Mixed Method Questionnaire Evaluation using Web Probing at the National Center for Health Statistics

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JPSM/MPSM Seminar

October 28, 2020

Outline

- NCHS' Mixed Method Approach to Question/Survey Evaluation

- Web Probing: History and Use

- Case Studies
  - NHIS E-Cigarette Question
  - RANDS during COVID-19 Telemedicine Access Question
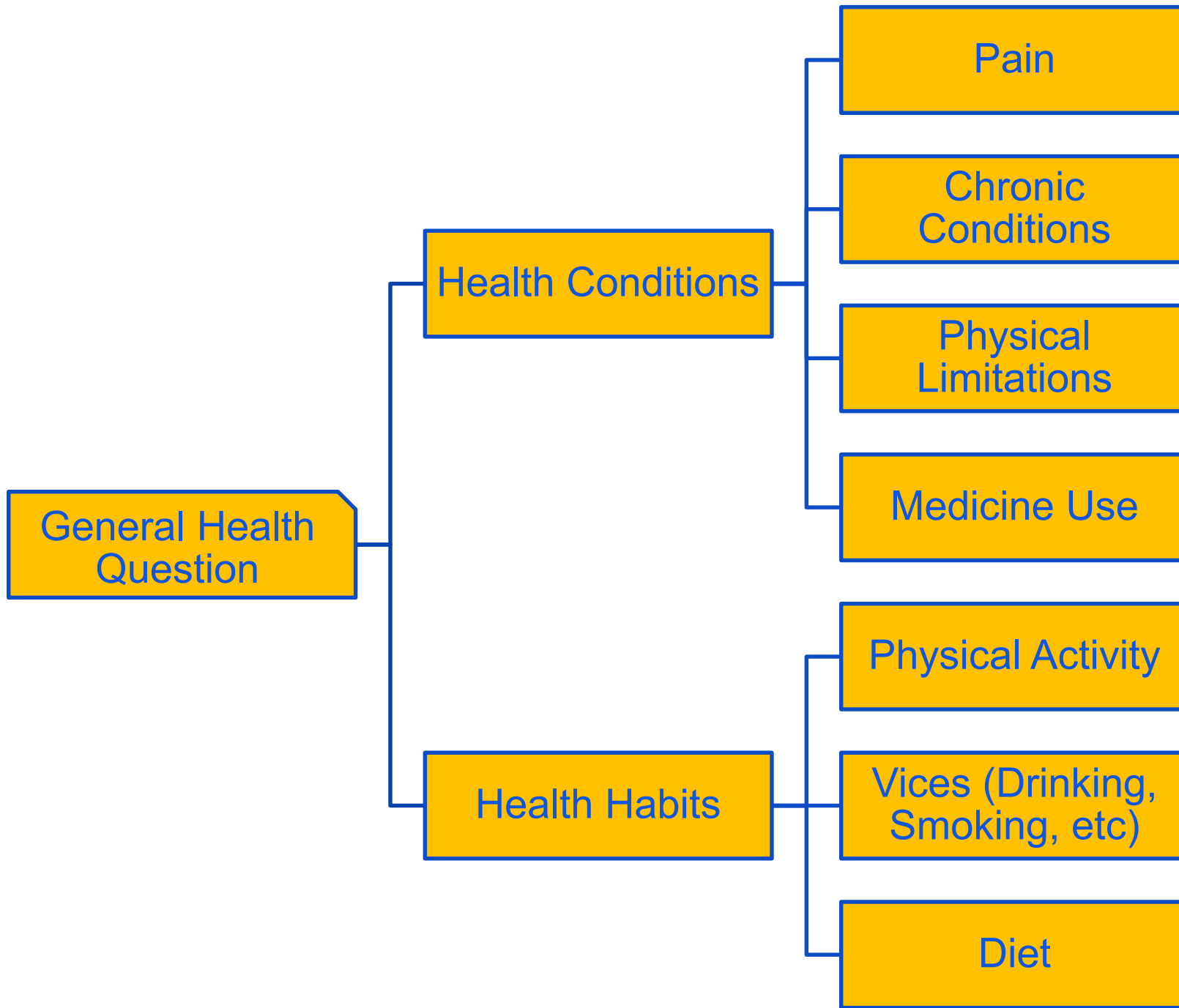
- Questions/Discussion

