

Mortality Experience of Respondents in the NHIS Linked Mortality Files

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Objectives

- National Health Interview Survey (NHIS) Linked Mortality files recently updated to include 5 additional years of mortality follow-up and additional NHIS surveys:
 - Mortality follow-up through 2011
 - 1985-2009 NHIS surveys.
- How well was vital status of respondents in the linked files ascertained? Assess for different:
 - Age groups
 - Race-sex groups (white males, white females, black males, black females)
 - Lengths of follow-up
 - Survey years

Motivation

- NHIS Linked Mortality files provide the opportunity to examine associations of health measures with mortality in a nationally representative sample.
- Is the ascertained mortality experience of NHIS Linked Mortality file respondents representative of the U.S. population? Possible reasons for differences:
 - Civilian noninstitutionalized population versus resident population
 - Differences in linkage eligibility by race-ethnicity, sex, age, education, income and other subgroups.
 - Problems with linkage.

NHIS

- NHIS has monitored the health of the U.S. population since 1957.
- NHIS collects information on a broad range of health topics through personal household interviews:
 - Basic social and demographic information
 - Health status and conditions
 - Health behaviors
 - Health care access and utilization.

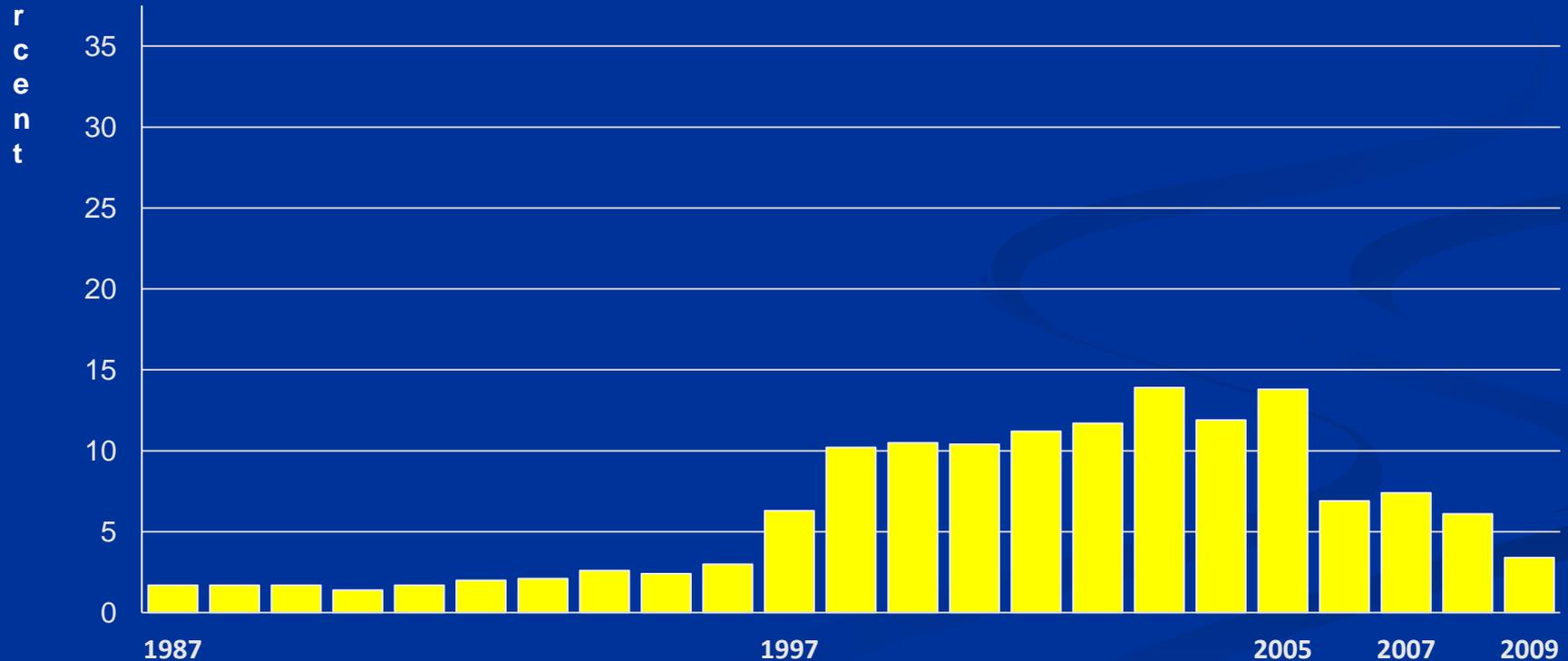
NHIS

- Large-scale household interview survey, currently about 35,000-40,000 households, 75,000-100,000 people.
- Cross-sectional - conducted continuously, throughout the year, annual cohorts.
- Nationally representative survey of the U.S. civilian noninstitutionalized population:
 - Multistage probability sample
 - Oversampling: currently African American, Asian, and Hispanic persons.

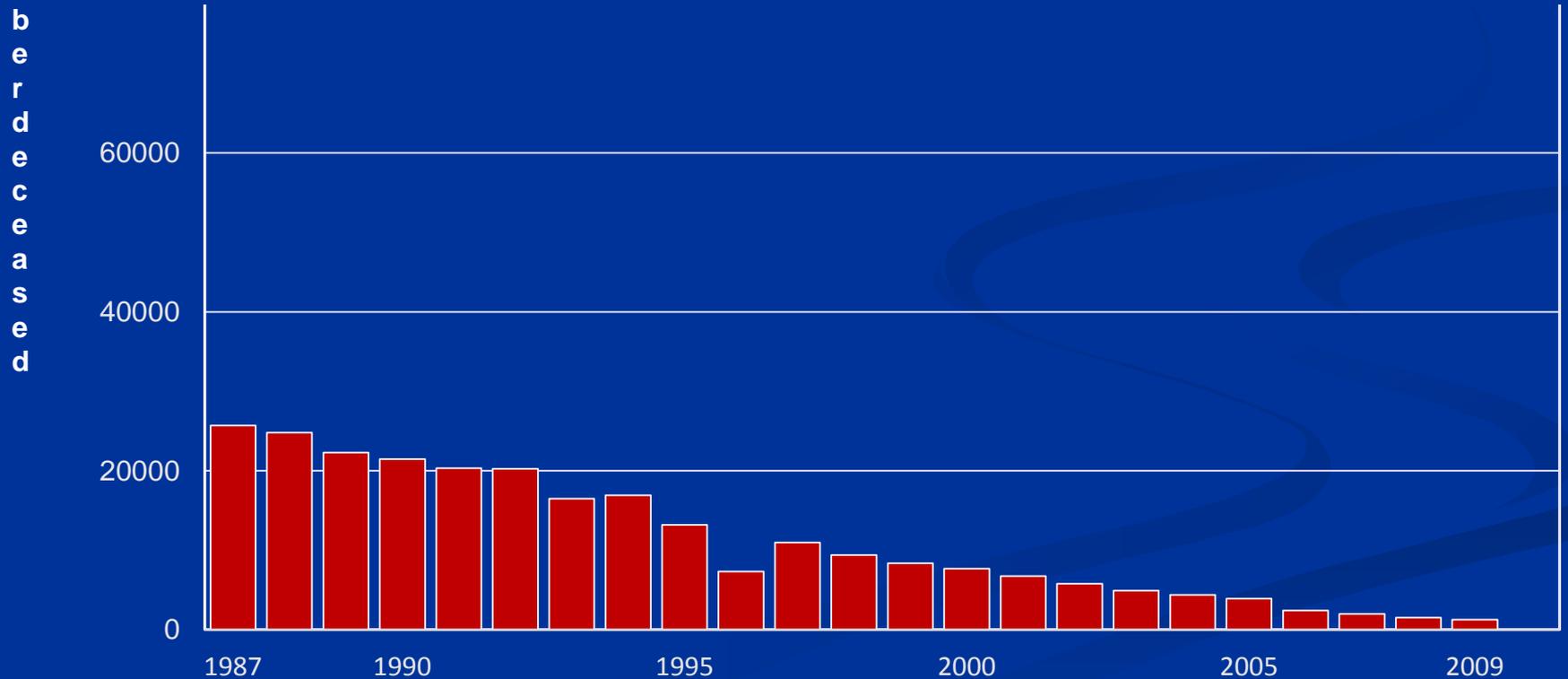
NHIS Linked Mortality File

- Passive mortality follow-up - no death certificates collected.
- Eligible NHIS respondents from the 1985-2009 NHIS surveys linked to the National Death Index (NDI) to obtain mortality follow-up through 2011.
- NDI information obtained for linked respondents:
 - Date and state of death
 - Underlying and multiple causes of death.

