

# Census Bureau Evaluation of Proposed Changes to the ACS Disability Questions

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# Motivation and Background

- The American Community Survey (ACS) is our largest household survey and a critical source of national and sub-national disability estimates in the U.S.
- Current ACS Disability measure: ACS-6.
  - Standardized 6-item question set.
  - Developed by the ACS Subcommittee on Disability Measurement.
  - Used since 2008.
- Proposed Change: Washington Group Short Set on Functioning (WG-SS).
  - Developed by the Washington Group (WG) on Disability Statistics.
  - The Washington Group has invested considerable time and resources into evaluating the validity of the WG-SS in the U.S. and internationally (Altman, 2016).
  - By WG tallies, used in over 90 national surveys or censuses worldwide, including key health surveys in the U.S.
  - Recommended by the National Center for Health Statistics (NCHS) and the United Nations.

# Side-by-Side Comparison: ACS-6 and WG-SS

## ACS-6

- **Dichotomous** response categories:
  - Yes.
  - No.
- 6<sup>th</sup> domain measured:
  - **Independent living.**

- 6-item question set.
- Based on WHO's ICF.
- Measures 6 functional domains including:
  - Vision.
  - Hearing.
  - Ambulation.
  - Cognition.
  - Self-Care.

## WG-SS

- **Graded** response categories:
  - No difficulty.
  - Some difficulty.
  - A lot of difficulty.
  - Cannot do at all.
- 6<sup>th</sup> domain measured:
  - **Communication.**

# Question Wording Differences

	American Community Survey (ACS-6)	Washington Group - Short Set (WG-SS)
<b>Hearing</b>	Is this person <b>deaf</b> or does he/she have <b>serious</b> difficulty hearing?	Does this person have difficulty hearing, <b>even if using a hearing aid</b> ?
<b>Seeing</b>	Is this person <b>blind</b> or does he/she have <b>serious</b> difficulty seeing even <b>when</b> wearing glasses?	Does this person have difficulty seeing, even <b>if</b> wearing glasses?
<b>Cognition</b>	<b>Because of a physical, mental, or emotional condition</b> , does this person have <b>serious</b> difficulty concentrating, remembering, or <b>making decisions</b> ?	Does this person have difficulty remembering or concentrating?
<b>Ambulation</b>	Does this person have <b>serious</b> difficulty walking or climbing <b>stairs</b> ?	Does this person have difficulty walking or climbing <b>steps</b> ?
<b>Self-Care</b>	Does this person have difficulty dressing or <b>bathing</b> ?	Does this person have difficulty with <b>self-care, such as washing all over</b> or dressing?

# Census Bureau Evaluation of the WG-SS

- In 2020-2022, the Census Bureau tested proposed changes to the American Community Survey.
- This included testing a disability measure based on the Washington Group Short Set on Functioning (WG-SS).
  - Advantages of WG-SS: internationally comparable; graded response categories.
- Structure and purpose of the evaluation of the WG-SS:
  - **Part 1: Cognitive Interviews** – to examine validity of WG-SS.
  - **Part 2: Field Test** – to evaluate performance of WG-SS in ACS environment.

# Cognitive Testing: Research Goals and Methods

- Cognitive interviews were conducted in 2020-2021:
  - Three rounds of cognitive interviewing (language: English and Spanish).
  - Due to COVID-19 pandemic, all interviews were conducted virtually.
- Research goals:
  1. Evaluate wording differences between WG-SS and ACS-6 and whether questions understood as intended.
  2. Assess how respondents decide between WG-SS response categories.
- A total of **419** interviews were conducted (over 3 rounds).

# Cognitive Interviews: Construct Validity

## - Self Care and Ambulation

*Does this person have difficulty with self-care, such as washing all over or dressing?*



**Washing all over:** Phrase seemed strange to some, but generally understood as intended.

*Does this person have difficulty walking or climbing steps?*



**Difficulty climbing steps:** Less consistently understood than “stairs”, but generally worked as intended.

Vast majority later described difficulties consistent with intended concepts.

# Cognitive Interviews: Condition Capture

## - Cognition and Communication

*Does this person have difficulty remembering or concentrating?*



**Removed concept** of “difficulty making decisions.”

- Interview probe: *Can you give me some examples of health conditions that make it difficult to remember or concentrate?*

*Using his or her usual language, does this person have difficulty communicating, for example understanding or being understood?*



**New concept** for ACS.

- Interview probe: *Can you give me some examples of conditions that may make it difficult to communicate?*
- Spanish language revisions required.



# Cognitive Interviews: Construct Validity

## - Hearing and Seeing

*Does this person have difficulty hearing, even if using a hearing aid?*



**Removed terms** “deaf” and “serious [difficulty]”;  
**Added** “even if” clause.

*Does this person have difficulty seeing, even if wearing glasses?*



**Removed terms** “blind” and “serious [difficulty].”  
➤ Some reports of difficulty due to outdated prescriptions.

For both questions: “Even if...” clause sometimes overlooked.

# Cognitive Interviews: Response Category Selection

## **Ambulation:** “Some Difficulty”

- Respondent who currently has difficulty walking or climbing steps due to recent foot surgery, but anticipates a full recovery without further issues.
- Individual with a pinched nerve that doesn't bother him to the same degree every day.
- Respondent over age 60 who “can't get upstairs in 3 minutes but...can in 6 minutes”.

## **Ambulation:**

“A Lot of Difficulty” or “Cannot Do at All”

- Respondent who, after suffering a stroke, has use of only one limb.
- Respondent who uses a walking stick and is not allowed to climb steps on her own.
- Nursing home resident who used to be able to climb steps with “a lot of difficulty” but now “cannot do [it] at all” because she is wheelchair-bound.

# Cognitive Interviews: Key Take-Aways

- Provided additional evidence of the validity of the WG-SS.
- Although alternative wording was tested, the interviews indicated that the WG-SS wording worked sufficiently well.
- Next step: Further evaluated a version of the WG-SS in the 2022 ACS Content Field Test.