NCHS' Mixed-Method Approach
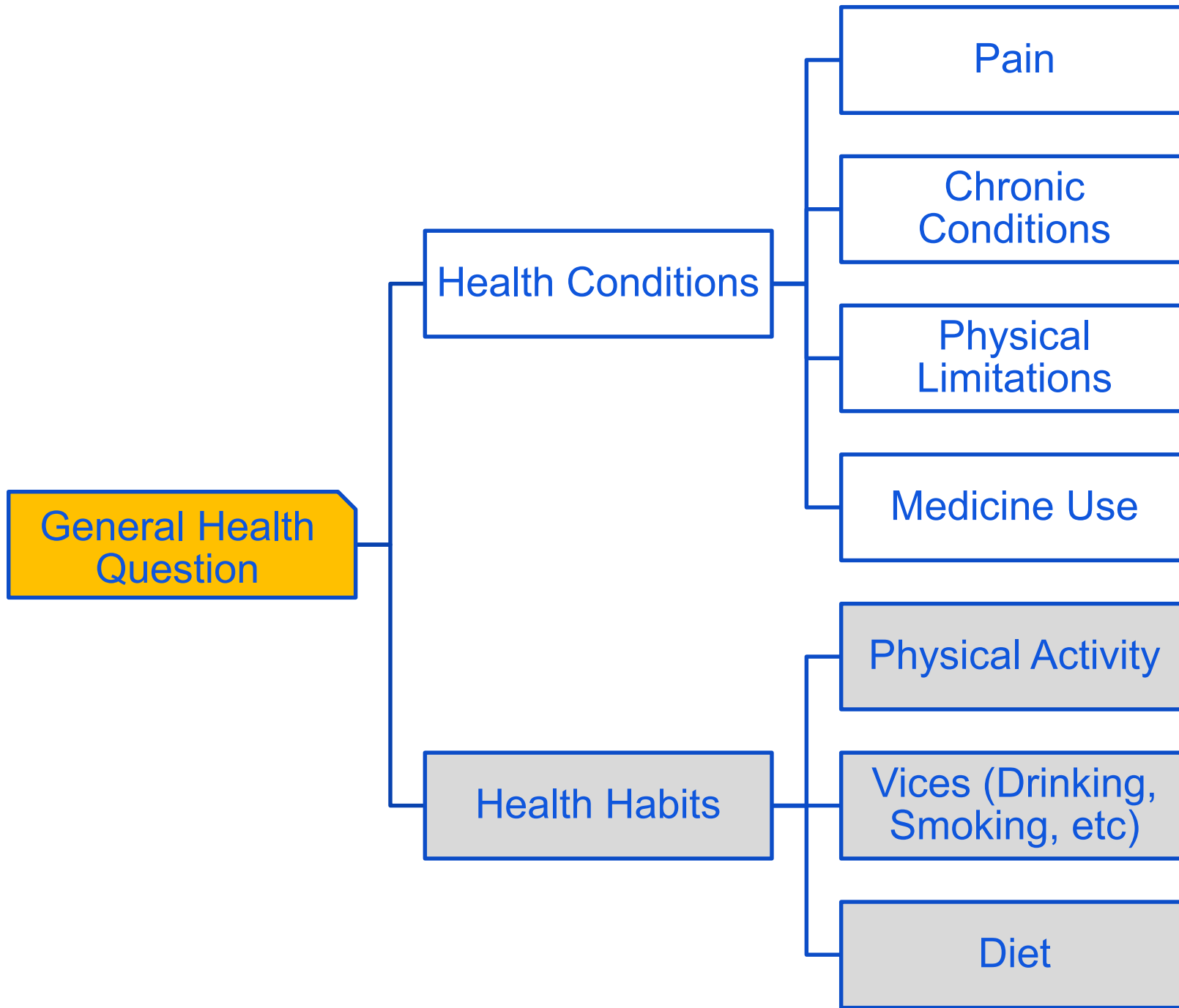
- NCHS uses two complimentary methods when examining items for measurement error and comparability:

    1. Cognitive Interviewing

    2. Web Probing/Web Panel-Based Research

- Traditionally, NCHS' Collaborating Center for Questionnaire Design and Evaluation Research (CCQDER) has used cognitive interviewing almost exclusively.

- Shift to include web panel work over the last ~5 years

Cognitive Interviewing at NCHS

- Examines Validity, Comparability, and Response
  - We focus on identifying the constructs that survey items capture
  - Output is a set of constructs/interpretations that:
    - Survey and subject matter experts can use to determine whether or not the question is suiting their needs
    - Data users can consult to better understand what the final estimates mean
  - We can compare the constructs that certain sub-groups of respondents use to others, to see if there are differences in interpretation or use of answer categories

NHIS Question: Would you say your health in general is excellent, very good, good, fair, or poor?

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                                                           ┌─────────────────────┐
                                                           │        Pain         │
                                                           └─────────────────────┘
                                                           ┌─────────────────────┐
                                                           │       Chronic       │
                                                           │     Conditions      │
                                                           └─────────────────────┘
                            ┌──────────────────┐           ┌─────────────────────┐
                            │ Health Conditions│           │      Physical       │
                            └──────────────────┘           │     Limitations     │
                                                           └─────────────────────┘
                                                           ┌─────────────────────┐
                                                           │    Medicine Use     │
┌──────────────────┐                                       └─────────────────────┘
│  General Health  │
│    Question      │
└──────────────────┘                                       ┌─────────────────────┐
                                                           │  Physical Activity  │
                                                           └─────────────────────┘
                            ┌──────────────────┐           ┌─────────────────────┐
                            │   Health Habits  │           │  Vices (Drinking,   │
                            └──────────────────┘           │   Smoking, etc)     │
                                                           └─────────────────────┘
                                                           ┌─────────────────────┐
                                                           │        Diet         │
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General Health Question

Health Conditions
- Pain
- Chronic Conditions
- Physical Limitations
- Medicine Use

Health Habits
- Physical Activity
- Vices (Drinking, Smoking, etc)
- Diet

Why move towards a mixed methodology?

- The point of employing mixed methods is not just to arbitrarily increase the number of methods, but rather to combine methods that help address each others' limitations.

- Cognitive interviewing is <u>excellent</u> at uncovering patterns of interpretation and response.

- However, it is limited by its sample—we use small, purposive samples that targets recruitment of respondents in a theoretical manner

  - If we're studying injury, we need to find people who engage in activities where injury is common; if we're studying opioid use, we need to interview people who have chronic pain or have had surgeries.

Web Probing

- Growing method that uses set cognitive probes on web surveys to expand on findings from offline cognitive testing.

