Lessons Learned in 2010 for the 2020 Census

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Overview

- Complexity and Cost of the 2010 Census

- Approaches for Evaluating the 2010 Census

- What is Currently Known about the 2010 Census

- Links between the 2010 and 2020 Censuses

- The 2020 Approach

- Lessons from 2010 and Attempting to Address them in 2020

- Status of 2020 Planning

What Makes the Decennial Census So Complex and Costly?

- Constitution requires that a census be conducted every 10 years.
- Largest civilian activity the federal government undertakes
- Attempts to count every person living in the United States as of April 1

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What Makes the Decennial Census So Complex and Costly?

- Ever growing number of operations to meet stakeholder needs

- Expanding and changing population

- Increased population diversity but decreased willingness to respond

- Complexity does not increase linearly

- Neither does cost

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What Are Cost Contributors?

- Increasing population diversity

- Demand for ever-increasing accuracy

- Failure or challenges with linking major acquisitions, budgets, requirements, and schedules

- Limited 2000-2009 updating of the Master Address File and TIGER maps led to a design incorporating "last-minute" (2009) updates

- Lack of full public participation in self response

Quality In a Census

Distance from an Ideal

- No measured ideal

Comparison to Alternatives

- Demographic Analysis and Postcensal Population Estimates
- Census Coverage Measurement (CCM)

Process Indicators

- Census Program for Evaluations and Experiments (CPEX)

Distance from an Ideal

- Common evaluation with known truth
  - Percentage correct on examinations
  - Percentage unscheduled downtime for computer systems
- Ideal for all population enumeration use:
  - "Count every resident once and only once and in the right place"
- For a census we have no <u>measured</u> ideal

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Comparison to Alternatives

- Demographic analysis estimates and Postcensal population estimates
  - Vital registration system supplies births, deaths
  - International migration from multiple sources

- National totals by age, sex, and race/ethnicity

- Limitations:
  - Unauthorized migration
  - Race/ethnicity reporting on records

Comparison to Alternatives

- Post-enumeration sample survey
  - Matches and nonmatches to census
- Estimates of matches and nonmatches for areas of 100,000 population or more
- Limitations
  - Subject to sampling variance
  - "Correlation bias"
  - Recall error regarding April 1 status

The purpose of the 2010 CPEX is to:

- Measure the effectiveness and impact on data quality of the 2010 Census operations, systems, and processes;

- Explore new methods and validate research from earlier in the decade to inform early 2020 tests;

- Provide indicators as to how programs were implemented compared to the plan and include lessons learned; and

- Provide an overview of the quality aspects of census operations

Process Indicators

Four types of CPEX studies (109):

- Assessments (54) - final volumes, rates, and costs for individual operations or processes.

- Quality Profiles (17) - document the results of quality control operations.

- Evaluations (32) - analyze and synthesize the effectiveness of census components.

- Experiments (6) - national surveys that inform planning of future censuses.

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Process Indicators

Current Status of CPEX Studies:

- All of the studies have been approved by the CPEX Governing Board.

- 16 reports already have been briefed; an additional 48 reports will be briefed by the end of 2011.

- Included in these reports are assessments of major operations such as:

  - Census Address Canvassing Assessment

  - Census Nonresponse Followup Operations (NRO) Assessment

Process Indicators

Feature	Evaluative Indicator Relative to 2000
Local government participation in Update of Census Addresses	Percentage of governments is lower; percentage of population represented is similar
Continuous update of Address List	Total housing units closer to independent estimate; fewer deleted listings (4 million vs 6 million in 2000); fewer additions in followup phase (635K vs 689K)
Communications campaign	Similar awareness, intention to participate

Process Indicators

Feature	Evaluative Indicator Relative to 2000
Short-form only design	Higher participation rates than long form (overall 72% in 2010 vs. combined short-long 69% in 2000)
Bilingual questionnaire to 13 million households with >20% Spanish-speakers	Increased participation rate by about 2 percentage points in areas where sent
Replacement form sent to 40 million households, targeting hard to enumerate	Increased participation in hard to enumerate areas

Process Indicators

Feature	Evaluative Indicator Relative to 2000
Verification of composition for households with dynamic membership	Recontact with more households (7.5 million versus 2.5 million)
Assignment to enumerators	Fewer miles per interview
Nonresponse followup visiting rules the same	Higher percentage of population counts in households from proxy respondents

Process Indicators

Feature	Evaluative Indicator Relative to 2000
Unit and Person Imputation Rates	Slightly lower rates of unit and person imputation than 2000
Quality control reinterviews	Essentially all enumerators subject to reinterviews (vs. 75% in 2000); smaller percentage of enumerators failing to meet quality standards
Meeting deadlines on data collection	All 11 operations since mid-2009 on schedule and significantly under budget ($1.87 billion returned)

Process Indicators

Feature	Evaluative Indicator
Coverage Followup	66 percent completion rate, with 5% of households adding at least one person and 22% deleting at least one person – resulting in a net decrease of 884,254 people in the census roster.
Coverage Followup	There were 80% more Spanish-language interviews than expected, which required rapidly hiring more Spanish-language interviewers to cover demand.

