

turning knowledge into practice

GeoframeTM: A New Method of Field Enumeration

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RTI International is a trade name of Research Triangle Institute

Today's Presentation is about:

- How we:
 - Built a robust area probability sample
 - For the Hispanic/Latino Adult Tobacco Survey (H/LATS)
 - With a budget and schedule that did not accommodate traditional methods of household enumeration (also known as “field enumeration” or “counting and listing”)
- And how the methods we employed could be used in other studies

Traditional Sample Frame Creation

- Face-to-face interviewing using area probability samples is the assumed gold standard for conducting representative surveys
- Steps to traditional area probability sample frame development include:
 - Selection of geographic area of interest
 - Selection of segments within the geographic area
 - Household enumeration (listing of all dwelling units in study segments)
- Create sample by selection of dwelling units within segments

Household Enumeration

- Involves sending a staff of listers (hourly staff) to create lists of dwelling units within segments in an organized way
- This staff needs to be recruited, trained and supervised
- Sometimes still conducted using paper-and-pencil which requires data entry, processing and review of listers' work before sample can be selected
- While robust, process is time-consuming and costly

Alternatives to Household Enumeration

- High cost of household enumeration has led researchers to look for alternatives to this step in the process
- In recent years large surveys have successfully used samples based on postal lists to eliminate need for household enumeration¹
 - ¹ Iannacchione, Vincent, Jennifer Staab, and David Redden. 2003. Evaluating the use of residential mailing lists in a metropolitan household survey. *Public Opinion Quarterly*, 67(2):202-210.
- Need for enumeration still exists in areas where postal lists do not provide good coverage (e.g., rural areas)

Hispanic/Latino Adult Tobacco Survey

- Conducted for the Office of Smoking and Health (OSH) in the Centers for Disease Control (CDC)
- Designed to address possible under-representation of Hispanic/Latino respondents in state- or nation-wide adult tobacco surveys conducted by telephone
- The challenge was to conduct a scientifically valid survey of residents of the colonias in El Paso County, Texas

Las Colonias in El Paso County

In general, colonias:

- Are unincorporated areas on the Texas-Mexico border
- Are home to many immigrants from Latin America
- Have some very recent immigrants as well as families who have lived there for multiple generations
- Receive few public services (such as water, sewer, electricity, telephone, etc.)

Las Colonias in El Paso County (con't)

- Families often begin by living in a trailer or similar structure
- Gradually build more permanent dwellings, often one room at a time
- Often have multiple related families living together on one piece of land
- Depending on how long the family has been in the colonias, housing unit can be anything from a one-room shed to a large house with outbuildings

Colonias Property: Single Trailer



Colonias Property: Multiple Trailers with Some Construction



Colonias Property: Established



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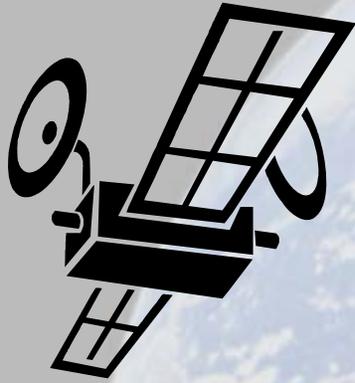
Why Couldn't We Use Traditional or Other Low-Cost Methods to Create a Survey Sample?

- Telephone coverage believed insufficient to conduct telephone study
- Could not construct low-cost area probability sample for in-person interviewing using postal lists because a high proportion of residents receive mail through P.O. boxes
- Traditional counting and listing not affordable and would have been challenging since street addresses often poorly marked on houses
- Needed to create sample on tight schedule that did not allow time for traditional counting and listing

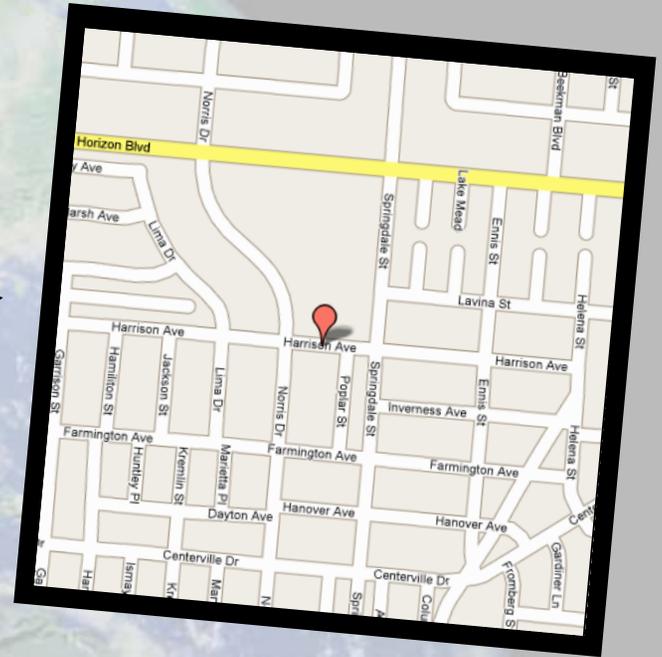
GeoFrame™

- For this study, the RTI project team developed a process known as GeoFrame™ that allowed us to conduct household enumeration in the colonias much more efficiently than with the traditional method
- Used usual approach for constructing an area probability sample:
 - Defined colonias of interest
 - Estimated size of universe (just under 9,000 DUs)
 - Used GeoFrame™ to conduct household enumeration

