Everything You Always Wanted to Know About Trend Analyses and Mode Effects*

* But were afraid to ask

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Overall Goals of the Training

Trend Analysis

- Demonstrate how to do analyses using separate and combined HINTS 2003, 2005 and 2007 data. Use combined data to get means

- Will demonstrate using SUDAAN code

Mode Analysis

- How to test for mode effects

- What mode effects to look for

Aims for Trend Talk

- Demonstrate how separate HINTS 2003, 2005 and 2007 data can be used to:
  - Test for differences in outcomes between survey iterations
    - Across groups or by subgroups
- Demonstrate using a combined HINTS 2003, 2005, 2007 data set to:
  - Test for differences in outcomes between survey iterations
    - Across groups or by subgroups
  - Test for differences in outcomes controlling for covariates
    - Across groups or by subgroups
  - Gain a larger sample size
    - Used to calculate means and variances
    - Most useful for variables not expected to change over time

Overview of Analyses

- Outcome for all analyses: “Have you ever looked for information about cancer from any source?”
  - HC-9 in HINTS 2003
  - CA-08 in HINTS 2005
  - HC-08 in HINTS 2007
  - Will demonstrate using RDD weights from 2007

- Covariates:
  - Agegroup (3 levels)
  - Education (4 levels)
  - Race/Ethnicity (4 levels)
  - Gender
  - Income (4 levels)
  - Hintsyear (3 levels)

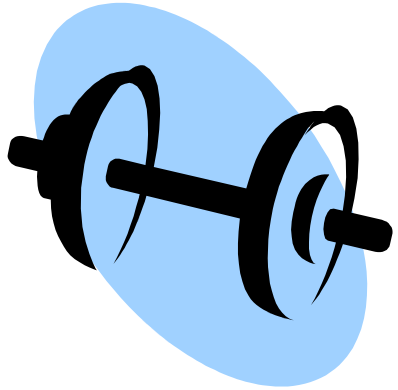
- Syntax examples
  - Exclusive use of SAS and SUDAAN
  - Other programs can be used (e.g., STATA, WesVar)

Overview (cont.)

- Techniques here are general
  - Can be used for other HINTS analyses
  - Can be used with other data sets with multiple years
- Assumptions
  - Three independent cross-sectional surveys
  - Same questions, formats, and interpretation
  - Replicate weights for all surveys are available
- References
  - Korn and Graubard (1999) Analysis of Health Surveys
  - Rizzo et al. (2008). Analytic methods to examine changes across years using HINTS 2003 & 2005 data. Examining trends and averages using combined cross-sectional survey data from multiple years. http://hints.cancer.gov/docs/HINTS_Data_Users_Handbook-2008.pdf

HINTS Statistical Weights

- All three HINTS iterations contain full sample and 50 replicate weights.
- Weights derived from:
  - selection probabilities
  - response rates
  - post-stratification adjustment



- HINTS 50 replicate weights obtained by deleting 1/50th of the respondents (and re-weighting)
  - Each replicate is similar to a HINTS yearly sample
  - The variability in replicate estimates can be used to estimate variance

Replicate & Full-sample Weights

- Full-sample weight is the statistical weight described earlier
- Replicate weights only available with certain datasets
  - Obtained by deleting mutually exclusive, exhaustive parts of the sample and weighting these

Example Using HINTS 2003 Weights: Full Sample and Replicate

Sub	fwgt	fwgt1	fwgt2
1	14,367	14,693	14,837
2	109,694	111,069	111,021
3	14,767	0	14,859
4	18,467	19,301	0

Full sample (fwgt) and 2 replicate weights (fwgt1, fwgt2) for 4 sampled people.
First two subjects are in both replicates while other two are not.
The sum of each column of weights is the same – 209,454,391.

Analyses Using Separate Data Sets

Testing for Change Using Separate Datasets

- Do not need combined data
- Do need the following information:
  - Estimates and variances from each survey year*

Year	True value	Estimated value	Variance of estimate
2003	θ_{2003}	θ_{2003}	$v\left(\hat{\theta}_{2003}\right)$
2005	θ_{2005}	θ_{2005}	$v\left(\hat{\theta}_{2005}\right)$
2007	θ_{2007}	θ_{2007}	$v\left(\hat{\theta}_{2007}\right)$
Change	$\Delta = \theta_{200X} - \theta_{200Y}$	$\hat{\Delta} = \hat{\theta}_{200X} - \hat{\theta}_{200Y}$	$v\left(\hat{\Delta}\right) = v\left(\hat{\theta}_{200X}\right) + v\left(\hat{\theta}_{200Y}\right)$

