Oregon Health Authority

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TOBACCO 21 EVALUATION

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FINAL REPORT

RMC RESEARCH

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EXECUTIVE SUMMARY

In August 2017 Oregon Governor Kate Brown signed Senate Bill 754, which raised the age of purchase for tobacco and vaping products in Oregon from 18 to 21 years of age. Most addiction to tobacco starts in adolescence: for example, about 90% of adults who smoke reportedly started smoking before turning 18, and almost 100% reportedly started before turning 26.[1] Senate Bill 754 was developed to help prevent young people from ever starting to smoke and to reduce the deaths, disease, and health care costs caused by tobacco use. Senate Bill 754, also referred to as Tobacco 21, went into effect on January 1, 2018.

The Oregon Health Authority (OHA) contracted RMC Research to conduct an evaluation of Tobacco 21. The evaluation used social media advertising to conduct cross-sectional online surveys of youth aged 13 to 17 and young adults aged 18 to 25 in all counties in Oregon before (pre-legislation, December 2017) and 9 months after the Tobacco 21 law took effect (post-legislation, September 2018). Respondents aged 18–20 were of particular interest post-legislation because Tobacco 21 implementation should directly impact access to tobacco products in this age range.

This report includes findings from both the pre-legislation and post-legislation surveys regarding tobacco use and Tobacco 21 outcomes such as recent initiation of tobacco use (within the past 6 months), perceived ease of access to tobacco, requests for proof of age when purchasing tobacco products, and age of tobacco use initiation (see Exhibit 1). Findings focused on youth and young adults who reported using tobacco in their lifetime and in the past 30 days (current tobacco users). Analyses compared outcomes by age group (i.e., aged 13–17, 18–20, 21–25) and by geographic area (i.e., Portland metro area[2] and Oregon, outside Portland metro area), controlling for demographic differences between samples.

Key findings included:

- Consistent with predicted effects from Tobacco 21, overall **recent initiation (within the past 6 months) of tobacco use decreased statistically significantly** (from 23% to 18%) from pre- to post-legislation. Consistent with expected effects of Tobacco 21 legislation, recent initiation decreased statistically significantly among current tobacco users aged 13–17 (from 34% to 25%) and aged 18–20 (23% to 18%).
- Consistent with predicted effects from Tobacco 21, current tobacco users' **perceived ease of access to tobacco and vaping products decreased statistically significantly** from pre- to post-legislation. Importantly, a statistically significant decrease occurred in the percentage of tobacco users aged 18–20 who reported that it was *sort of easy* or *very easy* to obtain tobacco products.
  - From pre- to post-legislation, a shift in where tobacco products were obtained by current tobacco users aged 18–20 was observed descriptively, with their patterns becoming more similar to patterns of youth rather than patterns of tobacco users aged 21–25.
  - From pre- to post-legislation, current tobacco users in both geographic regions reported a statistically significant decrease in ease of access to tobacco products.
- From pre- to post-legislation, the **frequency of requests for proof of age did not change statistically significantly**.

[1]U.S. Department of Health and Human Services. (2012). *Preventing Tobacco Use Among Youth and Young Adults: A Report of the Surgeon General.* Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health.
[2]The Portland metro area includes Clackamas, Columbia, Multnomah, Washington, and Yamhill Counties.

- Current tobacco users in Oregon, outside Portland metro area who tried to purchase products in a store in the past 30 days were statistically significantly *less* likely to be asked for proof of age than those in the Portland metro area.

- From pre- to post-legislation, the average **age of initiation of tobacco use did not change statistically significantly** among youth and young adult tobacco users.
- Descriptively, tobacco use trends at pre- and post-legislation were similar, though reported use of e-cigarettes increased and reported use of chewing tobacco decreased.[3]

Most current tobacco users demonstrated awareness of the new legal age.

- At post-legislation 90% of current tobacco users correctly answered that the legal age to purchase tobacco products is "21 or older." Young adults aged 18–20 were statistically significantly more likely to answer correctly, compared to youth and to young adults aged 21–25 (94% correct, compared to 89% and 88%, respectively).

Exhibit 1—Tobacco 21 Evaluation Findings

Outcome	Evaluation Findings
Initiation of tobacco use within the past 6 months	▶ From pre- to post-legislation, recent initiation (within the past 6 months) of tobacco use decreased statistically significantly (from 23% to 18%). ▶ Specifically, recent initiation decreased statistically significantly among current tobacco users aged 13–17 (from 34% to 25%) and aged 18–20 (23% to 18%). ▶ From pre- to post-legislation, statistically significantly fewer Portland metro area tobacco users reported initiating use of tobacco products within the past 6 months (from 23% to 17%). ▶ Descriptively, among those who initiated use within the past 6 months, e-cigarettes increased in popularity as first type of tobacco tried. "Other products" (i.e., cigars, hookah, chewing tobacco) decreased in popularity from pre- to post-legislation.
Perceived ease of access to tobacco and vaping products	▶ From pre- to post-legislation, current tobacco users' perceived ease of access to tobacco and vaping products decreased statistically significantly. ▶ There was a statistically significant decrease in the percentage of current tobacco users aged 18–20 who reported that it was *sort of easy* or *very easy* to obtain tobacco products. ▶ From pre- to post-legislation, current tobacco users in both geographic regions reported a statistically significant decrease in ease of access to tobacco products.
Frequency of requests for proof of age	▶ From pre- to post-legislation, frequency of requests for proof of age did not change statistically significantly. ▶ There was an increase in frequency of proof of age requests for youth tobacco users aged 13–17 from pre- to post-legislation, though the increase was not statistically significant. ▶ Although tobacco users in Oregon, outside Portland metro area who tried to purchase products in a store in the past 30 days were statistically significantly less likely to be asked for proof of age compared to those in the Portland metro area, the difference between pre- and post-legislation was not statistically significant. ▶ At both pre- and post-legislation, descriptively youth reported being asked to show identification when attempting to purchase tobacco products less frequently than young adults.

[3]Descriptive analyses were conducted to describe patterns in tobacco use. Inferential analyses were not conducted for these items.

Outcome	Evaluation Findings
Age of initiation of tobacco use	▶ The average age of initiation of tobacco use did not change statistically significantly between pre- and post-legislation. ▶ Descriptively, the average age that current tobacco users first used any type of tobacco product was 14.8 at pre-legislation and 14.9 at post-legislation. ▶ Descriptively, overall the average age of initiation was younger among current tobacco users aged 13–17 (around age 13) and the average age was older among those aged 18–25 (around age 15). ▶ Descriptively, current tobacco users in Oregon, outside Portland metro area reported initiating tobacco use at a younger age than those in the Portland metro area.
Type of tobacco first used[4]	▶ Descriptively, e-cigarettes were the most common tobacco product first used by youth and cigarettes were the most common tobacco product first used by young adults. ▶ At pre-legislation there were differences by region (Portland metro area and Oregon, outside Portland metro area) in type of tobacco product first tried whereas at post-legislation patterns were more similar descriptively. ▶ At post-legislation, "other products" (i.e., cigars, hookah, chewing tobacco) descriptively decreased in popularity as the type of tobacco first tried.
Where tobacco products were obtained[5]	▶ From pre- to post-legislation, a shift in where tobacco products were obtained by current tobacco users aged 18–20 was observed descriptively. Pre-legislation their patterns resembled those of users aged 21–25 (e.g., obtained frequently from convenience stores or grocery stores). Post-legislation, their patterns were more similar to those of youth (e.g., an increase in frequency of obtaining from friends or family aged 21 or older). ▶ Overall, descriptively there were minimal differences by geographic region regarding where tobacco users obtained tobacco products.
Tobacco use[6]	▶ At both pre- and post-legislation, lifetime and current use of e-cigarettes was descriptively higher for youth than young adults; lifetime and current hookah use was higher for young adults than youth; current use of cigarettes was higher for young adults than youth. ▶ Descriptively, past 30-day use of e-cigarettes among current tobacco users was about 9% higher for all age groups at post-legislation, compared to pre-legislation. ▶ Use of chewing tobacco decreased descriptively for all age groups and both geographic areas from pre- to post-legislation. ▶ Use of flavored tobacco products was descriptively more common among youth and young adults aged 18–20 than among young adults aged 21–25 at both pre- and post-legislation and more common among current tobacco users in Oregon, outside of Portland metro than among Portland metro tobacco users. ▶ Although the most common reason current tobacco users cited for using vaping or Juuling products was as an alternative to cigarettes at both pre- and post-legislation, a higher percentage descriptively cited "nicotine" at post-legislation compared to pre-legislation.

[4] Descriptive analyses were conducted to describe patterns in tobacco use. Inferential analyses were not conducted for these items.
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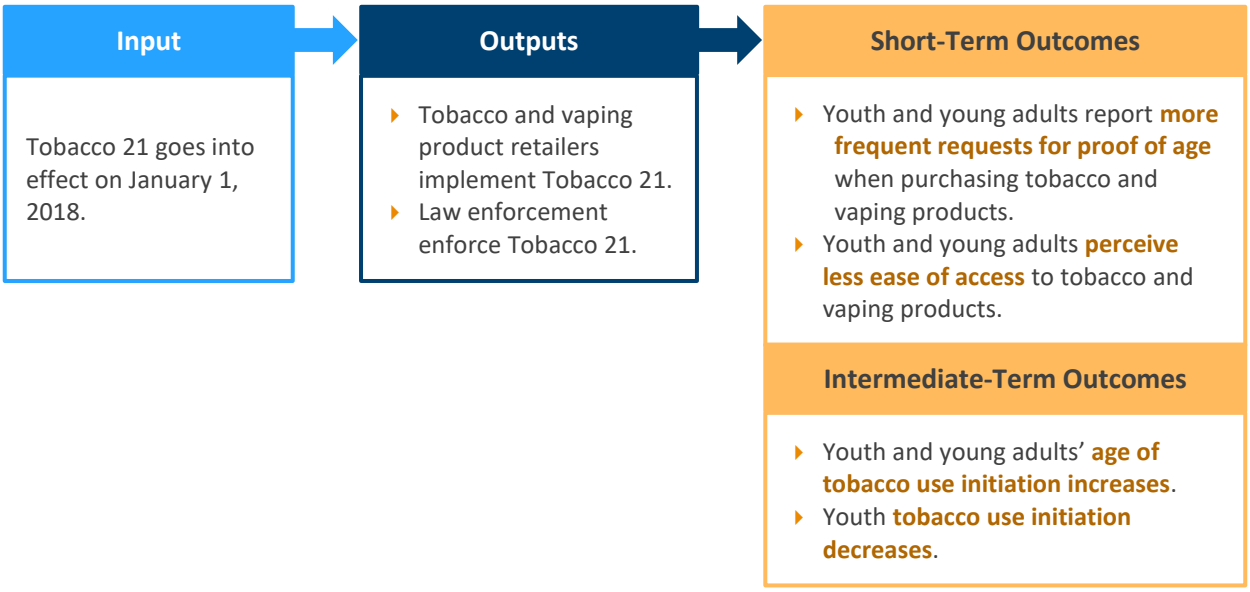
EVALUATION DESIGN

RMC Research conducted the Tobacco 21 evaluation to assess the short-term and intermediate-term outcomes of implementation of Tobacco 21, as depicted in the logic model in Exhibit 2. The evaluation used social media advertising to recruit for online surveys with youth aged 13 to 17 and young adults aged 18 to 25 in all counties in Oregon before (pre-legislation, December 2017) and 9 months after the Tobacco 21 law took effect (post-legislation, September 2018).

Exhibit 2—Oregon Tobacco 21 Logic Model



The evaluation assessed the following cross-sectional changes from pre- to post-legislation, self-reported by respondents: (a) past 6-month tobacco initiation; (b) perceived ease of access of tobacco and vaping products; (c) requests for proof of age when trying to purchase tobacco or vaping products; and (d) age of initiation of tobacco use. This final report reflects findings from the pre- and post-legislation data collection. Outcomes were compared by age group (i.e., youth aged 13–17 and young adults aged 18–20 and 21–25) and by geographic area (i.e., the Portland metro area[7] and Oregon, outside Portland metro area). Exhibit 3 displays the evaluation questions.

[7]The Portland metro area includes Clackamas, Columbia, Multnomah, Washington, and Yamhill Counties.

Exhibit 3—Oregon Tobacco 21 Evaluation Questions

Evaluation Question	Outcome
Between pre- and post-legislation, to what extent did the:	
1. Initiation of tobacco use decrease among youth and young adults aged 13 to 25?	▶ Percentage of current tobacco users who report initiating tobacco use within the past 6 months
2. Perceived ease of access to tobacco and vaping products decrease among youth and young adults aged 13 to 25?	▶ Percentage of current tobacco users who report it was *very easy* or *sort of easy* to access tobacco products
3. Frequency of requests for proof of age increase among youth and young adults aged 13 to 25?	▶ Percentage of current tobacco users who state that requests for proof of age occurred every time in the last 30 days
4. Average age of initiation of tobacco use increase among youth and young adults aged 13 to 25?	▶ Average age of initiation of any tobacco use

THE OREGON TOBACCO SURVEY

The Oregon Tobacco Survey (OTS) asked youth (aged 13–17) and young adult (aged 18–20 and 21–25) tobacco users questions about their experiences with tobacco and vaping products that were expected to be affected by the implementation of Tobacco 21. Questions related to current and lifetime tobacco use with a variety of products (i.e., cigarettes, e-cigarettes, little cigars, large cigars, chewing tobacco, hookah, Juuls, and other vaping products), age of initiation of tobacco use by product, reasons for using vaping/Juuling products, source of tobacco or vaping products, frequency of requests for proof of age, ease of access to tobacco or vaping products, and product used during first tobacco use. OHA developed the draft survey by consulting multiple sources to create a list of potential items. RMC Research finalized the survey items in collaboration with OHA. The OTS measures were drawn from multiple sources, including the Oregon Healthy Teens Survey (OHT).[8] The pre-legislation OTS appears in Appendix A and the post-legislation OTS appears in Appendix B.

DATA COLLECTION

The pre-legislation OTS data were collected via SurveyMonkey from December 15, 2017, through December 30, 2017, prior to implementation of Tobacco 21. After 9 months of Tobacco 21 implementation, post-legislation data were collected from August 30, 2018, though September 17, 2018. OTS participants were recruited via social media (i.e., Facebook, Instagram) ads that targeted participants in the appropriate age ranges and areas. The OTS took approximately 5 to 10 minutes to complete. Survey respondents had the option to enter in a lottery to win a $50 gift card; every 75 respondents, RMC Research randomly selected and notified a respondent of winning via the email address they provided in another SurveyMonkey survey, which kept contact information and survey responses separate, ensuring anonymity.

[8]https://public.health.oregon.gov/BirthDeathCertificates/Surveys/OregonHealthyTeens/Pages/index.aspx.

Sampling

The target sample for the OTS was tobacco-using youth (aged 13–17) and young adults (aged 18–20 and 21–25) residing in Oregon. To ensure statewide representation, the Portland metro area was sampled separately from all other Oregon counties.[9] The achieved sample sizes of 3,433 current tobacco users (i.e., reported lifetime use and past 30-day use) at pre-legislation and 1,836 current tobacco users at post-legislation are adequate for the general linear models used in the analyses described in this report. Of 2,220 post-legislation respondents, 4% (*n* = 90) said they *definitely did* complete the pre-legislation survey; 16% were unsure whether they had completed the pre-legislation survey.

Recruitment

RMC Research recruited youth and young adult tobacco-using survey respondents from all counties in Oregon using Facebook and Instagram. RMC Research developed a Facebook page and advertised the survey using Facebook and Instagram ads that appeared on users' Facebook walls and in their Instagram feeds. RMC Research developed engaging ads directed at potential participants in the desired age range and geographic region. The ad language[10] attempted to solicit responses only from tobacco product users, although guaranteeing that only tobacco users responded was not possible (see Appendix C for a sample ad used for social media recruitment). The evaluation team developed 2 types of recruitment ads, one for 13- to 17-year-olds and one for 18- to 25-year-olds, to ensure that the images used were age appropriate. Zip codes were used to target the ads to potential survey respondents in the desired regions. Clicking on the Facebook and Instagram ads directed users to the survey.

Because simultaneous ads within Facebook and Instagram compete for ad clicks, RMC Research created separate ad campaigns using zip codes to target nonoverlapping geographic areas during the same timeframe.[11] Within each region, separate campaigns occurred for youth (aged 13–17) and for young adults (aged 18–25) using identical ad language and age-appropriate images. In addition, to ensure adequate representation, additional campaigns targeted zip codes with higher percentages of African Americans and Native Americans according to Oregon census data.

To validate regions targeted during recruitment, respondents to the post-legislation survey were asked to provide their zip codes. Among respondents who did so (*n* = 2,119), 98% were valid Oregon zip codes. About 90% of respondents entered zip codes that aligned with the specific geographic region the ads targeted. However, approximately 35% of the respondents to the ads that targeted Multnomah County entered a zip code within the Portland metro area but not within Multnomah County.

[9]RMC Research also oversampled Multnomah County youth and young adults and African American and Native American youth and young adults at the request of OHA and Multnomah County. The results from these samples are not reported in this report.
[10]Ad language: "Win a $50 gift card by completing a 5-minute anonymous survey! You qualify if you currently use tobacco products in any form (including vaping products such as Juul and e-cigarettes)."
[11]Regions included Multnomah County; Portland metro area defined as Clackamas, Columbia, Multnomah, Washington, and Yamhill Counties; and Oregon, outside of Portland metro area.

ANALYSIS APPROACH

Each of the 4 evaluation questions were analyzed using generalized linear regression models to compare pre- and post-legislation results for all current tobacco users, controlling for demographic differences between samples. Age (as a continuous variable), race (White, American Indian/Alaska Native, Asian, Black/African American, Native Hawaiian/Pacific Islander, or more than 1 race[12]), ethnicity (Hispanic or non-Hispanic), gender (male, female, or something else), and region (Portland metro area or Oregon, outside Portland metro area) were included as covariates in all regression models to examine the impact of Tobacco 21 legislation on key outcomes regardless of these demographic variables. A chi-squared test of independence explored differences in tobacco use by sexual orientation; because no statistically significant differences in tobacco use were detected among straight and nonstraight respondents, sexual orientation was not included as a covariate in the analytic models.

Five separate post hoc models were used to address pre- and post-legislation change for each age group (compared to itself at 2 time points) and for each geographic region (compared to itself at each time point). For example, the model for youth was a subset of all current tobacco users who were aged 13–17, comparing responses at pre- and post-legislation. The 5 post hoc models (see Appendix D) examined pre- and post-legislation comparisons for the following subsets of current tobacco users, controlling for all covariates:

- Youth aged 13–17 only (age differences among youth were controlled for as a continuous age variable in the model).
- Young adults aged 18–20 only (age differences among young adults were controlled for as a continuous age variable in the model).
- Young adults aged 21–25 only (age differences among young adults were controlled for as a continuous age variable in the model).
- Portland metro area only (region was excluded as a covariate in the model because the model was stratified by this variable).
- Oregon, outside Portland metro area only (region was excluded as a covariate in the model because the model was stratified by this variable).

