

## ARIC Manuscript Proposal #3800

PC Reviewed: 3/9/21

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

Priority: 2

SC Reviewed: \_\_\_\_\_

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

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

**1.a. Full Title: Retrospective Evaluation of Severity of Stroke and Disability after Stroke in the Atherosclerosis Risk in Communities Cohort Study: Objectives and Methodology**

**b. Abbreviated Title (Length 26 characters): Stroke severity in ARIC**

**2. Writing Group:** Silvia Koton (first author), Josef Coresh (last author).

Writing group members: Shalom Patole, Michelle Johansen, Julia Carlson, Taylor Haight, Andrea L.C. Schneider, Rebecca F. Gottesman

I, the first author, confirm that all the coauthors have given their approval for this manuscript proposal. SK [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 collected in this project is already being analyzed, will be presented at the ISC 2021 and AHA-Epi 2021 and is used in the paper currently being written (ARIC manuscript proposal #3672); therefore, we aim to write the methods paper immediately after approval and publish it soon.

**4. Rationale:** Stroke severity is the most important predictor of post-stroke outcome<sup>1</sup> and has consistently been associated with short- and long-term mortality and disability after stroke<sup>2-6</sup>. Though the prospective ARIC cohort study includes high quality individual-level information on strokes in a large bi-racial cohort, direct measures of stroke severity and disability during hospitalization have not been prospectively collected. The National Institutes of Health Stroke Scale (NIHSS) is a simple, valid, reliable and widely used systematic tool for quantitative

measurement of ischemic stroke-related neurological deficits<sup>7</sup>. In 2018, our proposal to conduct an ARIC ancillary study was approved, allowing the retrospective collection of data from ARIC stroke hospitalization blinded charts of all incident and recurrent events adjudicated in ARIC as definite or probable ischemic or hemorrhagic (intracerebral hemorrhage- ICH and subarachnoid hemorrhage- SAH) stroke. Following ARIC approval, a manual for chart abstraction was developed and piloted. Charts were reviewed and data on all the items in the NIHSS were evaluated according to an algorithm for retrospective collection of the NIHSS score that has been shown to be valid across the entire scale spectrum<sup>8,9</sup>.

Although assessment of stroke severity by NIHSS was our main aim, we also reviewed all the available data on disability at discharge by modified Rankin Scale categories (discharge mRS 0-1,  $\geq 2$ ), and collected details on discharge destination, location of stroke, and reperfusion treatment for ischemic stroke. Overall, we collected data on 36 variables. To minimize inter-rater variation, all charts were reviewed by a lead abstraction physician, who classified stroke severity on admission into 5 groups according to the NIHSS score (NIHSS $\leq 5$ , 6-10, 11-15, 16-20,  $>20$ ) and disability at discharge into 2 categories (mRS 0-1,  $\geq 2$ ). A second independent chart review and classification of these variables were conducted by other physician reviewers in 236 charts, in order to assess inter-rater reliability. Data were entered into files designed for the present study using the REDCap software. Completeness and quality of data have been routinely assessed since data collection begun, in order to assure availability of information for as many stroke events as possible, as well as collection of valid information.

An abstract using the new severity data was accepted for oral presentation at the 2021 AHA International Stroke Conference and a second abstract was submitted for presentation at AHA-Epi 2021. Two manuscript proposals have been approved by the ARIC Publications Committee (#3490 and #3672) and a number of proposals are currently in preparation, all using the data collected in this project. Data collected in this project will be useful for a wide range of ARIC studies on stroke; therefore, it is important to publish a paper describing the objectives and methodology of the project.

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

Retrospective chart review can efficiently abstract standardized data on stroke severity and estimates of disability at discharge with high reliability.

## **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).**

In this methods paper, we will describe the entire process of planning, protocol writing, piloting, establishing and conducting the retrospective collection of data and assessment of all the previously mentioned variables. We have already reviewed charts on 1947 (1528, 78.5% incident) definite and probable ischemic (1720, 88.3%) and hemorrhagic strokes stroke events occurring in ARIC during 1987-2019. We are now completing the review of a small proportion of charts that were previously missing and intend to continue the study to include newly adjudicated events occurring in the most recent years in ARIC participants. We will tabulate the frequency of stroke severity and disability categories, and estimates of inter-rater reliability for

blinded chart review (correlation coefficients for continuous variables, and percentage of absolute agreement and Cohen Kappa Statistic for categorical and ordinal variables).

**7.a. Will the data be used for non-ARIC analysis or by a for-profit organization in this manuscript?** \_\_\_ Yes  X  No

**b. If Yes, is the author aware that the current derived consent file ICTDER05 must be used to exclude persons with a value RES\_OTH and/or RES\_DNA = “ARIC only” and/or “Not for Profit” ?** \_\_\_ Yes \_\_\_ No

(The file ICTDER 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 current derived consent file ICTDER05 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/mantrack/maintain/search/dtSearch.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)?**

#3672- Stroke Incidence and Severity as Risk Factors for Dementia and MCI in the ARIC cohort Study

#3490- Thirty-year trends in stroke severity on admission in the Atherosclerosis Risk in Communities (ARIC) 1987-2017

**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 (ancillary 2017.22, Trends in stroke severity, physical, cognitive and social outcomes in a community; and ancillary 2008.06, ARIC-NCS)**

\_\_\_ **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 <https://sites.csc.unc.edu/aric/approved-ancillary-studies>

**12a. 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.**

**12b. The NIH instituted a Public Access Policy in April, 2008** which ensures that the public has access to the published results of NIH funded research. It is **your responsibility to upload manuscripts to PubMed Central** whenever the journal does not and be in compliance with this policy. Four files about the public access policy from <http://publicaccess.nih.gov/> are posted in <http://www.csc.unc.edu/aric/index.php>, under Publications, Policies & Forms. [http://publicaccess.nih.gov/submit\\_process\\_journals.htm](http://publicaccess.nih.gov/submit_process_journals.htm) shows you which journals automatically upload articles to PubMed central.

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