

**An Assessment of the Cohort-Component-Based  
Demographic Analysis Estimates of the Population  
Aged 55 to 64 in 2010**

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**Applied Demography Conference  
January 8-10, 2014**

# Outline

- What is Demographic Analysis (DA)?
- DA estimation methodology for the population in different age groups.
- May 2012 release of 2010 DA estimates.
- Assessment of May 2012 DA estimates for the population aged 55 to 64 in 2010.
- Recommendations for DA in 2020.

# What is Demographic Analysis ?

Demographic Analysis (DA) refers to a set of methods that have been used by the U.S. Census Bureau since the 1950s to develop national-level estimates of the population for comparison with decennial census counts.

DA estimates are developed from historical vital statistics, estimates of international migration, and other data sources that are essentially independent of the census.

# Demographic Analysis: 2000

- DA estimates for the population under age 65 are based on historical components of change for cohorts beginning with 1935 [births, deaths, immigration, emigration]:

$$P = B - D + I - E$$

- DA estimates for those aged 65 and older are based on aggregate Medicare enrollment data for the latest available year, and estimates of those delaying enrollment or not eligible to enroll.

# 2010 Demographic Analysis Method for the Population Aged 65 and Older

- In 2010, it was possible to produce DA estimates for the population aged 65-74 from either the cohort-component approach or the Medicare file.
- In 2020, it will be possible to rely on the cohort-component approach to estimate the population aged 0-85; in 2030, aged 0-95, and so on.

# Original 2010 DA Estimates

- On December 6, 2010, the U.S. Census Bureau released five sets of DA estimates for the national population on April 1, 2010.
- The DA 2000 method was used to produce the estimates.
- The DA estimates were provided to serve as benchmarks for the 2010 Census data released later that month.
- The five sets reflect the sensitivity of the DA estimates to different, but plausible input values.

# Comparison of Census 2010 Counts and Original DA Estimates

- If the counts from the decennial census operation were to fall outside this demographically plausible range, concerns would be raised about the quality of the census.
- The DA estimates ranged from 305.6 to 312.7 million.
- The census count came in at 308,745,538--well within the range of the DA estimates.

## Assessment of the Difference

- However, inspection of the results by single year of age revealed that the census counts for the population aged 65 to 67 fell outside the range of the DA estimates.
- This was an unexpected outcome.
- There is no explanation for a low count for these specific ages.



# Revision to the Original DA Estimates

- We reexamined our assumptions about age at the time of enrollment in Medicare.
- We concluded that there was a behavioral change in the 2000-2010 decade.
- Now, most people do not delay enrollment. They enroll in Medicare at age 65.
- As a consequence, we might have overcorrected the population aged 65 to 69.

