Conceptualizing Disability: An Evaluation of Differences Between the American Community Survey and Washington Group Short Set Questions*

James M. Dahlhamer
Julie D. Weeks
Aaron Maitland
Jennifer H. Madans

Health Survey Research Methods Conference
Williamsburg, VA
March 4-7, 2020

* The analysis presented here is preliminary.

Background/Context

- American Community Survey (ACS) and Washington Group (WG) Short Set on Functioning questions both appeared on the National Health Interview Survey (NHIS) from 2010 through 2017
- In 2011 and 2012, both sets of questions were asked of a subset of adults
- Rare opportunity to assess the overlap or agreement in responses to two sets of disability questions

Research Questions

- What is the level of agreement between the ACS and WG disability measures?
- What factors are associated with non-agreement between the ACS and WG disability measures?
  - Sociodemographics
  - Health status
  - Interview process

National Health Interview Survey (NHIS)

- Multi-purpose household health survey
- In-person, CAPI interview (telephone follow-up, if necessary)
- Three main interview modules:
  - ***Family*** (ACS)
  - Sample child
  - ***Sample adult*** (WG)
- Interviews conducted in ~35,000 households each year

Comparing the Measures (1)

Vision

ACS: Are you blind or do you have **serious difficulty seeing** even when wearing glasses?

WG: Do you have **difficulty seeing**, even if wearing glasses?

Hearing

ACS: Are you deaf or do you have **serious difficulty hearing**?

WG: Do you have **difficulty hearing**, even if using a hearing aid?

Mobility

ACS: Do you have **serious difficulty walking or climbing stairs**?

WG: Do you have **difficulty walking or climbing stairs**?

Cognition

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

WG: Do you have **difficulty remembering or concentrating**?

Comparing the Measures (2)

Self Care

ACS: Do you have **difficulty dressing or bathing**?

WG: Do you have **difficulty with self-care** such as washing all over or dressing?