# Field Test: Methods

- Nationally representative sample of 120,000 housing unit addresses, excluding Puerto Rico, Alaska, and Hawaii (divided into 3 treatments).
- Split-ballot design: households received either control or test version of ACS.
  - Control treatment: same as production ACS.
  - Test treatment: included proposed change to disability question set.
- Modes of administration:
  - Self-response (internet and paper).
  - Nonresponse follow-up (Computer-Assisted Personal Interview [CAPI]).
- Content Follow-Up (CFU) interview.
- Response rates:

Response Rates	Control Treatment	Test Treatment
Original interview	83.6% (SE 0.4)	83.3% (SE 0.4)
CFU re-interview	32.9% (SE 0.5)	34.2% (SE 0.5)

# Field Test: Disability in Control vs. Test

## Control Yes/No

18a.	Hearing
18b.	Seeing
19a.	Cognitive
19b.	Ambulatory
19c.	Self-Care
20.	Independent Living

## Test Graded Response

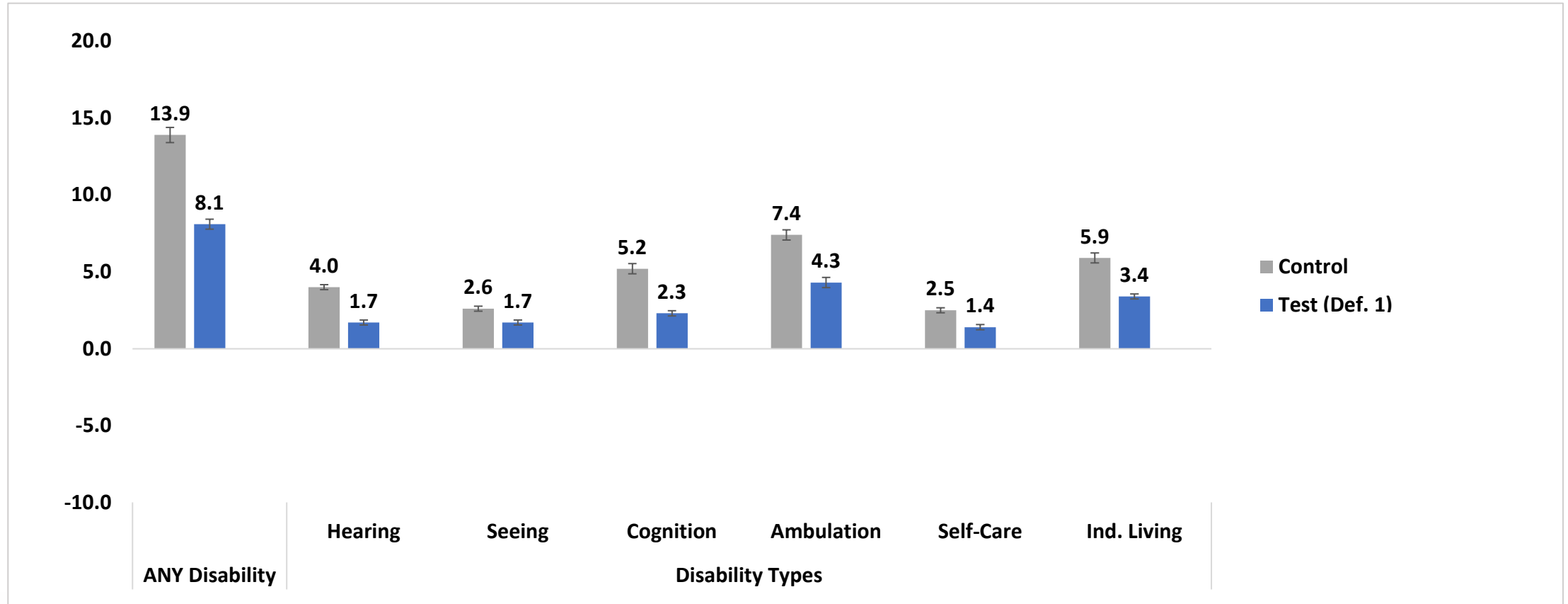
18a.	Seeing
18b.	Hearing
19a.	Ambulatory
19b.	Cognitive
19c.	Self-Care
19d.	Communication
20.	Independent Living

# Field Test: Goals

- **Primary: To evaluate performance in the ACS environment.**
  - Key elements of the ACS environment include...
    - Multiple modes (CAPI; paper; internet).
    - Within-household proxy reporting.
  - Decision criteria:
    - Response reliability (Gross Difference Rate [GDR] and Index of Inconsistency [IOI]).
    - Item missing data rates.
- **Secondary: To explore the impact on ACS disability estimates.**
  - Informational only- Not a decision criteria.
- Two definitions tested:
  - **Definition 1:** ‘a lot of difficulty’ or ‘cannot do at all’ (recommended by WG).
  - **Definition 2:** ‘some difficulty’, ‘a lot of difficulty’ or ‘cannot do at all’.

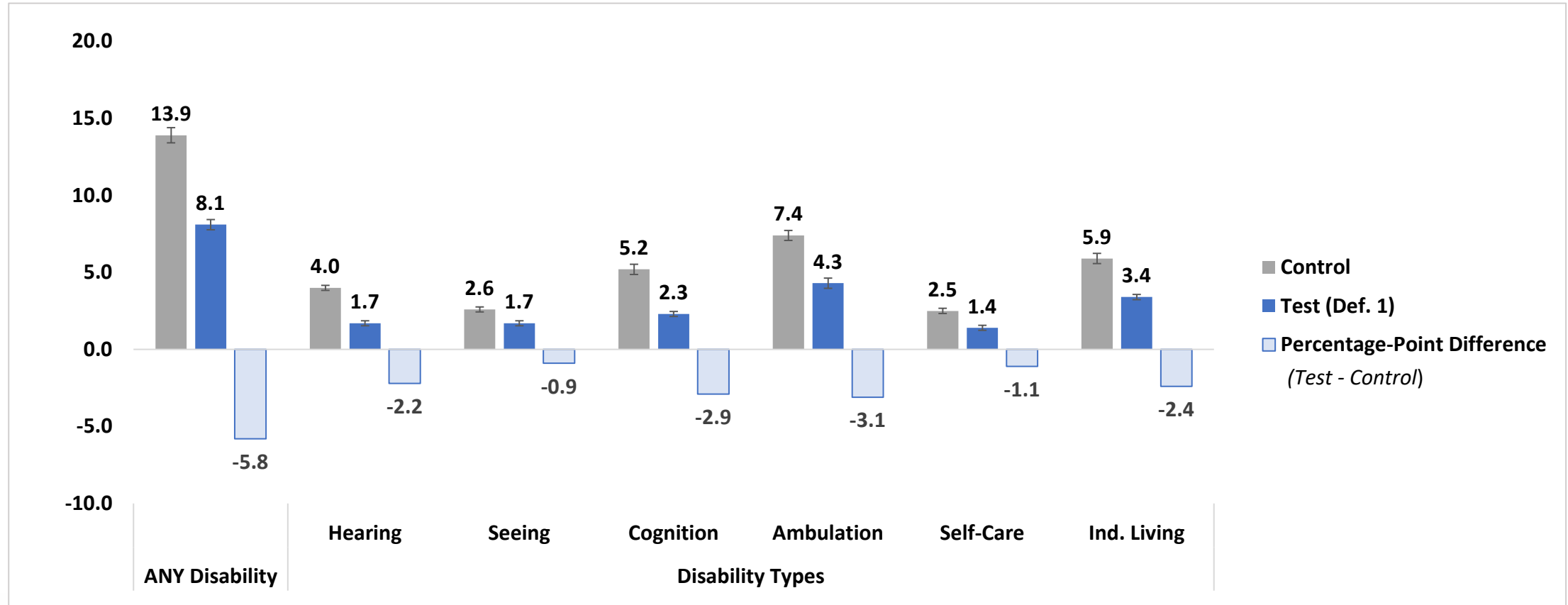
# Field Test: Percentage with a Disability by Treatment and Type

