

## ARIC Manuscript Proposal #1895

PC Reviewed: 2/14/12  
SC Reviewed: \_\_\_\_\_

Status: A  
Status: \_\_\_\_\_

Priority: 2  
Priority: \_\_\_\_\_

**1.a. Full Title:** Concordance of longitudinal smoking status in spouse pairs in the Atherosclerosis Risk in the Communities Study (ARIC)

**b. Abbreviated Title (Length 26 characters):** Smoking status in spouse pairs

### 2. Writing Group:

Writing group members: Laura Cobb, Mara McAdams DeMarco, Rachel Huxley, Mark Woodward, Josef Coresh, and Cheryl Anderson. Others welcome.

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

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**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).

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**3. Timeline:** Data analysis to start after approval of this manuscript proposal, first draft available by April, 2012

**4. Rationale:** Previous studies have found that married couples share cardiovascular risk factors, which suggests there is an environmental component to the risk of cardiovascular disease (Castelnuovo, 2008). The previous studies of American spouse pairs have utilized cross-sectional data (Venters, 1984; Brenn, 1997; Kuo, 2007; Sutton; 1980). However, longitudinal data of cardiovascular risk factors may be the more appropriate to assess the concordance of risk factors such as smoking status. One cross sectional study (Venters, 1984) found that smoking patterns were significantly concordant for married pairs. One meta-analysis of spouse pairs reported that the overall correlation coefficient for smoking was 0.23 and the odds ratio for concordance in smoking was 3.25 (95% CI: 2.94, 3.59). However, these studies were cross-sectional in design (Castelnuovo, 2008). No studies have evaluated the longitudinal smoking status in spouse pairs. None have evaluated the probability of quitting smoking based on the spouses smoking status.

The Atherosclerosis Risk in the Communities Study (ARIC) presents a unique opportunity to investigate longitudinal smoking behaviors between spouse pairs. ARIC has over 4,500 couples enrolled in the study and data relating to various measures of smoking status including the number of cigarettes smoked, age of smoking initiation and age of smoking cessation. These data will allow us to obtain an estimate of the risk of smoking based on the smoking status of the spouse as well as an estimation of the 9-year probability of quitting smoking among spouses who smoke. As ARIC contains both African-American and White race couples we will also be able to determine whether smoking patterns among spouses differ by race.

**These results will have important implications for directing smoking cessation interventions specifically to couples rather than individuals.**

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

*Primary study questions:*

Is smoking status correlated among middle-aged spouse pairs?

Is one spouses smoking status associated with the other spouse quitting smoking?

Does having a spouse who smokes an impediment to quitting smoking?

*Secondary study questions:*

Are the ages at smoking initiation correlated for spouse pairs?

Are the number of cigarettes smoked correlated for spouse pairs?

**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).**

*Population:* All married couples that were identified in ARIC through the Household Enumeration Form. Both members of the spouse pairs must be ARIC participants. We will define couples by any of the five rules that are included in the ARIC Memorandum on Spouse Pairs (September 12, 2008). The pairing is based on the ARIC household enumeration conducted prior to the first visit. Briefly, marital status and pairing will be established at Visit 1 when interviewers asked participants about their current marital status. Respondent options included married, never married, divorced, separated, and widowed. For Visit 2 (1990-1992) the same current marital status question was asked of participants. Marital status was not asked in Visit 3 or 4. After visit 2 we will be able to update status for deaths (widowhood). Currently, the analysis is limited by not having updated marital status after visit 2. We will only study spouse pairs who are both enrolled in ARIC.

| *Study design:* Longitudinal cohort

*Exposure:*

Study participants will be grouped as ‘current’ smokers if they reported smoking at study baseline, ‘former’ smoker if they reported having quit and ‘never’ smoker if they reported having never smoked at baseline. For current and former smokers the number of cigarettes smoked per day (CPD) will be classified into three approximately equal sized groups: <15, 15-24, and > 25 CPD. Information on age of initiation of smoking and age at quitting will also be obtained. However, these variables were only collected in a continuous form at baseline. Pack-years of smoking will be calculated by calculating the average number of cigarettes smoked per day multiplied by the years of smoking divided by 20. The number of years since quitting before baseline will be obtained by subtracting the age at quitting from baseline age.

*Exclusions*

- ethnicity other than Black or White
- missing data on smoking status at any of the four study visits
- missing data for one spouse on smoking behavior
- spouse not an ARIC participant
- Participants who are divorced or separated at baseline

*Data analysis:*

The main factors we will assess concordance between spouse pairs are 1) smoking status, 2) age of smoking initiation, 3) age at smoking cessation and 4) number of cigarettes smoked. First, we will look at the unadjusted Spearman or Pearson correlation, based on the normality distribution of the variables.

Additionally, we will identify husbands and wives who quit smoking both at baseline and over 9 years of follow-up. We will use a generalized estimating equation to estimate the odds of one spouse quitting smoking based on the other spouses smoking status (time-varying). Additionally, we will account for age, race, smoking, alcohol intake, education, time-varying hypertension, number of cigarettes smoked and duration of smoking (ie pack years) CVD and other health conditions. We will consider any participant who reported being a former smoker as having quit smoking. However, we will check to see how many spouses restart smoking after quitting.

*Limitations:*

The unit of analysis is the couple. Therefore, missing data for one member of the spouse pair will negate the entire couple from the analysis. Additionally, we will need to update the marital status on the couples over follow-up.

**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

(This file ICTDER03 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 ICTDER03 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.csc.unc.edu/ARIC/search.php>**  
 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)?**

No studies have utilized the spouse pair data. However, one manuscript have evaluated:

