ARIC Manuscript Proposal #3420

PC Reviewed: 6/18/19   **Status: _____**   **Priority: 2**
SC Reviewed: _____   **Status: _____**   **Priority: ____**

1.a. Full Title: Predictors of residential location change in the ARIC Study

  b. Abbreviated Title (Length 26 characters): Predictors of moving

2.   Writing Group:
    Writing group members: Melinda C. Power, Xiaohui Xu, Eric A. Whitsel, Richard Smith, Jay Stewart, Eun Sug Park, Qi Ying, Mads Pedersen, Erin Bennett

I, the first author, confirm that all the coauthors have given their approval for this manuscript proposal. __MP___ **[please confirm with your initials electronically or in writing]**

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3.   Timeline: 1 year from approval

4.   Rationale:

In 2017-2018, approximately 10% of the US population moved to a new residential location. The majority of these moves (6%) were within a single US county.[1] Of those who moved out of county, slightly over 40% of moves were to a different US state. Historically, moving was more common. From the 1950s to the 1970s, approximately 20% of the US population moved to a new residential location, with 11%-13% of moves within a US county and approximately 3% of moves crossings state lines.[1]

Setting aside the practical issues of maintaining updated contact information and ensuring high follow-up of study participants, residential moves represent both a challenge and opportunity for epidemiologic studies. Many studies of contextual exposures, including environmental pollutants and neighborhood characteristics, must deal with the fact that their participants often move. Moving impacts the accuracy of exposure assessment, as the exact date of move is often unknown. It can also lead to issues related to reverse causation, where some aspect of the outcome contributes to the decision to move, which then impacts the exposure. One common approach is to exclude movers; however, this has the potential to induce selection bias to the extent that moving is related to the exposure and outcome of interest. To the contrary, studying movers may provide better insight into the impact of contextual exposures. Studies of the health impacts of a change in environmental pollutants or neighborhood characteristics associated with a move may provide stronger evidence for or against a causal role of contextual exposures than studies that contrast outcomes across those who live in different neighborhoods.

In order to better address the challenges and take advantage of the opportunities associated with movers, we need to characterize who moves and who stays, understand what factors predict moving versus staying, and understand whether and how contextual exposures differ or remain the same when a participant moves. To address this gap, we propose to explore the predictors of moving and characterize the difference in neighborhood characteristics associated with a move among participants in the Atherosclerosis Risk in Communities Study.

5.   Main Hypothesis/Study Questions:

Aim 1. Summarize the characteristics of movers versus stayers across ARIC Visits 1-4
Aim 2. Assess the predictors of moving versus staying across ARIC Visit 1-4 and explore differences by sociodemographic and pre-move neighborhood characteristics
Aim 3. Characterize the difference in neighborhood characteristics associated with a move, and whether these differ by sociodemographic or pre-move neighborhood characteristics

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).

We will use data from ARIC Visits 1-4. We will define movers by measuring the pair-wise distances between serial, visit-specific participant address coordinates and identifying those exceeding the median error historically associated with street-type address matches.[2,3] We will subtype movers by geographic complexity (within-county; inter-county; inter-state) and Euclidean distance (to overcome issues of irregular geographic boundaries), examine whether predictors of moving differ by subtype, and examine sensitivity of observations to re-identification of distances exceeding the median error historically associated with centroid-type address matches. All ARIC participants with valid geocodes will be eligible for inclusion.

While we will focus on all moves between Visits 1 and 4, we will also do analyses restricted to predictors of moving from visit 2 to 3 based on the greater availability of predictors at Visit 2 (cognitive status, life satisfaction)

We will consider several sets of potential predictors of moving:
1. Sociodemographic and socioeconomic characteristics (e.g., age, race/ethnicity, gender, education)
2. Indicators of life events, social engagement, and psycho-social health (e.g., social activity, marital status, life satisfaction, depression, employment and retirement status)
3. Participant health and health behaviors (e.g. Self-rated health, stroke, CHD, cognitive status, diabetes, hypertension, BMI, asthma, arthritis, rheumatism, emphysema, number of medications, limitation in usual activities due to any reason, limitation in usual activities due to health)
4. Neighborhood-level characteristics (Study site, area-level SES)

To begin, we will compare movers to non-movers using tabulations and summary statistics. Given our large number of potential predictors, we will then run LASSO logistic regression to develop a predictive model of movers versus stayers. These analyses will be repeated across subgroups defined by study site, sociodemographic characteristics, and mover subtype.

Among movers, we will also tabulate and summarize pre- and post-move neighborhood characteristics to determine what impact moving has on these factors, overall and by study site, sociodemographics, and distance/subtype of move.

7.a. Will the data be used for non-CVD analysis in this manuscript? __x__ Yes ____ 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? _x___ 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? _x___ Yes ____ 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"? __x__ 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.cscc.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)?

#960 Individual and area-level life-course SES and decline in renal function: the ARIC study

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 (list number* _2016.20__)
 ___ 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 https://www2.cscc.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.cscc.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.

1. CPS Historical Migration/Geographic Mobility Tables. (Accessed 06/04/2019, 2019, at https://www.census.gov/data/tables/time-series/demo/geographic-mobility/historic.html.)
2. Whitsel E, Quibrera P, Smith R, et al. Accuracy of commercial geocoding: assessment and implications. Epidemiol Perspect Innov 2006;3:1-12.
3. Whitsel EA, Rose KM, Wood JL, Henley AC, Liao D, Heiss G. Accuracy and repeatability of commercial geocoding. Am J Epidemiol 2004;160:1023-9.