The Impact of Response Burden on Data Quality in a Longitudinal Survey

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Gaps in the field

"The topic of respondent burden is not a neat, clearly defined topic about which there is an abundance of literature" (Bradburn, 1978: p49)

"Response burden is not a straight forward area to discuss, measure and manage" (Jones, 2012: p1)

Gaps in the field

- Undeveloped conceptualization
- Lack of good measurement
- Lack of empirical research on
  - What predicts response burden
  - The impact of burden on data quality and statistical estimates

How is burden defined? Perceived/Subjective Burden

- "…perceived response burden … negative feelings such as annoyance, frustration or inconvenience which may be experienced by survey participants" (Frankel, 1980: p1)
- "…respondent burden … the presumed hardships entailed in being a survey participant" (Sharp and Frankel 1983: p36)
- "…respondent's experience…" (Haraldsen 2004: p398)
- "… perception of time and burden associated with the response task" (Giesen 2012: p1-2)
- "[T]he degree to which a survey respondent perceives participation in a survey research project as difficult, time consuming, or emotionally stressful…" (Graf 2008: p740)

How is burden defined?
Actual/Objective Burden

- "... characteristic of research activity intervening between the survey instrument and response activity which, if increased, will decrease the probability of the respondent providing the full information required..." (Corbin 1977: p9)
- "... respondent can feel burdened whenever the question appears either threatening or difficult..." (Warriner 1991: p256)
- "the length of the interview" (Groves et al. 1991: p251)
- "the number and size of the respondent's tasks" (Hoogendoorn and Sikkel 1998: p189)

How is burden measured?

- Characteristics of survey/tasks causing burden
  - Length of interview (Groves et al. 1999; Singer et al., 1999; Hoogendoorn, 2004)
  - Frequency of interview (Hoogendoorn et al., 1998)
  - Difficulty of response tasks (Filton, 1981)
- Rs' attitude towards and beliefs about surveys
  - Self-reports
    - Interest in survey (Sharp et al., 1983; Hoogendoorn, 2004; Fricker et al. 2011; 2012)
    - Importance of interview (Sharp et al., 1983)
  - Interviewer notes
    - Rs' complaint about survey burden (Martin et al., 2011)
- Effects of response burden
  - Willingness to be re-interviewed (Sharp et al., 1983; Fricker et all., 2011; 2012)
  - Feeling of exhaustion (Stocke and Langfeldt; 2004)

What are effects of response burden?

- Burden measured through objective survey/task characteristics
  - Leading to unit nonresponse (e.g., Groves et al. 1999; Rolstad, Adler, and Rydén 2011)
- Burden measured as "perception"
  - Leading to panel attrition (e.g., Martin et al. 2001; Fricker et al. 2011)
  - Leading to item nonresponse (e.g., Warriner 1991)
  - Leading to break-offs (e.g., Galesic 2006)
  - Leading to delayed responses (e.g., Giesen 2012)
- Burden measured as "effects of burden"
  - Leading to negative evaluations of surveys (Stocke and Langfeldt; 2004)

Objectives of this talk

- What is the impact of self-reported burdensome feelings on data quality?
- What is the impact of self-reported burdensome feelings on estimates?
  - Estimates of means
  - Regression estimates
- What is the cost-error trade-off?

Data

- Consumer Expenditure Interview Survey (CE)
  - Longitudinal survey conducted by BLS
    - Providing information on buying habits of American consumers
      - Expenditures, income, consumer characteristics
    - Rotation panel design
      - Panel members are interviewed every quarter up to five times
      - In each interview quarter, 5 panels in different stage of panel life
- Pooled cases who completed their 5th interviews between October 2012 and March 2013
  - A total of 3,340 cases used

