

# The impacts of e-cigarette flavours: An overview of systematic reviews

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## Main findings

- Non-tobacco flavourings for e-cigarettes may increase e-cigarette appeal and harms, which may vary by flavour, and apply across different population groups.
- The impacts of e-cigarette flavours on e-cigarette and cigarette use are inconclusive.
- There is still a paucity of evidence. Trials and well-designed longitudinal studies should report outcomes categorized by flavours used.

## Results

### Appeal/perceptions of vaping

- Appeal of EC:
  - Seven (H<sub>3</sub>L<sub>4</sub>) reported increased the appeal of EC
  - One<sup>H</sup> reported mixed evidence.
  - One<sup>H</sup> reported among people who smoke non-menthol tobacco, tobacco flavours were also appealing
- Motivation to try or continue using EC:
  - Five (H<sub>1</sub>L<sub>4</sub>) reported increased motivation to start or continue use in various populations (youth, pregnancy, tobacco use experience, mixed)
- Perceptions of harm from EC
  - One<sup>L</sup> reported increased concerns among young hookah users of 'gateway effect' from tobacco-flavoured EC
  - A review<sup>L</sup> of HCPs reported concerns over the potential impact on respiratory health. HCPs recommended restricting flavours.
  - Decreased harm perceptions among mixed young populations (L<sub>2</sub>) and young people with EC no combustible tobacco use history (L<sub>1</sub>)

### Harms from vaping

- Most reviews found increased risk of harms from specific flavours or flavour components.
- Evidence of: cell damage when exposed to flavoured EC liquid, chemical analyses observing potentially toxic components, or reports of adverse events like throat irritation.
- No reviews reported any evidence of serious harms in humans

### Smoking behaviours

- Smoking cessation:
  - Five (H<sub>4</sub>L<sub>1</sub>) comparing non-tobacco flavours with tobacco-flavours use did not find any association between flavours and quitting smoking.
- Smoking initiation
  - Two<sup>H</sup> found no clear evidence of an association

### Vaping behaviours

- Initiation:
  - Two (H<sub>1</sub>L<sub>1</sub>) indicated that the availability of flavours may promote uptake of EC use; two (H<sub>1</sub>L<sub>1</sub>) found mixed/inconclusive evidence.
- Flavour selection and preference:
  - Fruit and sweet flavours consistently popular
  - Tobacco/menthol flavours sometimes more popular among current/former and older combustible tobacco users
  - Preferences varied based on a range of factors

\*H<sub>1</sub> = one higher quality review; L<sub>1</sub> = one lower quality review

## Methods

**Inclusion criteria:** peer reviewed and published systematic reviews investigating the impacts of e-cigarette flavours on any outcome

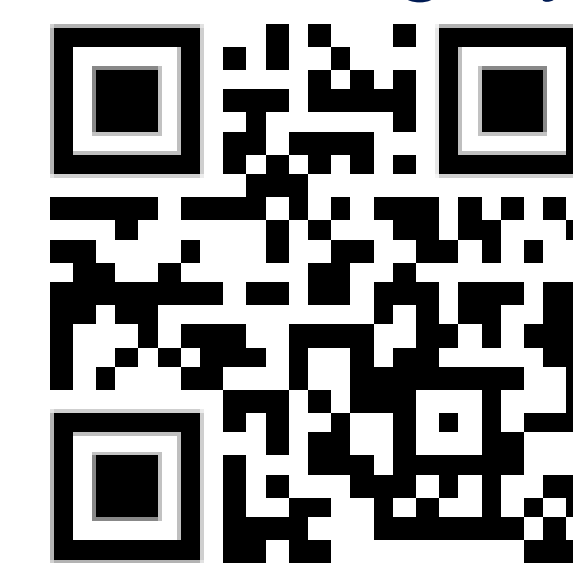
**Searches:** MEDLINE, Embase, PsycINFO, Cochrane Database of Systematic Reviews, PROSPERO, and Epistomonikos. Search date February 2024

**Screening and data extraction:** screening in duplicate, data extraction extracted and independently checked by second reviewer

**Study appraisal:** using critical domains of AMSTAR2

**Synthesis:** Narrative synthesis and review findings charted in effect/association direction plots, following Synthesis Without Meta-analysis (SWiM) guidance.