When using **Definition 1**, the estimated percentage of the U.S. population with a disability was significantly lower in test than in control (two-tailed t-tests at the  $\alpha=0.1$  level).



# Field Test: Percentage with a Disability by Treatment and Type

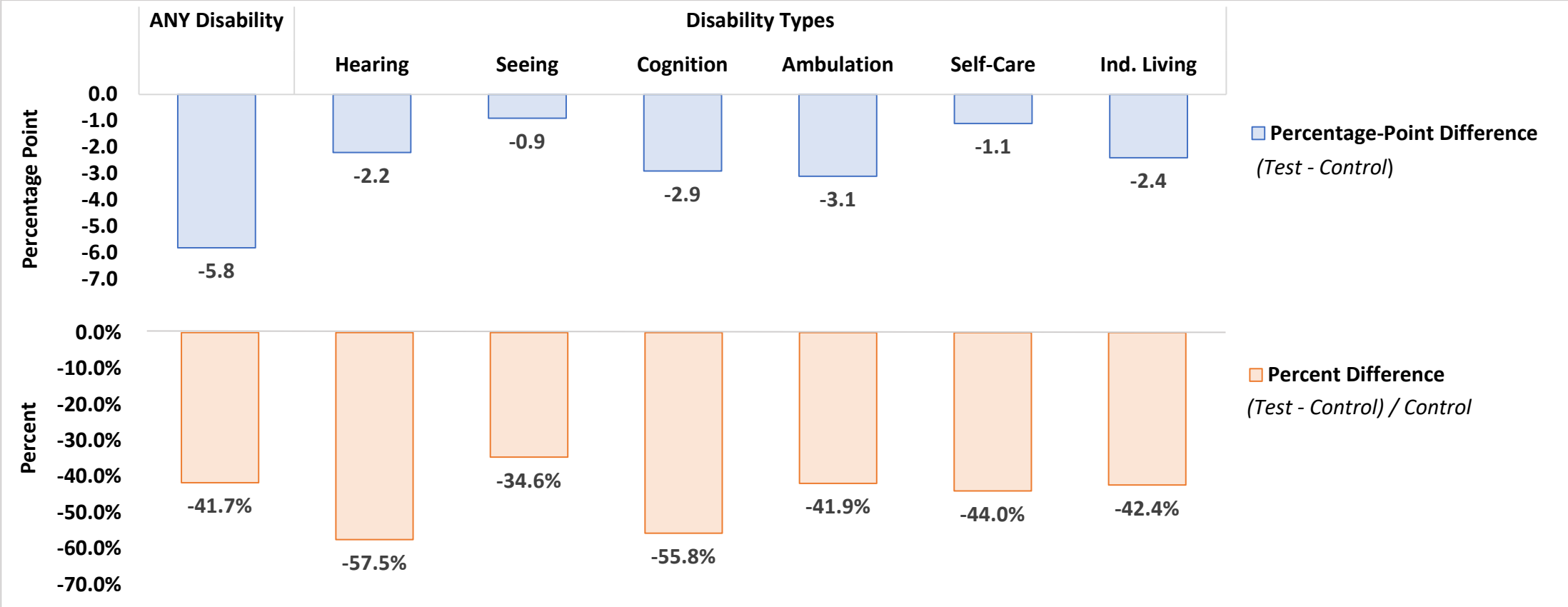
When using **Definition 1**, the estimated percentage of the U.S. population with a disability was significantly lower in test than in control (two-tailed t-tests at the  $\alpha=0.1$  level).





# Field Test: Difference Between Test and Control Disability Estimates

The magnitude of the difference between test (Def. 1) and control may vary by disability type.

