

Appendix 2.2

Key Measures of Use

Overview *A2.2-2*

Ever Use *A2.2-2*

Past-30-Day Use *A2.2-2*

Frequent Use *A2.2-3*

Susceptibility to Use *A2.2-3*

Dual Use and Poly Use *A2.2-3*

Other Measures *A2.2-3*

NYTS Measures—Special Issues *A2.2-4*

Data Analysis *A2.2-4*

References *A2.2-16*

List of Tables

Table A2.2-1 E-cigarette items from sources of national data on e-cigarette use among youth and young adults *A2.2-5*

Table A2.2-2 E-cigarette items from PATH on e-cigarette use among youth and young adults *A2.2-10*

Overview

Standardizing measures of e-cigarette use is currently a challenge because of rapid and ongoing changes in the marketplace and in the products themselves. Also challenging is the task of performing robust analyses of the data on use of these products, given the variety of approaches employed to assess ever use and past-30-day use of e-cigarettes in the peer-reviewed literature articles included in this review. E-cigarettes are known by a variety of names, and names may vary by country, region, age group, cigarette smoking status, or reason for using the device. Common names for these products include “e-cigarette,” “e-cig,” “vape pen,” “mods,” “hookah pen,”

“e-hookah,” “e-cigar,” and “e-pipe.” Because specific e-cigarette brands are often also distributed regionally, it is unclear whether the inclusion of brand callouts in measurement items in the national surveys influence individual respondents. The surveys employed in this report (NYTS, MTF, NATS) do not ask about type of e-cigarette device used (e.g., whether it was an “open system” or “closed system” device, or whether nicotine was present or absent in the fluid). Therefore, this information is absent in this report. Key terms and measures employed in the chapter are reviewed here and illustrated in Tables A2.2-1 and A2.2-2.

Ever Use

The definition of ever (lifetime) use of e-cigarettes varies slightly among the surveys used in this report. In the NYTS, NATS, and Styles surveys, an ever user is defined as “one who has ever used e-cigarettes, even just one time.” In the MTF, ever use is defined by someone “smoking an

electronic vaporizer at least once or twice.” There are also notable differences in measures of ever e-cigarette use on the NYTS between the survey periods 2011–2013 and 2014. These differences are explained in more detail in a later section (see NYTS Measures—Special Issues).

Past-30-Day Use

Use of a tobacco product on at least 1 day in the past 30 days has traditionally been used to measure “current use” for adolescents and young adults. However, surveillance of tobacco-use behaviors among youth is enhanced through the assessment of additional measures. Therefore, additional data regarding the intensity of use (e.g., the number of days the product was used in the past 30 days) are also provided (see below). Measures of past-30-day use of e-cigarettes are available on the NYTS, MTF, and Styles surveys (Table A2.2-1). On these instruments, past-30-day use includes use on at least 1 day in the 30 days preceding the survey. Similar to the measures of ever use, there are notable differences in measures of past-30-day use on the NYTS between the survey periods 2011–2013 and 2014. These differences are explained in more detail in a later section (see NYTS Measures—Special Issues). On the NATS, “current use” is measured as use of the product “now,” which can refer to “every day,” “some days,” or “rarely.” See Table A2.2-1 for these details.

Because of the novelty of e-cigarettes, it is possible that solely assessing past-30-day use may capture

an appreciable number of recent e-cigarette initiates who were only experimenting with these products, but may not continue using them regularly (Kozlowski and Giovino 2014; Warner 2015). For example, the 2014 Minnesota Adult Tobacco Survey found that among current smokers who reported past-30-day e-cigarette use, 59% had used e-cigarettes on 5 or fewer of the past 30 days (infrequent users); 28.7% had used e-cigarettes between 6 and 29 of the past 30 days (intermediate users); and 12.3% had used e-cigarettes on all 30 of the past 30 days (daily users) (Amato et al. 2016). These findings suggest that defining prevalence among young adults as any e-cigarette use in the past 30 days may include experimenters who may not progress to regular use. Future research is warranted to further explore how many past-30-day users go on to more persistent use patterns and the most appropriate measures to use in assessing youth tobacco behaviors, particularly for novel products.