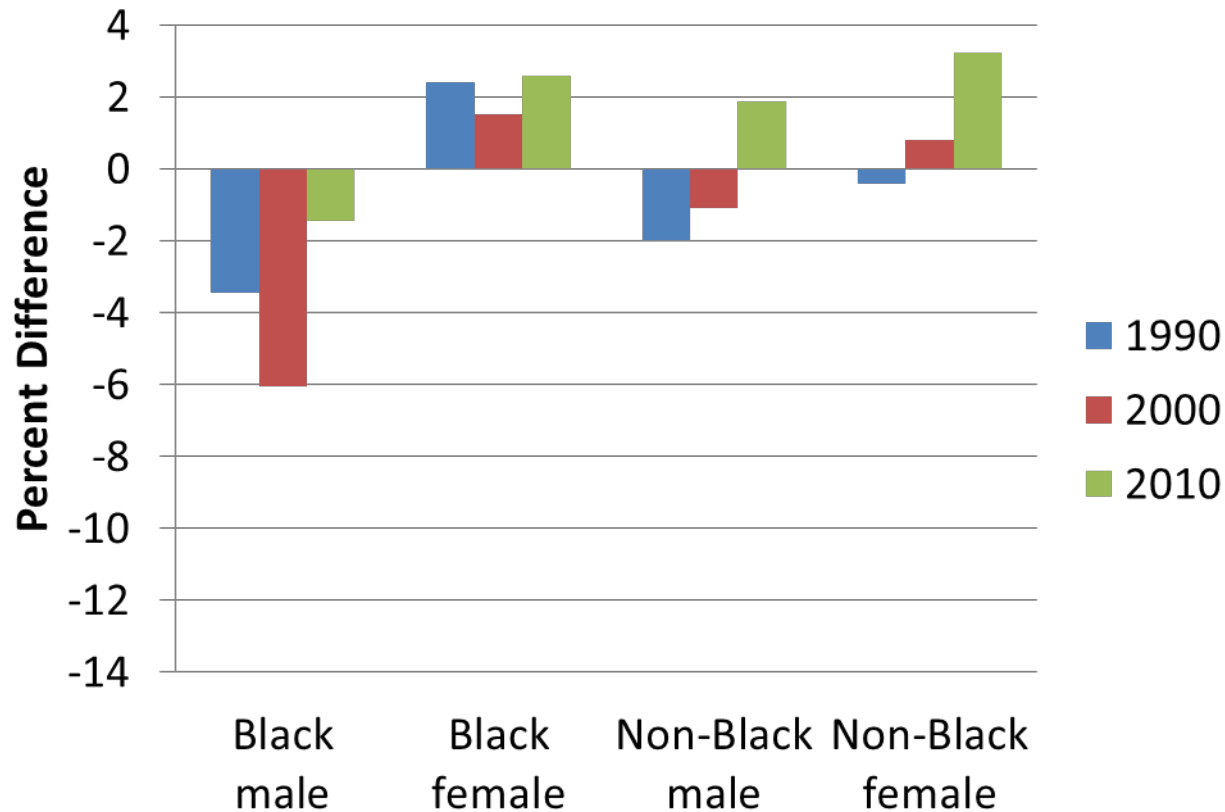
## Revised DA 2010 Estimates

- In the May 2012 release, we replaced the Medicare-based estimates with the cohort-component-based estimates for ages 65 to 74.
- We recommended that the cohort-component approach be used to produce the population aged 0-84 in 2020.
- We need to know how the cohort-component-based DA estimates for the population aged 55-64 in 2010 might look in 2020.

## Initial analysis

- Percent differences between the census and DA estimates by race, sex and age group in Census 1990, 2000 and 2010.

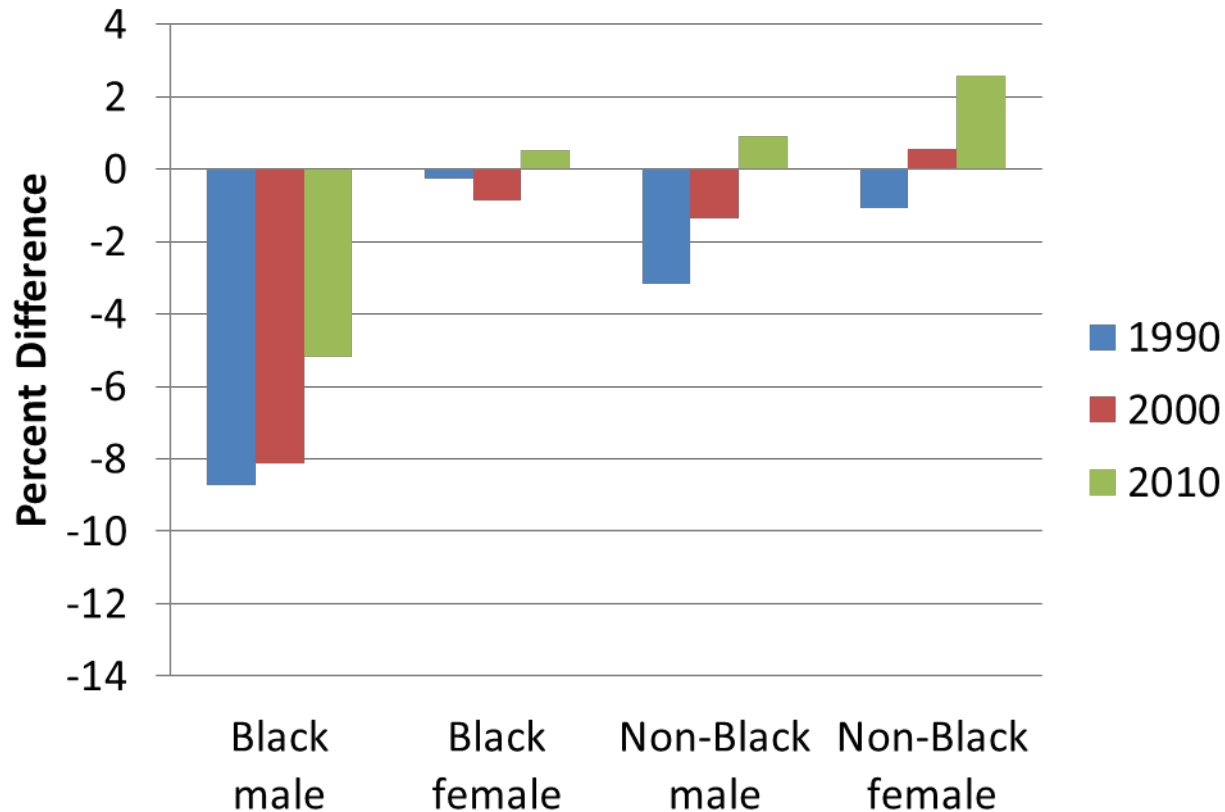
# Figure 1. Population Aged 60-64 Comparison of DA and Census: 1990, 2000 and 2010



