Solving the Problems Cell Phones Create for Survey Research

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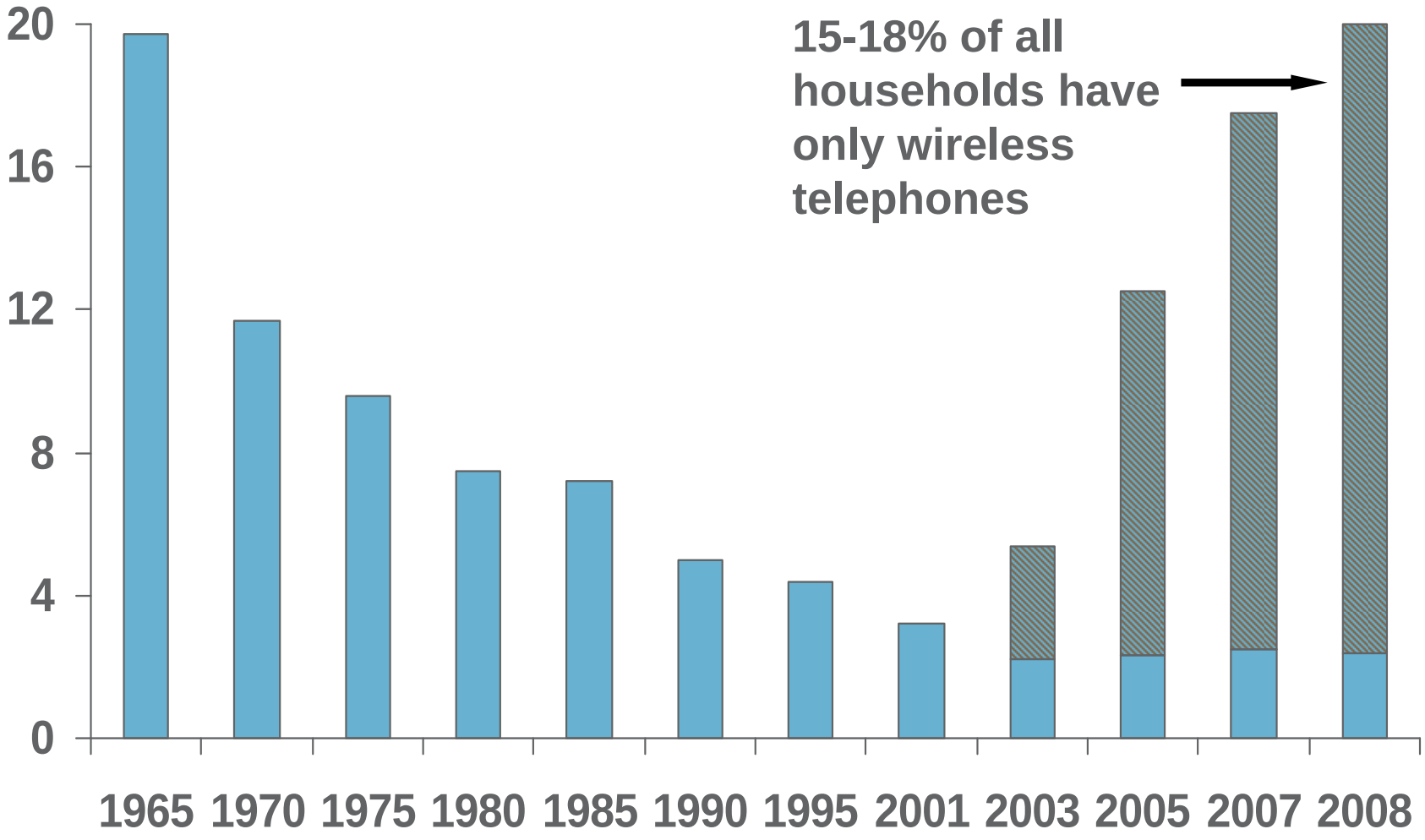
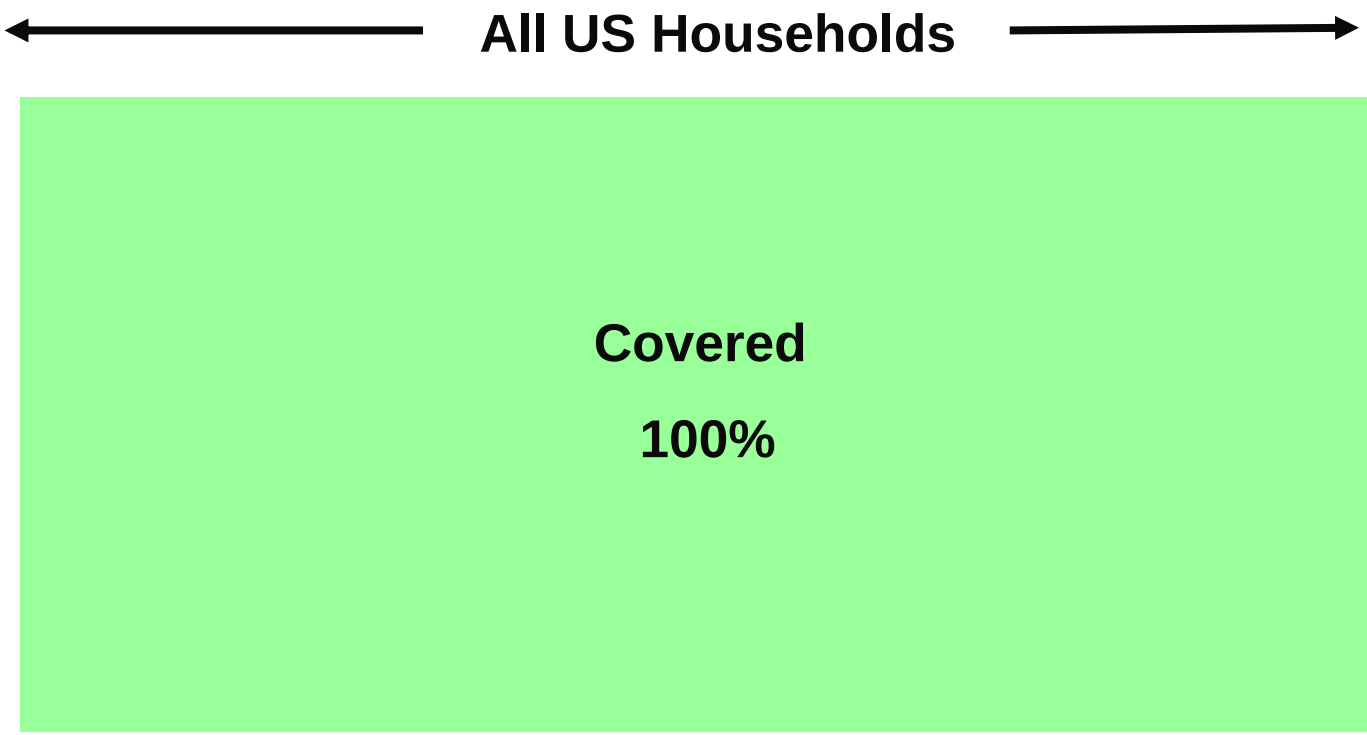
Random digit dialing (RDD) has served us well … so why change?