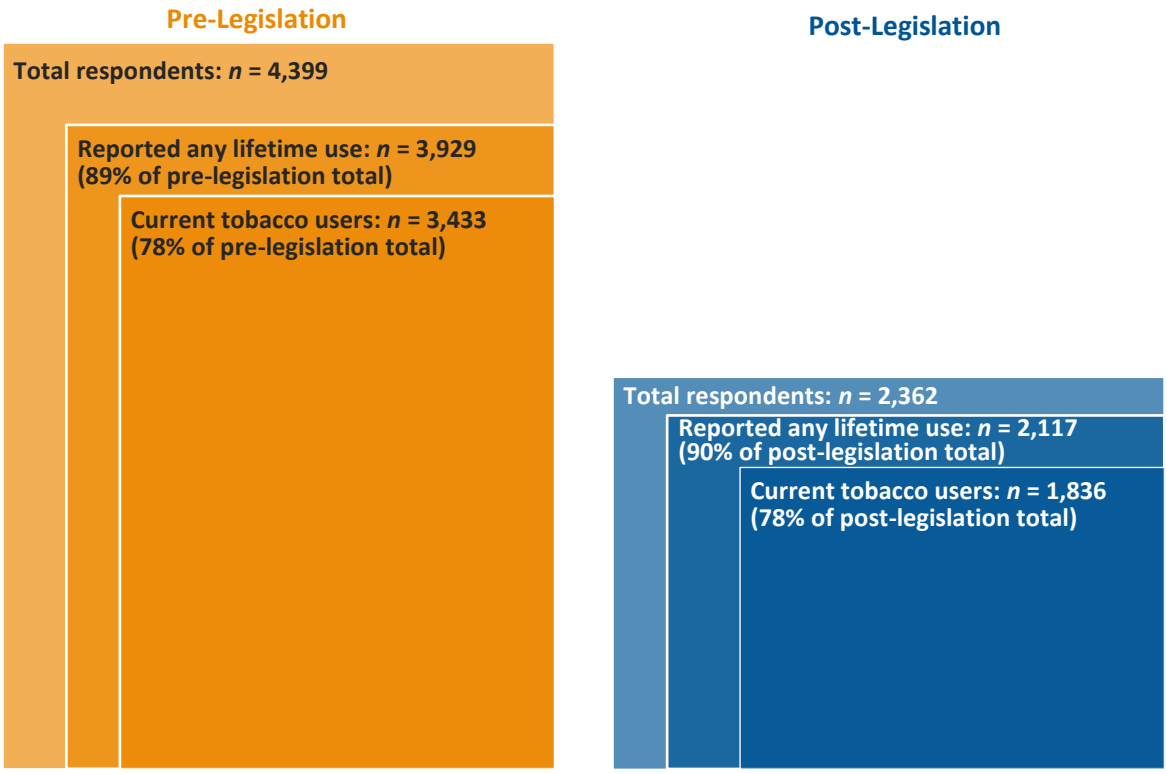
Additionally, this report includes descriptive analyses for sample demographic characteristics and tobacco use patterns and inferential analyses by age group (i.e., youth aged 13–17 and young adults aged 18–20 and 21–25) and by geographic region (i.e., Portland metro and Oregon, outside Portland metro area). Comparisons with *p*-values less than .05 were considered statistically significant. All analyses were conducted using IBM SPSS version 24.

[12]Because the "race" item on the survey allowed respondents to check more than 1 response, multiple responses were recorded as "more than 1 race."

SAMPLE CHARACTERISTICS

A total of 4,399 individuals aged 13–25 responded to the pre-legislation survey and 2,362 individuals aged 13–25 responded to the post-legislation survey. **Only those who reported using tobacco in their lifetime and in the past 30 days are included in the remainder of this report** (i.e., *current tobacco users*; 3,433 respondents in the pre-legislation sample and 1,836 respondents in the post-legislation sample). Exhibit 4 shows the total number of respondents relative to the number who reported any lifetime tobacco use and relative to the number of respondents who were current tobacco users. A complete table of the sample by age group and region is included in Appendix D.

Exhibit 4
Though the sample at pre-legislation was larger than post-legislation, over 1,800 current tobacco users were included in the post-legislation analysis in this report.



The data visualizations in this report use the following symbols to indicate the subsamples included in the analyses:

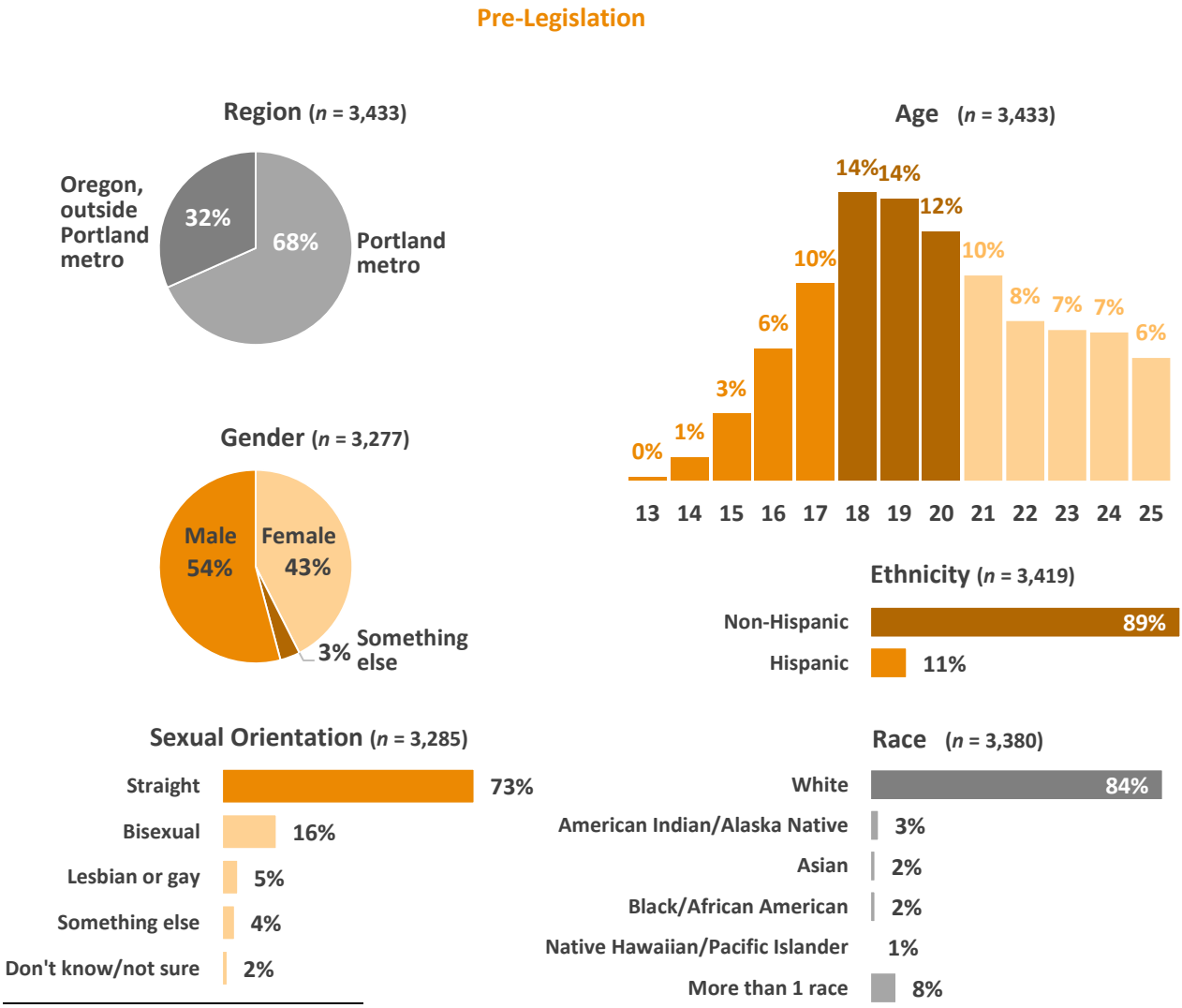
- **C** Using tobacco **currently** (in past 30 days)
- **I** Using tobacco currently and **initiated** use within the past 6 months
- **A** **Attempted** to purchase tobacco products within the past 30 days

DEMOGRAPHICS OF SAMPLE

Exhibit 5 and Exhibit 6 show the demographic makeup for survey respondents who were included in the analyses (i.e., current tobacco users) for each survey administration. Most in both the pre-legislation and post-legislation samples were White (84% and 83%, respectively) and non-Hispanic (89% and 87%, respectively), consistent with the population of Oregon. Approximately two thirds of the respondents in both samples were in the Portland metro area (68% and 66%, respectively). Current tobacco users at post-legislation were statistically significantly older than those at pre-legislation: 43% of those respondents were aged 21–25 at post-legislation, compared to 39% of the pre-legislation sample. Statistically significant differences were also evident among the 2 survey samples in terms of non-Hispanic ethnicity (pre-legislation: 89% non-Hispanic; post-legislation: 87% non-Hispanic), gender (pre-: 54% male; post-: 46% male), and sexual orientation (pre-: 73% straight; post-: 65% straight).

Exhibit 5
At pre-legislation current tobacco users were typically young adults aged 18–25, White, non-Hispanic, and identified as straight. Approximately two thirds were in the Portland metro area. More than half identified as male.[13]

C



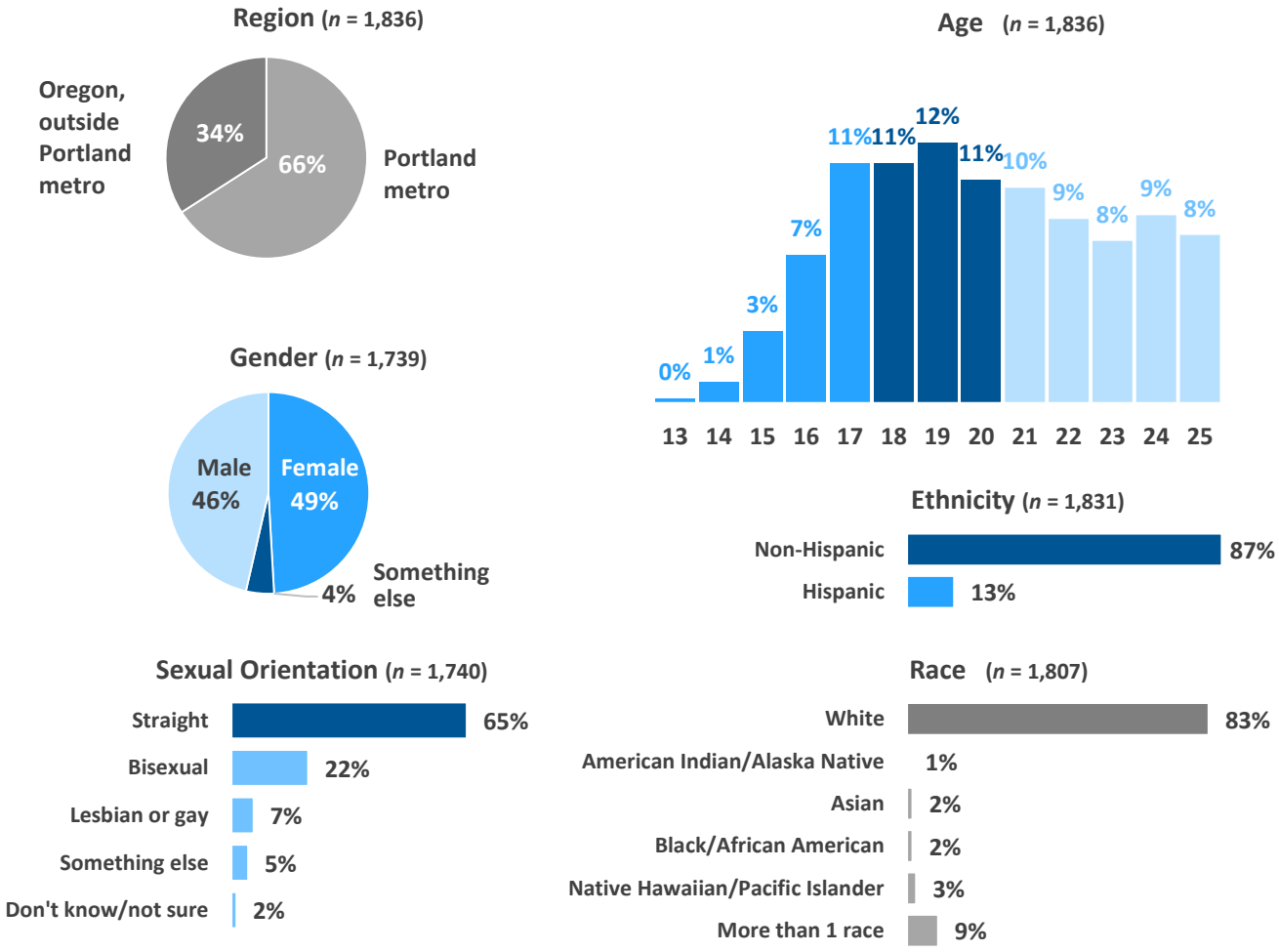
[13] See Exhibit 6 for statistically significant differences between pre- and post-legislation.

Exhibit 6

At post-legislation current tobacco users were statistically significantly older than at pre-legislation, and a statistically significantly higher percentage identified as Hispanic. At post-legislation a statistically significantly smaller percentage identified as straight or male than in the pre-legislation sample.

C

Post-Legislation



PRE- TO POST-LEGISLATION FINDINGS

Only those survey respondents who reported (a) ever using tobacco products and (b) past 30-day use were included in the analyses. Age, race, ethnicity, gender, and location[14] were included as covariates in the analytic models. Additionally, subanalyses were conducted by age group (i.e., youth aged 13–17 and young adults aged 18–20 and aged 21–25) and by geographic area (Portland metro area and Oregon, outside Portland metro).

A Tobacco 21 knowledge question was included at post-legislation: "How old do you have to be to buy tobacco products in Oregon?" Among current tobacco users 90% correctly responded "21 or older." Young adults aged 18–20 were statistically significantly more likely to answer correctly compared to youth and to young adults aged 21–25 (94% correct compared to 89% and 88%, respectively). No statistically significant difference was observed by geographic area.

INITIATION OF TOBACCO USE IN PAST 6 MONTHS

Current tobacco users reported whether they first used any tobacco or vaping/Juuling product "within the past 6 months" or "more than 6 months ago."

> ***Between pre- and post-legislation, to what extent did the initiation of tobacco use decrease among youth and young adults aged 13 to 25?***

Overall, recent initiation (within the past 6 months) of tobacco use decreased statistically significantly from pre- to post-legislation (23% to 18%).

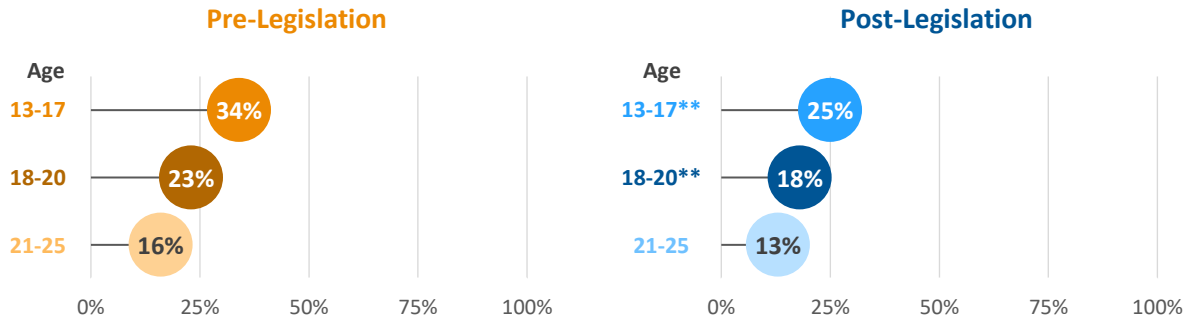
Age Comparisons Pre- and Post-Legislation

Recent initiation of tobacco use decreased statistically significantly from pre- to post-legislation among those aged 13–17 (decrease from 34% to 25%) and those aged 18–20 (decrease from 23% to 18%), as shown in Exhibit 7. The decrease observed for the oldest group of current tobacco users (aged 21–25) was not statistically significant.

[14]Age (as a continuous variable); race (White, American Indian/Alaska Native, Asian, Black/African American, Native Hawaiian/Pacific Islander, or more than 1 race); ethnicity (Hispanic or non-Hispanic); gender (male, female, or something else); and region (Portland metro area or Oregon, outside Portland metro area).

Exhibit 7
Recent initiation of tobacco use decreased statistically significantly from pre- to post-legislation for youth and for young adults aged 18–20.

C



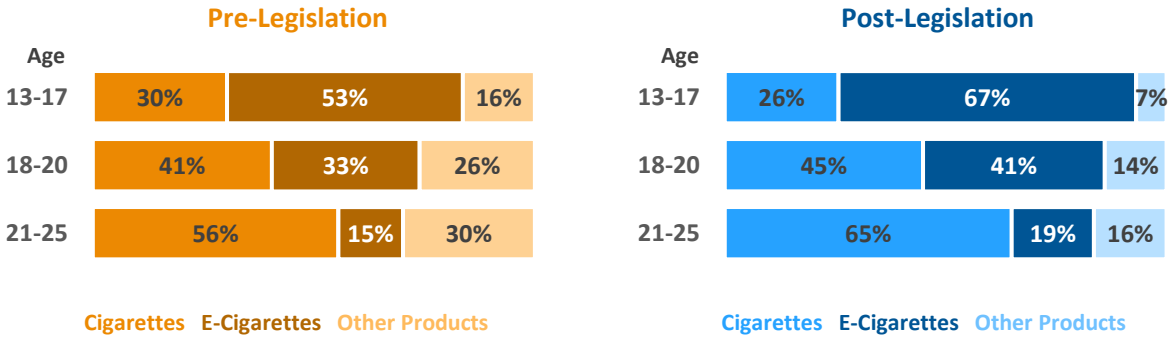
Pre-Legislation. 13–17: *n* = 653. 18–20: *n* = 1,273. 21–25: *n* = 1,225.
Post-Legislation. 13–17: *n* = 381. 18–20: *n* = 555. 21–25: *n* = 773.
**Statistically significant difference between pre- and post-legislation at $p < 0.01$.

