

Department of State Health Services
Update on Investigation of Severe Pulmonary Illness among
People who have Reported Vaping

As of September 18, 2019

Background

Vaping is the use of an electronic device (electronic cigarette, e-cigarette, vaporizer, vape[s], vape pen, dab pen, or other device) to inhale substances (nicotine, marijuana, THC, THC concentrations, CBD, synthetic cannabinoids, flavorings, or other substances). E-cigarettes have been for sale in the United States since 2007.

More than 928,000 Texas adults, 4.7% of the adult population, reported current e-cigarette use in 2017. Younger adults, 18-29 years of age, were more likely to use e-cigarettes compared with adults 45 years of age and older.

In 2018:

- Over 330,000 middle and high school students reported current e-cigarette use. This represents 13% of all Texas students.
- E-cigarette use was three times as prevalent among high school students (18.9%) as middle school students (6%).

Overall, youth use of e-cigarettes has more than quadrupled from 3% in 2012 to 13% in 2018.

More information can be found on the [DSHS Vaping website](#).

Public Health Concern – Case Investigations

The Texas Department of State Health Services (DSHS) is investigating suspected cases of pulmonary disease among individuals who report vaping. On August 14th, DSHS was notified of a potential case of vaping-associated respiratory illness in an adolescent who initially had complaints of shortness of breath, nausea, and vomiting.

As of the date of this report, using the CDC surveillance case definition (Appendix A), 37 cases are under investigation in Texas:

- 13 are classified as confirmed cases.
- 12 are classified as probable cases.
- DSHS is reviewing medical records to classify the remainder.

Data are subject to change as new information is received.

Similar cases have occurred in multiple other states, many resulting in hospitalization. As of September 18, 2019, CDC reports that 380 confirmed and probable cases of lung illness associated with the use of e-cigarette products have been reported from 36 states and 1 U.S. territory. Six deaths have been confirmed. No infectious disease has been identified among cases and lung illness is likely associated with a chemical exposure. However, it is not known what is causing these illnesses. No specific substance or product has been linked to all cases.

Case Characteristics

Of the 25 confirmed or probable cases in Texas:

- The majority (60%) are under 20 years of age.
- Cases range in age from 16 through 39 years old, with an average age of 21 years.
- 76% are male.
- Almost all cases interviewed by DSHS (n=8; 89%) have reported vaping products containing Tetrahydrocannabinol (THC), the primary psychoactive ingredient in marijuana.

In Texas and other states, cases have experienced symptoms including cough, shortness of breath, fatigue, nausea, vomiting, and diarrhea. Symptoms have typically worsened over a period of days or weeks before admission to the hospital. Illness severity has varied. Many patients have required supplemental oxygen and some have required high-level intensive care and respiratory support; some have been intubated and/or been placed on extracorporeal membrane oxygenation. Symptoms have not generally improved with antibiotic treatment alone, but some patients have improved with the use of corticosteroids.

What DSHS and Federal Partners Are Doing

DSHS

DSHS is working with local and regional health departments, other states, the Centers for Disease Control and Prevention (CDC), and the Food and Drug Administration (FDA) to better characterize case demographics, clinical characteristics, and exposures.

DSHS is partnering with local health departments to identify and investigate cases and share important public health information. DSHS is also searching for cases in the Texas Poison Center Network and [ESSENCE](#), the statewide syndromic surveillance system used by Local Health Departments (LHDs), DSHS, and data providers. Cases are reported to DSHS, and a team of physicians and epidemiologists review medical records and interview

patients to learn more about each case with the goal of identifying the cause of the illnesses.

Additionally, DSHS has:

- Released on the DSHS website and disseminated to external stakeholders a health alert on August 16, 2019 (Appendix B) and an update on September 5, 2019 (Appendix C).
- Adapted case definition and data collection tools developed by CDC and other states for use in Texas.
- Sent out information to ESSENCE users with key terms to include in medical records.
- Coordinated with FDA, local and regional health departments, and hospitals for vaping product sample collection.
- Developed a document for public consumption with information on the vaping epidemic and resources for parents and posted it to the [DSHS Vaping website](#).

CDC

CDC is working closely with other state health departments to coordinate and standardize data collection efforts. CDC is assisting states with epidemiological and laboratory investigations and has initiated an incident command structure to coordinate activities. CDC will continue to support states in the refinement of data collection tools and health communication materials, assist in identifying options to facilitate laboratory testing of vaping products and solutions, and facilitate information sharing among state health departments.

In partnership with states, CDC developed a working surveillance case definition and a set of standardized tools to support consistency across state investigations. DSHS has adapted and is using these tools.

CDC is also allowing states to voluntarily share data with them, which CDC will use to provide aggregate case counts and help identify shared risk factors across states.

More information is available [on the CDC's outbreak page](#).

