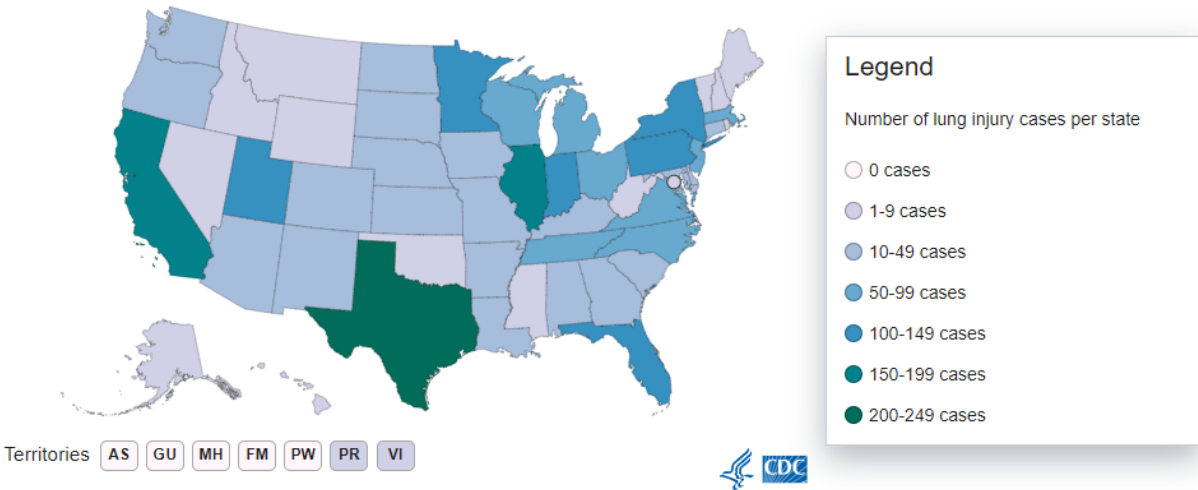
In August 2019, hospitals started to see an influx of patients presenting with pneumonia-like illness, all within a similar age-bracket, and otherwise healthy. The patients have all reported a history of using e-cigarette, or vaping products within 90 days from the onset of symptoms.

Electronic cigarettes (e-cigarettes), also called vapes, e-hookas, vape pens, tank systems, mods, and electronic nicotine devices produce an aerosol by heating liquid using containing nicotine, flavoring, and other additives. Tetrahydrocannabinol (THC) can also be used in e-cigarettes.

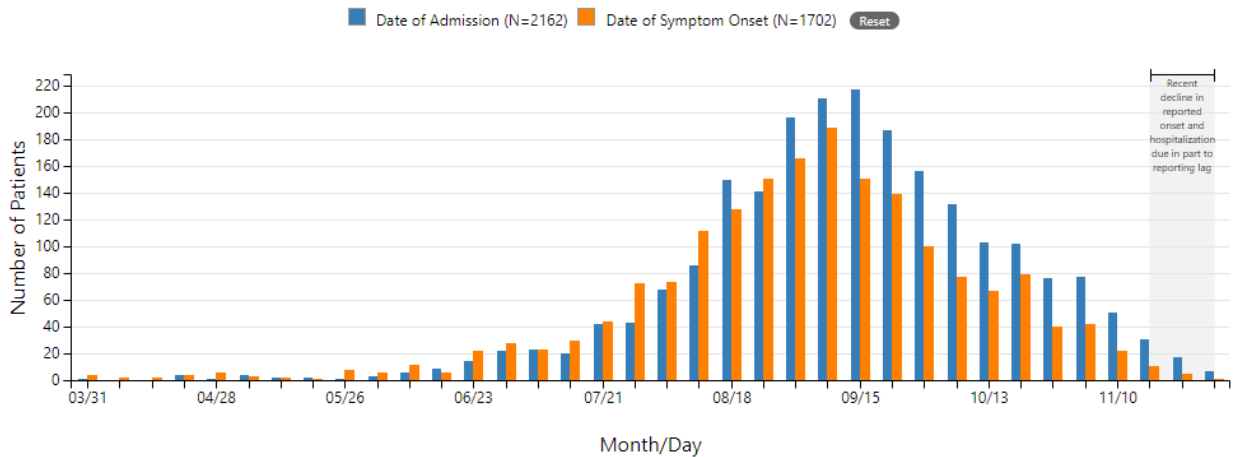
With no previous illness related to use of e-cigarette products or causal factor, the outbreak was termed E-Cigarette or Vaping Associated Lung Injury or EVALI. As of December 10, 2019, there are 2,409 hospitalized cases of EVALI from all 50 states, the District of Columbia, and two U.S. territories (Puerto Rico and U.S. Virgin Islands). There have been 52 confirmed deaths in 25 states and the District of Columbia.

