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June 10, 2009

2010 DECENNIAL CENSUS PROGRAM DECISION MEMORANDUM SERIES

No. 29

MEMORANDUM FOR The Distribution List

From: Arnold Jackson *[signed]*
Associate Director for the Decennial Census

Subject: Decision Not to Move the Schedule for Conducting the Person
Interview in the 2010 Census Coverage Measurement

Contact Persons: Magdalena Ramos (301-763-4295) or Patrick J. Cantwell (301-
763-4982), Decennial Statistical Studies Division

This memorandum documents the decision not to move the schedule for conducting the Person Interview (PI) in the 2010 Census Coverage Measurement (CCM).

Background

In planning the 2010 CCM survey, one of the Census Bureau's chief concerns was maintaining independence between the census field operations--mainly the Coverage Follow-Up (CFU)--and the CCM PI. If the former affects the latter, we have "contaminated" the CCM results. Similarly, the CCM can affect the census operations, but its effect would be much smaller in scale. Either possibility can create a dependence between the census and the independent (CCM) enumerations that can lead to bias in the dual systems estimator--the statistical model used for the CCM net error estimates--and less accurate measures of coverage in the census.

Therefore, our current design for the 2010 Census requires operational independence of the census and the CCM such that the census operations in a CCM sample area must be complete before the CCM PI begins in that area. This is more important for 2010 than it was in the 2000 Census because improvements in the census CFU interview make the questionnaire very similar to the CCM PI and could cause more respondent conditioning if they overlap.

Specifically, the 2010 PI operation is scheduled from 08/14/10 to 10/09/10. Based on recommendations from the National Academy of Sciences (NAS) and experts attending the CCM Estimation workshop held in January 2009, the CCM Operational Integration Team (OIT) considered moving up the 2010 PI start date one to three weeks earlier than the current baseline start to lessen recall bias and reduce the number of movers. Shortly thereafter, we also considered several other options that would entail moving the start of PI about six weeks earlier--closer to the precedent set in previous censuses--by implementing an early telephone phase of interviews.

After much consideration, the CCM OIT and the Decennial Statistics Studies Division (DSSD) still have serious concerns about making any changes to the complex CCM schedule at this late date. After the Census Bureau in the mid-decade weighed the potential effects of contamination bias and recall bias, as well as other issues fully discussed in the recommendation memorandum, a preliminary decision to delay the start of 2010 PI until completion of CFU operations was set in place in November 2005. This decision was later confirmed in November 2007 after the examination of a 2006 study on contamination bias. The attached recommendation memorandum, DSSD 2010 Census Coverage Measurement Memorandum Series #A-34 on "Recommendation Not to Move the Schedule for Conducting the Person Interview in the 2010 Census Coverage Measurement," includes references for these early decisions.

The scheduling of all our field, programming, processing, and matching operations was based on this plan and would require considerable amounts of restructuring to change. Further, parts of the schedule developing the PI and PI reinterview questionnaires, programming field control systems, and producing field materials are already considered aggressive and risky due to the decision to descope CCM from the Field Data Collection Automation (FDCA) contract in December 2007. With any major changes, we would have serious concerns for completing required activities in each of these areas.

Decision

The Census Bureau backs the recommendation from the CCM OIT and DSSD with a decision that no changes be made to the current schedule for the 2010 CCM PI.

Attachment



UNITED STATES DEPARTMENT OF COMMERCE
Economics and Statistics Administration
U.S. Census Bureau
Washington, DC 20233-0001

May 12, 2009

DSSD 2010 CENSUS COVERAGE MEASUREMENT MEMORANDUM SERIES #A-34

MEMORANDUM FOR Frank A. Vitrano
Chief, Decennial Management Division

From: David C. Whitford (*signed*)
Chief, Decennial Statistical Studies Division

Prepared by: Magdalena Ramos and Patrick J. Cantwell
Team Leaders, Census Coverage Measurement Operational
Integration Team, Decennial Statistical Studies Division

Subject: Recommendation Not to Move the Schedule for Conducting the
Person Interview in the 2010 Census Coverage Measurement

In planning the 2010 Census Coverage Measurement (CCM) survey, one of the Census Bureau's chief concerns was maintaining independence between the census field operations--mainly the Coverage Follow-Up (CFU)--and the CCM Person Interview (PI). If the former affects the latter, we have "contaminated" the CCM results. Similarly, the CCM can affect the census operations, but its effect would be much smaller in scale. Either possibility can create a dependence between the census and the independent (CCM) enumerations that can lead to bias in the dual systems estimator--the statistical model used for the CCM net error estimates--and less accurate measures of coverage in the census (Bell 2005).

Therefore, our current design for the 2010 Census requires operational independence of the census and the CCM such that the census operations in a CCM sample area must be complete before the CCM PI begins in that area. This is more important for 2010 than it was in the 2000 Census because improvements in the census CFU interview make the questionnaire very similar to the CCM PI and could cause more respondent conditioning if they overlap. See Whitford and Kostanich (2005) for more information.

