



# Dynamics of family households and elderly living arrangements in China, 1990–2010

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## Abstract

This article presents analyses on dynamics of family households and elderly living arrangements in China mainly based on the micro data of 2010, 2000 and 1990 censuses. We demonstrate and discuss the trends and rural–urban differentials of largely declined household size, quickly increasing one-person and one-couple-only households, substantially increased proportions of elderly living alone or with spouse only. It is strikingly interesting that proportion of three-generation family households increased by 18.9% in rural area but decreased by 23.7% in urban areas in 2010 compared to 1990, due to rural–urban differences in demographic effects of large fertility decline and socioeconomic/attitude changes. We also present and discuss two interesting demographic phenomenon which were relatively overlooked in the literature. First, increase in number of households is much larger than population growth, due to shrinking of the household size and decomposition of larger families into smaller ones, and very much slowed-down population growth. Second, increases in numbers of elderly (especially oldest-old) who live alone or with spouse only are dramatically larger than the increase in the corresponding proportions, due to the effects of rapid population aging, while later and larger birth cohorts become old. Such trends have important implications for the analyses on the current and future market demands of the products and services, of which households are the consumption units. We recommend that the studies on home-based energy use and sustainable development should be based on analyses of family household dynamics rather than population growth.

**Keywords** Dynamics of family households · Elderly living arrangements · Shrinking household size · Increasing number of households · China

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## 1 Introduction

Under the rapid socioeconomic transformations, which have been taken place in China over the last several decades, how have the Chinese family households and elderly living arrangements changed? How can we better understand these dynamic changes? Our previous studies based on the one-per-thousand micro sample data from 1982, 1990 and 2000 censuses of China have shown that, during the period of 1982–2000, the one-person and one-couple-only households have been increasing quickly; average household size decreased significantly; the proportions of elderly-couple only households and elderly who did not live with children substantially increased (Zeng and Wang 2003). Other studies also had similar findings and concluded that the family transformation in China during the period 1982–2000 was caused by factors including the tremendous fertility decline, rapid industrialization, increasing migration, rise in women's education, and the significant changes in social attitudes and economic mobility related to co-residence between old parents and adult children (Wang 2006; Guo 2008; Fan 2002; Cheung and Yeung 2013).

The most recent census of China in 2010 reveals that the trends outlined above have continued. For example, although the total number of households continues to increase in China, the average household size reduced from 3.44 in 2000 to 3.09 in 2010; in particular, small households with only one or two persons have increased rapidly (Zhou 2013). With regard to the household structure, Wang (2013) found that the nuclear households, the three-generation stem family households, and the one-person households make up the majority of the Chinese household in 2010. Among these three major types of households, the proportion of three-generation stem family household remain stable in recent decades, whereas the proportions of the nuclear family households has significantly declined in 2010 as compared to 2000 due to the rapid increase of the one-person household. Hu and Peng (2014) and Cheung and Yeung (2013) pointed out that the young rural immigrants to urban areas could have contributed to the growth of one-person households in both rural and urban areas: the inflow of young immigrants increase the one-person household in cities; simultaneously the left-behind elderly parents in rural area contribute to the increase of one-person elderly household in the rural regions. With regard to elderly living arrangements, the increase in the proportion of elderly aged 65 or over who live alone or with spouse only and the decrease of the proportion of elderly living in three-generation stem family households from 1982 to 2010 are very substantial (Wang 2014; Zhang 2013).

Based on our own and others' previous studies, this article intends to make some significant contributions to better understanding of dynamics of households and elderly living arrangements in China. We conduct comparative analyses across different periods as well as rural and urban areas, based on analysing the micro data files of the 2010, 2000, and 1990 censuses in combination with the officially published 100% cross-tabulations. We integrate the analysis of elderly living arrangements with the family household dynamics in this article because

Chinese population has been aging rapidly (Banister et al. 2010) and family is the most important institution for old-age support in Chinese society (Pei and Pillai 1999; Chen and Silverstein 2000; Yeung and Xu 2012). We will investigate the trends and patterns based on not only dynamics of proportion distributions of the household types/sizes and elderly living arrangements but also changes in the absolute numbers, which are useful for socioeconomic planning and business/market analyses. The next section outlines the data sources and the approach of analyses. The third and fourth sections present the general patterns and dynamic changes of family household sizes and types as well as the living arrangements of the elderly since 1990. The fifth section discusses the rural–urban differentials. Throughout the paper, we will also discuss socio-economic and cultural explanations on the patterns and dynamic changes in Chinese family household and elderly living arrangements.

## 2 Data sources and the approach of analyses

The analyses presented in this article are mainly based on the micro sample data of the 2010, 2000, and 1990 censuses with a sample size of 1.34, 12.6 and 1.14 million persons, respectively (the sample fraction was one-per-thousand of the total population for 2010 and 1990 censuses and one-per-hundred for 2000 census).<sup>1</sup> Based on analyzing the 1953, 1964, and 1982 censuses data and the 1982 one-per-thousand fertility survey data, Coale (1984) concluded that the data passed a series of stringent tests of accuracy and consistency. Other scholars who have analyzed Chinese censuses and survey data have reached similar conclusions (Kannisto 1986; Lavelly 2001; Cai 2013). Underreporting of births has, however, become a problem in recent decades contributing to underestimation of not only fertility but also family household size. Based on sophisticated demographic analysis using the censuses and various other kinds of data, many scholars demonstrated that the overall fertility in China (especially in urban areas) has been far below the replacement level since the late 1990s (Zhang and Zhao 2006; Zhao and Chen 2011), and thus the effects of underreporting of births on statistics of magnitude of family household size may not be very large. Statistical officers and scholars in the field generally believe that census enumerations had become more difficult in the process of radical market economic reform mainly because many more people were moving around and the administrative system was not yet adapted to the tremendous changes. For example, based on post-census sampling surveys, the officially published net undercount rate of the 2000 census was 1.81%, in contrast to 0.6% in the 1990 census. However, the officially reported net undercount rate in the 2010 census was 0.12%, largely reduced compared to 2000 and 1990, perhaps due to the more mature administrative system adapted to the

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<sup>1</sup> Because of the huge sample size of the census micro data and we only use the aggregate measures in this article, we believe that it may not be necessary to perform statistical tests for evaluating the differentials across periods, sex, broad age groups of younger elderly and the oldest-old and rural–urban sectors.

market economic system (Cui et al. 2013). In general, the undercount rates in the contemporary Chinese censuses are not very high as compared to other countries (Zhao 2011). Nevertheless, we must keep the issue of undercount rate in mind, although it may not significantly affect our analysis on family household types and living arrangements of elderly who usually do not move around.

Note that the governmental socioeconomic planning and private business market analysis need not only detailed proportions distributions but also absolute numbers of households by types/sizes and elders by living arrangements. In some circumstances, the dynamic changes in absolute numbers may be of more practical usefulness than that of proportions. For example, as to be discussed in Sect. 4.3, the numbers of Chinese oldest-old aged 80+ living alone (who may likely need care services) in 2010 increased by 233.2% compared to 1990, in contrast to 21.8% increase in the proportion of oldest-old living alone among total population in the same period.

