

Using Adaptive Design in the 2014 Census Test

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The views expressed are those of the author and not necessarily those of the U.S. Census Bureau

Outline

1. 2020 Census Planning
2. Adaptive Design
3. 2013 Census Test
4. 2014 Census Test and Preliminary Results
5. 2015 Census Test
6. Summary

Planning for the 2020 Census

- Design and conduct a census that costs less per housing unit than the 2010 Census while maintaining high quality
- Identify cost drivers and implement innovative enumeration methods aimed at reducing these costs
 - Adaptive Design during the Nonresponse Followup Operation
- Focus early research and testing program on major innovations to the design of the census oriented around major cost drivers of the 2010 Census

Adaptive Design

Two key aspects for our Decennial application

- Level of effort
 - Administrative Record Availability
 - Historical return rates for area
- Timing of the effort
 - Which cases are a priority to contact on each day?
 - What time should we contact the units?

Adaptive Design Challenges for a Decennial Census

- One-time data collection
 - Every 10 years
- Magnitude of Workload
 - Millions of housing units
- Census of Population and Housing
 - Both population and housing unit outcomes

2013 Census Test

Operational feasibility of the use of administrative records and adaptive contact strategy tailored to each household to reduce nonresponse follow-up (NRFU) workload and increase productivity

- Sample size of housing units in Philadelphia, drawn from Census 2010 NRFU universe
- Four panels that combined contact treatments (fixed and adaptive) with use of administrative records
- Data collection began in November 2013 and ended in early December 2013
- Used results to inform the 2014 Census Test

2013 Census Test Design

	Adaptive Design	Fixed
Administrative Records used for enumeration	<ul style="list-style-type: none"> -Use administrative records to enumerate before field -CATI telephone -Max in-person Contacts 3 -Propensity Model determines cases worked 	<ul style="list-style-type: none"> -Use administrative records to enumerate before field -Decentralized telephone -Max in-person Contacts 3 -FRs determine cases worked
Administrative Records not used for enumeration	<ul style="list-style-type: none"> -Use administrative records to inform business rules -CATI telephone -1 or 3 contacts -Propensity Model determines cases worked 	<ul style="list-style-type: none"> -No use of administrative records -Decentralized telephone -Max in-person Contacts 3 -FRs determine cases worked

2013 Adaptive Design Operational Lessons

- Response propensity models, using 2010 data and Contact History Information can score open cases daily.
- Systems can then dynamically assign cases based on propensity scores.
- Automated daily case assignment was unprecedented.
- Issues identified during the Test:
 - Response propensity models need further scrutiny and testing to ensure effectiveness
 - Geographic location of cases needs to be integrated into prioritized case assignments
 - More research on models and rules for handling vacant households and “deletes” is needed
 - More research on models and rules for obtaining proxy responses is needed
 - More research on daily case assignments for enumerators is needed

2014 Census Test

Self-response and Nonresponse Followup Test

Parts of Montgomery County, MD and the District of Columbia

Census Day July 1, 2014

Self-response mailings started on June 23rd

NRFU operations started on August 14th

Test designed to compare different strategies aimed at reducing costs

- Show some preliminary results related to administrative record removal and interviewing results
- Additional results shown at upcoming 2020 Census Program Management Review on January 9th.

Nonresponse Followup (NRFU) Panels

- Control Panel
- Reduced Contact Strategy, no Administrative Records usage
- Reduced Contact Strategy with Administrative Records
- Adaptive Design with Administrative Records Usage

