

# **Gender differences in the duration of living arrangements in later life course among older Chinese adults**

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## **1. Introduction**

China has entered an aging society, with 30.9% of the population expected to be aged 65 and above by 2050 (United Nations, 2024). Traditionally, adult children have provided care and financial support by living together with their older parents. However, this traditional living arrangement has been disrupted by declining fertility rates and the high migration rates of the working-age population (Zhao et al., 2018). In 2020, over 56% of individuals aged 65 and older were not living with their adult children; this percentage represents the combined proportion of those living with a spouse or living alone, with or without a caregiver. Moreover, 46.54% of older people lived alone or with a spouse only. Although the tradition of co-residence with children has persisted to some extent, living arrangements in China have gradually become aligned with those in Western societies, showing a notable increase in the prevalence of solo living (Wang, 2024; Esteve et al, 2020).

Thus, it is expected that older adults will spend a longer period living alone in the future. These shifts present significant challenges, as the pension system remains limited and the healthcare needs of the older population may go unmet due to the lack of caregivers in the households. In the context of declining mortality and increasing life expectancy, it remains unclear how long older adults will stay in each type of living arrangement and how transitions between them occur.

This research aims to quantify the length of time that older adults are expected to spend in different living arrangements during later life, and to investigate whether these durations differ by gender. Additionally, we also estimate the transition probabilities between living arrangements, to understand the dynamics behind the living situations of older individuals and set up an analysis that can help in identifying vulnerabilities for policy implementations.

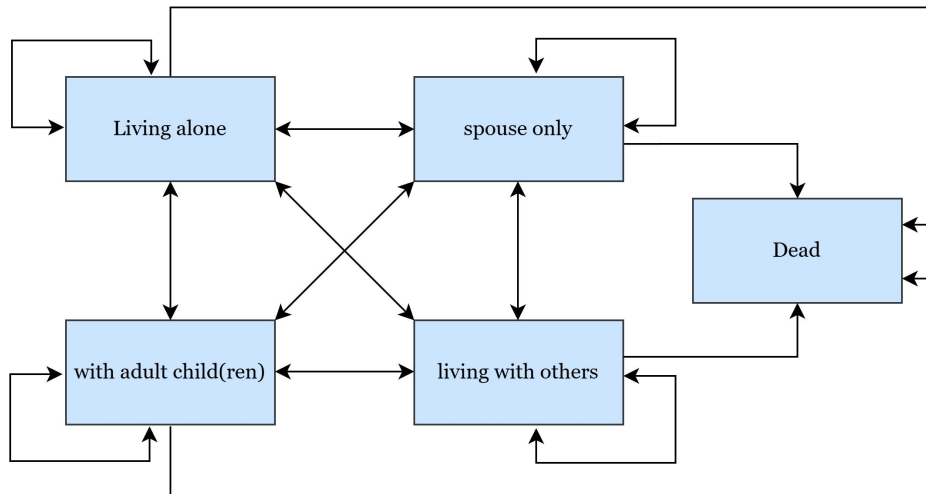
## **2. Data and Methods**

Data comes from the Chinese Longitudinal Healthy Longevity Survey (CLHLS) from 2008 to 2018. A cohort analysis was conducted using the 2008, 2011, 2014, and 2018 waves of the CLHLS, excluding respondents who were newly enrolled after the 2008 baseline survey. Respondents aged between 65 and 105 were included, while individuals who were living in an institution at any observation were excluded (2.74% of the sample in this age interval).To

estimate the life expectancy of older adults in each living arrangement, a multistate model was applied.

**Figure 1** summarizes all the states between which individuals could transition. Older adults could either remain in the same living arrangement until death or transition among the four types of living arrangements during the survey years. Death was considered the only absorbing state in the transition process. Transitions were assumed to depend on the current state. When the living arrangement differed between two consecutive surveys, the transition was assumed to have occurred at the midpoint between them. If an individual died before the next survey, it was assumed that he or she maintained the same living arrangement as in the previous wave until death.

The R package “dtms” was used to implement multistate life table methods to estimate the expected number of years in each type of living arrangement.