*** From SUDAAN proc descript or proc crosstab or SAS proc survey means.**

Analyses Using Combined 2003, 2005 and 2007 Data

Final Sample and Replicate Weights for Trend/Mode Tests

	Final Sample Weights	Replicate Weights 1-50	Replicate Weights 51-100	Replicate Weights 101-150
HINTS 2003	2003 Final Weight (fwgt)	2003 Replicate Weights (fwgt1-fwgt50)	2003 Final Weight (fwgt)	2003 Final Weight (fwgt)
HINTS 2005	2005 Final Weight (fwgt)	2005 Final Weight (fwgt)	2005 Replicate Weights (fwgt1-fwgt50)	2005 Final Weight (fwgt)
HINTS 2007	2007 Final Weight (rwgt0)	2007 Final Weight (rwgt0)	2007 Final Weight (rwgt0)	2007 Replicate Weights (rwgt1-rwgt50)
Combined Data	Final Weight (nfwgt)	Final Replicate Weights (nfwgt1-nfwgt50)	Final Replicate Weights (nfwgt51-nfwgt100)	Final Replicate Weights (nfwgt101-nfwgt150)

SAS Syntax to Create Sample/Replicate Weights for Trend Analyses (2007 Composite)

```
***Set new weight variables for the combined dataset;
        array origwgts[50] fwgt1-fwgt50;
        array cmbdwgts[50] cwgt1-cwgt50;
        array newwgts[150] nfwgt1-nfwgt150;

        do i = 1 to 50;
                if hintsyear=1 then do;***2003;
                        nfwgt=fwgt;
                        newwgts[i]     = origwgts[i];
                        newwgts[i+50]  = fwgt;
                        newwgts[i+100] = fwgt;
                        end;
                else if hintsyear=2 then do;***2005;
                        nfwgt=fwgt;
                        newwgts[i]     = fwgt;
                        newwgts[i+50]  = origwgts[i];
                        newwgts[i+100] = fwgt;
                        end;
                else if hintsyear=3 then do;***2007;
                        nfwgt=cwgt0;
                        newwgts[i]     = cwgt0;
                        newwgts[i+50]  = cwgt0;
                        newwgts[i+100] = cmbdwgts[i];
                        end;
                end;
        drop fwgt--fwgt50 i;
        label nfwgt="Final full-sample weight";
        attrib nfwgt1-nfwgt150 label="Final sample replicate weights";
```

2003/05 Replicate Weights

2007 Replicate Weights (Composite)

HINTSYEAR Variable

SAS Syntax to Create Sample/Replicate Weights for Trend Analyses (2007 RDD)

```
***Set new weight variables for the combined dataset;
array origwgts[50] fwgt1-fwgt50;
array catiwgts[50] rwgt1-rwgt50;
array newwgts[150] nfwgt1-nfwgt150;

do i = 1 to 50;
        if hintsyear=1 then do;***2003;
                nfwgt=fwgt;
                newwgts[i]     = origwgts[i];
                newwgts[i+50]  = fwgt;
                newwgts[i+100] = fwgt;
                end;
        else if hintsyear=2 then do;***2005;
                nfwgt=fwgt;
                newwgts[i]     = fwgt;
                newwgts[i+50]  = origwgts[i];
                newwgts[i+100] = fwgt;
                end;
        else if hintsyear=3 then do;***2007;
                nfwgt=rwgt0;
                newwgts[i]     = rwgt0;
                newwgts[i+50]  = rwgt0;
                newwgts[i+100] = catiwgts[i];
                end;
        end;
label nfwgt="Final full-sample weight";
attrib nfwgt1-nfwgt150 label="Final sample replicate weights";
```

2003/05 Replicate Weights

2007 Replicate Weights (RDD)

HINTSYEAR Variable

Design Statements for Combined Data

```
proc procedurename data=combined design=jackknife;
weight nfwgt;
jackwgts nfwgt1-nfwgt150 /adjjack=.98;
```

Notes:

