Internet adoption among U.S. adults in 2003 and 2008:
Diffusion patterns and digital disparities

Philip Massey, PhD, MPH
Assistant Professor, Department of Community Health and Prevention
Drexel University School of Public Health

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Presentation aims

- Demonstrate <u>data integration</u> across HINTS iterations

- Describe <u>trends</u> in internet use among the general U.S. adult population

- Examine factors associated with internet use <u>between 2003 & 2008</u>

Pervasiveness of the internet

- Internet use nearly ubiquitous
  - 80% of U.S. adult population (Pew, 2012)

- Increase in internet use over past 15 years

- Internet use associated with:
  - Younger age, greater education, higher income, current employment

- What factors associated with <u>changes</u> in internet use between 2003 & 2008?

Data source: HINTS

- Cross-sectional survey
  - Probability sample, nationally representative, oversampling of minority populations
- Will use data from 2003 & 2008 waves

	Overall response	Screener response	Interview response	Total number of respondents
HINTS 2003	33%	55%	60%	6,369
HINTS 2005	21%	34%	61%	5,586
HINTS 2008				
RDD	24%	42%	57%	4,081
Address	31%	40%	77%	3,593

HINTS 2008 mode comparisons

	Internet use (%)	SE (%)	95% CI	
Combined weight				
Mail	71.91	0.79	*70.32*	*73.51*
Telephone	64.59	1.11	*62.35*	*66.83*
Mode-specific weight				
Mail	71.13	0.88	*69.36*	*72.90*
Telephone	66.28	1.07	*64.13*	*68.44*
Weighted study sub-population				
Mail	74.09	0.97	*72.14*	*76.04*
Telephone	69.24	1.20	*66.84*	*71.65*

HINTS data comparisons

Comparing internet use by data source
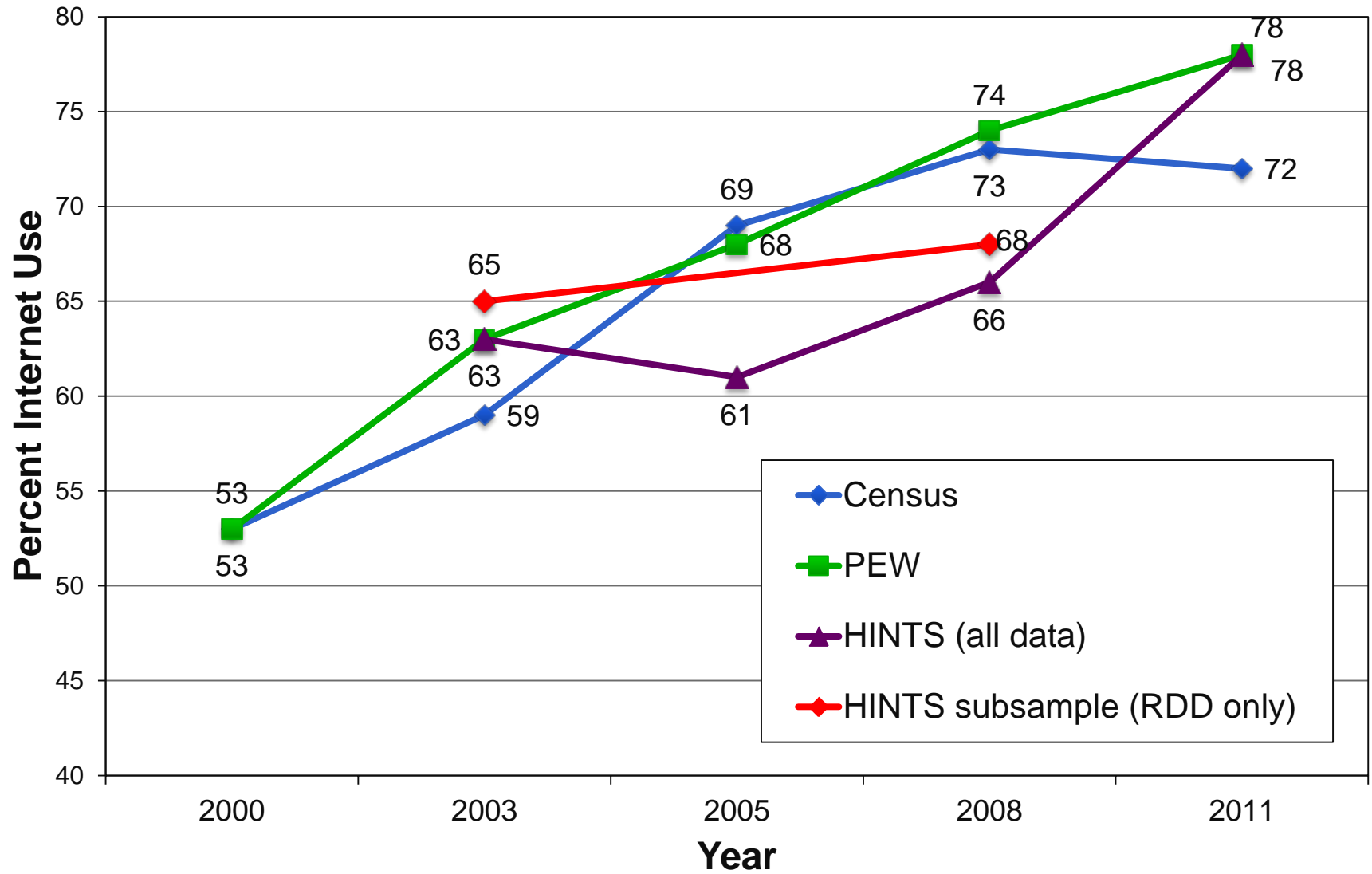
Changes in weighted internet use by sample characteristic, HINTS 2003 & 2008, N=8495