Type of Tobacco First Used

Current tobacco users were asked what type of product they used the very first time they used any tobacco or vaping/Juuling product. At both pre- and post-legislation, youth who had ever used tobacco were statistically significantly more likely to report first using e-cigarettes compared to young adults, who were statistically significantly more likely to report first using cigarettes.

C I

Exhibit 8
Among current tobacco users who initiated use within the past 6 months, e-cigarettes increased in popularity as first type of tobacco tried, and "other products" (i.e., cigars, hookah, chewing tobacco) decreased.



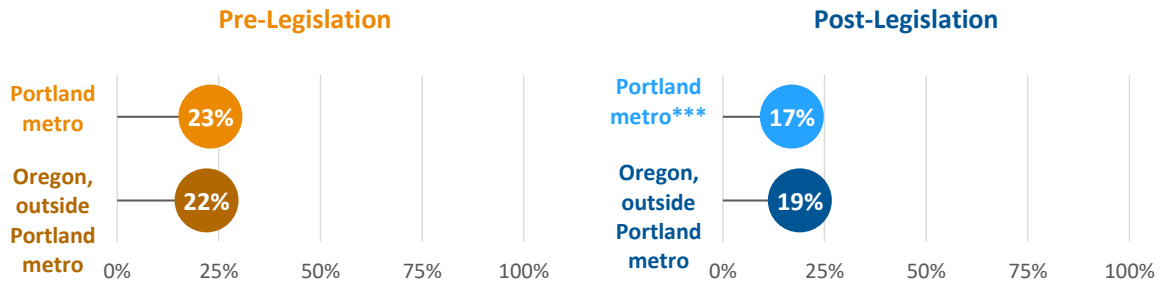
Pre-Legislation. 13–17: *n* = 227. 18–20: *n* = 296. 21–25: *n* = 198.
Post-Legislation. 13–17: *n* = 101. 18–20: *n* = 107. 21–25: *n* = 97.
Descriptive analysis only.

Geographic Comparisons Pre- and Post-Legislation

As Exhibit 9 shows, statistically significantly fewer current tobacco users in the Portland metro area reported initiating use of tobacco products within the past 6 months post-legislation (17%) compared to pre-legislation (23%). There were no pre- and post-legislation differences in the recent initiation of tobacco use for those in Oregon, outside Portland metro area.

C

Exhibit 9
Recent initiation of tobacco use decreased statistically significantly from pre- to post-legislation among those in the Portland metro area.



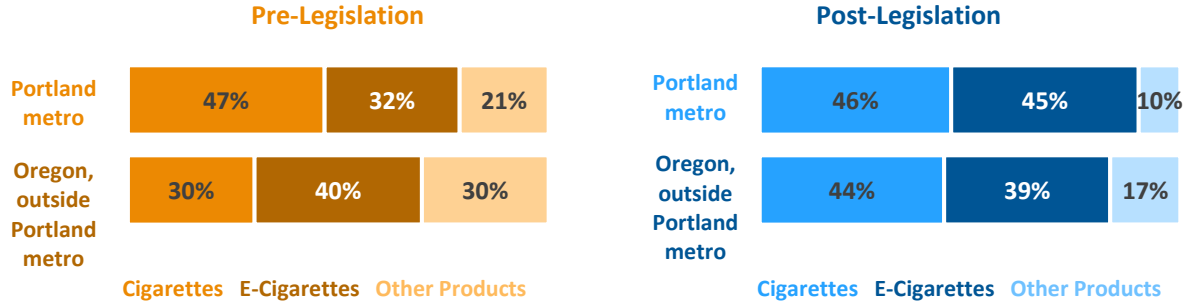
Pre-legislation. Portland metro: *n* = 2,134. Oregon, outside Portland metro: *n* = 1,017.
Post-legislation. Portland metro: *n* = 1,102. Oregon, outside Portland metro: *n* = 568.
***Statistically significant difference between pre- and post-legislation at $p < 0.001$.

Type of Tobacco First Used

At pre-legislation statistically significant differences were evident by region in terms of type of tobacco product first used. At post-legislation, the type of product was much more similar between respondents in the Portland metro area and those in Oregon, outside Portland metro area, as Exhibit 10 shows.

C I

Exhibit 10
Among those who initiated use within the past 6 months, "other products" (i.e., cigars, hookah, chewing tobacco) decreased descriptively in popularity at post-legislation as the type of tobacco first tried.



Pre-Legislation Portland metro: *n* = 492. Oregon, outside Portland metro: *n* = 229.
Post-Legislation. Portland metro: *n* = 191. Oregon, outside Portland metro: *n* = 114.
Descriptive analysis only.

PERCEIVED EASE OF ACCESS TO TOBACCO AND VAPING PRODUCTS

Current tobacco users were asked how easy it was for them to obtain the cigarettes, vaping/Juuling products, or other tobacco products that they use.

> ***Between pre- and post-legislation, to what extent did the perceived ease of access to tobacco and vaping products decrease among youth and young adults aged 13 to 25?***

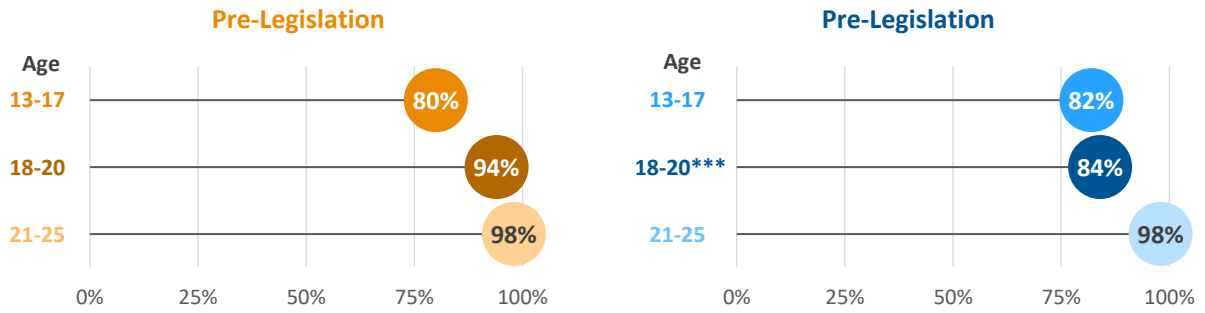
Overall, there were statistically significant decreases between pre- and post-legislation in the reported ease of access to tobacco and vaping products. At post-legislation statistically significantly fewer current tobacco users reported purchasing tobacco products from convenience stores, grocery stores, or tobacco or vape shops, and statistically significantly more current tobacco users reported purchasing tobacco products from the internet.

Age Comparisons Pre- and Post-Legislation

As Exhibit 11 shows, **the percentage of young adults aged 18–20 who reported that it was *sort of easy* or *very easy* to obtain tobacco products decreased statistically significantly from pre- to post-legislation.** The percentage of youth aged 13–17 who reported that it was *sort of easy* or *very easy* increased slightly from pre- to post-legislation samples, but not statistically significantly.

C

Exhibit 11
The percentage of young adults aged 18–20 reporting that it was *sort of easy* or *very easy* to obtain tobacco products decreased statistically significantly from pre- to post-legislation.



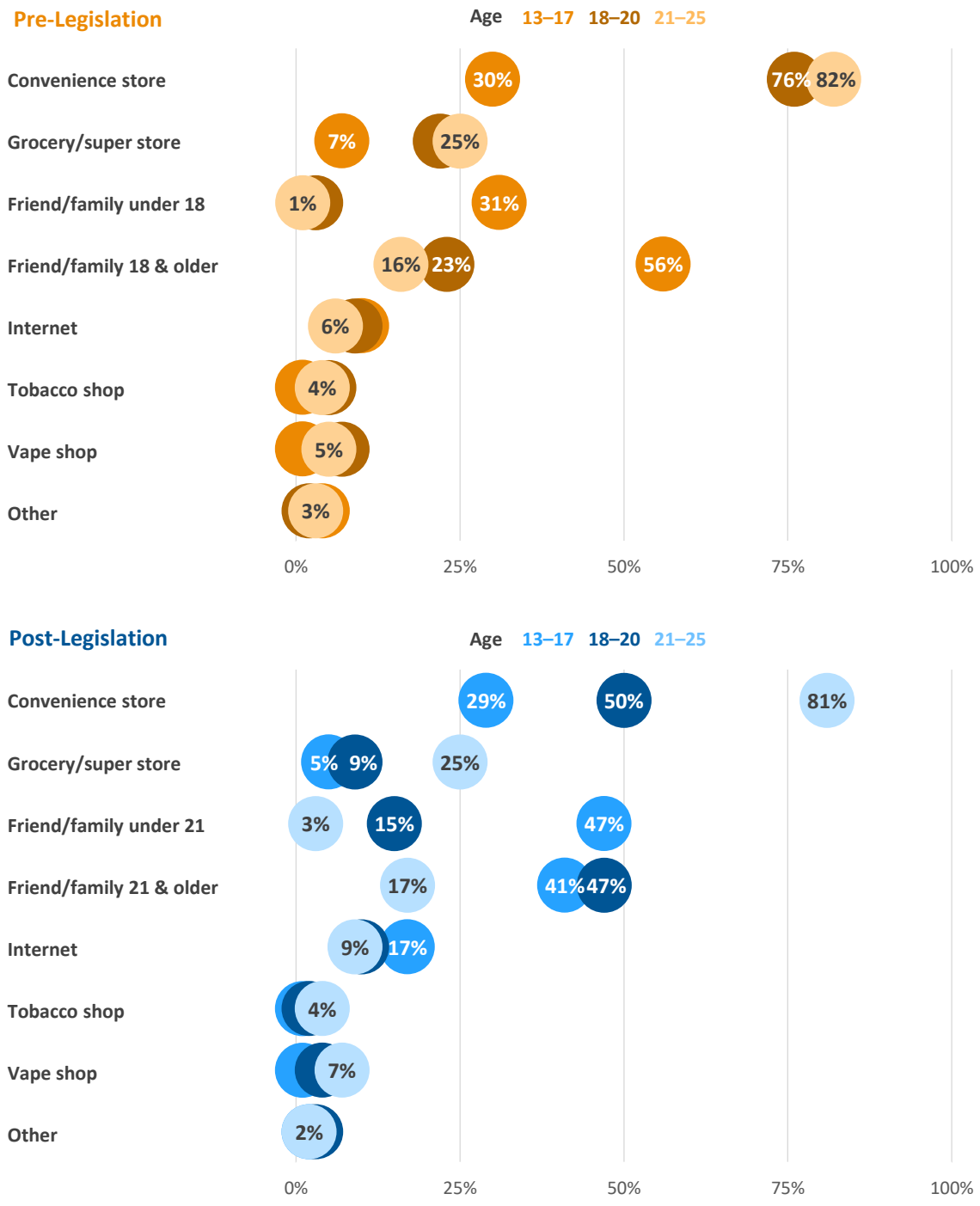
Pre-Legislation. 13–17: *n* = 668. 18–20: *n* = 1,289. 21–25: *n* = 1,254.
Post-Legislation. 13–17: *n* = 382. 18–20: *n* = 563. 21–25: *n* = 760.
***Statistically significant difference between pre- and post-legislation at $p < 0.001$.

Where Tobacco Products Were Obtained

Current tobacco users reported where they obtained cigarettes, vaping/Juuling products, or other tobacco products, as shown in Exhibit 12. From pre- to post-legislation, a descriptive shift in where tobacco products were obtained by young adults aged 18–20 was observed. Pre-legislation, young adults aged 18–20 and adults aged 21–25 obtained tobacco products in similar locations (i.e., convenience stores or grocery stores), whereas post-legislation, young adults aged 18–20 reported a pattern of obtaining tobacco products more similar to the pattern of youth aged 13–17 (e.g., increased frequency of obtaining tobacco products from friends or family aged 21 or older).

C

Exhibit 12
From pre- to post-legislation, where tobacco products were obtained by young adults aged 18–20 shifted from following patterns of young adults aged 21–25 to following patterns of youth aged 13–17.



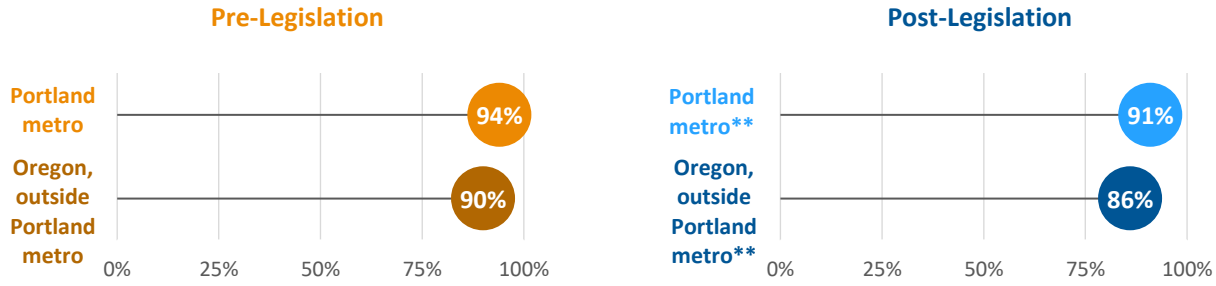
Pre-Legislation. 13–17: *n* = 719. 18–20: *n* = 1,383. 21–25: *n* = 1,331.
Post-Legislation. 13–17: *n* = 419. 18–20: *n* = 625. 21–25: *n* = 792.
Descriptive analysis only.

Geographic Comparisons Pre- and Post-Legislation

As shown in Exhibit 13, **current tobacco users in both geographic regions reported a statistically significant decrease in ease of obtaining tobacco products from pre- to post-legislation**.

Exhibit 13
The percentage of current tobacco users in both geographic regions reporting that it was *sort of easy* or *very easy* to obtain tobacco products decreased statistically significantly from pre- to post-legislation.

C



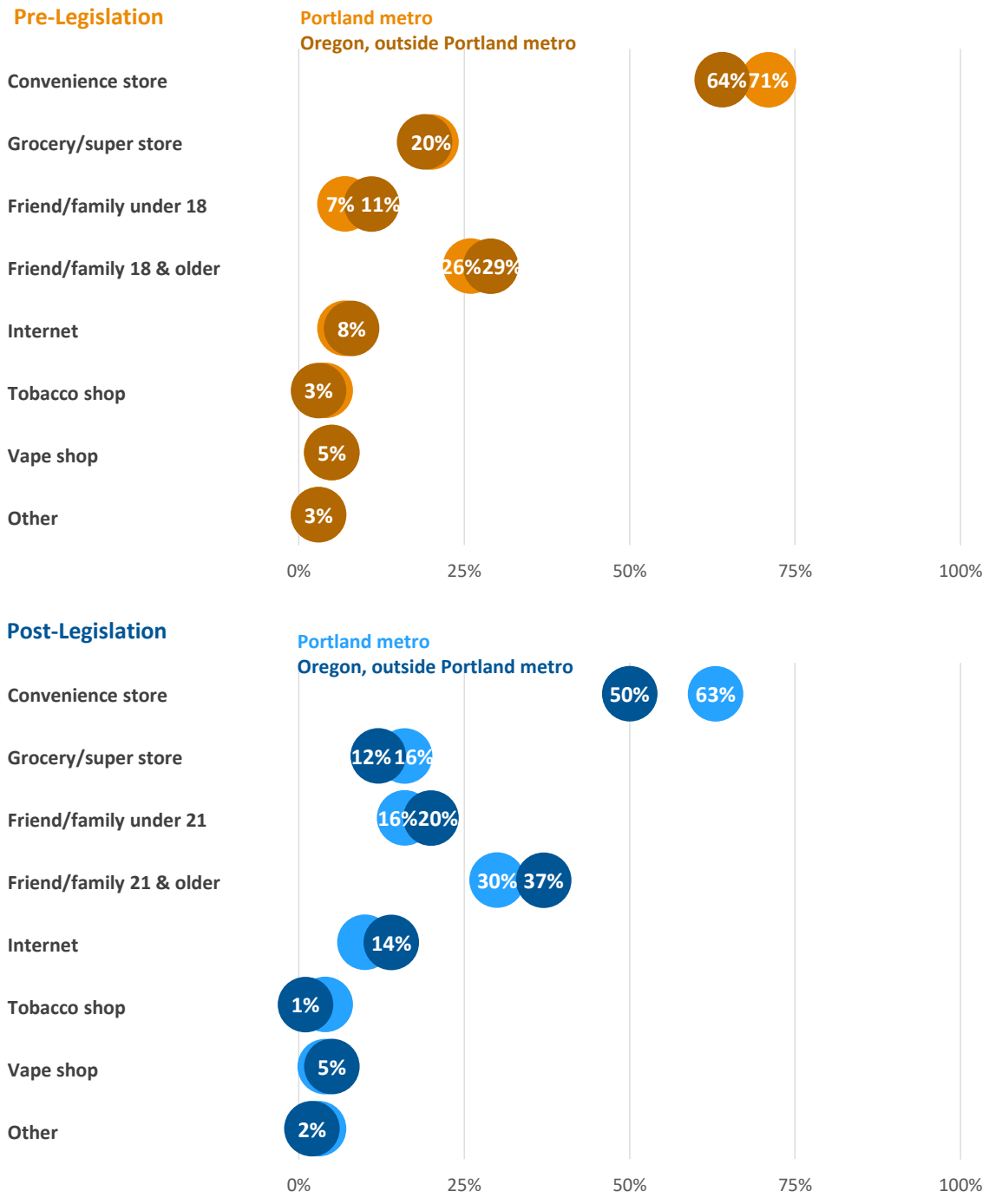
Pre-Legislation. Portland metro: *n* = 2,179. Oregon, outside Portland metro: *n* = 1,032.
Post-Legislation Portland metro: *n* = 1,120. Oregon, outside Portland metro: *n* = 585.
**Statistically significant difference between pre- and post-legislation at $p < 0.01$.

Where Tobacco Products Were Obtained

Exhibit 14 shows where current tobacco users in the 2 geographic regions who had used tobacco in the past 30 days obtained tobacco products.

Exhibit 14

Among those who used tobacco in the past 30 days, there were minimal differences between the Portland metro area and Oregon, outside Portland metro area with respect to the where they obtained tobacco products.



Pre-Legislation. Portland metro: *n* = 2,179. Oregon, outside Portland metro: *n* = 1,032.
Post-Legislation. Portland metro: *n* = 1,120. Oregon, outside Portland metro: *n* = 585.
Descriptive analysis only.

FREQUENCY OF REQUESTS FOR PROOF OF AGE

Current tobacco users reported how frequently[15] they had been asked to show their identification if they tried to purchase tobacco products in a store in the past 30 days.