1) nfwgt= Final sample weight for estimated US point estimates

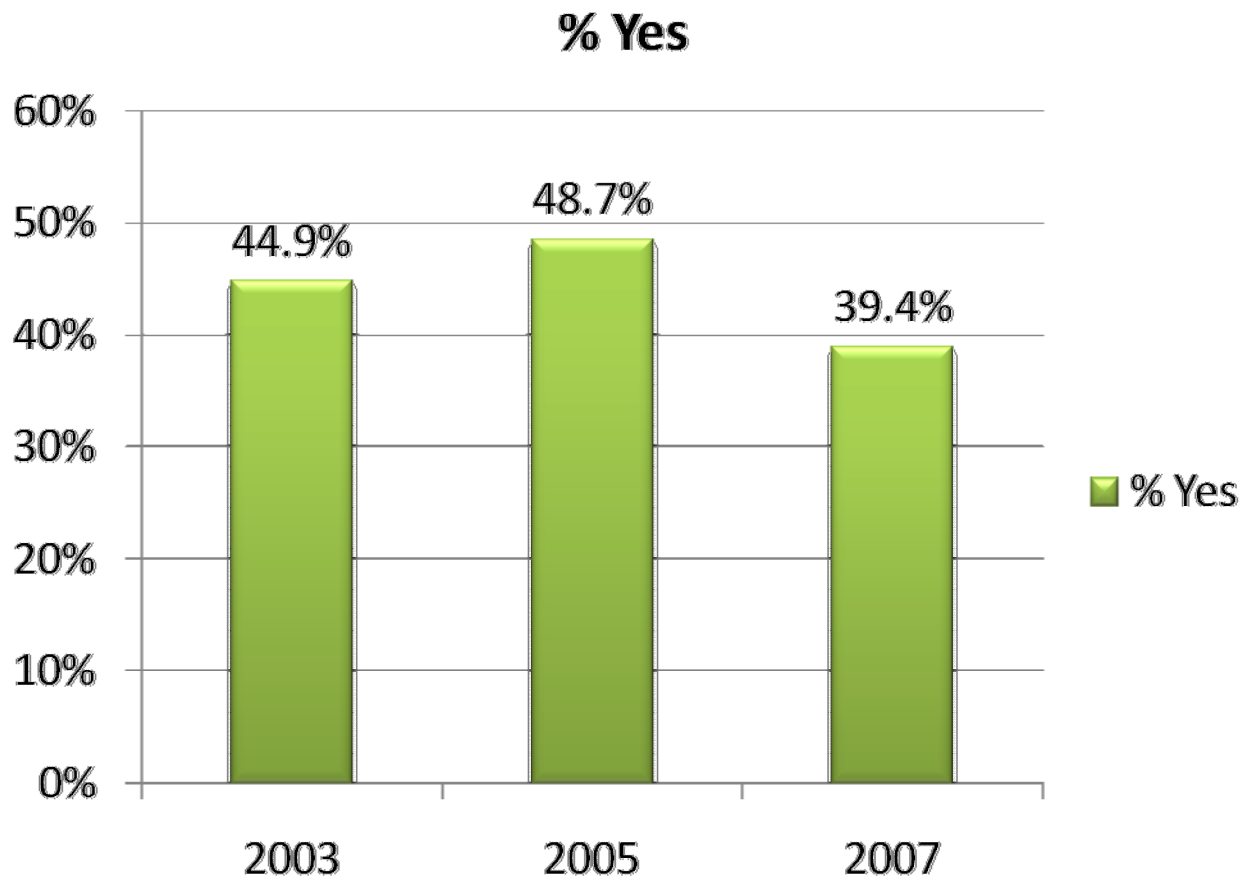
2) nfwgt1 to nfwgt150= Replicate weights for variance estimates

T-Tests and Linear and Quadratic Tests Using a Combined Dataset

```
***T Tests and Tests of Linear and Quadratic Trends;
proc descript data=hints design=jackknife;
weight nfwgt;
jackwgts nfwgt1-nfwgt150 / adjjack=0.98;
var seekCancer;
class hintsYear / nofreq;

contrast hintsYear=(1 -1 0) / name="Test of 2003 vs 2005";
contrast hintsYear=(1 0 -1) / name="Test of 2003 vs 2007";
contrast hintsYear=(0 1 -1) / name="Test of 2005 vs 2007";
contrast hintsYear=(1 0 -1)/name="Survey Year Contrast(Linear)";
contrast hintsYear=(1 -2 1)/name="Survey Year Contrast (Quadratic)";
polynomial hintsYear=2/ name="Survey Year Contrast (Linear & Quadratic)";

print nsum mean semean upmean="95% UCI Mean" lowmean="95% LCI Mean"
t_mean p_mean;
run;
```

Note: Outcome variable is coded 0/1

“Have you ever looked for cancer information from any source?”



Note: All pairwise and polynomial trends are statistically significant (alpha=.05); Used RDD weights in 2007

Estimating Change While Controlling for Covariates With Combined Data

- Can only be done with combined data
- Across all subjects
- By demographic subgroup
  - Demonstrate using education
- Use a regression approach:
  - Multiple regression for continuous outcomes
  - Logistic regression for dichotomous outcomes
- Created HINTSYEAR variable to code for survey iteration
- Used recoded/reformatted demographic variables as covariates

Testing for Changes Across Years Controlling for Covariates-Syntax

```
***SUDAAN - Accounting for demographic variables, test difference in
cancer seeking between survey years;
***SUDAAN - Test for linear and quadratic trends of cancer seeking
and survey year;

proc rlogist data=hints design=jackknife;
weight nfwgt;
jackwgts nfwgt1-nfwgt150 / adjjack=0.98;

class hintsYear spgender ageGroup educA race income / nofreq;
model seekCancer = hintsYear spgender ageGroup educA race income;
reflevel hintsYear=1 spgender=1 ageGroup=1 educA=1 race=1 income=1;

effects hintsYear = (1 -1 0)  / name="SURVEY-YEAR 2003 VS 2005";
effects hintsYear = (1 0 -1)  / name="SURVEY-YEAR 2003 VS 2007";
effects hintsYear = (0 1 -1)  / name="SURVEY-YEAR 2005 VS. 2007";
effects hintsYear = (1 0 -1) / name="LINEAR TREND SURVEY-YEAR";
effects hintsYear = (1 -2 1) / name="QUADRATIC TREND SURVEY-YEAR";

run;
```