- Probes can be added to "production" surveys, but there are downsides:
  - Cost of questionnaire development/programming
  - Additional burden
  - Potential for framing effects

- The maturation of commercial web survey panels have provided researchers with a low cost/risk way of using this method
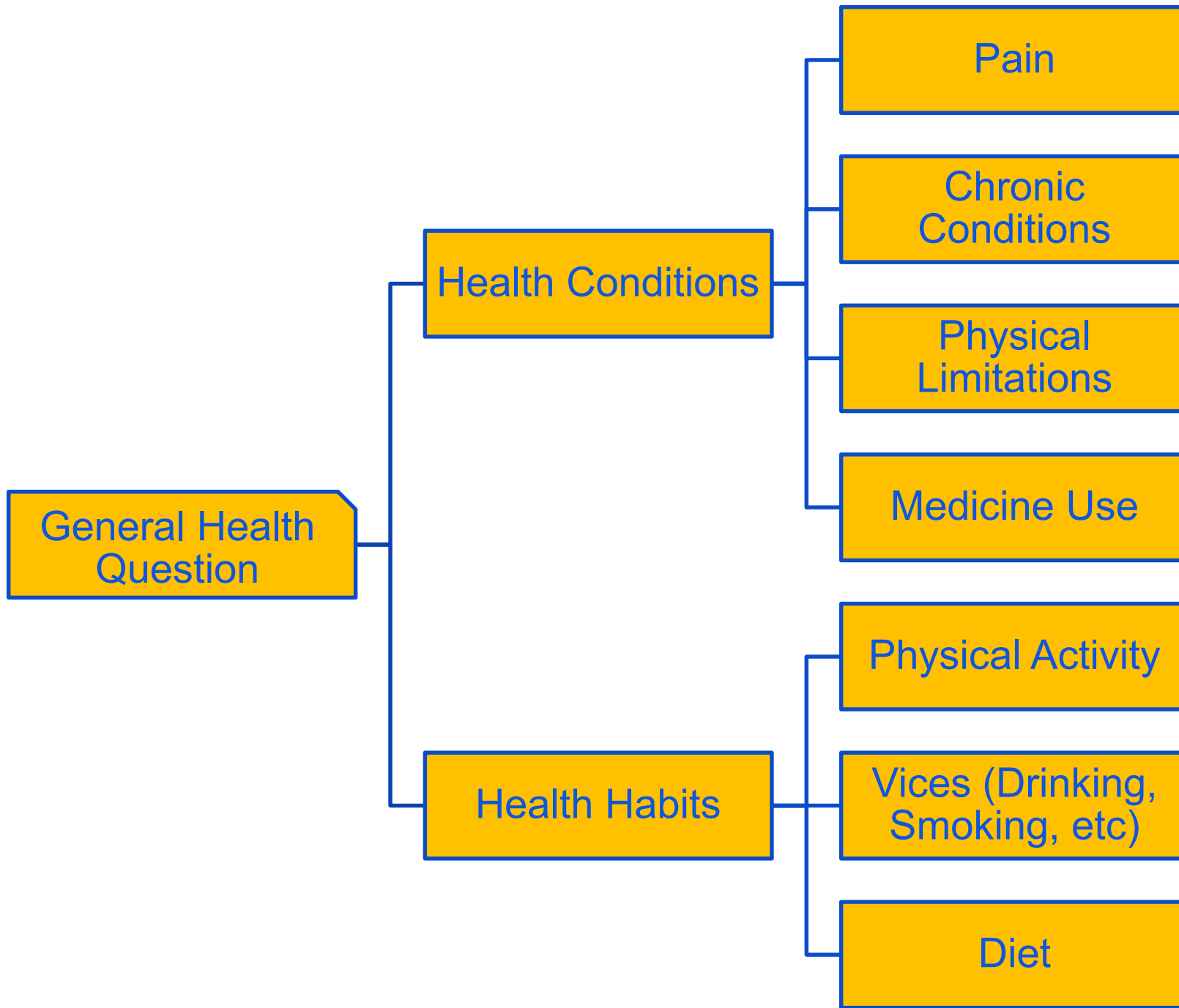
Web Probing

- Two basic forms of web probing:
    1. Open-ended collects text data and provides primary qualitative data
        - Attempts to collect comparable data to face-to-face cog interviews
        - Leverages large sample size as compared to CIs
        - Uses a standard/scripted probe, so potentially obtains less nuanced information than CIs
        - Potentially burdensome, with a risk of breakoffs or item non-response
        - Need to be coded
    2. Close-ended collects quantitative data and relies on previous qualitative data

Web Probing

- Two basic forms of web probing:
  1. Open-ended collects text data and provides primary qualitative data
  2. Close-ended collects quantitative data and relies on previous qualitative data
     - Attempts to quantify qualitative findings by administering close-ended questions based on previous CI findings
     - Leverages statistical sample to extrapolate CI findings from a purposive sample to a population
     - Questions appear similar to other survey questions, so less downside than open-ends
     - Requires previous qualitative work; cannot serve as primary source of contextual/interpretative data

Web Probing

- Overall, the goals of both forms are to:
  - Collect meaningful data that assists in questionnaire evaluation
  - Has a neutral impact on the survey response for the other items on the questionnaire
- At NCHS, we <u>prefer</u> the use of close-ended probes…

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                                                          ┌─────────────────┐
                                                          │      Pain       │
                                                          └─────────────────┘
                                                          ┌─────────────────┐
                                                          │     Chronic     │
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                                                          └─────────────────┘
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                                                          │      Diet       │
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Question evaluation research: Embedded probes added to RANDS

- In general, would you say your health is excellent, very good, good, fair or poor?

