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[CAStoR]

Trends in Adolescent Exclusive and Dual Cigarettes and Electronic Nicotine Delivery Systems (ENDS) Use: Monitoring the Future Survey

Authors: Yixian (Crystal) Chen PhD¹, Evelyn Jimenez-Mendoza MSc², Jihyun Jeon PhD², Rafael Meza PhD¹
Affiliations: ¹British Columbia Cancer Research Institute, ²University of Michigan

TCORS Grantee Meeting

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- Nothing to disclose

Specific Aims

- Assess trends in exclusive cigarette and ENDS use among U.S. adolescents from 2017 to 2022
- Characterize dual use patterns of cigarettes and ENDS
- Explore sex-specific trends, focusing on differences between boys and girls

Data Source and Study Design

- Data: Monitoring the Future (MTF) survey (2017-2022)
- Sample: 8th, 10th, and 12th graders
- Representative sample of U.S. adolescents
- Cross-sectional, stratified by grade and sex

Methodology

- Complex sampling design: clustering, stratification, weighting
- Use definitions: any, exclusive, and dual past 30-day use of cigarettes and ENDS
- Analytical tools: Joinpoint regression analysis

Methodology

- Past 30-Day Use Definitions for Cigarette, ENDS, and Dual use
 - Any **Cigarette** Use: Use of at least 1 cigarette
 - Daily **Cigarette** Use: Use of at least 1 cigarette per day
 - Exclusive **Cigarette** Use: Cigarette use without ENDS use
- Any **ENDS** Use: Use of ENDS at least once
- Regular **ENDS** Use: Use of ENDS at least 10 days
- Exclusive **ENDS** Use: Use of ENDS without cigarette use
- Any **Dual** Use: Use of both cigarettes and ENDS
- Daily Cigarette **&** Any ENDS Use: Daily cigarette use along with any ENDS use
- Regular ENDS **&** Any Cigarette Use: Regular ENDS use with any cigarette use

Results – Exclusive Cigarette Use

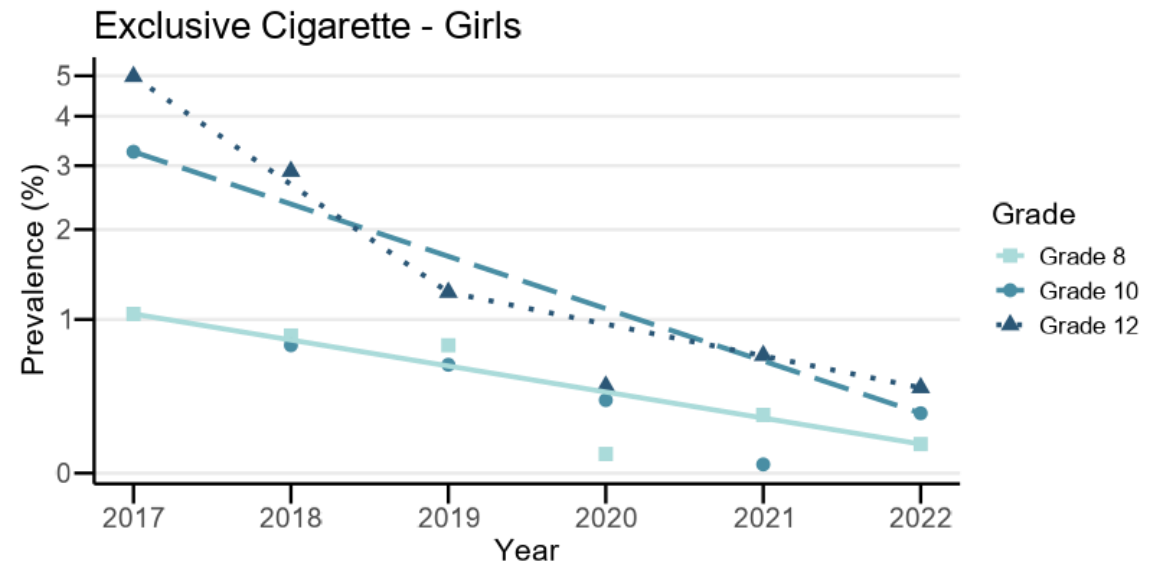
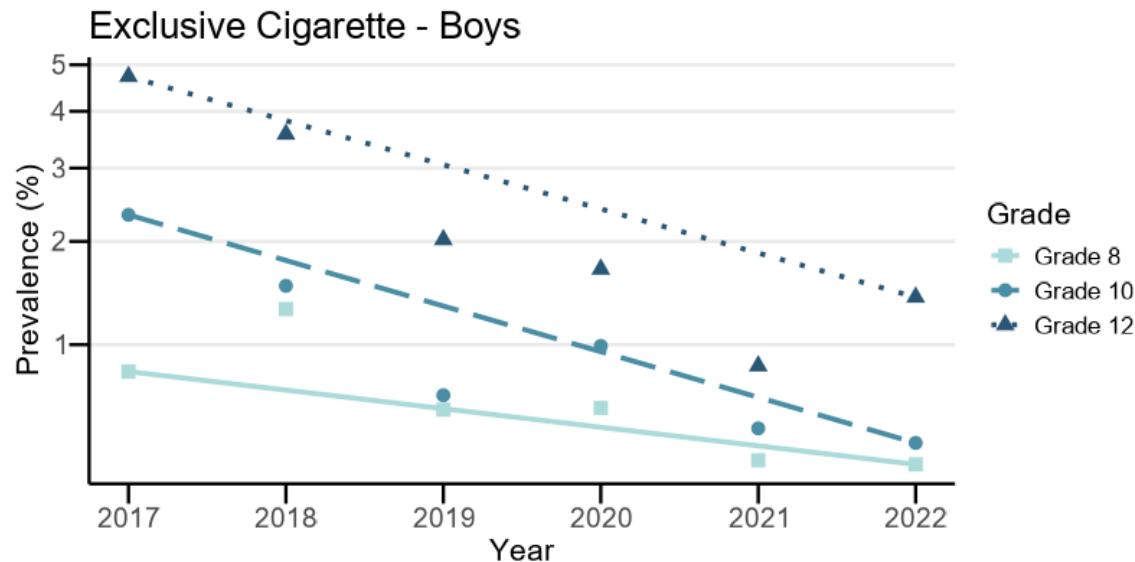
- Significant declines in exclusive cigarette use across all grades