Note: Outcome variable is a dummy coded (0,1);

Testing for Changes by Demographic Subgroup Controlling for Covariates

Test for differences across levels of **education.** Start with lowest level (Less Than High School) controlling for age, gender, race and income (note SUBPOPN statement)

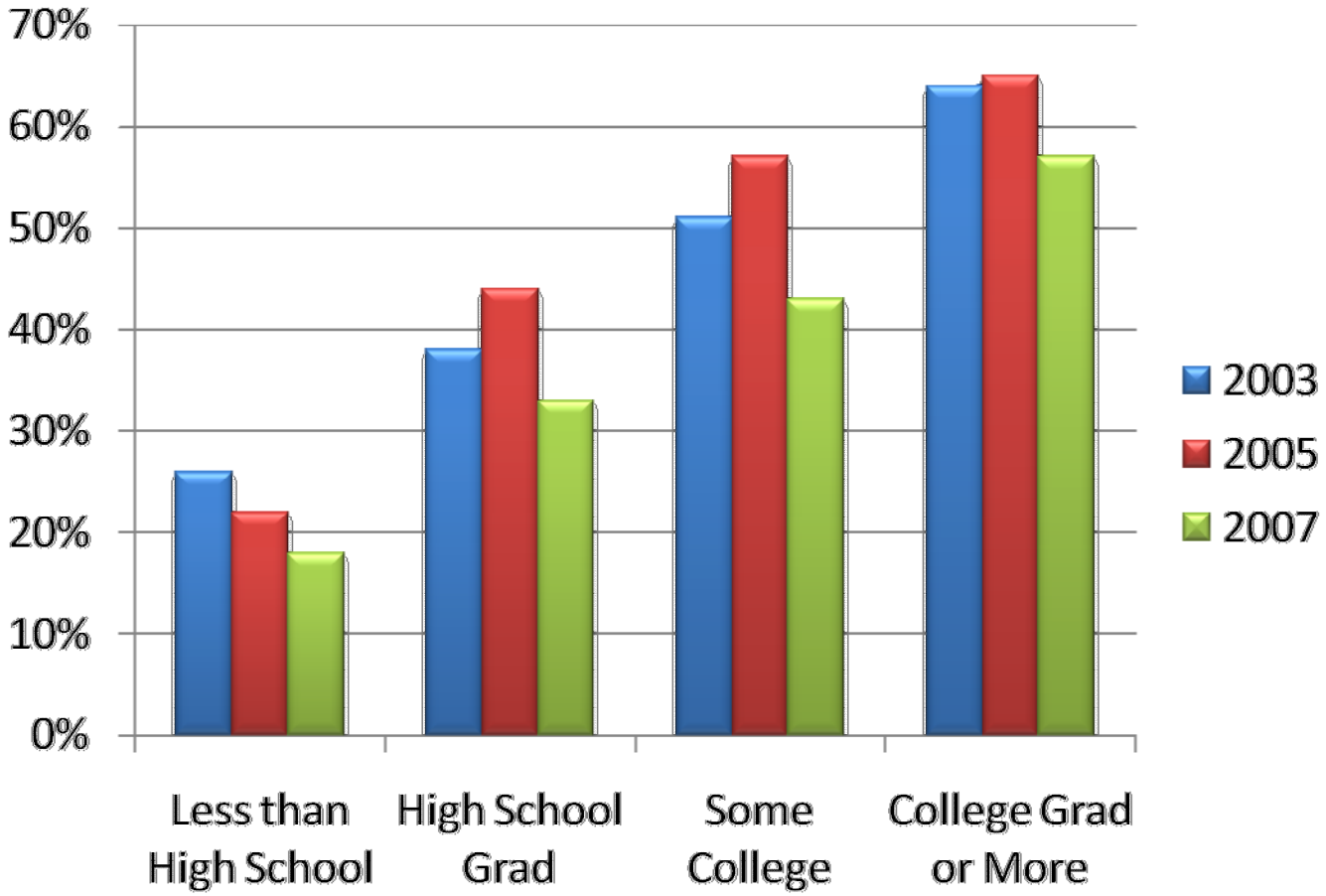
```
proc rlogist data=hints design=jackknife ;
weight nfwgt;
jackwgts nfwgt1-nfwgt150 / adjjack=0.98;
subpopn educA=1 / name="Education Level: Less than High School";
class hintsYear spgender ageGroup race income / nofreq;
model seekCancer = hintsYear spgender ageGroup race income;
reflevel hintsYear=1 spgender=1 ageGroup=1 race=1 income=1;

effects hintsYear = (1 -1 0)  / name="SURVEY-YEAR 2003 VS 2005";
effects hintsYear = (1 0 -1)  / name="SURVEY-YEAR 2003 VS 2007";
effects hintsYear = (0 1 -1)  / name="SURVEY-YEAR 2005 VS 2007";
effects hintsYear = (1 0 -1) / name="LINEAR TREND SURVEY-YEAR";
effects hintsYear = (1 -2 1) / name="QUADRATIC TREND";
run;
```