Full protocol available here →

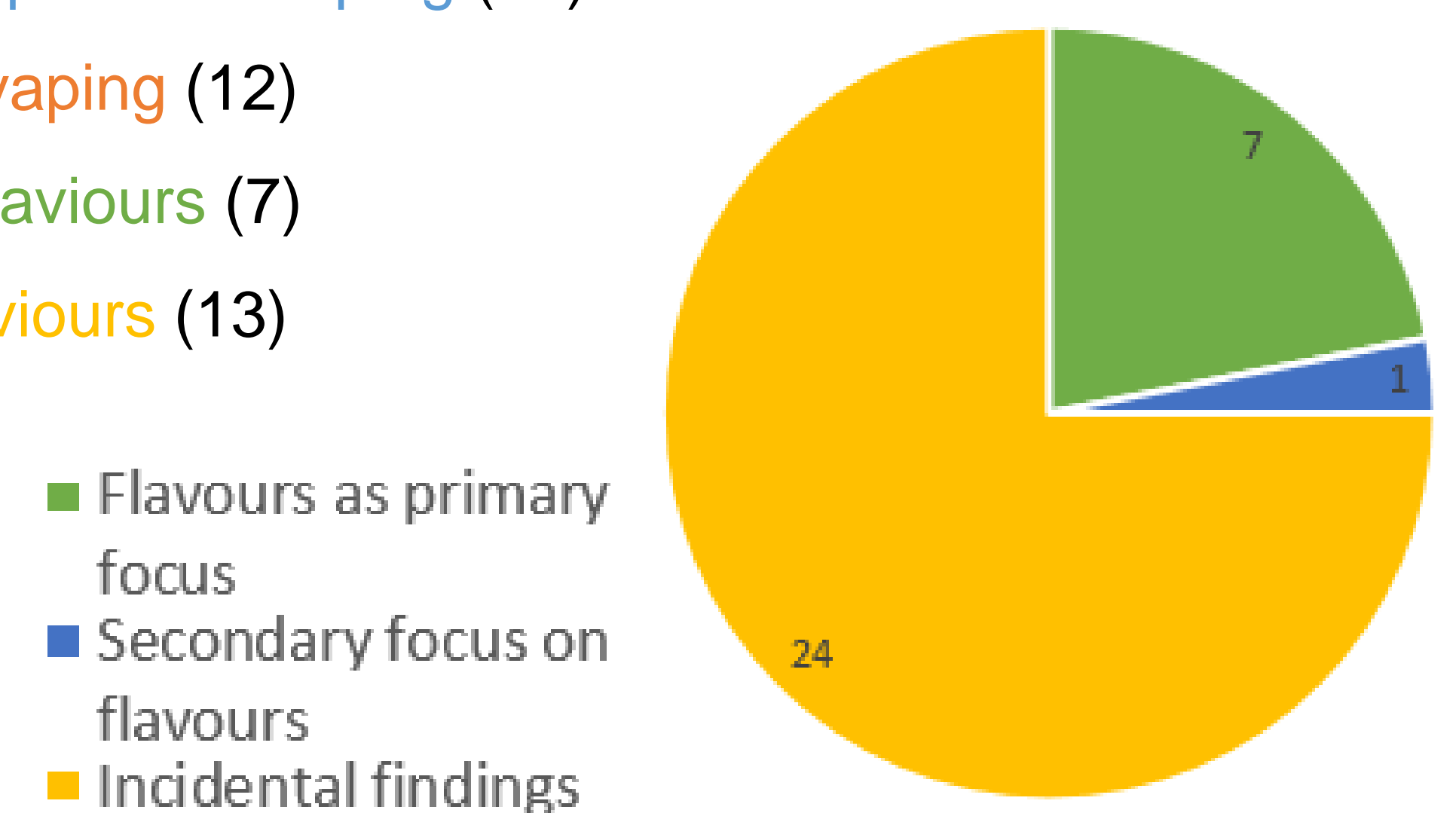


## We found:

- Thirty-two reviews including 1967 primary studies (including overlap)
- Eleven reviews of higher quality; 21 of lower quality.
- Review search dates ranged from 2013-24
- Relevant evidence from 326 unique primary studies. Of these, 33 were included in more than one review.
- No reviews declared funding from tobacco or EC industry, or financial conflicts for reviews in question.

## Outcomes

- Reviews reported the impacts of flavours on:
  - appeal/perceptions of vaping (13)
  - harms from vaping (12)
  - smoking behaviours (7)
  - vaping behaviours (13)



## Funding & declarations

Funding support is provided by grant 2U54CA229974 from the National Institutes of Health, National Cancer Institute and Food and Drug Administration.

Please add "yes" or "no" to each table cell. If "yes", please turn cell background color to yellow.	Tobacco Industry	E-cigarette & nicotine product industry (excluding pharma)	Pharma Industry
The work being presented has received funding or other means of support from any of the following sources:	No	No	No
Any of the authors have received funding (including consultancy) from any of the following sources in the past 5 years:	No	No	No

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