> ***Between pre- and post-legislation, to what extent did the frequency of requests for proof of age increase among youth and young adults aged 13 to 25?***

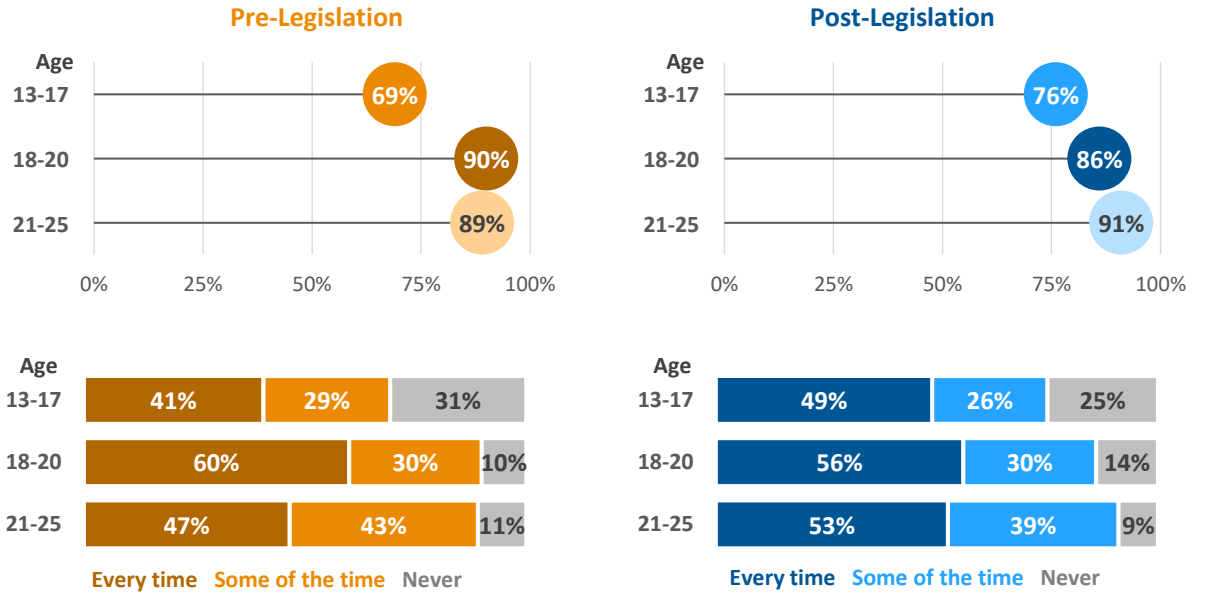
Overall, among those who tried to purchase tobacco products in a store in the past 30 days, **there was no statistically significant change between pre- and post-legislation in the reported frequency of requests for proof of age to purchase tobacco products in a store.**

Age Comparisons Pre- and Post-Legislation

At both pre- and post-legislation, youth who tried to purchase tobacco products in a store in the past 30 days reported being asked to show their identification statistically significantly *less* frequently than young adults. At pre- and post-legislation 90% of young adults reported being asked *some of the time* or *every time* compared to 69% of youth at pre-legislation and 76% at post-legislation. Although proof of age requests reportedly increased for youth aged 13–17 and young adults aged 21–25, the increase was not statistically significant, as Exhibit 15 shows. Similarly, there was a statistically nonsignificant decrease in proof of age requests for young adults aged 18–20 from pre- to post-legislation.

C A

Exhibit 15
There was an increase from pre-legislation to post-legislation in proof of age requests[16] for youth aged 13–17, but not statistically significantly so. Of those who tried to purchase tobacco products in a store in the past 30 days, youth were asked to show identification statistically significantly less frequently than young adults.



Pre-Legislation. 13–17: *n* = 281. 18–20: *n* = 1,242. 21–25: *n* = 1,221. Post-Legislation. 13–17: *n* = 159. 18–20: *n* = 404. 21–25: *n* = 736.

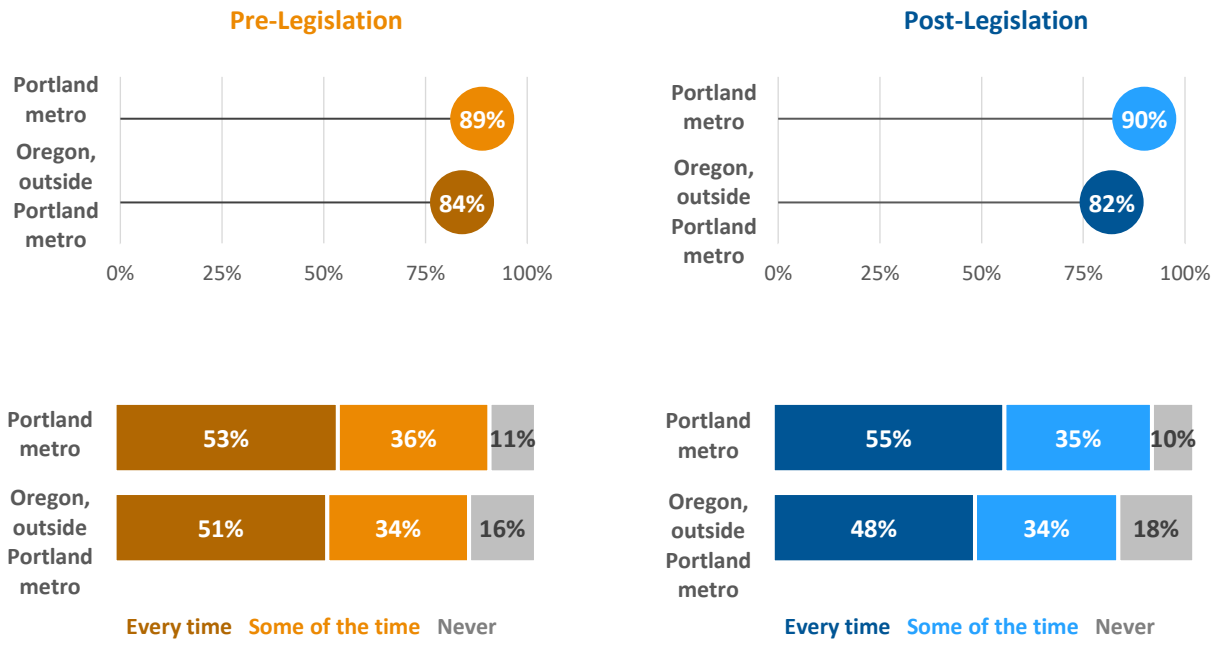
[15]Those who reported that they were asked to show identification *some of the time* or *every time* were recoded as "Yes;" those who reported that they were *never* asked to show identification were recoded as "No."
[16]Percentages show those who reported being asked to show identification *some of the time* or *every time*.

Geographic Comparisons Pre- and Post-Legislation

Overall, tobacco users in Oregon, outside Portland metro area were statistically significantly less likely to be asked to show proof of age when purchasing tobacco products than those in the Portland metro area. No statistically significant differences were observed between pre- and post-legislation, as shown in Exhibit 16.

C A

Exhibit 16
Of those who tried to purchase tobacco products in a store in the past 30 days, tobacco users in Oregon, outside Portland metro area were statistically significantly less likely to be asked to show proof of age[17] when purchasing tobacco products than those in the Portland metro area.



Pre-Legislation. Portland metro: *n* = 1,923. Oregon, outside Portland metro: *n* = 821.
Post-Legislation. Portland metro: *n* = 908. Oregon, outside Portland metro: *n* = 391.

[17]Percentages show those who reported being asked to show identification *some of the time* or *every time*.

AVERAGE AGE OF INITIATION OF TOBACCO USE

Current tobacco users reported how old they were the first time they used each of the 3 main tobacco products (cigarettes; e-cigarettes or vaping products; and cigars, hookah, or chewing tobacco). Overall, approximately 83% of respondents in the analytic sample reported initiating *any* tobacco use before the age of 18, and 99% reported initiating use before the age of 21. No statistically significant differences were evident between the pre- and post-legislation samples.

> ***Between pre- and post-legislation, to what extent did the average age of initiation of tobacco use increase among youth and young adults aged 13 to 25?***

The mean age of initiation of tobacco use for any type of tobacco was slightly but not statistically significantly older among post-legislation current tobacco users than pre-legislation (*M* = 14.9 and *M* = 14.8, respectively). The age of initiation for any tobacco product reported by survey respondents ranged from ages 3–24 among both pre-legislation and post-legislation current tobacco users. Overall, cigarette use was initiated at the youngest average age (*M* = 15.2); the average age of initiation was older for e-cigarette use (*M* = 17.1); and the average age of initiation of use of other products (i.e., cigars, hookah, chewing tobacco) fell in the middle (*M* = 16.2).

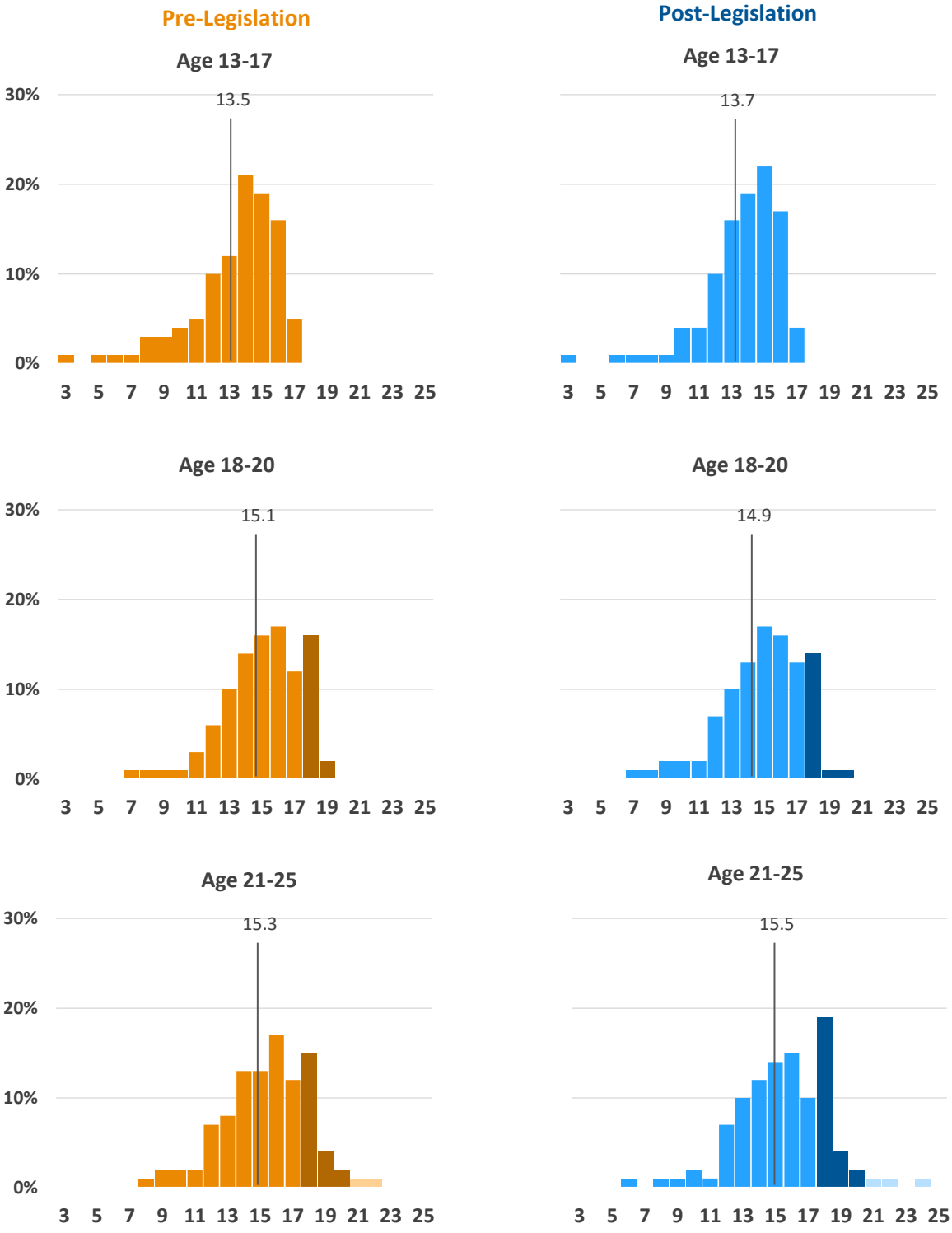
Age Comparisons Pre- and Post-Legislation

At both pre- and post-legislation, young adults (aged 18–25) reported first use of all 3 tobacco products at a statistically significantly older average age (*M* = 15.2 years old) than youth (*M* = 13.6 years old). No statistically significant differences occurred from pre- to post-legislation for any age group, as Exhibit 17 shows.

C

Exhibit 17

Although youth initiated use for *any* type of tobacco product at a younger average age, there was no statistically significant difference between pre- and post-legislation.



Because the number of respondents varied by product (i.e., cigarette, e-cigarette, other type), sample size ranges are reported. **Pre-Legislation**. 13–17: *n* = 665. 18–20: *n* = 1,292. 21–25: *n* = 1,256. **Post-Legislation**. 13–17: *n* = 382. 18–20: *n* = 563. 21–25: *n* = 762.

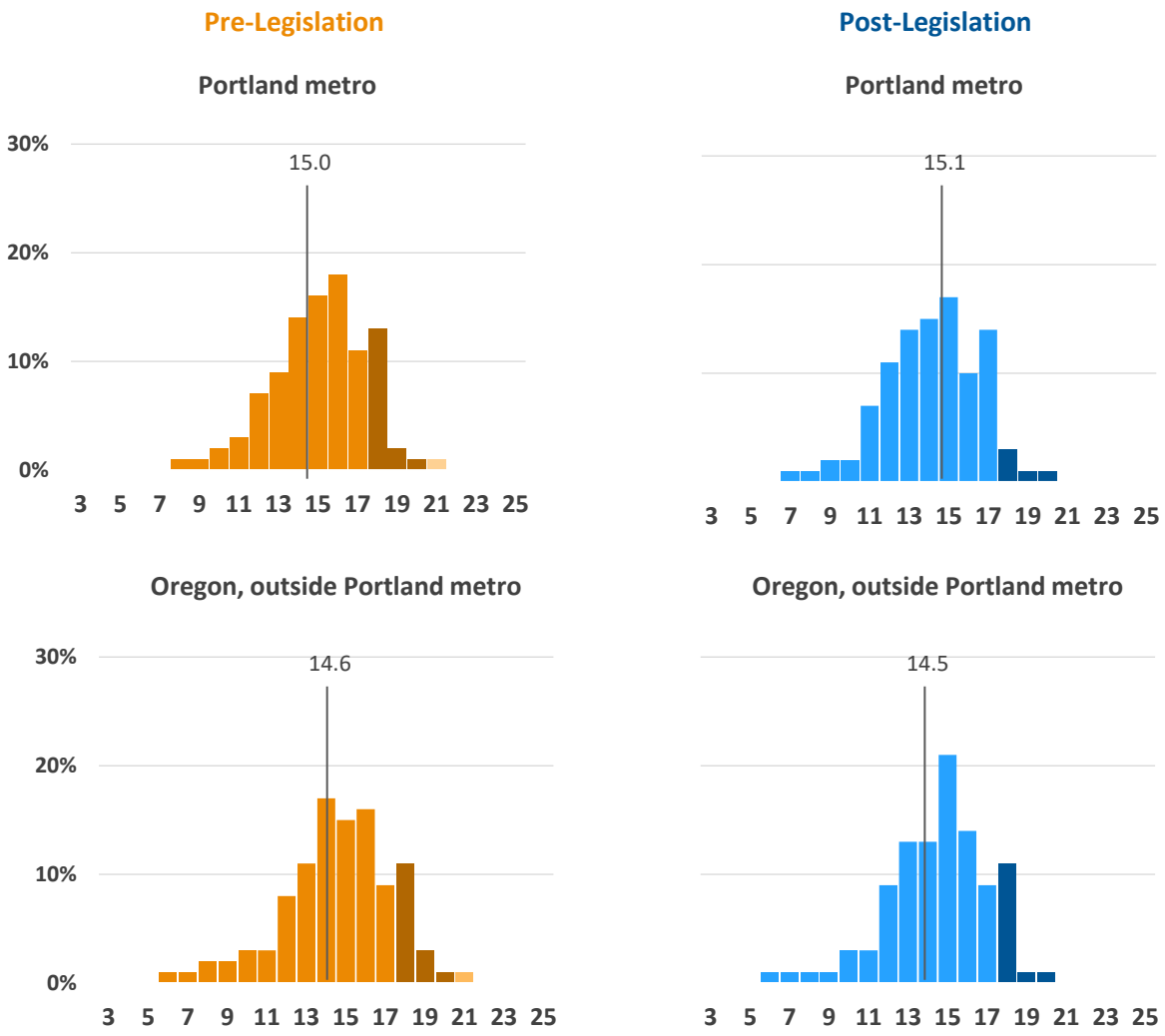
Geographic Comparisons Pre- and Post-Legislation

At both pre- and post-legislation, survey respondents in the Portland metro area reported first use of all 3 tobacco products at a statistically significantly older average age than respondents in Oregon, outside Portland metro area.

Exhibit 18

C

Although initiation of use for *any* type of tobacco product occurred at an older age for Portland metro area current tobacco users than for those in Oregon, outside Portland metro area, no statistically significant difference was evident by region between pre- and post-legislation.



Because the number of respondents varied by product (i.e., cigarette, e-cigarette, other type), sample size ranges are reported.
Pre-Legislation. Portland metro: *n* = 2,183. Oregon, outside Portland metro: *n* = 1,032.
Post-Legislation Portland metro: *n* = 1,122. Oregon, outside Portland metro: *n* = 585.

DESCRIPTIVES: USE OF TOBACCO PRODUCTS

The survey asked a series of questions about tobacco use. First, the survey asked whether respondents had ever used cigarettes; e-cigarettes or other vaping products; or cigars, hookah, or chewing tobacco in their lifetime. Respondents with any lifetime use were then asked how many days out of the past 30 they had used each of 7 types of tobacco (cigarettes, menthol cigarettes, e-cigarettes, small cigars, large cigars, hookah, and chewing tobacco). The following exhibits show descriptive statistics for pre- and post-legislative current tobacco users (i.e., respondents who reported any lifetime tobacco use and 30-day tobacco use), comparing youth (aged 13–17) to young adults (aged 18–20 and 21–25) and comparing respondents in the Portland metro area to those in Oregon, outside Portland metro area.