Note: Can also test three other levels of education substituting remaining values in the SUBPOPN statement;

Testing for Changes by Levels of Education: Results

	Odds Ratio	Lower Bound 95% CI	Upper Bound 95% CI
Less Than High School			
2003	1.00	1.00	1.00
2005	0.82	0.56	1.20
2007	0.64	0.40	1.01
High School Graduate			
2003	1.00	1.00	1.00
2005	1.28	1.05	1.56
2007	0.80	0.65	0.99
Some College			
2003	1.00	1.00	1.00
2005	1.28	1.01	1.62
2007	0.72	0.59	0.89
College Graduate or More			
2003	1.00	1.00	1.00
2005	1.07	0.87	1.31
2007	0.77	0.63	0.95

Adjusted Marginal Percentages (Means)



Note: Used linear regression and least-square means to get values; RDD weights in 2007

Estimating Weighted Mean Using Data Combined Across 2003, 05, 07

- Can be used to create larger sample size
- Best used for variables not expected to change over time
- Can be assessed across respondents and by subgroups
- Will calculate weighted mean across combined data
  - Weights each year proportional to its estimated population

Calculate Mean % of Respondents Using Combined Data

```
proc descript data=hints design=jackknife;
weight nfwgt;
jackwgts nfwgt1-nfwgt150 / adjjack=0.98;

var seekCancer;

catlevel 1;

print nsum percent lowpct uppct/style=nchs;

run;
```

Note:

1) Will give sample size, mean %, lower and upper 95% CI;
2) Will get accurate weighted mean;
3) Sample size will be 3x population;

Calculate Mean % of Respondents by Subgroups

```
proc descript data=combined design=jackknife;

weight nfwgt;

jackwgts nfwgt1-nfwgt150 /adjjack=.98;

class hintsyear seekcancer spgender ageGroup race income
/nofreq;

var seekcancer;

catlevel 1;

tables (spgender ageGroup race income);

print nsum percent lowpct uppct/style=nchs;

run;
```

Note: Will give sample size, mean %, lower and upper 95% CI;

Means From Combined Data

Variables		Weighted Mean	LL 95% CI	UL 95% CI
All		**44.27**	**43.35**	**45.20**
Age				
	18-34	38.38	36.10	40.72
	35-64	49.86	48.59	51.13
	65+	36.95	35.19	38.75
Race				
	NH White	49.38	48.23	50.54
	NH Black	40.41	36.67	44.27
	Hispanic	24.20	21.61	26.99
	NH Other	45.38	39.25	51.64
Gender				
	Male	37.32	35.77	38.90
	Female	50.76	49.48	52.04
Income				
	< $20k	33.01	30.62	35.49
	$20k - <$50k	42.56	40.75	44.40
	$50k+	53.45	51.71	55.17

Summary

- Creating the combined data set is hardest part, but gives more versatility than using separate data sets
  - Do not use combined data to get single-year estimates unless you adjust denominator df
- If using combined data, make sure variable names, formats, and interpretations are equivalent across years
- With three data points can test for linear and quadratic trends
- Once you have combined data, analyses are similar to those done with a single data set

Mode Discussion

- Why was a Dual Frame-Dual Mode design used?
- Deciding on which mode (frame) you use
- What weights should be used when conducting different types of analyzes

HINTS 2007:
Dual Frame – Dual Mode Survey

- Dual frames:
  - Random Digit Dial RDD
  - Address sample: Residential address used by the USPS to deliver mail
- Dual Mode:
  - RDD was administered by telephone
  - Address was administered by mail.
    - Small number of Hispanics call in for Spanish interview

Why a Dual Frame, Dual Mode Design (DFDM)?

- Continued decline in quality of the RDD frame
  - Response rate continues to decline (HINTS 2003 vs 2005)
  - Increasing number of persons without landline telephones
  - Cost of RDD is increasing because of the two above points
    - More calls and special procedures have to be used to get response
    - Have to add in a cell phone frame ---- not clear how this works. It is also more expensive to use this methodology.

- DFDM allows for continuing the trend from previous and future HINTS data collection
  - Some anticipation that future HINTs surveys will move away from RDD-telephone survey

Methodological Advantage

- There are many studies that are multi-mode, but cannot assess effects (e.g., NHIS; CPS; NCVS)
- DFSM allows testing for robustness of results by measurement method
- Can use the advantages of each mode for different analytic issues

Disadvantage of Design

- Introduces some decisions that have to be made on which mode or modes should be used in analysis

- Concentrating on a single mode reduces sample size

Steps for Analysis

1. Trend analysis or Focus on Hispanics?
2. Compare estimates for the Address frame and the RDD frame
3. If there is not a difference, then use composite weights
4. If there is a difference, then:
    1. Select a mode, and/or
    2. Conduct analysis both ways

Step 1: Trend analysis?

