



# Asking about Gender as a Single, Non-binary Construct Versus a Two-Step Question Approach

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FCSM Conference

October 25, 2023

The findings and conclusions in this presentation are those of the authors and do not necessarily represent the official position of the National Center for Health Statistics, Centers for Disease Control and Prevention.

# Outline

- Question design at NCHS
- Our gender identity projects and cognitive interview findings
- RANDS background and data
- RANDS findings

# Question Design Approach at NCHS

- Empirical, data-driven question design decisions
- Respondent-centered (as opposed to expert-centered)
- Qualitative study of respondents' interpretive processes
- Comparative analyses across different respondent groups
- Mixed-method validation with split-sample experiments

# CCQDER/NCHS Gender Identity Projects

- Applied Projects: Develop/Test single item, non-binary gender question
  - US State Dept: Passport (n = 100)
  - US State Dept: Employee Management System (n = 44)
  - NCHS: Health Surveys (n = 150)
    - English
    - Spanish (Research Support Services)
- Research Studies: Examine performance of 2-question design
  - Cognitive interviewing studies
  - Split-sample experiments with embedded construct/error probes (RANDS)
- Studies available: [www.cdc.gov/qbank/SOGI](http://www.cdc.gov/qbank/SOGI)

# Cognitive Interview Findings: Response Process Differences

## Gender Minority Respondents

- Response process framed by opposing interests: Inclusion vs Privacy
  - Inclusion (benefits)
    - Recognition and affirmation
    - Data collection to understand and reduce disparities
  - Privacy (risks)
    - Exposure to rudeness and degradation
    - Exposure to discrimination: job loss, housing, access to health care
    - Personal safety; Physical harm
- Sophisticated understanding of concepts
- Fluid understanding of self; shifting identities

## Non-minority Respondents

- No risk in reporting
- Gender is typically understood as inherent and fixed
- Gender and sex are typically understood as the same
- Some respondents conflate 'sex,' 'gender,' with 'sexual orientation'

# Final Wording: Non-binary Question

Are you: *Select all that apply.*

- Female
- Male
- Transgender, non-binary, or another gender
  
- To increase sense of inclusion and reduce non-response for gender minorities:
  - Identity labels
  - ‘Select all that apply’
- To reduce confusion and false-positive error for non-minorities
  - Simple response items
  - Omission of words ‘sex’ and ‘gender’ in the question stem

# **RANDS Background and Data**

# RANDS Background

- RANDS<sup>1</sup> program: ongoing series of surveys by the Division of Research and Methodology at NCHS using quantitative and mixed methods to assess measurement error, validity, and bias
- Administered by NORC at the University of Chicago, AmeriSpeak survey probability-based panel + opt-in Lucid and Community Marketing Insights non-probability panels
- RANDS 8, June - July, 2023 (n = 16,648)
  - Gender minority oversample (n = 526)
  - ½ sample two-step question, ½ sample non-binary question

1. <https://www.cdc.gov/nchs/rands/index.htm>

## Two-step

What sex were you assigned at birth on your original birth certificate?

- Female
- Male

*Your responses are very important and will be kept confidential. If you still prefer not to say, please indicate that below.*

What sex were you assigned at birth, on your original birth certificate?

What is your current gender? *Mark only one.*

- Female
- Male
- Transgender
- Two-Spirit [AI/AN only]
- I use a different term, please specify: [text]

Just to confirm, you were assigned {FILL} at birth and describe yourself as {FILL}. Is that correct?

## Non-binary gender

Are you: *Select all that apply.*

- Female
- Male
- Transgender, non-binary, or another gender

	Cis women	Cis men	Cis total	Gender minority	Missing
Two-step, no confirmation, no nudge	4,305 (52%)	3,599 (43%)	7,904 (95%)	352 (4%)	24 (0.3%)
Two-step, with nudge, no confirmation	4,314 (52%)	3,611 (44%)	7,925 (96%)	354 (4%)	1 (0.01%)
Two-step, with confirmation and nudge	4,330 (52%)	3,618 (44%)	7,948 (96%)	330 (4%)	2 (0.02%)

	Cis women	Cis men	Cis total	Gender minority	Missing
Non-binary question	4,374 (52%)	3,597 (43%)	7,971 (95%)	379 (5%)	18 (0.2%)