Age Comparisons Pre- and Post-Legislation

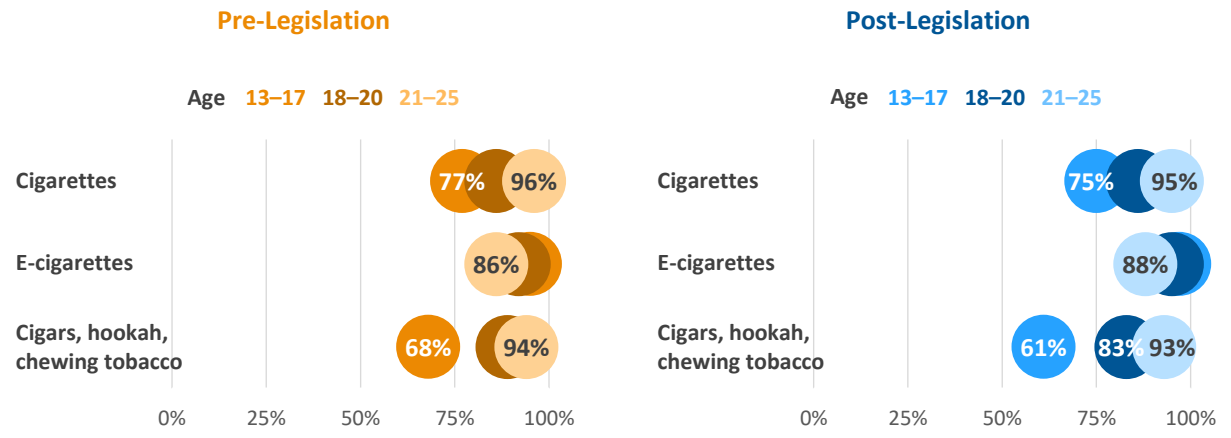
Overall, tobacco use trends were similar at pre- and post-legislation among current tobacco users. Descriptive differences are highlighted in the following exhibits. Complete frequency tables for each item, by time point and age group, are included in Appendix D.

Tobacco Product Use Current Tobacco Users

Exhibit 19 displays any lifetime use of cigarettes; e-cigarettes and other vaping products; and cigars, hookah, and chewing tobacco by age group.

C

Exhibit 19
Among current tobacco users at both pre- and post-legislation, youth aged 13–17 reported a higher percentage of lifetime use of e-cigarettes than cigarettes or other tobacco products.



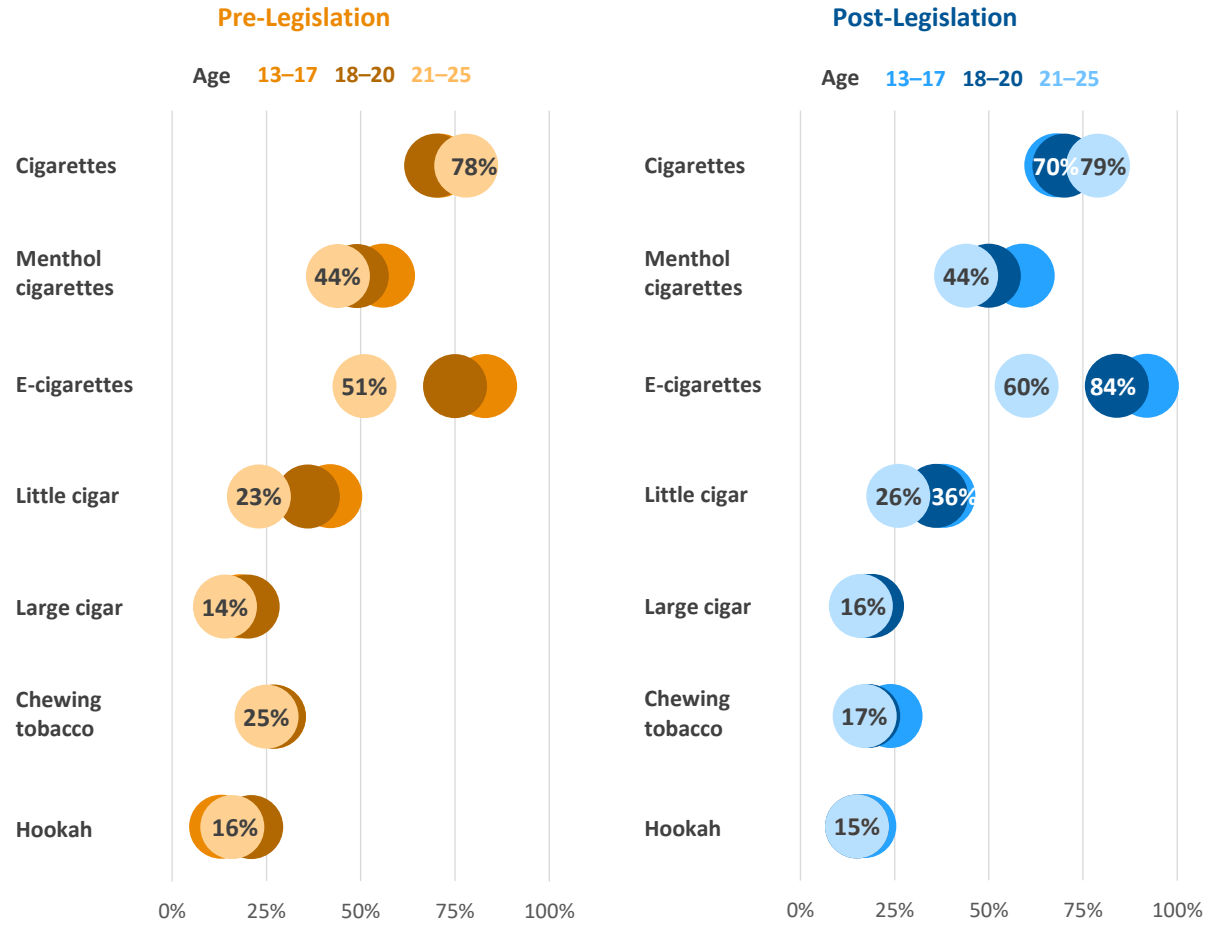
Because the number of respondents varied by product (i.e., cigarette, e-cigarette), sample size ranges are reported.
Pre-Legislation. 13–17: *n* = 719. 18–20: *n* = 1,381–1,382. 21–25: *n* = 1,329–1,331.
Post-Legislation. 13–17: *n* = 419. 18–20: *n* = 624–625. 21–25: *n* = 790–792.
Descriptive analysis only.

Past 30-Day Tobacco Use

Exhibit 20 displays past 30-day use of different types of tobacco products by age group.

Exhibit 20
Among current tobacco users, past 30-day use for e-cigarettes was about 9% higher for all age groups from pre- to post-legislation.

C



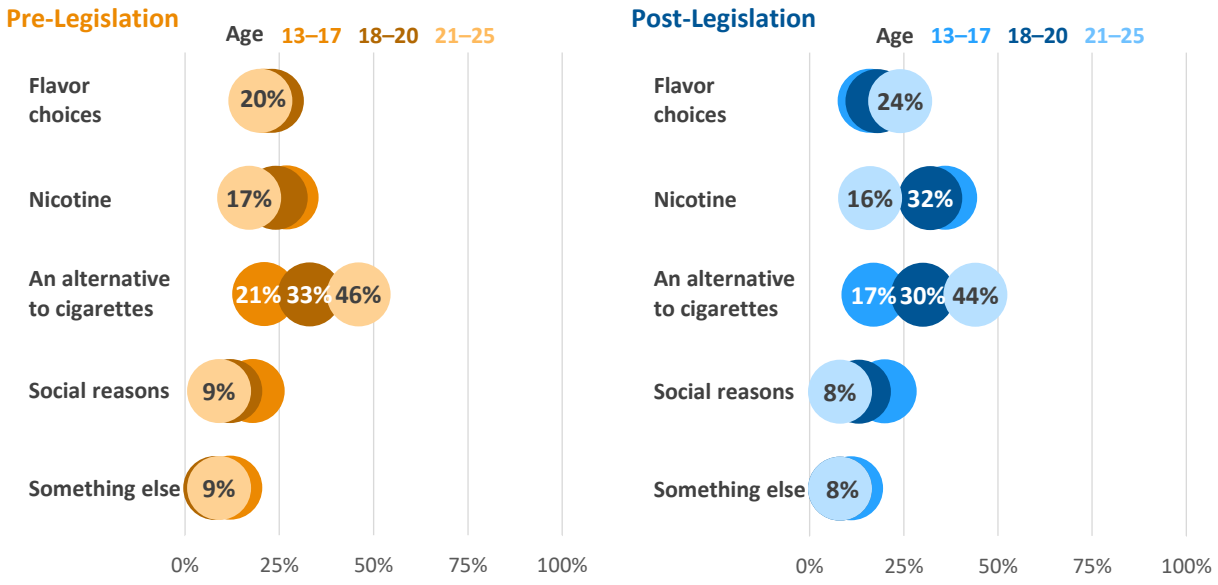
Because the number of respondents varied by product (i.e., cigarettes, menthol cigarettes), sample size ranges are reported.
Pre-Legislation. 13–17: *n* = 393–683. 18–20: *n* = 839–1,277. 21–25: *n* = 995–1,271.
Post-Legislation. 13–17: *n* = 214–404. 18–20: *n* = 378–595. 21–25: *n* = 600–755.
Descriptive analysis only.

Reason for Using Vaping/Juuling Products

Exhibit 21 displays the reasons for using vaping or Juuling products among those who had ever used such products by age group. At both pre- and post-legislation, the most common reason cited was as an alternative to cigarettes. However, a higher percentage of young adults at post-legislation cited "nicotine" than at pre-legislation in both geographic regions. Other "something else" responses at post-legislation were similar to those at pre-legislation, including out of curiosity or "just to try it" (*n* = 59), for cloud tricks (*n* = 29), for stress relief or relaxing (*n* = 25), and for convenience or the ability to smoke indoors (*n* = 15).

Exhibit 21

The percentage of young adults who reported that nicotine was the most important reason to use vaping products increased from pre- to post-legislation.



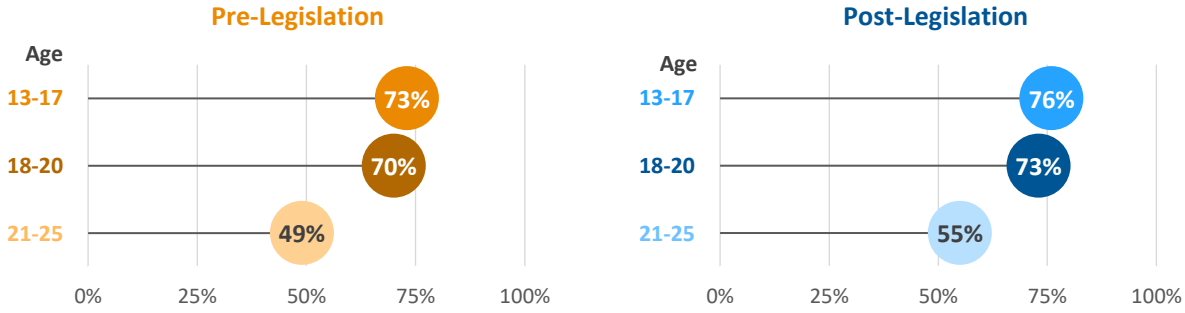
Pre-Legislation. 13–17: *n* = 666. 18–20: *n* = 1,242. 21–25: *n* = 1,099.
Post-Legislation. 13–17: *n* = 387. 18–20: *n* = 580. 21–25: *n* = 671.
Descriptive analysis only.

Current Use of Flavored Tobacco Products

Exhibit 22 shows the percentage of current tobacco users who reported currently using any tobacco or vaping/Juuling product with mint, fruit, coffee, candy, or other flavors, by age group.

Exhibit 22

Among current tobacco users, flavored tobacco products were currently used by approximately half of young adults aged 21–25, compared to approximately three quarters of youth and young adults aged 18–20.



Pre-Legislation. 13–17: *n* = 630. 18–20: *n* = 890. 21–25: *n* = 1,229.
Post-Legislation. 13–17: *n* = 390. 18–20: *n* = 566. 21–25: *n* = 738.
Descriptive analysis only.

Geographic Comparisons Pre- and Post-legislation

Overall, tobacco use trends were similar at pre- and post-legislation among current tobacco users. Descriptive differences are highlighted in the following exhibits. Complete frequency tables for each item, by time point and age group, are included in Appendix D.

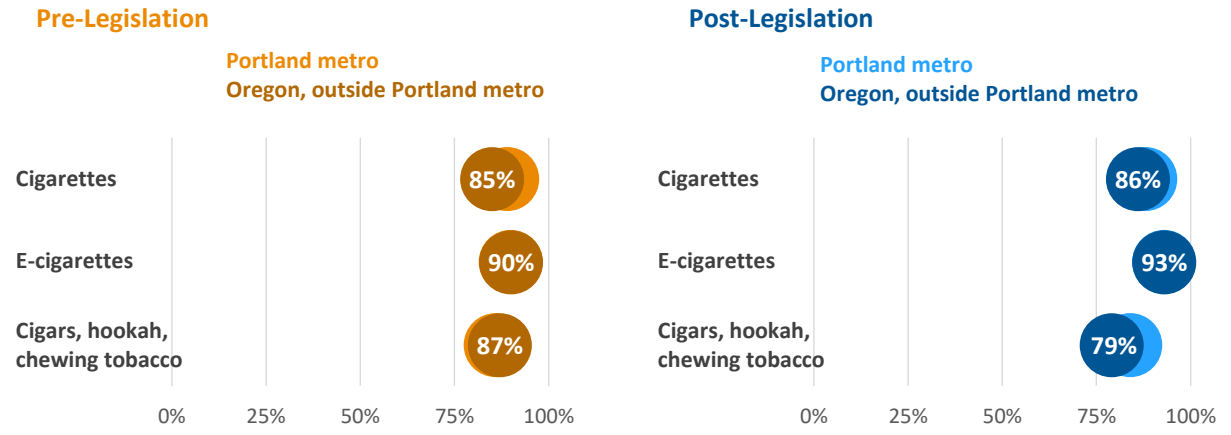
Tobacco Product Use Current Tobacco Users

Exhibit 23 displays any lifetime use of cigarettes; e-cigarettes and other vaping products; and cigars, hookah, and chewing tobacco by region.

Exhibit 23

Among current tobacco users, reported lifetime use of cigars, hookah or chewing tobacco decreased from pre-legislation to post-legislation in both geographic areas.

C

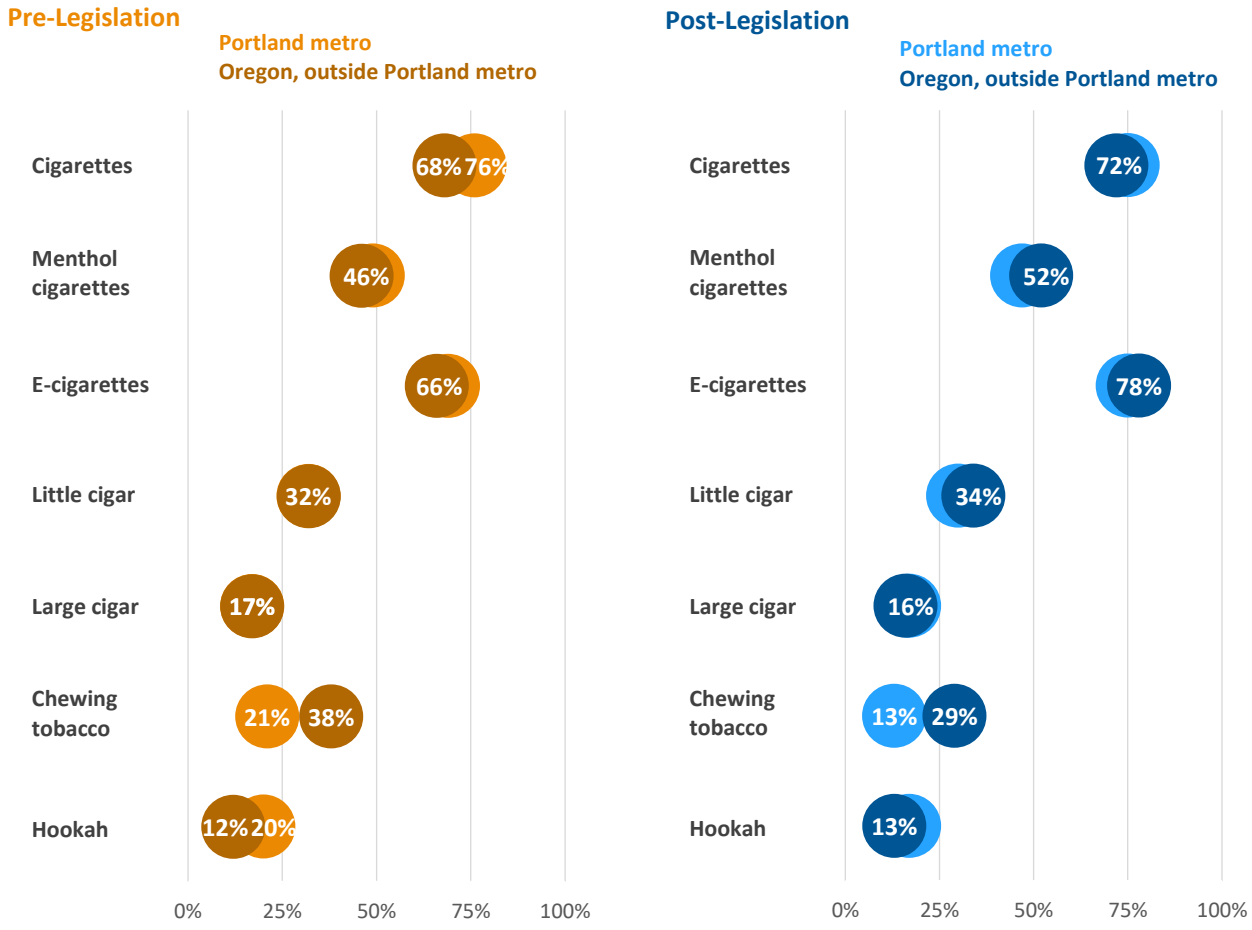


Because the number of respondents varied by product (i.e., cigarette, e-cigarette, other type), sample size ranges are reported.
Pre-Legislation. Portland metro: *n* = 2,344–2,345. Oregon, outside Portland metro: *n* = 1,085–1,089.
Post-Legislation. Portland metro: *n* = 1,209–1,210. Oregon, outside Portland metro: *n* = 624–626.
Descriptive analysis only.

Past 30-Day Tobacco Use

Exhibit 24 displays past 30-day use of different types of tobacco products by region.

Exhibit 24
Among current tobacco users, use of chewing tobacco decreased from pre-legislation to post-legislation.