ACS Response Options

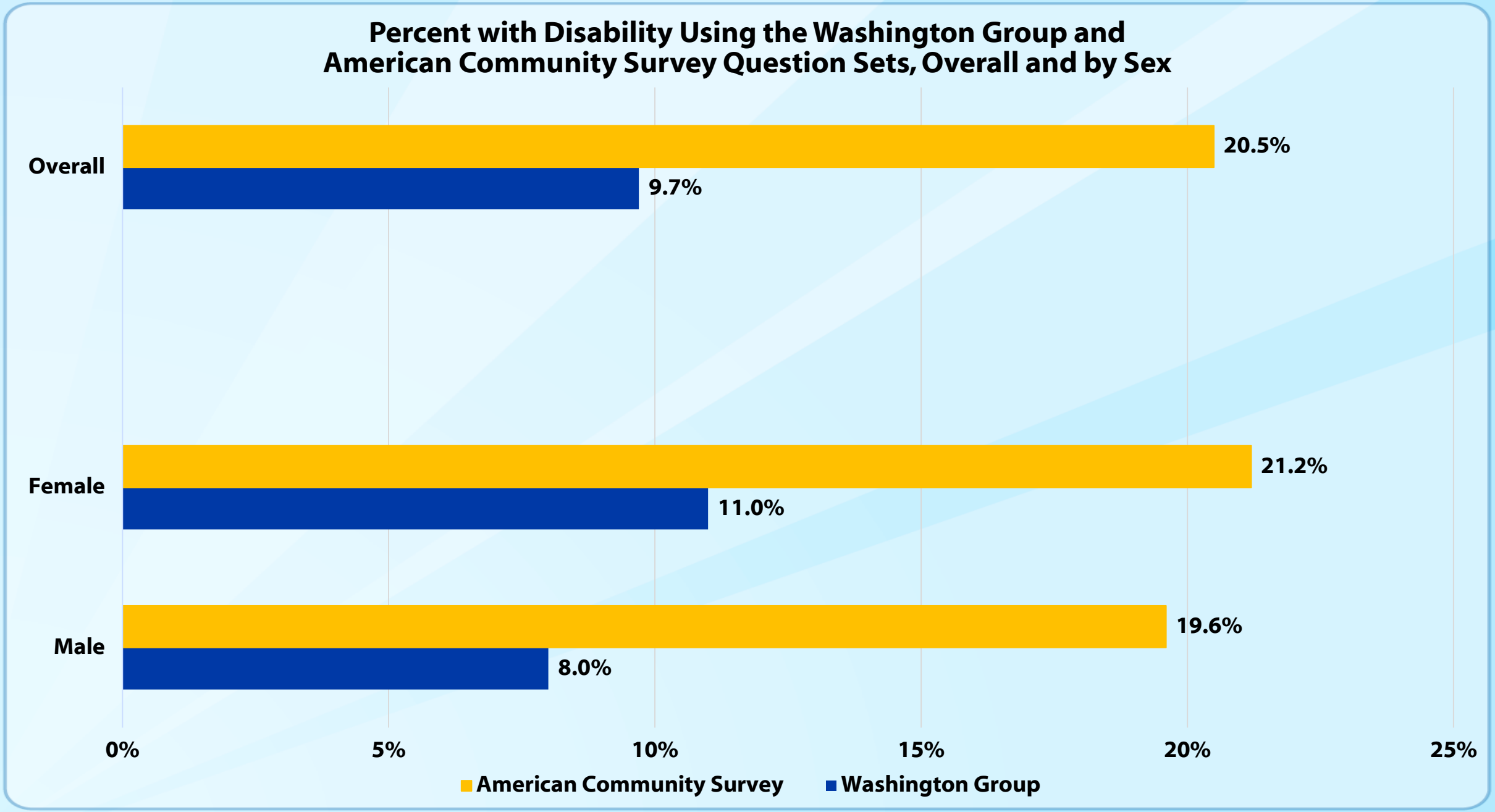
1. Yes
2. No

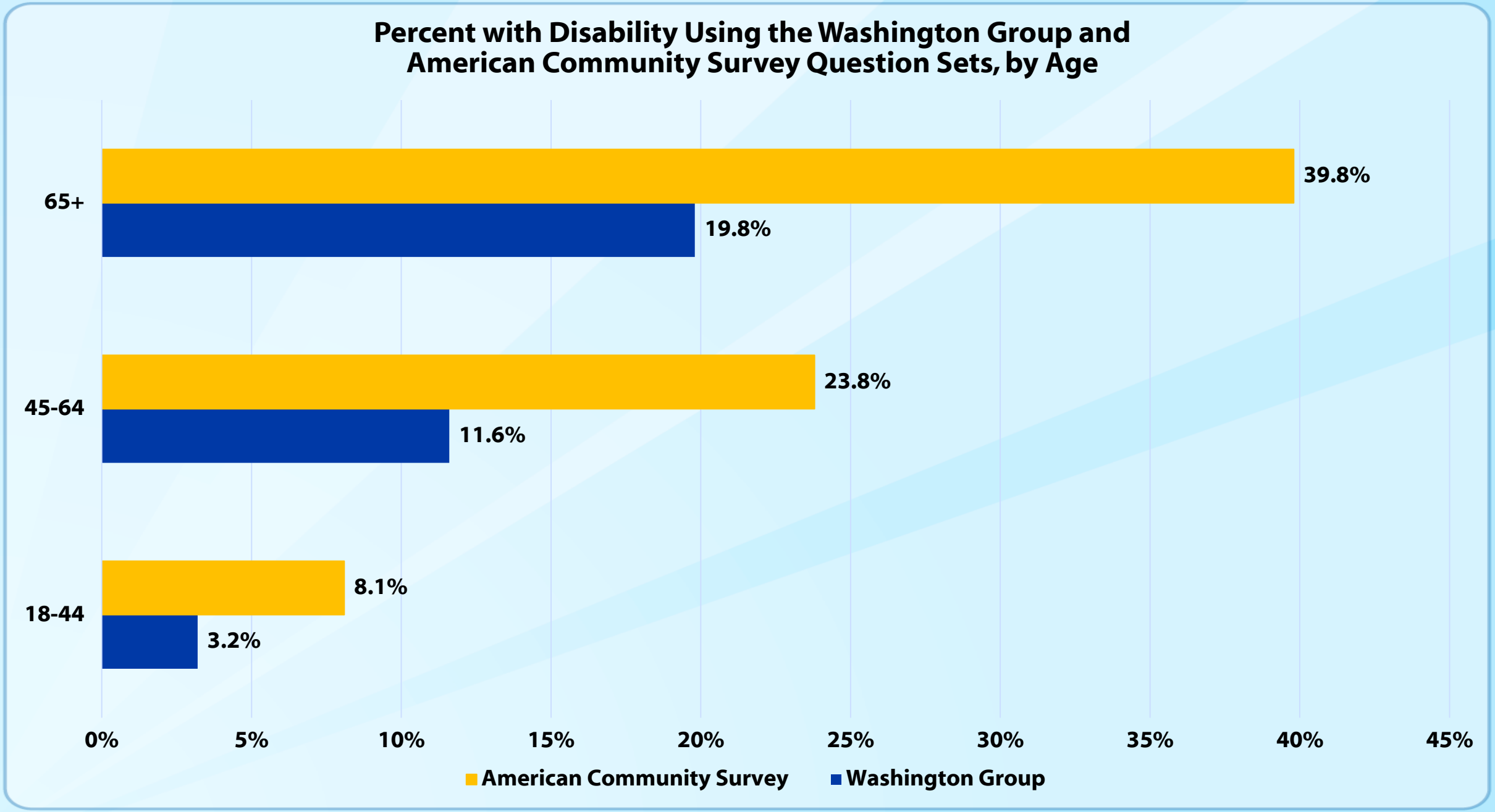
WG Response Options

