1.a. Full Title:

Incident Disease Survival and Potential Years of Life Lost: The ARIC Cohort (1987-2006)

b. Abbreviated Title (Length 26 characters):

Incident disease survival

2. Writing Group:

Writing group members:

Kathryn Rose, Anna Kucharska-Newton, Chirayath Suchindran, Wayne Rosamond, Aaron Folsom, others welcome

I, the first author, confirm that all the coauthors have given their approval for this manuscript proposal. _RF _ [please confirm with your initials electronically or in writing]

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3. **Timeline:**

Analyses to begin in Winter 2010. An abstract will be prepared for the January 5 deadline of the 2011 Society for Epidemiologic Research meeting. A manuscript draft is expected during Summer 2011.

4. **Rationale:**

Heart disease, cancer and stroke consistently rank high on lists of major causes of death\(^1\). These conditions also contribute to a large number of years of potential life lost (YPLL)\(^2\).

A report of the state of disparities in cardiovascular health in the United States (US) suggests that mortality from cardiovascular disease (CVD) is highest in blacks, and that reductions in mortality disparities in CVD are occurring by gender, but not by race\(^3\). Meanwhile, data from the National Center for Health Statistics (1961-1999) show an increase in mortality inequality across the US by both gender and geographic area\(^4\), and data from a New York City investigation indicate that a reduction seen in all-cause mortality (1990-2000) was lower for women compared to men, among both whites and blacks\(^5\).

Overall, cancer mortality is higher among men than women, and among blacks than whites\(^6\). There appear to be widening differentials in mortality and life expectancy by education, especially for heart disease and cancer\(^7\). Specifically, over the years 1981 to 2000, improvements in mortality and life expectancy for these conditions were seen among those with a high versus low education\(^7\), and similar results were found by Jemal et al. across the US within all race/gender groups\(^8\). It has also been demonstrated that obesity and smoking remain potent predictors of life expectancy\(^9\).

Existing studies have reported mortality rates in populations based upon cause of death data ascertained from death certificates. We propose to investigate the burden of mortality in terms of the time from incident disease diagnosis to death. These data provide an opportunity to assess the survival experience of the ARIC cohort over 20 years of follow-up for different types of incident disease. While there are likely not enough data to support an analysis of mortality trends over the time period 1987-2006, we wish to describe and compare the median survival and YPLL following incident disease diagnosis along with predictors of survival for each type of incident disease. We will determine if there are differences in survival within each incident disease diagnosis by selected demographic, socioeconomic, medical history/clinical and health behavior variables.

5. **Main Hypothesis/Study Questions:**

1. Describe and compare the median survival and years of potential life lost (YPLL)
related to distinct incident disease diagnoses [all coronary heart disease (CHD),
myocardial infarction (MI), heart failure (HF), stroke, all cancer, lung cancer] in the
   a. Determine if there are differences in survival within each incident disease
diagnosis by selected demographic, socioeconomic, medical history/clinical
and health behavior variables.

2. Identify predictors of survival for each type of incident disease.
   a. Examine potential differences by selected demographic, socioeconomic,
medical history/clinical and health behavior variables.

6. Data (variables, time window, source, inclusions/exclusions):

ARIC cohort data will be analyzed over the time period baseline-2006.

Time to death (all-cause mortality) following incident disease diagnosis [all coronary
heart disease (CHD), myocardial infarction (MI), heart failure (HF), stroke, all cancer, as
well as lung, breast, colon and prostate cancers] will be measured by the product-limit
(Kaplan-Meier) method. Survival curves will be produced from the model, and the
proportional hazards assumption will be assessed. Differences in survival curves will be
examined using the log rank test for selected demographic, socioeconomic, medical
history/clinical and health behavior variables. Multivariable Cox proportional hazard
models, unadjusted and adjusted, will evaluate predictors of survival for each type of
incident disease.

Covariates of interest for the survival analyses include age, race, study community,
gender, educational attainment, neighborhood (census tract-level) median household
income, marital status, self-rated health, smoking, body mass index, hypertension, and
diabetes.

A period contrast will be done if the number of events allow for stable estimates.

It is hypothesized that survival differences will exist between groups, such as that of
race/gender or educational attainment. If such survival differences are found, years of
potential life lost (YPLL) will be estimated for each group, using 75 years of age as the
referent. However, if necessary, race- and/or gender- specific estimates of life
expectancy may be used.

7.a. Will the data be used for non-CVD analysis in this manuscript?
   __x__ Yes   ____ No

   b. If Yes, is the author aware that the file ICTDER02 must be used to exclude
      persons with a value RES_OTH = “CVD Research” for non-DNA analysis, and
      for DNA analysis RES_DNA = “CVD Research” would be used?
Cancer data (diagnosis date) will be used for this research.

(This file ICTDER02 has been distributed to ARIC PIs, and contains the responses to consent updates related to stored sample use for research.)

8.a. Will the DNA data be used in this manuscript? ____ Yes  ____ No

8.b. If yes, is the author aware that either DNA data distributed by the Coordinating Center must be used, or the file ICTDER02 must be used to exclude those with value RES_DNA = “No use/storage DNA”? ____ Yes  ____ No

9. The lead author of this manuscript proposal has reviewed the list of existing ARIC Study manuscript proposals and has found no overlap between this proposal and previously approved manuscript proposals either published or still in active status. ARIC Investigators have access to the publications lists under the Study Members Area of the web site at: http://www.cscc.unc.edu/ARIC/search.php

10. What are the most related manuscript proposals in ARIC (authors are encouraged to contact lead authors of these proposals for comments on the new proposal or collaboration)?
MS# 126 (Folsom) MI survival
MS# 378 (Suchindran) CHD mortality and race differences in person years of life between ages 35-75
MS# 691 (Mosley) The moderating effects of social support on the association between negative emotions and CHD events, carotid arterial wall thickness, and mortality
MS# 927 (Rosamond) Heart failure incidence and survival: 13 year follow up of the ARIC cohort
MS# 1111 (Coady) Prognosis after MI and stroke prognosis

11. a. Is this manuscript proposal associated with any ARIC ancillary studies or use any ancillary study data? _____ Yes  ____ No

11.b. If yes, is the proposal

____ A. primarily the result of an ancillary study
____ B. primarily based on ARIC data with ancillary data playing a minor role (usually control variables; list number(s)*)

*ancillary studies are listed by number at http://www.cscc.unc.edu/aric/forms/

12. Manuscript preparation is expected to be completed in one to three years. If a
manuscript is not submitted for ARIC review at the end of the 3-years from the
date of the approval, the manuscript proposal will expire.

References

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2. Rosenberg DC, Buescher PA. Years of potential life lost by sex, race, and ethnicity:
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4. Ezzati M, Friedman AB, Kulkarni SC, Murray CJL. The Reversal of Fortunes: Trends
in County Mortality and Cross-County Mortality Disparities in the United States.
5. Freeman K, Zonszein J, Islam N, Blank A, Strelnick A. Mortality Trends and
Disparities Among Racial/Ethnic and Sex Subgroups in New York City, 1990 to
108.
7. Meara ER, Richards S, Cutler DM. The Gap Gets Bigger: Changes In Mortality And
8. Jemal A, Ward E, Anderson RN, Murray T, Thun MJ. Widening of Socioeconomic
9. Stewart ST, Cutler DM, Rosen AB. Forecasting the Effects of Obesity and Smoking