U S C E N S U S B U R E A U

Specifically, the 2010 PI operation is scheduled from 08/14/10 to 10/09/10. On the other hand, the PI interview for the 2000 Accuracy and Coverage Evaluation--the 2000 coverage measurement program--was conducted in two phases, a telephone phase starting in April 2000, and a personal visit phase starting in June 2000. The decision to eliminate the telephone phase in 2010 was originally based on the decision not to overlap with the CFU and other operational concerns discussed in Attachment A.

The issue of "recall bias" in the PI has been raised before and again more recently. As we allow more time between Census Day, April 1, and the day of the CCM interview, respondents are more likely to forget important details about the people who lived at a particular address on Census Day. That is, recall bias may increase. Technical work on this subject is briefly discussed below.

Further, with additional time before the CCM interview, we expect to see more people who move into the sample address (inmovers) between the census enumeration and the CCM PI, and will have to match our interview and their census record at their Census Day address. While we can handle inmovers, the matching becomes more difficult and can lead to uncertainty and increased error because it relies on complete address information from the respondent to properly find the Census Day address. Some background on our plans, these issues, the CCM schedule, and our concerns with changing the schedule is found in Attachment A, Section 2.

Based on recommendations from the National Academy of Sciences (NAS) and experts attending the CCM Estimation workshop held in January 2009, the CCM Operational Integration Team (CCM OIT) considered moving up the 2010 PI start date one to three weeks earlier than the current baseline start (08/14/10) to lessen recall bias and reduce the number of movers.

Shortly thereafter, we also considered several other options that would entail moving the start of PI about six weeks earlier--closer to the precedent set in previous censuses--by implementing an early telephone phase of interviews. Under two of these options, the extra six weeks would be made up by dropping some or all of the Initial Housing Unit matching and followup operations currently in our plan. These operations match the independent list of addresses collected in the CCM to those from the census in CCM sample areas to create the list of addresses to be sent for PI. A third option would make up time by identifying the PI sample on a flow basis. Discussion of our deliberations is contained in Attachment A, Sections 3 and 4.

After much consideration, we still have serious concerns about making any changes to the complex CCM schedule at this late date. After the Census Bureau weighed the potential effects of contamination bias and recall bias, as well as other issues, our original plan to delay the start of PI until completion of CFU operations was set in place during the decade and has been followed since a preliminary decision in November 2005 (Kostanich and Whitford 2005, Singh 2005, and Bell 2005). This decision was later confirmed in November 2007 after the examination of a 2006 study on contamination bias (Whitford 2007).

The scheduling of all our field, programming, processing, and matching operations was based on

this plan and would require considerable amounts of restructuring to change. Further, parts of the schedule developing the PI and PI reinterview questionnaires, programming field control systems, and producing field materials are already considered aggressive and risky due to the decision to descope CCM from the Field Data Collection Automation (FDCA) contract in December 2007. With any major changes, we would have serious concerns for completing required activities in each of these areas. Additional details about these concerns can be found in the attachments.

Apart from discounting the original decision to prevent contamination bias, any serious attempt to address recall bias and lessen the number of movers--and, hence, start the PI earlier--would require us to cut some testing, quality control, or even production activities. Many of the 2008 Census Dress Rehearsal CCM activities were dropped due to budget concerns (Vitranco 2007), but the Census Bureau developed limited operational testing of the planned activities when feasible. A change in the overall CCM program design would require us to implement the 2010 CCM without the benefit of fully testing the additional changes in either the Dress Rehearsal or operational tests. The Government Accountability Office (GAO) has expressed concern about our need to adequately test Census and CCM operations (GAO-09-413T, March 5, 2009). Therefore, making changes that risk our testing efforts should be carefully considered against the expected benefits.

Based on our consideration of the issues outlined above and discussed more thoroughly later in the attachments, the CCM OIT recommends that no changes be made to the current schedule for the 2010 CCM PI. As for moving it earlier one to three weeks, we feel the risks of changing the schedule for many interrelated operations outweigh the potential gains on recall bias and the reduction of movers. (See Section 3 in Attachment A.) On the other hand, moving the CCM PI about six weeks earlier would likely have a beneficial effect on recall bias and movers concerns. However, such a change would require dropping or shortening one or several production operations, such as the Initial Housing Unit operations, which improve the quality of the housing unit and person estimates, and increase the efficiency of the field operations. (See Attachment A, Section 4.)

