SOF Analysis Plan Submission Form

Date: May 20, 2010

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Other investigators who will be working on this analysis: Kris Ensrud, Peggy Cawthon
(We invite any of the Caregiver-SOF PI’s to contribute to this manuscript)

Analysis Plan Title: Self-ratings of health and change in walking speed in the Caregiver-SOF and the SOF samples.

Based on the suggestions from the SOF PI’s, we are submitting this AP to cover two sets of analyses and two anticipated manuscripts. The first manuscript will address the association between self-rated health and walking speed over 2 years in the Caregiver-SOF sample, which will provide the opportunity to evaluate whether caregiver status modifies this association. The second manuscript will address this association in the overall SOF sample, which will benefit from the larger sample, and potentially longer followup time.

Data sets to be used: First study: Caregiver-SOF datasets T1, T2, T3; Second study: SOF dataset.

Primary variables to be used in the analysis:

Exposure variables: Self-rated health status assessed at T1 (Caregiver-SOF). Four responses collapsed into a dichotomous variable to form the following categories: Excellent/Good and Fair/Poor. Caregiving status and caregiving intensity will also be evaluated as an effect modifier.

For the analyses of the overall SOF sample, we will likely use Self-rated health compared to people your age at V3 (V3COMP) and the first interview of the African-American sample (AACOMP). Response options ranged from Excellent to Very Poor, and we will likely combine Poor and Very Poor due to the small number of respondents in those categories. For these analyses, we will first use four categories of Self-rated health (Excellent, Good, Fair, Poor/Very Poor), and depending on the results may consider grouping these categories, as we propose for the Caregiver-SOF analyses. The reason for using SOF V3 as the baseline for these analyses is that the outcome variable (rapid walking speed) was first measured at SOF visit 2, but Self-rated health was not measured at this SOF visit.

Outcome variables: Percent change in walking speed will be calculated at T2 and T3 using the rapid walking speed test in the Caregiver-SOF sample, and using at least two followup measures of rapid walking speed in the SOF sample (V4RWKSPD—
V8RWKSPD). A negative percent change represents a decrease in walking speed from baseline, while a positive percent change represents an increase in walking speed from baseline.

Do you plan to submit an abstract based on these results? ☐ YES ☒ NO
If YES, when is the abstract due?

Who will perform the analyses?

☐ Coordinating Center
☒ Other local analyst, please specify: We will perform the analyses at BUSPH.

Please attach a 1-2 page description of your analysis plan. Please include the following:

1) Short background/rationale for addressing the research question
2) Brief description of statistical methods
3) Mock tables

E-mail this completed form (as an attachment) to Dana Kriesel (dkriesel@sfcc-cpmc.net).
Self-Ratings of Health and Change in Walking Speed Over 2-Years of Follow-Up

Research Question:

The research question is whether self-rated health is associated with a change in walking speed among older women over two years of follow-up, and whether this association differs in caregivers and noncaregivers.

Hypotheses:

This analysis will test the hypothesis that poor self-rated health is associated with a decrease in walking speed over time, and that this decrease in walking speed will be less for caregivers compared to noncaregivers.

I. Background/rationale for research question.

Older adults who rate their own health as poor consistently have a greater risk of mortality, even after adjustment for other variables.1-3 Further, those with poor self-ratings of health have an increased decline in self-reported measures of functional ability after adjustment for baseline disability.4-6 This decline in function is strongly associated with mortality7, so it may operate as an intermediary in the relationship between self-rated health and mortality. Objective measures of lower-extremity dysfunction, such as walking speed, are highly predictive of subsequent mobility-related and activity of daily living (ADL) related disability.8, 9 Thus, since self-rated health is associated with functional decline, it may also be associated with the lower-extremity dysfunction which may precede it.10 Elderly, informal caregivers report poorer self-rated health than older noncaregivers11, but it is unknown whether the association between self-rated health and lower extremity dysfunction differs in older caregivers and noncaregivers.

Elderly, informal caregivers are more physically active than elderly noncaregivers,12, 13 and higher levels of physical activity and leg strength are associated with a slower rate of mobility decline.14 The physical demands of caregiving may allow caregivers to stay active, which may enable them to maintain their physical health and functional ability.15 In addition to these potential benefits, feelings of usefulness to others and altruism are associated with lower morbidity and mortality in older adults.16, 17 Thus, although older caregivers report poorer self-rated health than older noncaregivers11, the physical and psychosocial benefits of caregiving may reduce the associated functional decline.

Research evaluating the influence of caregiving on morbidity and mortality has been inconsistent.11 While some studies have shown modestly elevated rates of mortality in caregivers13, 18, other studies have shown that providing care may be more beneficial than receiving it.19, 20 In a study evaluating functional decline in caregivers, older women who
performed more caregiving activities experienced the least functional decline compared to those who performed fewer or no caregiving activities.21 To date, no study has evaluated the association between self-rated health and change in walking speed among elderly informal caregivers.