- Use the telephone sample - This keeps the mode of interview consistent with HINTS 2003 and 2005

- If there is a need to increase the sample size, test for differences between the RDD and the address sample
  - If there are no differences, consider using the combined sample

Step 1 (cont): Focus on Hispanics?

- If Hispanics are a focus of analysis, then use the RDD sample
- Spanish speaking Hispanics are under-represented in the mail survey
  - Could be correlated with important outcomes

Step 2: Compare Estimates

- Descriptive analyses:
  - Compare frequencies and crosstabs between frames
- Relationships:
  - Run crosstabulations by frame-type
  - Run models separately by frame type or using frame type as a covariate

Weights Available on File

- Three types of weights
  - Address sample only (MWGT0)
  - RDD sample only (RWGT0)
  - Composite weight (CWGT0)

- For mode comparisons, use the frame specific weights (mwgto; rwgto)

Weights adjust for non-response and coverage

- Weights include adjustments for demographics, ever having cancer and health insurance status
- Each set of weights sums to national totals
- Weights do not fully compensate for
  - Under-representation of Hispanics on mail survey. Spanish speaking Hispanics may be different from those that filled out English questionnaire. Requires more analysis
  - Lack of coverage of cell-only on telephone. Cell-only individuals are different from those with a landline, even after controlling for demographic characteristics (Han and Cantor, 2008)

Example:
% Buying Medicine Online

	Address frame	RDD frame
Estimate	12.7	15.3
Standard Error	.9	.9

Z test: $(P_1 - P_2)/\text{sqrt}(V(P_1) + V(P_2)) = (12.7\text{-}15.3)/\text{sqrt}(.9^2 + .9^2)$

$= 2.04$

Weights to Test Significance within Statistical Program

	Final Sample Weights	**Replicate Weights 1-50**	**Replicate Weights 51-100**
Address sample	Address sample final weight (MWGT0)	Address replicate Weights (MWGT1 – MWGT50)	Address sample final weight (MWGT0)
RDD sample	RDD sample final Weight (rwgt0)	RDD Final Weight (rwgt0)	RDD sample Replicate weights (rwgt1-rwgt50)
Combined Data	Final Weight (nfwgt)	Final Replicate Weights (nfwgt1-nfwgt50)	Final Replicate Weights (nfwgt51-nfwgt100)

SAS Syntax to Create Sample/Replicate Weights for Mode Analysis

```
***Set new weight variables for the combined dataset;
array origwgts[50] mwgt1-mwgt50;
array catiwgts[50] rwgt1-rwgt50;
array newwgts[100] nfwgt1-nfwgt100;
do i = 1 to 50;
        if sampflag=1 then do;***address;
                nfwgt=mwgt0;
                newwgts[i]     = origwgts[i];
                newwgts[i+50]  = mwgt0;
                end;
        else if sampflag=2 then do;***RDD;
                nfwgt=rwgt0;
                newwgts[i+50]      = catiwgts[i];
                newwgts[i]         = rwgt0;
                end;
label nfwgt="Final full-sample weight";
attrib nfwgt1-nfwgt100 label="Final sample replicate weights";
```

Have you ever looked for information about cancer from any source?

	Address frame	RDD frame
Estimate	39.8	38.1
Standard Error	1.0	.8

T-Test for Differences in Proportions Using a Combined Dataset

```
***T Tests to test between modes ***;
proc descript data=hints design=jackknife;
weight nfwgt;
jackwgts nfwgt1-nfwgt100 / adjjack=0.98;
var seekCancer;
Class sampflag / nofreq;

Contrast sampflag=(1 -1) / name="Test of mail and telephone";


print nsum mean semean upmean="95% UCI Mean" lowmean="95% LCI Mean"
t_mean p_mean;
run;
```

Note: Outcome variable is coded 0/1

Step 3: If not significant, use the composite estimate

Have you ever looked for information about cancer from any source?

	Address frame	RDD frame	Composite
Estimate	39.8	38.1	39.5
Standard Error	1.0	.8	.6

Step 3: If not significant, use the composite estimate

Have you ever looked for information about cancer from any source?

	Address frame	RDD frame	Composite
Estimate	39.8	38.1	39.5
Standard Error	1.0	.8	.6

What if the difference is statistically significant?

- Is the difference substantively meaningful
  - Many differences will be statistically significant, but not very meaningful
  - If appropriate, consider collapsing categories

How much would you trust information about health or medical topics from the Internet?

	Address	RDD	
A lot	19.4	20.1	
Some	53.2	47.4	
A Little	18.7	18.1	
Not at all	8.6	14.4	
			P < .000

How much would you trust information about health or medical topics from Family or Friends?

	Address	RDD	
A lot	9.3	22.0	
Some	50.1	43.9	
A Little	35.8	27.4	
Not at all	4.7	6.7	
			P < .000

Analyzing relationships

- Examine the differences in estimates for the main outcome and analytic variables
- If there are differences, run analysis using the sample that is appropriate for the measures
- To use entire sample:
  - Run the analysis with each sample, and/or
  - Run analysis and include address type as an interaction term

How much would you trust information about health or medical topics from the Internet?

