Using Community-Level Correlates to Evaluate Nonresponse Effects in a Telephone Survey

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Nonresponse Methodologies

- Follow-up interviews with non-respondents
- Comparing early vs. late respondents
- Panel attrition studies
- Record match studies

Follow-up Interviews with Non-Respondents

- Response rates to follow-up interviews with non-respondents are typically low
  - May result in correlation bias
- Different data collection modes are common

Comparing Early vs. Late Respondents

- Assumes difficult-to-reach are most similar to non-respondents
- Total sample frame not included in analyses

Panel Attrition Studies

- Common baseline data for follow-up respondents and non-respondents
- Can distinguish between refusals and non-contacts
- Attrition process may qualitatively differ from initial nonresponse process

Records Match Studies

- Able to examine nonresponse across complete sample frames
- Studies have employed:
  - Census data (Groves & Couper, 1998; Gfroerer et al. 1997)
  - HMO data (Needle et al. 1985)

Purpose of Study

- Present methodology for nonresponse records match study of RDD telephone survey

Survey Data

- RDD telephone survey
- 4,155 Illinois citizens aged 16+
- January – August 2003
- Response Rate (AAPOR RR3) = 32.7%
- Mean interview length = 29.8 minutes
- Purpose to estimate substance abuse treatment needs

Multiple Data Sources

- Telephone sample area code/exchanges (n=20,774 #'s)
- Final sample disposition codes
- Zip codes for each phone number
- Census characteristics for each zip code (n=779 zip codes)
- Survey responses for each completed case

Dependent Variables

- Past year alcohol or drug abuse treatment need
- No current health insurance coverage
- Current physical disability
- Ever having been homeless
- Past year receipt of public aid
- Lifetime problem gambling

Nonresponse Measures

- Responded to survey
- Unable to contact
- Refused to participate

Ecological Variables: predictors of collective efficacy

- **Percentage of population at the same address for past 5 years (residential stability)**
- **Percentage of adults with professional or managerial occupations (concentrated affluence)**
- **Percentage of population that is below poverty level (concentrated disadvantage)**
- **Population density (urbanicity)**
- **Percentage of population that is foreign-born (concentrated immigration)**
- **The adult-to-child ratio (emphasis on children and family)**

HLM to examine associations between ecological measures and:

- Survey Nonresponse measures
- Study outcome measures

Equations

- **Level-1 Model:**

$$log[P/(1-P)] = \beta_0 + \beta_1(ST1) + \beta_2(ST2) + \beta_3(ST3) + \beta_4(ST4) + \beta_5(ST5) + \beta_6(ST6) + \beta_7(ST7)$$

- **Level-2 Model:**

$$\beta_0 = \gamma_{00} + \gamma_{01}(RS5YRS) + \gamma_{02}(PROF) + \gamma_{03}(PVRTY) + \gamma_{04}(DNSTY) + \gamma_{05}(FRGNBRN) + \gamma_{06}(ADLT2CHLD) + u_0$$

Effects on Response

Zip code level variables	Coefficient	(S.E.)
Intercept	-0.38***	(0.05)
% population at same address for past 5 years	-0.002	(0.003)
% adults with professional-managerial occupations	-0.49**	(0.20)
% population below poverty level	-0.18*	(0.09)
Population density	-0.12*	(0.06)
% population foreign-born	0.17	(0.17)
Adult-to-child ratio	-0.002	(0.04)

Effects on No Contact

Zip code level variables	Coefficient	(S.E.)
Intercept	-0.38***	(0.05)
% population at same address for past 5 years	0.0007	(0.003)
% adults with professional-managerial occupations	0.46*	(0.21)
% population below poverty level	0.06	(0.09)
Population density	0.08	(0.06)
% population foreign-born	0.21	(0.17)
Adult-to-child ratio	0.02	(0.05)

Effects on Refusal

Zip-code level Variables	Coefficient	(S.E.)
Intercept	-0.46***	(0.04)
% population at same address for past 5 years	0.007**	(0.003)
% adults with professional-managerial occupations	0.52**	(0.20)
% population below poverty level	0.16	(0.09)
Population density	0.03	(0.05)
% population foreign-born	-0.30	(0.16)
Adult-to-child ratio	0.01	(0.05)

Effects on Substance Abuse

Zip-code level Variables	Coefficient	(S.E.)
Intercept	-2.01***	(0.11)
% population at same address for past 5 years	0.001	(0.01)
% adults with professional-managerial occupations	0.71	(0.47)
% population below poverty level	0.01	(0.21)
Population density	-0.06	(0.14)
% population foreign-born	0.80	(0.48)
Adult-to-child ratio	-0.12	(0.10)

Effects on No Health Insurance

Zip code level variables	Coefficient	(SE)
Intercept	-2.17***	(0.13)
% population at same address for past 5 years	0.004	(0.01)
% adults with professional-managerial occupations	-0.91	(0.55)
% population below poverty level	0.53*	(0.26)
Population density	-0.24	(0.16)
% population foreign-born	1.04*	(0.49)
Adult-to-child ratio	0.05	(0.19)

Effects on Physical Disability

Zip code level variables	Coefficient	(SE)
Intercept	-1.35***	(0.09)
% population at same address for past 5 years	0.003	(0.01)
% adults with professional-managerial occupations	-0.32	(0.40)
% population below poverty level	0.46*	(0.20)
Population density	-0.03	(0.10)
% population foreign-born	-0.13	(0.39)
Adult-to-child ratio	0.03	(0.09)

Effects on Homelessness

Zip code level variables	Coefficient	(SE)
Intercept	-3.28***	(0.18)
% population at same address for past 5 years	-0.01	(0.01)
% adults with professional-managerial occupations	-1.22	(0.77)
% population below poverty level	0.34	(0.39)
Population density	0.10	(0.20)
% population foreign-born	-0.15	(0.62)
Adult-to-child ratio	-0.21	(0.16)

Effects on Public Aid

Zip code level variables	Coefficient	(SE)
Intercept	-1.45***	(0.09)
% population at same address for past 5 years	0.02**	(0.01)
% adults with professional-managerial occupations	-0.66	(0.45)
% population below poverty level	0.32	(0.22)
Population density	0.04	(0.11)
% population foreign-born	0.13	(0.35)
Adult-to-child ratio	0.12	(0.09)

Effects on Gambling

Zip code level variables	Coefficient	(SE)
Intercept	-2.97***	(0.16)
% population at same address for past 5 years	0.01	(0.01)
% adults with professional-managerial occupations	-0.28	(0.67)
% population below poverty level	0.03	(0.33)
Population density	-0.08	(0.21)
% population foreign-born	0.004	(0.63)
Adult-to-child ratio	0.38**	(0.12)

Directions of Ecological Effects

	Response	No Contact	Refusal	No Health Insurance	Physical Disability	Public Aid	Problem Gambling
% population at same address for past 5 years			+			+	
% adults with professional-managerial occupations	–	+	+				
% below poverty level	–			+	+		
Population density	–						
% population foreign-born				+			
Adult-to-child ratio							+

Conclusions

- RDD nonresponse can be predicted from zip code level ecological measures
- The independent effects of these forms of nonresponse bias on key survey measures can be evaluated
- This method could routinely be used in telephone surveys to adjust for nonresponse bias

Final Thoughts

- Proper unit of ecological area
- Availability of matched data
- Further Development