**Figure 1** Multi-state model of living arrangement-specific life expectancy

### 3. Results

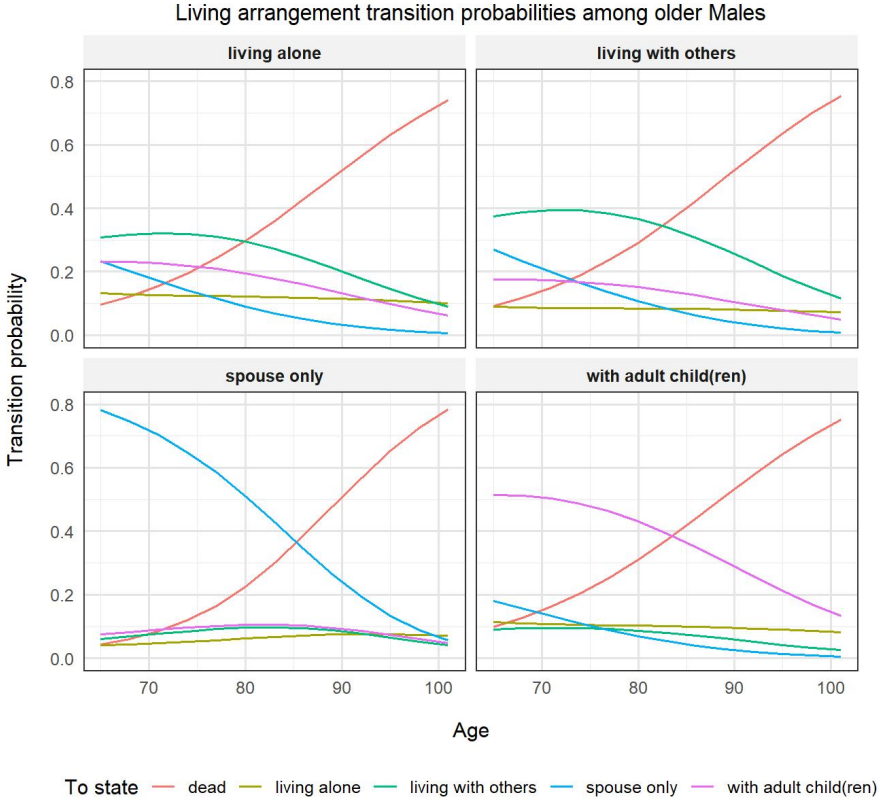
**Figure 2 and 3** show the transition probabilities among five states over age. In general, living arrangements tend to be stable among older Chinese adults, as they are more likely to maintain their current living arrangement in later life. Specifically, the transition between living with a spouse and living with adult children are relatively more stable compared to other types. For older adults living alone, they have a high probability of transitioning to living with others. Those who, at the start of the observation period, live with a spouse have very low probabilities of changing their living arrangements, but their probability of living alone increases with age. Women have slightly higher probabilities of transitioning to the other three types of living arrangements around 85 years old.

**Figure 4** shows the living arrangement-specific life expectancy at age 65 for men and women by the initial living arrangement. Those starting at age 65 in the “spouse only” category have the longest life expectancy for both men (15.83 years) and women (16.19 years). Specifically,

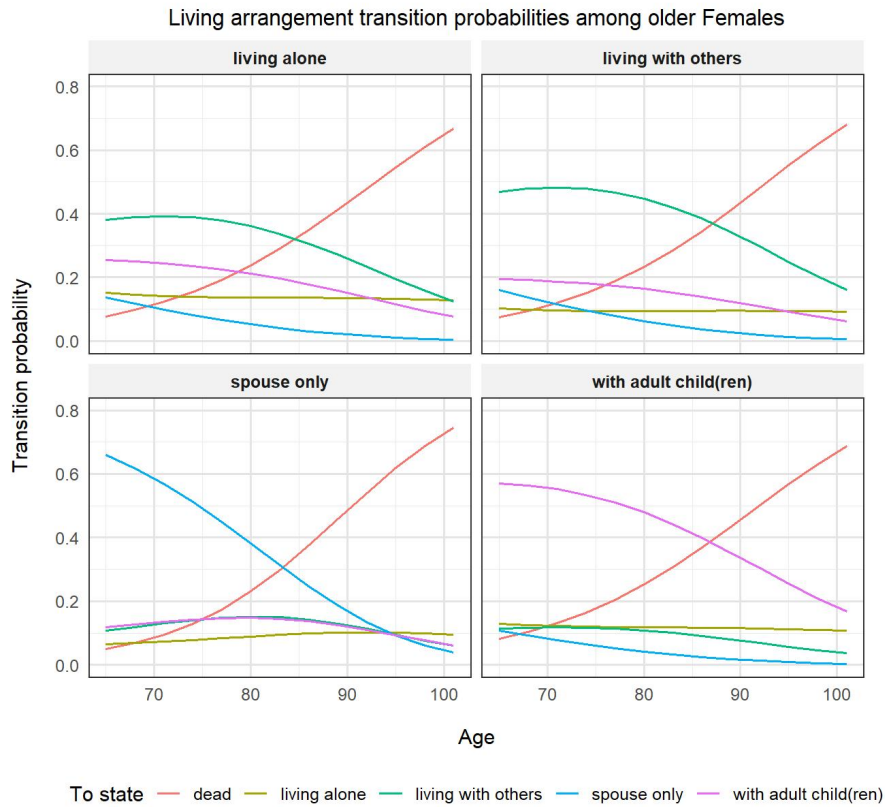
when the initial state is “spouse only”, men are expected to spend 2.73 years living with adult children, 9.76 years with a spouse, 2.19 years with others, and 1.15 years living alone. In contrast, women with the same initial state are expected to spend 3.93 years living with adult children, 6.98 years with a spouse, 3.62 years with others, and 1.65 years living alone.

