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Adolescents' Initiation and Past 30-Day Use of a JUUL E-Cigarette Containing Pod Flavors Marketed and Not Marketed by JUUL

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Background

The U.S. Food and Drug Administration (FDA) has identified flavors as the "core of the epidemic" of youth use of e-cigarettes that emerged in 2018.

The FDA has also asserted that much of the rise in youth e-cigarette use observed between 2017 and 2018 was driven by one brand – JUUL.

In 2018, JUUL, which manufactures pre-filled replaceable e-liquid pods for use in the JUUL vaporizer, became the fastest growing and highest selling brand of e-cigarette/vapor products in the United States.

However, during the same period, an increasing number of e-cigarette manufacturers began marketing pre-filled flavored e-liquid pods that are plug-compatible with the JUUL e-cigarette and/or closely resemble JUUL's pre-filled pods in size, shape and color.

Identifying the pod flavors with which youth have initiated use of a JUUL e-cigarette and the pod flavors that youth are currently vaping in JUUL e-cigarettes is therefore critically important.

Methods

A non-probabilistic sample of U.S. adolescents aged 13-17 years (n = 9,872) was recruited from an internet research panel to complete an online survey between 23 November and 13 December 2018. Individuals were excluded if they had not seen or heard of JUUL e-cigarettes before this study. Parental consent and youth assent were obtained.

The flavor of the first pod ever used in a JUUL e-cigarette was assessed in 2,689 ever-users of a JUUL e-cigarette by the question, *"What was the first pod flavor you ever tried using in your JUUL e-cigarette? (Select one)"*

The flavors of pods used in a JUUL e-cigarette in the past 30 days was assessed in 1,538 current users of the JUUL e-cigarette (i.e. use in the past 30 days) by the question, *"During the past 30 days, which pod flavors have you used in your JUUL e-cigarette, even once or twice? (Select one or more - please read the list carefully)"*.

In response to each question, participants selected from a list of 36 flavor descriptors, of which eight were offered in pre-filled pods manufactured by JUUL for use in the JUUL e-cigarette – known as 'JUULpods'.

The other 28 flavor names were identified from the websites of other e-cigarette/e-liquid manufacturers as flavors offered by at least one manufacturer other than JUUL in pre-filled replaceable pods that were plug-compatible with the JUUL e-cigarette and/or were visually similar to JUULpods in shape, size and color.

No images of e-cigarettes, e-liquids or pod refills or packaging were shown at any part of the survey.

The proportions of JUUL ever-users and JUUL current users who reported initial and past 30-day use of each flavor in a JUUL e-cigarette are reported, weighted to be nationally representative of the U.S. adolescent population on age, gender and census region.

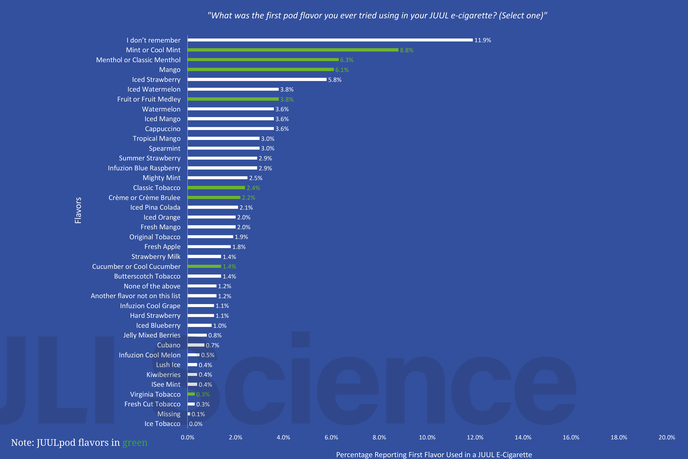

Figure 1. First pod flavor used in a JUUL e-cigarette U.S. adolescents aged 13-17 years who had ever used a JUUL e-cigarette (n = 2,689).