The statistical offices publish cross-tabulations of both proportions and absolute numbers based on the 100% census data, but these cross-tabulations only contain certain limited broad categories and do not have detailed information of households by types/sizes and contain very little information about elderly living arrangements. Thus, scholars rely on the data source of micro samples of the censuses to estimate the proportion distributions by detailed types of family households and elderly living arrangements, which are very useful for academic research and policy analysis. However, almost all of the previously published studies on family households and elderly living arrangements based on the census micro data included only proportion distributions, but did not contain detailed information about the cross-sectional and dynamic changes in absolute numbers. Our present study intends to contribute to this research field by estimating and discussing both detailed proportions and absolute numbers of family households by types/sizes and elderly population by living arrangements, based on the approach of integrated analyses on the census micro samples data and the official 100% cross-tabulations.

Note that it is not valid to simply multiply the detailed proportion distributions of family households and elderly living arrangements derived from the census micro sample data by the absolute numbers of the officially published very limited summary measures based on the 100% census data to estimate the corresponding detailed absolute numbers, as it would produce results which are not internally and logically consistent. Thus, to avoid the inconsistency, we apply the “BasePop” module of the ProFamy extended cohort-component model and its software program for households and elderly living arrangements projection (Zeng et al. 2014). Based on the detailed census micro samples data and the official 100% census data cross-tabulations of summary measures, the ProFamy “BasePop” module prepares the detailed 100% population distributions of households and living arrangements by household types/sizes, age/sex, co-residence and rural–urban residence in the census year as baseline for the family households projections, while ensuring the internal consistencies and accuracy. The ProFamy model and its technical modules (including BasePop) and procedures were described, numerically evaluated and discussed elsewhere (Zeng et al. 1998, 2014), and thus no need to be detailed here.

### 3 Changing family households, 1990–2010

#### 3.1 Chinese family household size is steadily decreasing

In 1990, four-person households constituted the largest share of all household categories by size, but it became the second largest in 2000 and the third in 2010. The five-or-more-person households account for 33% of the total family households in 1990 but sharply declined to 22% in 2000 and to 17% in 2010. Three-person households constituted the largest percentage share in both 2000 (30%) and 2010 (27%); whereas the two-person household became the second largest group of households in 2010 (23%). Large households were no longer popular, namely, the six-or-more-person households constituted 15.4% in 1990, and decreased to only 8.1% in 2000, and further down to 6.6% in 2010 (see Fig. 1).

The average family household size in China was 5.6 in 1930–1940 and 4.36 in 1982; it was reduced to 3.94 in 1990; further decreased to 3.45 in 2000 and then to 3.10 in 2010. Note that according to the Chinese census enumeration rules, the average family household sizes include the emigrants who left home for less than half a year for job-related reasons, and they were counted as home-household members; but these persons were not actually living in their home residence. Therefore, the actual average household size in China today would be even smaller than the published figures, if those who left home for less than half a year for finding a permanent job elsewhere were not counted as their hometown-household members. It is clear that Chinese family household size is steadily and substantially decreasing due to dramatically decreased fertility, the rapid industrialization, rise in education, and changes in people's attitudes, which tend to favor smaller family households.

Although Chinese family households maintain the typical Asian characteristics, namely, the three-generation extended family households remain a relatively large proportion of the household types (to be detailed in Sect. 3.5), Chinese family households in 2000–2010 were substantially smaller than those of many large Asian developing countries. For example, the average family household size in

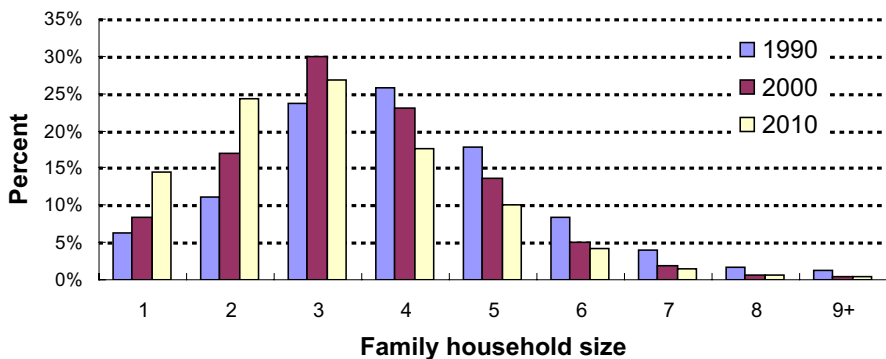


Fig. 1 Family household size distributions, rural–urban combined, 1990–2010, China

India and Indonesia in 2010 was 4.91 and 3.90 (per the Indian and Indonesian censuses), which is 58.9 and 26.2 percent larger than that in China in the same year, respectively.

### 3.2 Dramatically increased proportion of one-person and one-couple only households

One-person households in 2010, 2000 and 1990 accounted for 14.5, 8.3 and 6.3 percent of all households, respectively, representing a 75.1 and 131.8 percent increase in 2010 compared to 2000 and 1990, respectively.

The one-couple only family households accounted for 17.7% of all households in 2010, which was 2.7 times as large as that in 1990, and 1.4 times as large as that in 2000 (see Table 1). The average annual rate of increase in the percent of one-couple only households was 8.6% in the period between 1990 and 2010. This dramatic increase is likely due mainly to considerably more elderly couples living without their children (to be discussed later) and many couples delaying childbearing in 2010 as compared to 2000 and 1990; the increasing number of young couples in the cities who choose to remain childless (i.e., the so-called “Double Income and No Kids”) may also be a contributing factor. For example, based on the famous “Zero point index” surveys, the proportion of “Double Income and No Kids” family households in the largest Chinese cities of Beijing, Shanghai, Guanzhou and Wuhan increased from 1.1% in 1997 to 10.5% in 2004, and the average proportion among 20 Chinese cities (including middle and smaller size ones) was 6.5% in 2008.

However, the dramatically increased percentages Chinese one-person and one-couple only households are still much lower than those in Western countries. For example, the one-person and one-couple only households in the United States in 2010 constitute 26.7 and 27.2 percent of the total number of households, being 1.84, and 1.54 times as high as the Chinese ones, respectively. The main reasons why the percentages of one-person and one-couple only households in China are still much lower than those in Western countries are threefold. First, many fewer Chinese remain never-married for life. Second, most Chinese couples, especially about half of the population who live in rural areas, had their first birth earlier than their Western counterparts and much fewer couples remain permanently childless. Third, as discussed in greater details later, unlike the elderly in the Western countries who mostly do not live with their adult children, most Chinese elderly, especially those who have no spouse, live with their children, and such a tradition remains in place although it is declining.