Parameter	Address	RDD
Intercept	3.170**	3.180**
Age	-0.010**	-0.010**
Gender (male = 1)	-.170**	-.140**
Race (white = 1)	.040	.180*
Hispanic	-.100	-.160
Serious Mental Illness	-.160	-.350*

* = p<.05; ** = p<.01

How much would you trust information about health or medical topics from family or friends?

Parameter	Address	RDD
Intercept	2.860**	3.040**
Age	-.003**	-.003**
Gender (male = 1)	-.140**	.000
Race (white = 1)	.030	.000
Hispanic	-.140	-.130
Serious Mental Illness	-.190*	-.050

* = p<.05; ** = p<.01

Mode Differences on HINTS

- HINTs has a variety of question types that differ with respect to effects of mode
  - Open vs closed
  - Sensitive items
  - Ordinal scales
  - Knowledge questions

- Selecting a particular mode will depend on the types of measurement differences that apply for particular items

Measurement advantages of each mode

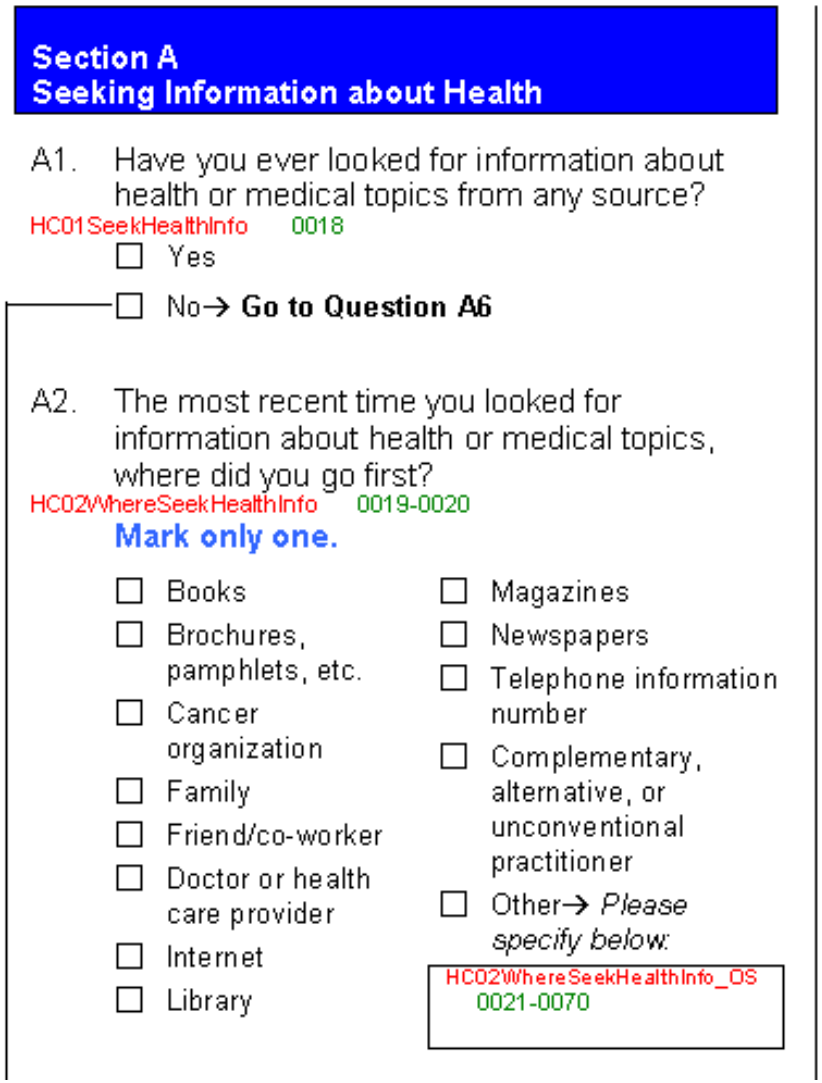
Mail Survey

- Fewer social desirability effects
- Reduced context and order effects
- Aided recall and/or reporting (cues)
- Fewer primacy/recency effects

Telephone Survey

- Less missing data
- Interviewer can answer questions (complicated definitions)
- Unaided recall and/or reporting

Open-ended with a list of responses



Section A
Seeking Information about Health

A1. Have you ever looked for information about health or medical topics from any source?

HC01SeekHealthInfo 0018

- ☐ Yes
- ☐ No→ **Go to Question A6**

A2. The most recent time you looked for information about health or medical topics, where did you go first?

HC02WhereSeekHealthInfo 0019-0020

Mark only one.