|	Internet use (weighted %)				% difference
	2003 [1]	SE	2008 [2]	SE	2008-2003
Overall internet use	64.8	0.8	68.3	1.2	3.5
Age group					
18-34	79.3	1.3	80.1	2.7	0.8
35-49	73.2	1.0	76.0	1.5	2.9
50-64	59.5	1.5	67.5	1.9	8.0**
65-74	28.1	1.6	43.6	2.7	15.5**
75+	18.1	2.2	16.7	2.4	-1.4
Gender					
Male	65.9	1.1	66.1	1.8	0.2
Female	63.7	0.8	70.6	1.2	6.9**
Race/ethnicity					
Non-Hispanic White	70.0	0.9	75.9	1.3	5.9**
Non-Hispanic Black	55.1	2.5	58.1	4.7	3.0
Hispanic	39.6	1.7	38.3	3.8	-1.3
Non-Hispanic Other	67.4	3.0	70.0	5.9	2.7
Education					
Less than high school	25.5	2.3	18.4	3.4	-7.1
High school graduate	51.9	1.4	58.6	2.5	6.7*
Some college	78.3	1.2	79.2	2.2	0.9
College graduate	90.9	0.6	92.2	1.0	1.4

*p<0.05; **p<0.01; [1] n=5458; [2] n=3037

Weighted multiple logistic regression on internet use with gender*age interaction, combined HINTS 2003 & 2008, N=8495

