SAMPLING WITH UNCERTAIN FRAME COUNTS: CHALLENGES IN SAMPLING HEAD START CHILDREN FOR THE FACES STUDY

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Head Start Family and Child Experiences Survey (FACES)

- FACES is a repeated cross-sectional study of Head Start program quality and child outcomes (previous cohorts: 1997, 2000, and 2003)
- Gathers comprehensive data on the cognitive and social-emotional development of Head Start children
- Each cohort of children is followed from entry into Head Start, through 1 or 2 years of program participation, with followup in the spring of kindergarten
2006 FACES Sample Design

- Four stages (targeted completes)
  - programs (60)
  - centers (2 per program)
  - classes (3 per center)
  - children (10 per class)

- Home visitors included

- First 3 stages selected PPS (estimated number of eligible children)
Eligible Sampling Units

- Programs
  - 50 states plus DC
  - Excluding AI/AN and Migrant/Seasonal programs
  - Providing direct services to child in target age group
  - In good standing (financially, operationally)

- Centers and Classes and Home Visitors

- Children Must Be:
  - Age 3+
  - New to Head Start
  - Enrolled at time of site visit
Sample Frames

- Head Start Program Information Report (PIR) for programs
- List of centers and classes from sites on a rolling basis as recruited and provided
- Class rosters from sites on rolling basis, two weeks before site visit
Timing and Availability of Frames (First 3 Stages)

- PIR available at time of sampling from 2004-2005 school year
- Center and class lists obtained in summer 2006, often before fall class enrollment known
- Estimated number of eligible children used as measure of size
- Estimates often way off (both directions)
Child Rosters
(Stage 4 Frames)

- Didn’t want to get these more than 2 weeks before site visit
  - Dynamic nature of class composition
  - Especially in first few weeks of school year

- Still a number of changes during that 2 week period
  - Roster error
  - Change since roster
Grouping Centers and Classes
Before Sampling

- More grouping needed than expected
- Center (fewer eligible children per center)
- Class (fewer eligible children per class—often selected all)
- Budgetary implications to have more centers and more classes
- Still ended up with sample shortfall at child level
## Final Fall 2006 Sample Sizes at Program, Center, and Class Levels

<table>
<thead>
<tr>
<th></th>
<th>Program</th>
<th>Center</th>
<th>Class</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sampled/Released</td>
<td>64</td>
<td>140</td>
<td>415</td>
</tr>
<tr>
<td>Eligible</td>
<td>63</td>
<td>135</td>
<td>410</td>
</tr>
<tr>
<td>Participating</td>
<td>60</td>
<td>135</td>
<td>410</td>
</tr>
<tr>
<td>Target</td>
<td>60</td>
<td>110 to</td>
<td>300 to</td>
</tr>
<tr>
<td></td>
<td></td>
<td>120</td>
<td>350</td>
</tr>
<tr>
<td>Sum of Weights</td>
<td>1,630</td>
<td>14,148</td>
<td>42,973</td>
</tr>
</tbody>
</table>
Target Child Sample Over Time (Initial Design)

- Select 3,274 children (fall 2006)
- Expected 90% consent and 45/55% split* 
  - 1,326 3yo cohort 
  - 1,621 4yo cohort 
- Expected 95% completes among consented in fall 2006 
- Expected completes in kindergarten year 
  - 766 3yo cohort (spring 2009) 
  - 1,171 4yo cohort (spring 2008) 

*From OMB package in prior round
Oversampling 3-Year-Olds (New to 2006 Cohort)

- Goal is to have comparable sample sizes between 2 age cohorts in kindergarten year
- Select **4,051** children (fall 2006)
- Expected 90% consent
  - **2,025** 3yo cohort
  - **1,621** 4yo cohort
- Expected 95% completes among consented in fall 2006
- Expected completes in kindergarten year
  - **1,170** 3yo cohort (spring 2009)
  - **1,171** 4yo cohort (spring 2008)
Oversampling Three-Year-Olds

- When oversampling, one usually knows the population proportion in each stratum (3yo vs. 4yo cohort)

- This was not known for the current year, and the age mix proportion changing over time

- Used estimates from prior rounds of FACES
Planned to Oversample 3-Year-Old Classes

- Thought most classes were single-age
- Turns out most were mixed-age

- Not an issue in prior rounds (not needed for sampling)

- At class level, ended up using synthetic MOS, giving classes with 3s a little boost in selection probability – but not enough to achieve sample targets
Oversampled 3s at Child Level Instead

- Wanted proportion of initial sample to be 56% 3yo and 44% 4yo (to end up with 50% each in kindergarten year)

- Within center, tried proportional allocation by age group first

- If < 56% 3yos, then figured out what was needed to get 56% within center
Original and Revised Strategy at Child Level

- Select 20 children per class group
- Subsample 10 for main release
- Randomly order other 10 to release as needed (replicate of size 1)
- Modified after first 20 programs (due to emerging sample size shortfall)
- Last 40 programs
  - abandoned replicate release process
  - if <80 elig. children in program, selected all
  - if <40 elig. children in center, selected all
  - otherwise, basically same process as before
## Final Fall 2006 Sample Sizes by Age Cohort

<table>
<thead>
<tr>
<th></th>
<th>All children in selected classes</th>
<th>Sampled/Released</th>
<th>Eligible/Consented</th>
<th>Target Consented</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>%</td>
<td>n</td>
<td>%</td>
</tr>
<tr>
<td>3-yr-olds</td>
<td>2,460</td>
<td>58.2</td>
<td>2,256</td>
<td>59.1</td>
</tr>
<tr>
<td>4-yr-olds</td>
<td>1,765</td>
<td>41.8</td>
<td>1,561</td>
<td>40.9</td>
</tr>
<tr>
<td>Total</td>
<td>4,225</td>
<td>100.0</td>
<td>3,817</td>
<td>100.0</td>
</tr>
</tbody>
</table>
Conclusions

• Lessons Learned
  – Estimates of class sizes and age mix unreliable before school year starts
  – Not sure would do things differently

• Difficulties encountered
  – Lack of accurate size estimates at each stage
  – Quick turnaround and rolling process – can’t see the big picture
  – Sample allocation based on partial/inaccurate picture can lead to sample sizes over/under target