

Interactive Data Visualization: A Case Study from ENDS Research

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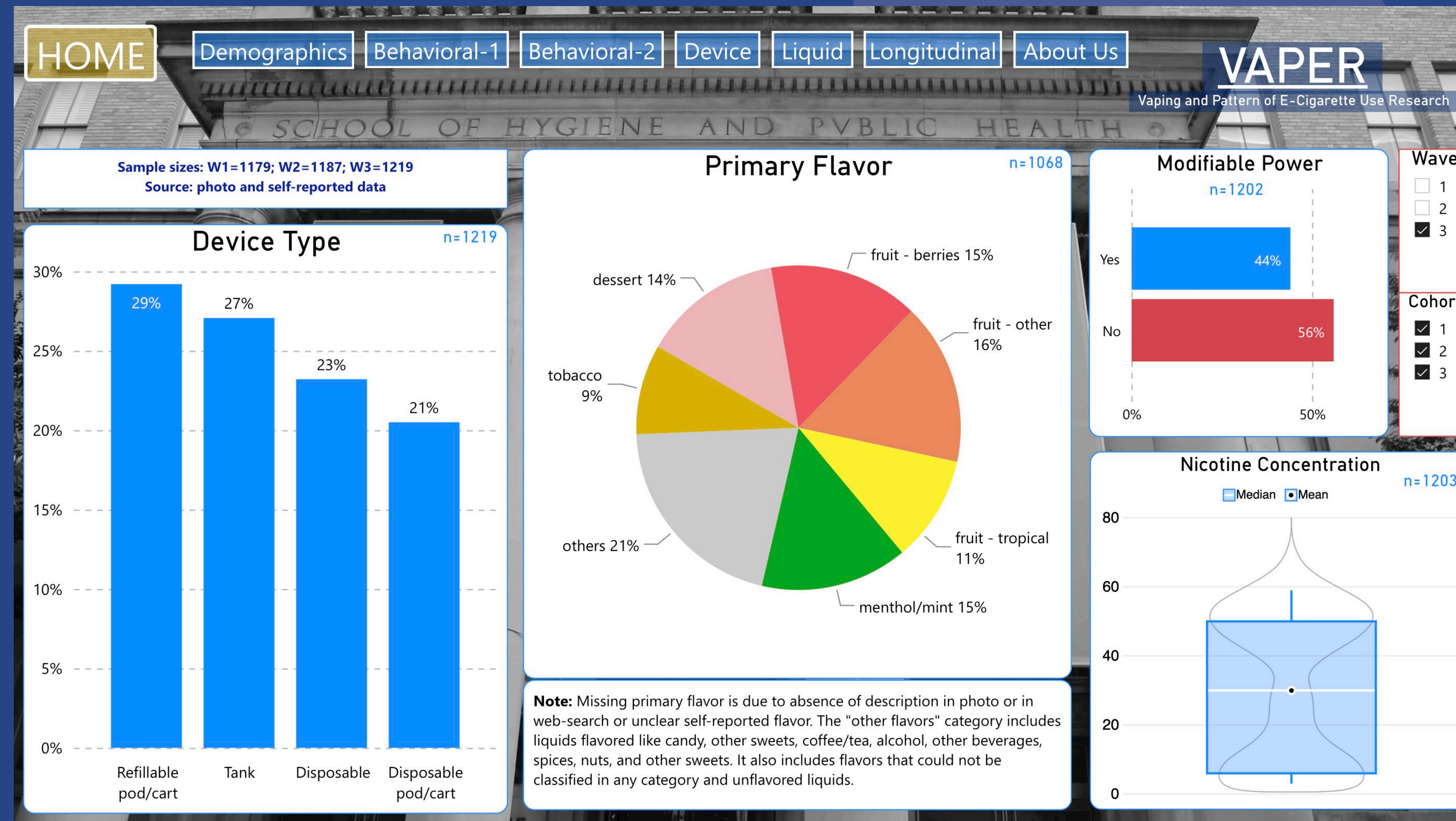
Background

The advancement of interactive data visualization has allowed quicker and more efficient data exploration. Here we present a case study from a longitudinal investigation of ENDS use to support tobacco regulatory science with visualization technologies, such as interactive dashboards, which can be used to support hypothesis generation and can enhance collaboration.

Methods

- 2338 U.S. adults (21+) frequently (5+ days/week) using an ENDS product participated in waves 1, 2, and/or 3 of the Vaping and Patterns of E-cigarette use Research (VAPER) Study – a longitudinal survey of ENDS use – between May 2020 and November 2021.
- HIPAA-compliant SharePoint storage was used to store the data dynamically and connected to Power BI to be configured and designed to visualize the data.

Visualization technologies can significantly reduce the time spent generating and distributing descriptions of fast-evolving domains such as e-cigarette use.



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Acknowledgements: Research reported in this presentation was supported by NIDA and FDA Center for Tobacco Products (CTP) under Award Number U54DA036105. The content is solely the responsibility of the authors and does not necessarily represent the official views of the NIH or the Food and Drug Administration.

Competing Interests: The authors have no competing interests to disclose

Methods (cont.)

- Through an iterative process, the VAPER team identified which variables would be included in the data visualization.

Results

- Key measures from the survey including nicotine formulation, primary liquid flavor, and device type were selected for descriptive analysis and inclusion in an interactive dashboard.
- A dashboard was built containing 28 charts and a table organized into pages by variable domain to serve the specific interests of users and allow users to explore differences across and within waves.
- In total, features utilized allowed viewing over 9000 possible combinations of descriptions of the sample across one or more variables, which, on average, took less than 1 second each to generate after deployment.
- The dashboard supports simultaneous interactive data viewing for study team members/collaborators/Federal partners across different institutions.

Conclusions

- Interactive visualization provides a high level of flexibility, enhancing the data exploration experience.
- Research teams conducting studies in fast-paced fields should consider building and using an interactive data visualization system.