Percent Ineligible for Linkage, 18+ years: NHIS 1987-2009

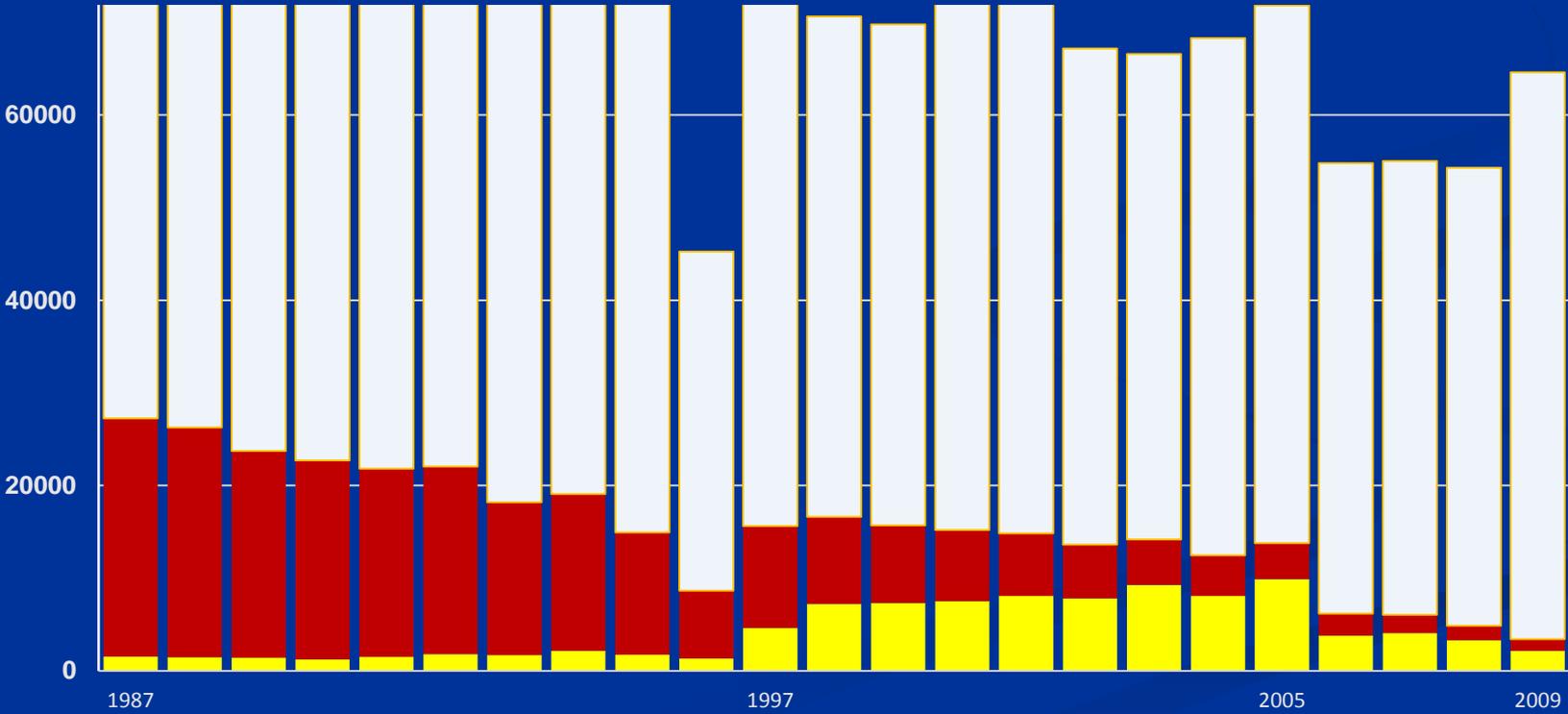


Number of Decedents, 18+ years: NHIS 1997-2009



Number of Adults Ineligible for Linkage, Presumed Alive, or Presumed Dead: NHIS 1987-2009

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NHIS and U.S. Mortality Experience

- Cumulative survival curves calculated for:
 - 1987-2009 NHIS Linked Mortality cohorts using Kaplan Meier product-limit method (incorporating sample weights and complex survey design), and
 - Corresponding U.S. resident populations using q_x from successive annual U.S. life tables..
 - 44 race-sex-age subgroups:
 - Race-sex: white males and females, black males and females
 - Baseline age groups:

18-24 years	55-59 years	75-79 years
25-34 years	60-64 years	80-84 years
35-44 years	65-69 years	86+ years
45-54 years	70-74 years	
- Sample weights and complex survey design (stratum and PSU) were used.

Results

- Selected cumulative survival curves:
 - White males, white females, black males, black females
 - Age groups:

NHIS linked mortality

25-34 years

45-54 years

65-69 years

75-79 years

U.S. resident population

30 years

47 years

67 years

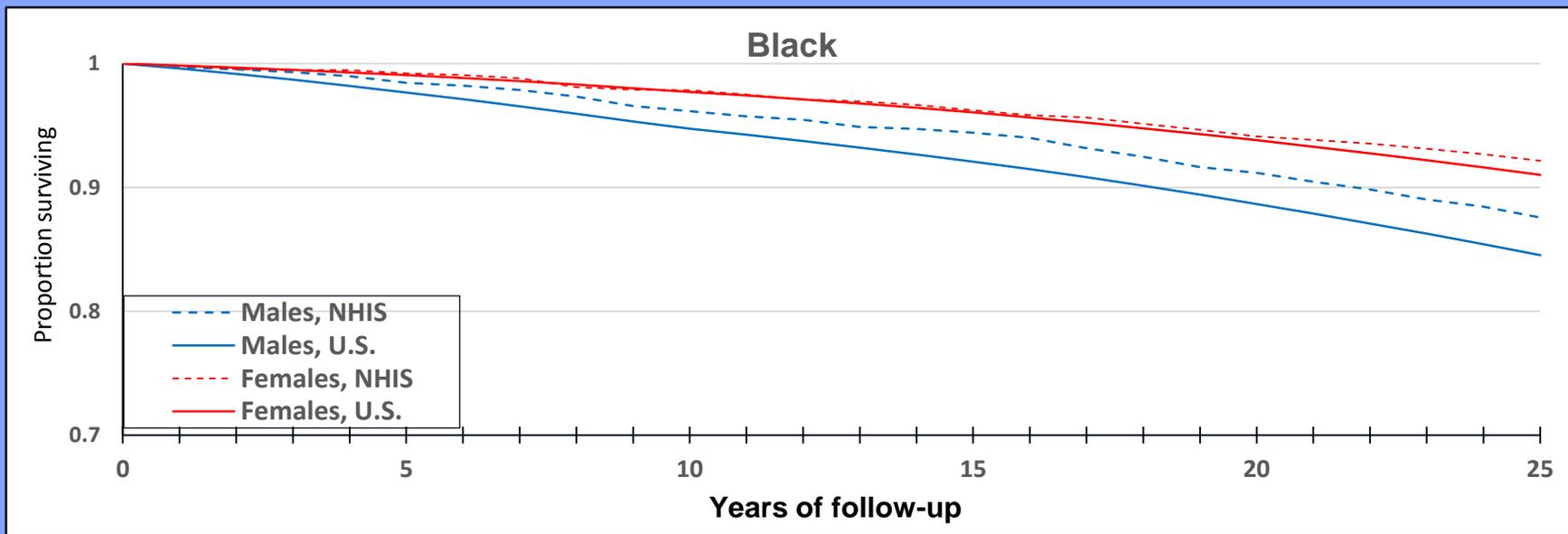
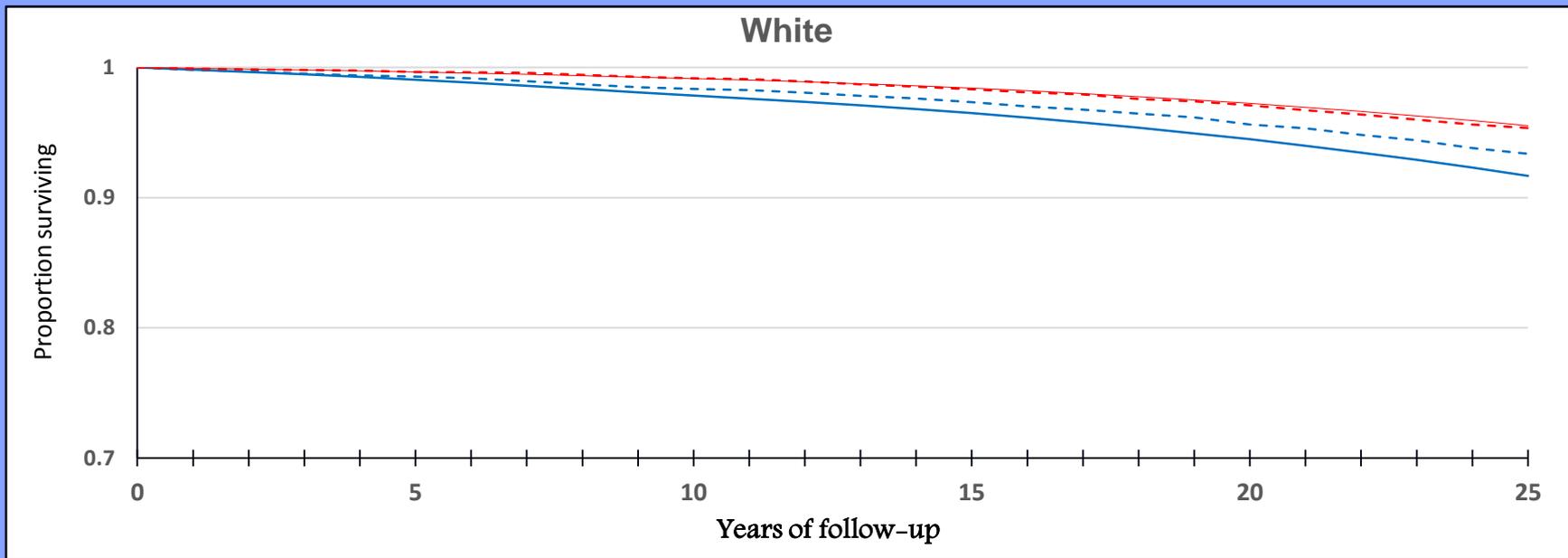
77 years

