Where am I calling? New telephony technologies and implications for respondent location in RDD samples

Eric Jodts, Westat
Hanna Popick, Westat
Jon Wivagg, Westat
Karen Melia, Westat

AAPOR 2014   Measurement and the Role of Public Opinion in a Democracy

Background

- New technologies such as voice over internet protocol (VoIP) and landline-to-cell porting have a growing impact in landline RDD samples.

- Landline respondents sometimes report answering the phone in unexpected locations.

Understanding Prevalence

- Westat conducted a national dual-frame RDD survey from 2012 to 2013.

- Total of about 45,000 landline completed interviews.

- Compared sampled state (based on exchange) and zip (from matched addresses, where available) information to location information provided by respondents during interview.

Match Rates

- The sample vs. respondent location match rate for the landline sample at the state level was high at 99.3%, while zip code was lower at 93.6%.

- Unresolved question: Are cases that do *not* match the sampled location different in an identifiable way from cases that *do* match?

Hypothesis

- Some proportion of mismatches are related to the type of service provider.

- New technologies related to service provider type, such as VoIP (cable service, Vonage, magicJack, Google Voice, etc.), may account for location inaccuracies.

Addressing Hypothesis

- In addition to loaded and collected state and zip code, need to ask respondents about their phone service providers.

- Westat conducted a national RDD survey in early 2014 specifically to address this hypothesis.

- Completed interviews with 354 respondents from a landline sampling frame.

  – Expanded frame from sampling vendor that includes VoIP providers

Survey Design & Results

Screening Questions: Reference phone number and phone use

- To account for call forwarding and other technologies, we told the respondent the number we dialed and asked if business or residential.

- 33 of 542 respondents who answered (6.1%) did not recognize the number dialed and the interview was terminated.

- If recognized and residential or mixed-use we continued with interview.

Survey Questions: Type of Phone

- Is the number I <u>dialed</u> a landline or a cell phone?

  - LANDLINE (N=347, 98%)

  - CELL PHONE (N=6, 1.7%)

  - VOIP (N=1, 0.3%)

  - SOMETHING ELSE (N=0)

  - DON'T KNOW (N=0)

  - REFUSED (N=0)

Survey Questions: Service Provider

- Who is the service provider for the number I dialed?

Landline	AT&T, CenturyLink, Cincinnati Bell, Claro Puerto Rico, FairPoint, Frontier, Hawaiian Telecom, TDS, Verizon, Windstream, Etc.
Cell Phone	AT&T Wireless, Cricket, MetroPCS, Sprint, T-Mobile, TracFone, US Cellular, Verizon Wireless, Etc.
VoIP	AT&T U-verse, Comcast, Cox, Lingo, magicJack, RCN, Time Warner, Verizon FiOS, Vonage, Etc.

Survey Questions: State and Zip code

For Landline and VoIP:

- In which state/zip is the number I dialed primarily located?

For Cell:

- In which state/zip is your primary or home address?

Defining Service Type by Providers

Provider Type	N After Coding
Landline	206
VoIP	119
Reported landline, service type unknown	25
Cell	4

Match Rates at State and Zip Code Level

State and Zip* Match Rates by Service Type

	Match at state level		Match at zip code level	
	Loaded and Collected Match (N)	**Match Rate (%)**	Loaded and Collected Match (N)	**Match Rate (%)**
Landline (N=145)	145	100	132	91.0
VoIP (N=79)	79	100	69	87.3
Reported landline (N=17)	17	100	13	76.5
Cell (N=3)	2	66.7	1	33.3
Total (N=244)	243	99.6	215	88.1

*From address match

Match Rates at State and Zip Code Level

State and Zip* Match Rates by Service Type

	Match at state level		Match at zip code level	
	Loaded and Collected Match (N)	**Match Rate (%)**	Loaded and Collected Match (N)	**Match Rate (%)**
Landline (N=206)	206	100	117	56.8
VoIP (N=119)	119	100	50	42.0
Reported landline (N=25)	24	96.0	11	44.0
Cell (N=4)	3	75.0	1	25.0
Total (N=354)	352	99.4	179	50.6

*Determined by exchange

Distance Between Unmatched Zip Codes

Distance Between Loaded* and Collected Zip for Unmatched Zip Codes

	Valid Zip but Unmatched (N)	Median Distance (Miles)	Average Distance (Miles)
Landline (N=206)	85	4.6	7.7
VoIP (N=119)	65	4.5	6.3
Reported landline (N=25)	13	4.4	149.6
Cell (N=4)	3	6.7	336.3
Total (N=354)	166	4.6	24.2

*Determined by exchange

Analysis by Westat GIS department, based on zip code centroids

County Match Rate for Unmatched Zip

Match rate for unmatched collected zip codes to loaded county*

	Valid Zip but Unmatched (N)	Unmatched Zip Still in County (N)	Within-county Match Rate (%)
Landline (N=206)	85	73	85.9
VoIP (N=119)	65	58	89.2
Reported landline (N=25)	13	9	69.2
Cell (N=4)	3	2	66.7
Total (N=354)	166	142	85.5

*Determined by exchange

Analysis by Westat GIS department

Survey Questions: Where answered?

- For landline/VoIP phone, respondents asked if they answered this call in a location other than the one they just provided (the primary location).

- Only one respondent indicated a different zip code for answering location, which was within the same state.

Conclusions

- The expanded landline frame from sampling vendor does include respondents using non-traditional service providers, including VoIP.

  – 119 of 354 respondents in this study (34%)

- Most respondents with VoIP do still identify their phone as a landline. Thus, existing HH screener weighting questions are capturing them.

- Numbers with VoIP service providers degrade in location accuracy at the zip code level, relative to traditional landline service.

Implications

- Depending on geographic precision needed (national, state, county, zip) the impact to your study may vary.

- If prevalence and portability of VoIP phones increase impacts will grow.

- Impact on weighting does not seem drastic yet

  – Respondents readily categorize phones with VoIP providers as a landline when asked if a landline or cell.

Continuing Research

- Will the prevalence and portability of VoIP service change over time?

- Will VoIP service's impact on match rates between loaded and collected location information (zip, county, etc.) change over time?

- Do VoIP users differ from other landline users?

Thank you.

With thanks again to Hanna Popick, Jon Wivagg, Karen Melia, and many others at Westat who contributed to this work.

For more information, contact Eric Jodts ericjodts@westat.com