Frequent Use

Measures of frequency of use are increasingly recommended for tobacco use surveillance studies of youth and young adults (Kozlowski and Giovino 2014; Amato et al. 2016; Warner 2015). In the NYTS, the frequency of use for youth is measured as the number of days a respondent used an e-cigarette in the last 30 days. For the purposes of the present report, frequent use for youth was defined

as use on 20 or more of the last 30 days preceding the survey (Kozlowski and Giovino 2014). In the NATS, frequent use for young adults is defined as using e-cigarettes “every day.” No past-30-day timeframe defines the young adult measure; rather, respondents in that study report whether they “now use” e-cigarettes “every day,” “some days,” rarely,” or “not at all.”

Susceptibility to Use

Susceptibility to use is defined as the absence of a firm resolve to not start smoking (Evans et al. 1995; Pierce et al. 1996, 1998). Originally developed to understand conventional cigarette smoking among youth, susceptibility predicts the onset of cigarette smoking among youth (Pierce et al. 1996) and has been widely applied in related studies (e.g., Unger et al. 1997; Filice et al. 2003; Gritz et al. 2003; Sun et al. 2005; Bunnell et al. 2015). This construct is applied in the present report to be consistent with past reports (e.g., USDHHS 2012; Mowery et al. 2004; CDC 2010). Using the 2014 NYTS, susceptibility to e-cigarette use for the present report was defined

as failure to respond “definitely not” to the following questions: (a) “Do you think that you will try an electronic cigarette or e-cigarette soon?” (b) “If one of your best friends were to offer you an electronic cigarette or e-cigarette, would you use it?” (c) “Have you ever been curious about using an electronic cigarette or e-cigarette such as blu, 21st Century Smoke, or NJOY?” Alternative response options for these questions were, “definitely yes,” “probably yes,” and “probably no.” These items are consistent with the measurement of susceptibility to conventional cigarette smoking by youth (Evans et al. 1995; Pierce et al. 1996, 1998, 2005; Portnoy et al. 2014).

Dual Use and Poly Use

For the purposes of this chapter, “dual use” is defined as use of e-cigarettes and one other tobacco product, usually conventional cigarettes. Use of both products must have occurred in the same reporting period (e.g., either lifetime or in the past 30 days; see, for example, Tables 2.7a and 2.7b). “Poly use” is defined as use of e-cigarettes and two or more other tobacco products, which include conventional

cigarettes, traditional cigars, cigarillos, filtered little cigars, hookahs, pipe tobacco, smokeless tobacco, snus, dissolvable tobacco, and bidis/kreteks. Sometimes these products are divided into combustibles (which, in analyses, are typically limited to cigarettes, all cigar products, and hookahs) and noncombustibles (typically limited to smokeless tobacco, snus, and dissolvable tobacco).

Other Measures

Measures specific to other constructs, such as reasons to use e-cigarettes and the use of flavored e-cigarettes, are provided in Tables A2.2-1 and A2.2-2.

NYTS Measures—Special Issues

Measures of ever use and past-30-day use of e-cigarettes on the NYTS varied between 2011–2013 and 2014. From 2011 to 2013, the NYTS asked, “Which of the following tobacco products have you tried, even just one time?” The response option “electronic cigarettes or e-cigarettes, such as Ruyan or NJOY” was the 9th choice of 11 choices in a check-all-that-apply list. The literature on “check-all-that-apply” approaches to survey items suggests, however, that these approaches elicit fewer answers for two reasons: satisficing and primacy. “Satisficing” is when respondents minimally answer a question to quickly move through the survey; “primacy” is the likelihood that the respondent will pay the most attention to the first item in a list with many response options (Smyth et al. 2005). As the e-cigarette response options for both ever and past-30-day use questions were only the 9th choice out of 11 choices, and outdated brand callouts were included, the pre-2014 NYTS e-cigarette items could have suffered from satisficing and primacy and, as a result, potentially underestimated e-cigarette use in 2011–2013.