NOTE: Percent Difference = (Census-DA)/DA\*100

Source: U.S. Census Bureau, 2012

## Figure 2. Population Aged 55-59 Comparison of DA and Census: 1990, 2000 and 2010



NOTE: Percent Difference = (Census-DA)/DA\*100

Source: U.S. Census Bureau, 2012

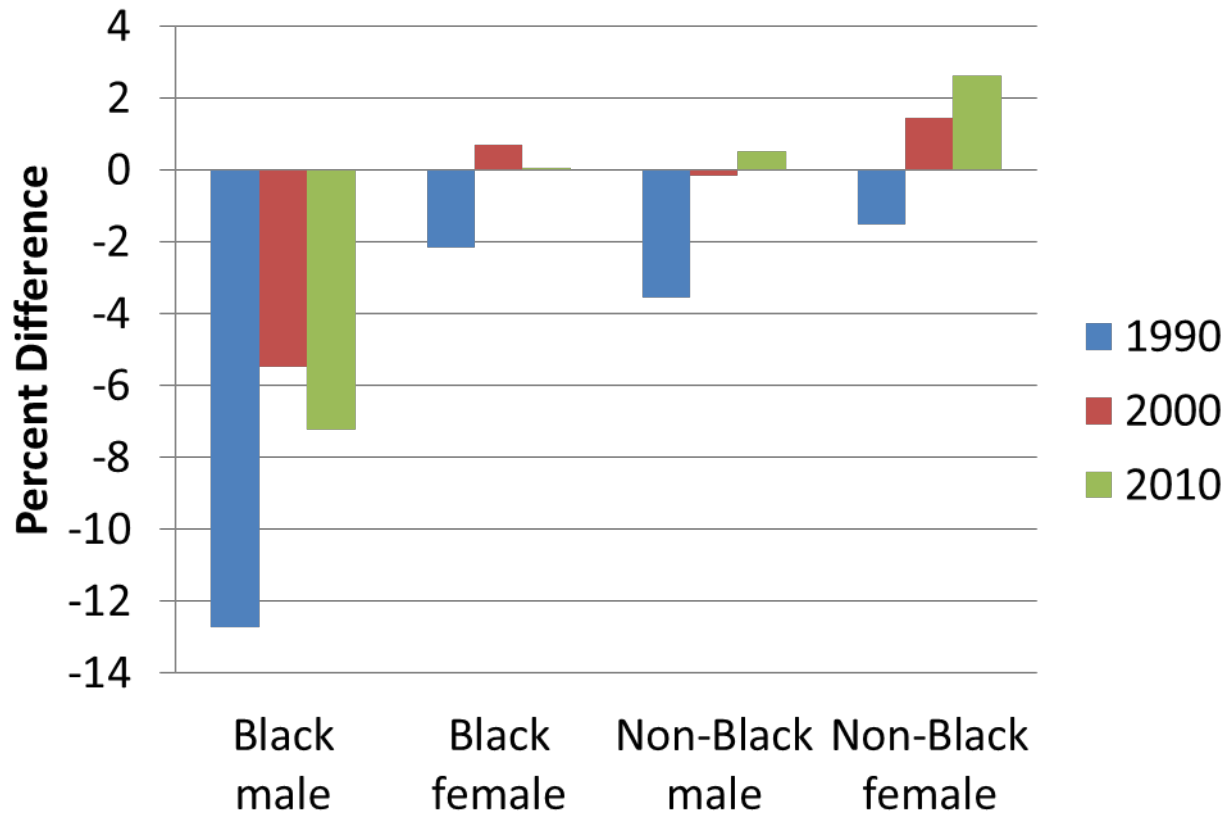
# Outcome

- The shift to the cohort-component method brought the 2010 DA estimates for ages 65 to 67 below the census for
  - Non-Black males and females,
  - Black females,
  - But not Black males.
- The DA estimates for Black males were higher than the census in 1990 and 2000.
- Further analysis is required to understand this pattern.