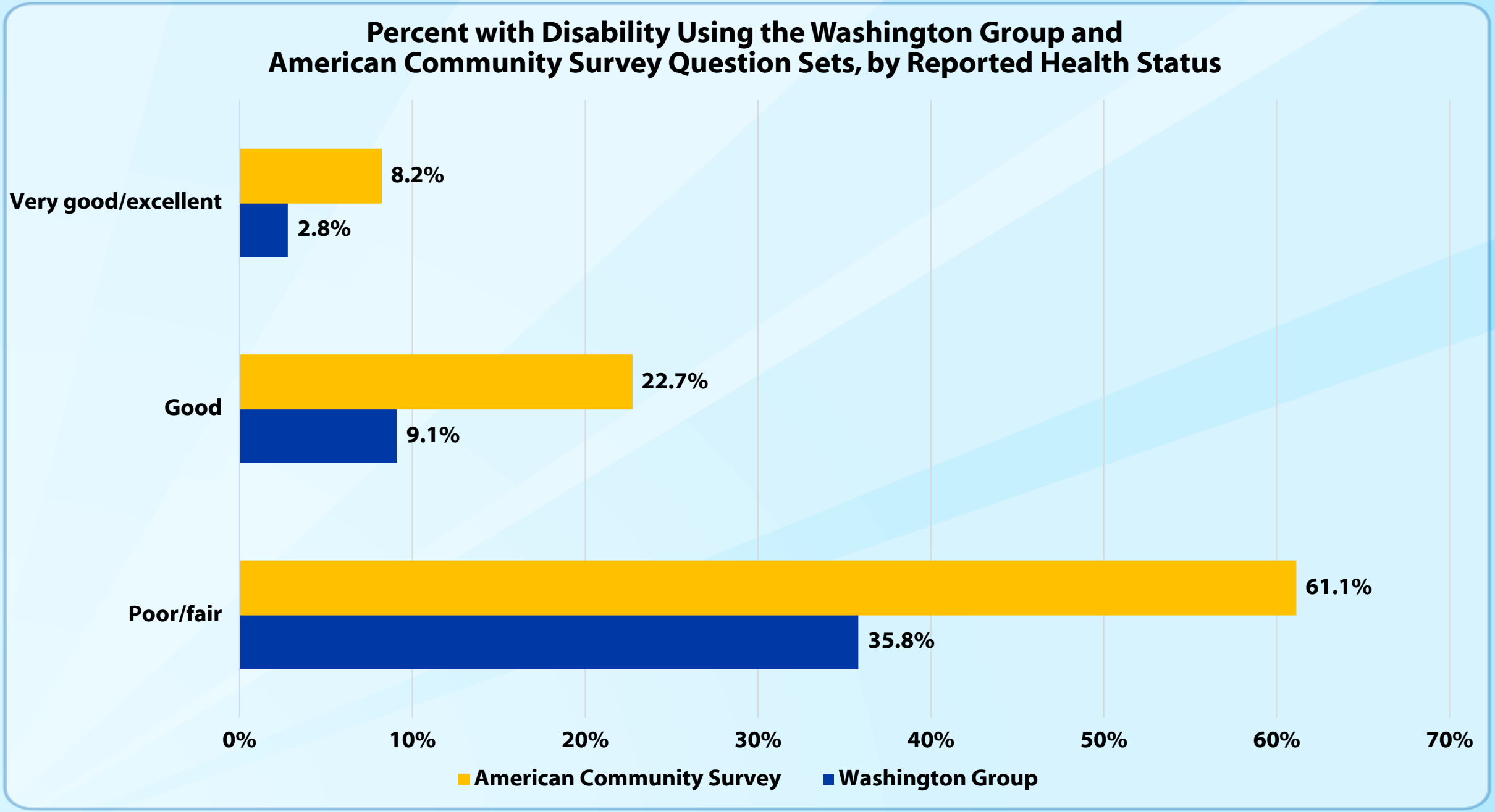
1. No difficulty
2. Some difficulty
3. A lot of difficulty
4. Cannot do at all/unable to do