- Validity of the estimates produced
- Landline telephone frame coverage declining significantly & quickly
  - Cell phone-only households
- Telephone number portability
  - Numbers increasingly not in the geography we think they are

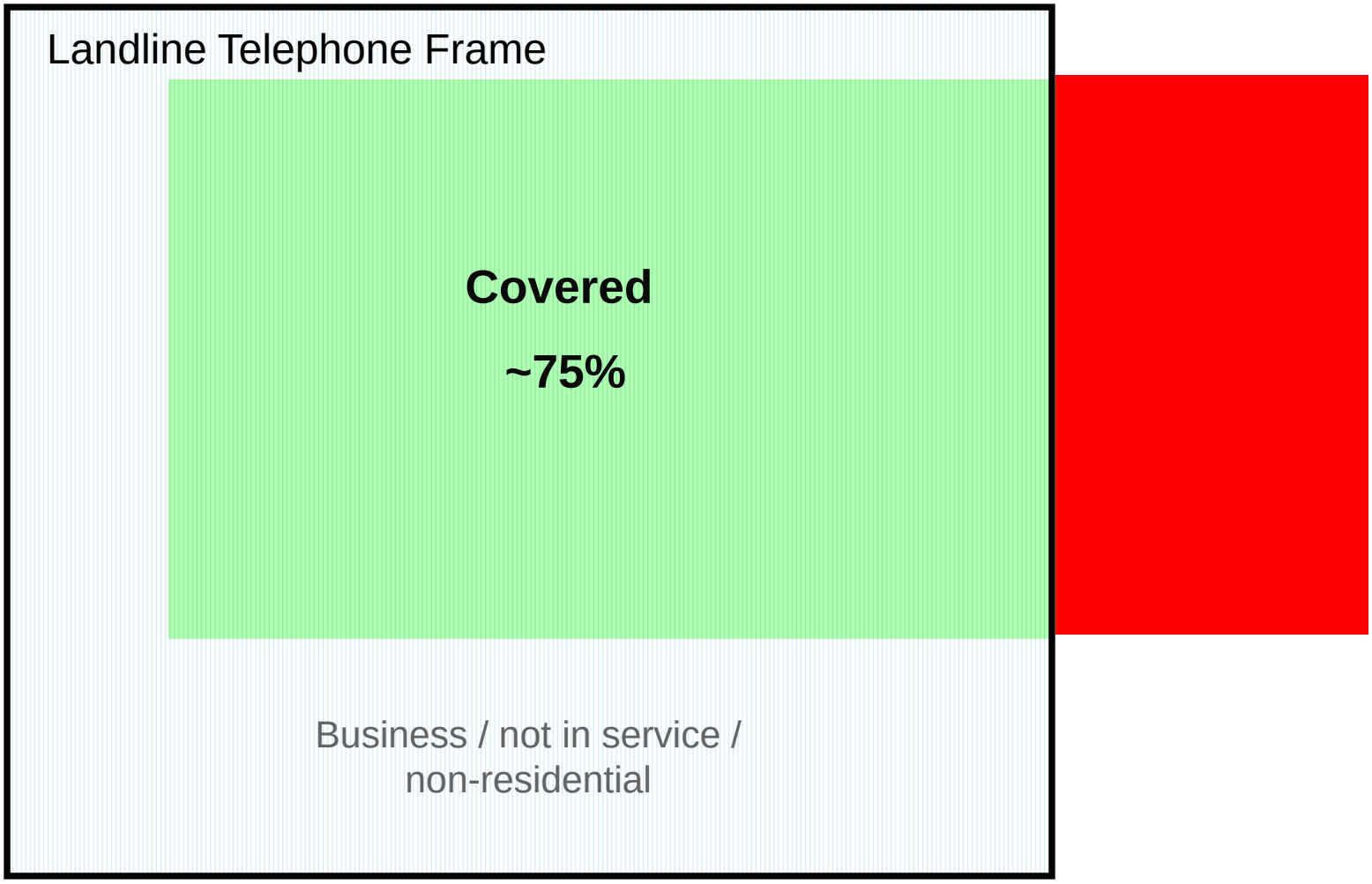
Percentage of U.S. households without landline telephones