# Further analysis

- Age/period effects

# Figure 3. Population Aged 50-54 Comparison of DA and Census: 1990, 2000 and 2010

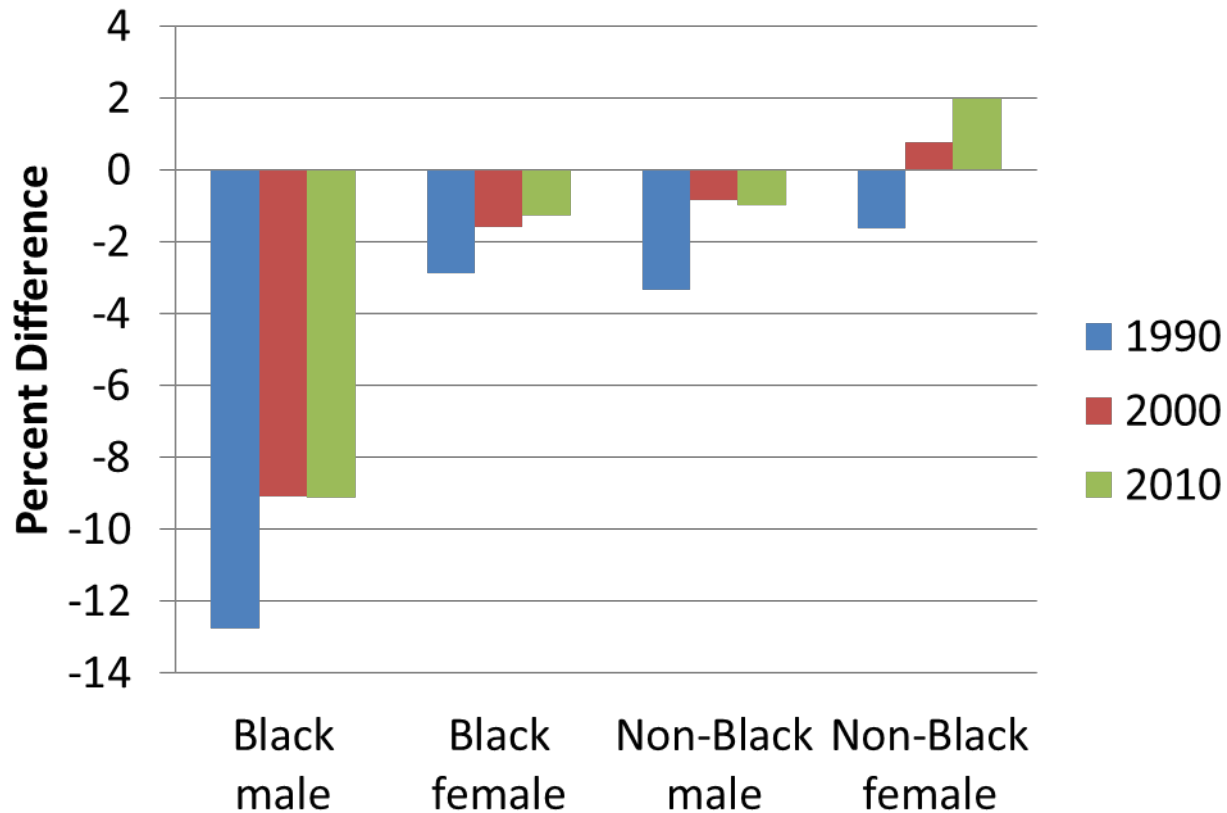