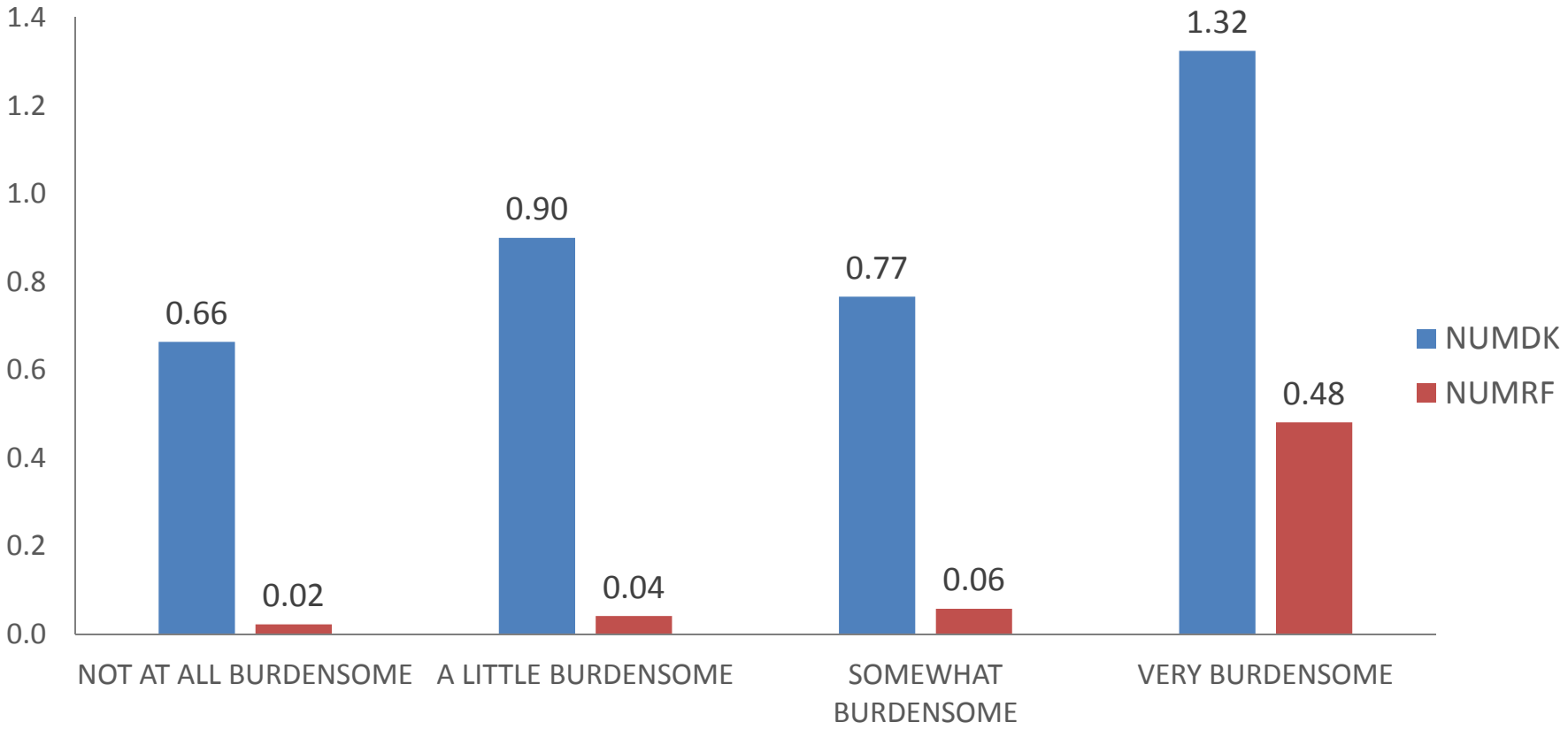
Burden measured in CE

- 5th interview conducted between October 2012 and March 2013
  - How burdensome was this survey to you?
    - Very burdensome (376)
    - Somewhat burdensome (909)
    - A little burdensome (1049)
    - Not at all burdensome (1006)