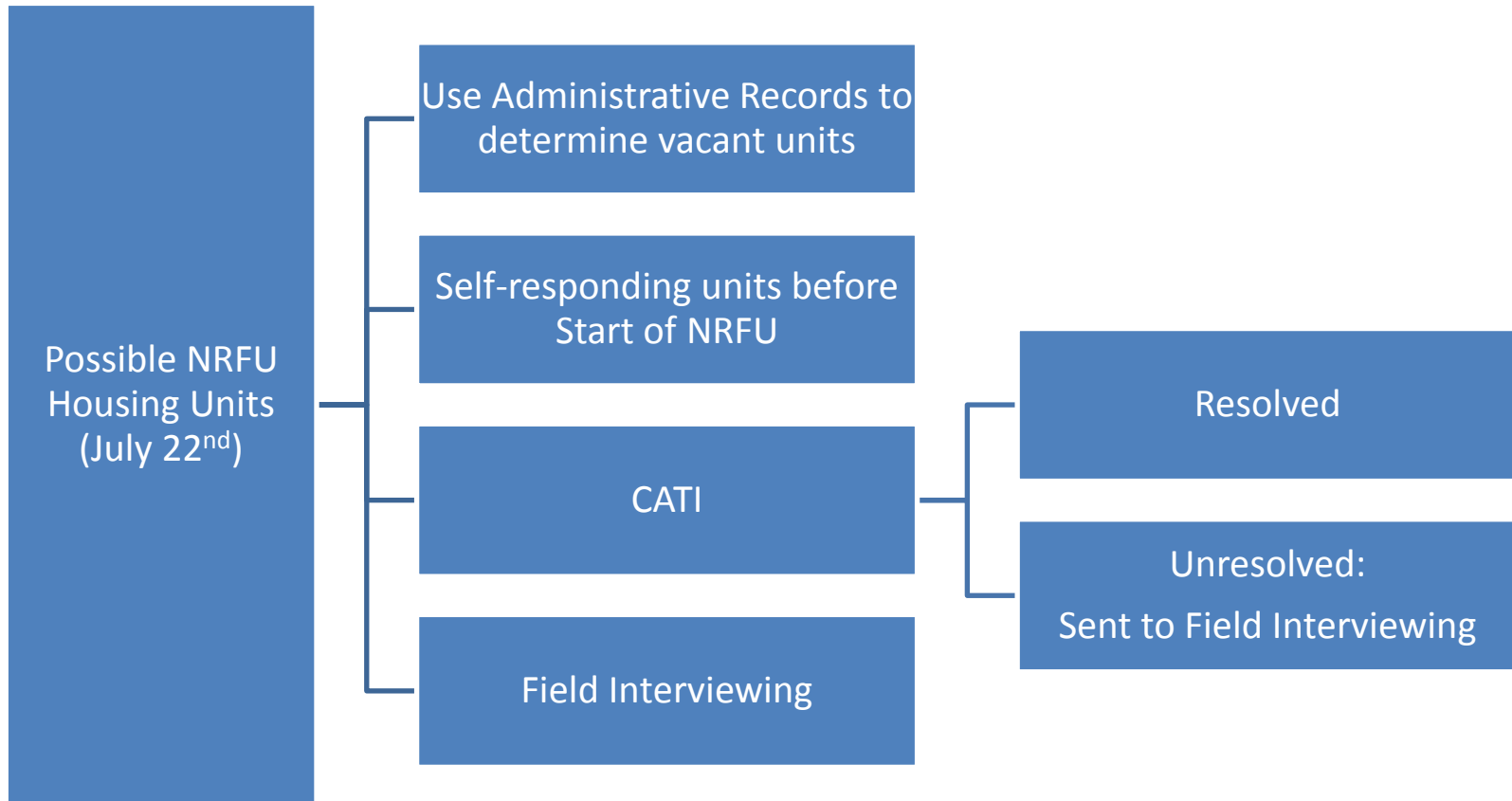
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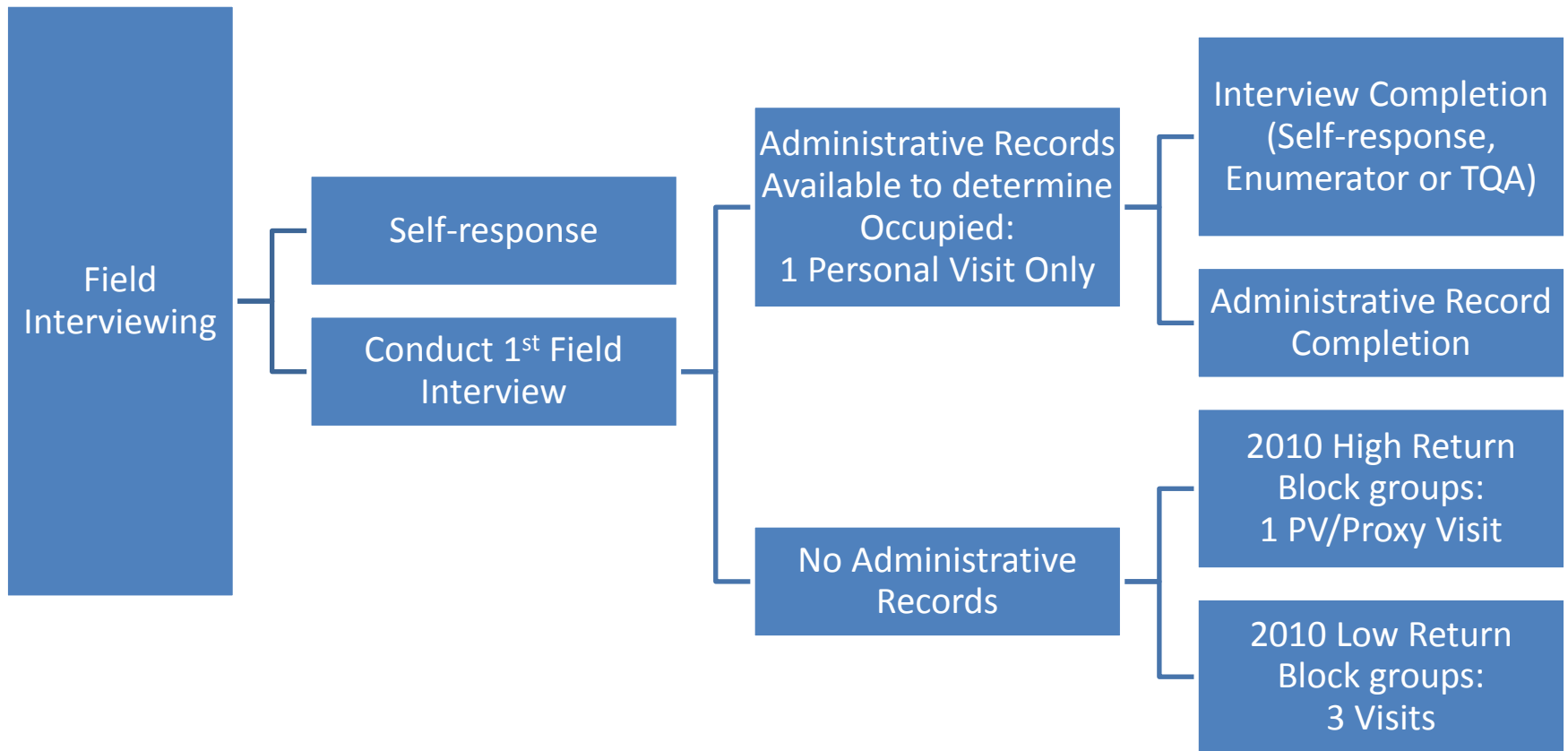
Control Panel

