ARIC Manuscript Proposal #1262

1.a. Full Title: Pathways of socioeconomic health disparities among persons with type 2 diabetes: the Atherosclerosis Risk in Communities Study

b. Abbreviated Title (Length 26 characters): SES & health: pathways in DM

2. Writing Group:
   Writing group members: Rosemary Dray-Spira, MD, PhD
   Fred Brancati, MD, MHS
   Tiffany Gary, PhD, MHS
   Ana Diez-Roux, MD, PhD
   Gerardo Heiss, MD, PhD
   Others welcome

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

First author: Rosemary Dray-Spira, MD, PhD
Address: Welch Center for Prevention, Epidemiology & Clinical Research
         Johns Hopkins School of Public Health
         2024 E. Monument St
         Baltimore, MD 21287
         Phone:  410-502 2359   Fax:  410-955 0476
         E-mail: rdraysp1@jhmi.edu

Corresponding/senior author (if different from first author correspondence will be sent to both the first author & the corresponding author): Rosemary Dray-Spira

3. Timeline: Begin immediately

4. Rationale:
   Because type 2 diabetes is common in all populations in industrialized nations and affects persons at all levels of the society, it may serve as a model condition for evaluating the associations between socioeconomic status (SES) and health among persons with chronic disease. For someone with diabetes, SES may influence access to and quality of care. It may also influence diabetes-related knowledge, communication with providers, ability to
adhere to recommended medication, exercise and dietary regimens, and treatment choices. As a result, SES may have a profound impact on the morbidity and mortality associated with diabetes, and socioeconomic disparities in health are likely to be more marked in people with diabetes than among the non-diabetic population. This suggests that reducing social health inequalities among persons with diabetes may have a major public health impact.

Although several studies have reported evidence for a socioeconomic gradient in morbidity and mortality among persons with type 2 diabetes, the pathways through which SES may influence health outcomes among persons with diabetes have been poorly studied. Published data suggest that the socioeconomic gradient in morbidity and mortality reported among persons with type 2 diabetes is only partly explained by socioeconomic differences regarding characteristics of diabetes itself (Chaturvedi 1998; van der Meer and Mackenbach 1999; Larrañaga 2005; Lawlor 2007). According to their conceptual framework, Brown et al. suggest that the pathways through which SES may influence health outcomes among persons with diabetes are likely to involve a large range of factors at different levels (Brown 2004). At a first level, the relation between SES and health outcomes is likely to be mediated by “proximal” factors including health behaviours (i.e., self-monitoring of blood glucose concentrations, adjustment of insulin and oral antidiabetic agents in response to blood glucose readings and intercurrent illnesses, management of comorbid medical conditions, dietary adherence, exercise, smoking), access to health care (i.e., availability of health care services and effective use of those services by patients) and process of care (i.e., the technical and interpersonal care provided to patients within the health care setting). At a second level, the relation between SES on one hand and health outcomes, health behaviours, access to care, process of care on the other hand is potentially influenced by various “distal” pathways including characteristics of the individual (i.e., social support, mental health, stress, comorbidity, health literacy, language barriers, culture and acculturation); characteristics of the provider (clinician speciality and decision-making style); characteristics of communities or neighbourhoods (i.e., availability and accessibility of health services, healthy foods, and places to exercise, prevailing attitudes toward health, environmental exposures); and characteristics of the health care system (i.e., financial barriers to care, management of referral care). To our knowledge, to date such a conceptual model has not been tested per se.

5. Main Hypothesis/Study Questions:

The present study will attempt to investigate the pathways of the associations between individual and neighborhood SES and health among persons with diabetes.

Our main hypotheses are the followings:

- there are significant socioeconomic disparities in the various aspects of diabetes management including health behaviours, access to care and process of care;
- individuals’ characteristics including social support, comorbidity and depressive symptoms contribute to explain such social disparities in the various aspects of diabetes management;
- these disparities contribute to explain the associations between individual and neighborhood SES and health among persons with diabetes.
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).

Outcomes
We are interested in various types of health outcomes:
- “general” health indicators: all-cause mortality, all-cause hospitalizations, poor self-perceived health, functional limitations
- indicators of diabetes complications: CVD morbidity and mortality, stroke, peripheral vascular disease, renal disease, retinopathy

Main exposure variables
Indicators of individual and neighborhood SES will constitute the main exposure variables. They will be assessed using various indicators:
- individual educational attainment (at baseline), occupation (at visits 1, 2, 3, 4), and family income (at visits 1, 3, 4)
- neighborhood SES index (at baseline) derived from 1990 census variables (Diez Roux 2001)
- a SES score combining these various individual and neighborhood socioeconomic indicators will be constructed

Other variables of interest
Age, gender, race, ARIC center, duration of diabetes
Indicators of health behaviors: smoking status [at visits 1, 2, 3, 4], physical activity [at visits 1 and 3], diet [at visits 1 and 3], BMI [at visits 1, 2, 3, 4]
Indicators of health care access: health insurance, sources/frequency of medical care [at visits 1, 2, 3, 4]
Indicators of health care process: plasma glucose level, blood lipids, hypertension, medication use [at visits 1, 2, 3, 4]
Social network/support as measured by the Lubben Social Network Scale and the Interpersonal Support Evaluation List (ISEL) [at visit 2]
Depressive symptoms as measured by the Maastricht Questionnaire [at visit 2]
Comorbid conditions [at visits 1, 2, 3, 4 and reported on hospital discharge diagnoses]

Data analysis
All white and African-American participants with diabetes (either prevalent at ARIC baseline or incident during the follow-up period) and available information on individual and neighborhood SES will be included in the analysis.
Social disparities in diabetes management will be quantified by measuring the associations between individual and neighborhood SES and the various aspects of disease management including health behaviours (i.e., physical activity, diet, BMI, smoking), access to care (i.e., use of a regular primary physician, health insurance) and process of care (i.e., medication use, glycemic control, lipid management, blood pressure management). The respective mediating/moderating role of social support, comorbidity and depressive symptoms in explaining the associations between SES and disease management will be examined. The associations between individual and neighborhood SES and health indicators will then be measured, adjusting for indicators of health
behaviours, health care access and process, social support, comorbidity and depressive symptoms, in order to estimate the extent to which such characteristics explain social health disparities among persons with diabetes. Analyses will be stratified by race and adjusted for age and diabetes duration, and the confounding/modifying role of gender will be systematically examined and accounted for. Analyses will be conducted using methods for longitudinal data analysis; multilevel models will be used to account for the clustering of subjects within neighbourhoods.

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 _____ 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 _____ 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/search.php

___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)?

MS # 454 (Diez-Roux A et al. Neighborhood of residence and incidence of CHD)
MS # 864 (Borell LN et al. Neighborhood characteristics and mortality in ARIC)

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

11.b. If yes, is the proposal

_____ A. primarily the result of an ancillary study (list number* _1998.02_)

___x__ Yes _______ No
B. primarily based on ARIC data with ancillary data playing a minor role (usually control variables; list number(s)* __________  __________ __________)

12. 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.

References