Impact of burden on data quality

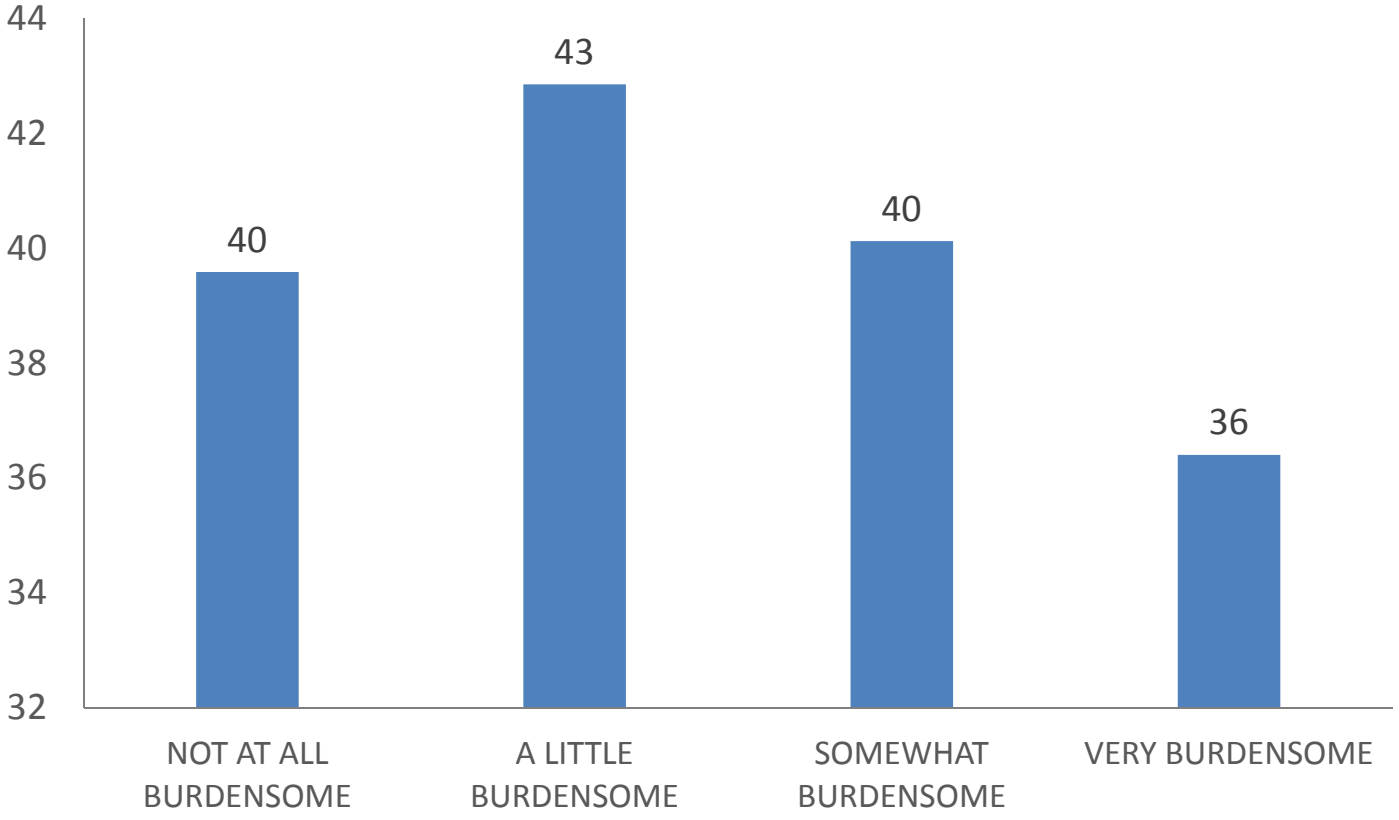
- Three indirect indicators of data quality
  - Number of "Don't Know" responses to expenditure questions reported
  - Number of "Refused" responses to expenditure questions reported
  - Number of unedited expense items reported