- When you answered the previous question about your health, what did you think of? (Mark all that apply)
  - ☐ My diet and nutrition
  - ☐ My exercise habits
  - ☐ My smoking or drinking habits
  - ☐ My health problems or conditions
  - ☐ The amount of times I seek health care
  - ☐ The amount of pain or fatigue I have
  - ☐ My conversations with my doctor

Question evaluation research: RANDS probe results of general health status question
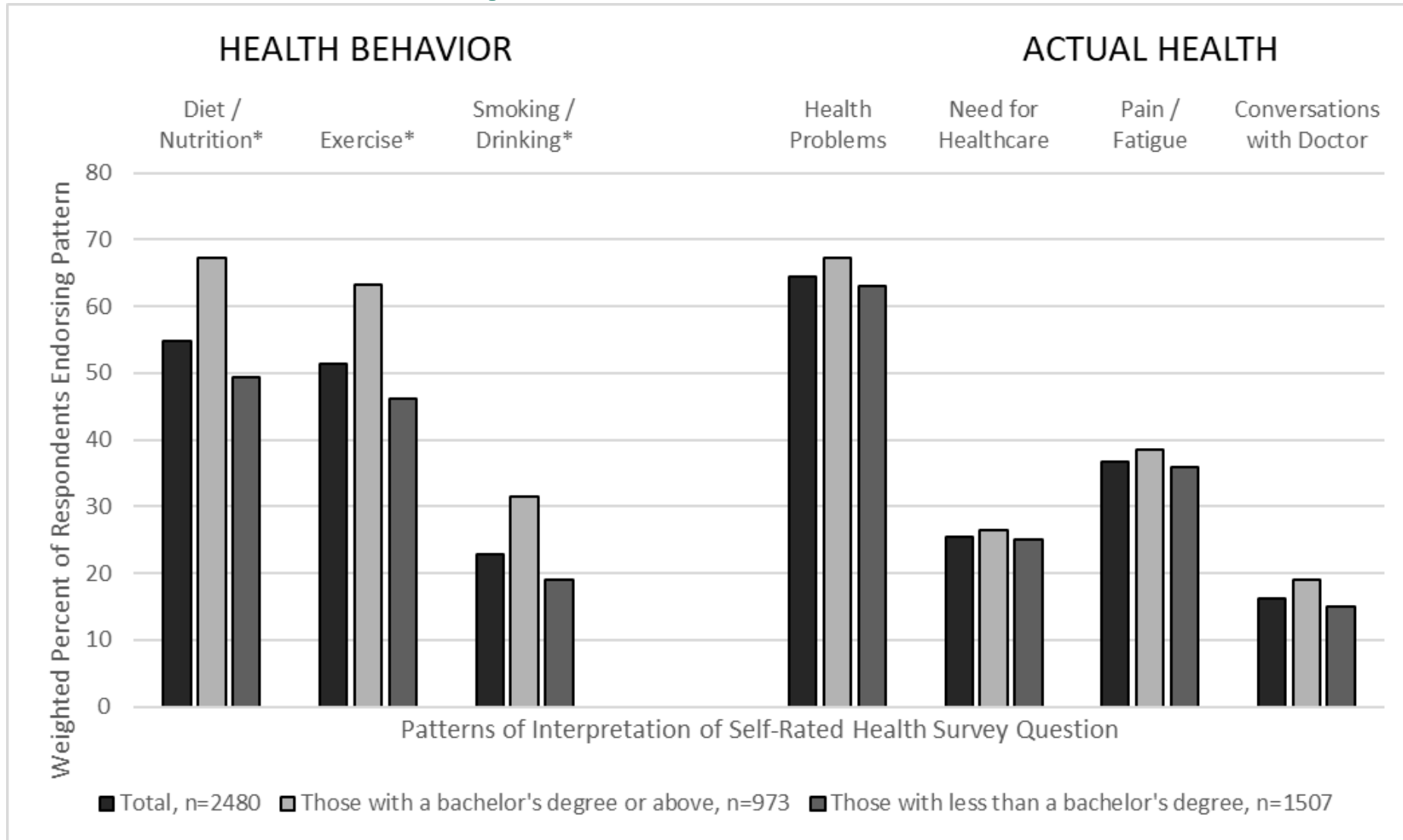
E-Cigarette Case Study

The next question is about electronic cigarettes or e-cigarettes. E-cigarettes and other electronic vaping products include electronic hookahs (e-hookahs), vape pens, e-cigars, and others. These products are battery-powered and usually contain nicotine and flavors such as fruit, mint, or candy.

Have you <u>ever</u> used an e-cigarette or other electronic vaping product, <u>even one time</u>, in your entire life?

○ Yes

○ No

PREVIOUS   CONTINUE

Have you <u>ever</u> used an e-cigarette or other electronic vaping product, <u>even one time</u>, in your entire life ?

○ Yes

○ No

PREVIOUS   CONTINUE

What counts as an e-cigarette?

Please select all that apply.