FDA

FDA is testing samples of vaping products at its Forensic Chemistry Center lab. When vape product samples are available for cases in Texas, DSHS coordinates with the FDA regional office to arrange sample submission. FDA has created [a sample collection website](#) with additional information.

Next Steps

- DSHS will continue to partner with local health departments, other states, and federal partners to learn more about the cause of these illnesses.
- DSHS will hold weekly vaping-specific calls with local jurisdictions to share updates at the national, state and local levels.
- DSHS will update stakeholders as new resources and state updates are posted to the DSHS website.
- DSHS is developing multimillion dollar campaign to promote cessation of tobacco products and provide education about e-cigarettes and recently passed legislation that increases the minimum age to purchase tobacco products to 21.

Case Status

Table 1. Severe Pulmonary Illness among People who have Reported Vaping with an Electronic Device by Case Status

Case Status	N (%) (n=43)
Confirmed	13 (30.23%)
Probable	12 (27.91%)
Suspect	0 (0.00%)
Not Case	5 (11.63%)
Under Investigation	13 (30.23%)
Total Exposures Investigated	43 (100.00%)

Case Geography (Confirmed and Probable Cases)

Table 2. Severe Pulmonary Illness Demographics among People who have Reported Vaping with an Electronic Device by Region (confirmed and probable cases)

Region	N (%) (n=25)
Region 1	0 (0.00%)
Region 2/3	11 (44.00%)
Region 4/5 N	1 (4.00%)
Region 6/5 S	7 (28.00%)
Region 7	1 (4.00%)
Region 8	3 (12.00%)
Region 9/10	1 (4.00%)
Region 11	1 (4.00%)
Region Unknown*	0 (0.00%)

**County and region may not be available for all cases as we await information from parent, guardian, or health care providers*

Appendix A

Severe Pulmonary Disease Associated with E-cigarette Use Outbreak Case Definition (CDC) - August 26, 2019

Confirmed Using an e-cigarette ("vaping") or dabbing* in 90 days prior to symptom onset
AND
Pulmonary infiltrate, such as opacities on plain film chest radiograph or ground-glass opacities on chest CT
AND
Absence of pulmonary infection on initial work-up: Minimum criteria include negative respiratory viral panel, influenza PCR or rapid test if local epidemiology supports testing. All other clinically indicated respiratory ID 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) must be negative
AND
No evidence in medical record of alternative plausible diagnoses (e.g., cardiac, rheumatologic or neoplastic process).

Probable Using an e-cigarette ("vaping") or dabbing* in 90 days prior to symptom onset
AND
Pulmonary infiltrate, such as opacities on plain film chest radiograph or ground-glass opacities on chest CT
AND
Infection identified via culture or PCR, but clinical team** believes this is not the sole cause of the underlying respiratory disease process **OR** Minimum criteria to rule out pulmonary infection not met (testing not performed) and clinical team** believes this is not the sole cause of the underlying respiratory disease process
AND
No evidence in medical record of alternative plausible diagnoses (e.g., cardiac, rheumatologic or neoplastic process).

Footnotes * Using an electronic device (e.g., electronic nicotine delivery system (ENDS), electronic cigarette, e-cigarette, vaporizer, vape(s), vape pen, dab pen, or other device) or dabbing to inhale substances (e.g., nicotine, marijuana, THC, THC concentrates, CBD, synthetic cannabinoids, flavorings, or other substances).

**Clinical team caring for the patient.

Appendix B

HEALTH ALERT: Severe Lung Disease Among Persons Who Report Vaping August 16, 2019

Background

The Texas Department of State Health Services (DSHS) is investigating suspected cases of pulmonary disease among individuals who report vaping. Similar cases have occurred in multiple other states, some resulting in hospitalization. All suspect cases reported vaping with products including nicotine and/or tetrahydrocannabinol (THC). Evaluation for infectious diseases was negative in all patients.

DSHS is working with other states and the Centers for Disease Control and Prevention to better characterize case demographics, clinical characteristics, and exposures.

Clinical Presentation

Individuals experienced respiratory symptoms including cough, shortness of breath, and fatigue. Some also experienced nausea, vomiting, and diarrhea. Symptoms worsened over a period of days or weeks before admission to the hospital. Illness severity has varied, and in some cases, severe lung disease has been reported.

On imaging, chest radiographs have demonstrated bilateral opacification, and CT imaging has demonstrated diffuse ground glass opacification.

Recommendations for Clinicians

Health care providers should:

- Ask patients presenting with respiratory symptoms about vaping history. If possible, inquire about the types of products used and methods of use.
- If vaping fluid commonly used by the patient is available, ask that it be set aside (not used) in case it is needed for testing.
- Be aware that some suspect cases have required high-level intensive care and respiratory support.