Number of “Don’t know” and “Refused” answers by Level of burden



*NUMDK: F(3,3336)=10.18, p<.0001; NUMRF: F(3, 3336)=59.36, p<0.0001

Number of unedited expense items reported by Level of burden

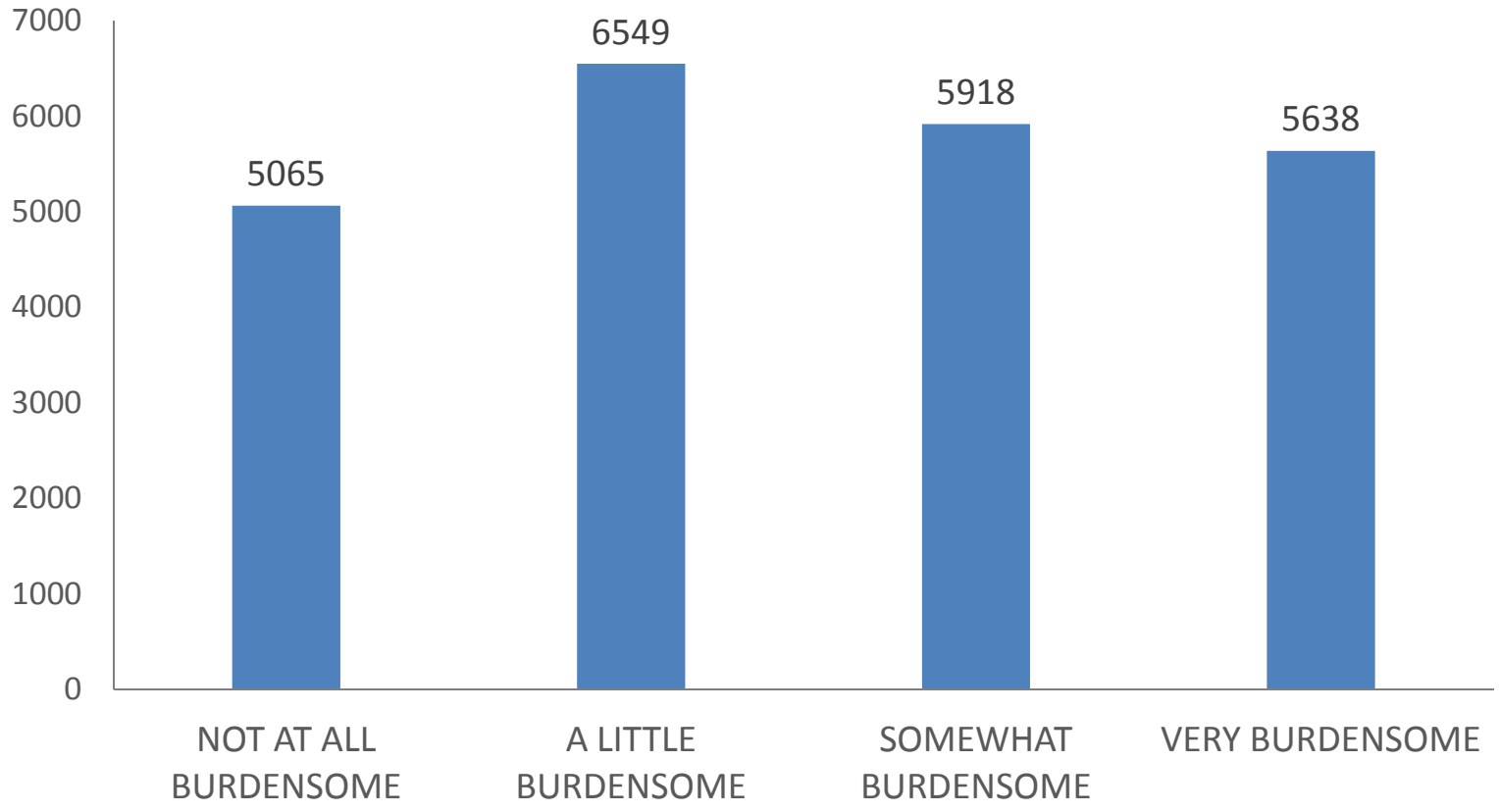


*NUMEXPN: F(3,3336)=10.54, p<.0001

Impact of burden on reports of expenditure

- Unweighted mean expenditure by level of burden
- Difference between estimates of mean expenditure with and without “burdened-out” respondents