- ☐ A vape with cannabis, THC, or CBD oil
- ☐ A vape with nicotine or other flavored oil
- ☐ A hookah-pen or e-hookah
- ☐ An e-vaporizer
- ☐ A tobacco cigarette or cigar
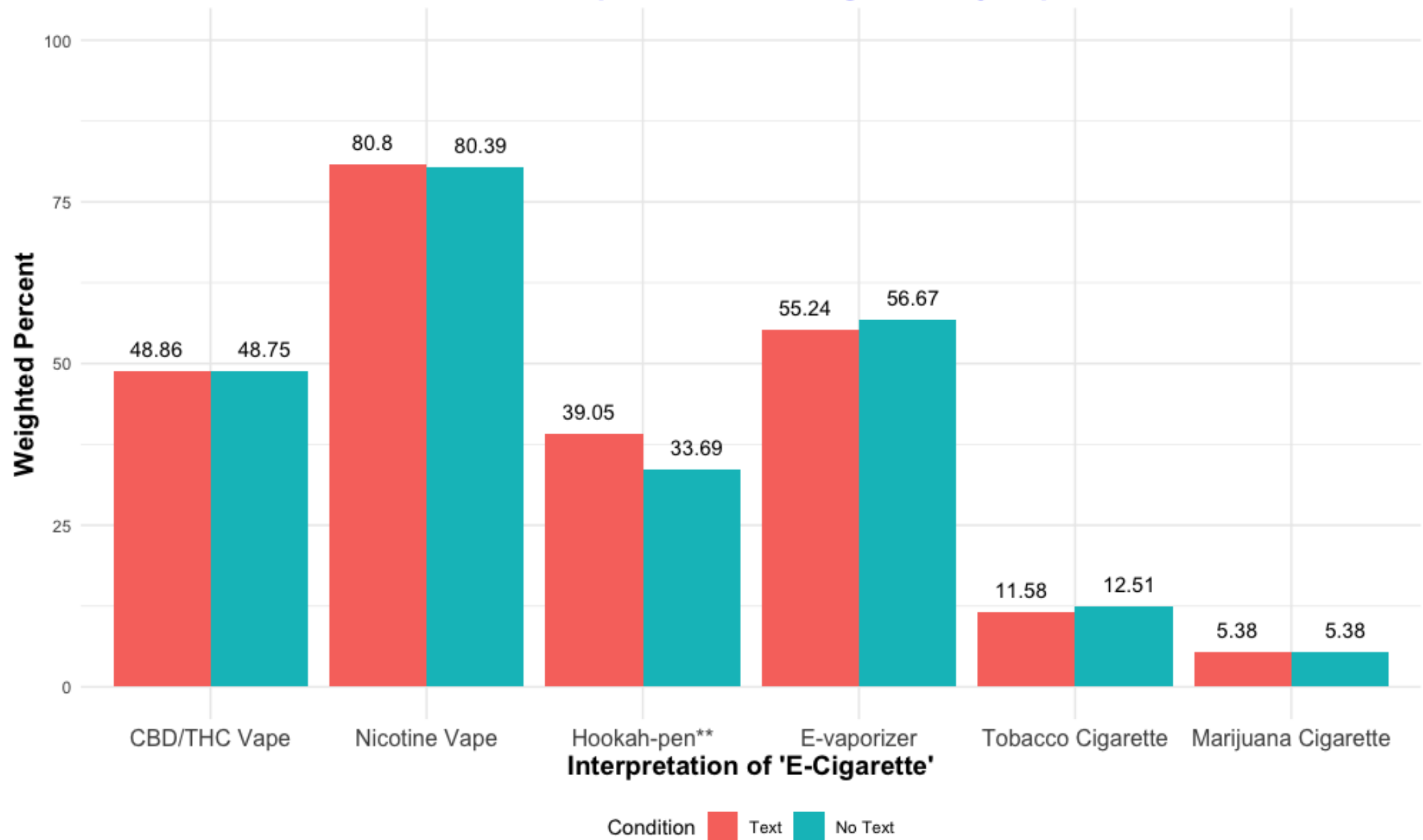- ☐ A marijuana cigarette

PREVIOUS   CONTINUE

Probe

In scope

Out of scope

What counts as an e-cigarette?

- ❑ A vape with cannabis, THC, or CBD oil
- ❑ A vape with nicotine or other flavored oil
- ❑ A hookah-pen or e-hookah
- ❑ An e-vaporizer
- ❑ A tobacco cigarette or cigar
- ❑ A marijuana cigarette

Prevalence of Patterns of Interpretation of 'E-Cigarette'

CBD/THC Vape: 48.81
Nicotine Vape: 80.6
Hookah-pen: 36.43
E-vaporizer: 55.94
Tobacco Cigarette: 12.03
Marijuana Cigarette: 5.38

Interpretation of 'E-Cigarette'

