

# ARIC MANUSCRIPT PROPOSAL FORM

Manuscript #611

## 1. Title: ARIC CHD Risk Prediction

Abbreviated Title (Length 26): CHD Risk Prediction

## 2. Writing Group (list individual with lead responsibility first):

Lead: Chambless, LE

Address: Collaborative Studies Coordinating Center

Biostatistics Department

University of North Carolina

NationsBank Plaza, CB #8030

137 E. Franklin Street, Suite 203

Chapel Hill, NC 27514

Phone: 919-962-3264; Fax: 919-962-3265

Email: [ucclec@mail.csc.unc.edu](mailto:ucclec@mail.csc.unc.edu)

Members of Writing group: Folsom, AR      Sharrett, R  
                                 Tyroler, H      Szklo, M  
                                 Jones, D      Heiss, G      Couper, D

## 3. Timeline:

Analysis will begin now, focusing first on what is needed for the NHLBI workshop in January, 1999. Submit paper by October, 1999.

## 4. Rationale:

ARIC has confirmed the independent associations of incident CHD with standard risk factors (e.g., those used in the recently published Framingham CHD prediction model), and with more recently established risk factors such as fibrinogen and Lp(a), and with indices of subclinical disease, such as intima-media wall thickness of the carotid arteries (IMT) and ankle/brachial blood pressure ratio (ABI), and with indices of socioeconomic status (SES). Now that ARIC has up to 11 years follow-up on 14,xxx persons free of CHD at baseline, with over 6XX incident CHD events, the study has a unique opportunity to address the ability of these factors collectively to predict 10 year CHD risk (in whites and blacks, men and women). The predictability of this set of factors can be compared to predictability using the standard risk factors alone or using a Framingham score function derived either directly from Framingham regression coefficients or from Framingham's simplified score sheet.

There is some potential overlap with ARIC MS524. This previously approved manuscript will focus on the standard risk factors alone (plus LVH by ECG and total/HDL cholesterol ratio) and will simply compare actual CHD incidence with that predicted by a Framingham risk score using the same risk factors, using several alternative definitions of CHD. MS524 was approved before the appearance of the new Framingham risk function paper (Wilson et al), so now may wish to consider also the newer risk function. This new proposal will focus on only one definition of CHD (excluding Rose angina, but still open as to whether coronary revascularization and silent MI should be included). It is primarily interested in the predictability of various sets of risk factors and models using ARIC data, one of which could utilize a Framingham risk function.

There is also some potential overlap with publications to result from the NHLBI CHD Risk Prediction Workshop, but these publications would summarize findings from many studies.

There is some potential overlap with MS385 (SES and incident CHD), but that paper should be finished first.

#### 5. Main Hypotheses/Questions:

ROC curves or other methods would be used to compare a set of 10 year CHD risk prediction models (Cox proportional hazard or parametric models) to assess whether more complex models, as specified below, significantly improve predictive ability. All models would include the risk factors smoking, LDL or total cholesterol, HDL cholesterol, blood pressure or hypertension status, and age, and all would be sex specific and would adjust for race or be race-specific. The following alternatives will be considered:

- (a) A categorical approach using established cutpoints, as in the Wilson paper
- (b) An approach using established risk functions from the Wilson paper
- (c) A continuous variable approach with only linear terms
- (d) A continuous approach allowing non-linearity, probably through cubic splining
- (e) Selected interactions included, certainly age with other factors, total or LDL cholesterol with HDL cholesterol
- (f) Additional risk factors (fibrinogen, Lp(a), triglycerides, apo-lipoproteins) added
- (g) Additional risk factors plus their interactions with standard risk factors
- (h) Indices of subclinical disease (ABI, IMT) added
- (i) Indices of subclinical disease plus their interactions with standard risk factors added
- (j) SES (education and income) added
- (k) SES and interactions with standard risk factors added

#### 6. Data:

Baseline risk factors only, as described above, incident CHD through 1996 (starting with 1995 data, for the Workshop).