Attachment A

Background and Discussion to Support the Recommendation Not to Change the Schedule for Conducting the Person Interview in the 2010 Census Coverage Measurement

In this attachment, we provide further details about the factors driving the schedule for Person Interview (PI) in the 2010 Census Coverage Measurement (CCM) survey, and reasons to support the recommendation not to change that schedule. Section 1 contains information about the CCM schedule, independence between census and CCM operations, possible contamination from overlap between those operations, recall bias, movers, the rationale for not having a telephone phase for the 2010 CCM PI, and risks already identified in the current schedule. In Section 2, we describe factors to issues and potential effects of moving the start of the PI one to three weeks earlier. Section 3 contains a description of the aspects and concerns over the introduction of a telephone phase of interviews for PI, which might move PI about six weeks earlier. Attachments B, C, and D provide additional information and detail to support the arguments in Attachment A.

1. Background

The CCM PI is an automated survey that gathers an independent roster of current day residents of the sample address and attempts to reconstruct the Census Day roster. It gathers the roster, demographic information, and places where the persons should or could have been counted in specific detail.

Decision on 2010 Person Interview Timing to Prevent Contamination with Census Operations

In planning the 2010 CCM survey, one of the Census Bureau's chief concerns was maintaining independence between the census field operations--mainly the Coverage Follow-Up (CFU)--and the CCM Person Interview (PI). If the former affects the latter, we have "contaminated" the CCM results. Similarly, the CCM can affect the census operations, but its effect would be much smaller in scale. Either possibility can create a dependence between the census and the independent (CCM) enumerations that can lead to bias in the dual systems estimator--the statistical model used for the CCM net error estimates--and less accurate measures of coverage in the census (Bell 2005).

Therefore, our current design for the 2010 Census requires operational independence of the census and the CCM such that the census operations in a CCM sample area must be complete before the CCM PI begins in that area. This is more important for 2010 than it was in the 2000 Census because improvements in the census CFU interview make the questionnaire very similar to the CCM PI and could cause more respondent conditioning if they overlap. See Whitford and Kostanich (2005) for more information.

Independence; Contamination from Overlap

We explored the effects of a potential overlap between the CCM PI and the census CFU. For 2010, we project a case workload of about 7.9 million people in CFU and 300,000 in CCM.

Attachment A

Based on 2008 completion rates for CFU, if we move PI, for example, three weeks earlier, we can expect an overlap of about 2,100 units between CFU and CCM.

The Census Bureau has done several contamination studies related to coverage measurement operations, as summarized in Table 1.

1990	No differences found between coverage measurement and non-coverage measurement blocks
1995	Differences found in mail-response rates in blocks with high rates of Asian-Pacific Islanders. Conclusion: some small evidence of potential contamination.
1998	Very few significant differences found in population coverage between coverage measurement blocks and non-coverage measurement blocks. Conclusion: no clear evidence of contamination.
2000	No contamination bias found.
2006	During the 2006 Census Test, the PI happened before the CFU in all areas. Several tests indicated some evidence of a difference in CFU responses between CCM and non-CCM areas. However, some of the sample sizes were small due to the size of the site tests. No strong evidence of contamination found.

According to documentation of an evaluation on contamination bias based on the 2006 Census Test (Whitford 2007), the Census Bureau stated that "[s]ince we have some evidence of an effect of the CCM person interview on the CFU results, the decision to delay the start of the CCM person interviewing until after the CFU operation is finished appears to be well-founded."

As mentioned earlier, after the Census Bureau weighed the potential effects of contamination bias and recall bias (discussed further below), as well as other issues, our original plan to delay the start of PI until completion of CFU operations was set in place during the decade and has been followed since a preliminary decision in November 2005 (Kostanich and Whitford 2005, Singh 2005, and Bell 2005). This decision was later confirmed in November 2007 after examining the 2006 study on contamination bias (Whitford 2007).

Changes in the Plans for Person Interview in 2010 Compared to 2000 and 1990

The 2010 PI operation is scheduled from 08/14/10 to 10/09/10. On the other hand, the PI interview for the 2000 Accuracy and Coverage Evaluation (A.C.E.)--the 2000 coverage measurement program--was conducted in two phases, a telephone phase starting in April 2000, and a personal visit phase starting in June 2000.

In the 2000 A.C.E., the PI followed activities in which we matched the A.C.E. listing of housing units to the census addresses. The matching operation helped to clean up the address list for PI. This was very important for the 2000 A.C.E., but, for the 2010 CCM, will be only a marginal

Attachment A

benefit because we will use a different procedure to handle movers in the sample. The two phases of A.C.E. PI--telephone and personal visit--worked as follows. Using a decentralized telephone operation, field supervisors began making contacts for PI in April, but only on cases in which a mail response had been received. Before starting personal visits, we waited one week after the Local Census Office had 90 percent completion of the Nonresponse Followup (NRFU) operation. The PI overlapped with the Coverage Edit Followup (CEFU) and Coverage Improvement Followup (CIFU) operations of the census. In the former, the Census Bureau tried to resolve count discrepancies and followed up large households. These census operations in 2000 bore little resemblance to the 2010 CFU operation, which closely resembles the CCM interview.