Weighted Percent

Scope — In Scope — Out of Scope

2019 RANDS, n= 2646, two-tailed test of proportions *<0.05, **<0.001, ***<0.001
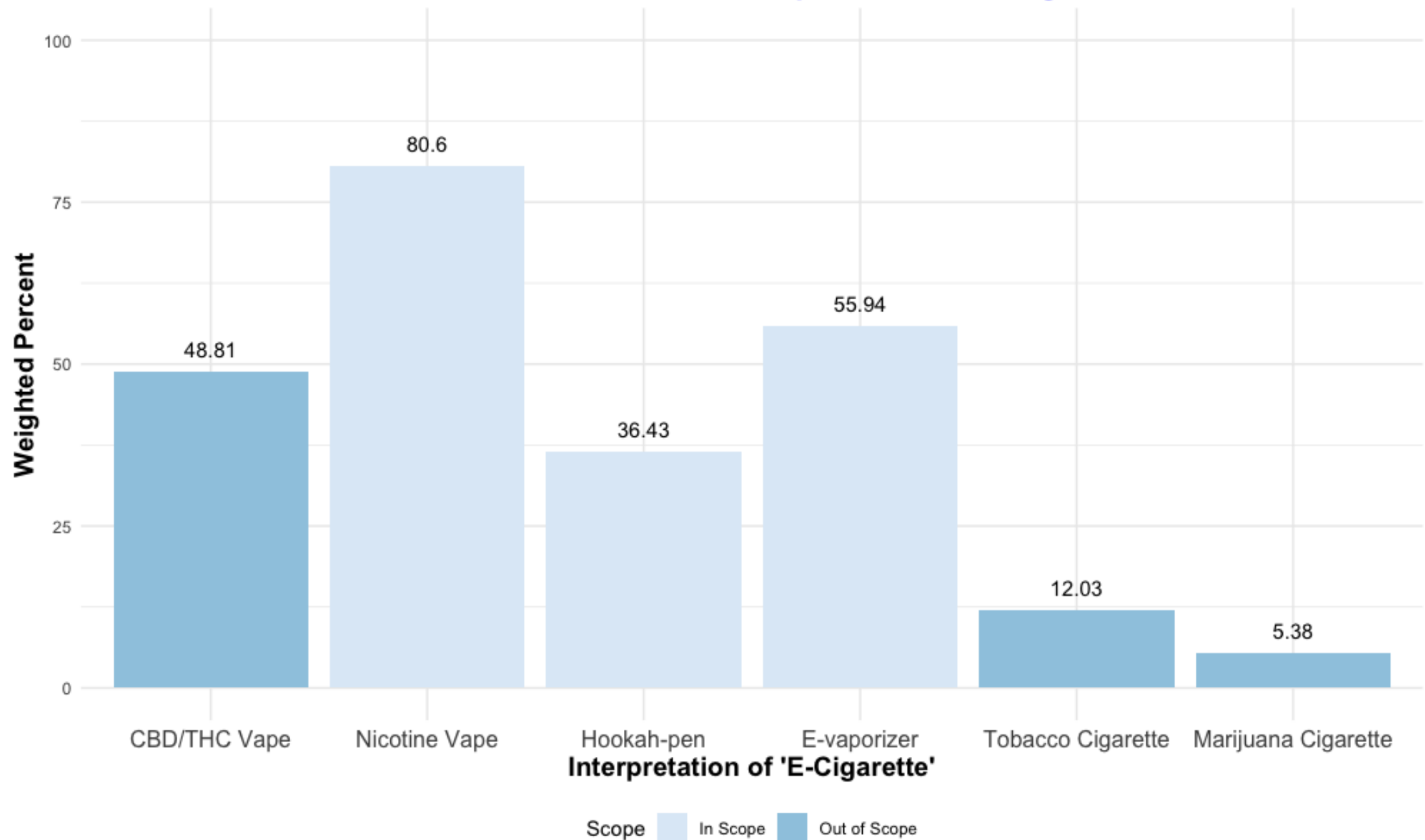
Prevalence of Patterns of Interpretation of 'E-Cigarette' by Experimental Condition

Weighted Percent (y-axis)

Interpretation of 'E-Cigarette' (x-axis)

CBD/THC Vape: Text 48.86, No Text 48.75
Nicotine Vape: Text 80.8, No Text 80.39
Hookah-pen**: Text 39.05, No Text 33.69
E-vaporizer: Text 55.24, No Text 56.67
Tobacco Cigarette: Text 11.58, No Text 12.51
Marijuana Cigarette: Text 5.38, No Text 5.38

Condition: Text, No Text

2019 RANDS, n= 2646, two-tailed test of proportions *<0.05, **<0.001, ***<0.001

Telemedicine Case Study

In the last two months, has this provider offered you an appointment with a doctor, nurse, or other health professional by video or by phone?

