1.a. Full Title: Impact of Insurance Status and Types on Inequities in Hospital Care of Acute Coronary Syndrome

b. Abbreviated Title (Length 26 characters): Insurance and Health Care

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

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3. Timeline:
   Complete analysis       Spring 2004
   Submit first draft to publications committer       Summer, 2004

4. Rationale: Increasing evidence suggests that access to medical care in the United States is related to whether an individual has health insurance or not, as well as different types of insurances. Previous work has demonstrated that the uninsured are less likely to receive certain health care services (1, 2, 3, 4, 5). Wenneker et al reported that insurance status was strongly associated with utilization of three expensive cardiac procedures among patients with circulatory disorders or chest pain (6). As numerous studies have documented, uninsured patients may have difficulty obtaining care in at least two ways. Firstly, the uninsured patients initially experience reduced access to health care providers. Secondly, they may also receive fewer services even after gaining entry to the health care system (7, 8, 9, 10). Patients with different types of health insurance but similar medical problems may receive different treatment strategies, or different intensities of treatment, with varying short-term and long-term outcomes (11, 12, 13). A number of studies have suggested that race, insurance status, and income are associated with unequal access to diagnostic procedures and treatment approaches in hospitalized patients (14). How insurance status affects resource use and hospital outcome on acute coronary syndrome patients has not been investigated in ARIC study. The objective of the present study from ARIC surveillance database is to examine the
relationship between patient insurance status to the process and outcome of hospital care.

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

Hypothesis 1: The uninsured acute coronary syndrome (ACS) patients have longer delay in time to critical interventions (door-to-needle time), such as reperfusion therapy, compared with insured patients.

Hypothesis 2: The uninsured ACS patients have shorter length of in-hospital stay than the insured patients.

Hypothesis 3: The uninsured patients have less access to surgical procedures (PTCA, bypass surgery) than the insured patients.

Hypothesis 4: Among the insured, there are inequalities in the hospital care (door-to-needle time, length of hospital stay, access to the surgical procedures) for different types of insurance status. Types of insurance status refers to prepaid insurance (Blue Dross/Blue Shield, HMO), medicare, medicaid, and other forms of insurance.

Finally, for the potential significant results that we might be able to find out of the hypotheses above, we would like to further look at some descriptive statistics on how fix are the findings through the years. Do these findings remain stable from 1997 through 2000 or not?

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

   **Study population:**
   Cohort surveillance database (1987 through 2000) will be used for this study. Participants from ARIC surveillance that were admitted to the hospitals with acute coronary syndrome will be included in this study. Acute coronary syndrome is defined as acute MI or unstable angina defined by the ICD-9 or ICD-10 code at the admission. For patients who have multiple occurrences of acute coronary syndrome, only the first occurrence of acute MI or acute coronary syndrome will be investigated.

   **Independent variable:**
   Insurance status will be determined at the time of the admission based on the hospital abstraction form. Insured vs unsurance status (self-pay or free care) will be compared. Among insured patients, different types of insurance will be compared (Medicare, Medicaid, and Prepaid insurance (Blue cross/Blue Shield, commercial payers, and prepaid health plans).

   **Outcome variables:**
   (1) In-hospital delay, defined as between the time of admission and the time of starting intervention treatment, also known as “door-to-needle” time.
   (2) Length of hospital stay, defined as the number of days between the data of arrival and the date of discharge fro patients who did not die in the hospital.
   (3) Coronay reperfusion initiation, defined as the presence or absence of commonly used cardiac procedures for reperfusion therapy.
   (4) Access (utilization frequency) of surgical procedures, including PTCA, bypass surgery.
Analysis plan:
Linear regression model will be used to address hypothesis for continuous variable outcomes while logistic regression will be used to test dichotomized variable outcomes. The comparative effect on in-hospital delay, length of hospital stay and coronary reperfusion therapy by insured and uninsured status will be assessed using both logistic and linear regression, adjusting for important confounders. Major clinical and demographic variables available in the database that are significant predictors of the outcome variables will be adjusted for as covariates in the logistic and linear regression models. Possible variables include age, gender, race, BMI, geographic site of hospital, type of hospital (teaching, non teaching), concurrent chronic diseases (hypertension, diabetes, etc), medication usage, time of admission, etc. Patients with missing information on insurance status, admission time and discharge time will be excluded. To reduce bias, we exclude from the analysis, length of in-hospital stay for patients who died in the hospital.

7.a. Will the data be used for non-CVD analysis in this manuscript?  _____ Yes  X 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  X No
(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  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  X 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://bios.unc.edu/units/cscc/ARIC/stdy/studymem.html

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)?

There are no directly overlapped proposals. Here is the most related proposal:
MS # 789 Effects of insurance status and transitions in insurance on CVD outcomes. There are two main differences in this proposal to ours:  a). MS789 focus on changing of insurance on the outcome of CVD, while our hypotheses focus on the difference among insurance types.  b). MS789 focus on outcome of CVD after discharge, while our hypotheses focus on the quality of care within hospitalization.
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.

12. References:

3) McWilliams JM, Zaslavsky AM, Meara E, Ayanian JZ. Impact of medicare coverage on basic clinical services for previously uninsured adults. JAMA. 2003;290:757-764.
12) Braveman PA, Egerter S, Benne T, Showstack J. Differences in hospital resource allocation among sick newborns according to insurance coverage. JAMA. 1991;266:3300-3308.