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Tobacco Control

Recommended core items to assess e-cigarette use in population-based surveys

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3 **1 Recommended core items to assess e-cigarette use in population-based surveys**
4 2
5 3 Jennifer L. Pearson, PhD, MPH^{1,2}
6 4 Sara C. Hitchman, PhD^{3,4}
7 5 Leonie S. Brose, PhD^{3,4}
8 6 Linda Bauld, PhD^{5,4}
9 7 Allison M. Glasser, MPH¹
10 8 Andrea C. Villanti, PhD, MPH^{1,2}
11 9 Ann McNeill, PhD^{3,4}
12 10 David B. Abrams, PhD^{1,2}
13 11 Joanna E. Cohen, PhD²
14 12
15 13
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¹ Schroeder Institute for Tobacco Research & Policy Studies at Truth Initiative, Washington, DC, USA

² Department of Health, Behavior, and Society, Johns Hopkins Bloomberg School of Public Health, Baltimore, MD, USA

³ Department of Addictions, Institute of Psychiatry, Psychology and Neuroscience, King's College London, London, England, UK

⁴ UK Centre for Tobacco and Alcohol Studies, London, England, UK

⁵ Institute for Social Marketing, School of Health Sciences, University of Stirling, Stirling, Scotland, UK

Corresponding author:

Jennifer L. Pearson, PhD, MPH

The Schroeder Institute for Tobacco Research and Policy Studies at Truth Initiative

900 G Street NW, Fourth Floor

Washington, DC 20001

Phone 202-454-5768

Email: jpearson@truthinitiative.org

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ABSTRACT

Background: A consistent approach using standardized items to assess e-cigarette use in both youth and adult populations will aid cross-survey and cross-national comparisons of the effect of e-cigarette (and tobacco) policies and improve our understanding of the population health impact of e-cigarette use.

Focusing on adult behavior, we propose a set of e-cigarette use items, discuss their utility and potential adaptation, and highlight e-cigarette constructs that researchers should avoid without further item development. Reliable and valid items will strengthen the emerging science and inform knowledge synthesis for policymaking.

Methods: Building on informal discussions at a series of international meetings of 65 experts from 15 countries, the authors provide recommendations for assessing e-cigarette use behavior, relative perceived harm, device type, presence of nicotine, flavors, and reasons for use.

Results: We recommend items assessing eight core constructs: e-cigarette ever use, frequency of use, and former daily use; relative perceived harm; device type; primary flavor preference; presence of nicotine; and primary reason for use. These items should be standardized or minimally adapted for the policy context and target population. Researchers should be prepared to update items as e-cigarette device characteristics change.

Conclusions: A minimum set of e-cigarette items is proposed to encourage consensus around items to allow for cross-survey and cross-jurisdictional comparisons of e-cigarette use behavior. These proposed items are a starting point. We recognize room for continued improvement, and welcome input from e-cigarette users and scientific colleagues.

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59 **What this paper adds:**

60 Jurisdictions have taken different approaches to regulating e-cigarette devices and e-cigarette use.
61 These different approaches present an opportunity to evaluate the effect of e-cigarette policies and
62 regulation on e-cigarette and tobacco product use. However, for cross-jurisdictional comparisons to be
63 useful, approaches to assessing e-cigarette use must be similar. The recommended set of eight e-
64 cigarette measures for surveillance includes two core items to distinguish ever use from more frequent
65 use and six items to assess former use, relative perceived harm, primary device type, primary flavour
66 preference, nicotine content, and primary reason for use.

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3 98 **INTRODUCTION**

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5 99 E-cigarette use has grown in many high- and middle- income countries,[1-12] resulting in a
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7
8 100 rapidly evolving e-cigarette marketplace. As e-cigarette use is still a relatively new behavior, researchers
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10 101 have taken a variety of approaches to measuring use, often adapting cigarette smoking items to assess
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12 102 e-cigarette use. The lack of a consistent approach to assessing e-cigarette use is a barrier to knowledge
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15 103 synthesis [13, 14] and to conducting meaningful cross-national comparisons of the effect of e-cigarette
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17 104 policies on population tobacco use patterns. It has been recommended that monitoring, evaluation, and
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19 105 research use standardized approaches and definitions of e-cigarette use for trial, occasional, and regular
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21 106 users and among youth and adult populations.[13, 15]