Suspected cases should be reported to the Texas Department of State Health Services at 512-776-7268.

Suspected cases include those with inhalation drug use* within 90 days prior to symptom onset **AND** clinical signs and symptoms** of respiratory dysfunction.

* Includes vaping or smoking of any plant or chemical, including nicotine, marijuana, THC concentrate, CBD, synthetic cannabinoids, or other.

** Includes shortness of breath, pleuritic chest pain (i.e., pain with inspiration), cough with or without hemoptysis, hypoxia (pulse oximetry $\leq 95\%$), with or without fever.

Recommendations for the Public

People who experience difficulty breathing, cough, or other symptoms in the days or months after vaping should seek immediate medical attention.

For More Information

For questions:

DSHS Environmental Surveillance and Toxicology Branch

512-776-7268

epitox@dshs.texas.gov

Get the facts about electronic cigarettes:

www.dshs.texas.gov/tobacco/E-Cigarettes/

Information for health care providers on adolescents and E-cigarette use:

www.txhealthsteps.com/static/courses/escape-the-vape/sections/section-1-1.html

Appendix C

UPDATED HEALTH ALERT: Severe Pulmonary Illness Among Persons Who Report Vaping September 5, 2019

Background

The Texas Department of State Health Services (DSHS) continues to investigate severe pulmonary illness among people who have reported vaping*. Some cases in Texas have reported vaping products containing nicotine and/or tetrahydrocannabinol (THC). Similar cases have occurred in multiple other states, some resulting in hospitalization.

DSHS is working with local health departments, other states, and the Centers for Disease Control and Prevention to better characterize case demographics, clinical characteristics, and exposures.

* Inhalation drug use with an electronic device (e.g., electronic nicotine delivery system (ENDS), electronic cigarette, e-cigarette, vaporizer, vape(s), vape pen, dab pen, or other device) or dabbing to inhale substances (e.g., nicotine, marijuana, THC, THC concentrates, CBD, synthetic cannabinoids, flavorings, or other substances).

Clinical Presentation

Individuals experienced respiratory symptoms including cough, shortness of breath, and fatigue. Some also experienced nausea, vomiting, and diarrhea. Symptoms worsened over a period of days or weeks before admission to the hospital. Illness severity has varied, and in some cases, severe lung disease has been reported. Many patients have required supplemental oxygen. Some have required assisted ventilation and oxygenation, and some were intubated.

Evaluation for infectious diseases was negative in all cases and no alternative diagnosis (e.g., rheumatologic or neoplastic process) has been identified as the underlying cause of illness.

Radiologic findings have varied. On imaging, chest radiographs have demonstrated bilateral opacification, and CT imaging has demonstrated diffuse ground-glass opacification. Radiographic abnormalities have not been present in all patients upon initial presentation.

Disease Reporting

Cases with similar clinical presentation and history of vaping should be reported to DSHS by calling 512-422-0925 (24 hours a day, 7 days a week).

Texas Health and Safety Code Ch. 161 (Sec. 161.0211) requires DSHS to conduct epidemiologic or toxicologic investigations of human illnesses or conditions and of environmental exposures that are harmful or believed to be harmful to the public health.

Recommendations for Clinicians

Health care professionals should:

- Where appropriate, ask patients about history of inhalation drug use with electronic devices. If possible, inquire about the types of products used and methods of use.
- Be aware that the illness can worsen over time and some suspect cases have required high-level intensive care and respiratory support.
- During patient assessment, ensure that “vape”, “vaping”, or “e-cigarette” is noted in the chief complaint history when applicable.
- If vaping products used by the patient are available, ask that they be set aside (not used) in case it is needed for testing.
- At the direction of the U.S. Food and Drug Administration (FDA), DSHS will coordinate product specimen submission related to this investigation. If you have collected samples, please contact DSHS at 512-422-0925 for sample submission instructions.

Additional recommendations for clinicians from the Centers for Disease Control and Prevention are available here: <https://emergency.cdc.gov/han/han00421.asp>.

Recommendations for the Public

While this investigation is ongoing, if you are concerned about these specific health risks, consider refraining from using e-cigarette products. People who experience difficulty breathing, cough, or other symptoms in the days or months after vaping should seek immediate medical attention.

Additional recommendations for the public from the Centers for Disease Control and Prevention are available here: <https://emergency.cdc.gov/han/han00421.asp>.

For More Information

For questions:

DSHS Environmental Surveillance and Toxicology Branch
512-776-7268 or 512-422-0925

epitox@dshs.texas.gov

Get the facts about electronic cigarettes:

www.dshs.texas.gov/tobacco/E-Cigarettes/

Information for health care providers on adolescents and E-cigarette use:

www.txhealthsteps.com/static/courses/escape-the-vape/sections/section-1-1.html