- NHIS Linked Mortality cohorts:
 - 1987: 25 years of follow-up
 - 2002: 10 years of follow-up
 - 2007: 5 years of follow-up

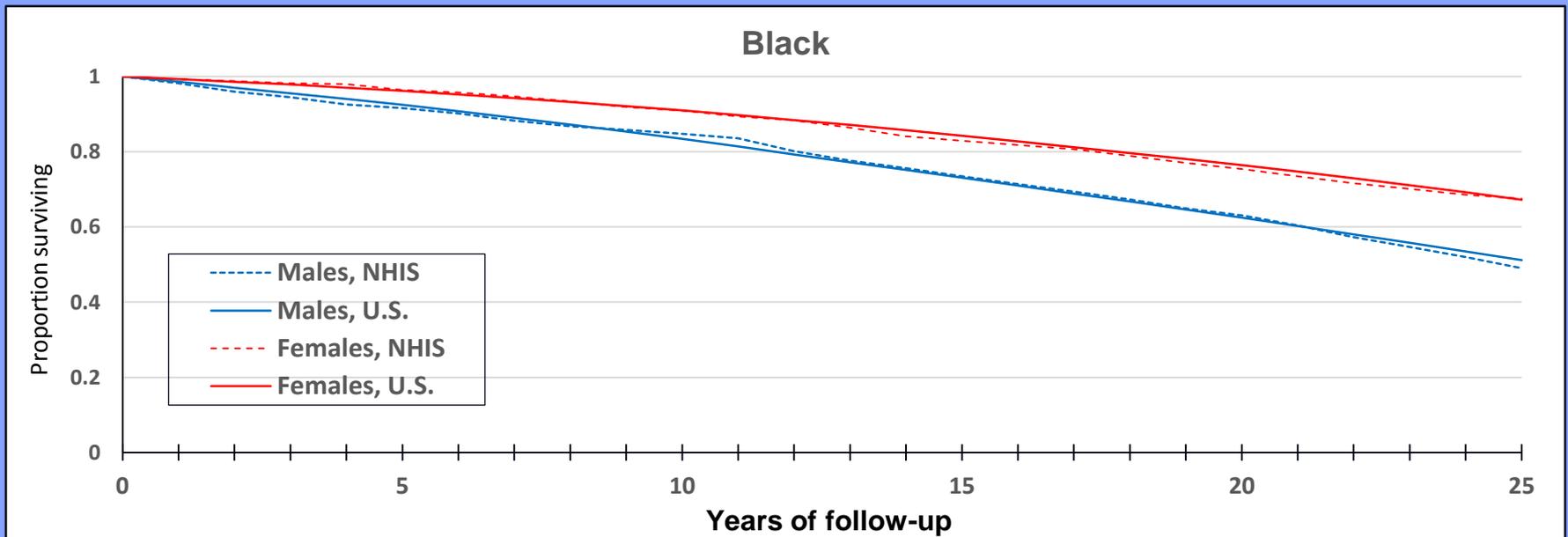
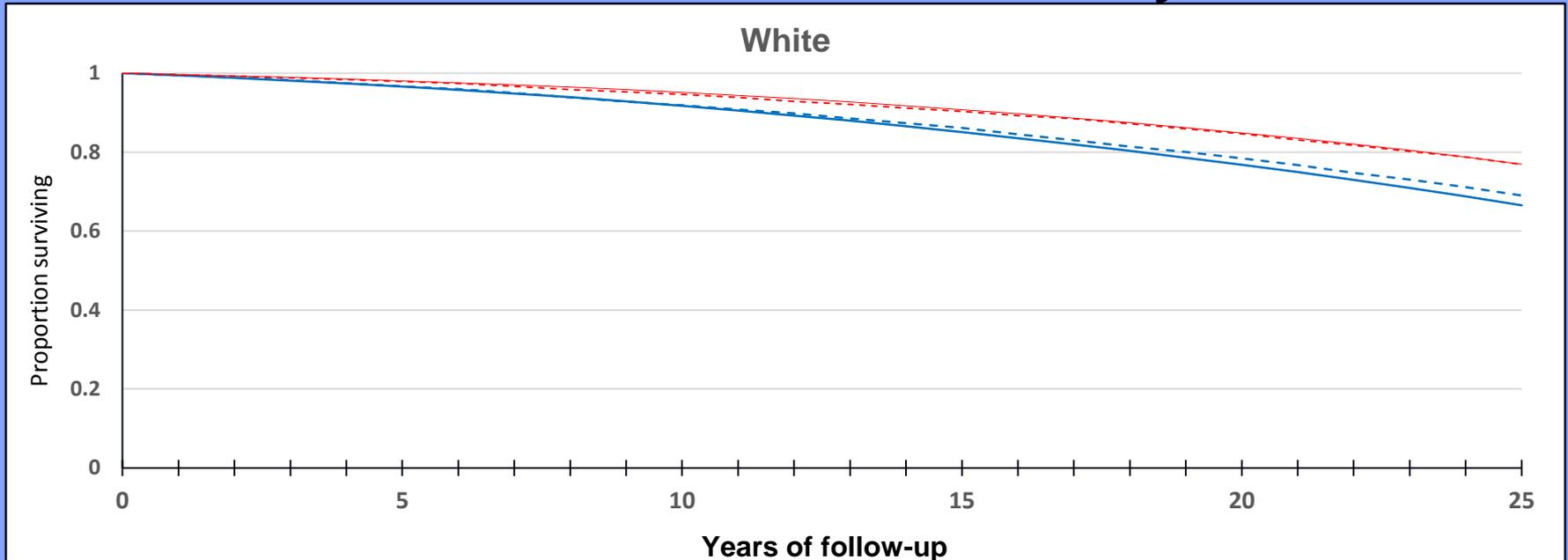
One Expected Result

- NHIS Linked Mortality file survival curves expected to be higher than those computed for the U.S. population:
 - NHIS sample does not include the institutionalized population; the U.S. population does.

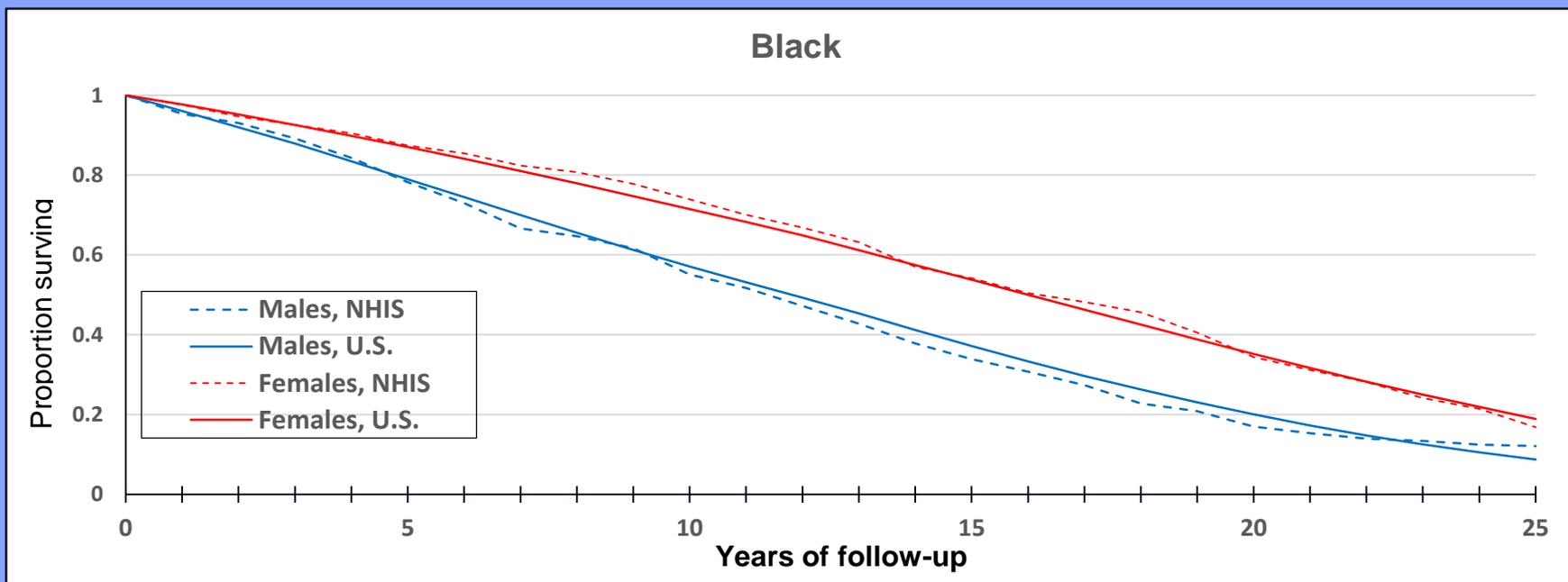
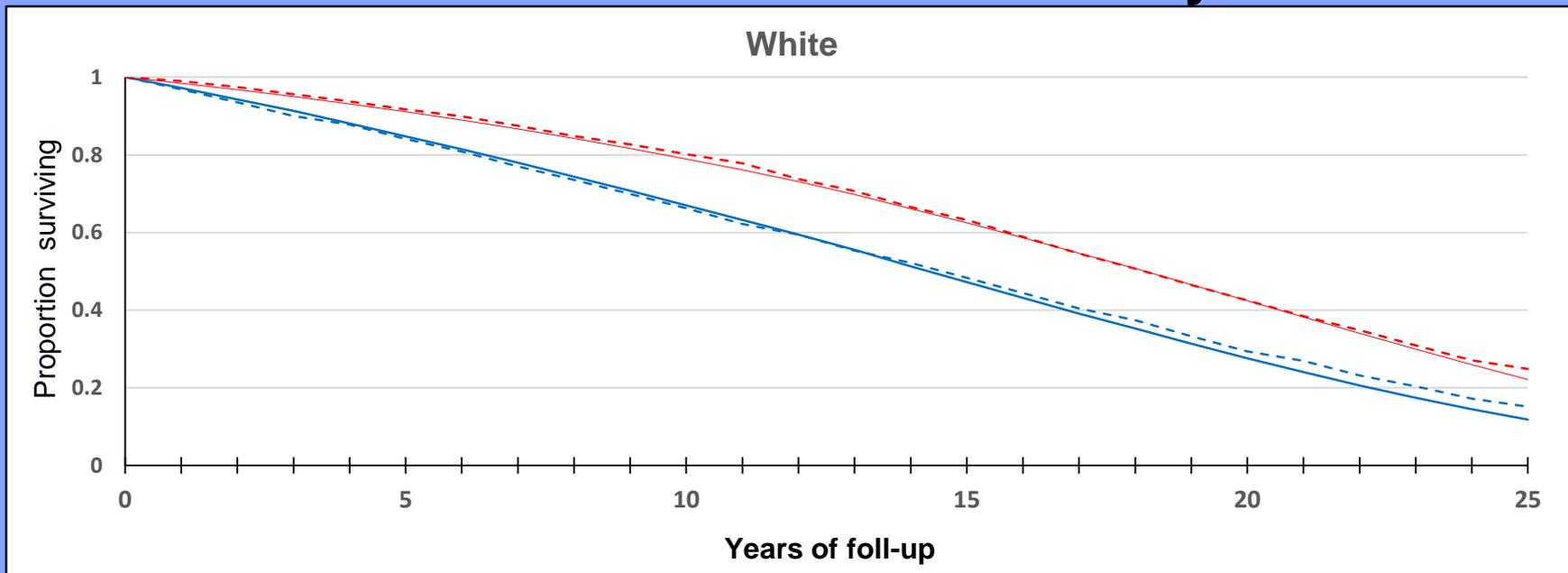
1987 NHIS Cohort Survival: 25-34 years