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25 107 As evidenced by at least 139 countries' adoption[16, 17] of the Global Adult and Global Youth
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27 108 Tobacco Surveys (GATS & GYTS), researchers, governments, and funders are aware of the power of
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29 109 common items for understanding the effect of policy on behavior. The following suggested core e-
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31 110 cigarette items are the result of a Robert Wood Johnson Foundation-funded (RWJF) project ('Harvesting
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33 111 Global Learning on Alternative Nicotine Delivery Systems (ANDS) to Inform U.S. Policy Action, Policy
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35 112 Research, and Surveillance') that brought together researchers and government representatives to
36
37 113 identify existing needs to support cross-national e-cigarette research and learning. While no formal
38
39 114 Delphi method was employed, the following recommendations are based on input from the 65
40
41 115 individuals from 15 countries included in the RWJF meeting series, as well as the authors' own
42
43 116 experiences developing questions, analyzing responses, and/or interpreting findings for the
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45 117 International Tobacco Control (ITC) 4-Country Study,[18] Smoking Toolkit (STS),[19] Population
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47 118 Assessment of Tobacco and Health (PATH) Study,[20] Online Panel Survey in Great Britain[27-29], Truth
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49 119 Initiative Young Adult Cohort Study [21], National Health Interview Survey,[3] and National Youth
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51 120 Tobacco Study[22, 23] surveys, providing unique insight into the strengths and limitations of various e-
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53 121 cigarette items.
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3 122 Focusing on adults, the purpose of this paper is to propose an efficient set of e-cigarette use
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5 123 items to enable accurate cross-jurisdictional comparisons of e-cigarette use behavior and to allow
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7 124 systematic evaluation of the effects of policy on e-cigarette and tobacco product use. While they still
8
9 125 need to undergo systematic evaluation, we hope that these proposed items will promote open dialogue
10
11 126 and further development of rigorous items for national and sub-national e-cigarette surveillance
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15 127 research.

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17 129 **ASSESSING E-CIGARETTE USE**

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22 130 There are several general issues that need to be considered when developing a survey with e-
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24 131 cigarette items. These include the survey's target population, the policy setting, and the mix of tobacco
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26 132 products and e-cigarette devices available to the target population. It is also important to take into
27
28 133 account e-cigarette terminology and to accurately differentiate between e-cigarettes, other emerging
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30 134 products, and traditional tobacco products. We describe these issues here before introducing a core set
31
32 135 of recommended items.

33 34 35 36 136 **E-cigarette terminology**

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39 137 E-cigarettes are known by a variety of names, with terms varying by region, age group, tobacco
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41 138 use status, or reason for use.[24, 25] Terms that have been used include electronic cigarettes, e-
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43 139 cigarettes, electronic nicotine delivery systems (ENDS), alternative nicotine delivery systems (ANDS),
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45 140 electronic vapor products, e-cigars, e-pipes, e-hookahs, e-shishas, personal vaporizers, vape pens, and
46
47 141 hookah pens. The meaning of these terms is not standardized, and the same term may be employed to
48
49 142 refer to different sub-types of devices. The researcher-generated terms 'ENDS' and 'ANDS' inaccurately
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51 143 imply that these devices always contain nicotine. These are academic terms and should be avoided in
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55 144 public-facing documents and presentations.[25] Currently, it is likely that the most universally