Data/Methods (1)

- Data collected from 17,985 sample adults who answered both the ACS and WG questions (2011-2012 NHIS)
- Research Question 1: Overall agreement between ACS and WG disability indicators based on the five common domains
  - For ACS, anyone who answers **yes** in any domain is considered to have a functional disability
  - For WG, anyone who answers **a lot of difficulty or cannot do at all/unable to do** in any domain is considered to have a functional disability
  - Overall agreement; positive agreement; negative agreement; kappa; prevalence adjusted, bias adjusted kappa (PABAK)
- All analyses are unweighted


Percent with Disability Using the Washington Group and American Community Survey Question Sets, Overall and by Sex
Overall
20.5%
9.7%
Female
21.2%
11.0%
Male
19.6%
8.0%
0%
5%
10%
15%
20%
25%
American Community Survey
Washington Group


Percent with Disability Using the Washington Group and American Community Survey Question Sets, by Age
65+
39.8%
19.8%
45-64
23.8%
11.6%
18-44
8.1%
3.2%
0%
5%
10%
15%
20%
25%
30%
35%
40%
45%
American Community Survey
Washington Group


Percent with Disability Using the Washington Group and American Community Survey Question Sets, by Reported Health Status
Very good/excellent
8.2%
2.8%
Good
22.7%
9.1%
Poor/fair
61.1%
35.8%
0%
10%
20%
30%
40%
50%
60%
70%
American Community Survey
Washington Group

Characteristics of Persons with Disability as Defined Using the Washington Group and American Community Survey Question Sets

	Washington Group		American Community Survey	
	%	Standard Error	%	Standard Error
Age				
18-44	14.2*	0.86	17.2*	0.70
45-64	40.6	1.28	39.7	0.86
65+	45.2	1.34	43.1	0.89
Female	65.9*	1.14	60.3*	0.81
Employed (18-64)	24.9*	1.47	34.4*	1.06
Reported Health Status				
Poor/fair	57.6*	1.25	46.7*	0.88
Good	25.8*	1.03	30.6*	0.76
Very good/excellent	16.6*	0.87	22.7*	0.69

* $p < .05$

Characteristics of Persons with Disability as Defined Using the Washington Group and American Community Survey Question Sets