### 3.3 Much faster increase in number of households than in population size

Figure 2 shows that the number of Chinese family households increased by 45.1% in 2010 compared to 1990, which is 2.5 times as large as that of the population growth (17.9%) during the same period. Figure 2 also demonstrates that the relative difference between the increase of households and population size in later period 2000–2010 was much larger than that in earlier period 1990–2000. More

**Table 1** Percent distributions of households by types, 1990–2010, China

	Rural and urban combined						Rural			Urban		
	1990	2000	2010	2010 vs. 1990 (%)	1990 (%)	2000 (%)	2010 (%)	2010 vs. 1990 (%)	1990 (%)	2000 (%)	2010 (%)	2010 vs. 1990 (%)
<b>One generation households</b>												
One person only	6.27	8.30	14.53	+131.8	5.87	6.93	12.44	+112.1	6.60	10.50	16.49	+149.7
One person and others	0.76	1.15	1.96	+158.4	0.52	0.86	0.70	+34.3	1.00	1.63	3.20	+219.6
Married couple	6.51	12.25	17.69	+171.8	5.86	10.43	16.63	+183.7	7.00	15.14	18.63	+166.1
Sub total of one generation	13.53	21.70	34.18	+152.5	12.25	18.21	29.77	+143.0	14.61	27.26	38.32	+162.3
<b>Two generation households</b>												
Married couple and children	58.56	52.75	41.63	-28.9	59.49	52.86	41.67	-30.0	57.78	52.58	41.61	-28.0
Lone mother and children	3.45	2.65	3.34	-3.1	3.09	2.74	3.39	+9.6	3.73	2.50	3.29	-11.8
Lone father and children	6.05	3.91	2.85	-53.0	6.01	4.12	2.48	-58.8	6.08	3.59	3.20	-47.4
Sub total of two generation	68.05	59.32	47.83	-29.7	68.60	59.72	47.54	-30.7	67.59	58.67	48.10	-28.8
<b>Three generation households</b>												
Married couple (mid-generation),	15.89	16.09	14.25	-10.3	16.94	18.84	18.07	+6.7	15.04	11.70	10.71	-28.8
Lone mother (mid-generation)	0.71	0.90	1.69	+138.5	0.52	1.00	2.15	+316.9	0.86	0.73	1.26	+46.5
Lone father (mid-generation)	1.82	2.00	2.06	+13.4	1.70	2.22	2.54	+49.8	1.91	1.64	1.62	-15.2
Sub total of three generation	18.41	18.98	18.00	-2.3	19.15	22.07	22.77	+18.9	17.80	14.07	13.58	-23.7
Average household size	3.46	3.46	3.07	-11.3	4.13	3.67	3.31	-19.9	3.80	3.11	2.83	-25.6

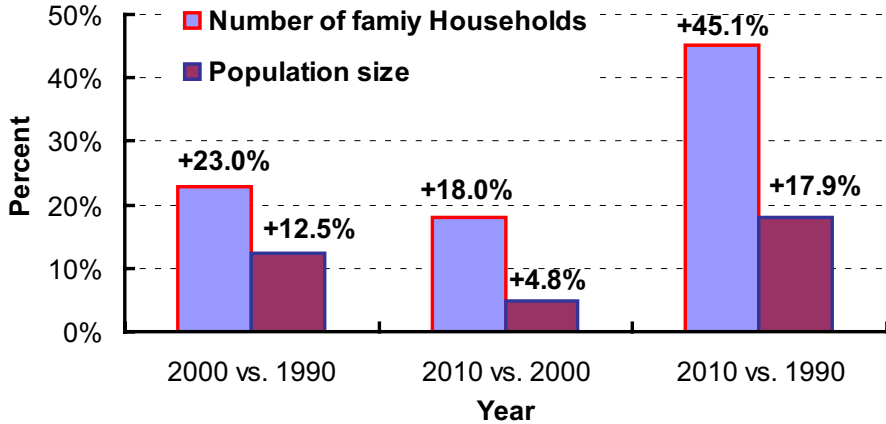


Fig. 2 Relative increases of number of households and population size, 1990–2010, China

specifically, the increase in the number of households was 3.8 times ( $= 18.0\%/4.8\%$ ) as large as that of population growth in 2000–2010, in contrast to the corresponding relative difference of 1.8 times ( $23.0\%/12.5\%$ ) in 1990–2000. The data shown in Fig. 2 clearly indicate that while population growth in China has slowed down substantially, the number of households is increasing rapidly because many Chinese people are forming one- or two-person and other kinds of small households.

The trends and pattern of much faster increase in number of households than the population growth have important implications in the current and future market demands for products and services, of which households (rather than individuals) are the consumption units, such as housing, home-based energy use, TV, refrigerators, washing machines, furniture and family-use vehicles. For example, there has been a rising consensus that households increase (rather than population growth) should be considered as one of the most important factors in analyses for home-based energy consumption (such as cooking, heating, cooling and private vehicles) and sustainable development (MacKellar et al. 1995; Liu et al. 2003). Even without population growth, energy consumption is driven by growing number of households resulting from smaller size of the residential units.

### 3.4 Substantially decreasing percent of two-generation nuclear family households

The proportions of nuclear family households of one-couple and children and single-parent and children households decreased by 28.9 and 33.7 percent respectively, from 1990 to 2010 (see Table 1). This substantial decrease in nuclear family households is due to the large increase in one-couple only and one-person households. The decreasing percentage of single-parent family households while the divorce rate in China is increasing (Wang et al. 2018; Fig. 1) may be due to that most divorces



involve couples who have no children or whose children have already left home, increased remarriage rates and the decreasing widowhood rate.

### 3.5 Changes in proportion of three-generation family households

While nuclear family households are the mainstream in Chinese society today, extended family households with three generations also constituted a relatively large proportion: 18.41, 18.98, and 18.00 percent in 1990, 2000, and 2010, respectively (see Table 1). The three-generation family household was the second largest family household type in 2010, while the most popular one was the two-generation nuclear households, and the third and fourth were one-couple-only and one-person-only households.

Note that the proportion of three-generation family households in rural areas had increased by 18.9% in 2010 as compared to 1990, but it had decreased by 23.7% in the urban areas in the same period, while the proportion of three-generation family households in rural and urban combined in slightly decreased by 2.3% in 1990–2010. We will discuss such interesting phenomenon and the dramatic rural–urban differentials in the Sect. 5.1.

## 4 Dynamics of elderly living arrangements, 1990–2010

Analysing the changes of elderly living arrangements would more directly and accurately reveal the changes in intergenerational co-residence between old parents and adult children than looking at only the proportions of three-generation versus nuclear family households as discussed above. Furthermore, we must pay special attention to the living arrangements of oldest-old aged 80+, who most likely need help of care in daily life and are increasing much faster than that of any other age groups. We, therefore, devote a substantial portion of this paper to analysing the dynamic changes in elderly living arrangements since 1990 and classify the elderly population into two broad groups of younger elders aged 65–79 and the oldest-old aged 80+.