Unweighted mean expenditure by Level of burden



*TOTEXPPQ: F(3,3336)=13.94, p<.0001

Unweighted mean expenditure by level of burden

Total number of expense categories	14
# of expense categories significantly different across levels of burden	11
# of expense categories with least expenditure amount for "very burdensome"	7
# of expense categories with 2nd least expenditure amount for "very burdensome"	4

Impact of burden on weighted mean expenditures

	WITH (n=3340)	WITHOUT (2904)	DIFFERENCE (n=370)	UCL	LCL
Total Expenditure	8636	8618	19	1138	-1101
Food	1251	1235	16	173	-141
Alcoholic beverages	65	67	-3	8	-14
Housing	2678	2663	15	581	-552
Apparel and services	222	225	-3	37	-42
Transportation	1656	1660	-4	136	-145
Health care	546	546	-1	36	-37
Entertainment	400	397	3	49	-43
Personal care	50	50	0	12	-13
Reading	21	21	-1	2	-3
Education	252	246	6	104	-92
Tobacco	49	51	-2	8	-12
Miscellaneous	106	110	-4	12	-20
Cash contributions	386	391	-5	160	-170
Pensions	956	954	2	182	-178

Impact of burden on regression coefficients

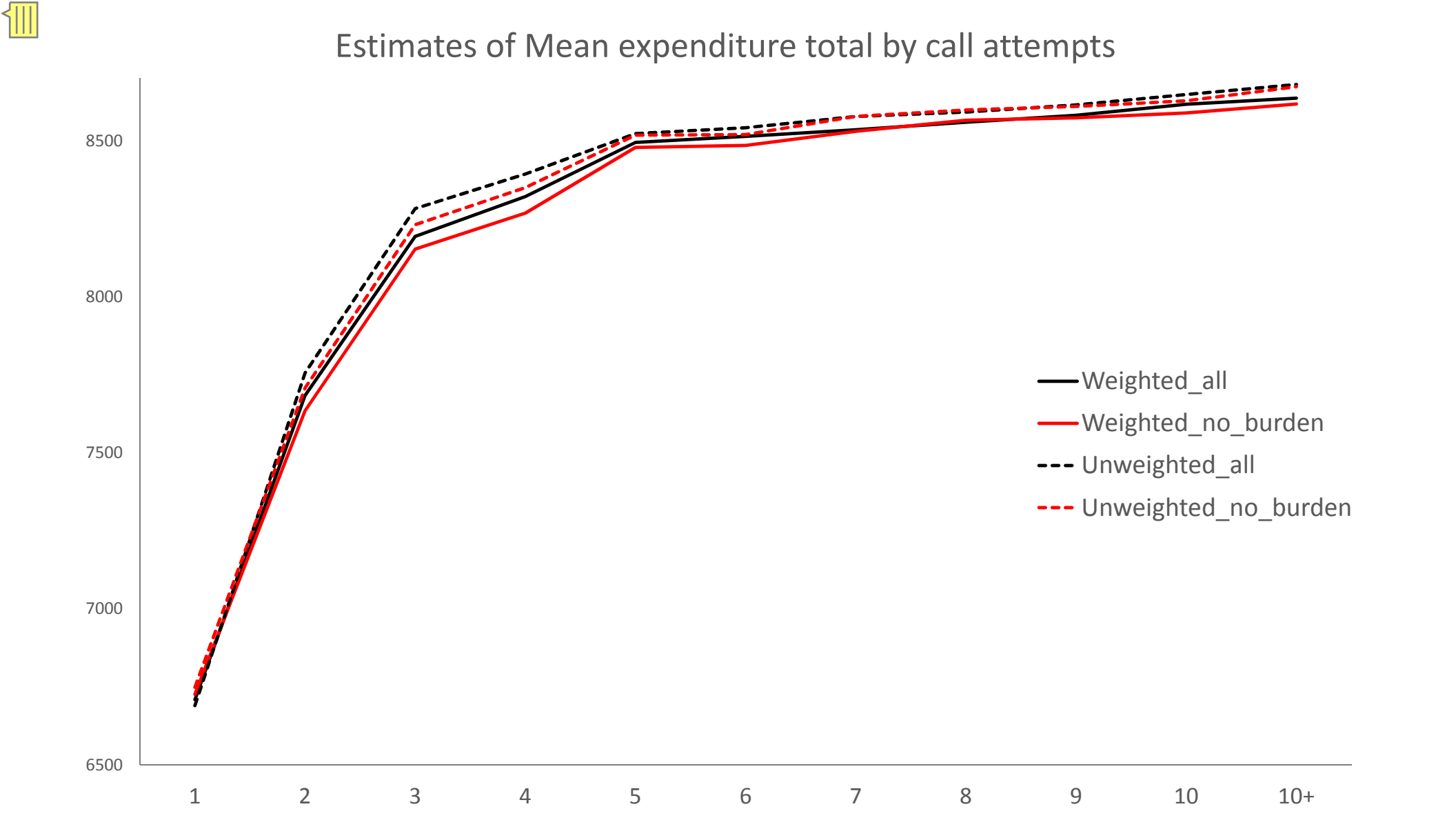
PSU=1111 DV=log(totexppq)	Model 1 (With “Very burdensome” cases)		Model 2 (Without "Very burdensome" cases)		Model 3 (All, "very burdensome" indicator in the model)	
	B	SE	B	Se	B	SE
Intercept	7.81	0.16	7.93	0.18	7.81	0.17
60 or older	*0.28*	0.16	0.27	0.17	*0.28*	0.16
College or More	**0.66**	0.14	**0.64**	0.15	**0.66**	0.14
Married	**0.56**	0.16	**0.48**	0.17	**0.56**	0.16