In 2014, the ever and past-30-day use survey questions for e-cigarettes on the NYTS were changed so that each of these products was asked about individually in a forced-choice setup. Ever e-cigarette use was assessed with the question “Have you ever used e-cigarettes such as blu, 21st Century Smoke, or NJOY, even one time?” Response options were only “No” or “Yes.” Past-30-day use of e-cigarettes was assessed by the question “During the past 30 days, on how many days did you use e-cigarettes such as blu, 21st Century Smoke, or NJOY?” At the time of the survey, these brands were among the most popular

nationwide; however, as noted previously, brands do vary regionally. It is likely that this change in item wording and approach captured more positive responses in 2014 than the approach used in 2011–2013. This is substantiated by a study of New Jersey adolescents using the New Jersey Youth Tobacco Survey (NJYTS) to compare the pre-2014 (i.e., 2011–2013) check-all-that-apply method with the 2014 forced-choice method. The study showed that the prevalence of e-cigarette use increased by 9.3 percentage points, from 14.9% to 24.2%, when using the forced-choice method employed in 2014 (Delnevo et al. 2016). Thus, the change in prevalence estimates between 2011–2013 and 2014 is likely attributable in part to the change in the survey question. However, the extent to which the NJYTS findings may be generalizable to the NYTS is unclear for several reasons: the questions assessed on the surveys are not absolutely identical; the NJYTS sample is markedly smaller; that study did not employ a random sampling design; and the demographic makeup of students varies between the two populations.

In 2013, the NYTS assessed perceived harm from e-cigarettes relative to harm from conventional cigarettes asking, “Do you believe any of the following are less harmful than cigarettes?” The e-cigarette response option was written as “Using electronic cigarettes, such as Ruyan or NJOY.” The brand references in this item changed in 2014 to be parallel with the ever use and past-30-day items for e-cigarette use. In 2012 and 2013, the NYTS assessed awareness of e-cigarette use, but this item was dropped in 2014 because of the extremely high prevalence of awareness observed in 2013.

Data Analysis

Data were analyzed for the present report using SAS-callable SUDAAN version 9.2 and weighted to account for the complex survey design, as well as adjusted for non-response. Each survey was analyzed separately. Chapter 2 focuses on data from the NYTS and NATS surveys, as these are the surveys that focus exclusively upon nationwide

e-cigarette and other tobacco product use. National prevalence estimates and 95% confidence intervals (CIs) were calculated. Differences were considered statistically significant if CIs did not overlap. Estimates with a relative standard error of greater than 40% were not reported because of the inherent instability of such estimates.

Table A2.2-1 E-cigarette items from sources of national data on e-cigarette use among youth and young adults

| Construct/topic | NYTS (2015) | NATS (2014) | Styles (2014) | MTF (2015) |
|----------------------------------|--|---|---|---|
| Preamble | The next 12 questions are about electronic cigarettes or e-cigarettes. E-cigarettes are electronic devices that usually contain a nicotine-based liquid that is vaporized and inhaled. You may also know them as vape-pens, hookah-pens, electronic hookahs (e-hookahs), electronic cigars (e-cigars), electronic pipes (e-pipes), or e-vaporizers. Some look like cigarettes, and others look like pens or small pipes. These are battery-powered devices that produce vapor instead of smoke. Some brand examples are NJOY, blu, VUSE, MarkTen, Finiti, Starbuzz, and Fantasi. | Electronic cigarettes, or e-cigarettes as they are often called, are battery-operated devices that simulate smoking a cigarette but do not involve the burning of tobacco. The heated vapor produced by an e-cigarette often contains nicotine. | — | Electronic vaporizers make a mist that is inhaled and have the feel of cigarette smoking. Examples include e-cigarettes and e-pens. |
| Lifetime use: Ever use | Have you ever used an electronic cigarette or e-cigarette, even once or twice? A. Yes B. No | Have you ever used an electronic cigarette, even just one time in your entire life? 1. Yes 2. No | Have you ever tried any of the following products, even just one time? 5. Electronic cigarettes or e-cigarettes, such as Ruyan or NJOY | Have you ever used an electronic vaporizer such as an e-cigarette? 1. Never 2. Once or twice 3. Occasionally but not regularly 4. Regularly in the past 5. Regularly now |
| Regular use: Current regular use | — | Do you now use electronic cigarettes every day, some days, rarely, or not at all? 1. Every day 2. Some days 3. Rarely 4. Not at all | — | — |