It should be noted that the design of the 1990 Post-Enumeration Survey (PES) did not include matching the Independent List to the census list. Thus, there was also no followup or subsequent matching of the housing unit list. However, the Independent Listing operation in 1990 was conducted later than in 2000 or what is planned in 2010. The 1990 Independent Listing was conducted from 02/09/90 to 03/09/90, with quality control operations completed on 03/16/90.

In the 2010 design, the CCM PI interview is more extensive than that in the A.C.E., but has no telephone interview phase. Relatively speaking, the PI starting date of 08/14/10 is almost four months later than the starting date of the 2000 PI telephone phase, 04/24/00, and almost two months later than the start of the 2000 personal visit phase, 06/19/00. The 2010 PI ends one month later than the 2000 PI. See Table 2 below.

Table 2. Timing for Person Interview by Decade in Coverage Measurement Surveys			
Year	Dates	Kickoff Event	Overlap with Coverage Operations
1990 PES	June 25 - September 27, 1990		Minor PES overlap with Nonresponse Followup (NRFU)
2000 A.C.E.	Telephone phase: April 24 - June 12, 2000	<i>Telephone:</i> After a unit returned the mail questionnaire (and was thus not part of the NRFU)	Minor A.C.E. overlap with NRFU Some A.C.E. telephone overlap with remainder of CEFU
	Personal visit phase: June 19 - September 1, 2000	<i>Personal visit:</i> 7 days after a Local Census Office completed 90% of the NRFU	Some A.C.E. telephone overlap with CIFU
2010 CCM (planned)	August 14 - October 9, 2010	When the entire census Coverage Followup is complete	Minor overlap with Coverage Followup

In 1990 and 2000, there was a small amount of overlap between the census operations and the coverage measurement activities, as shown in Table 2. Similarly, for 2010, a minor overlap is expected between the census CFU operation and the beginning of the CCM PI.

Recall Bias

Attachment A

Concerns with the timing of PI have resurrected the issue of recall bias, and suggestions that we start CCM PI earlier. The closer the PI is administered to Census Day, the less potential recall bias would be incurred. Determining residence status for people is a key to the CCM; errors in residence status determination in the 2000 A.C.E. rendered the results less accurate because the A.C.E. could not sufficiently detect erroneous enumerations.

By moving PI up one week, we may or may not see any appreciable quality differences induced by recall error. Little is known about when people who have moved or have other places to live start to forget when and where they lived or spent time through the year. Direct references in the literature concerning recall bias with respect to a person's residence are not available. Groves (1989, pp. 422-430) cites several studies of other characteristics in which recall decreases over time. However, the *rate* of decrease is not consistent across studies.

Although one would expect that a shorter duration between the target event and the recall date would generally reduce recall bias, one might not expect a decrease in duration of one week in a four-to-five-month duration to decrease recall bias significantly. On the other hand, one's ability to recall would likely differ if the PI were conducted as much as six weeks earlier. In addition, any effects of recall bias would be easier to predict under this time frame--six weeks earlier--as it is more like what we have encountered in the past.

Movers

In the CCM, we match people found through the independent listing (the P Sample) to the census list (the E Sample). People who have moved into a sample address must be matched at their Census Day address. This can be a difficult task because matchers must (1) assign census geography to the Census Day address provided by a respondent, and (2) then attempt to match there. Although advances in automation have made this easier, it remains a more difficult undertaking than matching nonmovers. We still rely on complete address information from a respondent to properly match movers rostered in the PI. With fewer movers, the matching operation is simpler and less error prone.

The 2000 A.C.E. PI started in April 2000 with telephone interviews. In 2010, the increased duration between Census Day and the planned PI in August will likely lead to an increase in the overall number of movers in CCM. If we move the PI one week earlier in 2010, we should expect some--possibly limited--reduction in the overall number of movers in CCM. We would expect this reduction to be much larger if we started PI up to six weeks earlier, but have no valid data to approximate the size.

Attachment A

Reasons for Eliminating the Telephone Phase for 2010 PI

Although there was concern with the length of the 2010 PI interview for a telephone operation, the decision to eliminate the telephone phase was made based on the risk of contamination and on several operational issues.

- (1) We wanted to delay the start of the personal visit PI until the CFU operations are completed in the area to avoid potential contamination. Refer to issues on contamination and CCM independence and recall bias in Bell (2005), Singh (2005), Whitford and Kostanich (2005), and Whitford (2007).
- (2) We had no time constraint to finish the PI early enough to produce adjusted numbers for redistricting, one of the main reasons for implementing the telephone phase in 2000.
- (3) In 2010, we can remain in the field for CCM PI later without affecting subsequent CCM activities because we cannot conduct the CCM Computer Person Matching operations on a flow basis as in 2000. This follows because the matching is done nationwide, which requires that we wait for the creation of the Census Unedited File for all states--rather than proceeding state by state as in 2000. These files will be completed a month later relative to 2000.