# Analyses

- Chi-squared tests of homogeneity with Rao-Scott second-order correction
  - Self-rated health, life satisfaction, anxiety, depression by question version
    - Two-step, no confirmation vs. non-binary
    - Two-step, with confirmation vs. non-binary
  - Low power, despite gender minority oversample
- Balanced AmeriSpeak and opt-in panels
  - Opt-in panel aligned to AmeriSpeak using propensity score methods
    - Sample weights adjusted and survey source treated as strata
  - Not weighting to the population

# Power

Null hypothesis	True	False
Rejected	Type I Error ( $\alpha$ )	Correct
Not rejected	Correct	Type II Error ( $\beta$ )

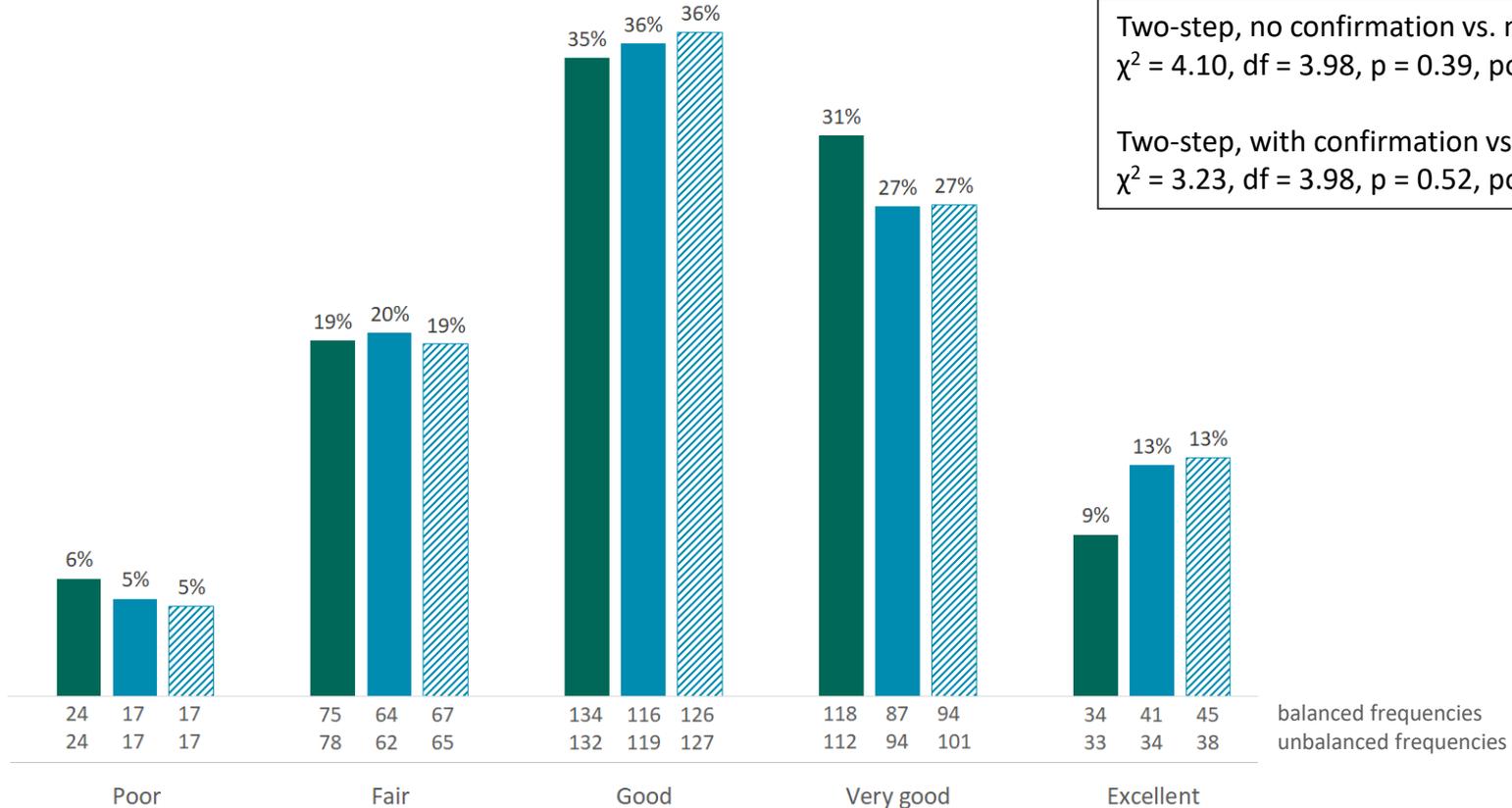
power



# RANDS Findings

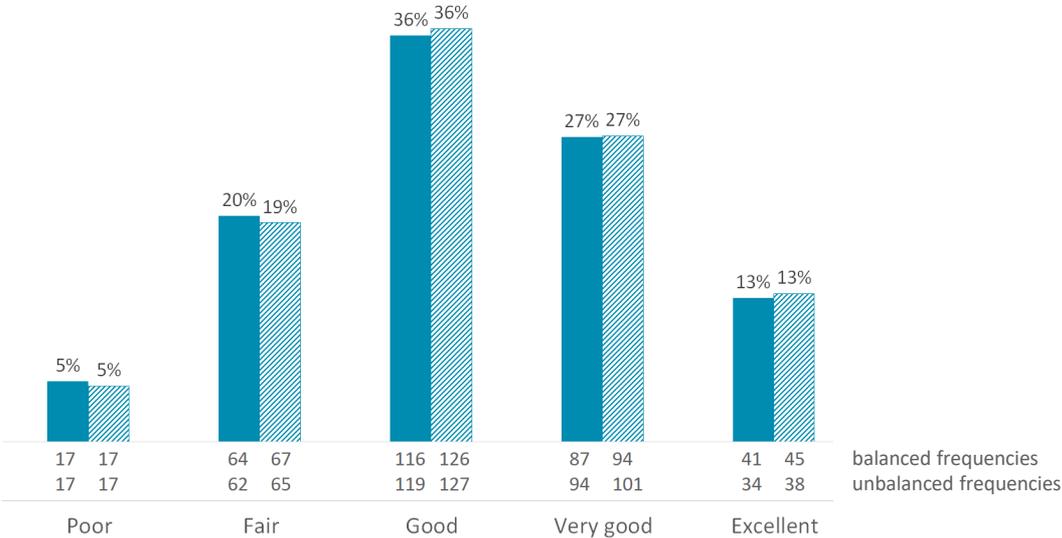
## Self-Rated Health Among Gender Minority Respondents; RANDS 8, 2023

▨ two-step, no confirmation   
 ■ two-step, with confirmation   
 ■ non-binary

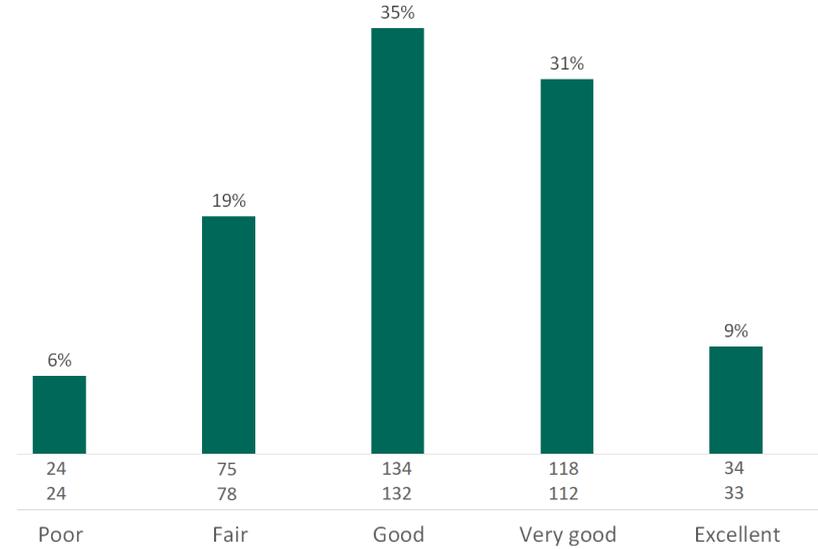


Self-Rated Health Among Gender Minority Respondents, Two-Step Question; RANDS 8, 2023

▨ two-step, no confirmation    ■ two-step, with confirmation



Self-Rated Health Among Gender Minority Respondents, Non-binary Question; RANDS 8, 2023