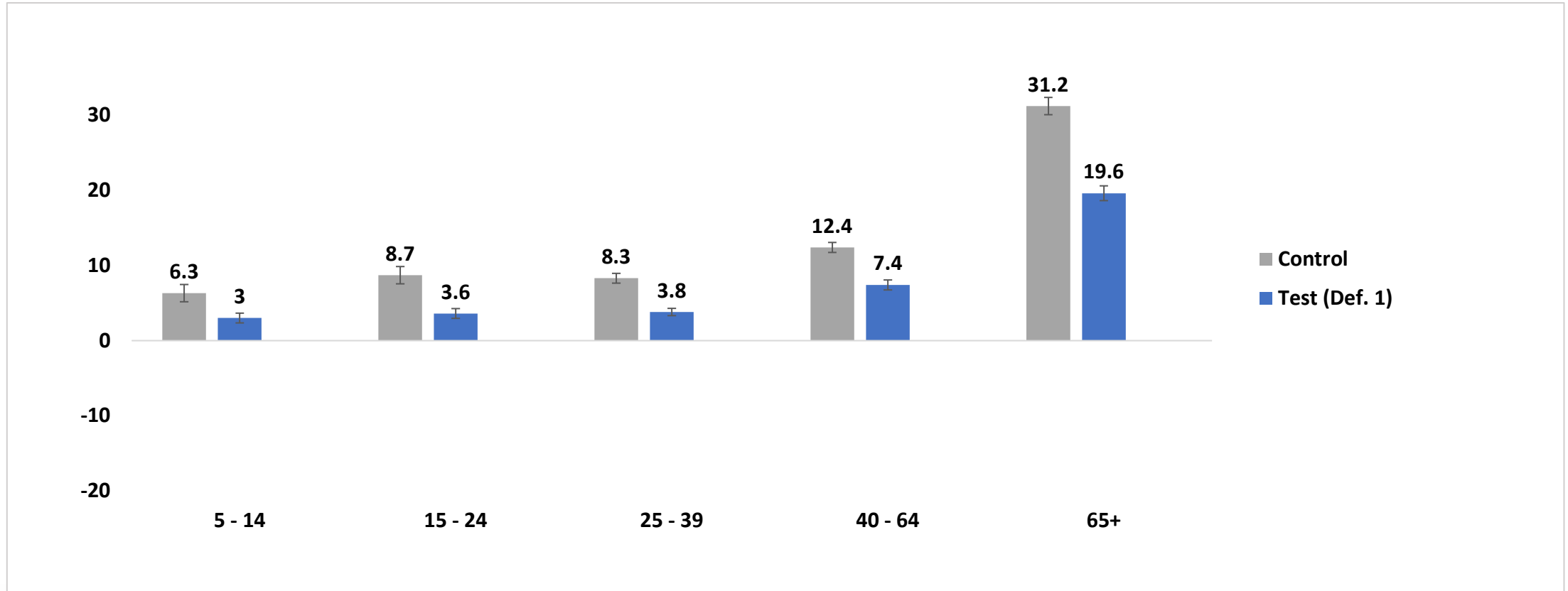


Source: U.S. Census Bureau, 2022 American Community Survey Content Test.

Note: All percent comparisons are nominal. We did not statistically test differences in percentages between disability types.

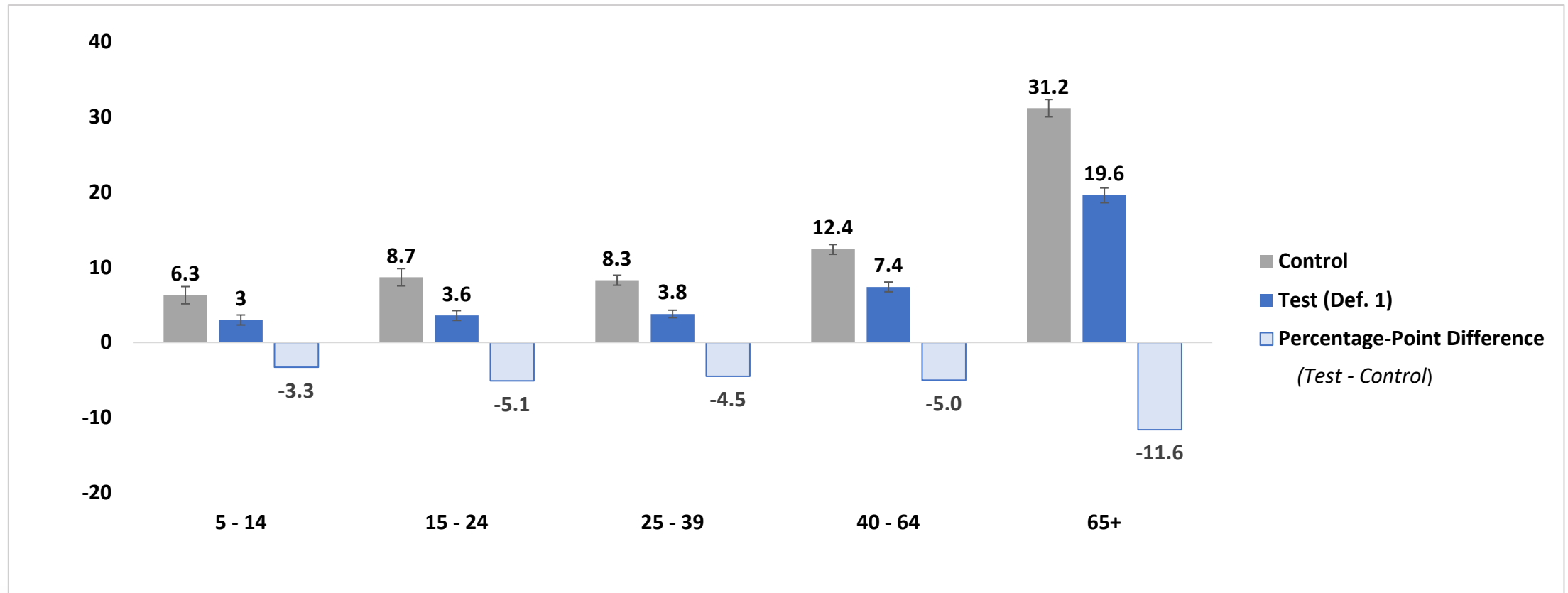
# Field Test: Percentage with a Disability by Age

When using **Definition 1**, the estimated percentage of the U.S. population with a disability was lower in test than in control across all age groups (except 0-4).



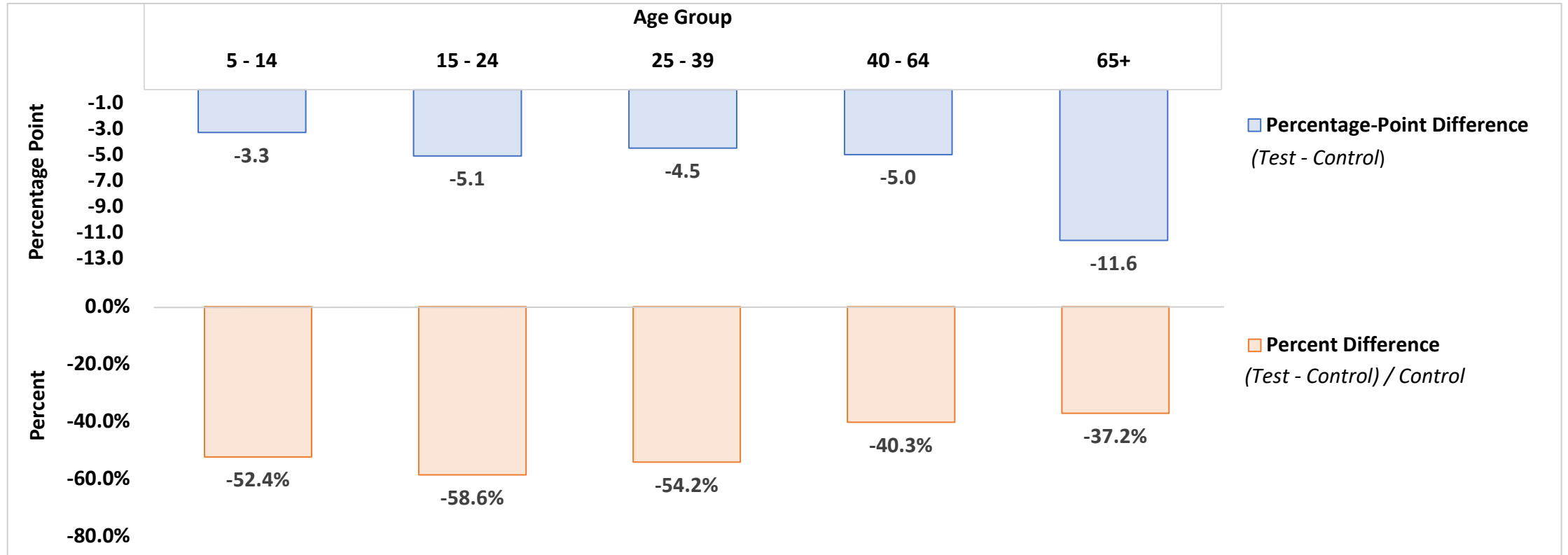
# Field Test: Percentage with a Disability by Age