Further, when we made the decision not to conduct a PI telephone phase in the 2010 CCM, we had not done a telephone test of the questionnaire, and there were concerns about collecting alternate address information on a telephone interview. At a later date, staff in the Statistical Research Division conducted a study called the Questionnaire Design Experimental Research Survey, using a similar questionnaire as that for CCM PI, and found no appreciable loss of data quality based on the number of alternate addresses gathered compared to personal visit PI.

Risks Already Identified in the Current Schedule

The following are risks already identified just to meet the current start date for PI:

- Timing for performing sampling tasks is very tight.
- Laptops and communications different from those used for the 2009 operational test will be used for the 2010 PI. Extra testing will be required for the laptops' set up process and communications systems.
- Materials for CCM operations in Puerto Rico need to be based on an early version of the Coverage Measurement Operations Control System (CMOCS) and instruments to meet the timing for translation and adaptation of training materials.
- The potential of any unexpected new major requirement arising from the 2009 operational PI test, to take place from April to May 2009, could require more development time.

2. Changing the Schedule One to Three Weeks

The milestones for important scheduled activities in the 2010 CCM are placed alongside analogous activities for the 2000 Accuracy and Coverage Evaluation (A.C.E.) in Table 3.

Table 3. Milestones for the 2010 Census Coverage Measurement and the 2000 A.C.E., from the Independent Listing to the Person Interview		
<i>Note:</i> Quality Control (QC) dates for field operations in parentheses		
2010 Census Coverage Measurement (CCM) Operation	2010	2000
Conduct CCM Independent Listing and QC	August 28, 2009 (September 3, 2009) December 5, 2009 (December 12, 2009)	August 23, 1999 December 6, 1999
Conduct CCM Initial Housing Unit Computer Matching	January 25, 2010 March 1, 2010	January 31, 2000 February 22, 2000
Conduct CCM Initial Housing Unit Before Followup (BFU) Clerical Matching	February 16, 2010 March 26, 2010	February, 7, 2000 March 9, 2000
Conduct CCM Initial Housing Unit Followup and QC	March 4, 2010 (March 11, 2010) April 23, 2010 (April 30, 2010)	February 16, 2000 (February 22, 2000) April 4, 2000 (April 7, 2000)
Conduct CCM Initial Housing Unit After Followup (AFU) Clerical Matching	March 29, 2010 May 19, 2010	March 6, 2000 April 18, 2000
Identify CCM Person Interview Sample (and deliver to TMO) (includes time for processing IHU matching results and creating PI Enhanced List, sampling and verification)	May 20, 2010 June 22, 2010	March 22, 2000 May 31, 2000
Load PI Sample in CMOCS	June 23, 2010 June 25, 2010	
Train Field Office Supervisors (includes time to determine workloads and hiring needs)	July 9, 2010 July 20, 2010	
Conduct CCM Person Interview and QC	<i>Personal Visit Only:</i> August 14, 2010 (August 21, 2010) October 2, 2010 (October 9, 2010)	<i>Telephone Phase:</i> April 24, 2000 (April 26,2000) June 12, 2000 <i>Personal Visit Phase:</i> June 19, 2000 August 18, 2000 (September 1, 2000)

The CCM Operational Integration Team (OIT) first considered moving up the 2010 PI start date two or three weeks earlier than the current baseline start (08/14/10) by cutting two weeks off the PI instrument and the CMOCS development and testing activities. Although we were able to cut the duration of several activities, we also identified schedule problems that eliminated most of the gains. (See Attachment B for more detail.) Therefore, we recommended that an earlier PI start of two or three weeks should *not* be implemented.

We then tried to cut one week. From the previous effort, we concluded that, to move PI earlier, we would have to deliver the sample cases to the TMO earlier, rather than try to reduce (a) the duration of the operations after the TMO receives the sample, and (b) the processing necessary to

Attachment A

establish the field assignment and training schedule. The alternative was to modify the schedule for the IHU matching and follow up operations. The required changes would

- cut one week off the end of IHU Computer Matching,
- cut the duration of BFU Clerical Matching and IHUFU by two days each, and
- cut the duration of AFU Clerical Matching by three days.

However, we concluded that the risks of changing the schedule for many operations outweighed the potential gains on recall bias and reduction of movers by starting PI only one week earlier. Here we mention very briefly some of the major advantages and disadvantages of such a change in schedule.

Pros:

Recall bias. By moving the person interview up a week, we might lessen the effects of recall bias--how much is not clear; and

Additional cushion for some operations. The current coding schedule is very tight. If the duration of PI remains at the current length, the proposal would allow one extra week for clerical geocoding of respondent-provided addresses from PI and residence status coding.

Cons: The disadvantages of changing the scheduled activities are numerous. We describe the major issues here, and provide more detail on the concerns in Attachment C.