	Odds ratio	95% CI			Odds ratio	95% CI	
Survey year				**Income**			
2003	1.0			Less than $20,000	1.0		
2008	1.08	0.90	1.31	$20,000-$34,000	1.86**	1.45	2.40
Women[1]				$35,000-$49,000	3.04**	2.29	4.02
18-34	1.0			$50,000-$74,999	5.41**	4.01	7.31
35-49	0.47**	0.34	0.66	$75,000 or more	9.23**	6.92	12.32
50-64	0.26**	0.19	0.36	**Race/ethnicity**			
65-74	0.07**	0.05	0.10	Hispanic	1.0		
75+	0.02**	0.01	0.03	Non-Hispanic White	4.22**	3.25	5.48
Men[1]				Non-Hispanic Black	2.36**	1.61	3.47
18-34	1.0			Other non-Hispanic	2.45*	1.56	3.85
35-49	0.33**	0.21	0.51	**Education**			
50-64	0.12**	0.07	0.19	Less than high school	1.0		
65-74	0.05**	0.03	0.08	High school graduate	2.10**	1.59	2.77
75+	0.04**	0.02	0.06	Some college	5.52**	3.98	7.64
Men vs. Women[2]				College graduate	13.33**	9.80	18.12
18-34	1.08	0.71	1.65	**Cancer history**			
35-49	0.75	0.53	1.04	No cancer diagnosis	1.0		
50-64	0.50**	0.38	0.65	Had cancer diagnosis	0.99	0.80	1.23
65-74	0.79	0.54	1.18	**Doctor visit in past year**			
75+	1.74	1.00	3.02	None	1.0		
Urbanicity				1 time	1.28	0.92	1.77
Metro	1.0			2 to 4 times	1.49*	1.10	2.02
Rural	0.76*	0.62	0.94	More than 5	1.58**	1.22	2.05
Intercept	0.85	0.54	1.36				

[1] Odds ratio for age groups among men and women; [2] Odds ratio within age groups (reference group: women); * p<0.05; ** p<0.01; F=56.28, p<0.000

Probability of internet use, gender*age
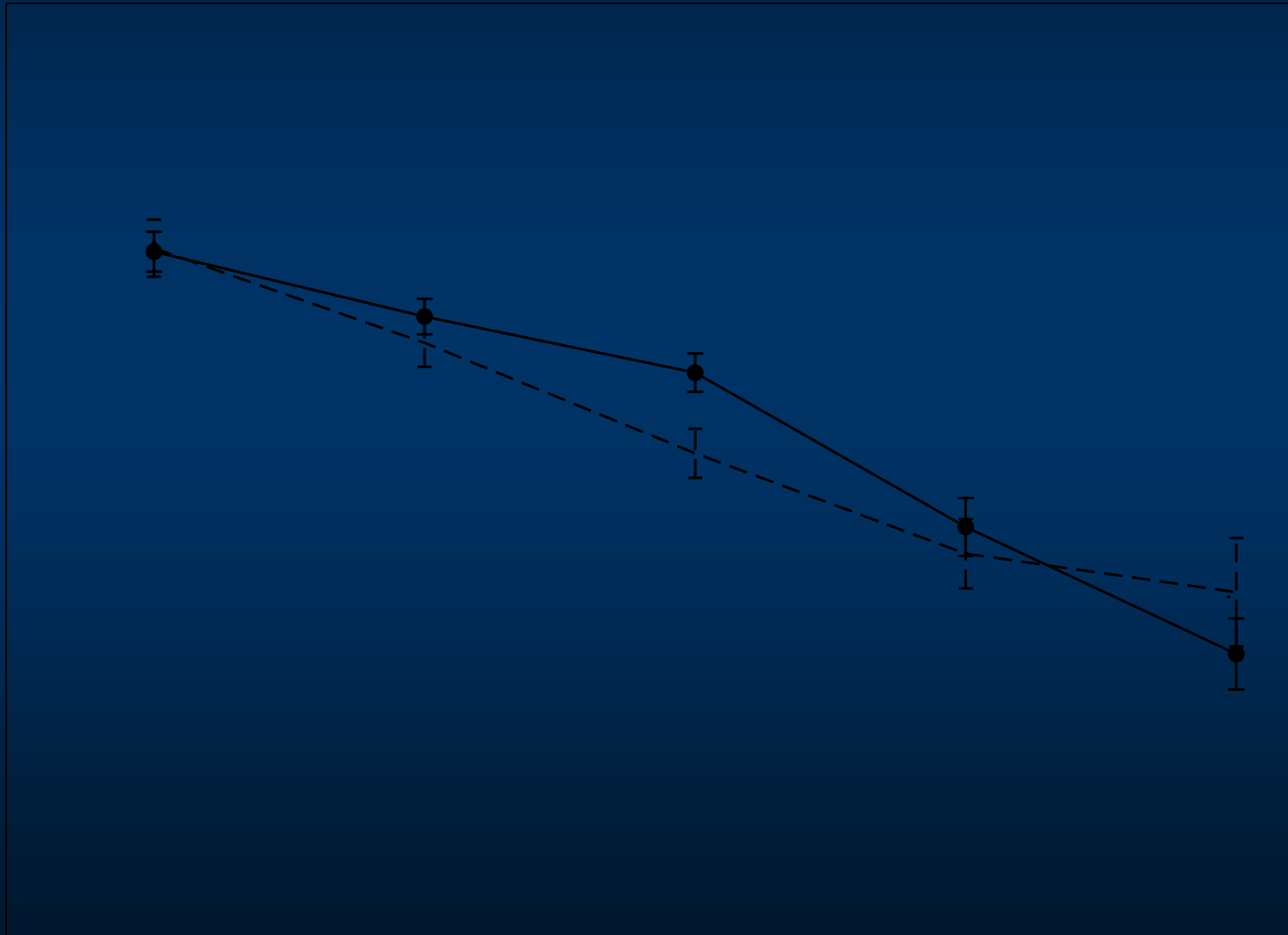
Weighted multiple logistic regression on diffusion patterns of internet use, combined HINTS 2003 & 2008, N=8495