EVALI Outbreak in Nevada 2019

Number of Lung Injury Cases Reported to CDC as of December 10, 2019



Dates of symptom onset and hospital admission for patients with lung injury associated with e-cigarette use, or vaping — United States, March 31–December 10, 2019



On December 18, 2019, the Division of Public and Behavioral Health (DBPH), Office of Public Health Informatics and Epidemiology (OPHIE) received the state’s sixth report of a confirmed

case of severe pulmonary disease associated with e-cigarette use. The state also has one probable case. Six confirmed cases occurred within the Southern Nevada Health District (SNHD) and the one probable case occurred within the Washoe County Health District (WCHD).

Primary Surveillance Definition

EVALI is currently considered a diagnosis of exclusion due to no specific test or marker for diagnosis. Providers should consider multiple etiologies, especially when looking at possible EVALI cases during flu season.

Clinical criteria:

Anyone who has used e-cigarettes or another vaping device in the past 90 days prior to symptom onset, pulmonary infiltrate, such as opacities, on plain film chest radiograph or ground-glass opacities on chest CT. No other evidence in medical record of alternative plausible diagnosis (e.g., cardiac, rheumatologic, or neoplastic process).

Epidemiological criteria:

Any person who has reported use of e-cigarettes or other vaping devices in the past 90 days and is experiencing fever, tachycardia, tachypnea, and hypoxemia.

Laboratory criteria:

A negative influenza polymerase chain reaction (PCR) test or rapid test, if local epidemiology supports influenza testing and all other clinically-induced respiratory infectious disease testing (e.g., urine Antigen for *Streptococcus pneumoniae* and *Legionella*, sputum culture if productive cough, bronchoalveolar lavage (BAL) culture if done, blood culture, HIV-related opportunistic respiratory infections if appropriate) are negative.

Case classification:

Confirmed: A case meeting clinical, epidemiological, and laboratory criteria.

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Probable: A case meeting the clinical and epidemiological criteria. A probable case can have the infection identified via culture or PCR but not believe that this infection is the sole cause of the underlying lung injury or meets the minimum criteria to rule out pulmonary infection not met (testing not performed) and believes the infection is not the sole cause of the underlying lung injury.