1987 NHIS Cohort Survival: 45-54 years

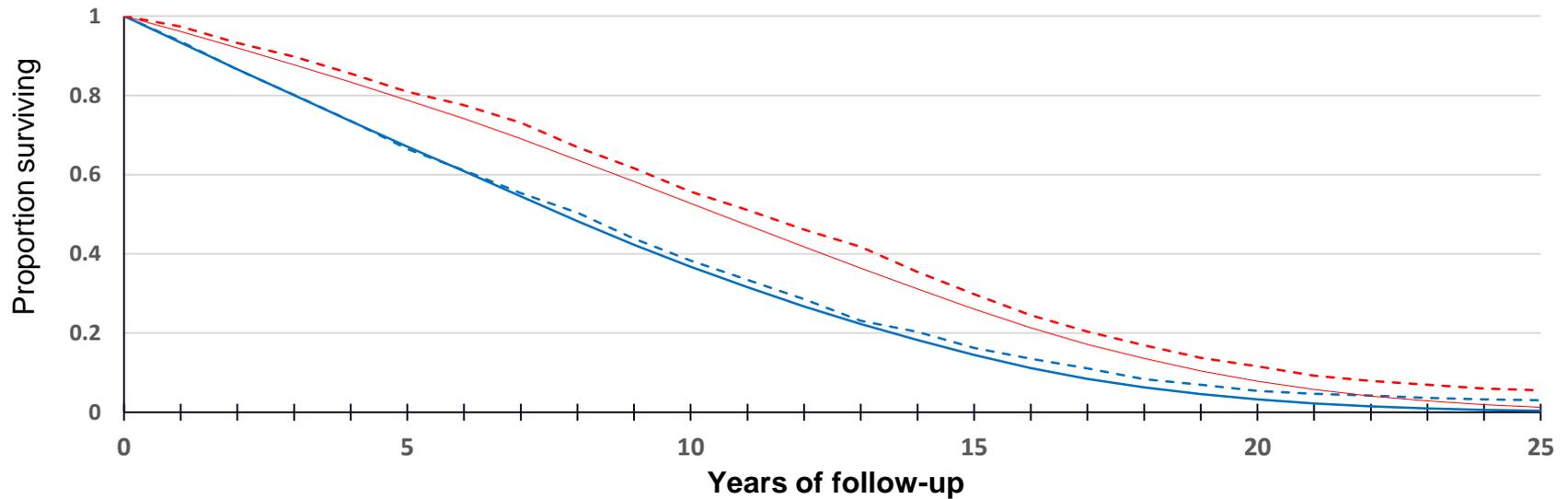


1987 NHIS Cohort Survival: 65-69 years

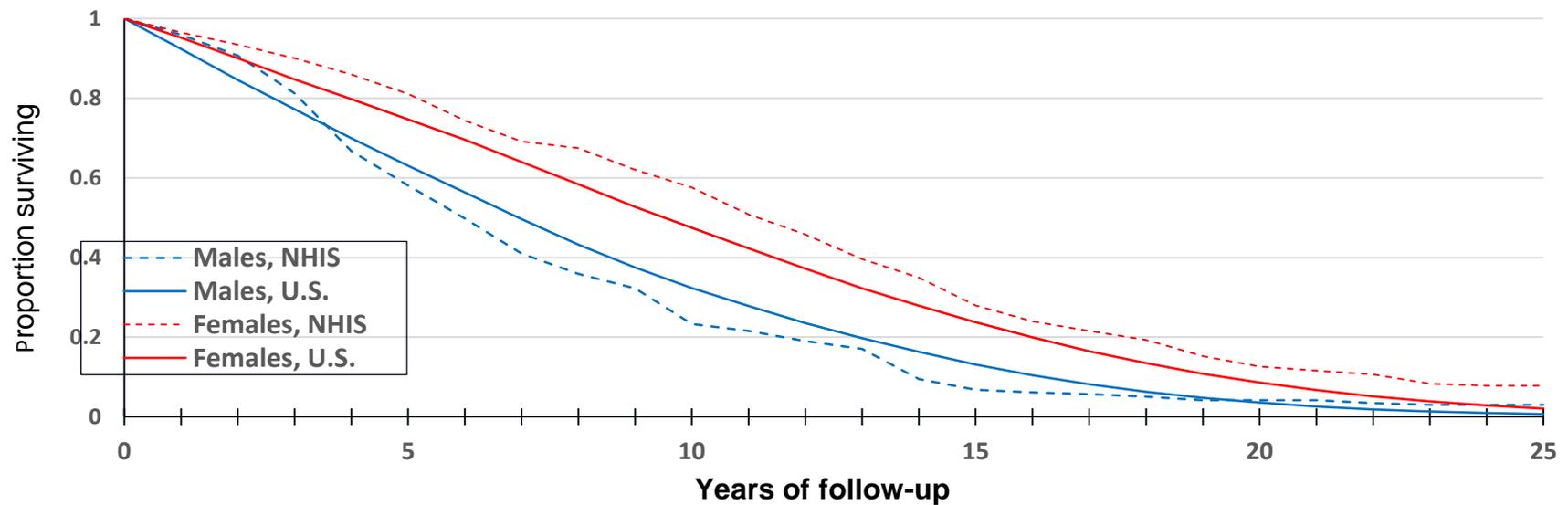


1987 NHIS Cohort Survival: 75-79 years

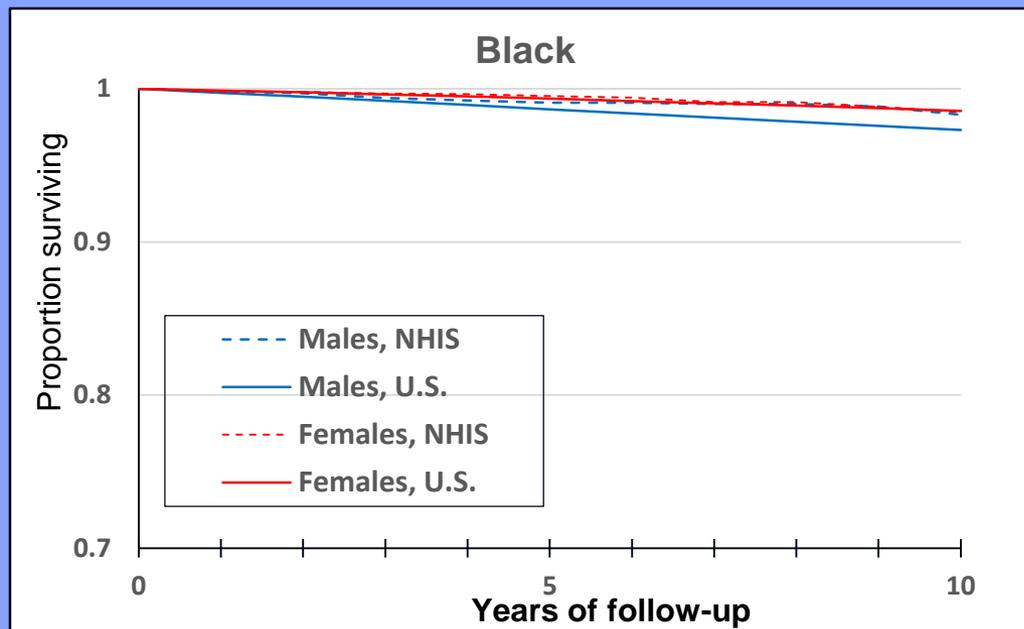
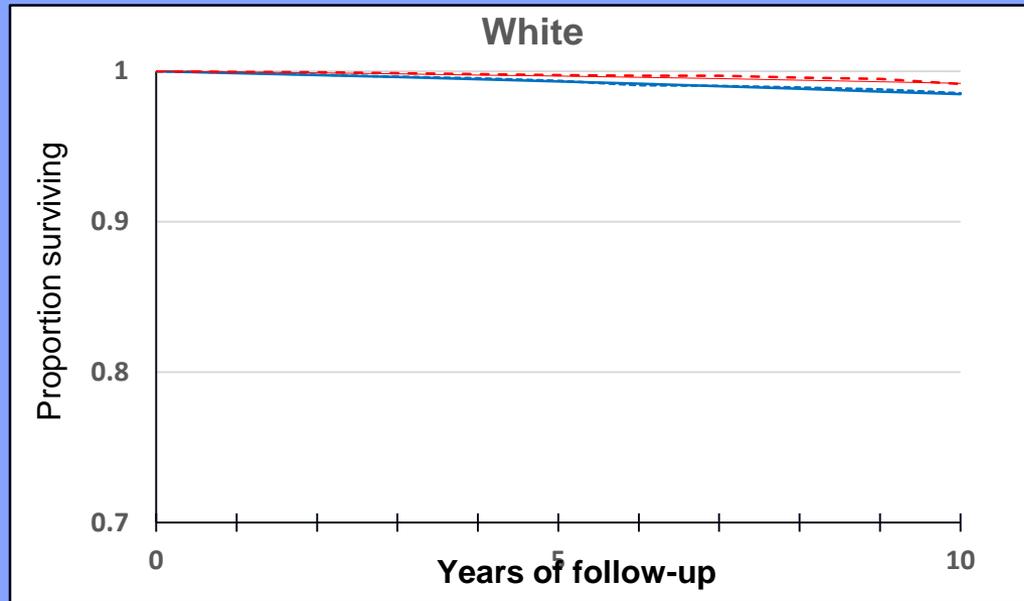
White