- **Similar approach to 2010 NRFU**
 - First attempt must be a personal visit
 - Up to 3 personal visits may be attempted
 - Up to 3 telephone calls may be attempted
 - Proxies allowed
 - Enumerators determine the best approach to use to obtain a completed interview
- **There are two major differences from the 2010 Census**
 - Enumerators used an automated instrument instead of paper questionnaire
 - Enumerators were provided telephone numbers (if available from administrative records) for their cases

Adaptive Design Panel



Adaptive Design Panel Continued



Adaptive Design Panel

- **Priority Cases for Fieldwork**
 - Enumerator training focused on adaptive design principles
 - 7 high priority cases assigned per day to each enumerator
 - Daily priority cases based on
 - Scheduled appointments
 - Geographic proximity of cases

2014 Preliminary Results:

- Completion result comparisons between Control and Adaptive Design panels
- Release additional finding at the 2020 Census Program Management Review on January 9, 2016.

NRFU Preliminary Personal Visit Results: Completion Percentages

Result	Control Panel	Adaptive Design Panel
Overall NRFU Completion	79%	86%
Administrative Record Vacant	n/a	4%
Self-response	33%	30%
Outbound CATI	n/a	4%
Personal Visit	44%	23%
Enumerator Phone	3%	1%
Administrative Record Occupied	n/a	25%

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Field Visits

Completions Per Case vs. Completions Per Field Attempt

Field visit cases

- Field enumerator made at least one contact attempt to the unit

Complete

- Interview completed by enumerator, self-response or TQA

Attempts

- Count the number of personal visit and proxy attempts

Field Visits

Completions Per Case vs. Completions Per Field Attempt

	Control Panel	Adaptive Design
Completion Per Case	61%	35%
Average attempts Per case	4.1	1.7
Completion Per Attempt	15%	21%

Planning for the 2015 Census Test

- Continue to use Administrative Records to determine level of effort
- Researching adaptive approaches to determine level and timing of effort.
- Re-Organize Census with Integrated Technology (ROCKIT)
 - Assigning attempts to interviewers each day
 - Interviewer availability
 - Optimal routing of cases to minimize travel
 - Best contact times based on American Community Survey interviews

Summary

- Implemented adaptive design approaches in 2013 Census Test
 - Level of Effort: Administrative record availability
 - Timing of Effort: Priority cases based on propensity model
- Implemented in 2014 Census Test
 - Level of Effort: Administrative records and 2010 return rates
 - Timing of Effort: Priority cases based on geographic closeness
- Will implement in 2015 Census Test
 - Continue application with more features for level and timing of effort in the 2015 Census Test

Thank you

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Nonresponse Followup Design and Operations Team

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