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3 145 understood terms are ‘electronic cigarettes,’ ‘e-cigarettes,’ or the phrase ‘e-cigarettes or other vaping
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5 146 devices.’
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9 147 A helpful way to introduce the relevant terminology in surveys is to include a ‘preamble,’ or a
10
11 148 brief introduction at the start of the e-cigarette section. For example, the Wave 1 survey instrument for
12
13 149 the PATH Study used this preamble:
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16 150 ‘The next questions are about e-cigarettes. Some e-cigarettes can be bought as one-time,
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18 151 disposable products, while others can be bought as reusable kits with a cartridge or tank system.
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20 152 Some people refill their own e-cigarettes with nicotine fluid, sometimes called ‘e- liquid.’
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22 153 Disposable e-cigarettes, e-cigarette cartridges and e-liquid come in many different flavors and
23
24 154 nicotine concentrations. Some common brands include Fin, NJOY, Blu, e-Go and Vuse.’
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28 155 This preamble was developed for use in the United States in 2014, and has been updated in each PATH
29
30 156 Study survey wave. Researchers should be aware that introductory text such as this preamble will need
31
32 157 to be modified as products change and the public develops familiarity with e-cigarettes. In markets
33
34 158 where ‘heat-not-burn’ products, such as iQos, have been introduced, the preamble could note that
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36 159 respondents should not consider these products when answering e-cigarette items. We strongly suggest
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38 160 pilot research to assess the appropriate e-cigarette terms in surveys, and if possible, we suggest
39
40 161 including both the standard (e.g., e-cigarette) and colloquial (e.g., vaping device) names. Future research
41
42 162 should include regular cognitive testing of terminology used to identify e-cigarette native terms used by
43
44 163 the survey’s target population. Surveys with appropriate modes may consider using pictures of devices.
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46 164 These pictures should also be cognitively tested and updated as e-cigarettes evolve in the target
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48 165 population’s setting.
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54 166 **Differentiating e-cigarettes from cigarettes and new emerging products**
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3 167 An additional challenge in e-cigarette survey item development is clearly differentiating
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5 168 cigarette items from e-cigarette items. As these devices do not produce smoke, it is not appropriate to
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8 169 refer to 'smoking' or 'smoker' when describing e-cigarette use, nor are these terms generally employed
9
10 170 among established e-cigarette users.[26] The scientifically accurate term for e-cigarette emissions is
11
12 171 'aerosol'; however, the popular term for e-cigarette emissions understood by the public is 'vapor.' E-
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15 172 cigarette use behavior should be described as 'use' or 'vaping.' We recommend differentiating e-
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17 173 cigarette use from 'smoking' when smoking is first mentioned in the survey. For example, the 2016
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19 174 Online Panel Survey in Great Britain[27-29] used the following text at the beginning of its tobacco use
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22 175 section: "When we refer to cigarettes, pipes, cigars, or other tobacco products, we are not referring to
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24 176 electronic cigarettes or vaping devices (because these do not contain tobacco)." In the case of vaping
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26 177 devices that could be used for nicotine or cannabis consumption, researchers could consider an
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29 178 additional item about the substance most commonly consumed with the device, which could then be
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31 179 used as a basis for skip patterns or form fills. We also strongly recommend that heat-not burn products
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33 180 be assessed separately from e-cigarette products. As heat-not-burn products continue to spread within
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35 181 and beyond the European Union and Japan, the research community will need to seriously consider how
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38 182 to assess use of these products so that they are differentiated from traditional combusted tobacco and
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40 183 vaping products.

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185 **Recommended e-cigarette items**

186 Table 1 presents a minimum set of e-cigarette items that, in the experience of the authors, are
187 essential to assessing the role of policy on e-cigarette and tobacco use behavior. The items cover eight
188 constructs: ever use, frequency of use, former daily use, relative perceived harm, device type, presence
189 of nicotine, flavor preference, and reasons for use. The first two constructs, ever use and frequency of