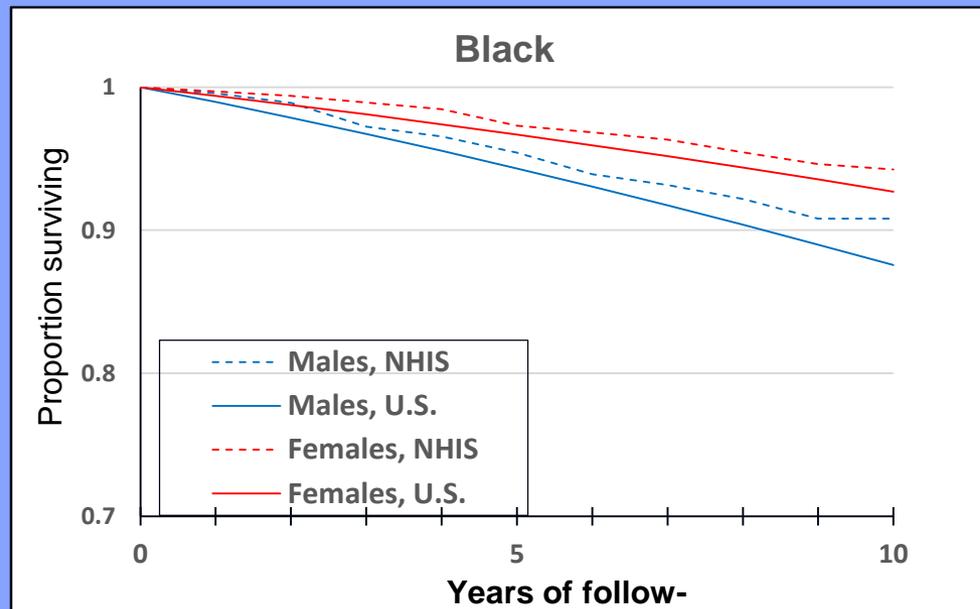
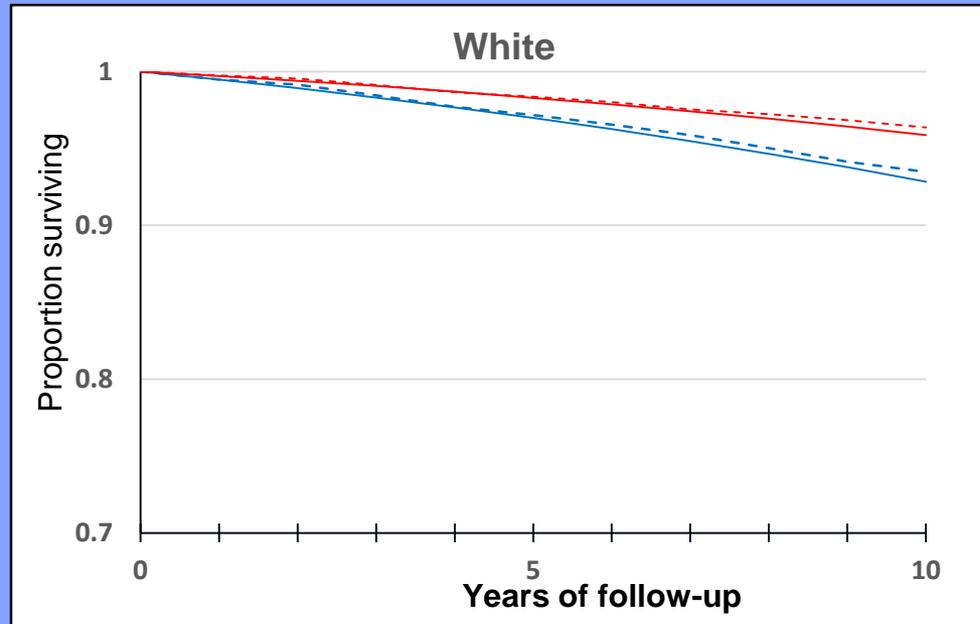
Black



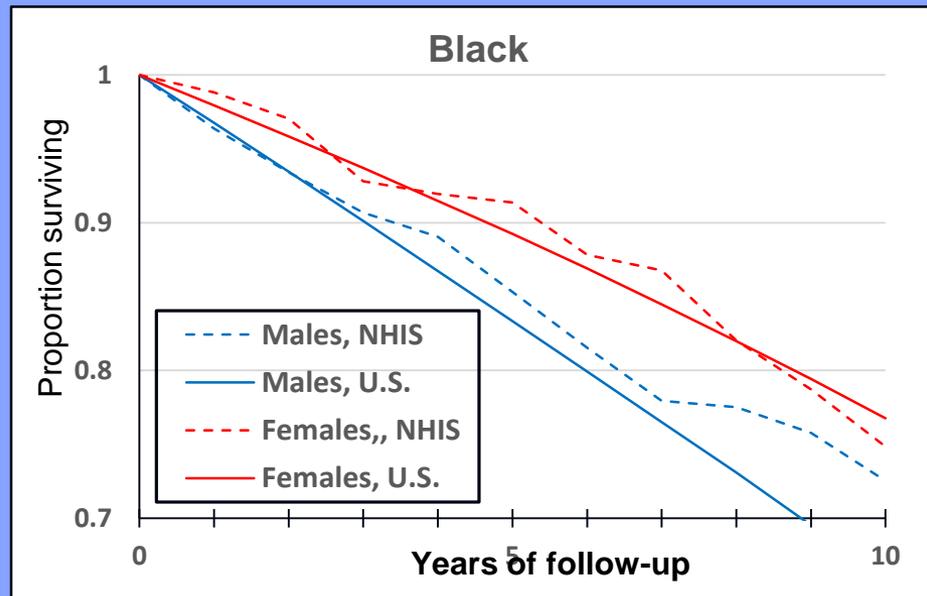
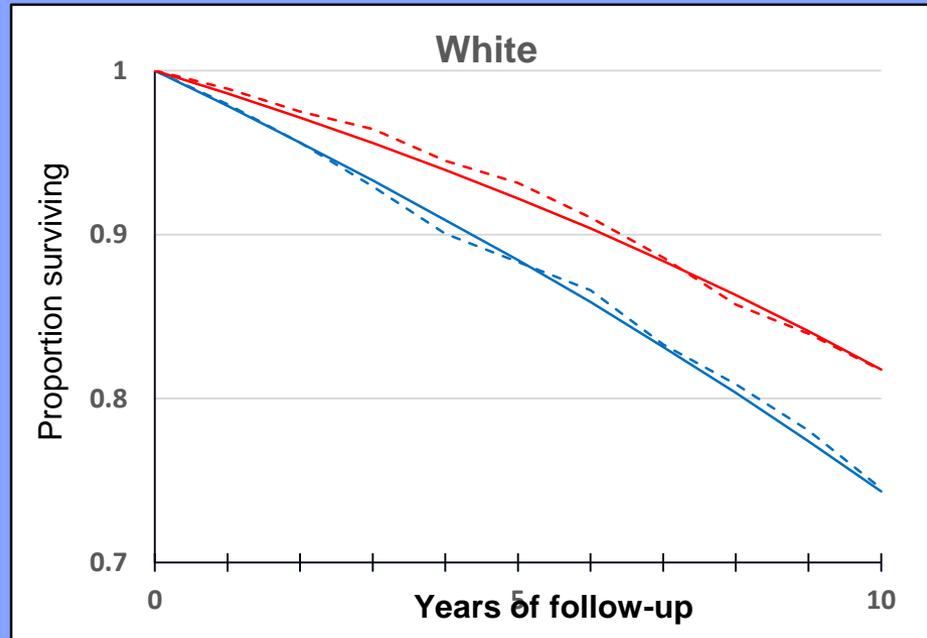
2002 NHIS Cohort Survival: 25-34 years



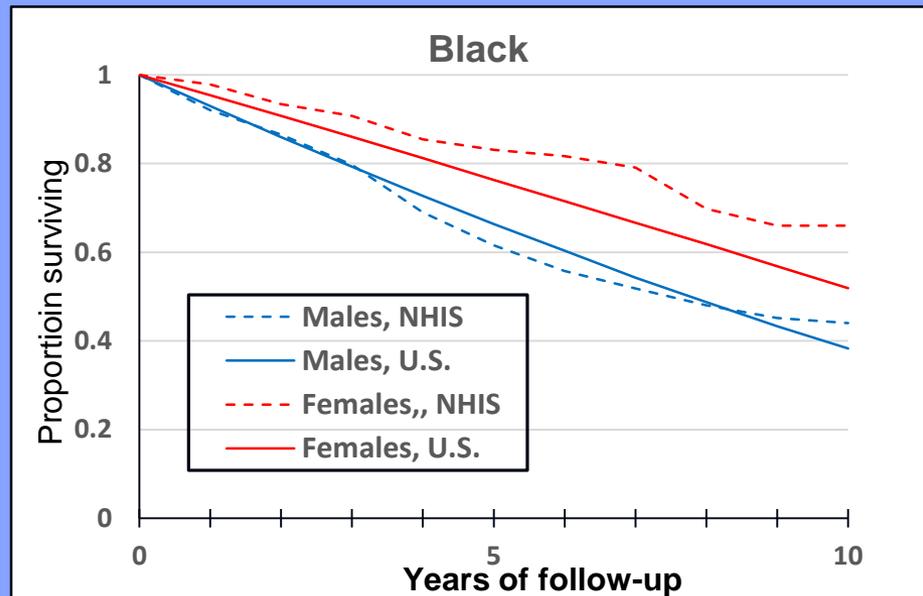
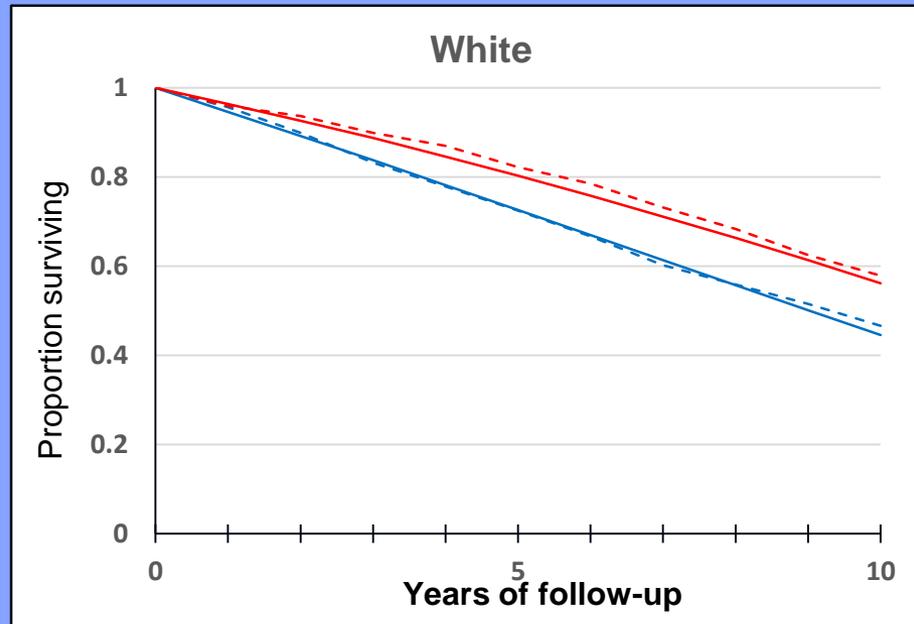
2002 NHIS Cohort Survival: 45-54 years