Geo-Positioning Satellite



Lat: XX° XX' XX"
Lon: YY° YY' YY"



Camera + GPS Receiver

Advantages of GeoFrame™: Reduce Time and Cost of Household Enumeration

- List unit as fast as you can take a picture, vs. writing or typing out addresses and descriptions
- Using GeoFrame™, team of two listed just under 9,000 households in just over 48 hours (approximately 3.1 dwelling units/minute)
- Sampling frame is already in electronic format (no key entry from paper)
- Entire process from beginning household enumeration to providing sample to interviewers fit into compressed schedule (4 weeks)

Advantages of GeoFrame™: Increased Quality of Sample

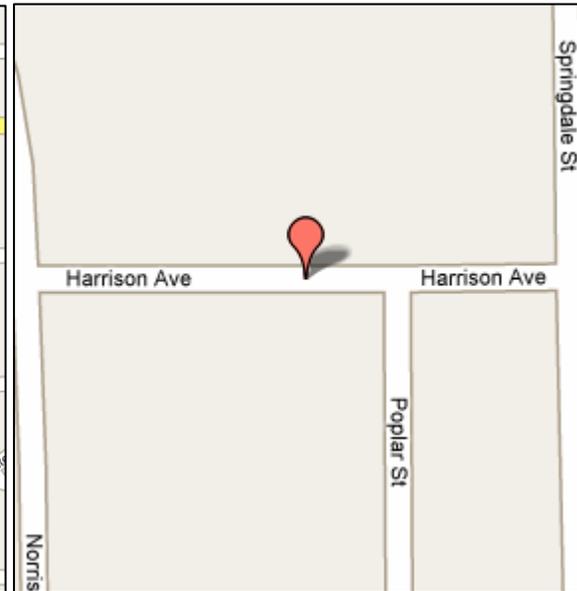
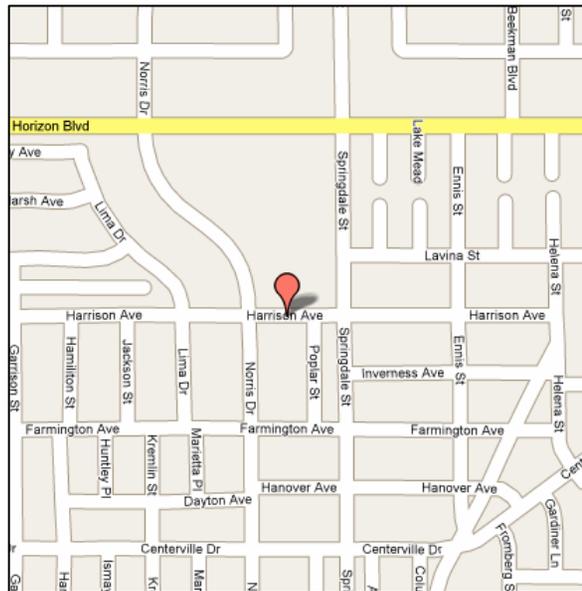
- Reduced time allowed us to use more senior staff to list sample (statistician and data collection task leader), who could resolve problems in the field
- Speed of sample listing allowed us to enumerate the entire frame and eliminate one stage of sampling, resulting in:
 - Less design effect
 - Expected greater precision of results for the cost
- Interviewers easily found sampled dwelling units

What Interviewer Going to Conduct an Interview Sees After Traditional Counting and Listing

Case Id No: 12345678		
Segment: 1001		
Street Address 1: 1234 Colonias Street		
Street Address 2:		
City: El Paso	State: TX	Zipcode: 55555
Notes: pink house		

CASEID: 12345678

AREA: South Side



Right Side [B01_0002]



Right Side [B01_0003]



Left Side [B01_0005]



Left Side [B01_0006]



Challenges with this Method

Poor view of houses from street

Changes to houses between sampling and data collection

- Context pictures and coordinates helped locate sampling units on H/LATS

Inability to get GPS signal

- Not an issue for H/LATS, could be in other locations

Next Steps: Our Current Research

- Determining feasibility of training traditional household enumerators (hourly staff) to enumerate households using GeoFrame™ reliably
- Evaluating speed and cost of household enumeration using GeoFrame™ versus traditional enumeration methods in different segments varied by type (e.g., urban, rural) and density
- Evaluating coverage of GeoFrame™ versus traditional enumeration methods using hourly staff

Conclusions

GeoFrame™:

- Allowed us to conduct a scientific study on a budget that ordinarily would not accommodate it
- Shows promise as a method to be used more widely to enumerate households in areas that postal listings do not cover well

Conclusions

GeoFrame™:

- Shows promise as a method to be used when addresses are not the best markers of dwelling units
 - Following disasters to study recovery efforts
 - Creating samples for multi-national studies
 - Creating samples other than households
- Useful to create samples where geospatial coordinates are needed for sample units

More on The H/LATS Study

- The H/LATS study required several additional innovations beyond this new method of household enumeration
- These are documented in other papers being presented at this conference and elsewhere, e.g.,

Customizing Survey Methods to the Target Population - Innovative Approaches to Improving Response Rates and Data Quality among Hispanics. Brian Evans, Rosanna Quiroz, Leslie Athey, Joseph McMichael, Vicky Albright, Michelle O'Hegarty, Ralph Caraballo, AAPOR 2008.

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