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3 190 use, are further identified as minimum core e-cigarette items when survey space is limited. It should be
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6 191 noted that this minimum set of items is insufficient for surveys of tobacco users or vapers.
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9 192 E-cigarette ever use: Ever use of e-cigarettes captures initiation or trial. While this construct is
10
11 193 useful for quantifying the proportion of initiates in a population and constructing skip patterns within
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13 194 surveys, it is minimally useful in analyses, as most ever use is limited to 1 or 2 instances.[3, 15]
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16 195 Researchers should use caution when employing this item as a measure of exposure to e-cigarettes.[30]
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18 196 Prior research has employed ever use as a measure of e-cigarette exposure among adult smokers;[31-
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20 197 33] however, this weak measure yields uninterpretable estimates of the effect of e-cigarette use on
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22 198 smoking. It should be noted that 'ever e-cigarette use' (i.e., trial) is different than 'former daily use,'
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24 199 which we present below.
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27 200 We recommend assessing e-cigarette ever use with an item from the ITC 4-Country Survey.[34]
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29 201 This item should be asked of all survey respondents and allow a 'Don't know' response. Additionally, e-
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31 202 cigarette ever use should be asked on its own rather than as part of a list of tobacco products, as the list
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33 203 approach is likely to underestimate use.[3]
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36 204 Frequency of e-cigarette use: It is still not known what levels of e-cigarette use are relevant to
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38 205 behavioral and health outcomes. Frequency of e-cigarette use is commonly assessed by asking the
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40 206 participant about the number of days he or she has used an e-cigarette in the past 30 days. However,
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42 207 due to the transience of e-cigarette use in some populations (i.e., smokers or young adults), we do not
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44 208 recommend this approach for estimating frequency of use for two reasons. First, this item encourages
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46 209 equating *any* level of use in the past 30 days with 'current' use, conflating recent initiates or
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48 210 experimental users who may be unlikely to progress to daily use with current, established e-cigarette
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50 211 users.[10, 12, 15, 35] Second, this item is most useful in combination with a subsequent item assessing
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52 212 the length of time the use pattern has endured, which increases the number of items in our core set of
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54 213 items.
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3 214 Our proposed item, adapted from the ITC 4-Country Survey,[34] allows for flexibility in defining
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5 215 a meaningful level of e-cigarette use. In addition to surveillance surveys, this item is also appropriate to
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7 216 assess within-person changes in cohort studies and could be used alone when only one or two questions
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9 217 on e-cigarettes are possible due to space restrictions. Researchers should include parallel items
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11 218 assessing frequency of e-cigarette use and cigarette smoking so that co-use of these products (i.e., 'dual
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13 219 use') can be compared.
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18 220 Former daily use: Assessing patterns of former daily use is important for understanding the
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20 221 impact of e-cigarette use on uptake or reduction of smoking, as well as e-cigarette-related health
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22 222 outcomes. PATH Waves 1-2 and the ITC surveys ask whether respondents who do not currently use e-
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24 223 cigarettes have ever used e-cigarettes 'fairly regularly.' Rather than leaving the definition of 'fairly
25
26 224 regularly' to respondents, we suggest asking about at least daily use over a month or more, which would
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28 225 indicate that the user had vaped for an extended period and may be relevant for behavioral outcomes.
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32 226 Relative perceived harm: Common theories of health behavior posit that harm perceptions
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34 227 influence tobacco use behavior, with lower perceived harm encouraging higher levels of
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36 228 experimentation and current use. PATH, ITC, STS, GATS, and the Truth Initiative Young Adult Cohort ask
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38 229 about absolute or relative perceived harm. We suggest assessing perceived harm relative to cigarettes
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40 230 (rather than absolute perceived harm) among all survey respondents due to their common use as a
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42 231 smoking cessation or harm reduction tools.[36, 37] Using an item adapted from PATH and the ITC 4-
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44 232 Country survey, we suggest assessing relative perceived harm to understand how tobacco use
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46 233 prevention and health communication campaigns, as well as media coverage, affect the perceptions of
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48 234 non-, former, and current tobacco users, and how these perceptions affect e-cigarette use.
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52 235 Device type: E-cigarettes are a diverse product class and must not be treated as a single product.
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54 236 With the wide variation in design, content, function, nicotine delivery, price, and availability of these
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56 237 products, different types of e-cigarette devices may have different behavioral and health effects. A
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3 238 growing body of work suggests that device characteristics such as nicotine content and type of battery
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5 239 are correlated with e-cigarette use behaviors and may affect smoking cessation.[28, 38-41] Given the
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7 240 diversity of the products, it is unsurprising that surveys vary widely in their approach to capturing device
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9 241 type. Some surveys (e.g. PATH Wave 2) split questions about devices into two parts: a first question
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11 242 about the size/shape of the device, and a second question about whether the device is disposable, uses
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13 243 pre-filled cartridges, or is refillable with liquids. Some studies (e.g. PATH Waves 1-2 and ITC) also use
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15 244 pictures of e-cigarette types.

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17 245 The wording and response options for our suggested device type item are driven by battery size,
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21 246 which has been shown to affect nicotine delivery[42, 43] and smoking cessation.[38] Our proposed
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23 247 response options identify four mutually exclusive types of devices (Table 1). For analyses, these items
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25 248 may be collapsed into Groups 1 and 2, likely to have less powerful batteries (often called “cigalikes”),
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27 249 and Groups 3 and 4, likely to have more powerful batteries, often called “second generation” and
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29 250 “mods.” Devices with larger batteries are normally refillable with e-liquid (e.g., a liquid containing some
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31 251 mix of propylene glycol, glycerin, water, flavoring, impurities, and often nicotine), which may be
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33 252 associated with a risk of unintentional poisoning and is a relevant data point in estimating population
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35 253 harms.[44, 45] While we have found this approach useful in understanding device characteristics in the
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37 254 UK and US, items assessing device characteristics will need to be adapted according to availability of e-
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39 255 cigarettes in different jurisdictions and the evolution of the devices. The utility of this approach may
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41 256 diminish as devices with more powerful batteries and pre-filled cartridges or sealed tanks are made
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43 257 available

