1.a. **Full Title**: Changing in alcohol consumption pattern and risk of incident CHD

b. **Abbreviated Title (Length 26 characters)**: Changing in drinking and incident CHD

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

   **Lead:** Flávio Danni Fuchs

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   Writing group members: Lloyd Chambless, Marsha Eingenbrodt

3. **Timeline**: Analysis can begin soon

4. **Rationale:**

   - The ARIC Ms ARIC MS # 449 “The association between alcoholic beverage consumption and incidence of coronary heart disease in whites and blacks” (Am J Epidemiol. 2004 Sep 1;160(5):466-74), showed a remarkable absence of association
between alcohol consumption (visit one) and the incidence of CHD (opposite associations in whites and blacks, and protection in rare drinkers. Despite this, the idea that alcohol is protective has been repetitively announced (see for instance Malinski MK, et al. Arch Intern Med. 2004 Mar 22; 164(6):623-8.) It has been shown that increasing the amount of alcohol consumption is associated with a decreasing risk of heart failure among older persons (Abramson JL, et al. JAMA. 2001; 285:1971-7). In the ARIC cohort persons who stopped drinking, started drinking, and those who continued to abstain all had similar odds of a health decline in comparison with those with a stable pattern of alcohol consumption (MS Marsha Eingbrodt, submitted). Would the variation in the pattern of alcohol consumption between visit one and two be associated with incident coronary heart disease? This topic has been explored in different cohorts. It is particularly important to support the recommendations for starting or stopping drinking in individuals at higher risk of developing coronary heart disease. Two recent reports on the subject: Wellmann J, Heidrich J, Berger K, Doring A, Heuschmann PU, Keil U. Changes in alcohol intake and risk of coronary heart disease and all-cause mortality in the MONICA/KORA-Augsburg cohort 1987-97. Eur J Cardiovasc Prev Rehabil 2004 Feb;11:48-55. Gronbaek M, Johansen D, Becker U, Hein HO, Schnohr P, Jensen G, Vestbo J, Sorensen TI. Changes in alcohol intake and mortality: a longitudinal population-based study. Epidemiology. 2004 Mar;15(2):222-8.

5. Main Hypothesis/Study Questions:

Hypothesis: Stable patterns of alcohol consumption are associated with lower incidence of CHD in whites and with a higher incidence in blacks.

For this and other definitions of stable patterns of alcohol consumption we will at first use the following categories: stopped drinking, started drinking, continued to abstain; continued to drink. In addition, we will explore the effect of the amount of ethanol change. For the categorical part, "stopped drinking" could be from previous relatively higher or lower levels. For example, former drinkers of one drink per week who quit may have a different effect of cardiovascular health, and a different reason for quitting, than former drinkers of 2 drinks per day. Similarly, "started drinking" could be broken into 2 levels, by their current visit 2 amounts. "Continued
Abstainers” needs no further breakdown. “Continued drinkers” could use 4 groups, H->H, H->L, L->L, L->H. That would give us 9 categories, with maybe the Continued Abstainers as reference group. The final strategy will depend on the results of bivariate exploratory analysis.

Adjustment for confounding is critical for interpretation of the study. To account for reasons for change in alcohol consumption, particularly poor health, we will adjust for perceived health change between visits 1 and 2 (decline, improved, unaltered). We will also consider vital exhaustion from the Maastricht questionnaire.

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

Sample: participants without CHD in visit one and two

Dependent variable: Incident CHD

Explanatory variables: Pattern of alcohol consumption between visit one and two: stable, started, stopped, increased, decreased, also broken down by level of alcohol consumption at baseline.

Control variables: age, gender, race, education, center, smoking status, diabetes status, physical activity, HDL, LDL, total cholesterol; body mass index, mean systolic and diastolic blood pressure, individual standing blood pressures, perceived health change between Visit 1 and Visit 2, antihypertensive medication use, coronary heart disease, atrial fibrillation/flutter by ECG at baseline, use of medication for congestive heart failure or arrhythmias at baseline, and vital exhaustion (from the Maastricht questionnaire at Visit 2).
The number of participants in categories of change of alcohol consumption are shown below, where Lighter drinker is at least 15 and less than 70 g/wk ethanol, and Regular Drinker is >= 70, and non-drinker includes < 15g/wk. These are not necessarily the final categories to be used, and sex-specific categories might be used, but the table does show that most of the change categories will provide sufficient sample size to make the analysis worthwhile, since there will be over 1300 CHD events. (This is, of course, not a claim for high power.) We will explore other breakdowns into change in alcohol consumption, including categorizing the amount of change. We do understand that power might be low, and in case of negative findings we would explain this in the manuscript. On the other hand, the data is already available, so low power does not seem to be a strong reason not to do the analysis.

<table>
<thead>
<tr>
<th>Alcohol change category</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-drinker $\rightarrow$ non-drinker</td>
<td>7968</td>
</tr>
<tr>
<td>Non-drinker $\rightarrow$ lighter drinker</td>
<td>336</td>
</tr>
<tr>
<td>Non-drinker $\rightarrow$ regular drinker</td>
<td>93</td>
</tr>
<tr>
<td>Lighter drinker $\rightarrow$ non-drinker</td>
<td>819</td>
</tr>
<tr>
<td>Lighter drinker $\rightarrow$ lighter drinker</td>
<td>1066</td>
</tr>
<tr>
<td>Lighter drinker $\rightarrow$ regular drinker</td>
<td>287</td>
</tr>
<tr>
<td>Regular drinker $\rightarrow$ non-drinker</td>
<td>246</td>
</tr>
<tr>
<td>Regular drinker $\rightarrow$ lighter drinker</td>
<td>432</td>
</tr>
<tr>
<td>Regular drinker $\rightarrow$ lighter drinker</td>
<td>1784</td>
</tr>
</tbody>
</table>

We realize that misclassification of change status is an issue, especially if no association is found. The issue will be discussed, but no formal correction for misclassification is found, because the authors know of no data on the assessment of misclassification for change in alcohol consumption.

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 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? ___ Yes ___ No
8.a. Will the DNA data be used in this manuscript?  
______ Yes  ___X___ 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.csec.unc.edu/ARIC/search.php

______ Yes  ___X___ 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. 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.