	Main effect (2003)			Interaction (Variable * 2008)		
	Coefficient	*95% CI*		*Coefficient*	*95% CI*	
Age group (ref: 18-34)						
35-49	-0.91**	-1.13	-0.70	-0.07	-0.73	0.58
50-64	-1.78**	-2.06	-1.51	0.08	-0.62	0.78
65-74	-2.94**	-3.27	-2.61	0.19	-0.50	0.89
75+	-3.30**	-3.70	-2.91	-0.69	-1.54	0.16
Gender (ref: Women)						
Men	-0.01	-0.18	0.16	-0.59**	-0.92	-0.26
Race/ethnicity (ref: Hispanic)						
Non-Hispanic white	1.22**	0.96	1.48	0.43	-0.13	0.99
Non-Hispanic black	0.70**	0.35	1.06	0.21	-0.61	1.03
Other non-Hispanic	0.98**	0.55	1.41	-0.34	-1.24	0.56
Education (ref: Less than high school)						
High school graduate	0.57**	0.25	0.89	0.46	-0.16	1.07
Some college	1.56**	1.17	1.95	0.34	-0.33	1.02
College graduate	2.37**	2.04	2.71	0.53	-0.11	1.18
Annual income (ref: Less than $20,000)						
$20,000-$34,000	0.55**	0.31	0.80	0.17	-0.37	0.72
$35,000-$49,000	1.01**	0.68	1.33	0.30	-0.29	0.89
$50,000-$74,999	1.56**	1.26	1.86	0.33	-0.28	0.95
$75,000 or more	2.09**	1.72	2.47	0.31	-0.26	0.89
Urbanicity (ref: Metro)						
Rural	-0.40**	-0.64	-0.15	0.21	-0.25	0.67
Intercept	-1.40	-1.76	-1.03			