### 4.1 Co-residence between old parents and adult children declined substantially

As shown in Tables 2, 3 and 4, the proportions of elderly living with children (including children and grandchildren hereafter, unless otherwise specified) have declined substantially in both periods 1990–2000 and 2000–2010. In the same time, the majority of Chinese elderly still live with their children, because children are currently the major source of old age care in Chinese society. Note that the decrease among the young-olds (Table 3) were faster than that among the oldest-olds (Table 4). More specifically, the proportions of younger male and female elderly aged 65–79 who co-resided with children in 2010 was lower by 28.5 and 21.3 percent respectively as compared to 1990 (Table 3); and the corresponding figures of

**Table 2** Percent distributions of living arrangements of elderly aged 65+, 1990–2010, China

	Rural and urban combined						Rural			Urban			
	1990		2010		2010 vs. 1990 (%)		1990	2000	2010	1990	2000	2010	2010 vs. 1990 (%)
<b>Ages 65+, males</b>													
Living alone	8.0	7.8	9.8	9.8	+22.9	8.5	7.9	10.9	6.4	7.5	8.4	+29.7	
With spouse only	23.5	33.4	40.4	40.4	+72.3	21.8	30.2	37.5	28.6	39.7	44.5	+55.6	
Sub total of not living with children	31.5	41.2	50.3	50.3	+59.7	30.3	38.1	48.4	35.0	47.2	52.8	+50.9	
Married, with children	42.5	38.0	33.8	33.8	-20.3	42.3	39.0	33.5	43.1	36.1	34.3	-20.3	
Not-married with children	23.5	18.8	13.9	13.9	-40.8	25.1	20.8	16.2	18.6	14.8	10.7	-42.2	
Sub total of living with children	66.0	56.8	47.8	47.8	-27.6	67.4	59.8	49.7	61.7	50.9	45.1	-26.9	
Institutionalized	1.1	0.8	0.9	0.9	-23.2	0.8	0.6	0.5	2.2	1.1	1.3	-41.6	
With others, not with spouse/child	1.4	1.2	1.1	1.1	-22.2	1.6	1.5	1.3	1.1	0.8	0.8	-25.1	
Ages 65+, males total	100	100	100	100		100	100	100	100	100	100		
<b>Ages 65+, females</b>													
Living alone	10.6	9.7	13.4	13.4	+26.6	10.3	8.7	12.5	11.4	11.7	14.6	+28.2	
With spouse only	14.2	20.4	25.9	25.9	+82.5	14.1	18.6	24.0	14.6	24.0	28.6	+96.3	
Sub total of not living with children	24.8	30.0	39.3	39.3	+58.6	24.4	27.2	36.5	26.0	35.7	43.2	+66.4	
Married, with children	22.8	28.5	26.4	26.4	+15.8	22.8	28.8	26.9	22.9	28.0	25.7	+12.3	
Not-married with children	51.1	40.6	33.3	33.3	-34.8	51.7	43.2	35.8	49.2	35.2	29.7	-39.6	
Sub total of living with children	73.9	69.1	59.7	59.7	-19.2	74.5	72.0	62.8	72.1	63.2	55.4	-23.1	
Institutionalized	0.4	0.3	0.5	0.5	+19.6	0.3	0.2	0.2	0.8	0.5	0.8	-3.8	
With others, not with spouse/child	1.0	0.6	0.6	0.6	-40.5	0.9	0.6	0.5	1.2	0.6	0.6	-48.2	
Ages 65+, females total	100	100	100	100		100	100	100	100	100	100		
<b>Ages 65+, both sexes</b>													
Living alone	9.4	8.8	11.7	11.7	+24.3	9.5	8.3	11.7	9.1	9.7	11.6	+27.3	
With spouse only	18.4	26.5	32.9	32.9	+78.6	17.6	24.1	30.5	21.0	31.5	36.2	+72.4	
Sub total of not living with children	27.8	35.3	44.6	44.6	+60.3	27.1	32.4	42.2	30.1	41.2	47.8	+58.7	

Table 2 (continued)

	Rural and urban combined						Rural			Urban		
	1990	2000	2010	2010 vs. 1990 (%)	1990	2000	2010	2010 vs. 1990 (%)	1990	2000	2010	2010 vs. 1990 (%)
Married, with children	31.8	33.0	30.0	-5.5	31.6	33.6	30.1	-4.8	32.2	31.9	29.8	-7.3
Not-married with children	38.6	30.3	24.0	-37.9	39.6	32.7	26.4	-33.5	35.1	25.5	20.6	-41.3
Sub total of living with children	70.3	63.3	53.9	-23.3	71.3	66.3	56.5	-20.8	67.3	57.3	50.4	-25.0
Institutionalized	0.7	0.5	0.7	-8.4	0.5	0.4	0.4	-20.5	1.5	0.8	1.0	-29.7
With others, not with spouse/child	1.2	0.9	0.8	-29.5	1.2	1.0	0.9	-22.6	1.1	0.7	0.7	-37.4
Ages 65+, both sexes total	100	100	100		100	100	100		100	100	100	

Table 3 Percent distributions of living arrangements of young-old aged 65–79, 1990–2010, China

	Rural and urban combined						Rural			Urban			
	1990		2010		2010 vs. 1990 (%)		1990	2000	2010	1990	2000	2010	2010 vs. 1990 (%)
<b>Ages 65–79, males</b>													
Living alone	7.5	7.4	8.9	8.9	+18.7	8.0	7.6	10.0	7.0	7.3	7.3	+22.8	
With spouse only	24.1	35.0	42.4	42.4	+75.9	22.4	31.8	39.8	29.4	41.2	46.2	+57.2	
Sub total of not living with children	31.6	42.4	51.3	51.3	+62.3	30.5	39.4	49.8	35.3	48.2	53.5	+51.4	
Married, with children	44.5	39.4	35.7	35.7	-19.8	44.3	40.4	35.3	45.1	37.3	36.2	-19.6	
Not-married with children	21.4	16.3	11.1	11.1	-48.2	23.0	18.1	13.0	16.3	12.7	8.3	-49.2	
Sub total of living with children	65.9	55.6	46.7	46.7	-29.0	67.3	58.5	48.3	61.4	50.0	44.5	-27.5	
Institutionalized	1.1	0.7	0.8	0.8	-28.5	0.7	0.6	0.5	2.2	1.1	1.2	-46.7	
With others, not with spouse/child	1.4	1.2	1.1	1.1	-19.1	1.5	1.5	1.3	1.0	0.8	0.8	-20.8	
Ages 65–79, males total	100	100	100	100		100	100	100	100	100	100		
<b>Ages 65–79, females</b>													
Living alone	9.8	9.2	12.0	12.0	+21.9	9.5	8.2	11.3	10.9	11.1	12.9	+17.8	
With spouse only	15.9	23.0	29.7	29.7	+86.6	15.7	21.1	27.6	16.5	27.0	32.5	+97.0	
Sub total of not living with children	25.7	32.2	41.7	41.7	+61.9	25.2	29.3	38.9	27.5	38.0	45.4	+65.4	
Married, with children	25.8	31.7	30.2	30.2	+17.2	25.7	32.1	31.0	26.1	30.7	29.1	+11.5	
Not-married with children	47.3	35.5	27.3	27.3	-42.3	48.1	38.0	29.4	44.6	30.5	24.4	-45.3	
Sub total of living with children	73.1	67.1	57.5	57.5	-21.3	73.8	70.1	60.4	70.8	61.1	53.5	-24.4	
Institutionalized	0.3	0.2	0.3	0.3	+6.3	0.2	0.1	0.2	0.7	0.4	0.5	-21.2	
With others, not with spouse/child	0.9	0.5	0.5	0.5	-43.6	0.8	0.5	0.5	1.1	0.5	0.5	-51.6	
Ages 65–79, females total	100	100	100	100		100	100	100	100	100	100		
<b>Ages 65–79, both sexes</b>													
Living alone	8.7	8.3	10.4	10.4	+19.7	8.8	7.9	10.7	8.5	9.1	10.1	+18.6	
With spouse only	19.8	28.8	36.0	36.0	+82.2	18.9	26.3	33.7	22.7	34.0	39.2	+73.0	
Sub total of not living with children	28.5	37.2	46.5	46.5	+63.1	27.6	34.2	44.4	31.2	43.0	49.4	+58.1	