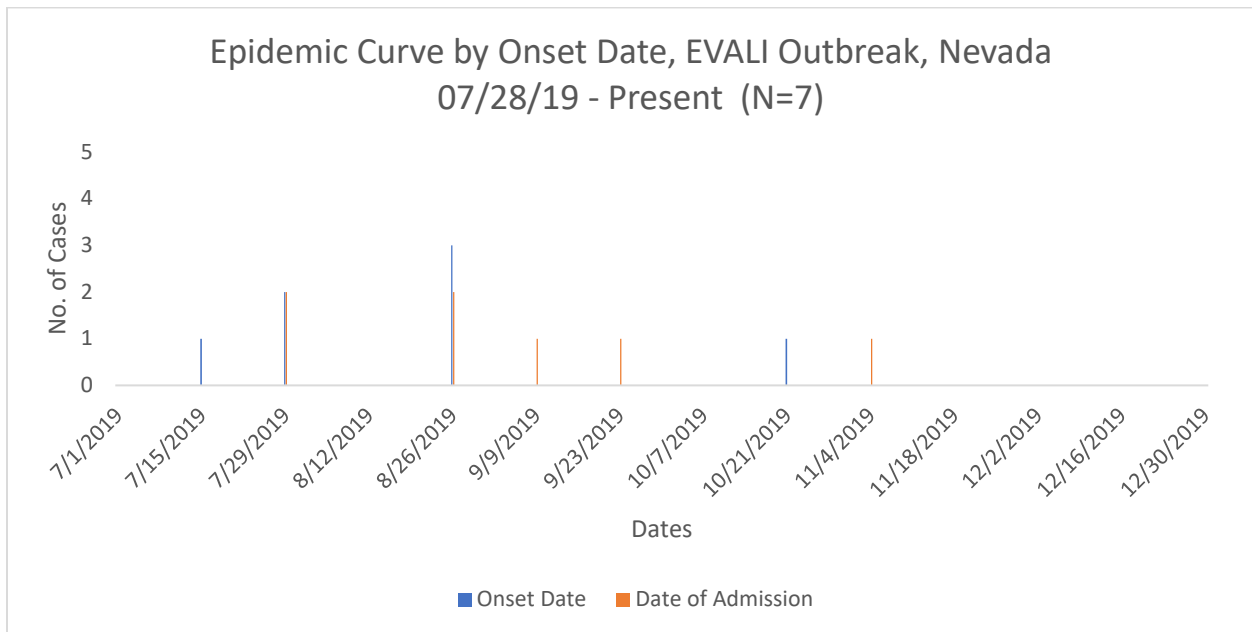
Epidemiology

A total of 7 cases met the case definition (6 confirmed, 1 probable). There have been no deaths reported in Nevada associated with EVALI.

Onset Dates

Range of onset of symptoms: 07/28/2019 – 10/31/2019

Range of date of admission to hospital: 07/31/2019 – 11/06/2019



Clinical symptoms at date of admission:

All of the cases reported chief complaints related to shortness of breath and difficulty breathing. The majority of cases presented with shortness of breath, diarrhea, and subjective fevers at time of admission to the hospital.

Table 1: Clinical Symptoms upon Admission of EVALI Patients, Nevada 2019

Symptoms	n	Total N	%
Shortness of Breath	5	7	71%
Difficulty breathing	3	7	43%
Chest pain, pleuritic	3	7	43%
Vomiting	3	7	43%
Diarrhea	4	7	57%
Subjective Fevers	5	7	71%
Nasal Congestion	3	7	43%
Muscle aches, myalgia	3	7	43%

Age

The median age was 33 (range: 16 years – 49 years). See table 2 for age group breakdown.

Table 2. EVALI Cases by Age Group, Nevada 2019

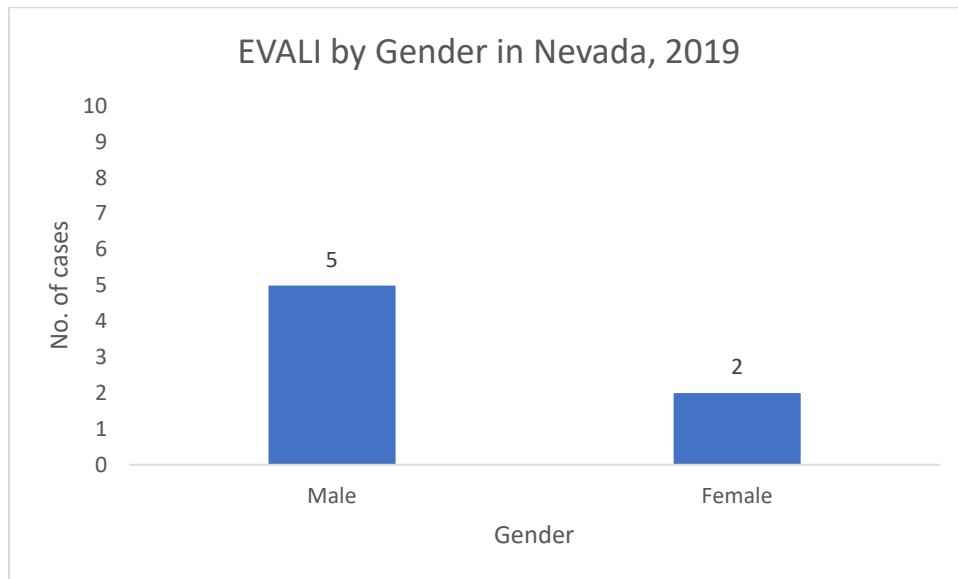
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Age Group	No.	%
13-17	1	14%
18-24	3	43%
25-34	1	14%
35-44	1	14%
45-64	1	14%
65-77	0	0%

Sex

71% of the cases were male (n=5), which matches what we are seeing on a national level.