- Boys

- Grade 8: annual percent change (APC) = **-26.7%** (95% CI: -40.2 to -10.2%)
- Grade 10: APC = **-32.6%** (95% CI: -40.6 to -23.5%)
- Grade 12: APC = **-23.9%** (95% CI: -37.3 to -7.73%)

- Girls

- Grade 8: APC = **-30.5%** (95% CI: -42.6 to -15.8%)
- Grade 10: APC = **-45.2%** (95% CI: -63.3 to -18.2%)
- Grade 12: AAPC = **-37.4%** (95% CI: -53.3 to -16.1%)



Results – Exclusive ENDS Use

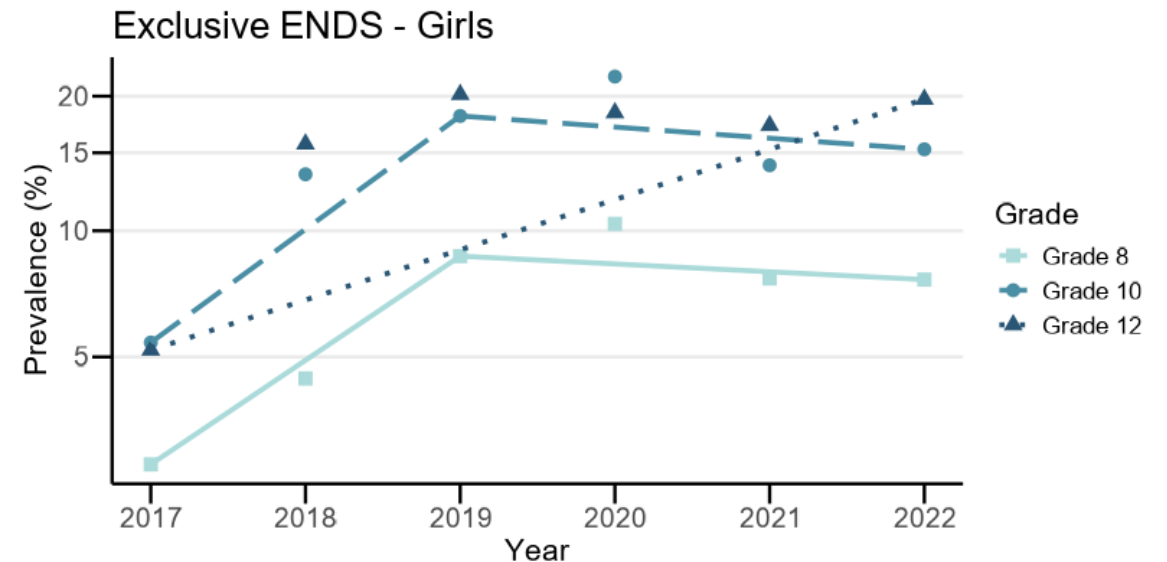
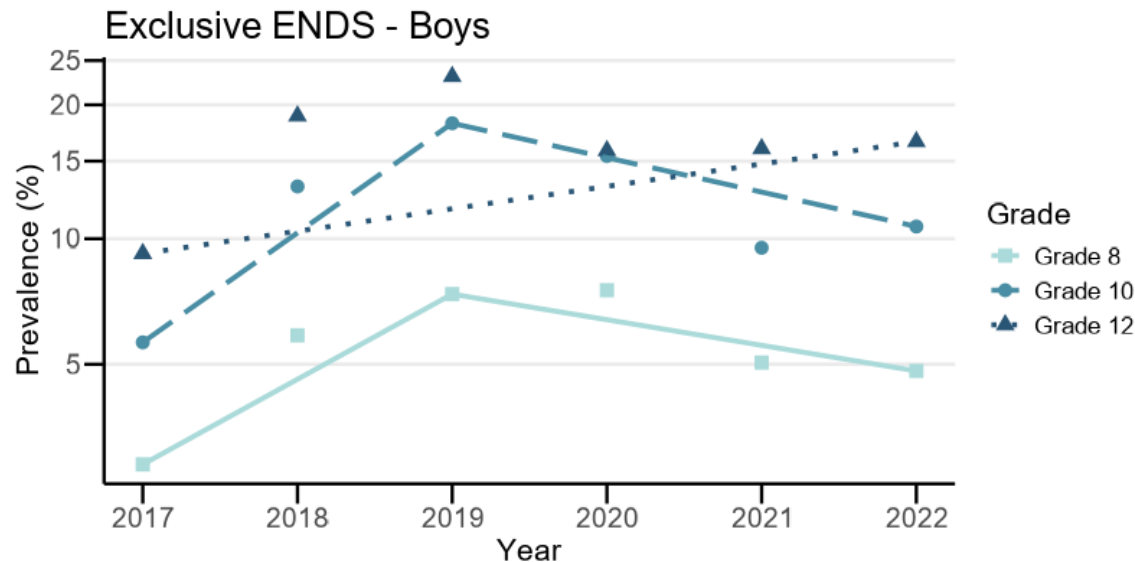
- Prevalences of exclusive ENDS use rose until 2019/2020, then stabilized (although most APCs or AAPCs were not significant)

- Boys

- Grade 8: AAPC = 9.0% (95% CI: -6.5 to 27.1%)
- Grade 10: AAPC = 9.8% (95% CI: -18.0 to 46.9%)
- Grade 12: APC = 6.1% (95% CI: -15.0 to 32.3%)

- Girls

- Grade 8: AAPC = **25.4%** (95% CI: 9.8 to 43.2%)
- Grade 10: AAPC = 17.1% (95% CI: -21.7 to 75.2%)
- Grade 12: APC = 13.6% (95% CI: -13.0 to 48.5%)