Table 3 (continued)

	Rural and urban combined						Rural			Urban		
	1990	2000	2010	2010 vs. 1990 (%)	2010 vs. 1990 (%)	2010 vs. 1990 (%)	1990	2000	2010	1990	2000	2010 vs. 1990 (%)
Married, with children	34.6	35.4	32.9	-4.7	34.4	36.1	33.1	-3.5	35.2	34.0	32.6	-7.4
Not-married with children	35.1	26.1	19.2	-45.2	36.4	28.4	21.2	-41.6	31.1	21.7	16.5	-47.0
Sub total of living with children	69.7	61.5	52.2	-25.1	70.8	64.5	54.4	-23.1	66.3	55.6	49.1	-25.9
Institutionalized	0.7	0.5	0.6	-18.1	0.5	0.4	0.4	-23.7	1.4	0.7	0.9	-39.7
With others, not with spouse/child	1.1	0.9	0.8	-27.6	1.1	1.0	0.9	-20.6	1.1	0.6	0.7	-37.2
Ages 65-79, both sexes total	100	100	100		100	100	100		100	100	100	

**Table 4** Percent distributions of living arrangements of oldest-old aged 80+, 1990–2010, China

	Rural and urban combined						Rural			Urban		
	1990		2010		2010 vs. 1990 (%)		1990	2010	2010 vs. 1990 (%)	1990	2010	2010 vs. 1990 (%)
	100	100	10.6	15.0	+16.8		13.4	10.2	+18.0	11.1	14.0	+25.6
<b>Ages 80+, males</b>												
Living alone	12.9	10.8	15.0	15.0	+16.8	13.4	10.2	15.8	+18.0	11.1	14.0	+25.6
With spouse only	17.1	20.7	29.3	29.3	+71.2	15.9	17.8	24.7	+55.6	21.0	35.4	+69.1
Sub total of not living with children	30.0	31.4	44.3	44.3	+47.9	29.3	28.0	40.5	+38.4	32.1	49.4	+54.0
Married, with children	23.0	27.0	23.8	23.8	+3.1	22.8	27.8	23.5	+3.2	23.9	24.1	+0.9
Not-married with children	44.0	39.4	29.6	29.6	-32.6	45.1	42.2	34.0	-24.7	40.4	33.5	-23.9
Sub total of living with children	67.0	66.4	53.4	53.4	-20.3	67.9	69.9	57.5	-15.3	64.3	58.9	-25.4
Institutionalized	1.2	0.9	1.2	1.2	+2.5	0.9	0.6	0.7	-17.4	2.1	1.6	-11.5
With others, not with spouse/child	1.8	1.3	1.0	1.0	-42.5	1.9	1.5	1.2	-35.3	1.5	0.9	-47.7
Ages 80+, males total	100	100	100	100		100	100	100		100	100	
<b>Ages 80+, females</b>												
Living alone	15.1	12.4	19.1	19.1	+26.8	15.4	11.0	17.1	+10.9	14.1	15.4	+58.4
With spouse only	4.0	6.4	10.6	10.6	+167.1	4.0	5.9	10.0	+147.6	3.8	7.6	+206.5
Sub total of not living with children	19.1	18.8	29.7	29.7	+56.0	19.5	16.8	27.1	+39.1	17.8	23.0	+33.8
Married, with children	5.2	12.2	11.1	11.1	+113.9	5.3	11.7	11.3	+114.9	5.1	13.3	+115.3
Not-married with children	73.7	67.4	57.4	57.4	-22.1	73.5	70.2	60.4	-17.7	74.2	61.4	-29.0
Sub total of living with children	78.9	79.5	68.5	68.5	-13.1	78.7	81.8	71.7	-8.9	79.3	74.6	-19.8
Institutionalized	0.7	0.7	0.9	0.9	+30.4	0.5	0.4	0.4	-17.5	1.4	1.3	+23.5
With others, not with spouse/child	1.4	1.0	0.9	0.9	-39.2	1.4	0.9	0.8	-39.3	1.5	1.2	-41.2
Ages 80+, females total	100	100	100	100		100	100	100		100	100	
<b>Ages 80+, both sexes</b>												
Living alone	14.3	11.8	17.4	17.4	+21.8	14.7	10.7	16.6	+12.7	13.1	14.1	+42.7
With spouse only	8.6	11.8	18.4	18.4	+113.8	8.3	10.4	15.9	+93.1	9.7	14.9	+126.7
Sub total of not living with children	22.9	23.6	35.8	35.8	+56.4	23.0	21.1	32.5	+41.6	22.7	28.9	+78.6

Table 4 (continued)

	Rural and urban combined						Rural			Urban			
	1990		2010		2010 vs. 1990 (%)		1990	2000	2010	1990	2000	2010	2010 vs. 1990 (%)
Married, with children	11.5	17.8	16.4	16.4	+42.6	11.5	17.8	16.2	+41.2	11.6	17.9	16.7	+44.2
Not-married with children	63.2	56.7	45.8	45.8	-27.5	63.4	59.6	49.8	-21.5	62.5	50.7	40.1	-35.9
Sub total of living with children	74.7	74.6	62.2	62.2	-16.7	74.9	77.3	66.0	-11.9	74.1	68.6	56.7	-23.4
Institutionalized	0.9	0.8	1.0	1.0	+20.2	0.6	0.5	0.5	-14.5	1.7	1.4	1.8	+9.1
With others, not with spouse/child	1.6	1.1	0.9	0.9	-39.8	1.6	1.1	1.0	-36.4	1.5	1.1	0.8	-43.9
Ages 80+, both sexes total	100	100	100	100		100	100	100		100	100	100	

decrease among male and female oldest-old (aged 80+) were 20.3 and 13.1 percent (Table 4). Among the male and female elderly populations aged 65+, the proportion of those living with children dropped by 27.6 and 19.2 percent respectively in 2010 as compared to 1990 (Table 2). These data indicate that the prevalence of the traditional co-residence between elderly parents and adult children has declined substantially from 1990 to 2010, and the decrease was considerably more profound among young-olds than among the oldest-olds, and the decrease was substantially faster among males than females. Such trends and patterns may be due to younger and healthier elderly parents' increasing preference to live independently, and due to more adult children migrated away from their elderly parents for job-related reasons. It is clear that the female elderly (either young-olds or oldest-olds) are much more likely to live with their adult children (see Tables 2, 3, 4) than male elderly; and this gender differentials have increased in 2000–2010 as compared to 1990. This is because elderly women are more likely to be widowed and economically dependent and they are also more likely prefer and to be requested by their children to live together to take care of grandchildren.

#### **4.2 Proportion of living alone and living with spouse only among Chinese elderly substantially increased**

The proportion of elderly aged 65+ who live alone has declined by 6.4% from 1990 to 2000, but increased by 33.0% in 2010 compared to 2000. In the 20-year period from 1990 to 2010, the proportion of elderly living alone has increased by 24.3% (Table 2). The relative increase of young-olds who lived alone was substantially faster than that for the oldest-olds, and the relative increase of female young-old and female oldest-old who lived alone was substantially faster than that of their male counterparts (Tables 3, 4).