Process Indicators

Feature	Evaluative Indicator
Behavior Coding of NRFU	Interview performance in question wording was worse than expected based on the 2004 and 2006 Census Tests: - across all questions, only 37% were asked in ideal form - highest number of major changes was to the household roster question (83%) - lowest number of major changes was to the sex question (12%)

Process Indicators

Feature	Evaluative Indicator
Behavior Coding of NRFU	Respondent behavior varied, with some questions having high numbers of codable responses and others not: - across all questions, adequate respondent behavior occurred on the first exchange 71% of the time - the overcount question had the highest occurrence of adequate answers (78%) - the age question had the lowest occurrence of adequate answers (34%)

Process Indicators

Feature	Evaluative Indicator
Confidentiality Notification	Mail return rates were not affected by the administrative records use message or statistical purposes message (between 78% and 79%)
Confidentiality Notification	Household-level item nonresponse and within-household population counts were not affected, but higher item nonresponse did result for some person items (e.g., race for persons of Hispanic origin)

Process Indicators

Feature	Evaluative Indicator
Group Quarters Enumeration	Ethnographic research recommended that dedicated protocols dealing with cultural considerations and communications be developed, and that organization and cultural specialists be employed to assist in creating methodology and conducting enumeration.

Process Indicators

Feature	Evaluative Indicator
Group Quarters Enumeration	Ethnographic research indicated that paper-based communication and enumeration was not effective for college dormitories and residence halls
Group Quarters Enumeration	Ethnographic research indicated that the population living in college dormitories and residence halls used texting, Facebook, and email constantly – with email being the preferred method of professional communication.

Process Indicators
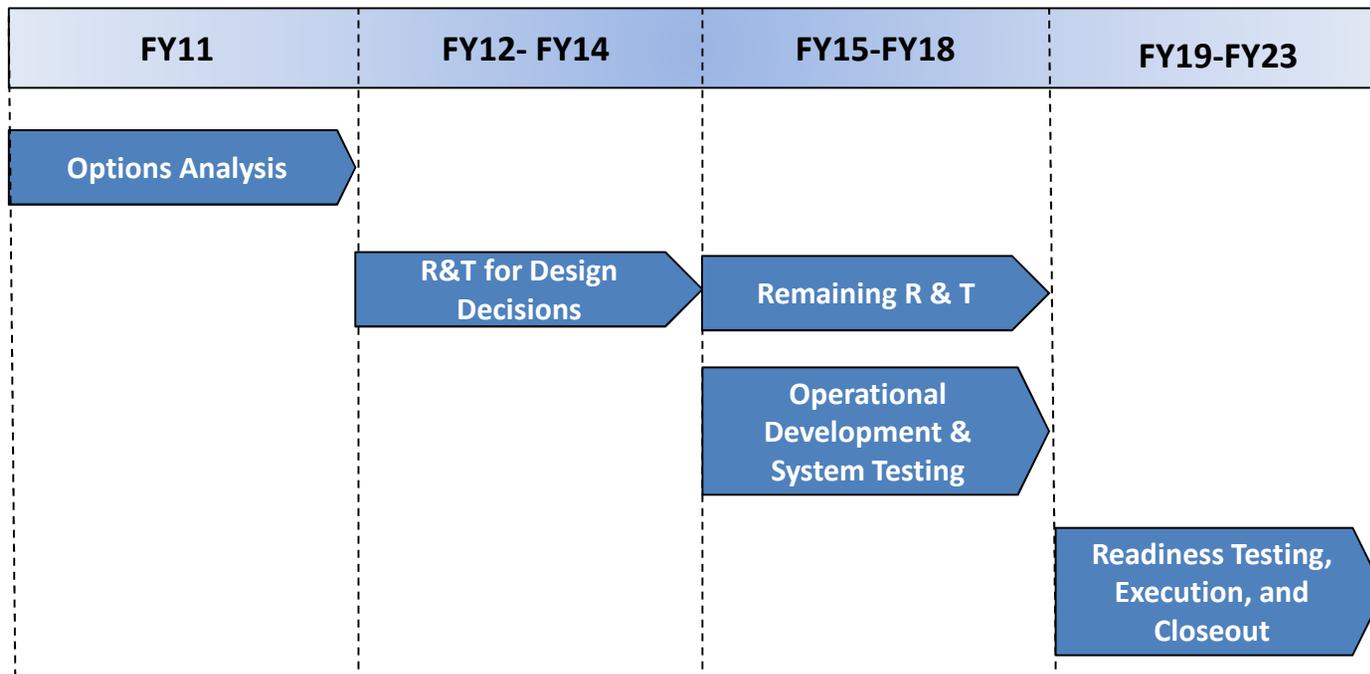
CPEX and 2020 Census Planning:

- 54 CPEX studies have been identified to provide information critical to planning and implementing early research projects for the 2020 Census.