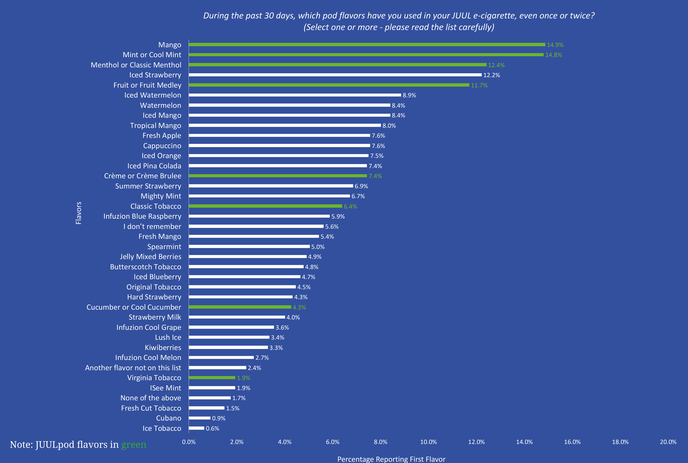

Figure 2. Pod flavors used in a JUUL e-cigarette in the past 30 days by U.S. adolescents aged 13-17 years who had used a JUUL e-cigarette in the past 30 days (n = 1,538).

Results

Ever-users of a JUUL e-cigarette were more likely to report having initiated use of a JUUL e-cigarette with a pod containing a characterizing flavor (58.7%) than a menthol/mint flavor (21.0%) or a tobacco flavor (5.6%).

JUUL ever-users were also more likely to report having initiated use of a JUUL e-cigarette with a pod containing a flavor not marketed by JUUL (54.0%) than with a flavor marketed by JUUL (31.3%).

'Mint', 'Menthol' and 'Mango', all flavors marketed by JUUL, were the most commonly reported as the 'first flavor tried' in a JUUL e-cigarette (8.8%, 6.3% and 6.1% of ever-users, respectively), and the flavors most commonly used in a JUUL e-cigarette in the past 30 days (14.8%, 12.4% and 14.9% of current users, respectively).

'Iced Strawberry', 'Iced Watermelon' and 'Watermelon' were the flavors not marketed by JUUL that were most commonly reported as the 'first flavor tried' in a JUUL e-cigarette (5.8%, 3.8% and 3.6% of ever-users, respectively), and the non-JUUL flavors most commonly used in a JUUL e-cigarette in the past 30 days (12.2%, 8.9% and 8.4% of current users, respectively).

Conclusions

Around half of adolescent ever-users of a JUUL e-cigarette reported initiating use of a JUUL e-cigarette with a pod flavor not marketed by JUUL, and the majority of current users reported using the JUUL e-cigarette to vape flavors that are not marketed by JUUL.

Results give insight to the flavors that adolescents say they have used and are using in a JUUL e-cigarette, but do not give insight to the identities of the manufacturers of those flavors.

It is possible that a proportion of youth have difficulty identifying the brands of pod-style vaporizers, pods and flavors they are using. Researchers should be mindful of several factors when designing surveys to measure youth use of JUUL vaping products, including:

1. The availability of an increasing number of brands of pre-filled pods that are plug-compatible with the JUUL e-cigarette.
2. The availability of at least ten pod mod-style vaping devices on the U.S. market that closely resemble the JUUL e-cigarette in size, shape, color, weight, look, feel and operation.
3. The increasing marketing of flavor descriptors by pod manufacturers other than JUUL that are verbally similar or identical to flavor descriptors marketed by JUUL (e.g. Mango, Tropical Mango, Fresh Mango).

Estimating the public health impact uniquely attributable to JUUL requires research that carefully distinguishes between youth use of products marketed by JUUL and use of vaping products that are compatible with or resemble those marketed by JUUL.

Ethics Approval

This study was approved by Advarra Institutional Review Board (Approval no. 00030080, 2 October 2018).

Declaration of Funding

Funding for this study was provided by JUUL Labs Inc. JUUL Labs Inc. had no input to or control over the study design, contents of the survey instrument, sample recruitment, data analysis, interpretation, or reporting of findings. The authors alone are responsible for the contents, production and decision to report this study.

JUUL Science