The relative increase in the proportion of elderly who lived with their spouse only for the oldest-olds (113.8%) in the period of 1990–2010 was much faster than that for the young-olds (82.2%), especially so for the female oldest-olds (167.1% increase) versus female young-old (86.6% increase). The large increase in the proportion of elderly who lived with their spouse only in 1990–2010 was likely because of the substantial decline in the proportion of elderly who lived with their adult children due to increase in preference for independent living, increased mobility of their children, decline in mortality of elders' spouses, and rise in remarriage rates among the elderly. The increase in remarriage rates among the elderly is a result of social reform and the progress of mate-matching services in the last two decades in China. The reform aimed to protect elders' rights, including the right to remarry, which in traditional Chinese society were often violated by the intervention of children and other family members. While the proportion of the elderly who live with a spouse only in China has increased substantially in the past two decades, it is still much lower than that in the Western countries, because the proportion of Chinese elderly who live with children is much higher than that in the Western countries (Zeng et al. 2013).

Note that both younger elderly women and oldest-old women are much more likely to be widowed and thus to live without a spouse, with children only or even



to live alone (see Tables 3, 4). On the other hand, elderly women are economically more dependent. Therefore, the disadvantages of women in marital life and independent family household living arrangements are substantially more serious than those of men at old ages, and the gender differentials tend to increase with age.

### 4.3 The relative increases in absolute numbers versus proportions of elderly by living arrangements

It is interesting to note that, while the proportions of elderly who live alone and live with a spouse only among elders aged 65+ in 2010 has increased by 24.3 and 78.6 percent since 1990, respectively (see Table 2), the absolute numbers of elders aged 65+ who lived alone and lived with a spouse only have increased by 134.7 and 237.3 percent in the same period (see Appendix Table 5). It is even more remarkable to note that the numbers of oldest-old who lived alone and lived with a spouse only have increased by 233.2 and 484.7 percent from 1990 to 2010 (see Appendix Table 7), in contrast, the increase in the proportions in the same period was 21.8 and 113.8 percent (see Table 4). The much larger relative increases in the absolute numbers of the elderly (especially the oldest-old) who live alone or with spouse only than the corresponding proportions are mainly due to the rapid population aging in China characterized by a rapid increase of the numbers of elderly especially the oldest-olds as the later and larger cohorts become elderly and oldest-old (ref. discussions in Sect. 2). The policy makers and business managers need to draw special attentions to such trends of dramatic increase in the absolute numbers of elderly (especially the oldest-olds) who live alone or live with spouse only (rather than looking at the proportions only) in their analysis, so as to appropriately plan for the social service programs and commercial market products.

## 5 The rural–urban differentials

### 5.1 Rural–urban differentials in family household structure

The average sizes of family households in Chinese rural and urban areas in 2010 were 3.3 and 2.8, respectively; the average household size in urban area dropped by 25.6% from 1990 to 2010, in contrast to the 19.9% decrease in the rural area in the same period (Table 1). As shown in Fig. 3, the major difference of the percentage distributions of households by size between rural and urban areas is that the percent of small households of 1 or 2–3 persons in urban area are much higher than those in rural areas, while the opposite was true for the larger household of 4–5 and 6+ persons. The rural–urban differences tend to be larger in the later years of 2010 and 2000 compared to 1990. The main factors for such substantial differentials of family household sizes between the Chinese urban and rural areas include the much lower fertility in urban than in rural areas, and the large rural–urban family structural differentials to be discussed below.

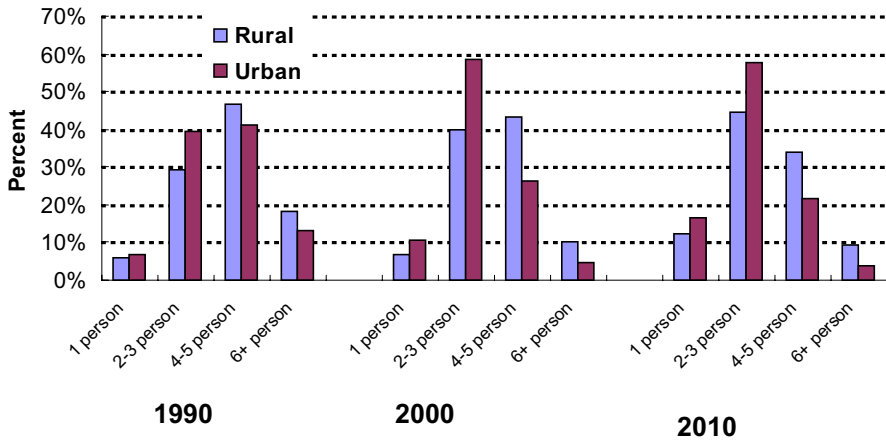


Fig. 3 Rural-urban comparisons of household size distributions, 1990–2010, China

The one-person households and one-couple only households were substantially less prevalent in rural areas than that in the urban areas as revealed in all three censuses conducted in 1990, 2000 and 2010 (see Table 1). The proportion of one-person only households has increased by 149.7% in the urban areas from 1990 to 2010, as compared to 112.1% increase in the rural areas. The higher and faster increase of one-person households in the urban areas may be a result of a higher divorce rate and that more not-married elderly prefer to have independent living or shortage or mobility of children in the cities than that in the countryside.

The proportion of one person and other(s) households in the urban area more than tripled in 2010 (3.2%) compared to 1990 (1.0%), while it has increased by 34.3% only in the rural areas. Data (not shown) indicate that almost all of the tremendous increase in proportion of households with one person and other(s) in 1990–2010 were from households with a reference person aged less than 65. Thus, we believe that this is mainly due to the fact that much more young or middle-age urban residents who do not live with spouse and children but share an apartment with the roommate(s).

The three-generation family households constituted 22.8% in the rural areas in 2010, in contrast to 13.6% in urban areas in the same year; these data indicate that the prevalence of three-generation family households in rural area was 1.7 times as high as that in the urban areas (see Table 1). It was interesting to note that, compare to 1990, the proportion of three-generation family households in 2010 increased by 18.9% in rural area, while it was decreased by 23.7% in the urban area (Table 1).

Was the family household structure in the rural areas in China in 2010 more traditional than that in 1990? This seems unlikely because it is contradictory to the expected attitudes and behavior changes induced by the rapid socioeconomic development and the opening door to the outside world that have been occurring in China including rural and urban areas in the past four decades. Moreover, as shown in Table 2, the co-residence between old parents and adult children in rural areas has also declined substantially during the period of 1990–2010. Therefore, we believe that, while the

proportion of two-generation nuclear family households has dropped substantially in rural areas (see Table 1), the considerable increase in the proportion of the three-generation family households in the rural areas in 2010 compared to 1990 was mainly due to the demographic effects of a sharp decline in fertility. More specifically, given that most rural elderly parents still live with one married child (although declining), the adult children who were born after the early 1970s and have much fewer siblings due to a large decline in fertility have a smaller chance of moving out of the parental home to form an independent nuclear family household (Zeng 1986, 1991), and thus resulted in the considerable structural increase in the proportion of three-generation households in rural China in 1990–2010. However, while rural fertility is still slightly above or around replacement level, fertility level in Chinese urban area declined to below replacement level in late 1970s and continued to decline or sustained at a very low level since then. As modeled and numerically simulated in Zeng (1986, 1991), if fertility continues to fall after reaching the replacement level, a further reduction in the birth rate will reduce the proportion of three-generation households because it will be impossible for some elderly parents to live with their married child even if they wish to do so due to the shortage of children. Of course, in addition to such impacts of far-below-replacement fertility level in the urban areas, largely changing attitudes concerning intergenerational co-residence and increasing job mobility of adult children are also the major factors contributing to substantially decreased proportion of three-generation households in urban China in 2010 compared to 1990.