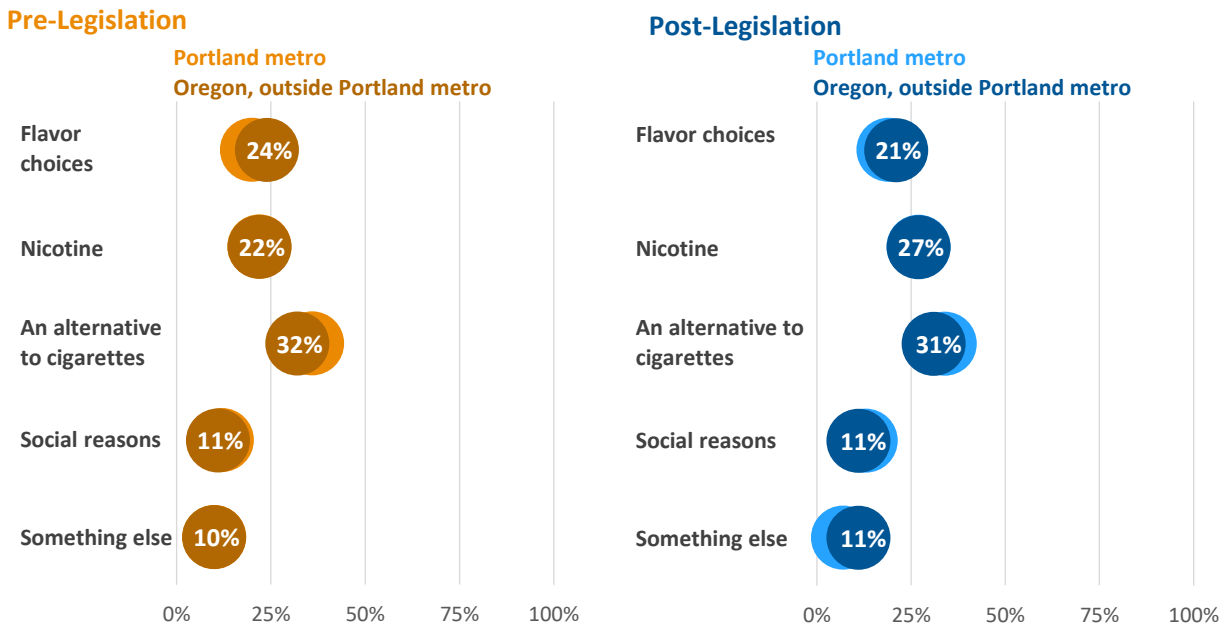
Because the number of respondents varied by product (i.e., cigarette, e-cigarette, other type), sample size ranges are reported.
Pre-Legislation Portland metro: *n* = 1,595–2,121. Oregon, outside Portland metro: *n* = 632–982.
Post-Legislation. Portland metro: *n* = 804–1,119. Oregon, outside Portland metro: *n* = 389–579.
Descriptive analysis only.

Reason for Using Vaping/Juuling Products

Exhibit 25 displays the reasons for using vaping or Juuling products among those who had ever used vaping products by geographic region. At both pre- and post-legislation, the most common reason current tobacco users cited was as an alternative to cigarettes, though a higher percentage at post-legislation cited nicotine than at pre-legislation in both geographic regions.

Exhibit 25

The most common reason for using vaping products among current tobacco users in both geographic regions was as an alternative to cigarettes.



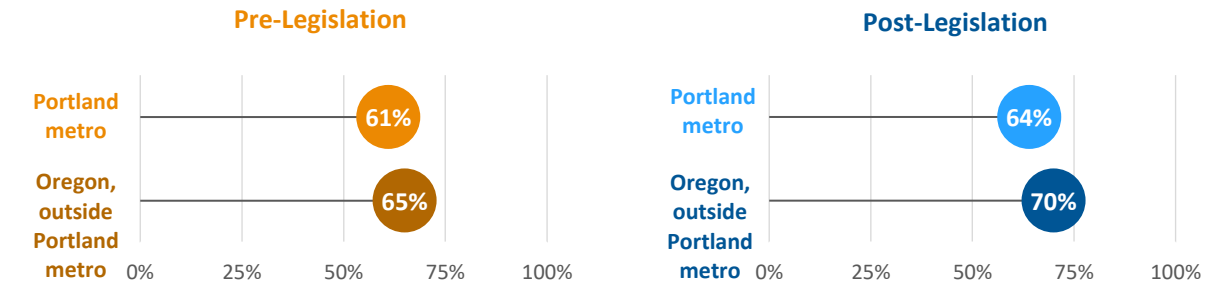
Pre-Legislation Portland metro: *n* = 2,060. Oregon, outside Portland metro: *n* = 947.
Post-Legislation Portland metro: *n* = 1,075. Oregon, outside Portland metro: *n* = 563.
Descriptive analysis only.

Current Use of Flavored Tobacco Products

Exhibit 26 shows the percentage of current tobacco users who reported currently using any tobacco or vaping/Juuling product with mint, fruit, coffee, candy, or other flavors, by age group.

Exhibit 26

Among current tobacco users, flavored tobacco products were slightly less popular in the Portland metro area compared to Oregon, outside Portland metro area.



Pre-Legislation Portland metro: *n* = 2,133. Oregon, outside Portland metro: *n* = 1,005.
Post-Legislation. Metro: *n* = 1,117. Oregon, outside Portland metro: *n* = 577.
Descriptive analysis only.

SUMMARY

Senate Bill 754, the Tobacco 21 law, was signed by Oregon's governor in August 2017 and went into effect on January 1, 2018. It was developed to help prevent young people from ever starting to smoke and to reduce the deaths, disease, and health care costs caused by tobacco use. Findings from both the pre-legislation and post-legislation surveys described tobacco use and Tobacco 21 outcomes such as recent initiation of tobacco use (within the past 6 months), perceived ease of access to tobacco, requests for proof of age when purchasing tobacco products, and age of tobacco use initiation. Findings focused on youth and young adults who reported using tobacco in their lifetime and in the past 30 days (current tobacco users). Analyses compared outcomes by age group (i.e., aged 13–17, 18–20, 21–25) and by geographic area (i.e., the Portland metro area[18] and Oregon, outside Portland metro area), controlling for demographic differences between samples.

Key findings consistent with predicted effects of Tobacco 21 included:

- From pre- to post-legislation, overall **recent initiation (within the past 6 months) of tobacco use decreased statistically significantly** (from 23% to 18%). In particular, recent initiation decreased statistically significantly among current tobacco users aged 13–17 (from 34% to 25%) and aged 18–20 (23% to 18%).
- From pre- to post-legislation, current tobacco users' **perceived ease of access to tobacco and vaping products decreased statistically significantly**. In particular, a statistically significant decrease occurred in the percentage of tobacco users aged 18–20 who reported that it was *sort of easy* or *very easy* to obtain tobacco products.
  - From pre- to post-legislation, where current tobacco users aged 18–20 obtained tobacco products shifted to be more similar to the patterns reported by tobacco users aged 13–17 rather than tobacco users aged 21–25.
  - From pre- to post-legislation, current tobacco users in both geographic regions reported a statistically significant decrease in ease of access to tobacco products.

In contrast, the findings did not support statistically significant change from pre- to post-legislation in average age of initiation of tobacco use, which might be due to the relatively brief timeframe (9 months) between the pre- and post-legislation data collections. The findings also did not indicate statistically significant change in the frequency of requests for proof of age among current tobacco users who tried to purchase products in a store in the past 30 days.

Regarding tobacco use at pre- and post-legislation, the trends descriptively appeared constant overall among current tobacco users. Notable exceptions were that reported use of e-cigarettes increased and reported use of chewing tobacco decreased descriptively overall.

Most current tobacco users demonstrated knowledge of the new legal age to purchase tobacco products. At post-legislation 90% of current tobacco users correctly answered that the legal age to purchase tobacco products is "21 or older." Young adults aged 18–20 were statistically significantly more likely to answer correctly, compared to youth aged 13–17 and young adults aged 21–25 (94% correct, compared to 89% and 88%, respectively).

[18]The Portland metro area includes Clackamas, Columbia, Multnomah, Washington, and Yamhill Counties.

EVALUATION LIMITATIONS

Resource and time constraints resulted in important limitations to the evaluation. A random sampling of respondents is generally considered a more rigorous sampling design because it typically results in a more demographically representative sample of the target population. However, randomly sampling youth and young adults who use tobacco is expensive and difficult. Youth who use tobacco are particularly difficult to reach because the population is small. Given the difficulty of reaching the target population, social media is a much more cost-effective and efficient way to reach a representative sample of youth and young adults who use tobacco, but it is not without limitations. One limitation is that not all individuals use social media. A recent Pew study found that among youth aged 13–17, 71% use Facebook and 52% use Instagram, and youth aged 13–17 use those social network sites most often.[19,20] Rates of use for young adults (aged 18–29) are even higher, with 82% using Facebook and 55% using Instagram.[21] Nonetheless, when respondents are not randomly sampled from the entire population, the possibility of selection bias[22] increases.

Because the Tobacco 21 law was implemented in all Oregon counties, constructing a control group of Oregon youth and young adults not affected by the law was not possible. As a result, we cannot know for certain whether observed changes can be attributed to Tobacco 21 or other factors, although the short timeframe (i.e., 9 months) between the pre- and post-legislation data collection minimizes the possibility of confounding factors producing the observed effects. Another limitation is that the need to maintain respondents' anonymity and reduce participant burden precluded measuring responses from the same individuals before and after Tobacco 21 was enacted. Instead, the evaluation team sampled a cross-section of the population pre- and post-legislation, resulting in a less powerful analytic design and introducing sample differences. This limitation was addressed analytically by statistically controlling for demographic and tobacco use differences in the samples.

Although the short timeframe of the study might have minimized the possibility of other confounding factors occurring that might affect outcomes, it might have been too brief to observe the full effects of the Tobacco 21 law. Even though the law went into effect on January 1, 2018, more time might be needed for retailers to fully educate their staff, for law enforcement to adequately enforce the law, and for the law to generate social norm change among tobacco users and the general public. The short timeframe likely accounted for the lack of statistically significant change in the average age of initiation because many respondents initiated use more than 9 months ago. The study timeframe might also account for the lack of statistically significant change in reported requests for proof of age.

Finally, by focusing exclusively on individuals who used tobacco, the evaluation was not able to provide evidence regarding the effects of the law on youth and young adults who did not use tobacco. For instance, the evaluation could not capture how many youths never initiated smoking because of the law. To partially address this limitation, the survey asked whether respondents had initiated tobacco use within the last 6 months.

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[19]Lenhart, Amanda. (2015, April). *Teen, social media and technology overview 2015*. Retrieved from Pew Research Center website: http://assets.pewresearch.org/wp-content/uploads/sites/14/2015/04/PI_TeensandTech_Update2015_0409151.pdf

[20]Anecdotally, we know Snapchat is widely used by youth and young adults in this age range; however, previous experience with the combined Facebook and Instagram advertising has been successful.

[21]Perrin, Andrew. (2015, October). *Social networking usage: 2005–2015*. Retrieved from Pew Research Center website http://assets.pewresearch.org/wp-content/uploads/sites/14/2015/10/PI_2015-10-08_Social-Networking-Usage-2005-2015_FINAL.pdf

[22]Selection bias is bias introduced when some individuals have a higher probability of being in the sample than others as occurs during nonrandom selection.

APPENDIX A
PRE-LEGISLATION OREGON TOBACCO SURVEY

Welcome to the Oregon Tobacco Survey! We are conducting a survey of people in the state of Oregon who currently use tobacco products (cigarettes, vaping products such as e-cigarettes and Juul, cigars, chewing tobacco, etc.).

- The survey will take **5–10 minutes**.
- Your participation is **voluntary and you can stop at any time.**
- Your responses are **anonymous** and cannot be linked to your identity in any way.
- Other than a loss of time, there are **no anticipated risks** for participating in this survey.
- Your answers are only used for the **purposes of the evaluation**. Your answers will be put together with other people's responses to create one report.
- This survey is being administered by RMC Research to help the Oregon Health Authority learn about youths' and young adults' experience with using and purchasing tobacco products.
- You will be given the option to provide your email address to be entered into a drawing to win a $50 Amazon or Target gift card. Your email address will be stored separately from your survey responses and cannot be tied to your responses.

Please contact Jennifer Lembach at RMC Research Corporation at **OregonSurvey@rmcres.com** if you have questions or concerns about the survey.

❑ Yes, I agree to participate ❑ No, I do not agree to participate (exit survey)

Question	Response Options
1. How old are you?	▸ 12 or younger (exit survey) ▸ 13–25 (radio button for each) ▸ 26 or older (exit survey)
2. Are you Hispanic or Latino?	▸ Yes ▸ No
3. What is your race? (*Select one or more options*)	❑ American Indian or Alaska Native ❑ Asian ❑ Black or African American ❑ Native Hawaiian or Other Pacific Islander ❑ White
4. Have you ever smoked all or part of a cigarette (menthol or non-menthol)?	▸ Yes ▸ No (SKIP TO Q8)
5. During the past 30 days did you smoke cigarettes?	▸ No ▸ Yes, on 5 or fewer days ▸ Yes, on 6 or more days

Question	Response Options
6. During the past 30 days did you smoke menthol cigarettes?	▶ No ▶ Yes, on 5 or fewer days ▶ Yes, on 6 or more days
7. How old were you when you smoked all or part of a cigarette for the first time?	▶ Open ended (numeric)
8. Have you ever used an e-cigarette, Juul, or other vaping product? (do not include marijuana)	▶ Yes ▶ No (SKIP TO Q13)
9. During the past 30 days did you use an e-cigarette, Juul, or other vaping product? (do not include marijuana)	▶ No ▶ Yes, on 5 or fewer days ▶ Yes, on 6 or more days
10. How old were you the first time you used an e-cigarette or other vaping/Juuling product?	▶ Open ended (numeric)
11. What would you say is the <u>most</u> important reason you use vaping/Juuling products?	▶ Flavor choices (SKIP to Q13) ▶ Nicotine (SKIP to Q13) ▶ An alternative to cigarettes (SKIP to Q13) ▶ Social reasons, such as to fit in, or friends think it's cool. (SKIP to Q13) ▶ Something else
12. Something else (specify)	▶ Open-ended (text)
13. Have you ever done any of the following: ▪ Smoked a little cigar or cigarillo, such as Swisher Sweets? ▪ Smoked a large cigar, such as Dutch Master or White Owl? ▪ Used chewing tobacco, snuff, snus, or dip? ▪ Smoked tobacco in a hookah?	▶ Yes ▶ No (SKIP to Q19)
14. During the past 30 days did you smoke a little cigar or cigarillo, such as Swisher Sweets?	▶ No ▶ Yes, on 5 or fewer days ▶ Yes, on 6 or more days
15. During the past 30 days did you smoke a large cigar, such as Dutch Master or White Owl?	▶ No ▶ Yes, on 5 or fewer days ▶ Yes, on 6 or more days
16. During the past 30 days did you use chewing tobacco, snuff, snus, or dip?	▶ No ▶ Yes, on 5 or fewer days ▶ Yes, on 6 or more days
17. During the past 30 days did you smoke tobacco in a hookah?	▶ No ▶ Yes, on 5 or fewer days ▶ Yes, on 6 or more days
18. How old were you the first time you used cigars, smokeless tobacco, or hookah?	▶ Open ended (numeric)

Question	Response Options
19. During the **past 30 days**, from which of the following sources did you get cigarettes, vaping/Juuling products, or other tobacco products? (*select one or more responses)*	❑ Convenience store or gas station (e.g., 7-Eleven, Plaid Pantry, Chevron) ❑ Grocery store or superstore (e.g., Fred Meyer, Walmart) ❑ The internet ❑ Friend or family member who is under 18 ❑ Friend or family member who is 18 or older ❑ Some other source ❑ I did not use any tobacco products in the past 30 days
20. Some other source: Specify	▶ Open-ended (text)
21. If you tried to purchase tobacco or vaping/Juuling products at any type of store **in the past 30 days**, how often were you asked to show ID?	▶ Every time ▶ Some of the time ▶ Never ▶ I have not tried to purchase these products at a store in the past 30 days.
22. How easy is it for you to get the cigarettes, vaping/Juuling products, or other tobacco products that you use?	▶ Very easy ▶ Sort of easy ▶ Sort of hard ▶ Very hard
23. When was the **first time** you ever used any tobacco or vaping/Juuling product?	▶ Within the past 6 months (since June, or summer 2017) ▶ More than 6 months ago ▶ I have never used any tobacco or vaping/Juuling product (SKIP to Q26)
24. The very first time you used any tobacco or vaping/Juuling product, which type of product did you use?	▶ Cigarette, menthol or non-menthol ▶ E-cigarette, Juul, or other tobacco vaping product ▶ Smokeless tobacco ▶ Little cigar or cigarillo ▶ Large cigar ▶ Hookah ▶ Another type of product
25. Do you currently use any tobacco, or vaping/Juuling product with mint, fruit, coffee, candy, or other flavors?	▶ Yes ▶ No ▶ Not sure
26. How do you identify?	▶ Female ▶ Male ▶ Something else fits better
27. Do you think of yourself as:	▶ Lesbian or gay ▶ Straight ▶ Bisexual ▶ Something else ▶ Don't know/Not sure

Thank you for completing the Oregon Tobacco Survey. **If you want to be entered into a drawing for a chance to win a $50 Amazon or Target gift card**, please click **here**.

Oregon Tobacco Survey Contact Information Form

[After participants completed the Oregon Tobacco survey, there was a link to this survey to collect contact information for the survey lottery].

You are eligible to enter a drawing for a $50 gift card. Winners will be drawn when the survey is over later this month. One winner will be drawn for every 75 entries. Duplicate entries will be discarded. **Your contact information for the drawing will be saved in a separate location and can never be linked to your survey data.** We will never send you spam or sell your name to anyone else.

Question	Response Options
1. Please enter your email address.	[Open text field]
2. Please reenter your email address.	[Open text field]
3. If you win a gift card, what kind of gift card would you like to receive?	▶ Target gift card ▶ Amazon gift card

[Text that appears on final page of the Contact Information Survey.]

Thank you again for completing the Oregon Tobacco Survey. An RMC Research Corporation staff member will email you if you win a $50 gift card.

As a reminder, your participation in the Oregon Tobacco Survey is confidential. Your name or contact information will not be linked to your survey answers in any way. Your name and contact information will only be used if you win the drawing. If you have any questions or concerns about the survey, please contact Jennifer Lembach at RMC Research Corporation at **OregonSurvey@rmcres.com**.

APPENDIX B
POST-LEGISLATION OREGON TOBACCO SURVEY

Welcome to the Oregon Tobacco Survey! We are conducting a survey of people in the state of Oregon who currently use tobacco products (cigarettes, vaping products such as e-cigarettes and Juul, cigars, chewing tobacco, etc.).