Those starting at age 65 living with adult children have the shortest total life expectancy of all groups, with 14.08 years for men and 15.30 years for women. The total life expectancy for those living with others is 14.43 years for men and 15.51 years for women. For men starting out living alone, they are expected to spend on average 4.49 years living with a spouse, 3.57 years with adult children, and 3.26 years living with others, but only 2.98 years living alone. Compared with men, women are expected to spend more years living with adult children and more time living alone, which is around 0.44 years more on average. Women who live alone at the initial stage are expected to spend 4.88 years in this living arrangement, a longer duration than men in the same situation (3.26 years).

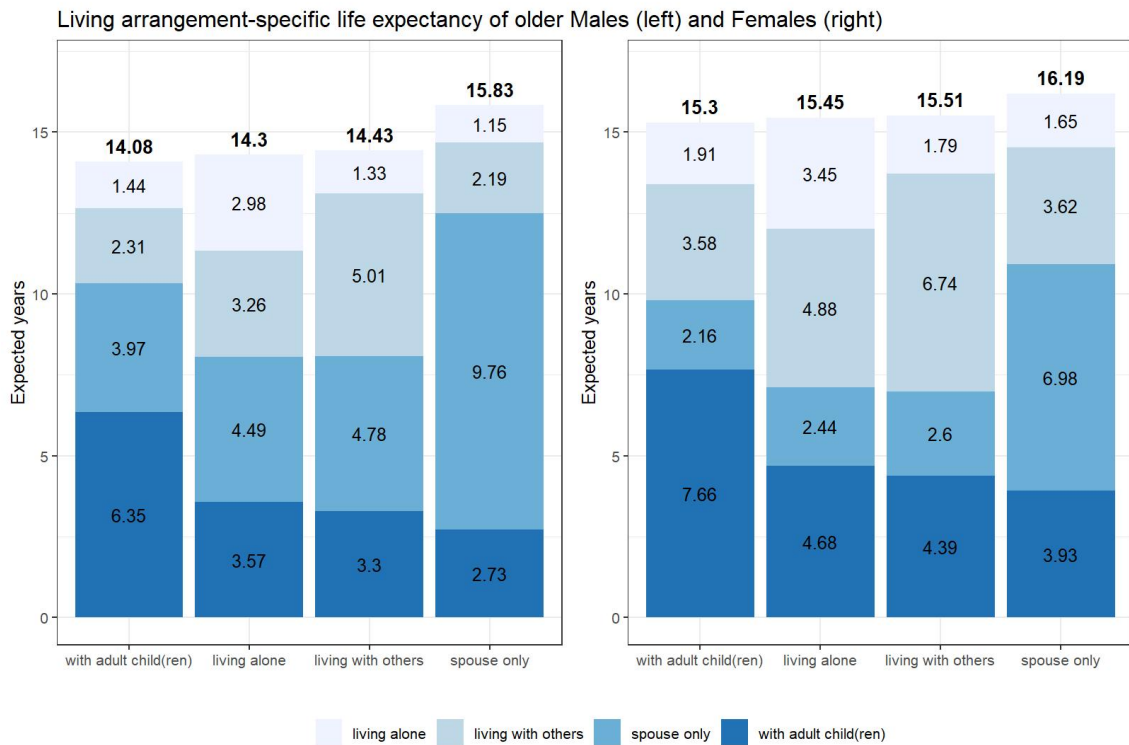
On average, men have a total life expectancy at age 65 of 14.71 years, comprising 1.48 years living alone, 2.79 years living with others, 4.44 years with adult children, and 6.00 years with their spouse. For women, the total life expectancy at aged 65 is 15.70 years, comprising 1.92 years living alone, 4.14 years living with others, 4.18 years with a spouse, and 5.45 years with their adult children. Therefore, for both genders, relatively little time is spent living alone, while most of the remaining life is spent with a spouse, adult children, or others. Overall, men tend to spend a larger proportion of their remaining life with a spouse (6.00 years) and fewer years living alone (1.48 years), regardless of their initial living arrangement.



**Figure 2** Transition probabilities among older males from initial state over age



**Figure 3** Transition probabilities among older females from initial state over age



**Figure 4** Living arrangement-specific life expectancy by gender and initial states

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