Table A2.2-1 Continued

| Construct/topic | NYTS (2015) | NATS (2014) | Styles (2014) | MTF (2015) |
|--------------------------------------|--|---|--|---|
| Past-30-day use: Ever Use | — | — | In the past 30 days, which of the following products have you used at least once? 5. Electronic cigarettes or e-cigarettes, such as blu, NJOY, or LOGIC | — |
| Past-30-day use: Number of days used | During the past 30 days, on how many days did you use electronic cigarettes or e-cigarettes? A. 0 days B. 1–2 days C. 3–5 days D. 6–9 days E. 10–19 days F. 20–29 days G. All 30 days | — | — | During the last 30 days, on how many days (if any) have you used an electronic vaporizer such as an e-cigarette? 1. 0 days 2. 1 or 2 days 3. 3–5 days 4. 6–9 days 5. 10–19 days 6. 20–30 days |
| Cessation: Use to quit | What are the reasons why you have used electronic cigarettes or e-cigarettes? C. To try to quit using tobacco products, such as cigarettes | At any time during the past 12 months, did you completely switch from smoking conventional cigarettes to using electronic or e-cigarettes? 1. Yes 2. No | — | — |
| Perceptions: E-cigarette awareness | — | Before today, had you ever heard of electronic cigarettes or e-cigarettes? 1. Yes 2. No | Which, if any, of the following products have you heard of? 3. Electronic cigarettes or e-cigarettes, such as Ruyan or NJOY | — |

Table A2.2-1 Continued

| Construct/topic | NYTS (2015) | NATS (2014) | Styles (2014) | MTF (2015) |
|--|--|--|----------------------|--|
| Perceptions (absolute): E-cigarette harm | How much do you think people harm themselves when they use e-cigarettes some days but not every day? A. No harm B. A little harm C. Some harm D. A lot of harm | How harmful do you think using electronic cigarettes is to a person's health? 1. Not harmful at all 2. Moderately harmful 3. Very harmful | — | The next questions ask for your opinions on the effects of using certain drugs and other substances. How much do you think people risk harming themselves (physically or in other ways) if they ... use electronic cigarettes (e-cigarettes) regularly? 1. No risk 2. Slight risk 3. Moderate risk 4. Great risk |
| Perceptions (relative to cigarettes): E-cigarette harm | What are the reasons why you have used electronic cigarettes or e-cigarettes? F. They are less harmful than other forms of tobacco, such as cigarettes. | — | — | — |

Table A2.2-1 Continued

| Construct/topic | NYTS (2015) | NATS (2014) | Styles (2014) | MTF (2015) |
|--|---|-------------|---|--|
| Perceptions: Reasons for e-cigarette use | <p>What are the reasons why you have used electronic cigarettes or e-cigarettes?</p> <p>A. I have never tried an electronic cigarette.</p> <p>B. Friend or family member used them.</p> <p>C. To try to quit using tobacco products, such as cigarettes.</p> <p>D. They cost less than other tobacco products, such as cigarettes.</p> <p>E. Famous people on TV or in movies use them.</p> <p>F. They are less harmful than other forms of tobacco, such as cigarettes.</p> <p>G. They are available in flavors, such as mint, candy, fruit, or chocolate.</p> <p>H. They can be used in areas where other tobacco products, such as cigarettes, are not allowed.</p> <p>I. I used them for some other reason.</p> | — | <p>What are the reasons you have used an electronic vapor product, such as an electronic cigarette (e-cigarette), electronic hookah (e-hookah), or vape pen?</p> <ol style="list-style-type: none"> 1. A friend or family member used them. 2. To try to quit using other forms of tobacco, such as cigarettes. 3. They cost less than other forms of tobacco, such as cigarettes. 4. Famous people on TV or in movies use them. 5. They are less harmful than other forms of tobacco, such as cigarettes. 6. They are available in flavors such as mint, candy, fruit, or chocolate. 7. They can be used in areas where other tobacco products, such as cigarettes, are not allowed. 8. I used them for some other reason. | <p>What have been the most important reasons for your using an electronic vaporizer such as an e-cigarette? (Mark all that apply.)</p> <ul style="list-style-type: none"> • To help me quit regular cigarettes. • Because regular cigarette use is not permitted. • To experiment—to see what it's like. • To relax or relieve tension. • To feel good or get high. • Because it looks cool. • To have a good time with my friends. • Because of boredom, nothing else to do. • Because it tastes good. • Because I am “hooked”—I have to have it. |
| Susceptibility: Curiosity | <p>Have you ever been curious about using an electronic cigarette or e-cigarette, even once or twice?</p> <p>A. Definitely yes</p> <p>B. Probably yes</p> <p>C. Probably not</p> <p>D. Definitely not</p> | — | — | — |