NOTE: Percent Difference = (Census-DA)/DA\*100

Source: U.S. Census Bureau, 2012



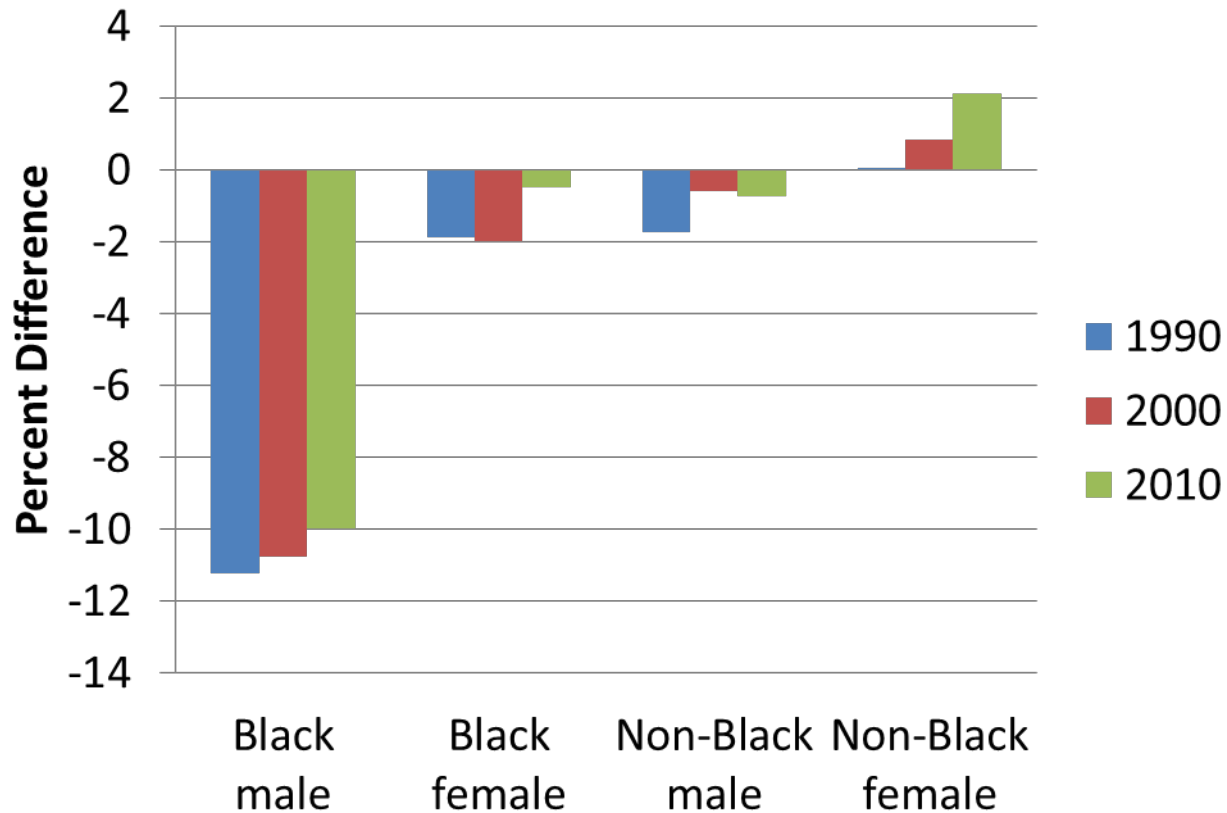
# Figure 4. Population Aged 45-49 Comparison of DA and Census: 1990, 2000 and 2010