When using **Definition 1**, the estimated percentage of the U.S. population with a disability was lower in test than in control across all age groups (except 0-4).



# Field Test: Difference Between Test and Control Disability Estimates by Age

The magnitude of the difference between test (Def. 1) and control may vary by age.



Source: U.S. Census Bureau, 2022 American Community Survey Content Test.

Note: All percent and percentage point comparisons are nominal. We did not statistically test differences in percentages between age groups.

# Field Test: Decision Criteria Results

- **Response reliability** (Decision Criterion #1).
  - Test had lower GDR than control, with only very limited exceptions (where no difference was detected between test and control).
  - Test had higher IOI than control for overall disability when all modes were combined, but not across all disability types and modes (sometimes, no difference detected).
- **Item missing data rates** (Decision Criterion #2).
  - Test had higher item missing data rates for overall disability when all modes combined, but results by disability type and mode varied.
  - When item missing data rates were higher in test, only by ~1 percentage point.
- **Conclusion: Test treatment meets the decision criteria.**
  - The proposed question set performs adequately in the ACS environment based on these criteria, including in self-response modes.

# Conclusion and Recommendations

- **The disability subcommittee is recommending the proposed change to the disability question set.**
- **If the proposed question set is adopted, definition 1 of disability is recommended as the primary Census Bureau measure.**

# Implementation

- The revised disability measure **will not be comparable** to the current ACS measure.



- The proposed disability measure is expected to capture a **smaller population** and a population with a **higher level of functional difficulty**.
- **Next steps:**
  - Conduct additional research to further examine how the population captured by the revised measure differs from that captured by the ACS-6.
  - Engage key stakeholders (e.g., members of disability subcommittee) to help communicate with data users about the change.
  - Other agencies will need to address the implications of this change for their own surveys and programs.

# Thank You

- Questions/comments?
- This project was made possible by the efforts of many, including:
  - Census Bureau staff in the American Community Survey Office, Application Development and Services Division, Center for Behavioral Science Methods, Decennial Information Technology Division, Decennial Statistical Studies Division, Field Division, National Processing Center, Population Division, and Social, Economic, and Housing Statistics Division.
  - Representatives from other agencies in the federal statistical system serving on OMB's Interagency Working Group for the ACS and the topical subcommittees formed by the Working Group for each topic tested in the 2022 ACS Content Test.
  - Staff in OMB's Statistical and Science Policy Office.
- For additional comments or questions, please contact:
  - Sharon Stern (Assistant Division Chief for Employment Characteristics, Social, Economic, and Housing Statistics Division, U.S. Census Bureau) at [Sharon.M.Stern@census.gov](mailto:Sharon.M.Stern@census.gov).



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# Appendix

# Wording Differences: Hearing and Seeing

## Control Version

**18** a. Is this person deaf or does he/she have serious difficulty hearing?

Yes

No

b. Is this person blind or does he/she have serious difficulty seeing even when wearing glasses?

Yes

No

## Differences in Test Version

- Switched order of ‘Hearing’ and ‘Seeing’ questions.
- Used graded scale answer choices.
- Removed word “serious”, and other wording adjustments to pick up a range of difficulties.
- Added the words “even if using a hearing aid” to the hearing question.

## Test Version

**18** a. Does this person have difficulty seeing, even if wearing glasses?

No difficulty

Some difficulty

A lot of difficulty

Cannot do at all

b. Does this person have difficulty hearing, even if using a hearing aid?

No difficulty

Some difficulty

A lot of difficulty

Cannot do at all

# Wording Differences: Cognition, Ambulation, Self-Care, and Communication

## Control Version

**19** a. Because of a physical, mental, or emotional condition, does this person have serious difficulty concentrating, remembering, or making decisions?

- Yes  
 No

b. Does this person have serious difficulty walking or climbing stairs?

- Yes  
 No

c. Does this person have difficulty dressing or bathing?

- Yes  
 No

## Test Version

**19** a. Does this person have difficulty walking or climbing steps?

- No difficulty  
 Some difficulty  
 A lot of difficulty  
 Cannot do at all

b. Does this person have difficulty remembering or concentrating?

- No difficulty  
 Some difficulty  
 A lot of difficulty  
 Cannot do at all

c. Does this person have difficulty with self-care, such as washing all over or dressing?

- No difficulty  
 Some difficulty  
 A lot of difficulty  
 Cannot do at all

d. Using his or her usual language, does this person have difficulty communicating, for example understanding or being understood?

- No difficulty  
 Some difficulty  
 A lot of difficulty  
 Cannot do at all

## Differences in Test Version

- Switched order of ‘Cognition’ and ‘Ambulation’ questions.
- Used graded scale answer choices.
- Added “Communication” question.
- Removed word “serious” to pick up a range of difficulties.
- Cognition question: Removed “preamble” and reference to “making decisions”.

# Wording Differences: Independent Living

## Control Version

**20** Because of a physical, mental, or emotional condition, does this person have difficulty doing errands alone such as visiting a doctor's office or shopping?

- Yes
- No

## Differences in Test Version

- Used graded scale answer choices.