Clearly, while family households have been radically changing in both rural and urban areas, rural Chinese family households are more traditional than are their urban counterparts, because the socio-economic development level and changes in people's attitudes about multi-generational co-residence is substantially slower in rural than in urban areas, as well as due to the different demographic effects of fertility decline between rural and urban areas.

## 5.2 Rural–urban differentials in elderly living arrangements and its dynamic changes

The proportions of elderly men who live with children in rural and urban areas in 2010 were 49.7 and 45.1 respectively, and the corresponding figures for women were 62.8 and 55.4, respectively (see Table 2). Obviously, the rural elderly are more likely to live with their children than their urban counterparts do. Moreover, the proportion of elderly living with children has declined at a slower speed in rural (20.8%) than in urban areas (25.0%) from 1990 to 2010.

The proportion of urban elderly women living alone is higher than that in rural areas by 2.1 percentage points. But the proportion of urban elderly men living alone is 2.5 percentage points lower than that in rural areas (see Table 2). In the urban area, there was a 25.6% increase of male oldest-old who lived alone, in contrast to 18.0% of increase of rural male oldest-old who lived alone between 1990 and 2010 (Table 4). In 2010, about one-fifth of female oldest-old living alone, representing a 58.4% increase compared to that in 1990 in the urban areas, in contrast to 15.4% of female oldest-old living alone in 2010 with a 10.9% increase in the rural areas in the period of

1990–2010 (Table 4). The rural–urban and gender differences in the proportions of oldest-old living alone are enormous, and the largely increased female oldest-old living alone in urban areas deserve attentions from the government and society.

The proportions of urban elderly men and women who lived with a spouse only in 2010 were higher than those of their rural counterparts by 7.0 and 4.6 percentage points respectively, and the higher widowhood rates and lower remarriage rates in rural areas than in urban areas may have contributed to this phenomenon.

Tables 5, 6 and 7 in the [Appendix](#) demonstrated the rural–urban differences in relative increases of absolute numbers of old adults by living arrangements, which are dramatically larger than the rural–urban difference in changes in the proportions of the different living arrangements of elderly presented in Tables 2, 3 and 4.

## 6 Conclusions

This article presents analyses on dynamics of family households and elderly living arrangements in China mainly based on the micro data of 2010, 2000 and 1990 censuses. We demonstrate and discuss the trends and rural–urban differentials of largely declined household size, quickly increasing one-person and one-couple-only households, substantially increased proportions of elderly living alone or with spouse only. It is strikingly interesting that proportion of three-generation family households increased by 18.9% in rural area but decreased by 23.7% in urban areas in 2010 compared to 1990, due to rural–urban differences in demographic effects of large fertility decline and socioeconomic/attitude changes. We also present and discuss two interesting demographic phenomenon which are relatively overlooked in the literature. First, increase in number of households is much larger than population growth, due to shrinking of the household, decompositions of larger families into smaller ones, and very much slowed-down population growth. Second, increases in numbers of elderly (especially oldest-old) who live alone or with spouse only are dramatically larger than the increase in the corresponding proportions, due to the effects of rapid population aging, while later and larger birth cohorts become old. Such trends have important implications for the analyses on the current and future market demands of the products and services, of which households are the consumption units, such as home-based energy use, housing, TV, refrigerators, washing machines, furniture, family-use vehicles and health care services. We recommend that the studies on home-based energy use and sustainable development should be based on analyses of family household dynamics rather than population growth.

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## Appendix

See Tables 5, 6 and 7.

**Table 5** Numbers of elderly aged 65+ by living arrangements (unit: 10,000), 1990–2010, China

	Rural and urban combined						Rural						Urban							
	1990		2010		2010 vs. 1990 (%)		1990		2010		2010 vs. 1990 (%)		1990		2010		2010 vs. 1990 (%)			
<b>Ages 65+, males</b>	230	325	560	145.3	184	219	350	+89.8	45	106	210	+366.5	199	559	1117	+459.8	244	665	1327	+442.7
Living alone	672	1394	2321	+243.9	473	835	1204	+154.6	301	508	862	+186.5	130	208	270	+107.8	431	717	1132	+162.8
With spouse only	902	1718	2881	+218.7	658	1053	1554	+136.3	16	16	18	+6.3	7.6	11	21	+169.4	698	1409	2512	+259.6
Sub total of not living with children	1217	1585	1937	+59.1	916	1077	1075	+17.4	270	270	433	+60.0	93	180	397	+327.6	118	369	775	+554.8
Married, with children	674	784	789	+18.2	544	575	519	-4.5	639	849	1261	+97.4	211	549	1173	+455.1	186	431	697	+274.6
Not-married with children	1891	2369	2726	+44.5	1460	1652	1595	+9.2	597	898	931	+56.0	400	541	807	+101.6	586	972	1504	+156.4
Sub total of living with children	32	32	50	+53.4	16	16	18	+6.3	1951	2246	2171	+11.3	6.5	7.7	21	+221.0	6.5	7.7	21	+221.0
Institutionalized	41	52	63	+55.3	34	41	42	+26.4	24	17	19	-19.8	10	9.2	16	+72.7	10	9.2	16	+72.7
With others, not with spouse/child	2866	4171	5721	+99.6	2168	2762	3209	+48.0	2620	3119	3458	+32.0	814	1537	2714	+233.5	814	1537	2714	+233.5
<b>Ages 65+, females</b>	363	450	830	+127.7	270	270	433	+60.0	270	270	433	+60.0	93	180	397	+327.6	93	180	397	+327.6
Living alone	487	948	1604	+228.1	369	579	828	+124.8	369	579	828	+124.8	118	369	775	+554.8	118	369	775	+554.8
With spouse only	850	1398	2434	+185.2	639	849	1261	+97.4	639	849	1261	+97.4	211	549	1173	+455.1	211	549	1173	+455.1
Sub total of not living with children	783	1329	1628	+108.2	597	898	931	+56.0	597	898	931	+56.0	186	431	697	+274.6	186	431	697	+274.6
Married, with children	1754	1889	2047	+17.2	1354	1348	1239	-8.5	1354	1348	1239	-8.5	400	541	807	+101.6	400	541	807	+101.6
Not-married with children	2537	3218	3674	+45.2	1951	2246	2171	+11.3	1951	2246	2171	+11.3	586	972	1504	+156.4	586	972	1504	+156.4
Sub total of living with children	13	14	29	+115.0	6.5	5.6	7.9	+20.8	6.5	5.6	7.9	+20.8	6.5	7.7	21	+221.0	6.5	7.7	21	+221.0
Institutionalized	33	27	35	+7.0	24	17	19	-19.8	24	17	19	-19.8	10	9.2	16	+72.7	10	9.2	16	+72.7
With others, not with spouse/child	3433	4657	6172	+79.8	2620	3119	3458	+32.0	2620	3119	3458	+32.0	814	1537	2714	+233.5	814	1537	2714	+233.5
<b>Ages 65+, both sexes</b>	592	774	1389	+134.7	455	488	783	+71.9	455	488	783	+71.9	138	286	607	+340.0	138	286	607	+340.0
Living alone	1160	2342	3927	+237.3	842	1414	2033	+141.6	842	1414	2033	+141.6	318	928	1893	+495.7	318	928	1893	+495.7
With spouse only	1752	3117	5316	+202.6	1296	1902	2816	+117.2	1296	1902	2816	+117.2	456	1214	2500	+448.6	456	1214	2500	+448.6
Sub total of not living with children																				