Results – Any Dual Use

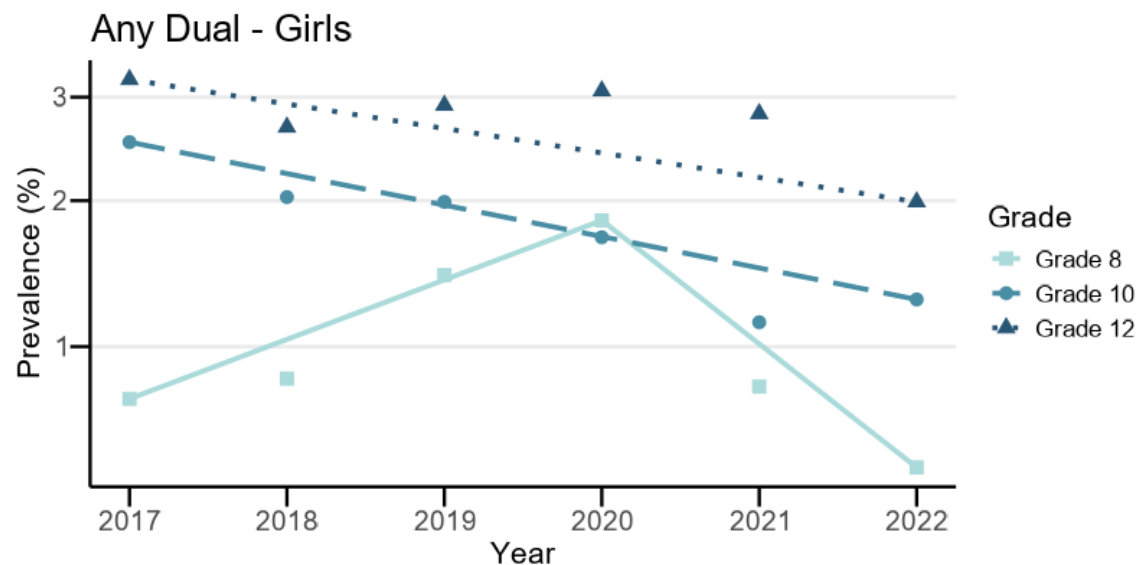
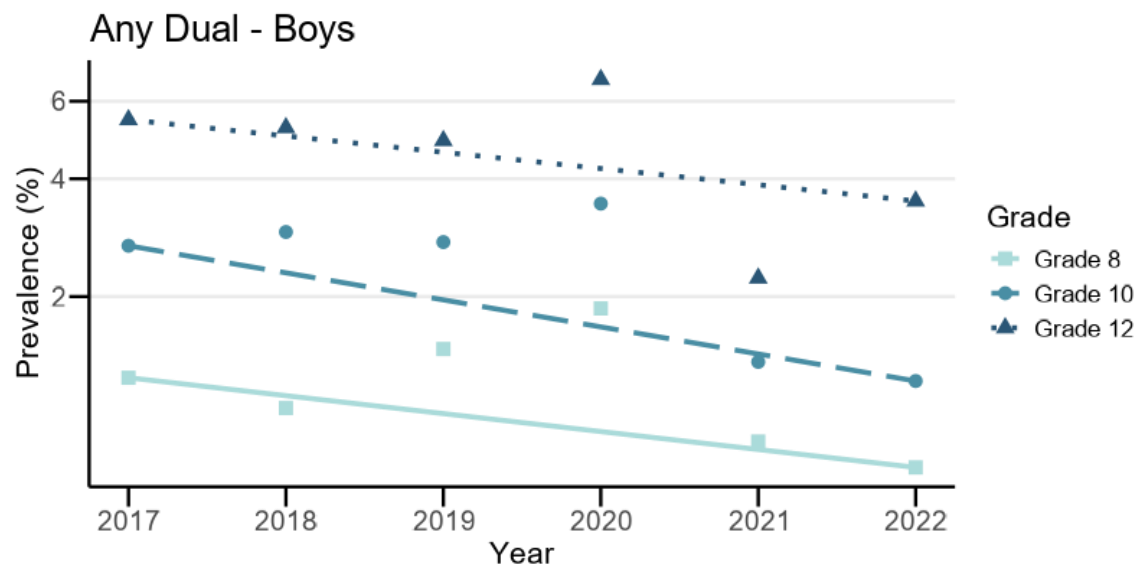
- Decline in any dual use from 2017 to 2022

- Boys

- Grade 8: APC = -15.9% (95% CI: -32.7 to 5.0%)
- Grade 10: APC = **-21.4%** (95% CI: -37.1 to -1.9%)
- Grade 12: APC = -14.2% (95% CI: -30.3 to 5.5%)

- Girls

- Grade 8: AAPC = -8.6% (95% CI: -35.9 to 30.2%)
- Grade 10: APC = **-13.4%** (95% CI: -18.2 to -8.3%)
- Grade 12: APC = **-8.2%** (95% CI: -14.2 to -1.8%)