○ Yes

○ No

○ Don't know

PREVIOUS CONTINUE

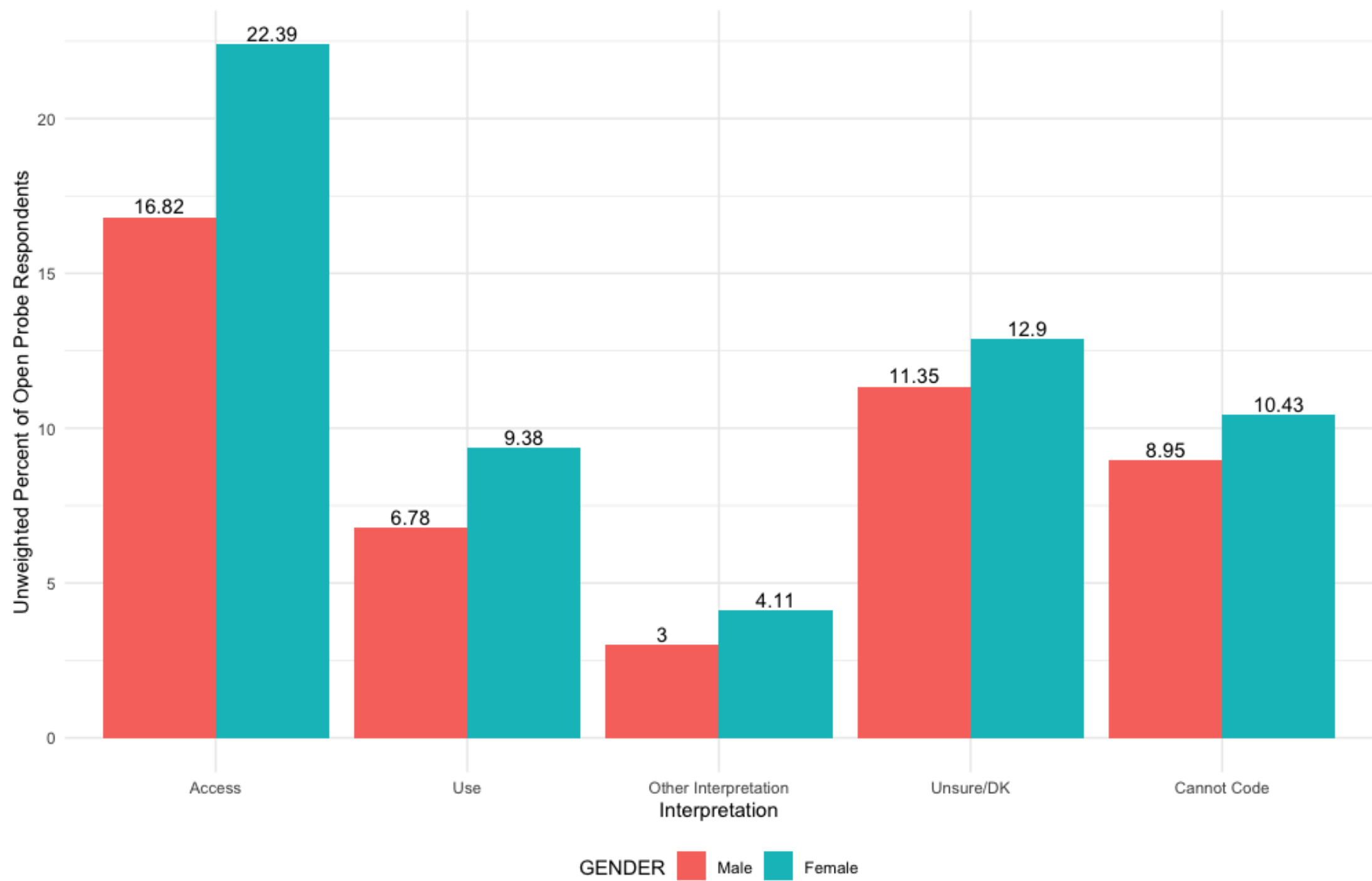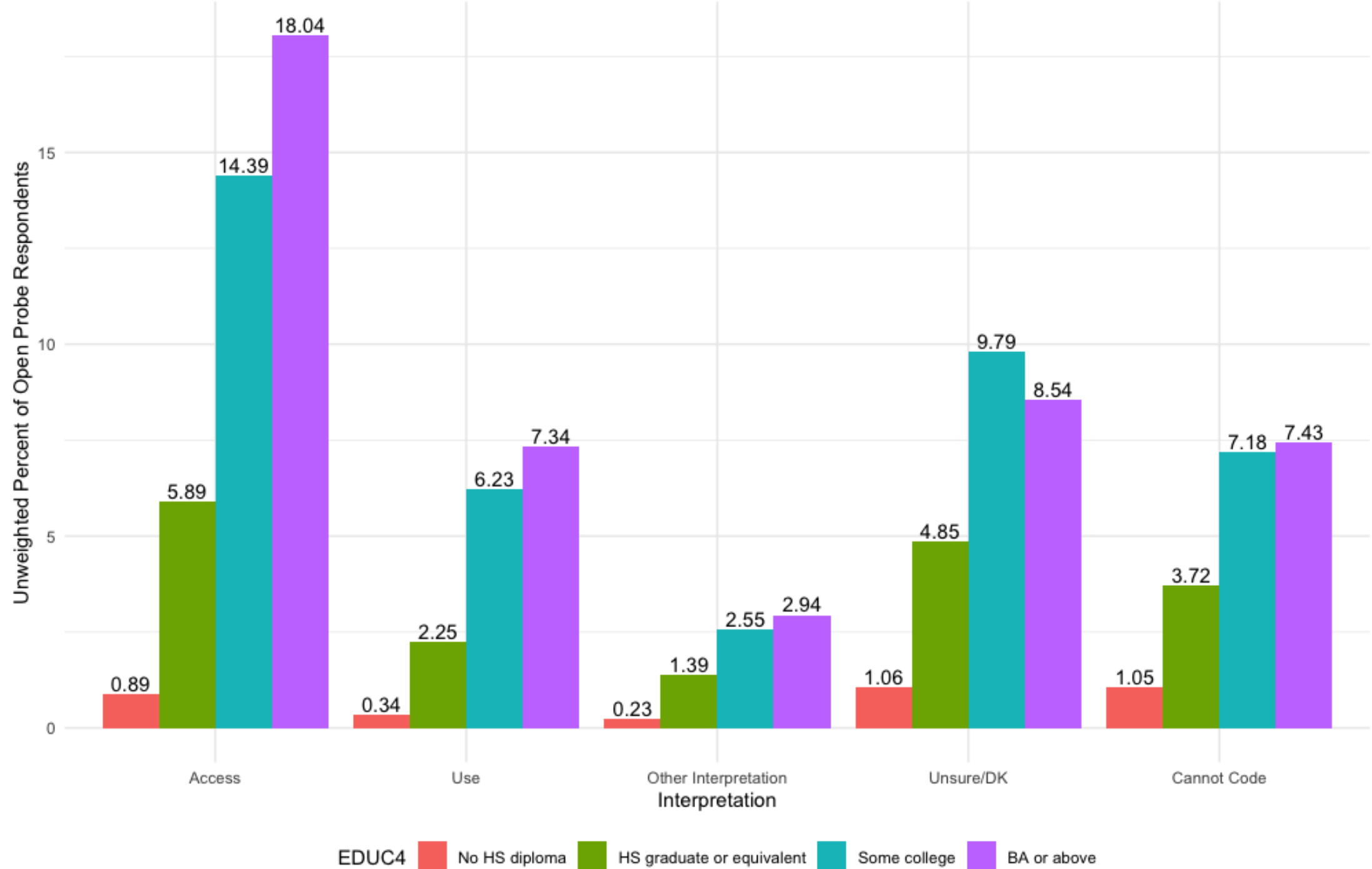How do you know whether your provider offers telemedicine, or not?