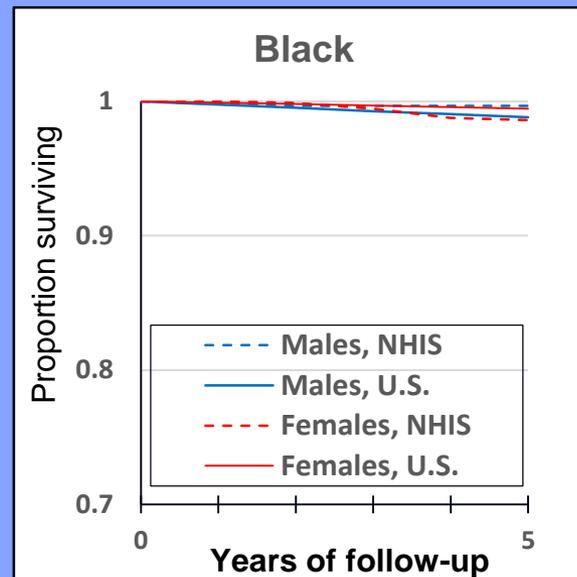
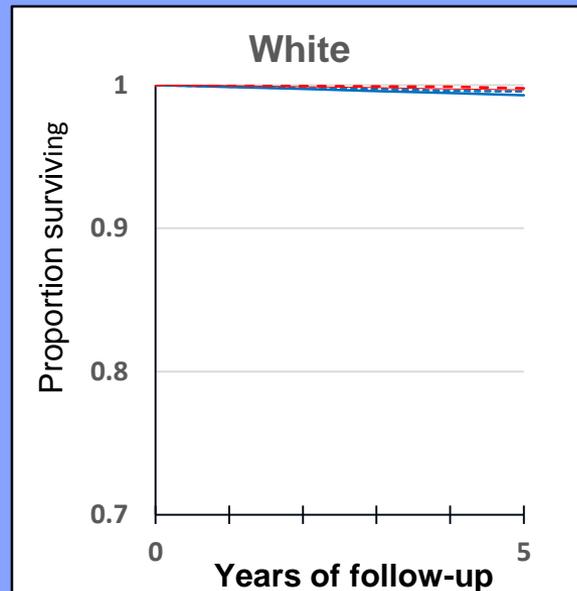
2002 NHIS Cohort Survival: 65-69 years



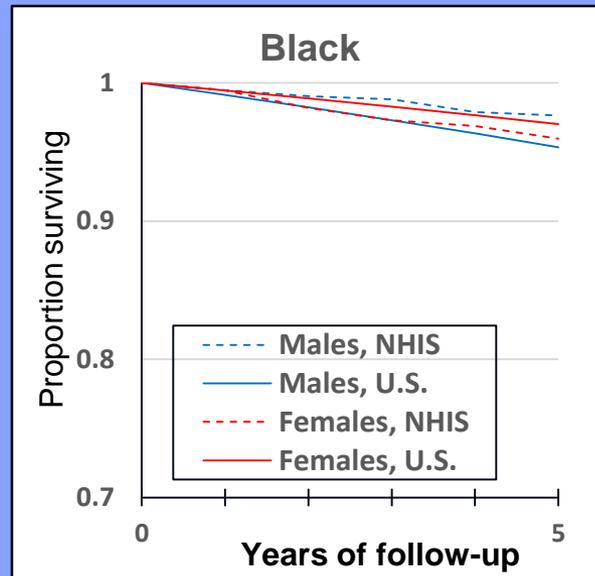
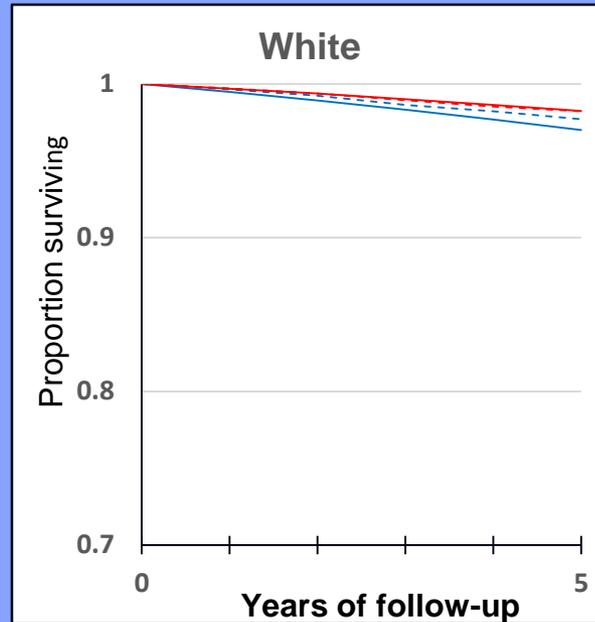
2002 NHIS Cohort Survival: 75-79 years



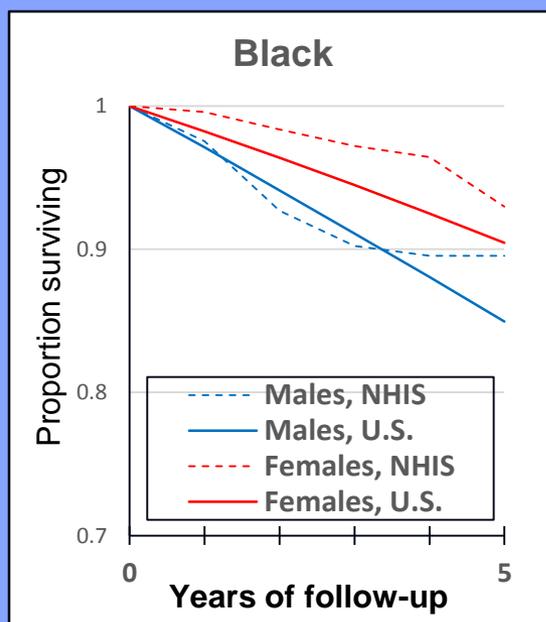
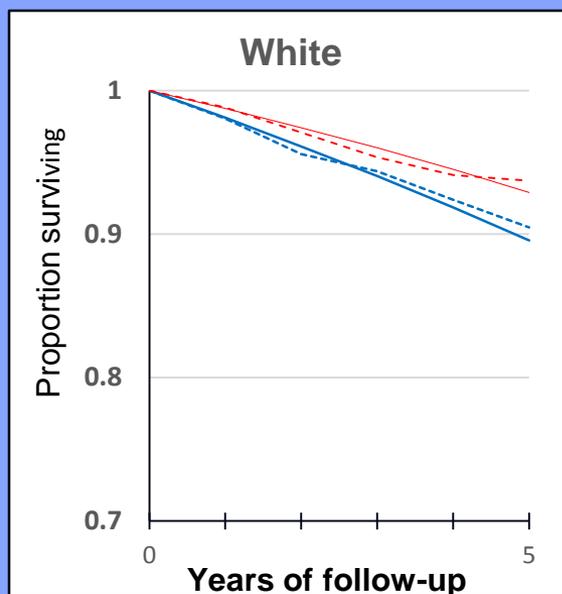
2007 NHIS Cohort Survival: 25-34 years