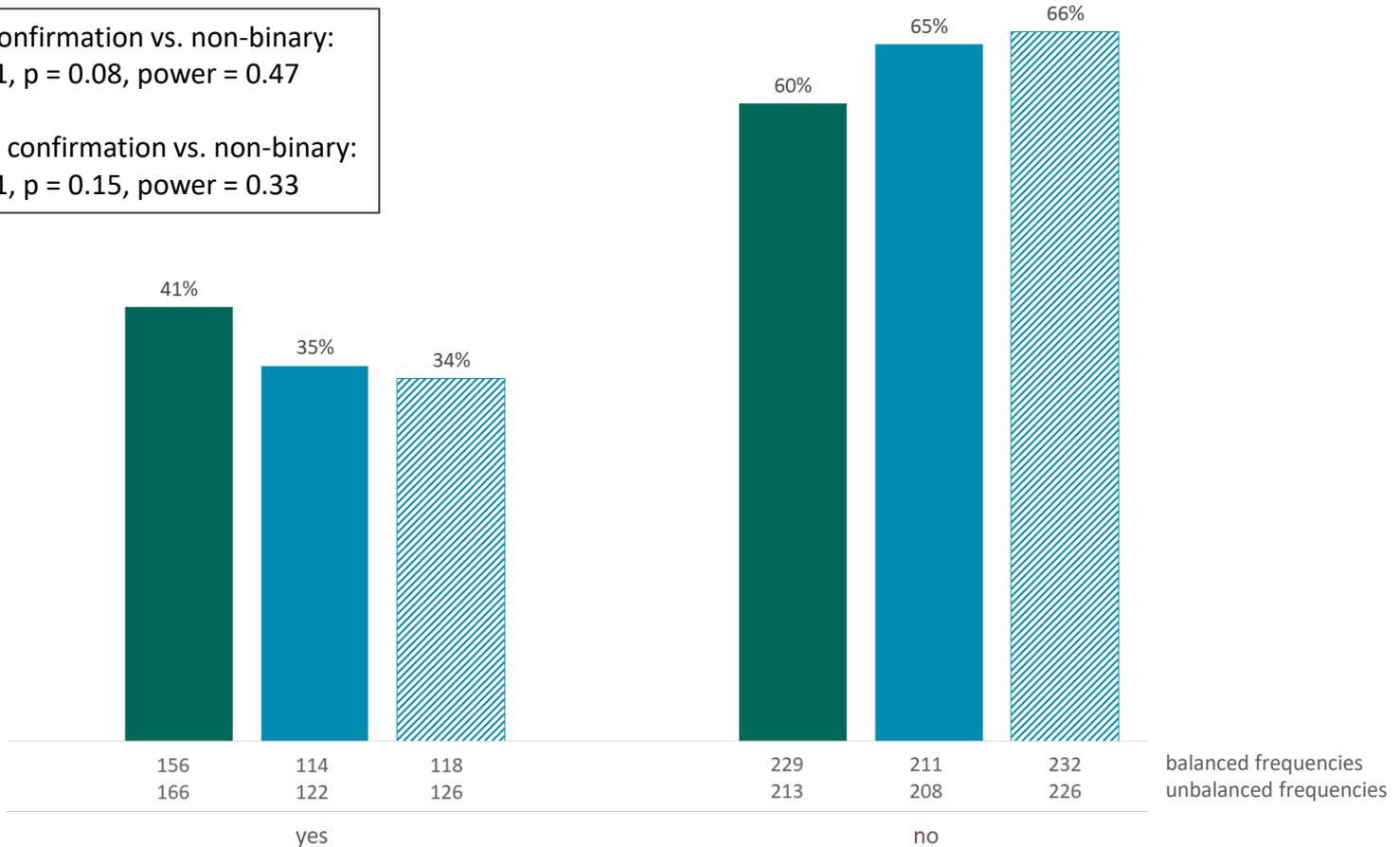


# Anxiety Among Gender Minority Respondents; RANDES 8, 2023

▨ two-step, no confirmation   
 ■ two-step, with confirmation   
 ■ non-binary

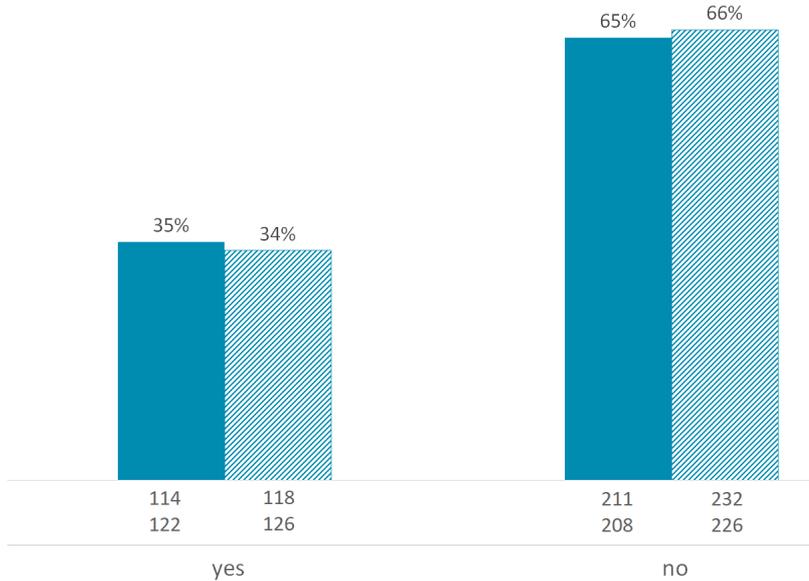
Two-step, no confirmation vs. non-binary:  
 $\chi^2 = 3.17$ ,  $df = 1$ ,  $p = 0.08$ , power = 0.47

Two-step, with confirmation vs. non-binary:  
 $\chi^2 = 2.05$ ,  $df = 1$ ,  $p = 0.15$ , power = 0.33