Table A2.2-1 Continued

| Construct/topic | NYTS (2015) | NATS (2014) | Styles (2014) | MTF (2015) |
|---|---|--|---------------|--|
| Susceptibility: Intention to use | Do you think you will try an electronic cigarette or e-cigarette soon? A. Definitely yes B. Probably yes C. Probably not D. Definitely not | Do you think you will use an electronic cigarette or e-cigarette in the next year? Would you say: 1. Definitely yes 2. Probably yes 3. Probably no 4. Definitely not | — | — |
| Susceptibility: Peer influence | If one of your best friends were to offer you an electronic cigarette or e-cigarette, would you use it? A. Definitely yes B. Probably yes C. Probably not D. Definitely not | — | — | (12th grade) How many of your friends would you estimate ... use an e-cigarette, e-pen, etc.? 1. None 2. A few 3. Some 4. Most 5. All |
| Flavored product use: Past-30-day flavored product use | Which of the following tobacco products that you used in the past 30 days were flavored to taste like menthol (mint), alcohol (wine, cognac), candy, fruit, chocolate, or other sweets? E. Electronic cigarettes or e-cigarettes | Were any of the electronic cigarettes that you used in the past 30 days flavored to taste like menthol, mint, clove, spice, candy, fruit, chocolate, or other sweets? 1. Yes 2. No | — | — |
| Photos of products included in survey | No | No | No | No |

Notes: MTF = Monitoring the Future; NATS = National Adult Tobacco Survey; NYTS = National Youth Tobacco Survey; PATH = Population Assessment of Tobacco and Health Study.

Table A2.2-2 E-cigarette items from PATH on e-cigarette use among youth and young adults

| Construct/topic | PATH (2014)—adult study | PATH (2014)—youth study |
|--|--|--|
| Preamble | <p>The next questions are about electronic or e-cigarettes. E-cigarettes look like regular cigarettes but are battery-powered and produce vapor instead of smoke. E-cigarettes can be bought as one-time, disposable products or can be bought as reusable kits with a cartridge. Some people refill their own cartridges with nicotine fluid, sometimes called “e-juice” or “e-liquid.” Disposable e-cigarettes, e-cigarette cartridges, and e-liquid come in many different flavors and nicotine concentrations.</p> | <p>The next questions are about electronic cigarettes, often called e-cigarettes. E-cigarettes look like regular cigarettes but are battery-powered and produce vapor instead of smoke. There are many types of e-cigarettes. Some common brands include NJOY, blu, and Smoking Everywhere. E-cigarettes can be bought as one-time, disposable products or can be bought as reusable kits with a cartridge. Some people refill their own cartridges with nicotine fluid, sometimes called “e-juice” or “e-liquid.” Disposable e-cigarettes, e-cigarette cartridges, and e-liquid come in many different flavors and nicotine concentrations.</p> |
| Regular use: Current regular use | <p>Do you now use e-cigarettes:</p> <ol style="list-style-type: none"> 1. Every day 2. Some days 3. Not at all | — |
| Regular use: Daily quantity | <p>On average, on those [FILL NUMBER OF DAYS FROM AE1022 days/days you used], how many [ECIGFILL] did you usually use each day? Please enter a number.</p> <ol style="list-style-type: none"> 1. Less than 1 each day 2. _ _ _ | <p>In the past 30 days, on the days you used an e-cigarette, how many [ECIGFILL] did you use per day?</p> <ol style="list-style-type: none"> 1. Less than 1 [ECIGFILL] per day 2. 1 [ECIGFILL] per day 3. 2 to 5 [ECIGFILL] per day 4. 6 to 10 [ECIGFILL] per day 5. 11 to 20 [ECIGFILL] per day 6. More than 20 [ECIGFILL] per day |
| Regular use: Type of e-cigarettes used | <p>Please think about the e-cigarette you use most of the time. Is your e-cigarette rechargeable?</p> <ol style="list-style-type: none"> 1. Yes 2. No <p>Does your e-cigarette use cartridges?</p> <ol style="list-style-type: none"> 1. Yes 2. No <p>Can you refill your [e-cigarette/e-cigarette cartridges] with “e-liquid”?</p> <ol style="list-style-type: none"> 1. Yes 2. No | <p>Please think about the e-cigarette you use most of the time. Is your e-cigarette rechargeable?</p> <ol style="list-style-type: none"> 1. Yes 2. No <p>Does your e-cigarette use cartridges?</p> <ol style="list-style-type: none"> 1. Yes 2. No <p>Can you refill your [e-cigarette/e-cigarette cartridges] with “e-liquid”?</p> <ol style="list-style-type: none"> 1. Yes 2. No |