Single-person Household	0.20	0.19	0.13	0.21	0.20	0.19
“Very burdensome” Indicator					-0.01	0.20
R-Square	0.44		0.39		0.44	
n	89		78		89	

Impact of burden on regression coefficients

Total number of regression models	37
# of models where regression estimates changed significance level	7

If “Very burdensome” cases were NOT collected…

	With "Very burdensome" cases	Without "Very burdensome" cases	Differences	% CHANGE
# of completed interviews	3,340	2,964	376	11.3%
Data collection effort				
Total number of attempts	13,294	11,598	1,696	12.8%
Total number of Refusers converted	345	232	113	32.8%
Total number of interview hours	3,764	3,338	426	11.3%
Post-survey processing effort				
Total number of "Don't know" to be edited/imputed	2,807	2,309	498	17.7%
Total number of "Refused" to be edited/imputed	301	120	181	60.1%


Estimates of Mean expenditure total by call attempts
8500
8000
7500
7000
6500
1
2
3
4
5
6
7
8
9
10
10+
Weighted_all
Weighted_no_burden
Unweighted_all
Unweighted_no_burden

Conclusions

- Respondents who reported “very burdensome” exhibited worse response behaviors and produced data of worse quality
- Removing these cases
  - doesn’t seem to change mean estimates
  - doesn’t seem to change conclusions from regression models
  - could result in cost savings in terms of
    - Number of contact attempts saved
    - Number of production hours saved
    - Number of items to be edited and/or imputed reduced

THANK YOU!

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