Already Tight Schedule. Because the schedule for Initial Housing Unit (IHU) operations has been put together to flow from one process to another with very little leeway, compressing the schedule puts many operations at risk. A bottleneck in the process might cause delays from which we could not recover.

Quality in Initial Housing Unit Matching. Removing a full week of duration from the IHU matching and follow up activities increases the risk to on-time completion. That might require us to revisit the schedule.

Software Development. If we move the PI operation up one week, we would have to shorten PI software development one week. The decision to descope CCM from the Field Data Collection Automation (FDCA) contract in December 2007 has forced us to string activities together with no room for error. Taking time out of the schedule will increase the risks associated with on-time development for 2010 PI.

Field Issues. The IHUFU field activities currently planned are not only tightly packed, but must be planned on preliminary estimates of the timing, size and location of the work, as they are interrelated with activities in other areas. The actual workload is known immediately before sending cases from completion of the matching activities for a particular area to the field. Changes to the IHUFU production schedule could lead to

Attachment A

requiring additional interviewers, higher field costs, and the possibility of not being able to complete the work on schedule.

3. Changing the Schedule Four to Six Weeks to Add a Telephone Phase

As an alternative to address concerns about recall bias in the 2010 CCM, the CCM OIT also revisited conducting some interviews by telephone before the start of personal visits, as was done in 2000. We considered a telephone operation that might allow us to start PI about six weeks earlier, for example, starting around 07/03/10. We considered three alternatives. Under each option, we would have to obtain the telephone numbers for the interviews. Access to a different file would be necessary under Options 2 and 3 below. It is not clear how we would obtain them under Option 1.

We describe the three alternatives. None of them are fully vetted for all risks and needed changes. The precise schedule would be determined depending on the option.

Option 1. Drop all IHU Matching and Followup operations, similar to 1990.

Option 2. Drop the field Initial Housing Unit Followup (IHUFU) and After Followup (AFU) Clerical Matching, but conduct the IHU Computer Matching operation and Before Followup (BFU) Clerical Matching.

Option 3. Change back to the 2000 flow processing for identifying the PI sample.

For Options 1 and 2, the key question is whether the benefits brought about by the IHU operations--including computer matching, IHUFU, and BFU and AFU Clerical Matching--outweigh the errors from recall bias and in locating an in-mover's Census Day address for matching. The current CCM design uses IHUFU and IHU matching operations to provide the following benefits. The operations

- provide better overlap between the P and E samples. The overlap reduces variance and reduces the E-sample interviewing workload;
- improve the Housing Unit estimation, by going back to the field to verify the listing of addresses earlier, rather than waiting until a year later in the final HUFU; and
- help resolve some discrepancies between the census and CCM independent lists of housing units, creating a better list of housing unit addresses to send to PI. We can remove duplicate units and listing errors, and can send census-only units to PI.

Below are some of the advantages and disadvantages to be considered if we introduce a telephone phase into the schedule.

Pros:

Attachment A

Recall bias. Starting the PI about six weeks earlier may deliver a serious reduction in recall bias.

Fewer movers. We would expect a significant cut in the number of movers in the P Sample by starting this much earlier.

Telephone Instrument. We have a telephone path in the 2009 instrument, but plan to use it only when respondents ask that we call them. It is also used for any telephone reinterviews if the full PI is collected from a nonproxy respondent.

Re-allocation of Resources. If the IHUFU operation were dropped--Options 1 and 2--then the programmers for the IHUFU CMOCS could be moved to the PI development and alleviate some of that risk.

Cons: As before, there are various disadvantages to consider. Below is a summary; more detail is found in Attachment D.

Lost Benefits of IHU Operations. Under Option 1, the benefits realized through the matching and followup operations, described above, would be lost. Under Option 2, this applies to the followup operations.

Developing the Instruments for a Telephone Phase. Under the current plans, TMO could not produce two instruments--one for PI, another for PI reinterview--more than a couple of weeks before the current PI baseline dates. Further, DSSD will not provide specifications or requirements earlier than scheduled, because we need to incorporate determinations from the April 2009 PI Operational Test. To produce the PI instruments in time for a telephone phase six weeks earlier, TMO would need additional programming and testing resources.

Field Issues. Many of the concerns expressed by Field Division above (regarding a change of one to three weeks) are exacerbated if we move operations six weeks earlier. Additional issues include the time required to translate and adapt training materials for the telephone operation. Some of the staffing concerns might be reduced somewhat if IHUFU is cut (Options 1 and 2).

Less Field Testing. Testing activities in the 2008 Dress Rehearsal had to be curtailed due to budget reasons. Any changes would add to our concerns, as there is limited time between now and the 2010 Census to appropriately test a redesigned system. The laptops and telecommunication systems used for 2010 are different from what is being used for the 2009 PI Operational Test.