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45 258 Nicotine content: Similar to understanding device characteristics, assessing e-cigarette nicotine
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49 259 content has no direct parallel cigarette survey item. Few of the first national and international surveys of
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51 260 e-cigarettes asked if the device contained nicotine. As countries banned nicotine-containing e-
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54 261 cigarettes, more surveys asked about whether devices used contained nicotine.[12, 46-49] These items
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3 262 often ask about nicotine concentration by percent, milligrams per milliliter (mg/mL), or by an ordinal
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5 263 descriptive term (e.g., “low,” “medium,” and “high”). Each of these approaches, however, has serious
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8 264 drawbacks. Asking about nicotine concentration by percent or mg/mL is difficult for inexperienced users,
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10 265 yielding a number of ‘don’t know’ responses (e.g., 12% ‘don’t know’ in a recent Action on Smoking and
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12 266 Health survey).[50, 51] Using terms that correspond to manufacturers’ descriptions (e.g. ‘low’) is also
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15 267 problematic because these labels do not necessarily capture similar ranges of nicotine concentrations
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17 268 across brands or jurisdictions.

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19 269 Our proposed nicotine content item requires some respondent knowledge and is similar to an
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22 270 item used in PATH Wave 2. Our item asks about ‘the vaping device you use most often’ because
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24 271 sophisticated users may use multiple nicotine concentrations, employing different strengths of nicotine
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26 272 in different situations or over time. It may be possible to collect more reliable information on e-liquid
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29 273 nicotine concentration among experienced users; however, the ultimate amount of nicotine delivered to
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31 274 the user depends on the device, the nicotine concentration, and the user’s experience with e-cigarettes,
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33 275 among other variables.[42, 52-55] Assessing nicotine fluid concentration is of limited application until
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35 276 we have refined items to accurately assess device characteristics such as battery wattage and coil
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38 277 resistance. In jurisdictions where certain nicotine concentrations are banned, it may be useful to adapt
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40 278 our suggested item to assess use of the banned e-liquid nicotine concentrations.

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42 279 Flavors: Most e-cigarettes, even those that taste like traditional cigarettes, are flavored because
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45 280 their main constituents (e.g., nicotine, propylene glycol) have little flavor. However, truly unflavored e-
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47 281 liquids (e.g., those that contain only propylene glycol, glycerin, water, and nicotine) are also available.
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49 282 Most existing surveys of e-cigarette use ask about flavors, but their approach differs. PATH Waves 1-2
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51 283 and ITC ask about flavors that are available in cigarettes (e.g., traditional tobacco, menthol or mint), as
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54 284 well as several other flavor categories (e.g. chocolate, fruit, clove or spice, alcoholic drink, dessert).
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56 285 While understanding the prevalence of different e-cigarette flavor preferences may shed light on the
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3 286 behavioral and public health impact of flavor use, this is a difficult behavior to accurately assess. First,
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5 287 respondents may find describing their preferred flavor using a list of generic terms challenging if their
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8 288 preferred flavor fits into multiple categories. For example, is “piña colada” an alcoholic drink or a fruit
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10 289 flavor? Second, like nicotine concentration, e-cigarette users may vape a variety of e-cigarette flavors.
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12 290 Respondents to the PATH Wave 2 and the 2016 ITC survey were provided a list of individual flavors and
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15 291 asked to “select all that apply” to describe their flavor use in the past 30 days. With this approach,
16
17 292 however, it is unclear whether the respondents are describing one preferred e-liquid flavor, or a range
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19 293 of preferred flavors.