Results – Other Dual Use

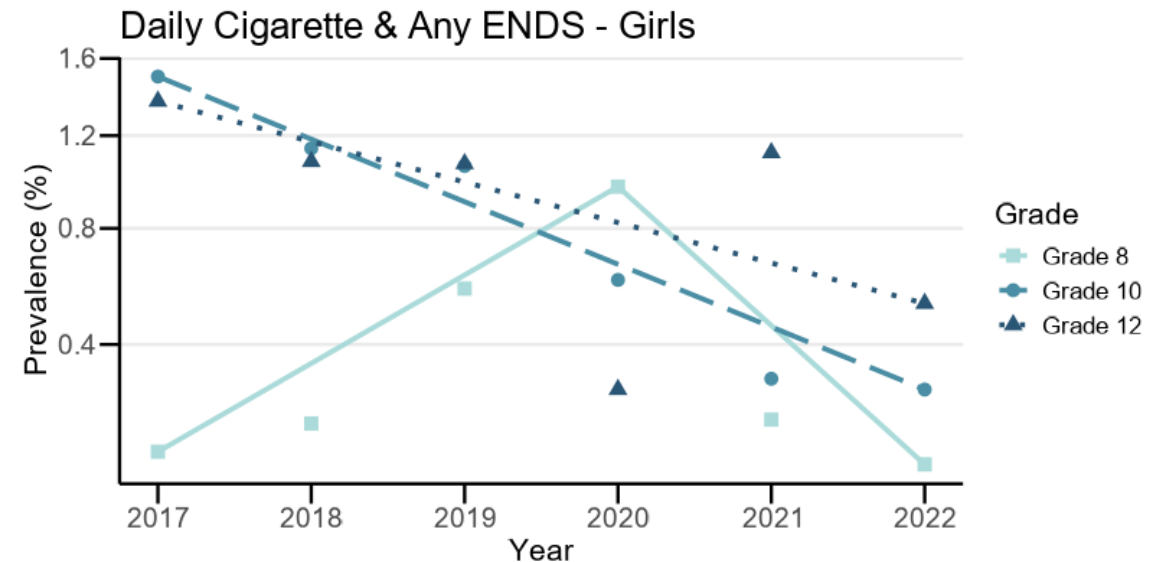
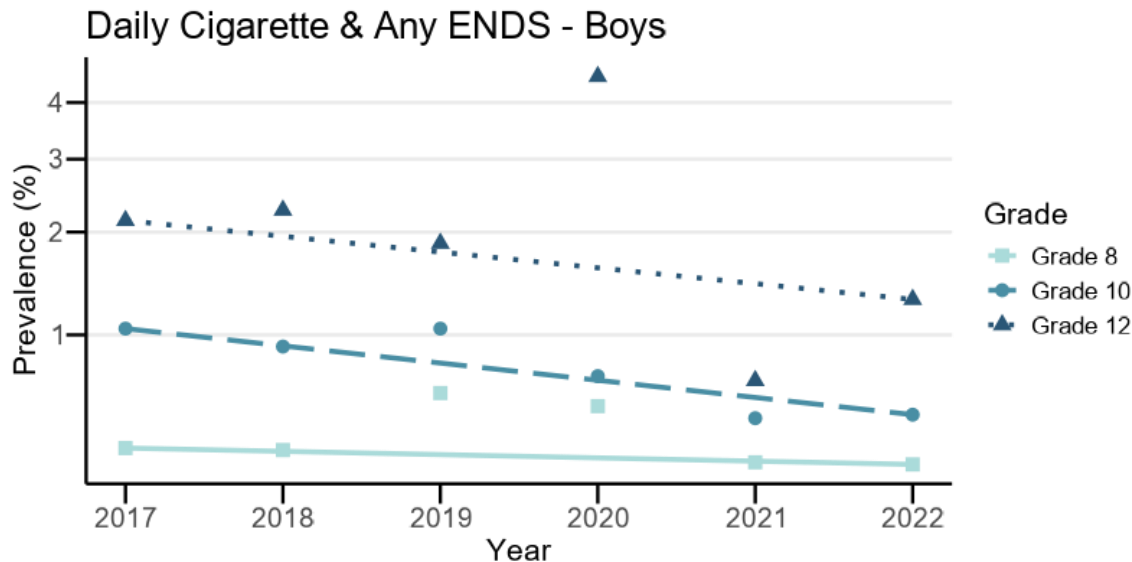
- Daily Cigarette & Any ENDS Use

- Boys

- Grade 8: APC = -10.4% (95% CI: -30.9 to 16.2%)
- Grade 10: APC = **-17.9%** (95% CI: -30.2 to -3.5%)
- Grade 12: APC = -19.3% (95% CI: -41.4 to 11.1%)

- Girls

- Grade 8: AAPC = -8.7% (95% CI: -45.2 to 51.9%)
- Grade 10: APC = **-29.7%** (95% CI: -37.7 to -20.6%)
- Grade 12: APC = **-18.4%** (95% CI: -27.1 to -8.6%)