Controlling for: Survey year, cancer history, and number of doctor visits in the past year
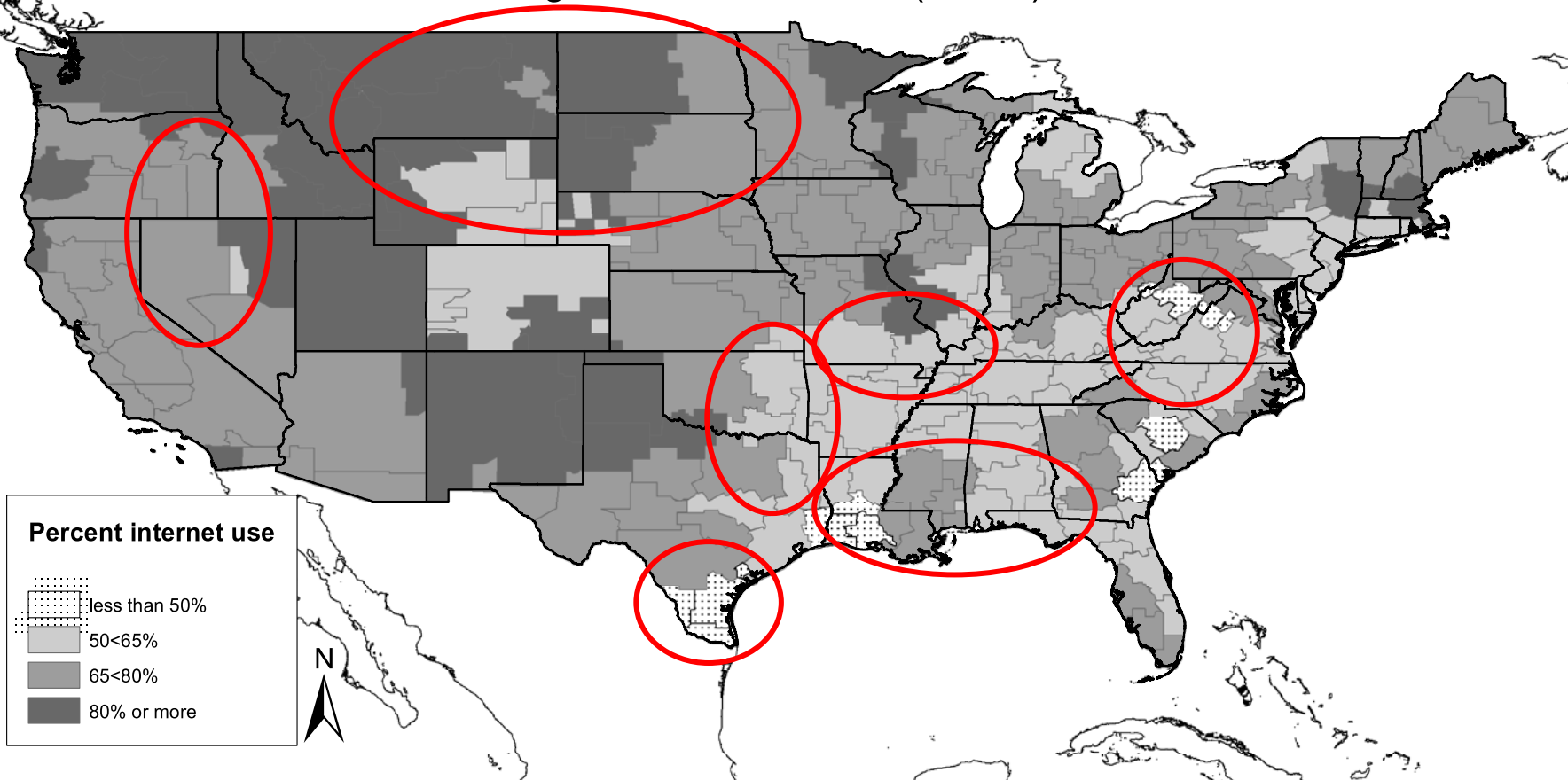*p<0.05; **p<0.01; F=49.87, p<0.000