PREVIOUS   CONTINUE

Analysis of the Telemedicine Access Probe

- n=10,855 responses (75.71% item response rate)
- Team of three CCQDER researchers coded all the responses
  - Coding scheme included "Access," "Use," "Not sure/Don't Know," "Other," and "Un-codable"
- With this data were were able to:
  - Apply the codes back to the file and do a bit of subgroup analysis
  - And more importantly, construct a close-ended probe for the second round of data collection…
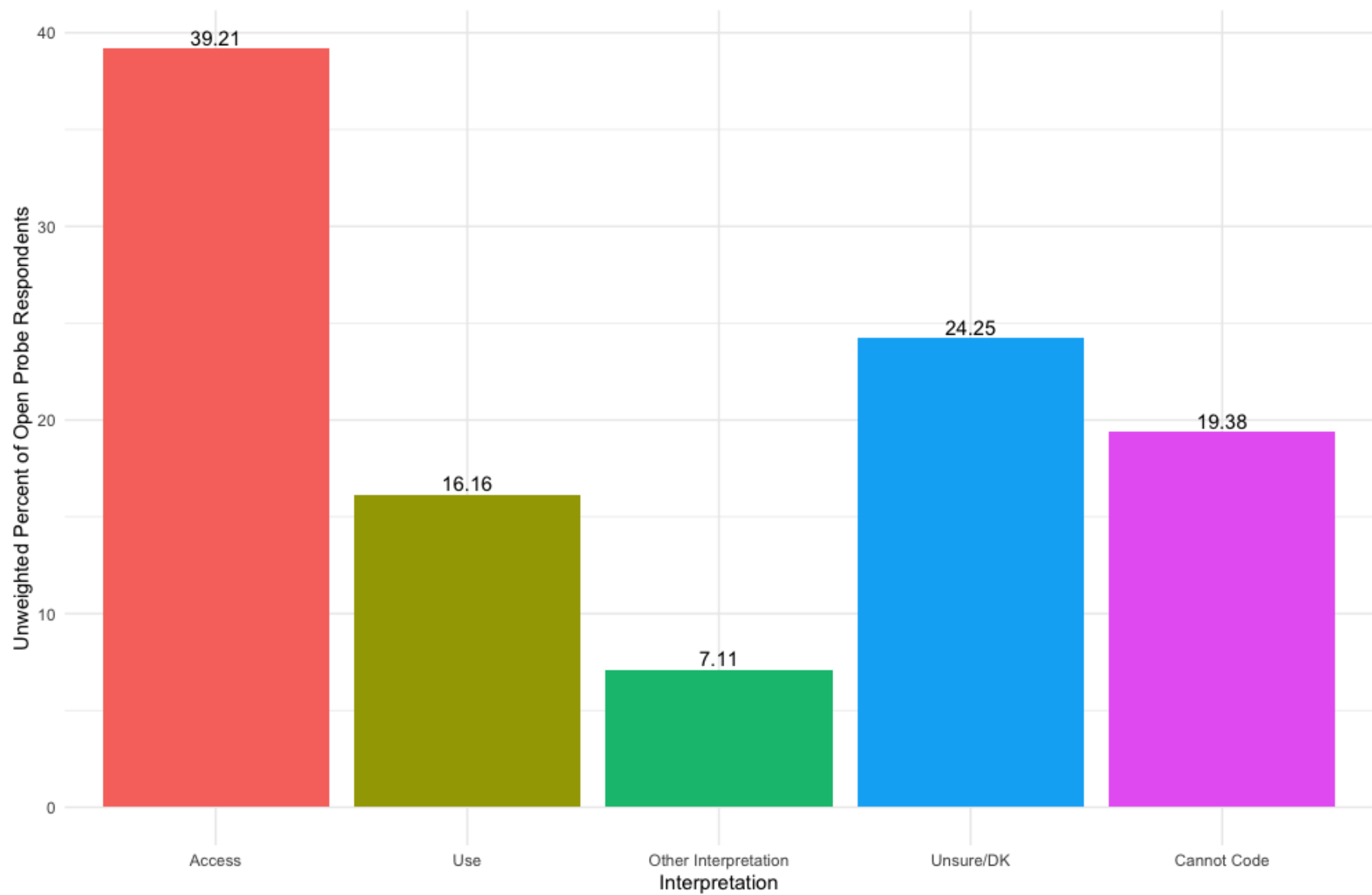
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