- The survey will take **5–10 minutes**.
- Your participation is **voluntary and you can stop at any time.**
- Your responses are **anonymous** and cannot be linked to your identity in any way.
- Other than a loss of time, there are **no anticipated risks** for participating in this survey.
- Your answers are only used for the **purposes of the evaluation**. Your answers will be put together with other people's responses to create one report.
- This survey is being administered by RMC Research to help the Oregon Health Authority learn about youths' and young adults' experience with using and purchasing tobacco products.
- You will be given the option to provide your email address to be entered into a drawing to win a $50 Amazon or Target gift card. Your email address will be stored separately from your survey responses and cannot be tied to your responses.

Please contact Rachel Lahoff at RMC Research Corporation at **OregonSurvey@rmcres.com** if you have questions or concerns about the survey.

❑ Yes, I agree to participate ❑ No, I do not agree to participate (exit survey)

Question	Response Options
3. How old are you?	▶ 12 or younger (exit survey) ▶ 13–25 (radio button for each) ▶ 26 or older (exit survey)
2. Are you Hispanic or Latino?	▶ Yes ▶ No
1. What is your race? (*Select one or more options*)	❑ American Indian or Alaska Native ❑ Asian ❑ Black or African American ❑ Native Hawaiian or Other Pacific Islander ❑ White
2. Have you ever smoked all or part of a cigarette (menthol or non-menthol)?	▶ Yes ▶ No (SKIP TO Q8)
3. During the past 30 days did you smoke cigarettes?	▶ No ▶ Yes, on 5 or fewer days ▶ Yes, on 6 or more days

Question	Response Options
4. During the past 30 days did you smoke menthol cigarettes?	▶ No ▶ Yes, on 5 or fewer days ▶ Yes, on 6 or more days
5. How old were you when you smoked all or part of a cigarette for the first time?	▶ Open ended (numeric)
6. Have you ever used an e-cigarette, Juul, or other vaping product? (do not include marijuana)	▶ Yes ▶ No (SKIP TO Q13)
7. During the past 30 days did you use an e-cigarette, Juul, or other vaping product? (do not include marijuana)	▶ No ▶ Yes, on 5 or fewer days ▶ Yes, on 6 or more days
8. How old were you the first time you used an e-cigarette or other vaping/Juuling product?	▶ Open ended (numeric)
9. What would you say is the **most important** reason you use vaping/Juuling products?	▶ Flavor choices (SKIP to Q13) ▶ Nicotine (SKIP to Q13) ▶ An alternative to cigarettes (SKIP to Q13) ▶ Social reasons, such as to fit in, or friends think it's cool. (SKIP to Q13) ▶ Something else
10. Please say what that "something else" is.	▶ Open-ended (text)
11. Have you **ever** done any of the following: ▪ Smoked a little cigar or cigarillo, such as Swisher Sweets? ▪ Smoked a large cigar, such as Dutch Master or White Owl? ▪ Used chewing tobacco, snuff, snus, or dip? ▪ Smoked tobacco in a hookah?	▶ Yes ▶ No (SKIP to Q19)
12. During **the past 30 days** did you smoke a little cigar or cigarillo, such as Swisher Sweets?	▶ No ▶ Yes, on 5 or fewer days ▶ Yes, on 6 or more days
13. During **the past 30 days** did you smoke a large cigar, such as Dutch Master or White Owl?	▶ No ▶ Yes, on 5 or fewer days ▶ Yes, on 6 or more days
14. During **the past 30 days** did you smoke tobacco in a hookah?	▶ No ▶ Yes, on 5 or fewer days ▶ Yes, on 6 or more days
15. During **the past 30 days** did you use chewing tobacco, snuff, snus, or dip?	▶ No ▶ Yes, on 5 or fewer days ▶ Yes, on 6 or more days
16. How old were you **the first time** you used cigars, smokeless tobacco, or hookah?	▶ Open ended (numeric)

Question	Response Options
17. During **the past 30 days**, from which of the following sources did you get cigarettes, vaping/Juuling products, or other tobacco products? (*select one or more responses)*	❑ Convenience store or gas station (e.g., 7-Eleven, Plaid Pantry, Chevron) ❑ Grocery store or superstore (e.g., Fred Meyer, Walmart) ❑ The internet ❑ Friend or family member who is under 21 ❑ Friend or family member who is 21 or older ❑ Some other source ❑ I did not use any tobacco products in the past 30 days
18. Some other source (please specify)	▶ Open-ended (text)
19. If you tried to purchase tobacco or vaping/Juuling products at any type of store **in the past 30 days**, how often were you asked to show ID?	▶ Every time ▶ Some of the time ▶ Never ▶ I have not tried to purchase these products at a store in the past 30 days.
20. How easy is it for you to get the cigarettes, vaping/Juuling products, or other tobacco products that you use?	▶ Very easy ▶ Sort of easy ▶ Sort of hard ▶ Very hard
21. When was the first time you ever used any tobacco or vaping/Juuling product?	▶ Within the past 6 months (since February 2018) ▶ More than 6 months ago ▶ I have never used any tobacco or vaping/Juuling product (SKIP to Q26)
22. The very first time you used any tobacco or vaping/Juuling product, which type of product did you use?	▶ Cigarette, menthol or non-menthol ▶ E-cigarette, Juul, or other tobacco vaping product ▶ Smokeless tobacco ▶ Little cigar or cigarillo ▶ Large cigar ▶ Hookah ▶ Another type of product
23. Do you currently use any tobacco, or vaping/Juuling product with mint, fruit, coffee, candy, or other flavors?	▶ Yes ▶ No ▶ Not sure
24. How do you identify?	▶ Female ▶ Male ▶ Something else fits better
25. Do you think of yourself as:	▶ Lesbian or gay ▶ Straight ▶ Bisexual ▶ Something else ▶ Don't know/Not sure
26. Please tell us your zip code. This helps us understand how well our survey is reaching people in different areas.	▶ Open-ended (text)

Question	Response Options
27. Pop quiz—how old do you have to be to buy tobacco products in Oregon?	▶ 16 or older ▶ 18 or older ▶ 21 or older ▶ 25 or older
28. Last question! Did you take the Oregon Tobacco Survey in December last year?	▶ Definitely yes ▶ Definitely no ▶ Not sure

Thank you for completing the Oregon Tobacco Survey. **If you want to be entered into a drawing for a chance to win a $50 Amazon or Target gift card**, please click **here**.

APPENDIX C
SAMPLE SOCIAL MEDIA RECRUITMENT ADS

APPENDIX D
DATA TABLES AND MODELS

Exhibit D1
Pre-Legislation and Post-Legislation Samples Compared to Recruitment Targets

Sample	Total Respondents	Respondent Tobacco Users (*Ever* Used)	Respondent Tobacco 30-Day Users (Current Tobacco Users)	Percentage of Respondents Who Are Current Tobacco Users
Pre-Legislation Sample				
Portland metro				
Youth	656	483	408	62%
Young adult	2,259	2,173	1,938	86%
Oregon, outside Portland metro				
Youth	578	411	311	54%
Young adult	906	862	776	86%
Total respondents	4,399	3,929	3,433	78%
Post-Legislation Sample				
Portland metro				
Youth	340	261	206	61%
Young adult	1,194	1,129	1,004	84%
Oregon, outside Portland metro				
Youth	351	273	213	61%
Young adult	477	454	413	87%
Total respondents	2,362	2,117	1,836	78%

Note. An additional 312 individuals at pre-legislation and 188 individuals at post-legislation (6.6% and 7.4% of all respondents, respectively) responded to the survey but did not complete enough items to be included here.

DESCRIPTIVE STATISTICS FOR CURRENT TOBACCO USERS, BY AGE GROUP

Exhibit D2
Respondents' Age

Response	Pre-Legislation			Wave 2		
	13–17	18–20	21–25	13–17	18–20	21–25
n	719	1,383	1,331	419	625	792
Mean	16.2	19.0	22.8	16.2	19.0	22.9
Standard deviation	0.96	0.81	1.42	0.92	0.80	1.44

Exhibit D3
Age first time used any form of tobacco

Response	Pre-Legislation			Wave 2		
	13–17	18–20	21–25	13–17	18–20	21–25
n	718	1,383	1,331	418	625	791
Mean	13.5	15.1	15.3	13.7	14.9	15.5
Standard deviation	2.50	2.48	2.78	2.23	2.61	2.76

Exhibit D4
Have you ever smoked all or part of a cigarette (menthol or non-menthol)?

Response	Pre-Legislation			Post-Legislation		
	13–17	18–20	21–25	13–17	18–20	21–25
n	719	1,381	1,331	419	625	792
Yes	77%	86%	96%	75%	86%	95%
No	23%	14%	4%	25%	14%	5%

Exhibit D5
How old were you when you smoked all or part of a cigarette for the first time?

Response	Pre-Legislation			Post-Legislation		
	13–17	18–20	21–25	13–17	18–20	21–25
n	554	1,188	1,270	314	536	754
Mean	13.7	15.3	15.7	13.8	15.1	15.9
Standard deviation	2.56	2.61	3.01	2.31	2.71	2.98

Exhibit D6
Have you ever used an e cigarette, Juul, or other vaping product? (do not include marijuana)

Response	Pre-Legislation			Post-Legislation		
	13–17	18–20	21–25	13–17	18–20	21–25
n	719	1,382	1,330	419	624	790
Yes	95%	92%	86%	97%	95%	88%
No	5%	8%	14%	3%	5%	12%

Exhibit D7
How old were you the first time you used an e-cigarette or other vaping/Juuling product?

Response	Pre-Legislation			Post-Legislation		
	13–17	18–20	21–25	13–17	18–20	21–25
n	683	1,274	1,142	403	594	698
Mean	14.5	16.6	19.2	14.7	16.6	19.1
Standard deviation	1.82	1.80	2.16	1.56	1.77	2.31

Exhibit D8
What would you say is the most important reason you use vaping/Juuling products?

Response	Pre-Legislation			Post-Legislation		
	13–17	18–20	21–25	13–17	18–20	21–25
n	666	1,242	1,099	387	580	671
Flavor choices	21%	23%	20%	16%	18%	24%
Nicotine	27%	24%	17%	36%	32%	16%
An alternative to cigarettes	21%	33%	46%	17%	30%	44%
Social reasons	18%	12%	9%	20%	13%	8%
Something else	13%	8%	9%	11%	8%	8%

Exhibit D9
Have you ever done any of the following: Smoked a little cigar or cigarillo, such as Swisher Sweets? Smoked a large cigar, such as Dutch Master or White Owl? Used chewing tobacco, snuff, snus, or dip? Smoked tobacco in a hookah?

Response	Pre-Legislation			Post-Legislation		
	13–17	18–20	21–25	13–17	18–20	21–25
n	719	1,381	1,329	419	625	791
Yes	68%	89%	94%	61%	83%	93%
No	32%	11%	6%	39%	17%	7%

Exhibit D10
How old were you the first time you used cigars, smokeless tobacco, or hookah?

Response	Pre-Legislation			Post-Legislation		
	13–17	18–20	21–25	13–17	18–20	21–25
n	482	1,221	1,248	252	520	733
Mean	14.4	16.2	16.8	14.6	16.1	17.0
Standard deviation	2.27	2.06	2.41	2.09	2.10	2.45

Exhibit D11
Tried to buy tobacco products in past 30 days.

Response	Pre-Legislation			Post-Legislation		
	13–17	18–20	21–25	13–17	18–20	21–25
n	708	1,361	1,311	414	612	788
Yes	40%	91%	93%	38%	66%	93%
No	60%	9%	7%	62%	34%	7%

Exhibit D12
During the past 30 days, did you . . .

Response	Pre-Legislation			Post-Legislation		
	13–17	18–20	21–25	13–17	18–20	21–25
n	393–683	839–1277	995–1271	214–404	378–595	600–755
Smoke cigarettes	71%	70%	78%	68%	70%	79%
Smoke menthol cigarettes	56%	49%	44%	59%	50%	44%
Use an e-cigarette, Juul, or other vaping product (not marijuana)	83%	75%	51%	92%	84%	60%
Smoked a little cigar or cigarillo	42%	36%	23%	38%	36%	26%
Smoked a large cigar	18%	20%	14%	17%	19%	16%
Use chewing tobacco, snuff, snus, or dip	27%	27%	25%	24%	18%	17%
Smoke tobacco in a hookah	13%	21%	16%	17%	15%	15%

Exhibit D13
Past 30 days, got any tobacco product from . . .

Response	Pre-Legislation			Post-Legislation		
	13–17	18–20	21–25	13–17	18–20	21–25
n	719	1,383	1,331	419	625	792
Convenience store or gas station	30%	76%	82%	29%	50%	81%
Grocery store or superstore (e.g., Fred Meyer, Walmart)	7%	22%	25%	5%	9%	25%
Friend or family member who is under 18[a]	31%	3%	1%	—	—	—
Friend or family member who is 18 or over[a]	56%	23%	16%	—	—	—
Friend or family member who is under 21[b]	—	—	—	47%	15%	3%
Friend or family member who is 21 or over[b]	—	—	—	41%	47%	17%
The internet	10%	9%	6%	17%	10%	9%
Tobacco shop[c]	1%	5%	4%	1%	2%	4%
Vape shop[c]	1%	7%	5%	1%	4%	7%
Some other source	4%	2%	3%	2%	3%	2%

[a]Only asked at pre-legislation. [b]Only asked at post-legislation. [c]Coded from open-ended responses.

Exhibit D14
If you tried to purchase tobacco or vaping/Juuling products at any type of store in the past 30 days, how often were you asked to show ID?

Response	Pre-Legislation			Post-Legislation		
	13–17	18–20	21–25	13–17	18–20	21–25
n	281	1,242	1,221	159	404	736
Every time	41%	60%	47%	49%	56%	53%
Some of the time	29%	30%	43%	26%	30%	39%
Never	31%	10%	11%	25%	14%	9%
Sometimes *or* always	69%	90%	89%	76%	86%	91%
Never	31%	10%	11%	25%	14%	9%

Exhibit D15
How easy is it for you to get the cigarettes, vaping/Juuling products, or other tobacco products that you use?

Response	Pre-Legislation			Post-Legislation		
	13–17	18–20	21–25	13–17	18–20	21–25
n	707	1,362	1,312	413	612	789
Very easy	43%	71%	85%	47%	51%	84%
Sort of easy	36%	23%	12%	35%	33%	13%
Sort of hard	15%	5%	2%	14%	11%	2%
Very hard	6%	1%	< 1%	5%	5%	1%
Easy *or* very easy	80%	94%	98%	82%	84%	97%
Hard *or* very hard	20%	6%	2%	18%	16%	3%

Exhibit D16
When was the first time you ever used any tobacco or vaping/Juuling product?

Response	Pre-Legislation			Post-Legislation		
	13–17	18–20	21–25	13–17	18–20	21–25
n	680	1,327	1,269	410	591	761
Within the past 6 months	34%	23%	16%	25%	18%	13%
More than 6 months ago	66%	77%	84%	75%	82%	87%

Exhibit D17
The very first time you used any tobacco or vaping/Juuling product, which type of product did you use?

Response	Pre-Legislation			Post-Legislation		
	13–17	18–20	21–25	13–17	18–20	21–25
n	670	1,303	1,257	398	580	753
Cigarette, menthol or non-menthol	39%	46%	63%	39%	52%	11%
E-cigarette, Juul, or other tobacco vaping product	43%	28%	9%	52%	31%	6%
All others	18%	26%	28%	9%	17%	23%
Smokeless tobacco	6%	12%	10%	5%	7%	6%
Little cigar or cigarillo	4%	5%	6%	1%	3%	6%
Large cigar	2%	2%	2%	0%	2%	3%
Hookah	2%	5%	10%	2%	3%	7%
Another type of product	4%	2%	1%	1%	1%	1%

Exhibit D18
Do you currently use any tobacco or vaping/Juuling product with mint, fruit, coffee, candy, or other flavors?

Response	Pre-Legislation			Post-Legislation		
	13–17	18–20	21–25	13–17	18–20	21–25
n	630	1,279	1,229	390	566	738
Yes	73%	70%	49%	76%	73%	55%
No	27%	30%	51%	24%	27%	45%

DESCRIPTIVE STATISTICS FOR CURRENT TOBACCO USERS, BY REGION

Exhibit D19
Respondents' Age

Response	Pre-Legislation		Post-Legislation	
	Portland metro	Oregon, outside Portland metro	Portland metro	Oregon, outside Portland metro
n	2,346	1,087	1,210	626
Mean	20.1	19.3	20.4	19.3
Standard deviation	2.75	2.77	2.84	2.95

Exhibit D20
Age First Time Respondents Used Any Form of Tobacco

Response	Pre-Legislation		Post-Legislation	
	Portland metro	Oregon, outside Portland metro	Portland metro	Oregon, outside Portland metro
n	2,345	1,087	1,209	625
Mean	15.0	14.6	15.1	14.5
Standard deviation	2.66	2.75	2.69	2.62

Exhibit D21
Have you ever smoked all or part of a cigarette (menthol or non-menthol)?

Response	Pre-Legislation		Post-Legislation	
	Portland metro	Oregon, outside Portland metro	Portland metro	Oregon, outside Portland metro
n	2,345	1,086	1,210	626
Yes	89%	85%	88%	86%
No	11%	15%	12%	14%

Exhibit D22
How old were you when you smoked all or part of a cigarette for the first time?

Response	Pre-Legislation		Post-Legislation	
	Portland metro	Oregon, outside Portland metro	Portland metro	Oregon, outside Portland metro
n	2086	926	1066	538
Mean	15.3	15.0	15.4	14.9
Standard deviation	2.86	2.89	2.84	2.92

Exhibit D23
Have you ever used an e-cigarette, Juul, or other vaping product? (do not include marijuana)

Response	Pre-Legislation		Post-Legislation	
	Portland metro	Oregon, outside Portland metro	Portland metro	Oregon, outside Portland metro
n	2,344	1,087	1,209	624
Yes	90%	90%	93%	93%
No	10%	10%	7%	7%

Exhibit D24
How old were you the first time you used an e-cigarette or other vaping/Juuling product?

Response	Pre-Legislation		Post-Legislation	
	Portland metro	Oregon, outside Portland metro	Portland metro	Oregon, outside Portland metro
n	2,119	980	1,117	578
Mean	17.3	16.7	17.6	16.5
Standard deviation	2.61	2.64	2.67	2.52

Exhibit D25
What would you say is the most important reason you use vaping/Juuling products?

Response	Pre-Legislation		Post-Legislation	
	Portland metro	Oregon, outside Portland metro	Portland metro	Oregon, outside Portland metro
n	2,060	947	1,075	563
Flavor choices	20%	24%	19%	21%
Nicotine	22%	22%	27%	27%
An alternative to cigarettes	36%	32%	34%	31%
Social reasons	12%	11%	13%	11%
Something else	10%	10%	7%	11%

Exhibit D26
Have you ever done any of the following: Smoked a little cigar or cigarillo, such as Swisher Sweets? Smoked a large cigar, such as Dutch Master or White Owl? Used chewing tobacco, snuff, snus, or dip? Smoked tobacco in a hookah?