Table A2.2-2 Continued

| Construct/topic | PATH (2014)—adult study | PATH (2014)—youth study |
|--------------------------------|---|--|
| Regular use: Brand | <p>[Do/Did] you have a regular brand of e-cigarettes that you usually [use/used]?</p> <ol style="list-style-type: none"> 1. Yes 2. No <p>What brand of e-cigarette [do/did] you [usually/last] use? Please select it from the choices below by touching the screen. [If you do not see it below, touch the button marked “NEXT.” If you do not see it below, touch the box marked “Something else.”]</p> <p>About how long (did you use/have you been using) your regular brand of e-cigarette?</p> <ol style="list-style-type: none"> 1. I ___ I ___ I DAYS 2. I ___ I ___ I MONTHS 3. I ___ I ___ I YEARS <p>You said earlier that you last used an e-cigarette [TIME OF LAST USE]. Think about the very last puff you took. Was the brand [NEQBRAND]?</p> <ol style="list-style-type: none"> 1. Yes 2. No | <p>[Do/Did] you have a regular brand of e-cigarettes that you usually [use/used]?</p> <ol style="list-style-type: none"> 1. Yes 2. No <p>What brand of e-cigarette [do/did] you [usually/last] use? Please select it from the choices below by touching the screen. [If you do not see it below, touch the button marked “NEXT.” If you do not see it below, touch the box marked “Something else.”]</p> |
| Lifetime use: Ever use | — | <p>Have you ever used an e-cigarette, such as NJOY, blu, or Smoking Everywhere, even one or two times?</p> <ol style="list-style-type: none"> 1. Yes 2. No |
| Lifetime use: Age of first use | <p>How old were you when you first used an e-cigarette, even one or two times?</p> <p> _ _ </p> <p>When you first used an e-cigarette, even one or two times, were you...</p> <ol style="list-style-type: none"> 1. Less than 18 years old, 2. 18 to 24 years old, 3. 25 to 34 years old, 4. 35 to 44 years old, 5. 45 to 54 years old, or 6. 55 years old or older? | <p>How old were you when you first tried an e-cigarette, even one or two times?</p> <p> _ _ </p> <p>When you first tried an e-cigarette, even one or two times, were you ...</p> <ol style="list-style-type: none"> 1. Less than 12 years old, 2. 12 to 14 years old, or 3. 15 to 17 years old? |

Table A2.2-2 Continued

| Construct/topic | PATH (2014)—adult study | PATH (2014)—youth study |
|---------------------------------------|--|--|
| Lifetime use: Number used entire life | How many disposable e-cigarettes or e-cigarette cartridges have you used in your entire life? 1. 1 or more puffs but never a whole one 2. 1 to 10 3. 11 to 20 4. 21 to 50 5. 51 to 99 6. 100 or more | How many disposable e-cigarettes or e-cigarette cartridges have you used in your entire life? 1. 1 or more puffs but never a whole one 2. 1 to 10 3. 11 to 20 4. 21 to 50 5. 51 to 99 6. 100 or more |
| Past-30-day use | (A) In the past 30 days, have you used an e-cigarette, even one or two times? 1. Yes 2. No (B) (Y) When was the last time you used an e-cigarette, even one or two times? 1. Earlier today 2. Not today but sometime in the past 7 days 3. Not in the past 7 days but sometime in the past 30 days 4. Not in the past 30 days, but sometime in the past 6 months 5. Not in the past 6 months but sometime in the past year 6. 1–4 years ago 7. 5 or more years ago | — |
| Past-30-day use: Number of days used | On how many of the past 30 days did you use an e-cigarette? 1. _ _ | In the past 30 days, on how many days did you use an e-cigarette? _ _ |
| Cessation: Use to quit | (A) [Do/Did] you use e-cigarettes as a way of cutting down on your cigarette smoking? 1. Yes 2. No | — |
| Susceptibility: Curiosity | — | Have you ever been curious about using e-cigarettes? 1. Very curious 2. Somewhat curious 3. A little curious 4. Not at all curious |