Results – Other Dual Use

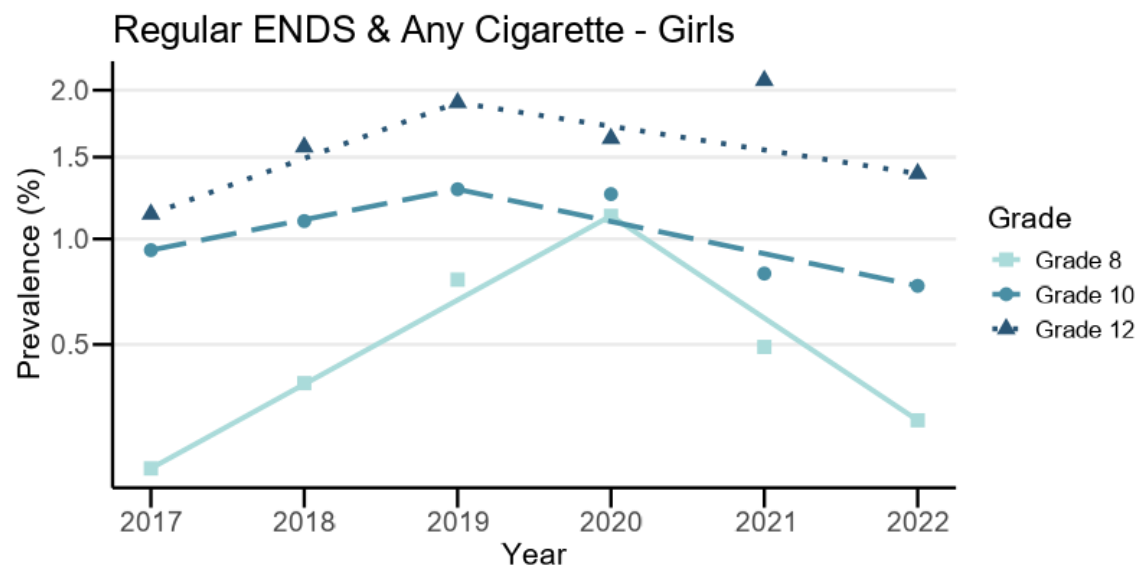
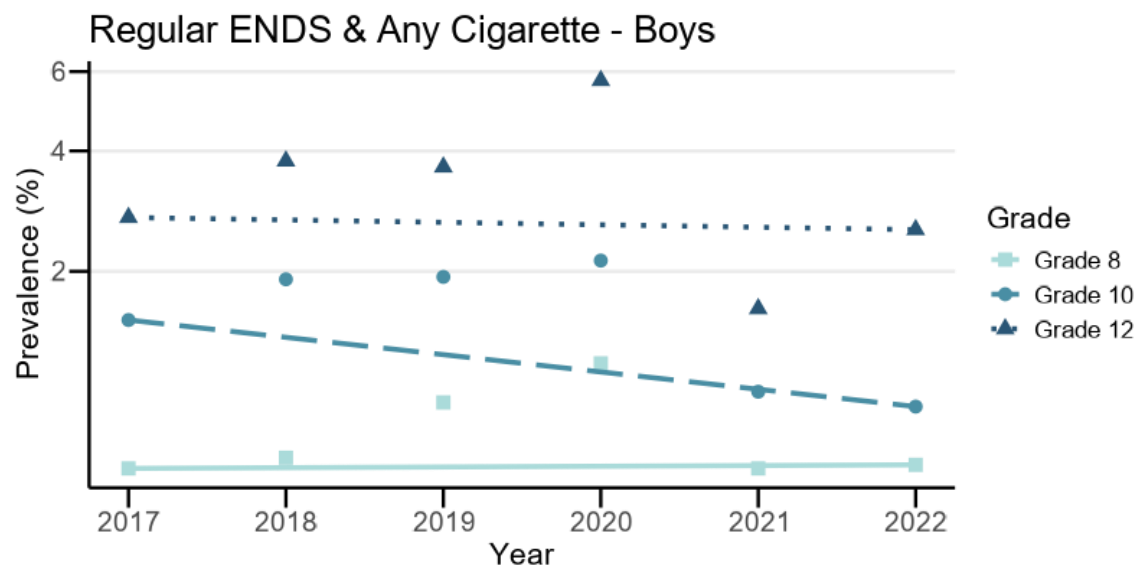
• Regular ENDS & Any Cigarette Use

