1.a. Full Title: Lifecourse Socioeconomic Position and Diabetes in Middle-aged Adults

b. Abbreviated Title (Length 26 characters): Lifecourse SEP and Diabetes

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

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   Luisa Borrell
   Kathy Rose
   Seronda Jackson
   Jay Kaufman

This manuscript is part of the Lifecourse SES study, Gerardo Heiss, PI.

3. Timeline:

   Submit proposal to Publications Committee: Nov 2003
   Complete Analysis:                                        April 2004
   Submit draft to Publications Committee:      May 2004

4. Rationale:

   Diabetes has been shown to be associated with socioeconomic position (SEP) in adulthood with higher prevalence rates of type II diabetes in the lower socioeconomic groups (Everson 2002). Recent evidence suggests that early life experiences (including the early childhood environment) may be related to cardiovascular risk in adulthood (Davey Smith 1998). For example, childhood socioeconomic status has been shown to be inversely related to cardiovascular disease mortality, even after accounting for adult SES (Claussen 2003). The mechanisms mediating these associations have yet to be determined. It has
been suggested that childhood socioeconomic environment may be related to the development of insulin resistance and diabetes in adulthood (Lawlor 2002; Lawlor 2003; Parker 2003). Using data from the ARIC Study and the Ancillary Study “Lifecourse Socioeconomic Status, Social Context and CVD,” we propose to investigate the independent contributions of socioeconomic conditions over the lifecourse to diabetes prevalence in middle age.

5. Main Hypothesis/Study Questions:

1) Childhood and adult socioeconomic circumstances will be independently associated with diabetes in middle age.

2) Childhood SEP will be a stronger predictor of prevalent diabetes than adult SEP.

3) Lifecourse SEP trajectories characterized by (a) low SEP in childhood followed by increasing SEP over the lifecourse and (b) persistently low SEP over the lifecourse will be associated with greater prevalence of diabetes in adulthood.

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

a) Outcomes:

Two outcomes will be investigated in these analyses: prevalent diabetes at ARIC visit 4 (dichotomous outcome defined based on standard ARIC criteria) and an insulin resistance score among persons without prevalent diabetes at ARIC visit 4 (continuous outcome).

b) Independent variables:

Individual socioeconomic indicators at childhood and adulthood will be used for the analysis. Initially, four separate dimensions will be investigated: education, occupation, home ownership, and area of residence. Parental education (a marker of childhood SEP) is available from ARIC visit 4 and adult education is available from the ARIC baseline. Parental occupation and participant occupation at ages 30, 40, 50, and at visit 4 (or in a subsequent follow-up) is available from the Lifecourse Ancillary Study. Occupation is available both in census categories and characterized based on the criteria developed by Wright. Parental home ownership and participant home ownership at ages 30, 40, 50, and at the ARIC baseline are available from the Lifecourse Ancillary Study. Parental place of residence (at the county level) and participant place of residence (at the tract level) is available at ages 30, 40, 50, and at the ARIC visits from the Lifecourse Ancillary Study.
Each SEP indicator for each time period will be classified into three categories (low, middle, high). Analyses for research questions 1-2 will be restricted to parental (childhood) and adult indicators collected at the latest available ARIC follow-up. Categories will be constructed based on meaningful cut-offs whenever sample size allows. Alternatively, percentile-based categories (based on distribution observed at each time period in the sample) will be used. Analyses of trajectories (research question 3) will employ the full range of indicators available (childhood, ages 30, 40, 50, and the most recent ARIC adult measure).

c) Inclusions/Exclusions:

Participants with missing data on the outcomes of interest and with missing relevant lifecourse SES variables will be excluded from the analyses.

d) Age, sex, center and race/ethnicity will be examined as covariates. Heterogeneity in associations by race/ethnicity will be investigated if sample size allows.

e) Statistical Analysis:

After descriptive analyses, linear or logistic regression will be used to estimate independent associations of childhood and adult SEP with insulin resistance score and diabetes prevalence after adjustment for age and center (research questions 1 and 2). Exploratory trajectory analysis (mixture models using PROC TRAJ in SAS) will be used in explore trajectories in SEP present in the data. Using these results (plus a priori hypotheses) participants will be categorized into trajectory types. These trajectory types will be examined in relation to diabetes outcomes in adulthood using linear and logistic regression. Results will be shown before and after adjustment for body mass index. Analyses will initially be stratified by sex and race; pooled analyses may be reported if the distribution of exposures allow it and if no heterogeneity of effects is present.

Table 1. Lifecourse socioeconomic variables and diabetes-related outcomes by race and sex

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<th>White men</th>
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Table 2. Age adjusted odds ratios of diabetes prevalence associated with lifecourse socioeconomic indicators

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* In persons without prevalent disease

In order to examine consistency across different SEP measures, similar tables will be created for all types of SEP indicators. If similar results are observed only one or two indicators will be shown. Similar tables will also be created for mean differences in the insulin resistance syndrome score.
e) References


Lawlor DA, Davey Smith G, Ebrahim S. Life course influences on insulin resistance: findings from the British Women’s Heart and Health Study. Diabetes Care 2003;26:97-103.


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://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)?

Manuscript 859. The lead author has been contacted and is a co-author on this manuscript.

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.