Table A2.2-2 Continued

| Construct/topic | PATH (2014)—adult study | PATH (2014)—youth study |
|--|--|--|
| Susceptibility: Intention to use | — | Do you think that you will try an e-cigarette soon? 1. Definitely yes 2. Probably yes 3. Probably not 4. Definitely not |
| Susceptibility: Peer influence | — | If one of your best friends were to offer you an e-cigarette, would you use it? 1. Definitely yes 2. Probably yes 3. Probably not 4. Definitely not |
| Perceptions: E-cigarette awareness | — | Have you ever seen or heard of an electronic cigarette or e-cigarette before this study? 1. Yes 2. No |
| Perceptions: Reasons for e-cigarette use | <p>The next questions are about the reasons people use e-cigarettes. Please select which reasons apply to you.</p> <p>I use e-cigarettes because:</p> <ul style="list-style-type: none"> • They [are/were] affordable. • People in the media or other public figures [use/used] e-cigarettes. • I [can/could] use e-cigarettes at times when or in places where smoking cigarettes [isn't/wasn't] allowed. • They might [be/have been] less harmful to me than cigarettes. • They might [be/have been] less harmful to people around me than cigarettes. • [ECIGFILL] [come/came] in flavors I [like/liked]. • Using e-cigarettes helps people to quit smoking cigarettes. • E-cigarettes don't smell. • Using an e-cigarette [feels/felt] like smoking a regular cigarette. • E-cigarettes [are/were] more acceptable to nontobacco users. • People who are important to me [use/used] e-cigarettes. • I [like/liked] socializing while using an e-cigarette. • The advertising for e-cigarettes [appeals/appealed] to me. | <p>The next questions are about the reasons people use e-cigarettes. Please select which reasons apply to you.</p> <p>I use e-cigarettes because:</p> <ul style="list-style-type: none"> • They [are/were] affordable. • People in the media or other public figures [use/used] e-cigarettes. • I [can/could] use e-cigarettes at times when or in places where smoking cigarettes [isn't/wasn't] allowed. • They might [be/have been] less harmful to me than cigarettes. • They might [be/have been] less harmful to people around me than cigarettes. • [ECIGFILL] [come/came] in flavors I [like/liked]. • Using e-cigarettes helps people to quit smoking cigarettes. • E-cigarettes don't smell. • Using an e-cigarette [feels/felt] like smoking a regular cigarette. • E-cigarettes [are/were] more acceptable to nontobacco users. • People who are important to me [use/used] e-cigarettes. • I [like/liked] socializing while using an e-cigarette. • The advertising for e-cigarettes [appeals/appealed] to me. |

Table A2.2-2 Continued

| Construct/topic | PATH (2014)—adult study | PATH (2014)—youth study |
|--|---|---|
| Perceptions (absolute): E-cigarette harm | — | How much do you think people harm themselves when they use e-cigarettes? 1. No harm 2. Little harm 3. Some harm 4. A lot of harm |
| Perceptions (severity): E-cigarette harm | (Y) How long do you think someone has to use e-cigarettes before it harms their health? 1. It will never harm their health 2. Less than 1 year 3. 1 year 4. 5 years 5. 10 years 6. 20 years or more | — |
| Perceptions (relative to cigarettes): E-cigarette harm | — | Is using e-cigarettes less harmful, about the same, or more harmful than smoking cigarettes? 1. Less harmful 2. About the same 3. More harmful |
| Perceptions: Addictive potential | — | How likely is someone to become addicted to e-cigarettes? 1. Very unlikely 2. Somewhat unlikely 3. Neither likely nor unlikely 4. Somewhat likely 5. Very likely |
| Flavored product use: First use of flavored product | When you first started using e-cigarettes, did you use cartridges or disposable e-cigarettes flavored to taste like menthol, mint, clove, spice, candy, fruit, chocolate, alcohol (such as wine or cognac), or other sweets? 1. Yes 2. No | Was the first e-cigarette you used flavored to taste like menthol, mint, clove, spice, candy, fruit, chocolate, alcohol (such as wine or cognac), or other sweets? 1. Yes 2. No |
| Flavored product use: Past-30-day flavored product use | (Y/A) In the past 30 days, were/was any of the [products] you used flavored to taste like menthol, mint, clove, spice, fruit, chocolate, alcoholic drinks, candy, or other sweets? | In the past 30 days, were any of the [ECIGFILL] you used flavored to taste like menthol, mint, clove, spice, candy, fruit, chocolate, alcohol (such as wine or cognac), or other sweets? 1. Yes 2. No |

Table A2.2-2 Continued

| Construct/topic | PATH (2014)—adult study | PATH (2014)—youth study |
|---------------------------------------|--------------------------------|--------------------------------|
| Photos of products included in survey | Yes | Yes |

Notes: PATH = Population Assessment of Tobacco and Health Study. Y = youth interview; A = adult interview.