- ☐ Books
- ☐ Brochures, pamphlets, etc.
- ☐ Cancer organization
- ☐ Family
- ☐ Friend/co-worker
- ☐ Doctor or health care provider
- ☐ Internet
- ☐ Library
- ☐ Magazines
- ☐ Newspapers
- ☐ Telephone information number
- ☐ Complementary, alternative, or unconventional practitioner
- ☐ Other→ *Please specify below:*

HC02WhereSeekHealthInfo_OS 0021-0070

Results for HC-01

- Significant difference between modes:
  - Mail questionnaire: 77%
  - Telephone: 61%
- Mail respondents can see follow-up question:
  - This defines the targeted behavior
  - List serves as memory cues (aided recall)
- Recommend using the mail survey because the estimates are based on better understanding of the question

Open ended asking for dates

I5. When do you expect to have your next Pap test?

BR59WhenNextPapTest 0686

Mark only one.

- ☐ A year or less from now
- ☐ More than 1 but not more than 3 years from now
- ☐ More than 3 but not more than 5 years from now
- ☐ Over 5 years from now
- ☐ Am not planning to have another
- ☐ If I have symptoms
- ☐ When doctor/health care provider recommends
- ☐ I am not planning to have another because I got or am planning to get the HPV vaccine
- ☐ I am not planning to have another because I got or am planning to get the HPV test instead

Items provide aided recall for mail survey respondents

- Other items similar to this: are BR-76; BR-88; BR91; BR-94
- Seeing categories aids mail survey respondent in the recall task:
  - Defines dating accuracy
  - Cues respondent with non-time related categories
- If can't combine, use mail because of aided recall

When do you expect to get your next pap test?

BR-59	**Phone**	**Mail**
A year or less	78%	71%
1 to 3 years	4%	10%
3 to 5 years	--	2%
Not planning to	10%	6%
If symptomatic	--	2%
When Doctor recommends	2%	8%
Planning HPV test instead	--	1%
Don’t Know	5%	--

Ordinal Scales: Mail vs Telephone

- Prior research has found telephone interviews are more likely to respond on the extremes (Tarnai and Dillman, 1992; De Leeuw, 2005; Dillman et al, 2008)
  - More “satisficing” on the telephone
  - On telephone, Rs tend to respond on extreme points
  - Not a consistent effect
- In many cases, the effect is not large
- Use composite or mail survey, depending on importance of mode differences

Examples of ordinal scales

- Likert
  - Strongly agree
  - Somewhat agree
  - Somewhat disagree
  - Strongly disagree
- Evaluation scale
  - Excellent
  - Very good
  - Good
  - Fair
  - poor
- Frequency
  - Always
  - Usually
  - Sometimes
  - Never
  - A lot
  - Some
  - A little
  - Not at all

During the past 12 months, how often did doctors, nurses, or other health professionals give you the chance to ask all the health-related questions you had?

Would you say…

HS-07a	**Phone**	**Mail**	**Comp**
Always	58%	56%	57%
Usually	25%	32%	28%
Sometimes	14%	11%	12%
Never	4%	1.5%	3%

Social Desirability

- Self-Administered questionnaires are less subject to social desirability
- Respondents will report higher incidence of behaviors and/or attitudes that are not socially acceptable
- For behaviors that are sensitive or socially undesirable, use the mail survey

During the past 30 days, how often did you feel worthless?

HD03Worthless	**Phone**	**Mail**	**Comp**
All of the time	1%	2%	2%
Most of the time	2%	4%	3%
Some of the time	7%	9%	8%
A little of the time	9%	14%	12%
None of the time	81%	72%	75%

During the past 30 days, how often did you feel worthless?

HD03Worthless	**Phone**	**Mail**	**Comp**
All of the time	1%	2%	2%
Most of the time	2%	4%	3%
Some of the time	7%	9%	8%
A little of the time	9%	14%	12%
None of the time	81%	72%	75%

Knowledge Questions and “Don’t Know”

- There are a number of items that ask respondents what are recommended health procedures
  - Exercise (BR-07); sunlight and vitamin D (BR-16); cigarette products (BR-40; BR-45); HPV (BR -67, 68, 70), effectiveness of different colon cancer tests (BR-96).
  - Telephone has significantly more “Don’t Know” than mail
  - Taking out the DK group, the distributions between mail and telephone get much closer.
- Mail survey did not include a DK category
- If “Don’t Know” is important to analyze, then you should use the telephone.

How many servings of fruits and vegetables do you think the average adult should eat each day for good health?

	With DK*		Without DK	
BR-03	Phone	Mail	Phone	Mail
0 – 2 servings	21%	25%	24%	25%
3 – 4 servings	34%	42%	39%	42%
5 – 6 servings	24%	26%	27%	26%
7 or more servings	9%	7%	10%	7%
Don't Know	13%	--	na	na

*DK – Don't Know; -- < .5%; Na – not applicable

Examples of other question types

- Items with “mark all that apply” (sources of cancer information; where heard about HPV)
  - Mail survey respondents report more than telephone respondents
- Items requiring technical definitions (colon cancer tests)
  - Interviewer is able to supply definitions and reinforce the definition during the interview

Thank-you

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