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22 294 Ultimately, the flavor response options should be dependent on the current situation in the
23
24 295 target population’s jurisdiction and the purpose of the research. In the US, for example, menthol
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26 296 cigarettes are legal and prevalent, but other flavored cigarettes are banned. Thus, it makes sense to ask
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28 297 about menthol e-liquid use separately from other flavors. In different policy contexts, it may make sense
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30 298 to ask about other flavors. Our recommended item focuses on the most common flavor because some
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32 299 users may consume multiple flavors in a day or week. The proposed response options avoid the problem
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34 300 of multiple categorization of a flavor and decrease response burden. While switching between flavors is
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36 301 an important construct that should be assessed in surveys with large sample of daily vapers, this item is
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38 302 of limited use in a general population survey in settings where daily e-cigarette use is uncommon, which
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40 303 describes nearly all current settings.
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45 304 Reasons for use: Given the opportunity, e-cigarette users will nominate multiple reasons for e-
46
47 305 cigarette use.[36, 56] While allowing respondents to choose multiple reasons for use reflects complex
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49 306 motivations for the behavior, it has limited utility for understanding the role of e-cigarette use and
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51 307 behavioral intention in e-cigarette and tobacco use behavior. It could be argued that qualitative
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53 308 research may be more appropriate for in-depth explorations of reasons for use. However, where survey
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55 309 space allows, a single question on the main reason why e-cigarettes or vaping products are/were used
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3 310 may be relevant for policy and practice. If the survey mode allows, researchers may also consider asking
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5 311 respondents to rank their reasons for use, which would still allow for comparisons of top reasons across
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7 312 jurisdictions. If the purpose of a survey is to measure the effectiveness of e-cigarettes for smoking
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9 313 cessation, we recommend including 'e-cigarette or vaping device' in a list of questions that assess what
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11 314 approach, support, or aids were used during a specific attempt to stop smoking (e.g., in the last
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13 315 attempt).[57]
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16 316 **E-cigarette items of limited utility**

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21 317 In addition to our eight recommended items, we highlight three constructs which we believe are
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23 318 of limited utility in most jurisdictions: e-cigarette awareness, e-cigarette or e-liquid quantity of
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25 319 consumption, and e-cigarette or e-liquid brands.
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28 320 E-cigarette awareness: Until recently, most national surveys asked about awareness of e-
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30 321 cigarettes. In 2014 and 2015, the US National Adult Tobacco Survey (NATS) and STS in England did not
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32 322 assess awareness because previous surveys had shown e-cigarette awareness was near universal (93%
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34 323 in the UK as early as 2012[58] and 86.4% in the US in 2013[59]). We recommend dropping the
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36 324 awareness item in jurisdictions where awareness has reached saturation.
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39 325 E-cigarette or e-liquid quantity of consumption: One complex issue in e-cigarette research is
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41 326 evaluating how much e-liquid users consume. Research suggests that frequency of e-cigarette use is
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43 327 relevant to smoking cessation effectiveness.[28, 29, 60] Many surveys follow approaches similar to
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45 328 those assessing heaviness of smoking among cigarette smokers,[61] asking about consumption of
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47 329 cartridges or disposable e-cigarettes per day, or number of e-cigarette puffs per day. For users of
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49 330 refillable e-cigarettes, items ask how long it takes to use a specific amount of e-liquid (i.e., 10ml) or the
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51 331 size (in ml) of the last bottle purchased and how long it usually lasts. Interestingly, this is similar to
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53 332 methods that have been developed for assessing cannabis consumption. [62] PATH, ITC, and STS all ask
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3 333 questions about the daily quantity of e-cigarette use. PATH and ITC ask about daily consumption in
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5 334 product units, and how long one's last purchase of liquid will last (ITC), while STS asks about number of
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7 335 times per day the e-cigarette is used. However, e-liquid bottles and e-cigarette refillable reservoirs are
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9 336 of varying sizes, so time to depletion is of limited utility without reliable information about the
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11 337 respondent's device. Additionally, e-liquid consumption as a function of puffs per day will vary by the
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13 338 user's puff topography and device settings. Similar to frequency of use, the field is in its infancy and we
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15 339 are only beginning to accurately measure and understand how heaviness of use/daily quantity may
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17 340 predict public health outcomes. Without item testing, we recommend including these items with
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19 341 caution and ask that researchers share their lessons learned and publish formative work to advance the
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21 342 field.
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27 343 E-cigarette and e-liquid brands: It is common practice in surveys of smoking behavior to include
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29 344 questions about the respondent's preferred brand; this practice has been applied to brand varieties of
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31 345 devices and e-liquid. Assessing e-cigarette device brands is challenging, as there are thousands of
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33 346 varieties, and it is unclear how brand loyal e-cigarette users are to device and e-liquid makers.
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35 347 Experienced e-cigarette users may have more than one device, or may combine components from
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37 348 multiple brands. Casual e-cigarette users may not know the brand of their device or e-liquid. Despite
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39 349 these challenges, brand is a worthwhile construct for understanding the effect of marketing on e-
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41 350 cigarette use behavior.
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47 352 **CONCLUSION**