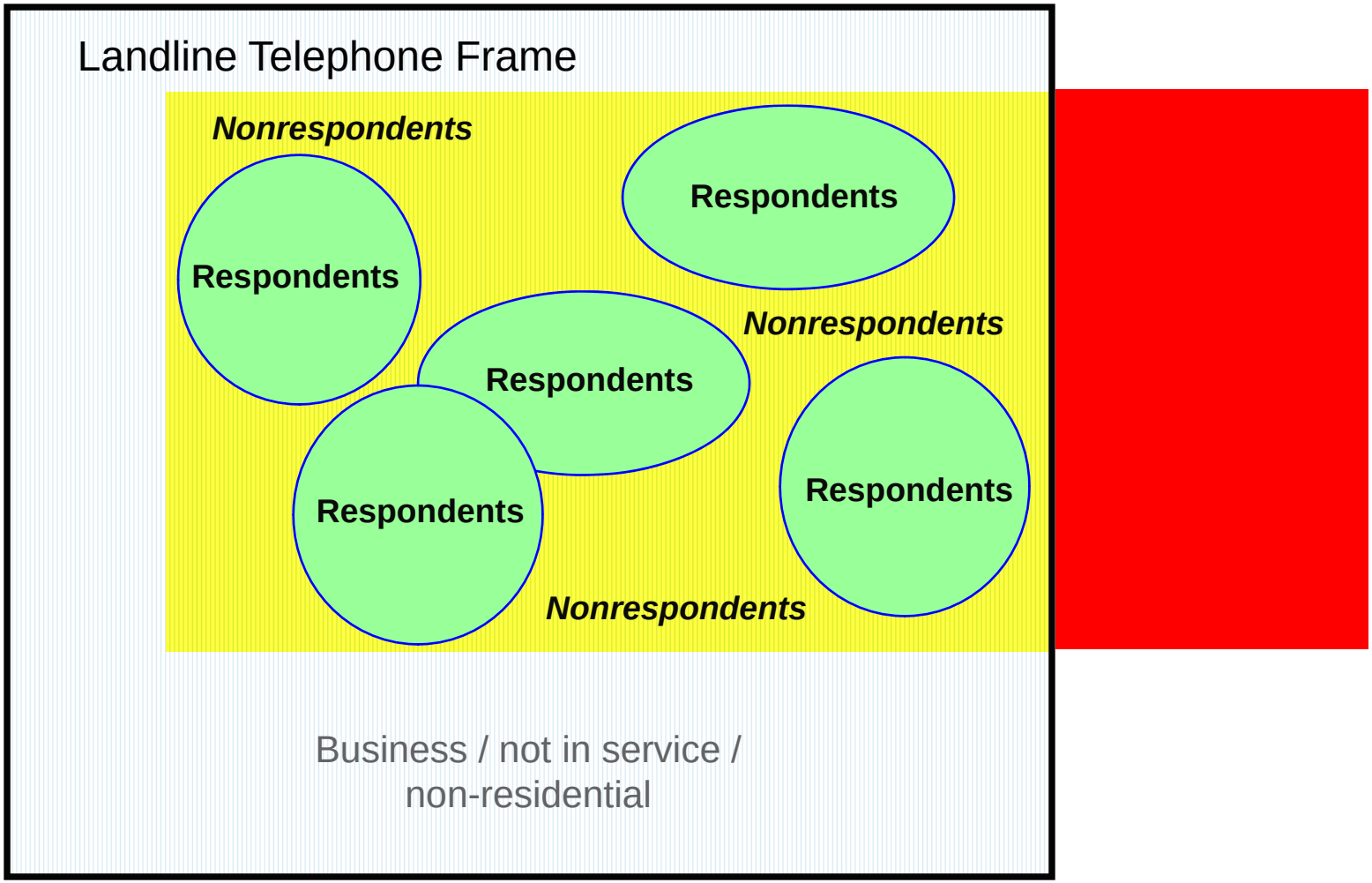
Ideally: Include all eligible households



Residential household coverage with current landline RDD model



Participation of residential households with current landline RDD model



Two potential alternatives to landline RDD

- Option 1: Dual frame landline / cell phone sampling:

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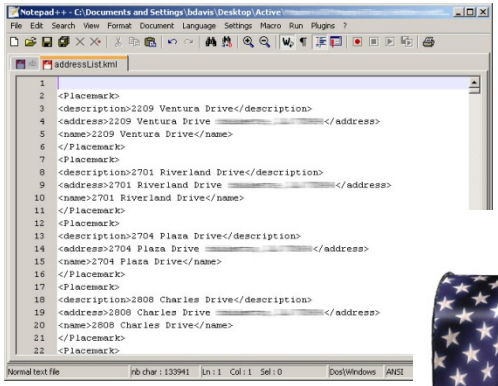
- Option 2: Address based sampling:



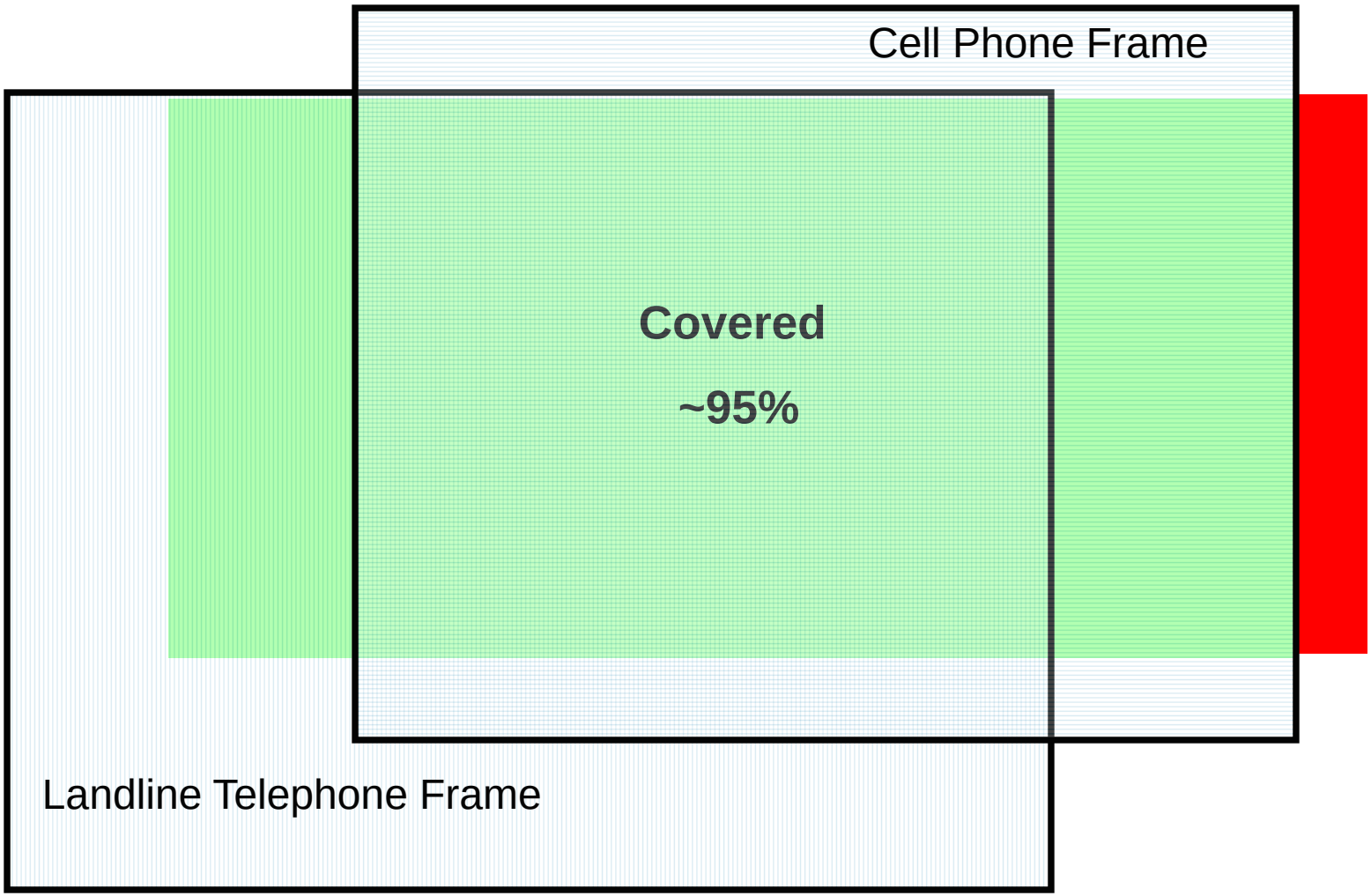
Option 1:
Dual frame landline/cell phone sampling

- Cell phone numbers can be sampled based on known cell phone exchanges & ported telephone numbers

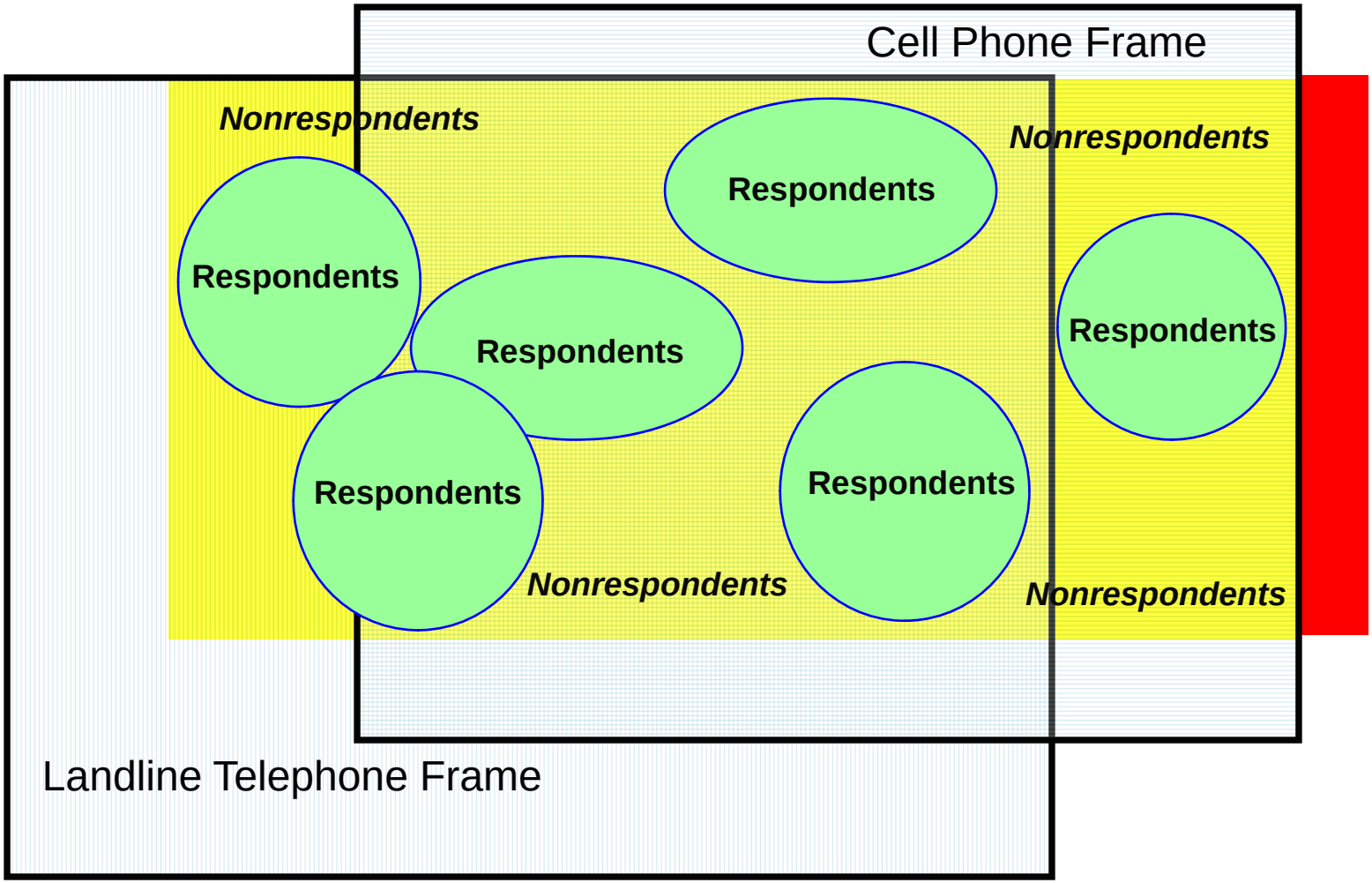
- Combine sample of landline exchanges with sample of cell phone exchanges
  - Screen for cell phone-only households

