ARIC Manuscript Proposal # 1386

1.a. Full Title: Marital status, coronary heart disease and diabetes among African-Americans: Incidence and Prevalence among participants in the Atherosclerosis Risk In Communities (ARIC) Study

b. Abbreviated Title (Length 26 characters): Marital Status, CHD and Diabetes

2. Writing Group:
   Writing group members: Michelle Hindin, PhD
   Hilary Schwandt, MHS (doctoral student at Hopkins)
   Josef Coresh, MD PhD
   Others welcome (We plan to add Sharon Wyatt from Jackson).

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

First author: Michelle Hindin
Address: Johns Hopkins Bloomberg School of Public Health
Department of Population, Family and Reproductive Health

Phone: 410-502-6038    Fax: 410-955-2303
E-mail: mhindin@jhsph.edu

ARIC author to be contacted if there are questions about the manuscript and the first author does not respond or cannot be located (this must be an ARIC investigator).
Name: Josef Coresh
Address: Johns Hopkins Bloomberg School of Public Health
Department of Epidemiology
Phone: 410-955-0495    Fax:
E-mail: coresh@jhu.edu

3. Timeline: We have a deadline from Mathematica to complete the manuscript by September 30th 2008.

4. Rationale: In general, marriage is thought to be protective against mortality and protective against adverse health outcomes including cardiovascular disease. There are thought to
be two causal pathways for the differences between married and unmarried individuals. First, it is thought that healthier people both get married and remain married longer. The second is that marriage confers positive health through social support, reducing stress, and promoting more healthful behaviors. In addition to the comparisons made between married and unmarried individuals, there is also evidence of a gender interaction between marriage and health outcomes. For men, marriage is often found to be a protective factor against poorer health outcomes and the assumed pathway to better health outcomes is through social support mechanisms. In contrast, marriage is often viewed as a factor leading to poorer health outcomes in women, and the mechanism is thought to be through the stress of multiple roles that women often occupy. In addition, recent evidence suggests that losing a spouse has differential impacts on men’s and women’s cardiovascular health in older ages. Without longitudinal data and without being able to control for potential confounders, selection into marriage, potential gender differences, and the temporal relationships are impossible to sort out. Overall, these issues have been studied less often in the African American community.

5. Main Hypothesis/Study Questions:

1) Among African-American men and women, is marital status associated with hypertension and diabetes?
   a. Married African American men and women will have lower prevalence of hypertension and diabetes and other major cardiovascular risk factors than unmarried African American men and women.

2) Over time, does marriage protect African-Americans from incidence of diabetes and coronary heart disease? Is the protection the same for men and women?
   a. As compared to never married, divorced and widowed African American individuals, African American married men and women will have lower incidence of diabetes and CHD.

3) How do cardiovascular risk factors and risk of coronary heart disease and diabetes correlate within African-American couples?

6. Design and analysis (study design, inclusion/exclusion, outcome and other variables of interest with specific reference to the time of their collection, summary of data analysis, and any anticipated methodologic limitations or challenges if present).

We will use secondary data primarily from the Jackson Mississippi site to look at marital status in the initial visit predicting cardiovascular disease, obesity, and diabetes using exercise and diet information as a potential mediators. We would also like to use the data that includes matched partners when available.

Study population: All ARIC African-American participants.

Cross-sectional analysis: Prevalence of diabetes, hypertension and coronary heart disease will be analyzed using logistic regression. Marital status was collected at visit 2 as well as in the initial ARIC screening. The latter data are being cleaned now and also
include the spouse pairs in ARIC. If available, the goal is to use baseline marital status as the key exposure. At visit 2 the marital status was collected as well. At visit 2, the distribution among African-Americans was: 438 Divorced, 1958 Married, 108 Never married, 279 Single and 467 Widowed.

Associations will be examined first adjusted for demographics, i.e. age and sex. They will then be adjusted for relevant health behaviors and other cardiovascular risk factors.

**Prospective analysis:** Risk of coronary heart disease and diabetes will be analyzed using Cox proportional hazards regression. We recognize diabetes definition based on fasting glucose is only available on study visits which makes the times of onset more discrete but this has been dealt with in previous ARIC analyses. Marital status will be the key predictor and analysis will be adjusted for:

A. Demographics (age, sex).
B. Major cardiovascular risk factors (smoking, hypertension, LDL and HDL cholesterol, and diabetes)
C. Health behaviors (smoking, physical activity, diet and alcohol consumption)
D. Other relevant risk factors (obesity and fasting glucose, socioeconomic status).

All models will also be stratified by gender since it is hypothesized that marriage will be more protective for men than for women. We recognize that the power for detecting interactions could be limited for some outcomes. We will also incidence of hypertension where the power should be higher.

**Correlation within couples:** Data from the ARIC screening visit prior to baseline should allow for identification of spouse pairs. These data should be available soon and will be examined for limitations since this is their first use. Within spouse pairs we will examine the correlation in cardiovascular risk factors. For continuous variables this will be done using linear regression. For cross-sectional categorical variables we will use conditional logistic regression. For prospective analysis our primary analysis will be gender specific and use the other spouses cardiovascular risk factors as time dependent covariates. For example, in an analysis of CHD risk among men, we will use the wife’s CHD status as a time dependent covariate to see the relative hazard of the husband developing CHD associated with the wife having diabetes or not. Other risk factors including diabetes, obesity and physical activity can be handled similarly. We recognize as a limitation that for measures assessed at the same visit for the spouse pair the time order between the spouse pairs is unclear (for example if both have diabetes detected at visit 4). Despite this limitation the ARIC study will be one of the largest prospective assessments of spouse pairs with measured cardiovascular risk factors over time.

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

b. If Yes, is the author aware that the file ICTDER03 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?  ____ Yes  ____ No
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 ICTDER03 must be used to exclude those with value RES_DNA = “No use/storage DNA”?
   ____ Yes  ____ No

8.c. If yes, is the author aware that the participants with RES_DNA = ‘not for profit’ restriction must be excluded if the data are used by a for profit group?
   ____ 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
   ____x_  Yes       ____ No

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)?

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

11.b. If yes, is the proposal
   ____x_ A. primarily the result of an ancillary study (list number* 2008.07)
   ___   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.