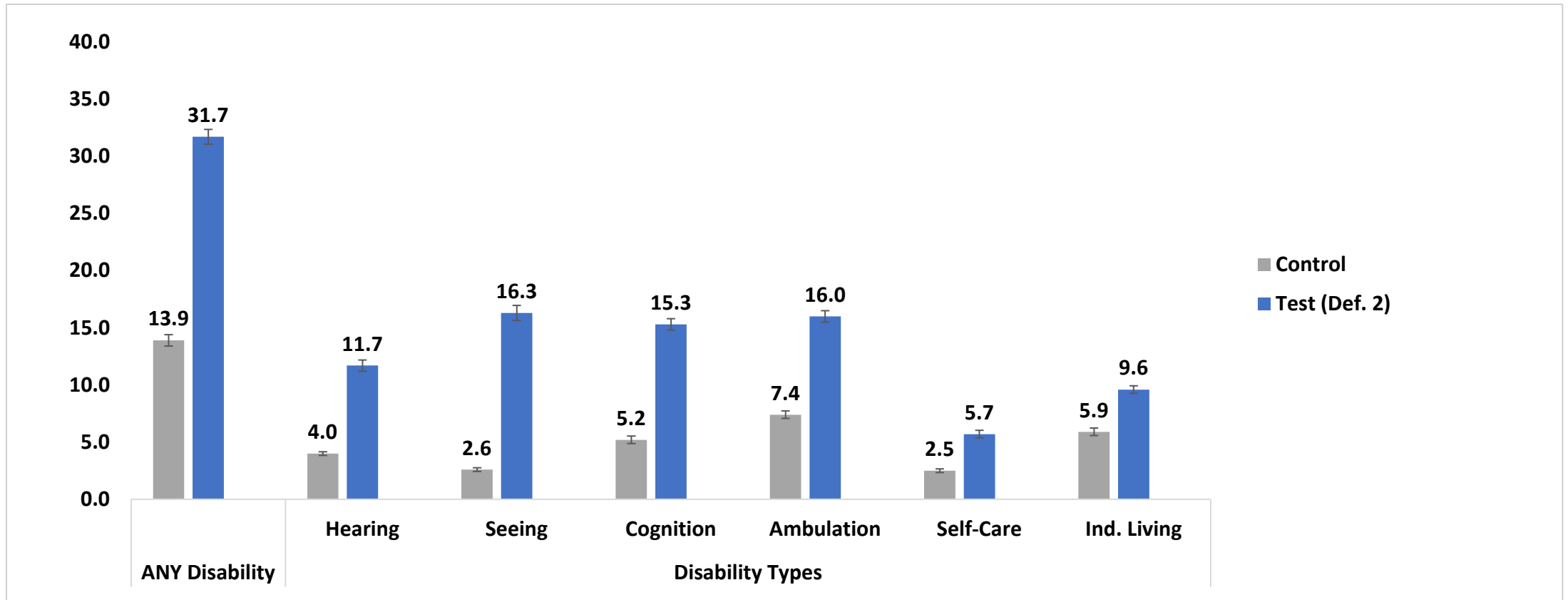
## Test Version

**20** Because of a physical, mental, or emotional condition, does this person have difficulty doing errands alone such as visiting a doctor's office or shopping?

- No difficulty
- Some difficulty
- A lot of difficulty
- Cannot do at all

# Field Test: Definition 2

## Disability Estimates by Disability Type

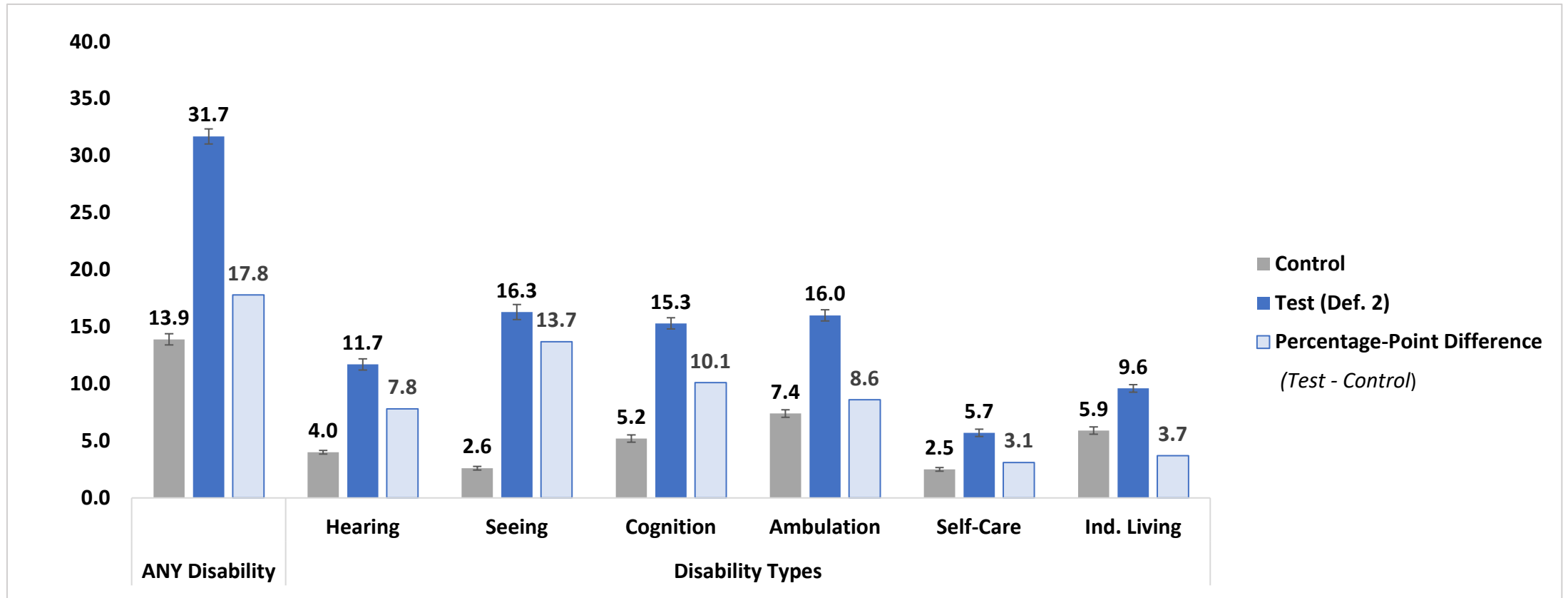


Source: U.S. Census Bureau, 2022 American Community Survey Content Test.

Note: All percent comparisons are nominal. We did not statistically test differences in percentages between disability types. Minor additive discrepancies are due to rounding.