    -or-
  - Interview all households regardless of frame (no screening)

Residential household coverage with dual frame landline/cell phone model



Participation of residential households with dual frame landline/cell phone model



Positive aspects of dual frame landline/cell phone sampling approach

- High coverage rate (~95%)
- Allows continued use of CATI / complex questionnaires
- Per unit cost for sample is comparable to RDD
- Good for quick turn-around studies
- Facilitates contact with “on-the-go” respondents who may be difficult to reach at home

Negative aspects of dual frame landline/cell phone sampling approach

- Inefficient frame (many units expired/not in service)
- Little or no sample frame information (no addresses, names, respondent characteristics, etc.)
- Numbers not tied to specific geography
- Costly to conduct cell phone surveys (especially if screening for cell phone only households)
- Legal constrains on use of autodialers
- Low response rates
- No advance mailings
- Concerns about respondent safety

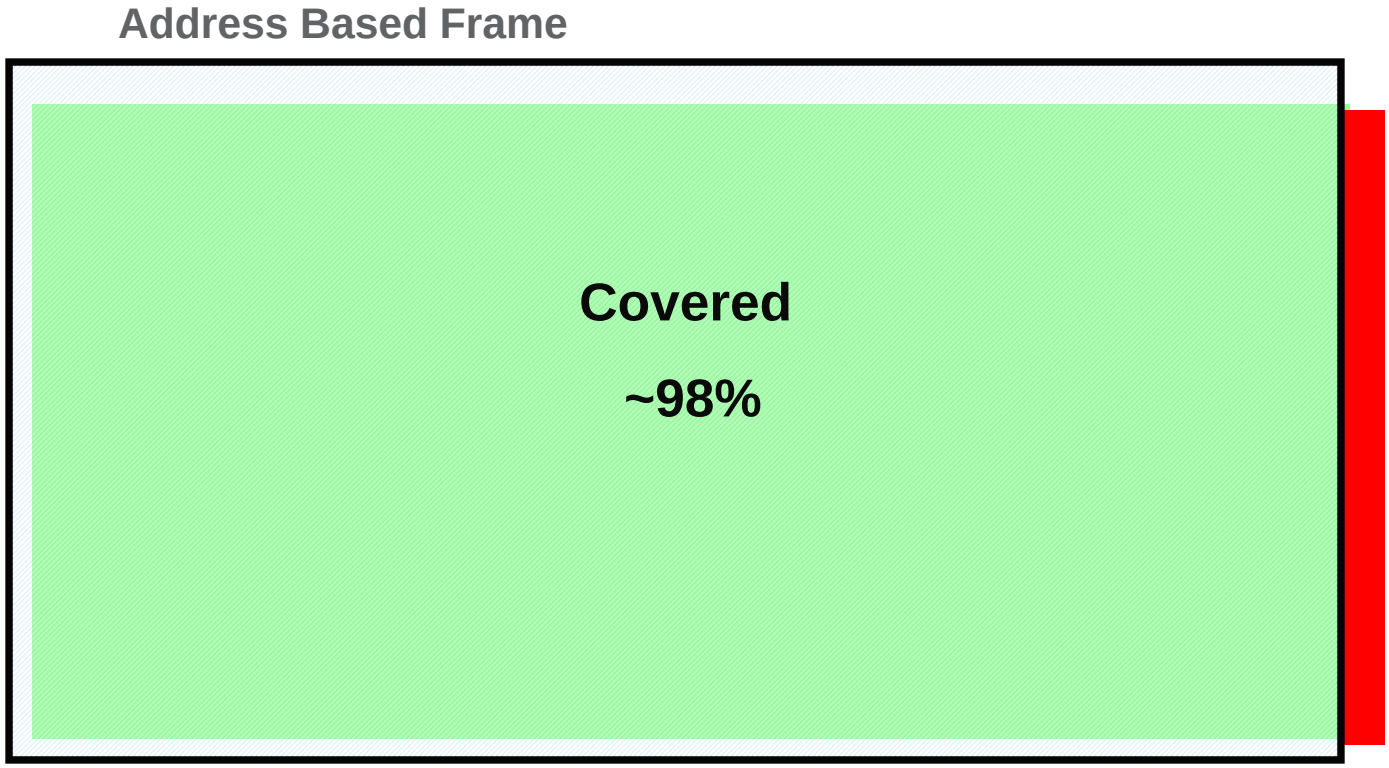
(More) negative aspects of dual frame landline/cell phone sampling approach

