Explaining Gender Differences in Functional Health and Mortality among Older Adults in Beijing

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The objectives of this paper are twofold: (1) to examine gender differences in the transitions in functional health and mortality over a five-year period among older adults in Beijing, and (2) to assess the extent to which gender differences can be explained by underlying disease patterns as well as social, economic, and psychosocial factors. Research that examines gender differences in health among older adults in developing countries is important for several reasons. First, decades of research on adult health and mortality have brought to light an important gender paradox: men are more likely to die, but women suffer from higher levels (i.e. prevalence and severity) of morbidity (Nathanson 1975; Verbrugge 1979; Waldron 1983). However, while the paradox has been widely accepted, the degree to which women are advantaged with respect to mortality, and men are advantaged with respect to morbidity, is still being debated. Recent research, for example, has suggested that gender differences in health may be more modest than had been previously thought (Arber and Cooper 1999; Case and Paxton 2005; Lahelma et al. 1999; Macintyre et al. 1996). Second, because most available research on the topic rely solely on data from Western developed countries, they leave open the question as to whether gender differences in health are easily generalizable to countries with different systems of stratification, patterns of gender relations, levels of socioeconomic developments and life expectancies. Third, there are few studies that document the mechanisms underlying the gender-health association in developing countries (Arber and Cooper 1999; Yount and Agree 2005). Finally, research on this topic across all societies has often overlooked older

adults despite the fact that health needs are the greatest in old age, women outnumber men in later life, and gender differences in health have been shown to vary across life stages.

Based on the above discussion, the current study will contribute to existing literature by: (1) examining gender differences in functional health and mortality using data from China, a setting that has received little attention with respect to the topic, (2) by extending a test of a detailed set of factors that have been shown in Western based samples to be important mediators in the gender-health association to China, a setting where social, economic, and cultural context greatly differ, and (3) by considering older adults. A focus on older adults is particularly timely given the rapid aging of China's population and the possible implications that this will have on future health care needs.

Data and Methods. Data will come from the 1992 and 1997 waves of the Beijing Multidimensional Longitudinal Study of Aging conducted by the Capital University of Medical Sciences in Beijing, China. The baseline survey in 1992 interviewed a representative sample of 3,257 older adults aged 55 and over living in three districts in the Beijing municipality (Xuan Wu, Da Xing, and Huai Rou). The three districts were selected based on their abilities to represent the total municipal area with respect to socioeconomic, demographic and geographical characteristics. The 1997 follow-up re-interviewed those who were still living in the original households or within the same area. The response rate and the follow-up rate for the 1992 and 1997 surveys, respectively, were both around 90% (Department of Social Medicine 1995).

In both the 1992 and 1997 surveys, respondents were asked whether they could perform a series of functioning tasks, such as ADLs (Katz et al. 1963) and Nagi measures (Nagi 1965), without any help from others. Response categories for each item were "independent", "with some help", and "totally dependent". We measure functional health using the following six

indicators that are available in both surveys: walking 300 meters, getting on and off a bed, walking up and down a flight of stairs, bathing, dressing, and eating.

We will begin our analyses with comparison of baseline functional health by gender across each of the individual functioning tasks above. We will then move on to multivariate analysis focusing on gender differences in the probability of making six possible functional transitions between 1992 and 1997. To this end, we will identify whether respondents are either functionally independent or dependent at each time of the surveys (i.e., 1992, 1997), depending on whether they report being able to perform all six tasks independently. Thus, six possible transitions are from either being functionally independent or dependent in 1992 to being independent, dependent, or deceased in 1997. We will first examine gender differences in the unadjusted probability of making each transition. We will then attempt to explain the mechanisms underlying gender differences by conducting a multivariate analysis that incorporates a series of possible mediating factors. The mediating factors to be examined are categorized into the following seven groups, each of which will be measured using several indicators as listed below:

(1) Socioeconomic conditions: education, occupation (one held the longest), assets, and difficulty meeting the financial needs

(2) Health behaviors: smoking, drinking, and exercising regularly

(3) Access to health care: health insurance status, preventive check-ups, financial difficulty in seeing a doctor if a need arises, and a difficulty in "physically" accessing a doctor (e.g., transportation, long lines)

(4) Social relationships and support: marital status, living arrangement, availability of various support outside the family, and whether one has a confidant

(5) Locus of control: scale created based on six locus of control questionnaire items

(6) Stressful life events: recent events (e.g., death of spouse, child, parent, or close friends), life-time events (e.g., prosecution, war, natural disaster)

(7) Diseases and self-rated health: serious conditions (e.g., stroke, cancer, coronary heart disease), other chronic conditions (e.g., diabetes, chronic bronchitis), debilitating conditions (e.g., arthritis, a slipped or ruptured disc), and self-rated health

To examine the relative importance of the seven groups of mediating factors on gender differences in the probability of making the six transitions, we will use a regression-based decomposition approach developed by Oaxaca (1973) and Blinder (1973), which enables the decomposition of differences into those due to differences in the means of explanatory factors and those due to differences in effects of explanatory factors on transition probabilities. The Oaxaca-Blinder approach further enables us to quantify the extent to which mean differences in each of the seven groups explain gender differences in the transitions.

Preliminary Results. Preliminary analyses show strong overall gender differences in baseline functional status, with women reporting higher rates of limitation. As presented in the Table 1, the extent of the difference, however, varies greatly by the specific type of activity examined. Women particularly suffer more than men from limitation with mobility-related functions, such as walking 300m and climbing up and down stairs. Over the five-year period, death was significantly more common among men who were functionally independent in 1992, while it was significantly more common among women who were dependent in 1992. Women were also significantly more likely than men to become functionally dependent during this period.

Our preliminary multivariate analyses on the role of the seven groups of mediating factors show that almost all coefficients are in expected directions and most are statistically significant at a conventional level ($p<0.05$ or higher). A test of relative importance of the seven groups shows that health behaviors play a particularly large role in creating gender differences in baseline functional health and in the probability of dying over the following five-year period.

Socioeconomic conditions and access to health care, in turn, explain the bulk of gender differences in becoming functionally dependent. In our discussion section of the paper, we will consider how our results compare to those reported earlier among the older populations in the U.S. and in several Western European countries.

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Table 1. Prevalence of Functional Limitations at Baseline (1992) and Functional Transitions between the Baseline and Follow-up (1992-1997)

	Total (N=3,257)	Males (N=1,592)	Females (N=1,664)
Percent with the following number of functional limitations at baseline (1992):			
0	89.5	92.7	86.4
1	2.8	1.7	3.8
2	3.8	2.3	5.3
3	1.7	1.1	2.4
4	0.7	0.7	0.7
5	0.6	0.7	0.4
6	0.9	0.9	1.0
Total %	100.0	100.0	100.0
Percent needing some help with the following task at baseline (1992):			
Walking 300 meters	7.7	5.4	10.0
Getting on and off a bed	1.8	1.8	1.8
Eating	1.3	1.1	1.4
Dressing	1.7	1.8	1.6
Bathing	4.9	4.1	5.7
Walking up and down stairs to 2nd floor	9.5	6.8	12.1
Percent making each transition between baseline and follow-up (1992-97):			
No limitation at both surveys	68.2	70.7	65.7
From no limitation to some limitation	8.6	6.5	10.6
From no limitation to death	12.4	15.1	9.6
From some limitation to no limitation	1.7	0.7	2.6
Some limitation at both surveys	3.1	2.1	4.0
From some limitation to death	6.1	4.8	7.4
Total %	100.0	100.0	100.0