# Field Test: Definition 2

## Disability Estimates by Disability Type

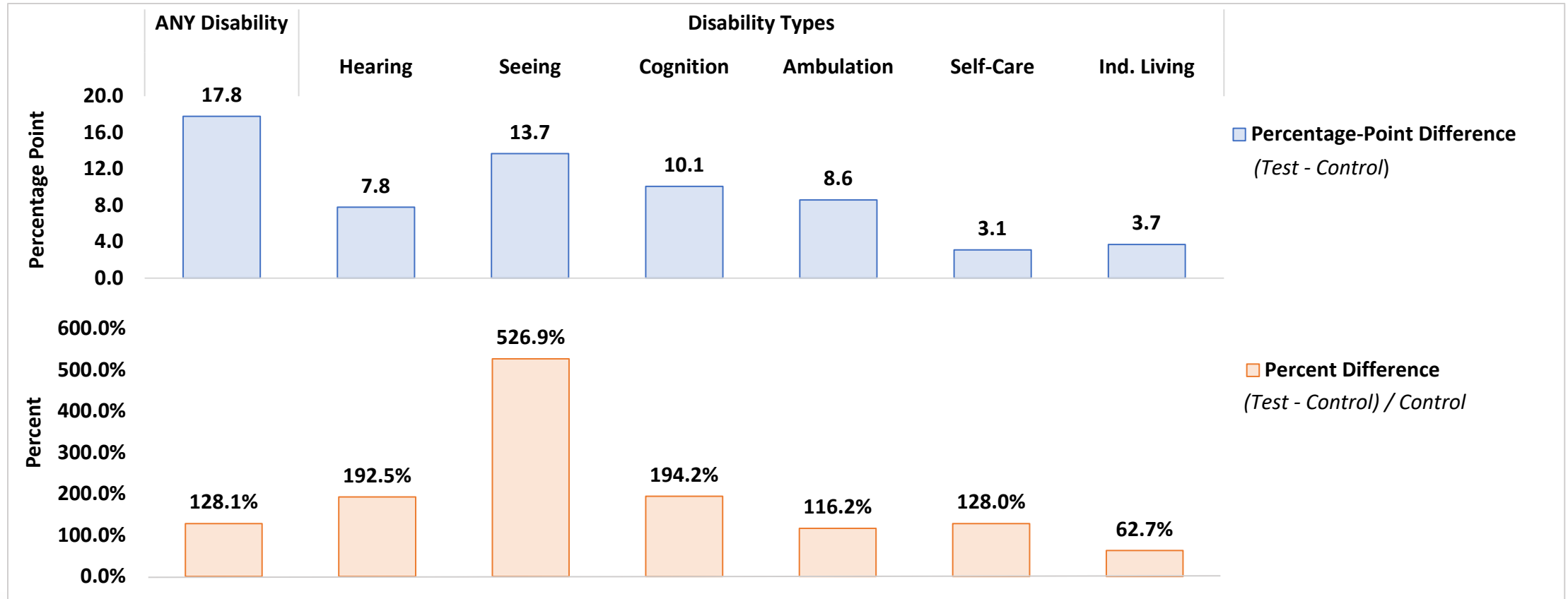


Source: U.S. Census Bureau, 2022 American Community Survey Content Test.

Note: All percent comparisons are nominal. We did not statistically test differences in percentages between disability types. Minor additive discrepancies are due to rounding.

# Field Test: Definition 2

## Differences by Disability Type



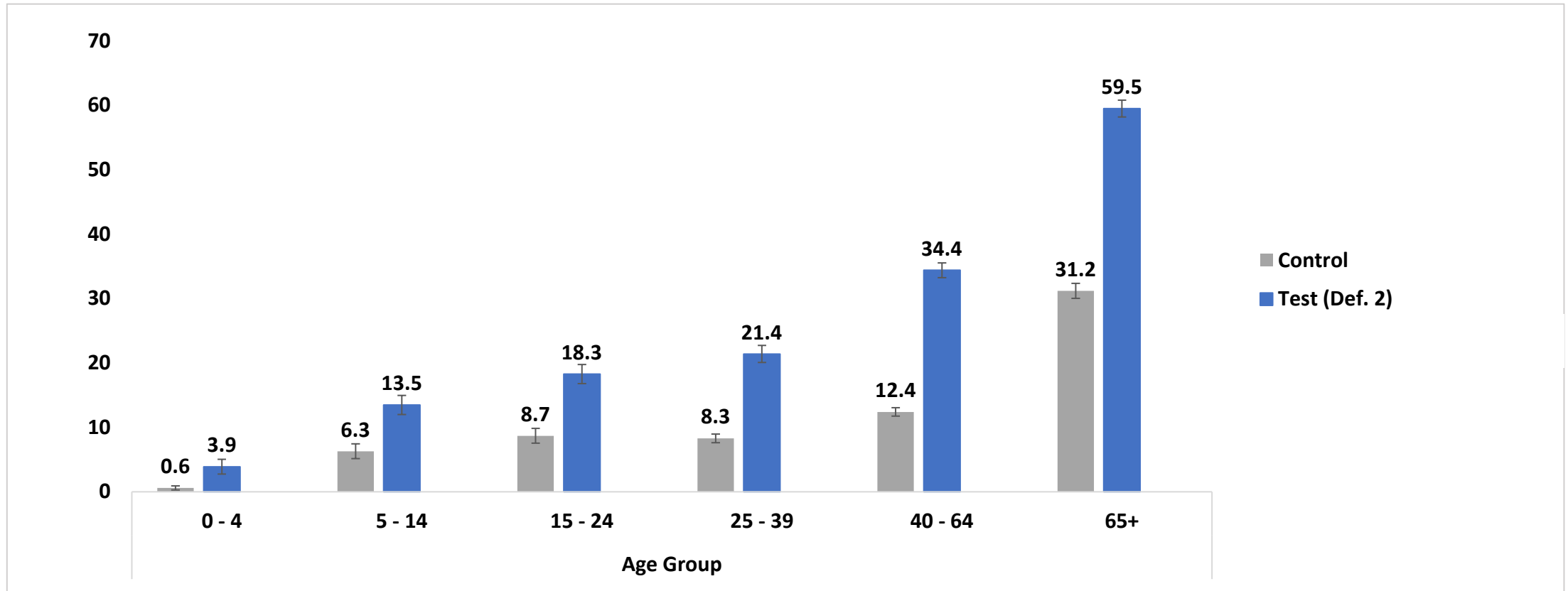
Source: U.S. Census Bureau, 2022 American Community Survey Content Test.

Note: All percent comparisons are nominal. We did not statistically test differences in percentages between disability types.