• Boys

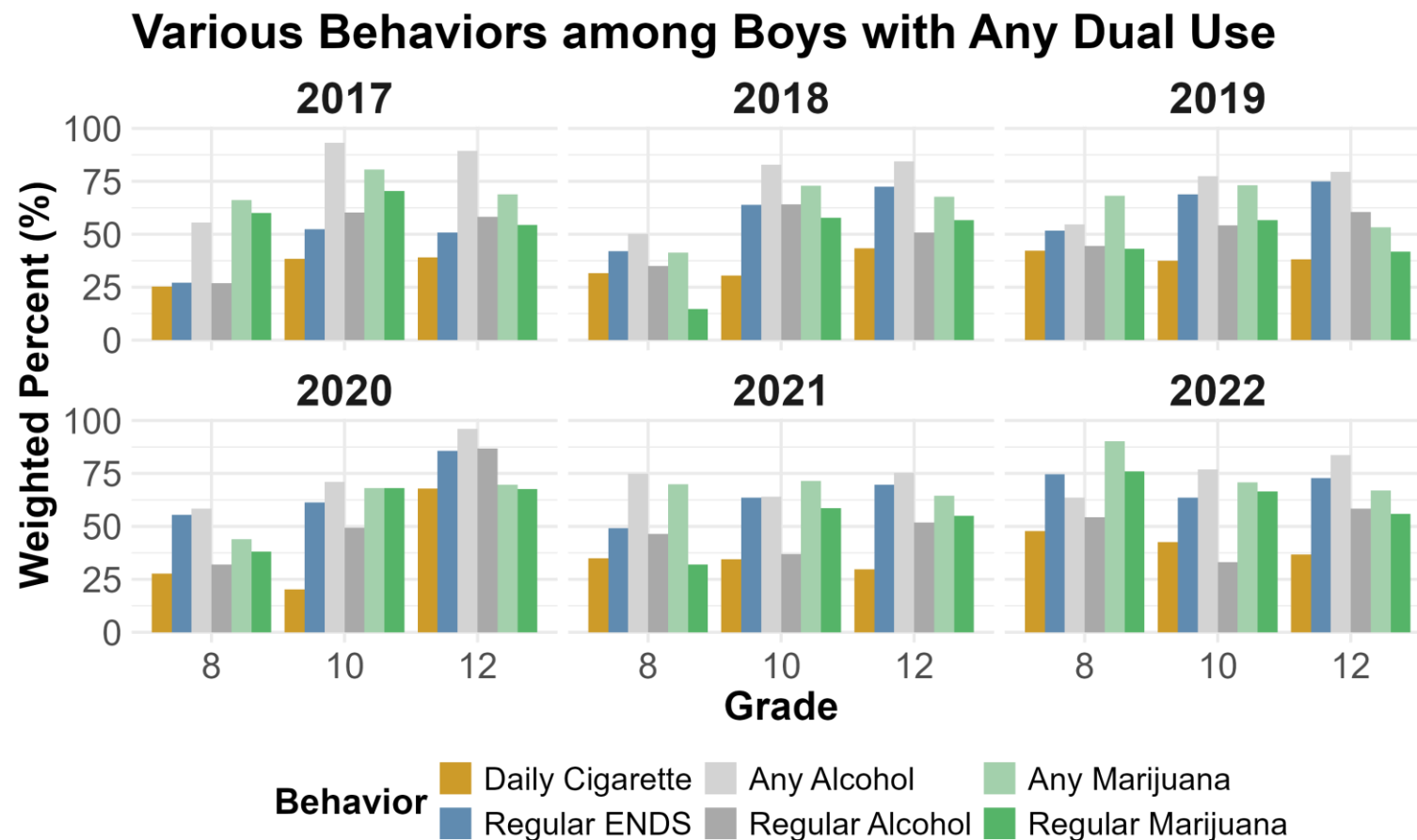
- Grade 8: APC = -8.0% (95% CI: -31.1 to 22.8%)
- Grade 10: APC = -**23.2%** (95% CI: -40.0 to -1.8%)
- Grade 12: APC = -6.4% (95% CI: -23.8 to 15.0%)

• Girls

- Grade 8: AAPC = 4.0% (95% CI: -31.0 to 56.7%)
- Grade 10: AAPC = -4.3% (95% CI: -17.9 to 11.6%)
- Grade 12: AAPC = 4.4% (95% CI: -23.6 to 42.6%)