NOTE: Percent Difference = (Census-DA)/DA\*100

Source: U.S. Census Bureau, 2012

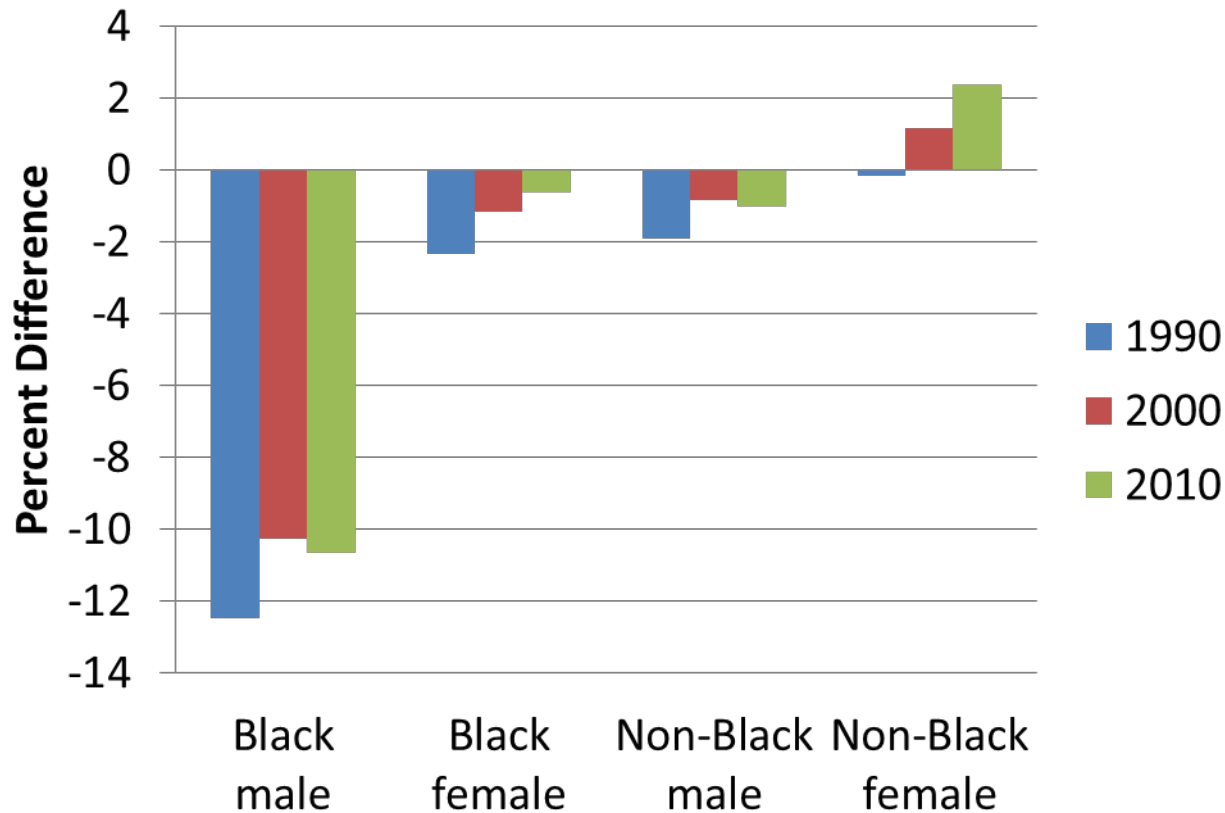
# Figure 5. Population Aged 40-44 Comparison of DA and Census: 1990, 2000 and 2010



NOTE: Percent Difference = (Census-DA)/DA\*100

Source: U.S. Census Bureau, 2012

# Figure 6. Population Aged 35-39 Comparison of DA and Census: 1990, 2000 and 2010



NOTE: Percent Difference = (Census-DA)/DA\*100

Source: U.S. Census Bureau, 2012

# Further analysis

- Cohort effects

# Table 1. Percent Difference Between DA and Census For the Population Born 1945-1954

Census Year	Age at Census	Black male	Black female	Non-Black male	Non-Black female
2010	55-64	-3.61	1.41	1.34	2.88
2000	45-54	-7.53	-0.60	-0.53	1.08
1990	35-44	-11.91	-2.15	-1.83	-0.07

NOTE: Percent Difference = (Census-DA)/DA\*100

Source: U.S. Census Bureau, 2012

# Estimates for Black Males Aged 55-64 in 2010

- DA estimates of Black males are higher than the count in all three censuses.
- Differences between the census count and the DA estimates are higher for Black males than Black females and non-Black males and females.
- Studies of differential coverage by race have documented age effects (e.g., young children) or period effects (improvements in census processes).
- A cohort pattern of coverage error by race and sex does not appear logical.

## Possible Explanations

- Pattern not due to race classification error:
  - Observed for both Black Alone and Black Alone or in Combination.
  - Not observed for Black females.
- Pattern observed in previous censuses for adjacent ages:
  - Studies of coverage errors have never detected a cohort effect.
- Overcorrection for birth underregistration in DA estimation:
  - Correction factors might be too high for Black males born between 1935 and 1944.

# Conclusion

- Cohort effects are difficult to explain in the context of census coverage errors.
- DA estimates appear to be too high for Black males aged 55-64 in 2010.
- Examine the components used to create the DA estimates for these cohorts.
- In particular, examine the correction for birth registration completeness for the early birth cohorts (1935-44).



# Contact Information

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