



Vaping: CDC investigation continues after patient dies from severe lung injuries

The US Centers for Disease Control and Prevention (CDC) is investigating a death and almost 200 cases of severe lung illness related to electronic cigarette use. **Abi Rimmer** and **Gareth Iacobucci** explore the situation in the US and the UK

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How many cases have there been?

On 23 August the CDC reported that a patient had died after being hospitalised with an unexplained respiratory illness after reported vaping or e-cigarette use. The case is the first death linked to vaping to be reported in the US and followed a spate of reports of severe lung illness which officials said were linked to vaping. As of 23 August, 193 cases of severe lung illness had been reported by 22 states.¹

How old are those affected?

In Illinois, the patient that died was an adult, officials said, but other patients in the state were aged between 17 and 38 and most have been men. In Wisconsin, where there are 16 confirmed cases, teens and young adults were initially affected, but officials have now reported cases in older age groups.²

What are the symptoms?

Many patients reported a gradual increase of symptoms including breathing difficulty, shortness of breath, or chest pain before they were hospitalised, said the CDC. Some also reported mild to moderate gastrointestinal illness, including vomiting and diarrhoea and fatigue.

What's caused this?

So far, CDC investigators haven't identified a cause and they have found no evidence to suggest that an infection is to blame. All patients had reported using e-cigarettes. Officials said that they haven't found a specific product or compound that links all of the cases, but many of the patients had recently used products containing tetrahydrocannabinol.

Have there been any adverse reactions reported in the UK?

The Medicines and Healthcare Products Regulatory Agency (MHRA) says that between August 2018 and August 2019 it had 12 Yellow Card reports of adverse reactions associated with e-cigarettes containing nicotine. Seven of these reports contained respiratory related reactions. The agency said it did not consider

these reports indicated severe or dangerous lung injury similar to those reported in the US, and had no safety concerns about the products that were reported.

How prevalent is vaping among young people?

It's gaining popularity. Use of e-cigarettes among American high school students increased from 11.7% to 20.8% between 2017 and 2018,³ and from 3.3% to 4.9% among middle school students. Usage is lower in the UK; a 2018 survey⁴ of 13 188 secondary school pupils in England in years 7 to 11 (mostly aged 11 to 15) found that 6% said they currently used e-cigarettes.

How are vaping devices changing?

Public Health England has said that the variety of devices available means that the term e-cigarette is no longer appropriate.⁵ Devices can be flat, memory stick shapes, or pebble or pen shaped. They also work differently. There are disposable products, and reusable, rechargeable kits designed with replaceable cartridges or pods. There are also reusable, rechargeable kits designed to be refilled with liquid by the user, and reusable, rechargeable kits that allow users to customise their product, for example by regulating the power delivery from the batteries to the heating element.

How do the UK and US regulatory environments compare?

The UK adopted stricter regulatory requirements in 2017 under the EU Tobacco Products Directive. All e-cigarettes and e-liquids must be notified to the MHRA before they can be sold. The regulations restrict e-cigarette tanks to a maximum capacity of 2 mL, the volume of nicotine containing liquid for sale in one refill container to 10 mL, and the nicotine strength of liquids to no more than 20 mg/mL. Products that contain nicotine must be child resistant, include new labelling requirements and warnings, and certain ingredients are banned, including colourings, caffeine, and taurine. In the US, product manufacturers have to comply with Food and Drug

Administration requirements⁶ but the system is not as stringent—there is no limit on the nicotine level in the US for example.

Does Public Health England still say that e-cigarettes are 95% less harmful than smoking tobacco?

Martin Dockrell, head of tobacco control at PHE, highlighted the tighter regulation of vaping products in the UK. “Unlike the US, all e-cigarette products in the UK are tightly regulated for quality and safety by the MHRA and they operate the Yellow Card Scheme, encouraging vapers to report any bad experiences,” he said. “Our advice remains that e-cigarettes are a fraction of the risk of smoking and smokers should switch completely.” But he stressed: “It’s important to use UK regulated

liquids and never risk vaping home made or illicit liquids or adding substances, any of which could be harmful.”

- 1 CDC. Transcript of August 23 2019 telebriefing on severe pulmonary disease associated with use of e-cigarettes. 2019. www.cdc.gov/media/releases/2019/t0823-telebriefing-severe-pulmonary-disease-e-cigarettes.html.
- 2 Wisconsin Department of Health Services. Outbreaks in Wisconsin. www.dhs.wisconsin.gov/outbreaks/index.htm.
- 3 Cullen KA, Ambrose BK, Gentzke AS, Apelberg BJ, Jamal A, King BA. Notes from the field: increase in the use of electronic cigarettes and any tobacco product among middle and high school students: United States, 2011-2018. *MMWR Morb Mortal Wkly Rep* 2018;67:1276-7. 10.15585/mmwr.mm6745a5 30439875
- 4 ASH. Fact sheet: use of e-cigarettes among young people in Great Britain. 2019. ash.org.uk/wp-content/uploads/2019/06/ASH-Factsheet-Youth-E-cigarette-Use-2019.pdf.
- 5 Public Health England. Vaping in England: an evidence update. February 2019. www.gov.uk/government/publications/vaping-in-england-an-evidence-update-february-2019/vaping-in-england-evidence-update-summary-february-2019.
- 6 FDA. Manufacturing. 6 June 2019. www.fda.gov/tobacco-products/compliance-enforcement-training/manufacturing.

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