Budget. There would be additional costs for development and testing software, implementing the field data collection on the telephone, and moving the IHUFU (initial)

Attachment A

operations to the FHUFU (final) timeframe. However, there will be budget reductions if IHU operations--in particular, IHUFU--are dropped

Additional Staff Time. If we pursue any option, time would have to be spent working out the new plan and schedule, slowing down development of the operations already under way. Most specifications for IHU operations are either complete or already well-developed from 2008. Under Options 1 and 2, which cut all or parts of IHU, some of these documents may have to be rewritten or revised to accommodate the changes.

Issues and Recommendations Specific to the Options

Option 1. Under this alternative, the Final HUFU and matching operations would have to be expanded to handle the IHU operations, including matching during the final housing unit phase. We would lose overlap between the P and E samples given the current design. The CCM OIT does not support this alternative because of potential negative effects on the CCM operations and estimates.

Option 2. The CCM OIT believes this would be the only alternative we could consider to implement a PI telephone phase, as it eliminates a major field operation, allowing resources to be re-allocated from those operations to the new activities for the PI telephone phase. Still, the risk to the software development and testing schedule is very high. We do not propose that the change be implemented at this late stage of the planning process.

Option 3. A lot of redesign would be required to go back to the 2000 sampling methodology. This option does not eliminate the need for the TMO to develop the IHUFU control system. In this alternative, we could still maintain all IHU matching and followup operations, but would start the PI telephone phase on a flow basis. The CCM OIT does not support this alternative because it (1) would increase risk for changes to software development for the sampling operations; (2) would add risk by augmenting software development for the PI telephone phase; and (3) does not reduce risk by cutting any other operation with its associated software development.

4. References

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Attachment B

Fixing the Current Schedule for the 2010 Census Coverage Measurement Person Interview, While Attempting to Move Person Interviewing One to Three Weeks Earlier

The Census Coverage Measurement (CCM) Operational Integration Team originally believed cutting two weeks in the 2010 Person Interview (PI) schedule could be accomplished by cutting some time from PI software testing and trimming the production schedule. However, while reviewing the schedule, we found it had logic problems that had not yet been identified or addressed. Thus, before considering any change to the baseline start for PI, we had to fix the current schedule. We found the following:

- (1) Loading the Sample Control Input File for the Coverage Measurement Operations Control System (CMOCS) was a milestone (requiring no duration) in the schedule. The Technologies Management Office (TMO) estimates it will take three days, *adding* three days to the schedule.
- (2) Another logic problem in the schedule related to training. The Field Division (FLD) needs sample data from the Decennial Statistics Studies Division (DSSD) at least two weeks before it trains Field Operation Supervisors (FOS), and optimally in time for Regional Census Center (RCC) staff training. To meet the baselined start date for PI, 08/14/10, the PI sample data must be delivered to the TMO (and then to FLD) by 06/25/10 to be able to train the FOS on 07/09/10, as planned. The schedule had the data delivery instead on 07/02/10, a week later than necessary- only one week before FOS training. Upon review, the DSSD agreed to deliver the PI sample by the 06/25/10 date by trimming tasks related to sampling. The TMO will release on that date by shortening the development and testing. Essentially, releasing this software a week earlier required cutting five days from predecessor activities. While meeting the needs for FOS training, this still did not meet the needs for RCC training, scheduled for 05/24/10. To address this, the TMO will provide a training database for the RCC staff training.

These two changes required us to make up eight extra days. We did this by shortening durations on subsampling activities, review of the PI sample, and loading of PI data into CMOCS for the RCCs. This will add some risk, as timing will be much tighter.

Meanwhile, these tasks were the ones we had planned to shorten to move up the PI start date by two weeks; they are no longer available. We couldn't identify any other tasks that could be shortened further. The delivery of the data on 06/25/10 is the critical point that we cannot move because (1) it is constrained by receiving Initial Housing Unit clerical matching results, and (2) we have tightened the timing for doing all the sample steps as much as we think is feasible.

As PI relies on the results of clerical matching, the only other option would be to move up other CCM activities. We thought we might save time by moving up the Initial Housing Unit Followup (IHUFU) operation and all subsequent tasks one week. We feel this would pose too much risk, as many changes to the IHUFU forms and field materials are needed based on the 2008 IHUFU operational test, and the timing for translation and Puerto Rico adaptation is already tight. Further, there is concern with overlapping the kitting of field material for Nonresponse Followup

Attachment B

operations and CCM at the National Processing Center. Moving the start of PI a week earlier would increase this overlap, and might threaten the timely delivery of the the IHUFU materials to the RCCs.

One to Three Weeks: Additional Detail on the Concerns Raised by the Census Coverage Measurement Operational Integration Team If We Were to Move the Person Interview Up One to Three Weeks

Quality in Initial Housing Unit Matching and Schedule Compression. Removing a full week of duration from the Initial Housing Unit (IHU) matching and followup activities increases the risk to on-time completion of these operations. The current schedule for the IHU operations is tight and is a flow process from the start of computer matching through the end of After Followup Matching. If any part of the process has a bottleneck or does not flow as expected, we will have less time to recover. That could mean cutting quality control processes or not finishing Housing Unit matching. This could require us to extend the IHU matching schedule, possibly delaying the start of PI and subsequent operations.