Internet use disparities change
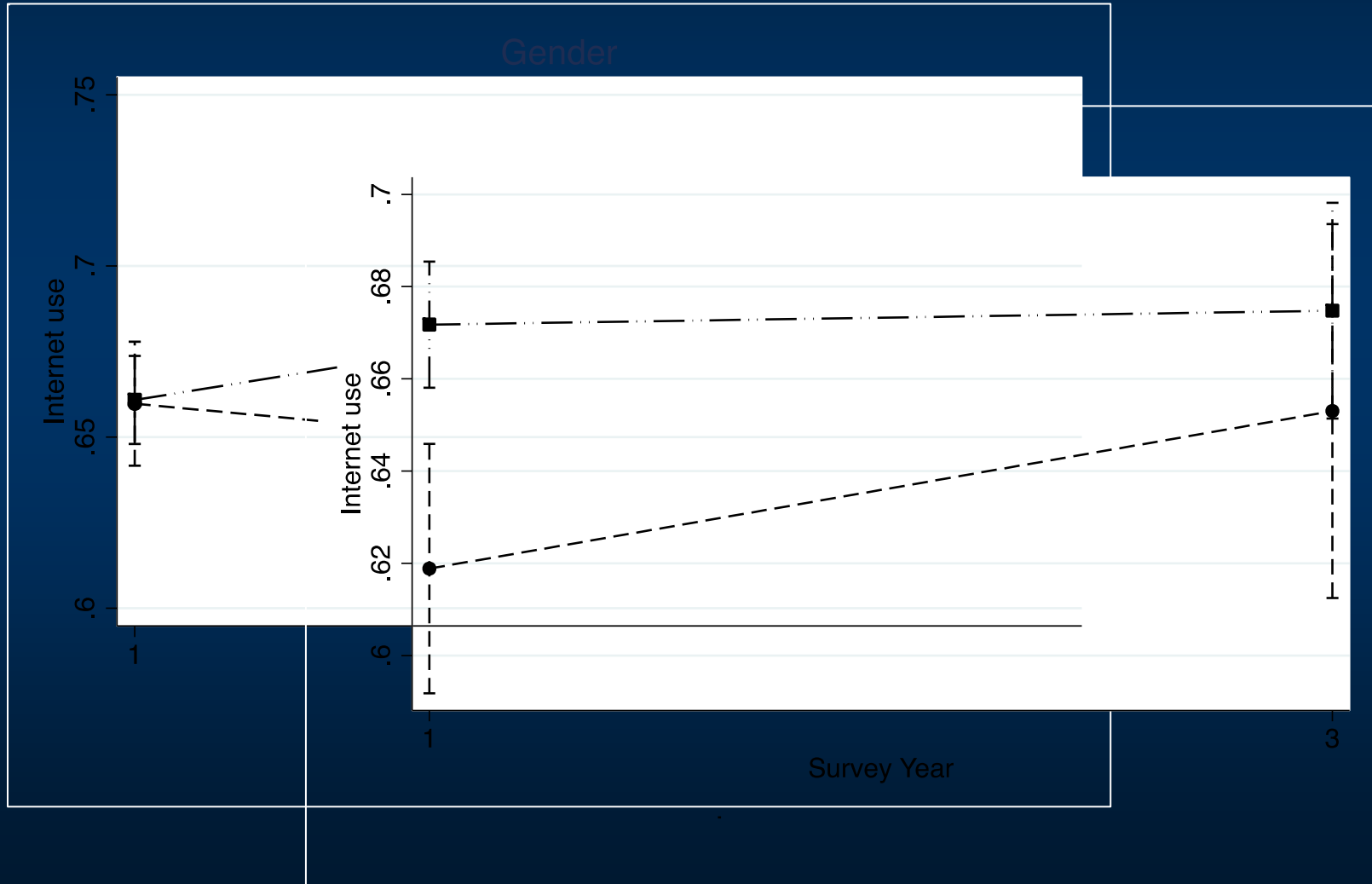
Internet use disparities persist
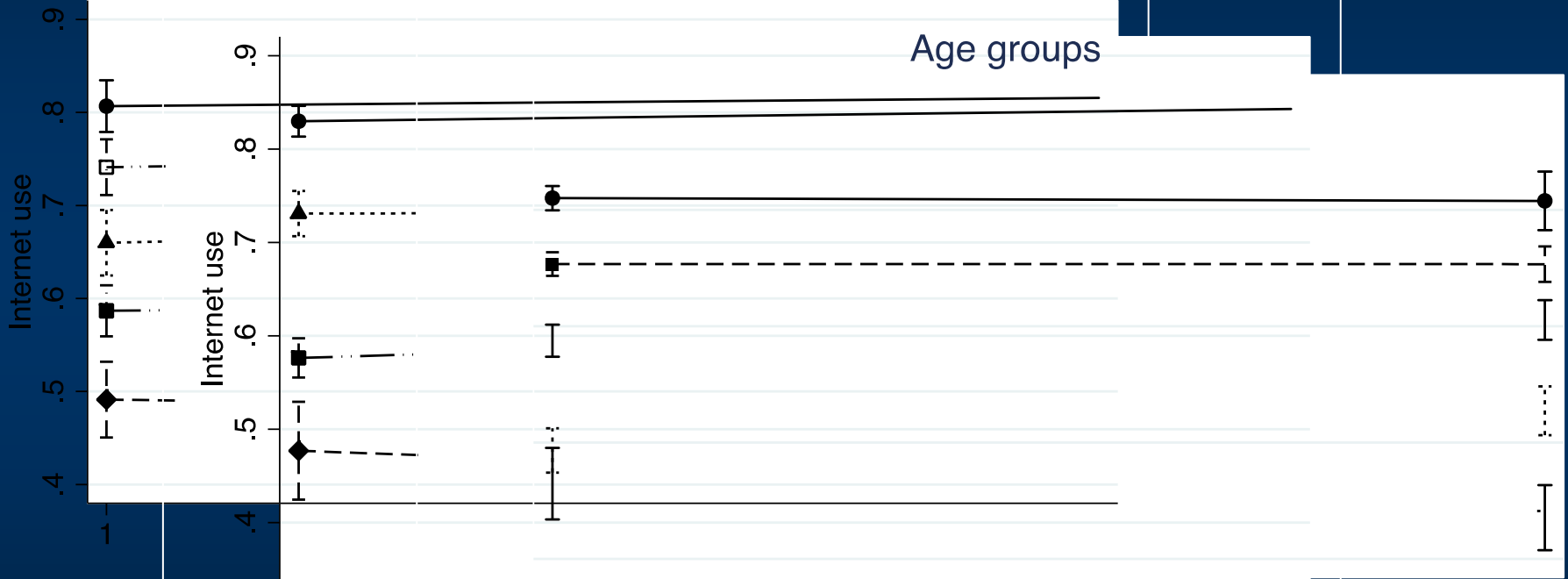
Internet use by market areas

2008 internet use among U.S. adults by designated market areas (DMAs)

Percent internet use

less than 50%
50<65%
65<80%
80% or more

N

Key Findings

- No significant change in overall internet use

- Greatest changes in internet use: "late majority adopters"

- Disparities persist over time

- Internet use among women increasing at significant rate compared to men

Strengths & Limitations

Strengths
- Nationally representative data, large sample sizes
- Integration of two data waves
- Robust methodologies
- Spatial analysis to complement regression models

Limitations
- Data challenges
- Purely descriptive
- Additional key constructs not included (i.e., digital skills, health literacy)

Future Steps

- Compare findings with other data sources (validity and reliability)
- Integrating HINTS 4
- Item consistency between iterations
- Staying relevant
- Balancing rigor with immediacy
- Examining patterns of health-related internet use
  - Electronic health records, electronic communication with provider

Thank you very much!

Philip Massey, PhD, MPH

pmm85@drexel.edu