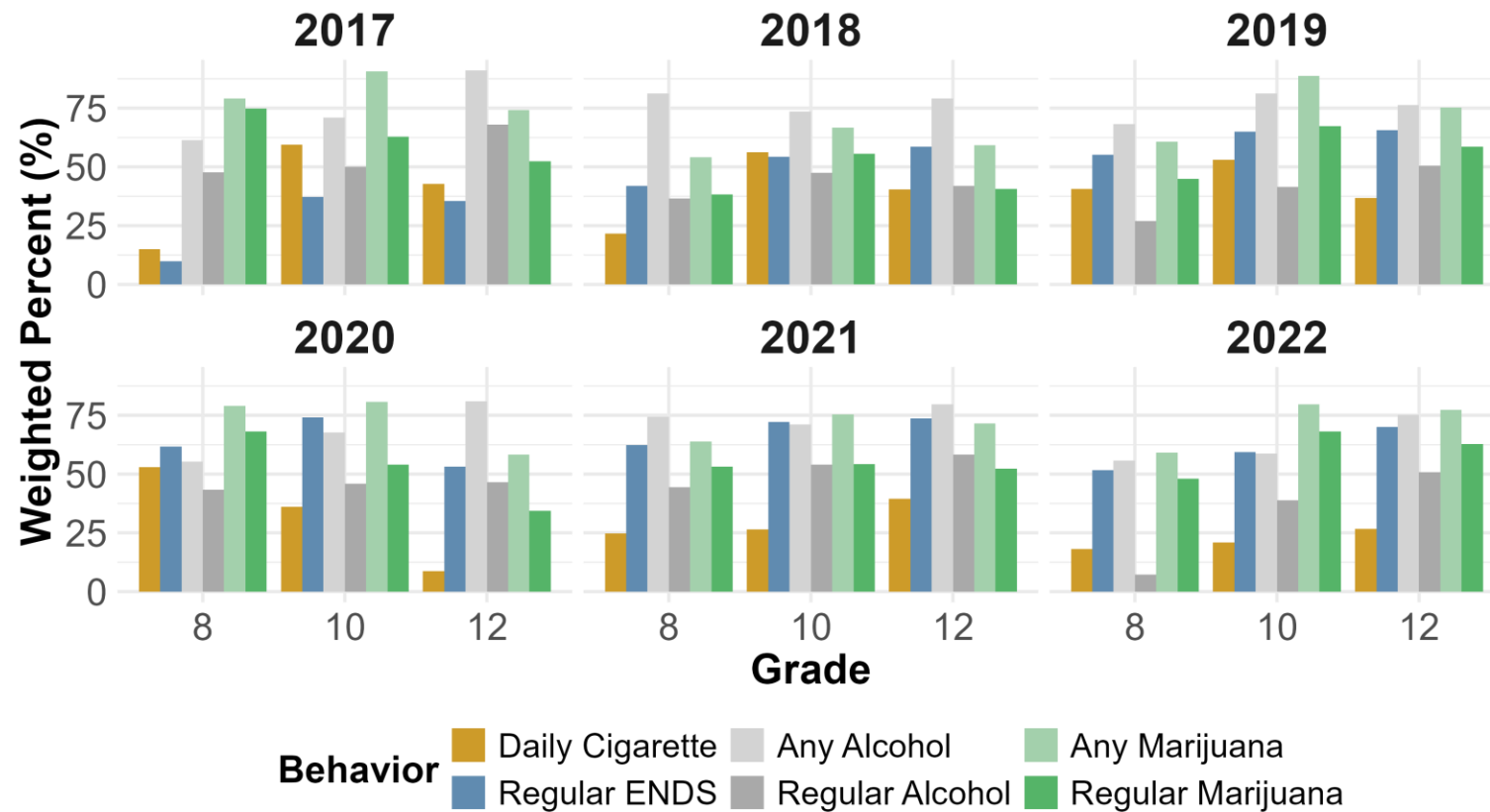
Sub-analysis of Dual Use



- High prevalence of regular substance use among boys with any dual use:
 - ENDS: Consistently above 50% after 2019
 - Alcohol: Above 60% in 12th graders (most years)
 - Marijuana: Peaked in 2020 (~70%) in 12th graders, remains above 50% after

Sub-analysis of Dual Use

Various Behaviors among Girls with Any Dual Use



- Regular alcohol, marijuana, and ENDS use are prevalent among girls with dual use.
 - ENDS: Above 50% for all grades after 2018
 - Alcohol: Consistently high in 12th graders, with over 50% in most years
 - Marijuana: Remains high, especially among 12th graders (~75% in 2022)

Conclusions

- Decline in exclusive cigarette and dual use
- Exclusive ENDS use remains high and has not significantly decreased
- Need for targeted prevention efforts

Implications for FDA's Tobacco Regulatory Authorities

- Strengthen regulations on adolescent ENDS use
- Continue efforts to reduce cigarette use
- Address sex-specific trends



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