Response	Pre-Legislation		Post-Legislation	
	Portland metro	Oregon, outside Portland metro	Portland metro	Oregon, outside Portland metro
n	2,022	1,085	1,209	626
Yes	86%	87%	84%	79%
No	14%	13%	16%	21%

Exhibit D27
How old were you the first time you used cigars, smokeless tobacco, or hookah?

Response	Pre-Legislation		Post-Legislation	
	Portland metro	Oregon, outside Portland metro	Portland metro	Oregon, outside Portland metro
n	2,012	939	1,011	494
Mean	16.3	15.7	16.5	15.8
Standard deviation	2.30	2.53	2.39	2.44

Exhibit D28
Tried to buy tobacco products in past 30 days.

Response	Pre-Legislation		Post-Legislation	
	Portland metro	Oregon, outside Portland metro	Portland metro	Oregon, outside Portland metro
n	2,309	1,071	1,195	619
Yes	83%	77%	76%	63%
No	17%	23%	24%	37%

Exhibit D29
During the past 30 days, did you . . .

Response	Pre-Legislation		Post-Legislation	
	Portland metro	Oregon, outside Portland metro	Portland metro	Oregon, outside Portland metro
n	1,595–2,121	632–982	804–1,119	389–579
Smoke cigarettes	76%	68%	75%	72%
Smoke menthol cigarettes	49%	46%	47%	52%
Use an e-cigarette, Juul, or other vaping product (not marijuana)	69%	66%	75%	78%
Smoked a little cigar or cigarillo	32%	32%	30%	34%
Smoked a large cigar	17%	17%	18%	16%
Use chewing tobacco, snuff, snus, or dip	21%	38%	13%	29%
Smoke tobacco in a hookah	20%	12%	17%	13%

Exhibit D30
Past 30 days, got any tobacco product from . . .

Response	Pre-Legislation		Post-Legislation	
	Portland metro	Oregon, outside Portland metro	Portland metro	Oregon, outside Portland metro
n	2,346	1,087	1,210	626
Convenience store or gas station	71%	64%	63%	50%
Grocery store or superstore (e.g., Fred Meyer, Walmart)	20%	19%	16%	12%
Friend or family member who is under 18[a]	7%	11%	—	—
Friend or family member who is 18 or over[a]	26%	29%	—	—
Friend or family member who is under 21[b]	—	—	16%	20%
Friend or family member who is 21 or over[b]	—	—	30%	37%
The internet	7%	8%	10%	14%
Tobacco shop[c]	4%	3%	4%	1%
Vape shop[c]	5%	5%	4%	5%
Some other source	3%	3%	3%	2%

[a]Only asked at pre-legislation. [b]Only asked at post-legislation. [c]Coded from open-ended responses.

Exhibit D31
If you tried to purchase tobacco or vaping/Juuling products at any type of store in the past 30 days, how often were you asked to show ID?

Response	Pre-Legislation		Post-Legislation	
	Portland metro	Oregon, outside Portland metro	Portland metro	Oregon, outside Portland metro
n	1,923	821	908	391
Every time	53%	51%	55%	48%
Some of the time	36%	31%	35%	34%
Never	11%	16%	10%	18%
Sometimes *or* always	89%	84%	90%	82%
Never	11%	16%	10%	18%

Exhibit D32
How easy is it for you to get the cigarettes, vaping/Juuling products, or other tobacco products that you use?

Response	Pre-Legislation		Post-Legislation	
	Portland metro	Oregon, outside Portland metro	Portland metro	Oregon, outside Portland metro
n	2,308	1,073	1,196	618
Very easy	72%	68%	67%	61%
Sort of easy	21%	22%	24%	26%
Sort of hard	5%	8%	7%	9%
Very hard	2%	2%	2%	4%
Easy *or* very easy	94%	90%	91%	86%
Hard *or* very hard	6%	10%	9%	14%

Exhibit D33
When was the first time you ever used any tobacco or vaping/Juuling product?

Response	Pre-Legislation		Post-Legislation	
	Portland metro	Oregon, outside Portland metro	Portland metro	Oregon, outside Portland metro
n	2,232	1,044	1,167	595
Within the past 6 months	23%	22%	17%	19%
More than 6 months ago	77%	78%	83%	81%

Exhibit D34
The very first time you used any tobacco or vaping/Juuling product, which type of product did you use?

Response	Pre-Legislation		Post-Legislation	
	Portland metro	Oregon, outside Portland metro	Portland metro	Oregon, outside Portland metro
n	2,196	1,034	1,145	586
Cigarette, menthol or non-menthol	55%	44%	58%	49%
E-cigarette, Juul, or other tobacco vaping product	23%	25%	25%	31%
All others	22%	31%	17%	20%
Smokeless tobacco	6%	18%	4%	10%
Little cigar or cigarillo	5%	5%	4%	4%
Large cigar	2%	2%	2%	1%
Hookah	7%	4%	6%	3%
Another type of product	2%	3%	1%	1%

Exhibit D35
Do you currently use any tobacco or vaping/Juuling product with mint, fruit, coffee, candy, or other flavors?

Response	Pre-Legislation		Post-Legislation	
	Portland metro	Oregon, outside Portland metro	Portland metro	Oregon, outside Portland metro
n	2,133	1,005	1,117	577
Yes	61%	65%	64%	70%
No	39%	35%	36%	30%

INITIATION OF TOBACCO USE IN PAST 6 MONTHS

The dependent variable for these models is the proportion of respondents who reported initiating tobacco use more than 6 months ago versus within the past 6 months.

Exhibit D36. Multiple Logistic Regression: All Current Tobacco Users

Parameter	Est.	SE	*p*
Intercept	-1.274**	0.4146	0.002
Age	0.133***	0.0135	0.000
Hispanic	0.441***	0.1118	0.000
Portland Metro	-0.061	0.0779	0.436
Survey administration (Pre-legislation)	**-0.307*** **	**0.0788**	**0.000**
Native American	-0.020	0.2472	0.937
Asian	-0.437	0.2515	0.082
African American	-0.655**	0.2515	0.009
Native Hawaiian/Pacific Islander	0.128	0.4031	0.751
White	0.063	0.1295	0.629
Female	-0.671**	0.2383	0.005
Male	-0.593*	0.2381	0.013

*$p < .05$. **$p < .01$. ***$p < .001$.

Exhibit D37. Multiple Logistic Regression: All Current Tobacco Users, by Age Group

Parameter	Model 1: Age 13–17		Model 2: Age 18–20		Model 3: Age 21–25	
	Est.	SE	Est.	SE	Est.	SE
Intercept	-3.589**	1.2510	-5.438***	1.4764	3.243**	1.2211
Age	0.278***	0.0710	0.348***	0.0731	-0.055	0.0450
Hispanic	0.345	0.2119	0.512**	0.1781	0.453*	0.1997
Portland Metro	-0.149	0.1392	-0.115	0.1274	0.103	0.1433
Survey administration (Pre-legislation)	**-0.439****	**0.1473**	**-0.311***	**0.1312**	**-0.237**	**0.1353**
Native American	0.135	0.4558	0.062	0.3951	-0.329	0.4484
Asian	-0.684	0.6081	-0.213	0.3967	-0.753	0.4108
African American	0.196	0.5517	-0.664	0.3856	-1.131**	0.4279
Native Hawaiian/Pacific Islander	0.255	0.7270	0.253	0.6010	-0.235	0.8238
White	0.002	0.2358	0.232	0.2016	-0.103	0.2511
Female	-0.296	0.4070	-0.808*	0.3950	-0.924	0.4747
Male	-0.439	0.4070	-0.601	0.3942	-0.873	0.4744

*p < .05. **p < .01. ***p < .001.

Exhibit D38. Multiple Logistic Regression: All Current Tobacco Users, by Region

Parameter	Model 1: Portland Metro		Model 2: Oregon, outside Portland metro	
	Est.	SE	Est.	SE
Intercept	-1.673**	0.5033	-0.569	0.7592
Age	0.138***	0.0165	0.124***	0.0234
Hispanic	0.545***	0.1533	0.235	0.2009
Portland Metro[a]	—	—	—	—
Survey administration (Pre-legislation)	**-0.368*****	**0.0982**	**-0.193**	**0.1328**
Native American	0.340	0.3416	-0.506	0.3799
Asian	-0.423	0.2796	-0.283	0.6154
African American	-0.567	0.2892	-0.910	0.5144
Native Hawaiian/Pacific Islander	0.550	0.5192	-0.771	0.6767
White	0.158	0.1533	-0.171	0.2446
Female	-0.667*	0.2730	-0.690	0.4949
Male	-0.617*	0.2727	-0.550	0.4945

*p < .05. **p < .01. ***p < .001. [a]This parameter is not included in the model, because it is redundant.

PERCEIVED EASE OF ACCESS TO TOBACCO AND VAPING PRODUCTS

The dependent variable for these models is the proportion of respondents who reported that tobacco products are *hard* or *very hard* to obtain versus *easy* or *very easy* to obtain.

Exhibit D39. Multiple Logistic Regression: All Current Tobacco Users

Parameter	Est.	SE	*p*
Intercept	3.995***	0.5887	0.000
Age	-0.297***	0.0220	0.000
Hispanic	0.142	0.1837	0.439
Portland Metro	-0.300**	0.1092	0.006
Survey administration (Pre-legislation)	**-0.381*** **	**0.1089**	**0.000**
Native American	-0.173	0.3693	0.639
Asian	0.343	0.3726	0.358
African American	0.119	0.3891	0.760
Native Hawaiian/Pacific Islander	0.171	0.5272	0.745
White	-0.082	0.1861	0.658
Female	-0.681**	0.2468	0.006
Male	-0.445	0.2441	0.069

*$p < .05$. **$p < .01$. ***$p < .001$.

Exhibit D40. Multiple Logistic Regression: All Current Tobacco Users, by Age Group

Parameter	Model 1: Age 13–17		Model 2: Age 18–20		Model 3: Age 21–25	
	Est.	SE	Est.	SE	Est.	SE
Intercept	-1.989	1.4847	0.109	2.1117	1.930	2.6998
Age	0.027	0.0841	-0.054	0.1048	-0.173	0.1079
Hispanic	0.237	0.2745	-0.046	0.2804	0.176	0.5403
Portland Metro	-0.194	0.1591	-0.394*	0.1733	-0.542	0.3122
Survey administration (Pre-legislation)	**0.237**	**0.1685**	**-1.122*** **	**0.1692**	**-0.143**	**0.3041**
Native American	-0.331	0.6028	0.069	0.5583	-0.322	0.8320
Asian	0.129	0.8213	-0.117	0.6042	0.813	0.6209
African American	0.250	0.6264	0.283	0.5663	-0.493	1.0910
Native Hawaiian/Pacific Islander	0.593	0.7267	0.288	0.8131	-19.258	22769.1433
White	0.266	0.2877	-0.138	0.2939	-0.851*	0.4311
Female	-0.733	0.3818	-0.584	0.4112	-1.144*	0.5325
Male	-0.570	0.3811	-0.160	0.4023	-0.941	0.5207

*$p < .05$. **$p < .01$. ***$p < .001$.

Exhibit D41. Multiple Logistic Regression: All Current Tobacco Users, by Region

Parameter	Model 1: Portland Metro		Model 2: Oregon, outside Portland metro	
	Est.	SE	Est.	SE
Intercept	4.865***	0.7762	1.822	0.9982
Age	-0.329***	0.0296	-0.261***	0.0334
Hispanic	-0.154	0.2265	0.646*	0.3233
Portland Metro[a]	—	—	—	—
Survey administration (Pre-legislation)	**-0.447****	**0.1450**	**-0.345***	**0.1658**
Native American	0.393	0.4916	-0.957	0.5818
Asian	0.745	0.4465	-0.333	0.8078
African American	0.281	0.5164	-0.001	0.6253
Native Hawaiian/Pacific Islander	0.376	0.7005	0.014	0.8401
White	0.261	0.2693	-0.494	0.2637
Female	-1.068***	0.2799	0.379	0.5637
Male	-0.702*	0.2734	0.430	0.5622

*$p < .05$. **$p < .01$. ***$p < .001$. [a]This parameter is not included in the model, because it is redundant.

FREQUENCY OF REQUESTS FOR PROOF OF AGE

The dependent variable for these models is the proportion of respondents who reported *never* being asked for ID versus those who were asked *sometimes* or *every time*.

Exhibit D42. Multiple Logistic Regression: All Current Tobacco Users

Parameter	Est.	SE	*p*
Intercept	1.108	0.5983	0.064
Age	-0.127***	0.0197	0.000
Hispanic	-0.064	0.1663	0.699
Portland Metro	-0.406***	0.1038	0.000
Survey administration (Pre-legislation)	**0.000**	**0.1089**	**0.997**
Native American	-0.149	0.3113	0.632
Asian	-0.507	0.3857	0.188
African American	-0.630	0.4281	0.141
Native Hawaiian/Pacific Islander	-0.114	0.5178	0.826
White	-0.385*	0.1651	0.020
Female	0.091	0.3067	0.768
Male	0.335	0.3035	0.270

*$p < .05$. **$p < .01$. ***$p < .001$.

Exhibit D43. Multiple Logistic Regression: All Current Tobacco Users, by Age Group

Parameter	Model 1: Age 13–17		Model 2: Age 18–20		Model 3: Age 21–25	
	Est.	SE	Est.	SE	Est.	SE
Intercept	8.268***	2.2089	-1.566	2.0653	-5.629***	1.5630
Age	-0.462***	0.1252	0.007	0.1015	0.102	0.0561
Hispanic	-0.426	0.3317	0.041	0.2910	0.191	0.2889
Portland Metro	-0.655**	0.2348	-0.128	0.1759	-0.468**	0.1659
Survey administration (Pre-legislation)	**0.341**	**0.2483**	**-0.243**	**0.1848**	**0.210**	**0.1679**
Native American	-0.889	0.6060	-0.387	0.5883	0.470	0.5057
Asian	0.318	0.9033	-1.128	0.7711	-0.156	0.5971
African American	-1.003	0.9430	-0.183	0.5923	-1.337	1.0544
Native Hawaiian/Pacific Islander	-0.331	0.9825	-0.894	1.0661	0.849	0.8367
White	-0.924*	0.3629	-0.381	0.2663	-0.031	0.2965
Female	0.134	0.7047	-0.268	0.4608	0.564	0.6077
Male	-0.061	0.7004	-0.014	0.4538	1.165	0.6015

*p < .05. **p < .01. ***p < .001.

Exhibit D44. Multiple Logistic Regression: All Current Tobacco Users, by Region

Parameter	Model 1: Portland Metro		Model 2: Oregon, outside Portland metro	
	Est.	SE	Est.	SE
Intercept	0.211	0.7560	2.009*	1.0084
Age	-0.120***	0.0254	-0.134***	0.0314
Hispanic	0.021	0.2129	-0.219	0.2728
Portland Metro[a]	—	—	—	—
Survey administration (Pre-legislation)	**0.006**	**0.1396**	**0.013**	**0.1761**
Native American	-0.156	0.4559	-0.262	0.4392
Asian	-0.331	0.4253	-1.213	1.0732
African American	-0.645	0.5081	-0.401	0.8276
Native Hawaiian/Pacific Islander	-0.538	0.7700	0.415	0.7830
White	-0.273	0.2136	-0.577*	0.2644
Female	0.126	0.3652	-0.136	0.5840
Male	0.477	0.3602	-0.063	0.5791

*p < .05. **p < .01. ***p < .001. [a]This parameter is not included in the model, because it is redundant.

AVERAGE AGE OF INITIATION OF TOBACCO USE

The dependent variable for these models is the age respondent first used any form of tobacco.

Exhibit D45. Univariate ANOVA: All Current Tobacco Users

Parameter	Est.	SE	*p*
Intercept	9.994***	0.414	0.000
Age	0.201***	0.013	0.000
Hispanic	0.027	0.125	0.830
Portland Metro	0.318***	0.080	0.000
Survey administration (Pre-legislation)	**-0.030**	**0.078**	**0.702**
Native American	-0.719**	0.259	0.006
Asian	0.536	0.278	0.054
African American	-0.844**	0.290	0.004
Native Hawaiian/Pacific Islander	0.266	0.420	0.526
White	0.081	0.134	0.546
Female	0.603**	0.200	0.003
Male	0.618**	0.200	0.002

*$p < .05$. **$p < .01$. ***$p < .001$.

Exhibit D46. Univariate ANOVA: All Current Tobacco Users, by Age Group

Parameter	Model 1: Age 13–17		Model 2: Age 18–20		Model 3: Age 21–25	
	Est.	SE	Est.	SE	Est.	SE
Intercept	1.800	1.316	10.013***	1.445	16.140***	1.135
Age	0.613***	0.075	0.198**	0.071	-0.019	0.043
Hispanic	0.503*	0.226	-0.234	0.195	-0.057	0.212
Portland Metro	0.125	0.142	0.283*	0.125	0.328*	0.139
Survey administration (Pre-legislation)	**-0.140**	**0.146**	**0.115**	**0.126**	**-0.187**	**0.127**
Native American	-0.414	0.452	-1.054*	0.413	-0.726	0.445
Asian	0.829	0.671	0.676	0.423	0.219	0.439
African American	-1.592**	0.557	-0.706	0.443	-0.512	0.489
Native Hawaiian/Pacific Islander	0.985	0.693	0.213	0.615	-0.253	0.829
White	-0.143	0.238	0.224	0.209	0.052	0.229
Female	1.184**	0.389	1.341***	4.186	-0.331	0.323
Male	1.134**	0.390	1.341***	4.217	-0.401	0.322

*p < .05. **p < .01. ***p < .001.

Exhibit D47. Univariate ANOVA: All Current Tobacco Users, by Region

Parameter	Model 1: Portland Metro		Model 2: Oregon, outside Portland metro	
	Est.	SE	Est.	SE
Intercept	10.687***	0.499	9.057***	0.766
Age	0.192***	0.016	0.214***	0.023
Hispanic	0.092	0.150	-0.122	0.227
Portland Metro[a]	—	—	—	—
Survey administration (Pre-legislation)	**-0.062**	**0.095**	**0.028**	**0.136**
Native American	-0.891**	0.340	-0.350	0.411
Asian	0.318	0.310	1.270*	0.644
African American	-0.618	0.329	-1.891**	0.617
Native Hawaiian/Pacific Islander	-0.018	0.487	0.951	0.824
White	-0.055	0.160	0.381	0.243
Female	0.451*	0.225	1.211**	0.437
Male	0.403	0.224	1.356**	0.435

*p < .05. **p < .01. ***p < .001. [a]This parameter is not included in the model, because it is redundant.