

ARIC Manuscript Proposal #2147

PC Reviewed: 5/14/13
SC Reviewed: _____

Status: A
Status: _____

Priority: 2
Priority: _____

1.a. Full Title: Concordance of myocardial infarction events between Medicare coding and ARIC adjudication among Cohort participants

b. Abbreviated Title (Length 26 characters): Accuracy of Medicare MI coding

2. Writing Group: Montika Bush, Sally Stearns, Anna Kucharska-Newton, Til Stürmer, Alan Brookhart, others welcome

I, the first author, confirm that all the coauthors have given their approval for this manuscript proposal. MB [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:

Analyses to be completed within one year following manuscript proposal approval.

4. Rationale:

Medicare claims data are now available for beneficiaries residing in the geographic areas of the ARIC study and represent a valuable resource for the investigation of the effect of contextual determinants on healthcare utilization. However, Medicare claims are created primarily for healthcare billing purposes. Their use in healthcare services research requires assessment of the validity of the claims with respect to identification of disease states.

Data for participants of the ARIC cohort have been linked with CMS Medicare data. This linked dataset creates a unique opportunity to examine the validity of diagnostic codes available from CMS Medicare claims in relation to adjudicated events. ARIC investigators are examining the agreement between ICD-9 diagnostic codes from CMS Medicare data with heart failure and atrial fibrillation events ascertained from medical records for the ARIC cohort participants. In this study we propose to perform a similar assessment of the agreement between ICD-9 and DRG diagnostic codes for myocardial infarction (MI) found in CMS Medicare claims with adjudicated definite or probable MI events.

Rosamond et al used ARIC cohort surveillance records to estimate the validity of discharge ICD-9 codes diagnostic of MI events available from participants' medical records in comparison with definite or probable MI events. [1]. We propose to complete a similar analysis using codes from the CMS Medicare claims discharge records.

While several studies have examined the ability of administrative claims to accurately report MI ([2], [3], [4]), the latest article published based upon Medicare claims was in 2004 for MIs occurring in 2000. [5]. There is therefore a need to provide an updated assessment that will consider changes in MI diagnostic criteria which were implemented following 2000.

The proposed research will be instrumental to the examination of outcomes following myocardial infarction events among CMS Medicare beneficiaries of the geographically defined ARIC communities.

5. Main Hypothesis/Study Questions:

1. Describe the agreement between MI-specific ICD-9 and DRG diagnostic codes obtained from CMS Medicare hospitalization records linked with MI-specific diagnostic codes obtained from hospital medical records for ARIC cohort participants for the years 2001-2010.
2. Using ARIC-adjudicated definite and probable MI events as the "gold standard", describe the sensitivity, specificity, and positive predictive value of MI-specific ICD-9 and DRG diagnostic codes obtained from CMS Medicare hospitalization records for the years 2001-2010.

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).

Study Population:

ARIC cohort members who participate in Medicare Part A at any point between January 1, 2001 and December 31, 2010 and have an adjudicated event are eligible for this study. ARIC cohort members will be excluded from this study if they participate in a Medicare

Advantage program for the entire study period. Participants may switch coverage types during the study period; therefore, events adjudicated in ARIC that occur when a participant is covered under Medicare Advantage will also be excluded from analysis. The unit of analysis will be an event; therefore, a single participant may be represented multiple times if they have more than one event during the study period. We will not limit the analyses to incident MI events.

Exposure/Outcome:

Definite or probable MI events based upon ARIC protocol adjudication will be the “gold standard” for comparisons. MI events will be identified from Medicare Provider Analysis and Review (MedPAR) file using diagnosis-related groups (DRG) codes (121, 122,123 – pre-Oct 1, 2008 and 280 to 285 – Oct 1, 2008 forward) and the Ninth Revision International Classification of Diseases Clinical Modifications (ICD9) codes beginning with “410”. We will evaluate ICD-9 codes found in any position on both the CMS Medicare claim and in the ARIC medical record.

Analysis:

We will use a retrospective cohort study design using data for ARIC cohort participants which have been successfully linked to Medicare claims data. The sensitivity, positive predictive value, and false positive rate of events over the entire study period will be summarized overall, by year, and by some or all potential variables of interest described below.

Potential Other Variables of Interest:

Gender, ethnicity, center, age at MI group (<72, ≥ 72), baseline marital status, Medicaid status at MI, and Diabetes status at MI

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 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 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 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)?

- #210 (Trends in the sensitivity, positive predictive value, false- positive rate, and comparability ratio of hospital discharge codes for acute myocardial infarction in four United States communities, 1987 – 2000)
- #1528 (Concordance of heart failure diagnostic codes comparing medical records and Medicare administrative claims in ARIC cohort participants)
- #1657 (Enumerating the community burden of heart failure)
- #1997 (Incidence of atrial fibrillation using the Centers for Medicare and Medicaid Services data)
- #2073 (Comparison of Venous Thromboembolism by ARIC hospitalizations vs. CMS)
- #1909 (Evaluation of ICD codes for Determining Subclasses of Myocardial Infarction in a Community Surveillance Study)

11.a. Is this manuscript proposal associated with any ARIC ancillary studies or use any ancillary study data? Yes No

11.b. If yes, is the proposal

- A. primarily the result of an ancillary study (list number* _____)**
 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 at <http://www.csc.unc.edu/aric/forms/>

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 shows you which journals automatically upload articles to Pubmed central.

References:

- [1] W. D. Rosamond, L. E. Chambless, P. D. Sorlie, E. M. Bell, S. Weitzman, J. C. Smith and A. R. Folsom, "Trends in the sensitivity, positive predictive value, false-positive rate, and comparability ratio of hospital discharge diagnosis codes for acute myocardial infarction in four US communities, 1987-2000.," *American Journal of Epidemiology*, vol. 160, no. 12, pp. 1147-1149, 2004.
- [2] P. M. Wahl, K. Rodgers, S. Schneeweiss, B. F. Gage, J. Butler, C. Wilmer, M. Nash, G. Esper, N. Gitlin, N. Osborn, L. J. Short and R. L. Bohn, "Validation of claims-based diagnostic and procedure codes for cardiovascular and gastrointestinal serious adverse events in a commercially-insured population.," *Pharmacoepidemiology and Drug Safety*, vol. 19, no. 6, pp. 596-603, June 2010.
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- [4] H. Kimm, J. E. Yun, S.-H. Lee, Y. Jang and S. H. Jee, "Validity of the diagnosis of acute myocardial infarction in korean national medical health insurance claims data: the korean heart study (1).," *Korean Circulation Journal*, vol. 42, no. 1, pp. 10-15, 2012.
- [5] Y. Kiyota, S. Schneeweiss, R. J. Glynn, C. C. Cannuscio, J. Avorn and D. H. Solomon, "Accuracy of Medicare claims-based diagnosis of acute myocardial infarction: estimating positive predictive value on the basis of review of hospital records.," *American Heart Journal*, vol. 148, no. 1, pp. 99-104, 2004.