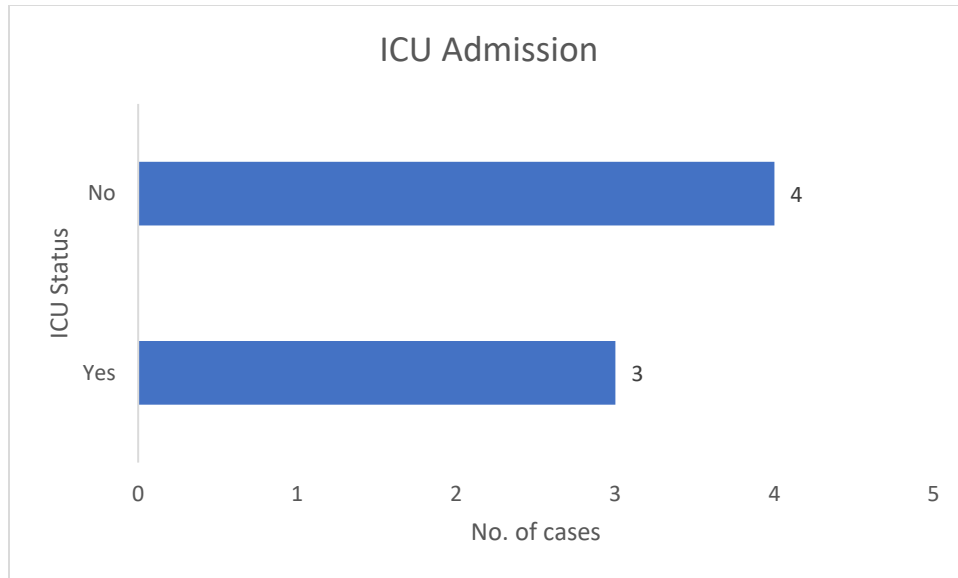
Breakdown by sex is provided below:



Hospitalization:

100% of cases were admitted to the hospital. Of the cases, 43% were admitted to the Intensive Care Unit (ICU).

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Average length of hospital stay: 8 days

Hospital Course:

Almost all the cases received oxygen via nasal cannula. Two patients received ventilatory support with CPAP or BiPAP (33%), and two patients (29%) needed mechanical ventilation via endotracheal or tracheal intubation.

Table 3. Hospital Treatment Course for EVALI Cases, Nevada 2019

Treatment Course	n	Total N	%
Ventilatory support with CPAP or BiPAP	2	7	29%
Mechanical ventilation via endotracheal or tracheal intubation	2	7	29%
Oxygen via nasal cannula	4	7	57%
Diagnosis of Acute Respiratory Distress Syndrome (ARDS)	1	7	14%

E-Cigarettes & Substances:

All of the cases reported using an e-cigarette or vape with pods or cartridges, 4 cases reported also using e-cigarettes or vape with tank that is refillable, and 1 case reported also using a disposable cigarette or vape. 29% reported smoking nicotine only and 71% reported using a THC based product. Five out of seven cases (71%) reported using flavors within their vaping device. There was a wide variety of flavors and brands used. Please see information below:

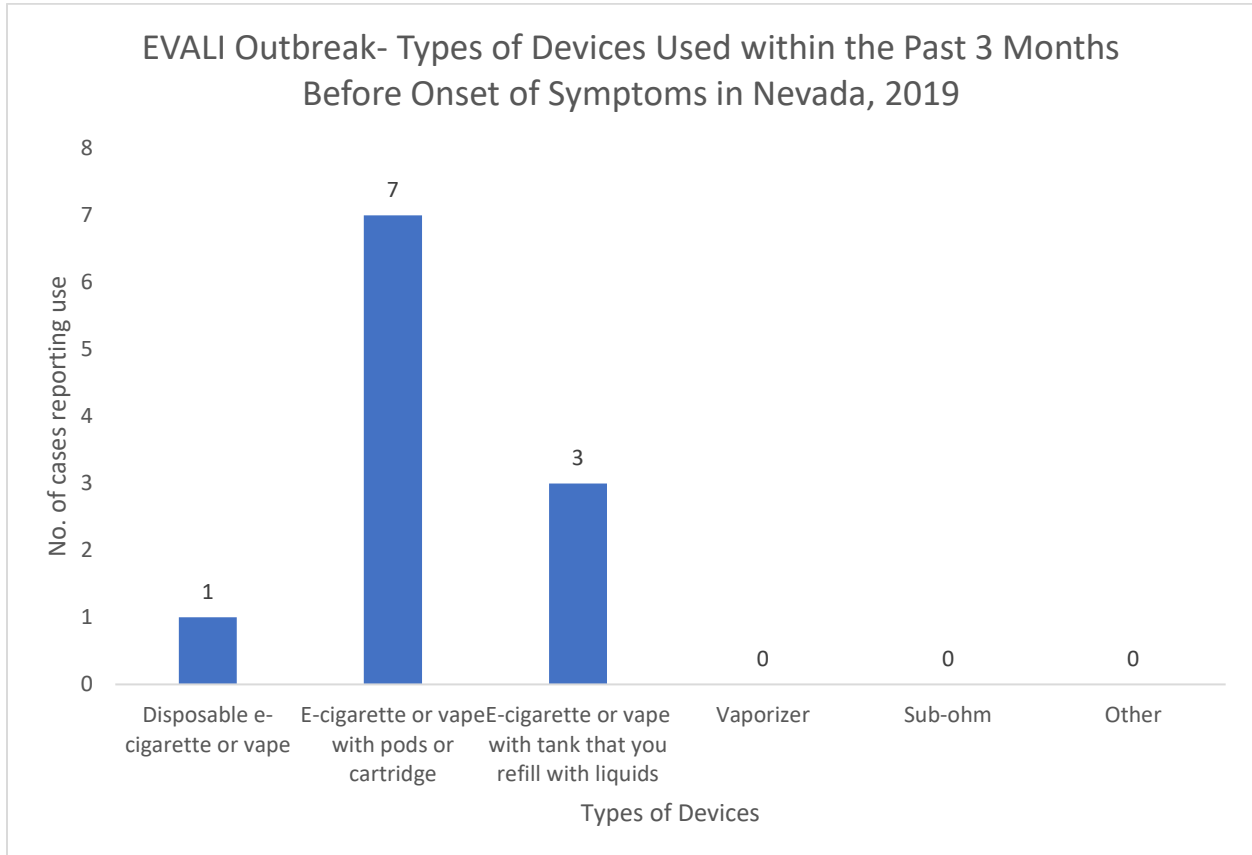


Table 4. Types of Substances Used by EVALI Cases, Nevada 2019

Substance	n	Total N	%
Nicotine	3	7	43%
Marijuana, THC, THC Concentrates, hash oil, wax	5	7	71%
Dank vapes	1	7	14%
Synthetic cannabinoids	0	5	0%
CBD or CBD oil	3	7	43%
Flavors	5	7	71%
Other (Meth)	1	7	14%

Brands: Silthy, Rove, Cookies, King Pin, Smart Cart, RSO, JUUL, Smok, and NJoy

Flavors: Skittles, Fruity Pebbles, Piscotti, Strawberry Banana, King Cush, Cookies and Cream, Pina Colada, and Crème Brulee

Purchase: Informally from friends, vape shop or dispensary, online from company, gas station, and flea market

Discussion

Outbreak investigation for EVALI is ongoing. The Centers for Disease Control and Prevention (CDC) and the Food and Drug Administration (FDA) continue to collect samples and run analysis. CDC has identified vitamin E acetate as a chemical of concern. CDC recently finished laboratory testing of bronchoalveolar lavage (BAL) fluid samples from 29 EVALI patients. All contained vitamin E acetate. This is used as an additive or thickening agent in THC-containing e-cigarette, or vaping, products. CDC tested for a range of other chemicals that might be found in

these products including plant oils, petroleum distillates like mineral oil, MCT oil, and terpenes. None of these other chemicals of concern were detected in the BAL fluid samples.

Recommendations

CDC recommends for the public:

- Do not use THC-containing e-cigarette, or vaping, products.
- Do not buy any type of e-cigarette, or vaping products, particularly those containing THC from informal sources like friends, family, or in-person or online dealers.
- Do not modify or add any substances to e-cigarette, or vaping, products that are not intended by the manufacturer, including products purchased through retail establishments.
- While it appears that vitamin E acetate is associated with EVALI, there is not enough evidence to rule out other chemicals of concern.

References

- Centers for Disease Control and Prevention. (2019). *Outbreak of Lung Injury Associated with the Use of E-Cigarette, or Vaping, Products*. Atlanta, GA: US Department of Health and Human Services. Retrieved from https://www.cdc.gov/tobacco/basic_information/e-cigarettes/severe-lung-disease.html.
- Jatlaoui TC, Wiltz JL, Kabbani S, et al. Update: Interim Guidance for Health Care Providers for Managing Patients with Suspected E-cigarette, or Vaping, Product Use–Associated Lung Injury — United States, November 2019. *MMWR Morb Mortal Wkly Rep*. ePub: 19 November 2019. DOI: [http://dx.doi.org/10.15585/mmwr.mm6846e2external icon](http://dx.doi.org/10.15585/mmwr.mm6846e2external_icon).
- Perrine CG, Pickens CM, Boehmer TK, et al. Characteristics of a Multistate Outbreak of Lung Injury Associated with E-cigarette Use, or Vaping — United States, 2019. *MMWR Morb Mortal Wkly Rep* 2019;68:860–864.
DOI: [http://dx.doi.org/10.15585/mmwr.mm6839e1external icon](http://dx.doi.org/10.15585/mmwr.mm6839e1external_icon).