- Lack of universe estimates at sub-national levels for weighting & adjustment
- Questionable level of cognitive engagement
- Compensation for potential air-time charges strongly encouraged
- May require shorter questionnaire length
- Excludes households with no telephone access
- Calling windows uncertain if respondent time zone is unknown

Option 2:
Address Based Sampling (ABS)

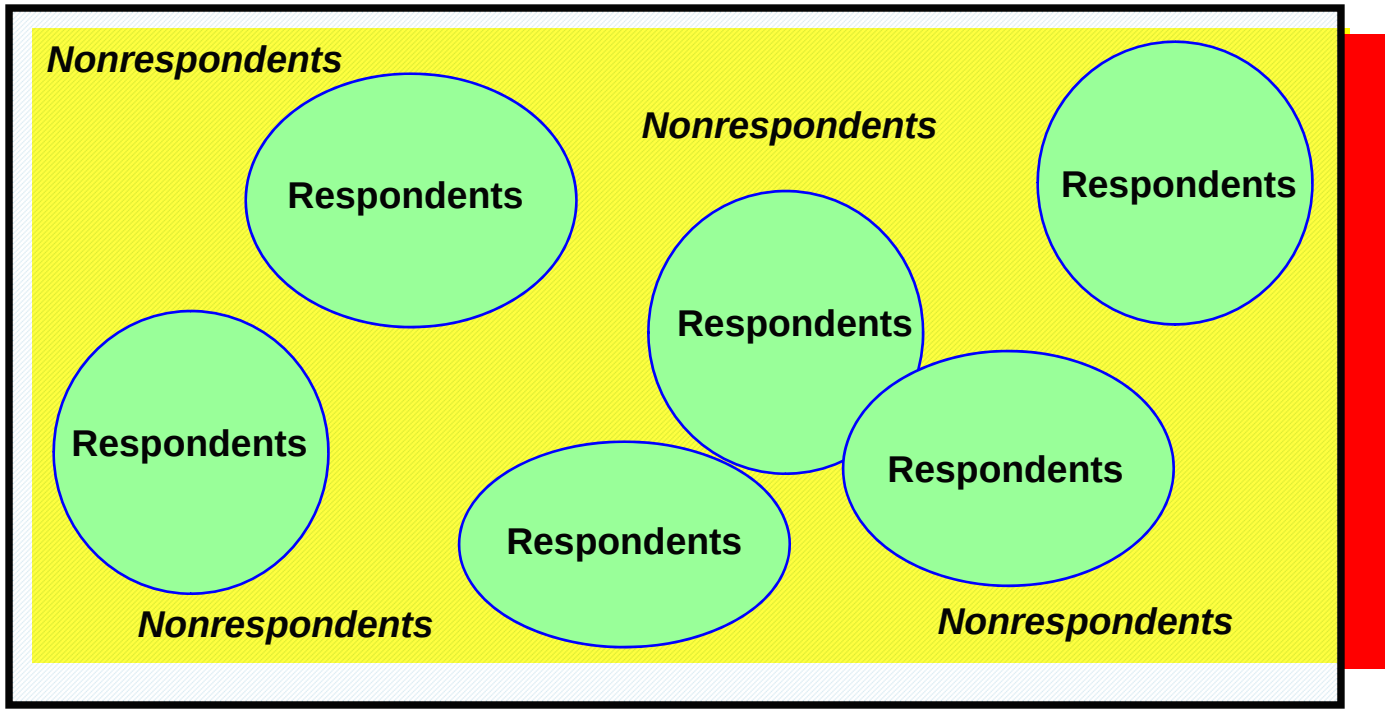
- Sample addresses rather than sample telephone numbers
- Current frame source: US Postal Service Delivery Sequence File (DSF):
  - All delivery point addresses serviced by USPS
  - Format conforms to USPS addressing standards
  - Available from survey sample vendors

Residential household coverage with address based sample model



Participation of residential household with address based sample model

Address Based Frame



Positive aspects of address based sampling approach

- High coverage rate (~98%)
  - More complete in urban area / less in rural
- Number of sample indicators available (age, surname, etc.)
  - Accuracy of indicators better than for landline telephone frame
- Geography is fixed / number portability not a problem
- Over 60% of addresses can be matched to telephone numbers
- Reaches cell phone only households & households with no telephone access

(More) positive aspects of address based sampling approach

- Highly efficient frame (few non-residential addresses after screening)
- Per unit cost for sample is comparable to RDD
- Improved accuracy and effectiveness of weighting procedures
  - Adjustments based on a broader set of respondents
- Reduction in the amount of sample required
- Facilitates multiple channels of data collection
- Can facilitate cost reductions over RDD depending on design

Negative aspects of address based sampling approach

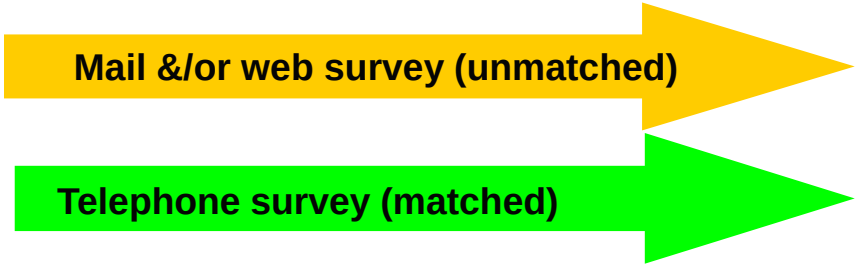
- Potentially slower turn around / longer field period for unmatched cases
- Heavier reliance on mail contact than telephone for some sample members
- Potentially limits complexity & length of questionnaire
- Can only match addresses to landline telephone numbers
- Small degree of multiplicity (ex. Households with city- style & PO Box)
- “Drop point units”: common address for multiple households (such as trailer park) may not have separate unit numbers

What would an address based sampling design look like?