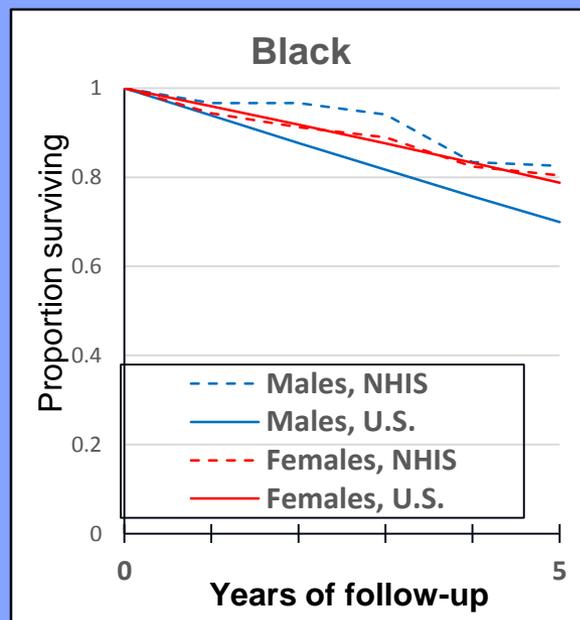
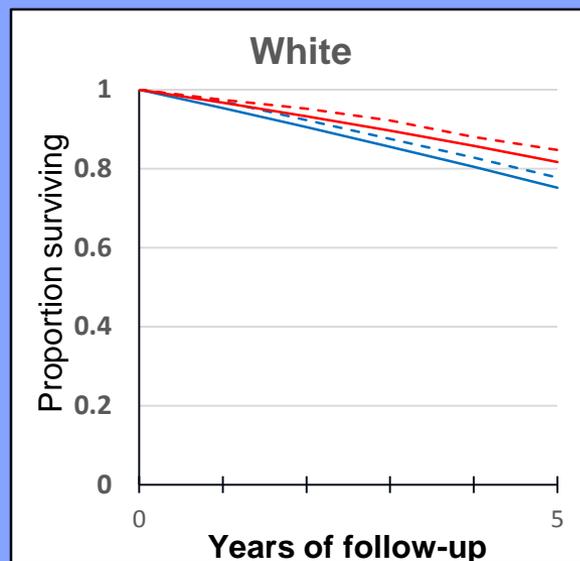
2007 NHIS Cohort Survival: 45-54 years



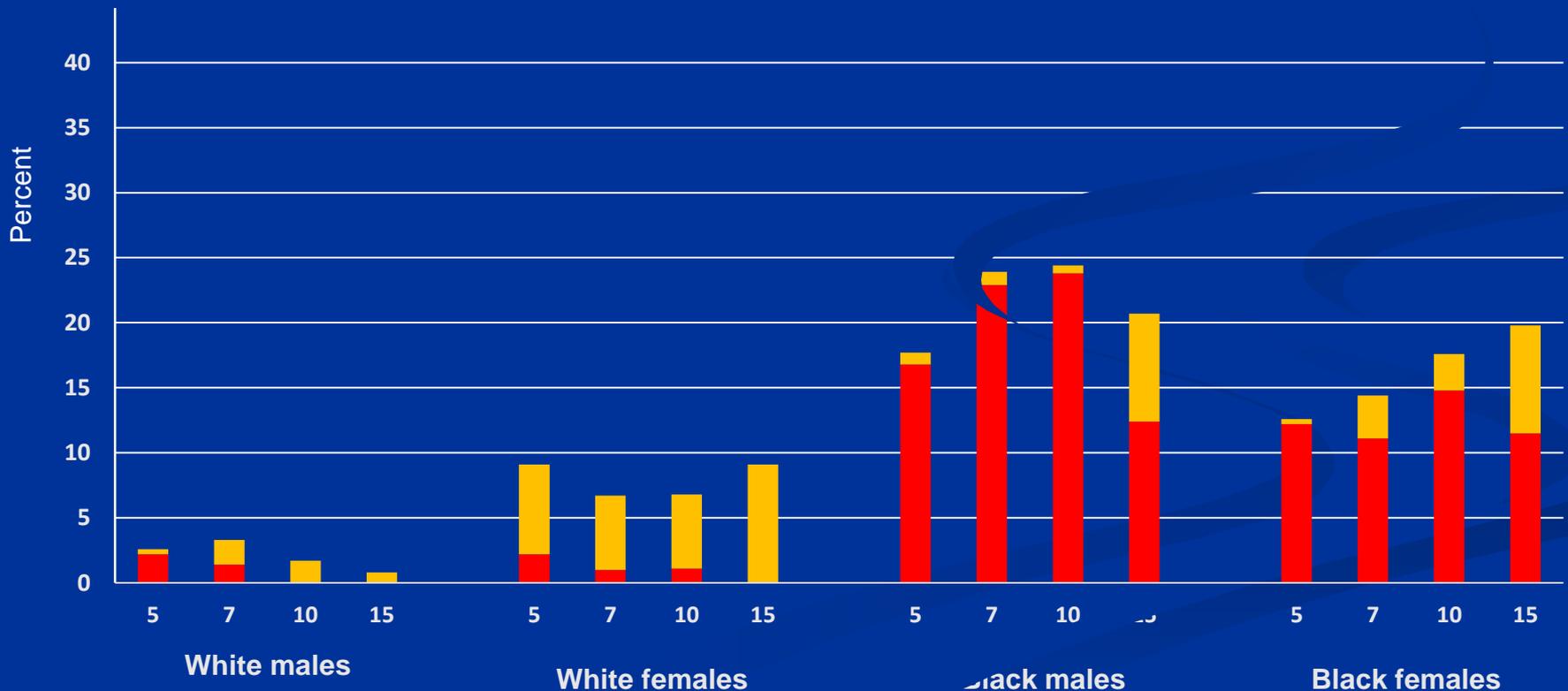
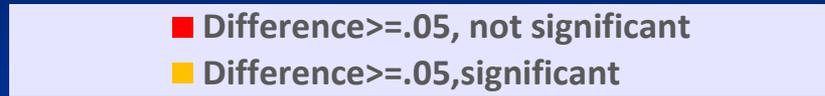
2007 NHIS Cohort Survival: 65-69 years



2007 NHIS Cohort Survival: 75-79 years



Difference between NHIS and U.S. survival ≥ 5 percentage points, by years of follow-up



Preliminary Results

- Differences between NHIS and U.S. survival usually not statistically significant.
- Differences by race-sex:
 - Black males have more NHIS-U.S. differences of 5 percentage points or more than other groups.
 - Black males and black females have more differences of 5 percentage points or more than white males and females.
 - For black persons, most differences of 5 percent or more are not statistically significant.
 - For white persons, most differences of this size are statistically significant.

Preliminary Conclusions

- Preliminary results indicate that there do not appear to be any serious biases in the ascertainment of vital stats in the NHIS linked mortality files.
 - For most of the age-race-sex subgroups examined so far, the NHIS and U.S. survival curves were similar.
 - Absolute differences between NHIS and U.S. survival curves larger for black males and females than for white males and females, but tend not to be statistically significant due to larger standard errors around estimates.

Next Steps

- More comprehensive comparison of NHIS and U.S. survival curves.
- Comparison of cause-of-death distribution of NHIS cohorts and that of the U.S. resident population.
- Expansion of analysis to Hispanic respondents.

More information

- NCHS data linkage activities:
http://www.cdc.gov/nchs/data_access/data_linkage_activities.htm
- Ingram DD, Lochner KA, Cox CS. Mortality experience of the 1986-2000 National Health Interview Survey Linked Mortality Files participants. National Center for Health Statistics. Vital Health Stat 2(147). 2008. Available from:
http://www.cdc.gov/nchs/data/series/sr_02/sr02_147.pdf