	Washington Group		American Community Survey	
	%	Standard Error	%	Standard Error
Age				
18-44	14.2*	0.86	17.2*	0.70
45-64	40.6	1.28	39.7	0.86
65+	45.2	1.34	43.1	0.89
Female	65.9*	1.14	60.3*	0.81
Employed (18-64)	**24.9***	**1.47**	**34.4***	**1.06**
Reported Health Status				
Poor/fair	57.6*	1.25	46.7*	0.88
Good	25.8*	1.03	30.6*	0.76
Very good/excellent	16.6*	0.87	22.7*	0.69

* $p < .05$

Characteristics of Persons with Disability as Defined Using the Washington Group and American Community Survey Question Sets

	Washington Group		American Community Survey	
	%	Standard Error	%	Standard Error
Age				
18-44	14.2*	0.86	17.2*	0.70
45-64	40.6	1.28	39.7	0.86
65+	45.2	1.34	43.1	0.89
Female	65.9*	1.14	60.3*	0.81
Employed (18-64)	24.9*	1.47	34.4*	1.06
Reported Health Status				
Poor/fair	**57.6***	**1.25**	**46.7***	**0.88**
Good	25.8*	1.03	30.6*	0.76
Very good/excellent	16.6*	0.87	22.7*	0.69

* $p < .05$

Overall Agreement

ACS Disability Indicator	WG Disability Indicator		
	Yes	**No**	**Total**
Yes	**1,557 (8.66%)**	2,125 (11.82%)	3,682
No	195 (1.08%)	**14,108 (78.44%)**	14,303
Total	1,752	16,233	17,985

Overall agreement:	.871
Positive agreement:	.573
Negative agreement:	.924
Kappa:	.508 (moderate)
Prevalence-adjusted bias-adjusted kappa:	.742 (substantial)

Overall Agreement

ACS Disability Indicator	WG Disability Indicator		
	Yes	No	Total
Yes	1,557 (8.66%)	**2,125 (11.82%)**	3,682
No	**195 (1.08%)**	14,108 (78.44%)	14,303
Total	1,752	16,233	17,985

Overall agreement:	.871
Positive agreement:	.573
Negative agreement:	.924
Kappa:	.508 (moderate)
Prevalence-adjusted bias-adjusted kappa:	.742 (substantial)

Data/Methods (2)

- Research Question 2: Factors associated with non-agreement
  - Binomial logistic regression
    - Agreement (ref)
  - Multinomial logistic regression
    - Agreement (ref): ACS=No/WG=No, ACS=Yes/WG=Yes
    - **ACS=Yes / WG=No**
    - **ACS=No / WG=Yes**
    - Covariates:

Sociodemographics:	Age	Sex	Race/ethnicity
	Education	Employment status	Poverty status
Health status:	Cognitive difficulties	Reported health status	Multiple chronic conditions
	Serious psychological distress		
Interview process:	Mode of interview	Language of interview	Speeding

Adjusted Odds Ratios from Binomial and Multinomial Logistic Regressions of Non-Agreement (n=17,743) (1)

	Non-agreement (n=2,268) vs. Agreement	ACS=No, WG=Yes (n=191) vs. Agreement	ACS=Yes, WG=No (n=2,077) vs. Agreement
Age (Ref=18-44)			
45-64	1.59*	1.23	1.63*
65+	2.06*	1.41	2.15*
Sex (Ref=male)			
Female	.87*	1.50*	.83*
Race and Ethnicity (Ref=Non Hispanic white)			
Hispanic	.89	1.14	.86
Non-Hispanic black	.94	1.13	.93
Non-Hispanic other	.70*	.91	.69*

* $p < .05$

Adjusted Odds Ratios from Binomial and Multinomial Logistic Regressions of Non-Agreement (n=17,743) (2)