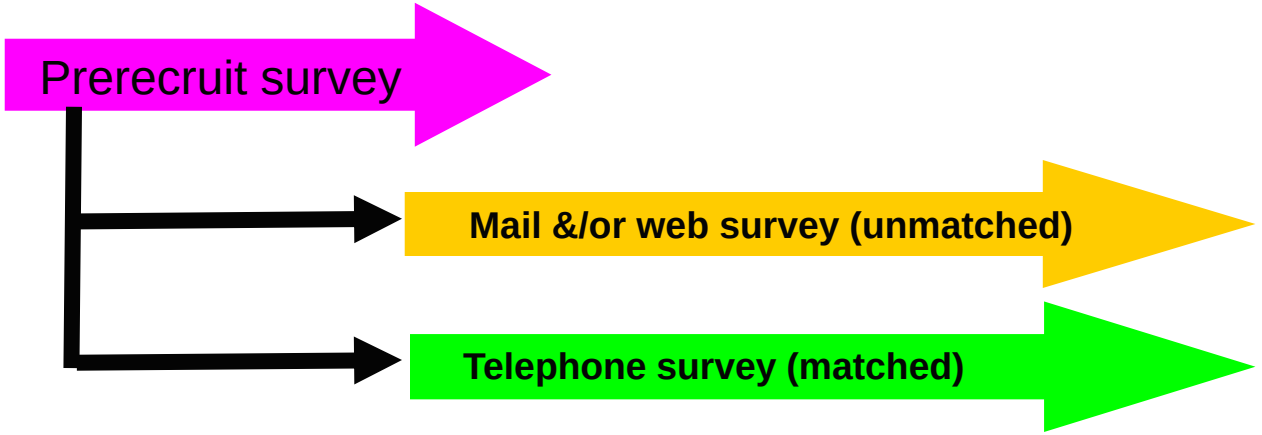
Examples of Potential ABS Designs

Single mode:

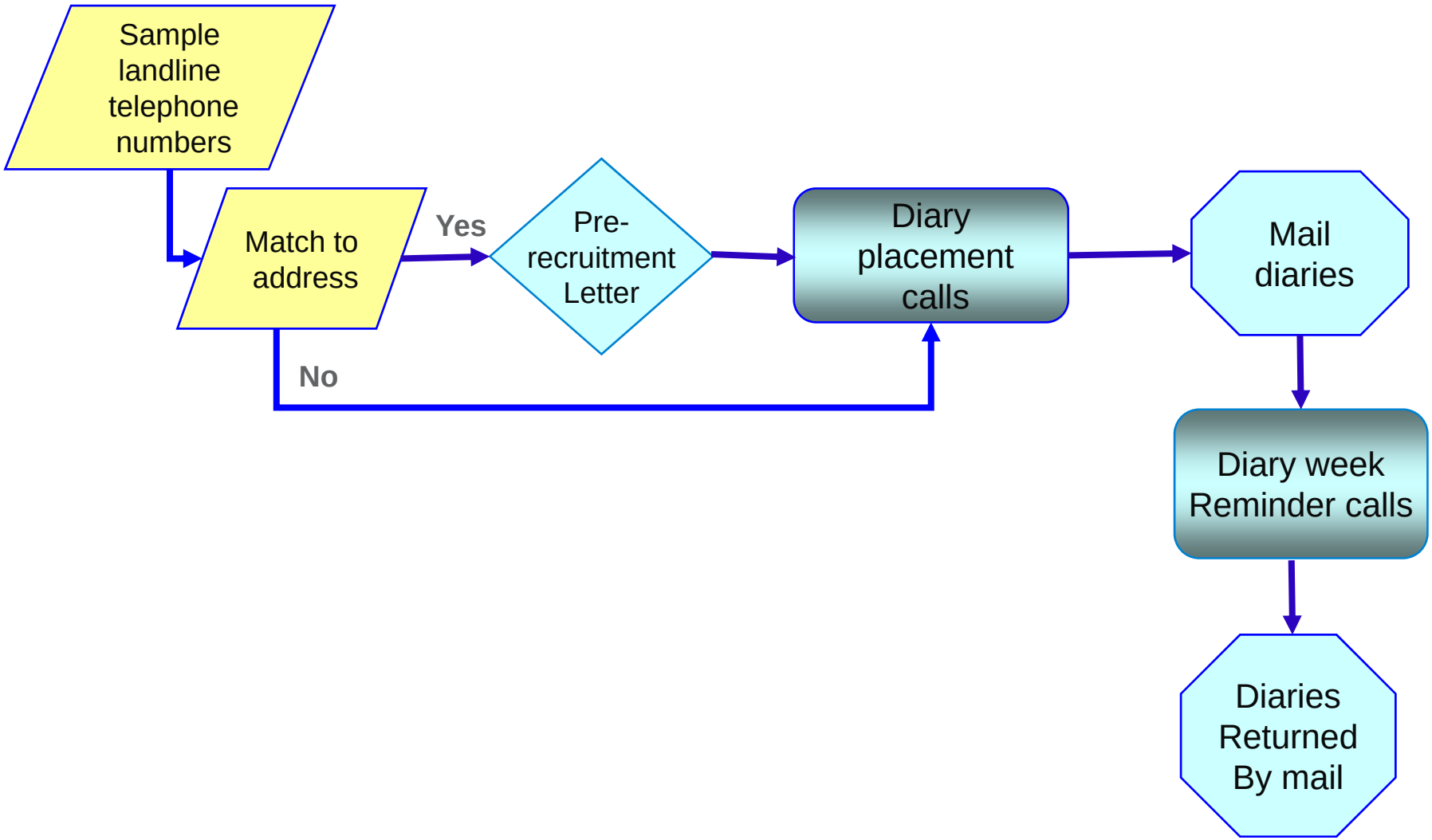
Dual mode:



Multi mode with pre-recruitment:



Example: Nielsen TV diary RDD design



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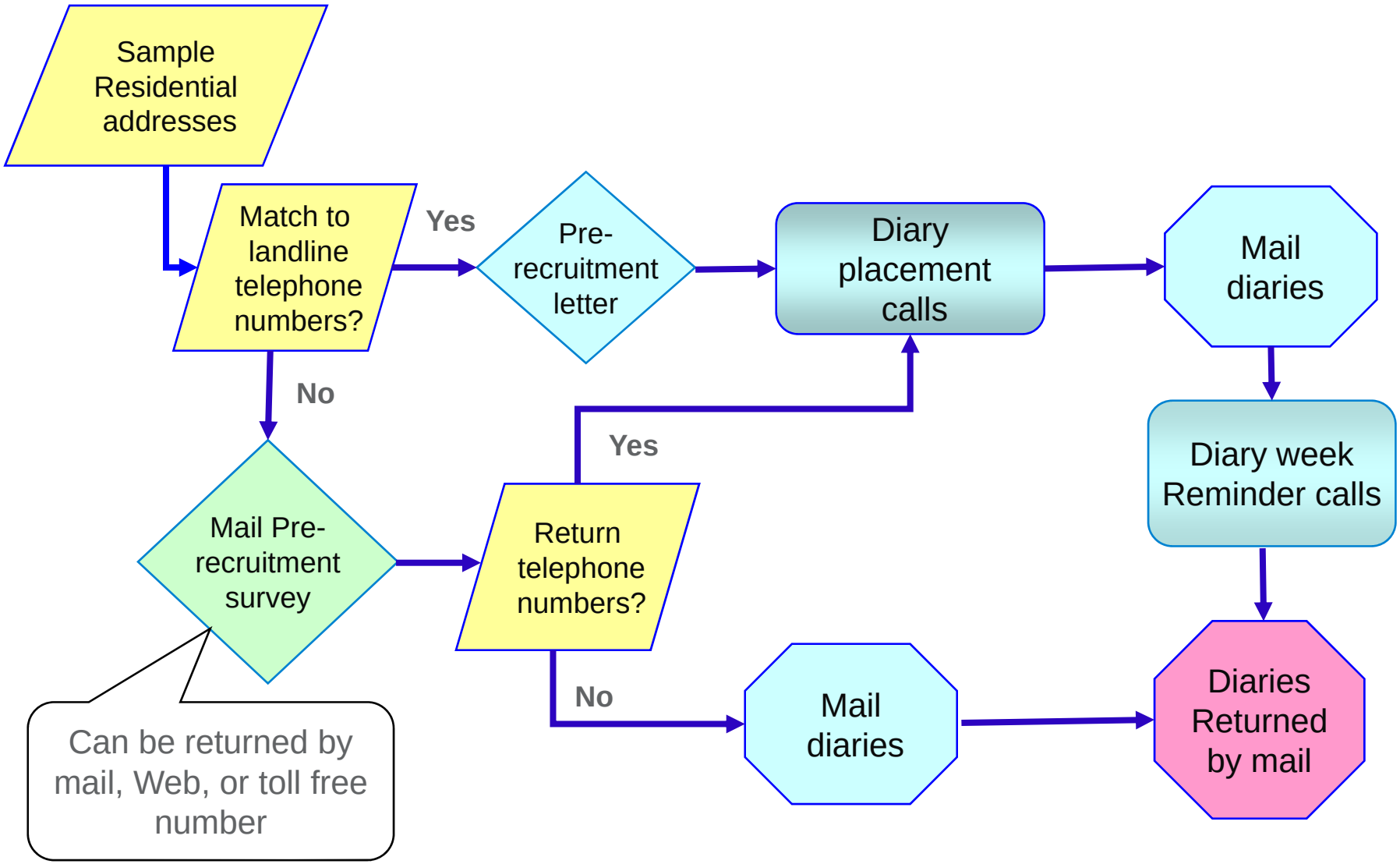

What key elements have we learned about ABS so far?

- Allows us to reach cell phone only households
- Improves coverage but not necessarily response rate in all cases
- Facilitates numerous survey designs & use of multiple modes of data collection
- Key sample indicators on ABS file are more accurate than corresponding indicators on landline frame
- Depending on design used, can reduce costs over RDD or dual telephone frame approaches

Total Participation Rate

- Response rates are an incomplete indicator of data quality
  - Not necessarily a good indicator of nonresponse bias
  - Does not account for under-coverage in telephone frames
- Need to view data in terms of total participation:

Coverage rate x **response rate** = **total participation rate**

- Example:

	Coverage	x	Response	=	TPR
RDD:	75%	x	26%	=	19.5%
Dual frame:					
Landline	75%	x	26%	=	19.5%
Cell phone*	18%	x	20%	=	3.6%
(LL+CP)					*(23.1%)*
ABS:	98%	x	25%	=	24.5%

* Assumes screening for cell phone-only households

In conclusion …

- For current studies to survive the basic designs will need to change:
  - Require a re-imagining of how data are collected
  - Means a lot of tough choices need to be made

- Address based sampling will take us further down the road than a landline + cell phone RDD approach

Thank you