Software Development. If we move the Person Interview (PI) operation one week earlier, we also have to shorten PI software development by one week. Between now and August of 2010, we must conduct the 2009 PI Operational Test, and assess known and new requirement changes. These include the development of the Puerto Rico version of the PI and PI Reinterview (PI RI) instruments and control systems, and the conversion to the “nextgen” laptops. (The laptops used in the 2009 Operational Test will not be used for 2010 PI.) Once we set requirements and implement development, a significant testing effort will be required to ensure all previous and new functionality meets the requirements. If we remove a week somewhere, integrated systems testing of the data flows between Census Bureau headquarters, the PI instrument, the PI RI instrument, and the Coverage Measurement Operations Control System (CMOCS) will be curtailed, thus introducing significant risk.

Field Concerns. There are two weeks between the proposed delivery date of the sample to the Regional Census Centers (RCCs) in the CMOCS and the start of Field Operations Supervisors (FOS) training. Two weeks is the absolute minimum needed to allow the RCCs to set up the geography in CMOCS; determine the number of interviewers by location (and, therefore, the number of FOSs and crew leaders); assign FOSs, crew leaders, and interviewers to geography; identify and secure training locations; schedule training; and make assignments. During this time, the RCC staff are also preparing for field staff training. If anything goes wrong and the sample is not loaded by the expected date, all of these activities are compromised. They cannot simply be moved back, because free training space that meets our needs is not always available. We would likely lose field staff if we change training plans, which means again having to go through the process of recruiting, selecting, entering new staff in CMOCS, and scheduling them for training. In addition, developing and testing CMOCS and the instruments must go perfectly on schedule, or the Field Division will be late with field and office staff manuals, training guides, etc., which would delay training, and have the same consequences as a delay in receiving the sample. Finally, if we decrease the duration for IHU Followup, we'd have to hire more interviewers, which could increase training and field costs.

Attachment D

Six Weeks: Additional Detail on the Concerns Raised by the Census Coverage Measurement Operational Integration Team If We Were to Incorporate a Telephone Phase and Start Person Interview About Six Weeks Earlier

To address the recall bias concerns, we considered whether inserting a telephone operation before the personal visit phase might allow us to start the PI about six weeks earlier than is currently planned. Some details of the issues considered follows.

Telephone Numbers. To conduct the telephone phase under the three options considered, we'd have to obtain the telephone numbers for the interviews. In 2000, the Accuracy and Coverage Evaluation accessed the numbers for census respondents on the Decennial Master Address File. If necessary, telephone numbers would be available on the Decennial Response File (DRF). In the current plan for Census Coverage Measurement (CCM), we don't have a requirement to get telephone numbers for CCM, and are only using the Universe Control and Management files. To conduct a telephone phase, we'd need to set up appropriate requirements and interface control documents, identify the appropriate timing for the initial transfer of census telephone numbers to CCM, and make this a priority. The ability to retrieve the phone numbers from the DRF would only be possible under Options 2 and 3.

Instrument Development Concerns. We have a telephone path in the 2009 instrument, but plan to use it only when respondents ask that we call them. It will also be used for the reinterview when conducted on the telephone if the full PI is collected from a nonproxy respondent. Under current assumptions, the Technologies Management Office (TMO) is not prepared to deliver an instrument for a telephone operation any time sooner than perhaps a couple of weeks before the current PI baseline dates. Nor is the Decennial Statistical Studies Division ready to provide specifications or requirements--currently due in mid-June--any sooner. Several months ago, when we discussed the possibility of a telephone phase several months earlier than the current baseline for personal visit, TMO indicated the need for a quick decision and expressed serious reservations about the PI instruments and control systems. They'd also require additional resources for programming and testing. Still, if we conduct a telephone phase and the Initial Housing Unit Followup (IHUFU) operation were dropped (Options 1 or 2), then the programmers for the IHUFU Coverage Measurement Operations Control System could be moved to the PI development and alleviate some of the risk.

Field Concerns. There are strong reservations from the Field Division about major redesigns to the CCM field operations, in particular, moving the start of PI earlier by six weeks. The reservations mentioned in Attachment C about moving the PI start one week earlier would be further intensified with a PI telephone phase. Getting new training even earlier to translation and adaptation for the telephone operation would depend on when the instruments could be made available for training development. If IHUFU were cut, then some of the staffing concerns for training development for PI may be reduced. If a telephone phase is considered, we should study

Attachment D

whether the implementation for Puerto Rico should also include a telephone phase for PI, because translation and adaptation is a major concern.