	Non-agreement (n=2,268) vs. Agreement	ACS=No, WG=Yes (n=191) vs. Agreement	ACS=Yes, WG=No (n=2,077) vs. Agreement
Education (Ref=Bachelors+)			
Less than high school	1.47*	2.65*	1.40*
High school/GED	1.22*	1.70	1.19*
Some college/AA degree	1.36*	2.03*	1.32*
Employment status (Ref=Employed)			
Not employed	1.64*	1.49*	1.65*
Poverty status (Ref=4.00+)			
In poverty	1.31*	1.13	1.33*
1.00 - <2.00	1.17*	0.96	1.19*
2.00 - <4.00	1.11	1.23	1.10

* $p < .05$

Adjusted Odds Ratios from Binomial and Multinomial Logistic Regressions of Non-Agreement (n=17,743) (3)

	Non-agreement (n=2,268) vs. Agreement	ACS=No, WG=Yes (n=191) vs. Agreement	ACS=Yes, WG=No (n=2,077) vs. Agreement
Cognitive difficulty (Ref=No)			
Yes	1.88*	.52	2.03*
Serious psychological distress in past 30 days (Ref=No)			
Yes	1.12	1.64	1.07
Reported health status (Ref=very good/ excellent)			
Poor/fair	2.58*	1.84*	2.67*
Good	2.00*	1.81*	2.02*
Multiple chronic conditions (Ref=No)			
Yes	1.51*	2.03*	1.47*

* $p < .05$

Adjusted Odds Ratios from Binomial and Multinomial Logistic Regressions of Non-Agreement (n=17,743) (4)

	Non-agreement (n=2,268) vs. Agreement	ACS=No, WG=Yes (n=191) vs. Agreement	ACS=Yes, WG=No (n=2,077) vs. Agreement
Language of interview (Ref=English)			
Other	.71*	1.57	.61*
Mode of interview (Ref=Both face-to-face)			
Both telephone	.93	1.01	.92
Other	.88	.86	.88
Speeding (Ref=No speeding)			
Speeding on WG	.67*	12.03*	.40*
Speeding on ACS	.22*	1.46	.19*
Speeding on both	1.40*	5.23*	1.31*

* $p < .05$

Summary (1)

- Agreement between the two disability indicators is fairly high and driven largely by negative agreement
- Odds of being classified as disabled by the ACS indicator, but not the WG indicator, increases with age and cognitive difficulty
- Generally, overall non-agreement is higher for those with lower socio-economic status and those in worse health
- Methodological factors such as language of interview and speeding through the questions were also related to non-agreement

Summary (2)

- Majority of respondents *agree* on both measures
- Majority of respondents, and the population in general, report *no disability* using both questions sets with their respective recommended disability cut-offs
- Evidence suggests that the two question sets capture the same underlying functional dimensions
- The ACS set identifies a larger population *with disability* (any 'yes') than the WG set (any 'a lot of difficulty' or 'unable'), using the recommended disability cut-offs

Next Steps (1)

- The ACS set identifies a larger population *with disability* (any 'yes') than the WG set (any 'a lot of difficulty' or 'unable')
  - Possibly due to how respondents interpret 'serious' in the ACS questions?

ACS Disability Indicator	WG Disability Indicator			
	Yes	Some Difficulty	No Difficulty	Total
Yes	1,557 (8.66%)	1,801 (10.01%)	324 (1.80%)	3,682
No	195 (1.08%)	3,049 (16.95%)	11,059 (61.49%)	14,303
Total	1,752	4,850	11,383	17,985

Next Steps (2)

- To what extent are the disability measures correlated with other measures that they are theoretically predicted to correlate with?

Odds Ratios from Bivariate Logistic Regressions of Various Outcomes by Disability Measure

Outcome	ACS Measure (yes vs. no)	WG Measure (yes vs. no)	Trichotomous WG Measure	
			Some difficulty (vs. no difficulty)	Disabled (vs. no difficulty)
Unemployed (18-64)	5.40	7.43	1.97	8.94
Less than high school (25+)	2.47	2.64	1.75	3.22
Rent home	1.18	1.46	0.89	1.41
In poverty	1.73	1.82	1.18	1.91
Poor/fair health	10.49	10.83	4.99	21.94

Thank you!

jdahlhamer@cdc.gov