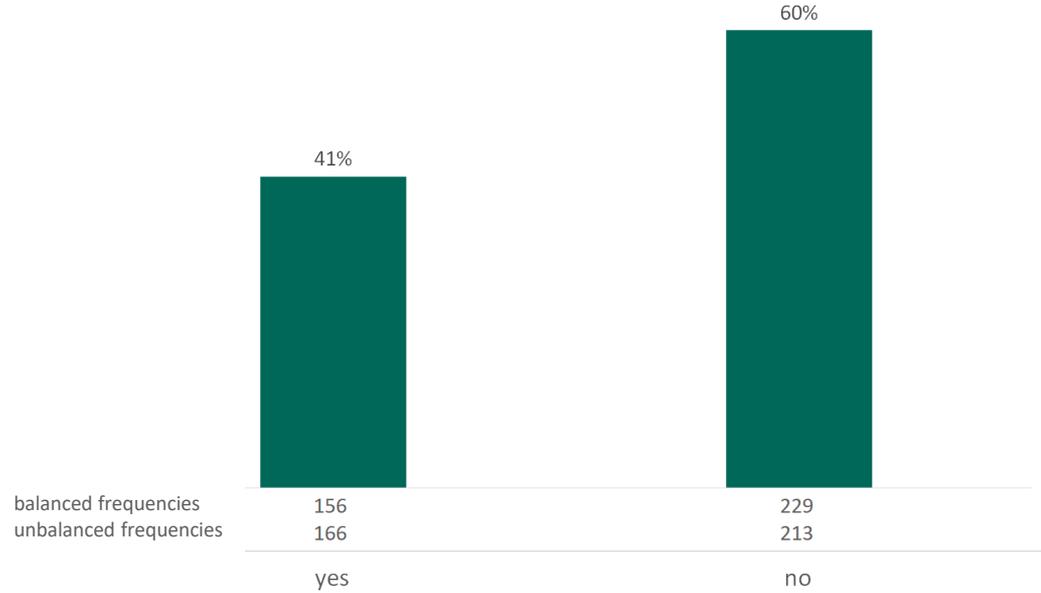


Anxiety Among Gender Minority Respondents, Two-Step Question; RANDS 8, 2023

▨ two-step, no confirmation    ■ two-step, with confirmation

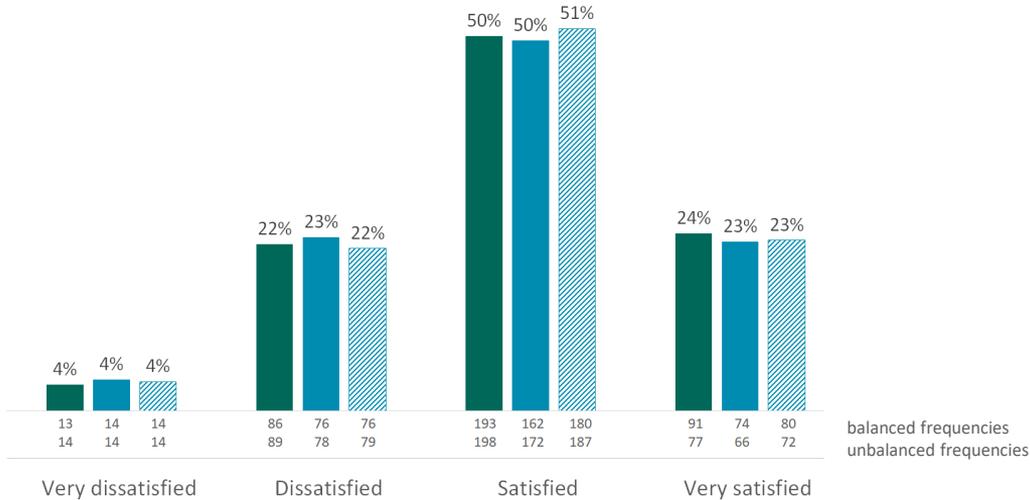


Anxiety Among Gender Minority Respondents, Non-binary Question; RANDS 8, 2023



## Life Satisfaction Among Gender Minority Respondents; RANDS 8, 2023

two-step, no confirmation    two-step, with confirmation    non-binary

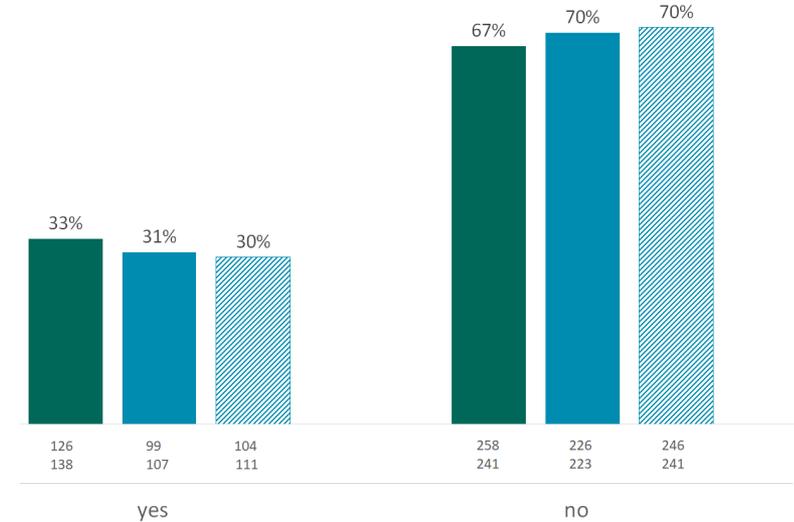


Two-step, no confirmation vs. non-binary:  
 $\chi^2 = 0.18$ ,  $df = 2.98$ ,  $p = 0.98$ , power = 0.06

Two-step, with confirmation vs. non-binary:  
 $\chi^2 = 0.35$ ,  $df = 2.98$ ,  $p = 0.95$ , power = 0.07

## Depression Among Gender Minority Respondents; RANDS 8, 2023

two-step, no confirmation    two-step, with confirmation    non-binary



Two-step, no confirmation vs. non-binary:  
 $\chi^2 = 0.82$ ,  $df = 1$ ,  $p = 0.36$ , power = 0.16

Two-step, with confirmation vs. non-binary:  
 $\chi^2 = 0.41$ ,  $df = 1$ ,  $p = 0.52$ , power = 0.11

# Findings Summary

- Two versions produce similar percentages for cisgender and gender minority respondents
- Differences between question version for self-rated health and anxiety, but power too low to determine statistically significant differences
  - Two-step corrected is closer to the non-binary question
  - Having false positives could inflate estimates of self-rated health and decrease estimates of anxiety
- Did not see differences between question version for life satisfaction and depression

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**RANDS:** <https://www.cdc.gov/nchs/rands/index.htm>

**Q-Bank:** providing access to survey question evaluation reports, question design and performance <https://wwwn.cdc.gov/qbank/>

**Q-Notes:** designed to facilitate the management and analysis of cognitive interviews  
<https://www.cdc.gov/nchs/ccqder/products/qnotes.htm>

For more information, contact CDC  
1-800-CDC-INFO (232-4636)  
TTY: 1-888-232-6348 [www.cdc.gov](http://www.cdc.gov)



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