2. **Description of statistical methods:**

**Exposure variables:** Assessed at baseline only by asking participants, “At the present time, would you say your health is excellent, good, fair, or poor?” These four responses will be collapsed into a dichotomous variable to form the following categories: Excellent/Good and Fair/Poor. Caregiving status and, among caregivers, caregiving intensity will be evaluated as an effect modifier.

**Outcome variables:** To assess walking speed, participants walked a two, three, or six meter course at a fast, but safe pace. The time to complete this task was measured in seconds and converted to walking speed (meters/second) by dividing the course length by the measured walking time. Percent change in walking speed will be calculated as the difference between walking speed at each annual follow-up and baseline walking speed, divided by baseline walking speed. A negative percent change will reflect a decrease in walking speed, while a positive percent change will reflect an increase in walking speed.

**Covariates:** Respondent sociodemographics such as age, race, marital status, and education. Health related variables such as BMI, number of chronic conditions, depressive symptoms, self-reported ADL/IADL limitations, and physical activity.

**Analytic plan:** The sample will be comprised of Caregiver-SOF participants with a self-rated health assessment at baseline, who did not die before the first annual follow-up interview, and have measured walking speed at baseline and each annual follow-up interview.

Bivariate comparisons of self-rated health levels at baseline will be conducted using chi-square tests for categorical variables and t-tests for continuous variables. To examine our hypothesis about the association between self-rated health and percent change in walking speed across the study period, we will use a repeated measures linear mixed model adjusting for baseline walking speed. Our main measure of association will be differences in adjusted mean percent change in walking speed in respondents with Excellent/Good versus Fair/Poor self-rated health. We also will conduct a stratified analysis of this association to assess effect measure modification by caregiver status and, among caregivers, by caregiving intensity. Potential confounders will be selected from an a priori list of variables known to be associated with self-rated health and walking speed, and those variables that change the difference in percent change in walking speed between self-rated health groups by more than 10% will
remain in the multivariable model. BMI, number of chronic conditions, depression, ADL/IADL limitations, and physical activity will be treated as time varying covariates.

3. **Mock Tables**: NOTE: These tables are presented for the Caregiver-SOF analyses.

Table 1: Participant Characteristics by Self-Rated Health Status at Baseline among 891 Older Women in the Caregiver-SOF Subsample

<table>
<thead>
<tr>
<th>Participant Characteristics, N (%)</th>
<th>Self-Rated Health</th>
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<tbody>
<tr>
<td></td>
<td>Fair/Poor N=189 (21.2%)</td>
<td>Excellent/Good N=702 (78.8%)</td>
<td>P-value</td>
<td></td>
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<tr>
<td>Sociodemographics</td>
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<tr>
<td>Age, mean (SD)</td>
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<tr>
<td>Race, white</td>
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<tr>
<td>Marital status, widowed</td>
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<tr>
<td>Education, ≥ high school</td>
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<tr>
<td>Health status</td>
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<td>Body mass index, mean (SD)</td>
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<td># of chronic conditions, mean (SD)</td>
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<td>Depressive symptoms</td>
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<td># of ADL limitations, mean (SD)</td>
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<td>Physical activity</td>
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<td>Physically active</td>
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<td>Moderately active</td>
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<tr>
<td>Sedentary</td>
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<td>Rapid walking speed, mean (SD)</td>
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<tr>
<td>Caregiving</td>
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<tr>
<td>Caregiving status, caregiver</td>
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<tr>
<td>High intensity caregiver</td>
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Table 2: Longitudinal Association between Self-Rated Health and Change in Walking Speed among All Participants, Caregivers, and Noncaregivers

<table>
<thead>
<tr>
<th></th>
<th>Mean % Change in Walking Speed from Baseline (SE)*</th>
<th>Fair/Poor Self-Rated Health</th>
<th>Excellent/Good Self-Rated Health</th>
<th>Difference</th>
<th>P-value</th>
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</thead>
<tbody>
<tr>
<td>All Participants</td>
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<tr>
<td>Caregivers</td>
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<td>Noncaregivers</td>
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* Adjusted for baseline walking speed and xxx covariables

Table 3: Longitudinal Association between Self-Rated Health and Change in Walking Speed among Caregivers by Caregiving Intensity

<table>
<thead>
<tr>
<th></th>
<th>Mean % Change in Walking Speed from Baseline (SE)</th>
<th>Fair/Poor Self-Rated Health</th>
<th>Excellent/Good Self-Rated Health</th>
<th>Difference</th>
<th>P-value</th>
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<tbody>
<tr>
<td>High Intensity Caregivers</td>
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<tr>
<td>Low Intensity Caregivers</td>
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</tbody>
</table>

* Adjusted for baseline walking speed and xxx covariables
References