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52 353 Using the combined experience of an international group of researchers, we have proposed a
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54 354 minimum set of e-cigarette items to encourage consensus around items and allow for cross-
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56 355 jurisdictional comparisons and surveillance of e-cigarette use. These proposed items are meant to open
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3 356 a dialogue on meaningful items for national e-cigarette surveillance and should be updated as
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5 357 measurement of e-cigarette use behavior evolves. We recognize that there is room for continued
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7 358 improvement of these items, and we welcome input from e-cigarette users and academic/public health
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9 359 colleagues. We also encourage discussion of how common definitions of e-cigarette use and consistency
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11 360 in reporting of results could advance the field. Additionally, this paper focuses on items for surveys and
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13 361 studies with adults only; future recommendations are needed for youth surveys, although some of the
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15 362 same items are applicable to youth. Standardized, reliable, and valid surveillance items will speed
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17 363 knowledge synthesis both within and across countries, will place patterns and reasons for e-cigarette
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19 364 use in the context of the emerging complexity of poly-tobacco/nicotine product use, and will better
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21 365 inform policymaking and regulation and the overall public health impact of e-cigarettes and related
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23 366 products.[63]
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31 369 **Ethics Approval Statement:** This manuscript does not include human subjects research, so ethics
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33 370 approval was not obtained.
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40 373 research, we have not included a research reporting statement.
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25
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Table 1. Recommended minimum core items to assess e-cigarette use in national surveys.

Construct	Item	Response options	Population/Respondents
CORE ITEM Ever use	Have you ever tried an e-cigarette or vaping device?	a) Yes b) No c) Don't know	All
CORE ITEM Frequency of Use	How often do you currently use an e-cigarette or vaping device?	a) Daily or almost daily b) Less than daily, but at least once a week c) Less than weekly, but at least once a month d) Less than monthly e) Not at all f) Don't know	Those who respond 'yes' to 'ever use' question
Relative harm	Compared to cigarettes, how harmful are e-cigarettes to a person's health?	a) Much less harmful than cigarettes b) Somewhat less harmful than cigarettes c) About the same as cigarettes d) Somewhat more harmful than cigarettes e) Much more harmful than cigarettes f) Don't know	All
Former daily use	Have you ever used an e-cigarette or vaping device daily for a month or more?	a) Yes b) No c) Don't know	Those who responded (a) 'yes' to the 'ever use' question but (b) 'less than daily, but at least once a week', (c) 'less than weekly, but at least once a month,' (d) 'less than monthly, or (e) 'not at all' to the frequency of use question. [Some further filtering may be needed depending on the frequency of use response option chosen and the target population.]
Device type	55 56 57	What e-cigarette or vaping device [do/did] you use	(the most)?

- a) A disposable e-cigarette or vaping device (non-rechargeable)
- b) An e-cigarette or vaping

Those who respond (a) 'yes' to 'ever use' question

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device that uses

Confidential: For Review Only

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		replaceable pre-filled cartridges (rechargeable)	
		c) An e-cigarette or vaping device with a tank that you refill with liquids (rechargeable)	
		d) A modular system that you refill with liquids (you use your own combination of separate devices: batteries, atomizers etc...) (rechargeable)	
		e) Don't know	
Presence of nicotine	Does the e-cigarette or vaping device that you use most often contain nicotine?	a) Yes b) No c) Don't know	Those who responded 'daily', 'less than daily, but at least once a week,' 'less than weekly, but at least once a month,' or 'less than monthly' to the frequency of use question.
Flavor preference	What flavor [do/did] you use most when vaping/using an e-cigarette or vaping device? (select one) [randomize list of response options]	a) Tobacco b) Tobacco menthol, menthol, or mint c) Some other flavour like fruit, candy, alcohol, coffee, vanilla, etc. d) No flavour e) Don't know	Those who respond 'yes' to 'ever use' question Note: List of flavours depending on policy context and research question
Reasons for use	What is (was) your <u>primary</u> reason for using an e-cigarette or vaping device? (select one) [randomize list of response options]	a) To quit smoking b) To cut down smoking c) To use when I cannot or am not allowed to smoke d) To avoid returning to smoking e) Because I enjoy(ed) it f) Curiosity/just wanted to try them g) Some other reason	For those who are at least once a month users

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h) Don't
know