# Field Test: Definition 2

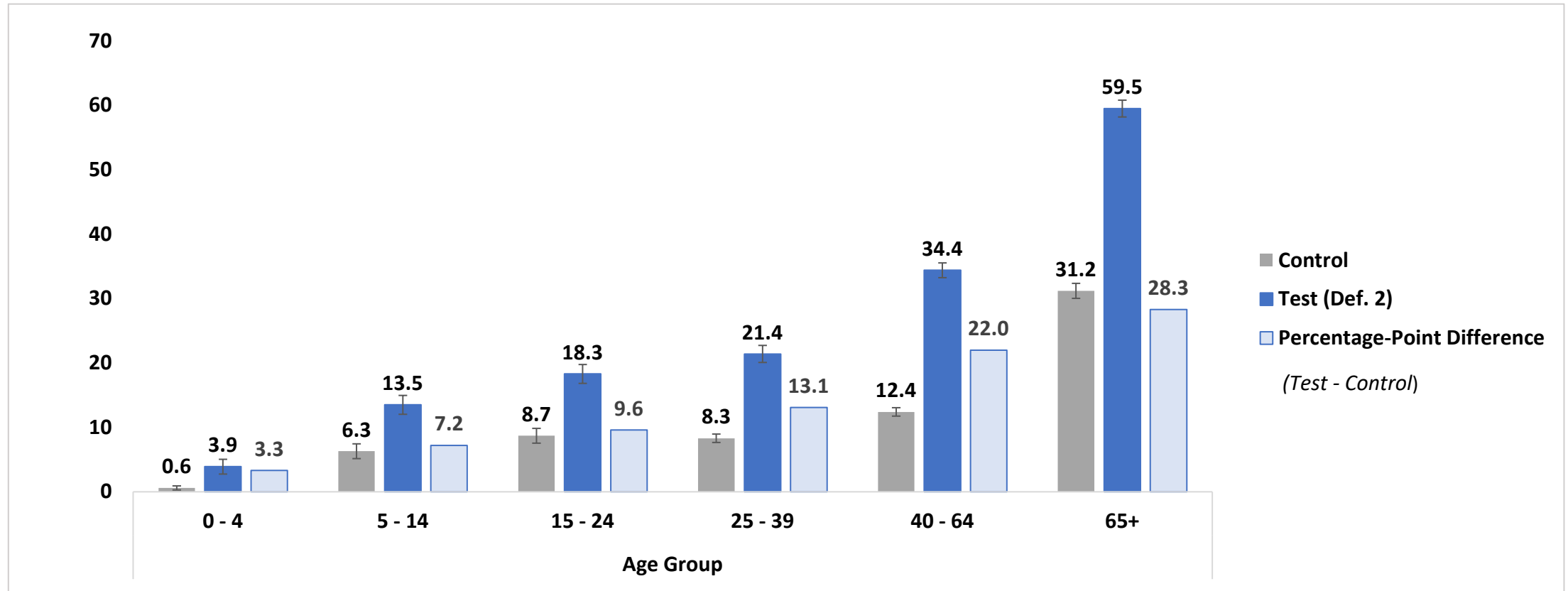
## Disability Estimates by Age



Source: U.S. Census Bureau, 2022 American Community Survey Content Test.

Note: All percent comparisons are nominal. We did not statistically test differences in percentages between age groups.

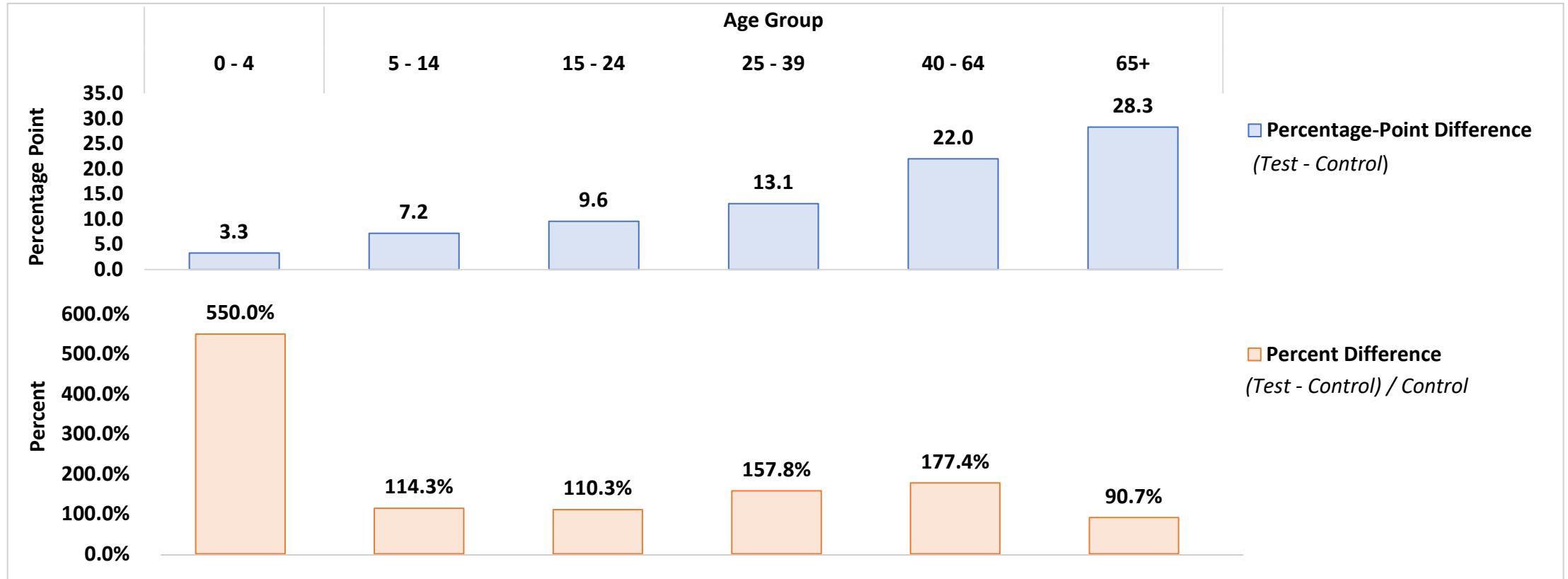
# Field Test: Definition 2 Disability Estimates by Age



Source: U.S. Census Bureau, 2022 American Community Survey Content Test.

Note: All percent comparisons are nominal. We did not statistically test differences in percentages between age groups.

# Field Test: Definition 2 Differences by Age Group



Source: U.S. Census Bureau, 2022 American Community Survey Content Test.

Note: All percent comparisons are nominal. We did not statistically test differences in percentages between age groups.