- We expect that four CPEX studies will provide substantial insights :

  - "2010 Census Match Study Evaluation"

  - "Evaluation of Address List Maintenance Using Supplemental Data"

  - "Address Canvassing Assessment"

  - "2010 Census Quality Survey Evaluation"

Process Indicators

Next Steps for CPEX

- Publish remaining CPEX study plans.

- Work with the Executive Steering Committee to oversee the bridging of 2010 CPEX results for early 2020 Research and Testing.

- Produce and disseminate final CPEX study reports.

- Summarize and disseminate critical conclusions from the CPEX studies.

- Identify recommendations and other lessons learned that indicate possible areas for future research and testing.

Bridging to the 2020 Test Cycle

- 2020 planning efforts identified critical research projects, to begin in FY2012, to inform the next census design.

- 2020 planning efforts identified critical output from the 2010 CPEX to inform the FY2012 research projects.

- Schedules are being aligned so key 2010 CPEX results can be used to design research projects for the 2020 census.

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Early 2020 Census Research General Timeline

FY11	FY12- FY14	FY15-FY18	FY19-FY23

Options Analysis

R&T for Design Decisions

Remaining R & T

Operational Development & System Testing

Readiness Testing, Execution, and Closeout

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The 2020 Approach

The multiyear integrated program for planning, testing, and developing the constitutionally mandated decennial census

- FY12 – plans will be developed and teams will identify candidate methods for testing a number of operational options over the next two years

- FY 2013 - focus on testing and eliminating options by conducting numerous small operational field tests

- FY 2014 - make preliminary design decision(s), in preparation for acquisitions beginning in FY 2015

2020 Approach vs. 2010 Approach

Program Integration

2010 Approach

– Program management plans were primarily focused on the production activities, they were not mature in the research and testing phase, resulting in plans being finalized late in the cycle
– Schedules were only developed for individual tests
– Schedule information was not always linked to the budget

2020 Approach

– Development of the Strategic Plan early in the life cycle
– Ongoing alignment of all activities with the strategic goals and objectives
– Full life cycle integrated schedule, including a Work Breakdown Structure (WBS) will link budgets, work, acquisitions, and testing

2020 Approach vs. 2010 Approach

Estimating Costs

2010 Approach

– Full life cycle budget developed in 2000, before work on the actual design for 2010 had even begun. This constrained us all decade

2020 Approach

– Budget incorporates successive approximation techniques for reduced uncertainty, allowing for alternative cost estimates and greater precision

2020 Approach vs. 2010 Approach

Contract Risk

2010 Approach

– Use of multiple acquisition strategies
– Constrained by early life cycle estimates

2020 Approach

– Adoption of an overall 2020 Census acquisition strategy
– Needs are documented in performance-based requirements and are aligned with funding
– Government and contractor efforts are fully integrated

2020 Approach vs. 2010 Approach

Risk Management

2010 Approach

– No formal mechanism to manage risk until the production phase of the program

2020 Approach

– Initiation of Risk Management at the beginning of the planning cycle

2020 Approach vs. 2010 Approach

Self-Response Options

2010 Approach

- Included bilingual form and replacement mailing, but no Internet option

2020 Approach

- Investigating of a wide array of electronic self-response options
- Research and testing of response modes tailored by demographics and geography

2020 Approach vs. 2010 Approach

Non-Response Options

2010 Approach

– Initially planned the use of handheld computers for Non-response Follow-up (later dropped)

2020 Approach

– Research and testing of automated data collection instruments

– Use of alternative modes of data collection

– Testing use of administrative records in various non-response applications

2020 Approach vs. 2010 Approach

Headquarters and Field Automation

2010 Approach

– Ended up using separate operational control systems, two listing devices, and no automated enumeration devices

2020 Approach

– Research and testing an integrated workload management system and automation of field operations
– Where appropriate, looking to use ACS and other demographic surveys as testing vehicles

2020 Approach vs. 2010 Approach

IT Infrastructure

2010 Approach

– One-of-a-kind systems were developed solely for the 2010 Census

2020 Approach

– Research and testing the feasibility of a common IT infrastructure for decennial and demographic programs

2020 Approach vs. 2010 Approach

Administrative Records

2010 Approach

– Use of administrative records in highly-restricted and limited applications

2020 Approach

– Conduct research to aggressively pursue testing the use of administrative records in non-response applications

Where are we with 2020 Planning

- Internal Communication - held off-sites with staff on the research agenda, systems engineering best practices, and program management best practices

- Preparing to kick-off the first research and testing teams October 1. Teams will not just be responsible for specific research projects. They will be expected to manage those projects using formal risk, schedule, budget, and requirements management processes.

- Began work on a 2010 "As-Was Architecture" to aid us in developing a 2020 Census Architecture for business operations and systems.

- Conducting a stake-holder analysis so that we can be more pro-active in engaging all types of stake-holders in our research and testing phase.

- At the request of the United Nations Statistics Commission, conducting an assessment of how the 2010 round of censuses has gone in countries around the world.