References

- Amato MS, Boyle RG, Levy D. How to define e-cigarette prevalence? Finding clues in the use frequency distribution. *Tobacco Control* 2016;25(e1):e24–e29.
- Bunnell RE, Agaku IT, Arrazola RA, Apelberg BJ, Caraballo RS, Corey CG, Coleman BN, Dube SR, King BA. Intentions to smoke cigarettes among never-smoking U.S. middle and high school electronic cigarette users: National Youth Tobacco Survey, 2011–2013. *Nicotine & Tobacco Research* 2015;17(2):228–35.
- Centers for Disease Control and Prevention. Tobacco use among middle and high school students—United States, 2000–2009. *Morbidity and Mortality Weekly Report* 2010;59(33):1063–8.
- Delnevo C, Gundersen D, Giovenco D, Bover-Manderski M, Giovino G. Measuring emerging tobacco product usage among young people. Presentation at the 22nd Annual Meeting of the Society for Research on Nicotine and Tobacco; March 4, 2016; Chicago.
- Evans N, Farkas A, Gilpin E, Berry C, Pierce JP. Influence of tobacco marketing and exposure to smokers on adolescent susceptibility to smoking. *Journal of the National Cancer Institute* 1995;87(20):1538–45.
- Filice GA, Hannan PJ, Lando HA, Joseph AM. A period of increased susceptibility to cigarette smoking among high school students. *Journal of School Health* 2003;73(7):272–8.
- Gritz ER, Prokhorov AV, Hudmon KS, Mullin Jones M, Rosenblum C, Chang CC, Chamberlain RM, Taylor WC, Johnston D, de Moor C. Predictors of susceptibility to smoking and ever smoking: a longitudinal study in a triethnic sample of adolescents. *Nicotine & Tobacco Research* 2003;5(4):493–506.
- Kozlowski LT, Giovino GA. Softening of monthly cigarette use in youth and the need to harden measures in surveillance. *Preventive Medicine Reports* 2014;1:53–5.
- Mowery PD, Farrelly MC, Haviland ML, Gable JM, Wells HE. Progression to established smoking among U.S. youths. *American Journal of Public Health* 2004;94(2):331–7.
- Pierce JP, Choi WS, Gilpin EA, Farkas AJ, Merritt RK. Validation of susceptibility as a predictor of which adolescents take up smoking in the United States. *Health Psychology* 1996;15(5):355–61.
- Pierce JP, Distefan JM, Kaplan RM, Gilpin EA. The role of curiosity in smoking initiation. *Addictive Behaviors* 2005;30(4):685–96.
- Pierce JP, Gilpin EA, Emery SL, Farkas AJ, Zhu SH, Choi WS, Berry CC, Distefan JM, White MM, Sorokos S, et al. *Tobacco Control in California: Who's Winning the War? An Evaluation of the Tobacco Control Program, 1989–1996*. La Jolla (CA): University of California, San Diego, 1998.
- Portnoy DB, Wu CC, Tworek C, Chen J, Borek N. Youth curiosity about cigarettes, smokeless tobacco, and cigars: prevalence and associations with advertising. *American Journal of Preventive Medicine* 2014;47(2 Suppl 1):S76–S86.
- Smyth J, Dillman D, Christian L, Stern MC. *Comparing check-all and forced-choice question formats in web surveys: The role of satisficing, depth of processing and acquiescence in explaining differences*. Pullman (WA): Social & Economic Science Research Center, 2005. Technical Report 05-029.
- Sun P, Unger JB, Sussman S. A new measure of smoking initiation and progression among adolescents. *American Journal of Health Behavior* 2005;29(1):3–11.
- U.S. Department of Health and Human Services. *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, 2012.
- Unger JB, Johnson CA, Stoddard JL, Nezami E, Chou CP. Identification of adolescents at risk for smoking initiation: validation of a measure of susceptibility. *Addictive Behaviors* 1997;22(1):81–91.
- Warner KE. The remarkable decrease in cigarette smoking by American youth: Further evidence. *Preventive Medicine Reports* 2015;2:259–61.