Table 5 (continued)

	Rural and urban combined						Rural			Urban		
	1990	2000	2010	2010 vs. 1990 (%)	1990	2000	2010	2010 vs. 1990 (%)	1990	2000	2010	2010 vs. 1990 (%)
	Married, with children	2000	2914	3566	+78.3	1513	1975	2007	+32.6	487	939	1559
Not-married with children	2428	2673	2834	+17.3	1898	1923	1758	-7.4	530	750	1076	+102.9
Sub total of living with children	4428	5587	6399	+44.9	3411	3898	3764	+10.4	1017	1689	2635	+159.1
Institutionalized	45	45	79	+72.9	23	22	25	+10.7	22	24	54	+142.9
With others, not with spouse/child	74	79	98	+33.1	57	58	61	+7.8	17	20	37	+116.4
Ages 65+, both sexes total	6299	8827	11,893	+88.8	4788	5881	6667	+39.3	1512	2947	5225	+245.6

**Table 6** Numbers of young-old aged 65–79 by living arrangements (unit: 10,000), 1990–2010, China

	Rural and urban combined						Rural						Urban					
	1990		2010		2010 vs. 1990 (%)		1990		2010		2010 vs. 1990 (%)		1990		2010		2010 vs. 1990 (%)	
<b>Ages 65–79, males</b>																		
Living alone	2790	3992	5271	5271	+89.1		2120	2640	3001	3001	+41.5	669	1352	2270	2270	+239.2		
With spouse only	626	1300	2062	2062	+228.2		441	779	1085	1085	+146.3	186	520	977	977	+426.5		
Sub total of not living with children	821	1576	2490	2490	+202.9		598	967	1359	1359	+127.3	223	609	1131	1131	+407.0		
Married, with children	1155	1463	1729	1729	+49.7		870	991	962	962	+10.7	285	471	767	767	+169.1		
Not-married with children	555	604	531	531	-3.4		452	445	356	356	-21.3	103	160	175	175	+70.1		
Sub total of living with children	1709	2067	2260	2260	+32.4		1321	1435	1318	1318	-0.3	388	631	942	942	+142.8		
Institutionalized	29	27	39	39	+33.4		15	14	14	14	-4.1	14	14	25	25	+78.4		
With others, not with spouse/child	36	46	54	54	+51.0		30	36	36	36	+23.0	6.6	10	17	17	+165.2		
Ages 65–79, males total	5190	7432	9686	9686	+86.6		3927	4905	5455	5455	+38.9	1263	2527	4231	4231	+235.0		
<b>Ages 65–79, females</b>																		
Living alone	288	358	594	594	+105.5		213	214	310	310	+45.8	75	144	284	284	+278.1		
With spouse only	467	901	1475	1475	+214.5		354	550	757	757	+114.2	114	351	718	718	+532.2		
Sub total of not living with children	755	1258	2070	2070	+173.0		567	764	1068	1068	+88.4	189	495	1002	1002	+430.9		
Married, with children	757	1238	1493	1493	+97.5		577	839	851	851	+47.3	180	400	643	643	+257.8		
Not-married with children	1388	1388	1346	1346	-2.7		1082	991	808	808	-25.3	307	396	538	538	+75.4		
Sub total of living with children	2146	2626	2839	2839	+32.7		1659	1830	1658	1658	-0.1	486	796	1181	1181	+142.7		
Institutionalized	9.4	8.2	17	17	+79.3		4.7	3.7	5.3	5.3	+11.4	4.7	4.7	12.0	12.0	+152.9		
With others, not with spouse/child	26	20	25	25	-5.0		18	13	13	13	-29.3	7.6	6.5	12	12	+55.4		
Ages 65–79, females total	2937	3912	4951	4951	+68.6		2249	2610	2744	2744	+22.0	687	1302	2206	2206	+221.0		
<b>Ages 65–79, both sexes</b>																		
Living alone	483	633	1022	1022	+111.9		370	401	584	584	+57.8	113	232	438	438	+288.7		
With spouse only	1093	2200	3539	3539	+222.6		794	1329	1843	1843	+132.1	299	871	1696	1696	+466.8		
Sub total of not living with children	1576	2834	4561	4561	+188.7		1164	1730	2427	2427	+108.5	412	1104	2134	2134	+418.1		

Table 6 (continued)

	Rural and urban combined				Rural				Urban			
	1990	2000	2010	2010 vs. 1990 (%)	1990	2000	2010	2010 vs. 1990 (%)	1990	2000	2010	2010 vs. 1990 (%)
Married, with children	1912	2701	3223	+68.6	1447	1830	1813	+25.3	464	871	1410	+203.5
Not-married with children	1943	1992	1875	-3.0	1534	1436	1163	-24.2	410	556	712	+73.7
Sub total of living with children	3855	4693	5097	+32.5	2981	3266	2976	-0.2	874	1427	2122	+142.7
Institutionalized	38	36	56	+45.0	19	18	19	-0.9	19	18	37	+97.7
With others, not with spouse/child	62	65	79	+28.1	48	49	50	+3.2	14	16	29	+105.7
Ages 65-79, both sexes total	5531	7627	9794	+77.1	4213	5063	5472	+29.9	1319	2565	4322	+227.6



**Table 7** Numbers of oldest-old aged 80+ by living arrangements (unit: 10,000), 1990–2010, China

	Rural and urban combined						Rural			Urban		
	1990		2010		2010 vs. 1990 (%)		1990	2010	2010 vs. 1990 (%)	1990	2010	2010 vs. 1990 (%)
<b>Ages 80+, males</b>												
Living alone	35	49	131	+278.3	27	32	76	+177.9	7.4	17	55	+646.5
With spouse only	46	94	259	+454.2	32	55	119	+266.6	14	39	140	+904.9
Sub total of not living with children	81	143	391	+378.9	60	87	195	+226.0	21	56	196	+815.1
Married, with children	62	123	209	+233.8	47	86	113	+143.1	16	37	95	+499.7
Not-married with children	119	179	258	+118.2	92	130	164	+77.5	27	49	94	+250.7
Sub total of living with children	182	302	467	+157.9	139	216	277	+99.5	43	85	190	+343.1
Institutionalized	3.3	4.0	11	+231.8	1.8	1.7	4	+94.5	1.4	2.3	7.1	+425.8
With others, not with spouse/child	4.9	6.0	9.1	+86.1	3.9	4.6	6.0	+52.3	1.0	1.3	3.1	+210.7
<b>Ages 80+, males total</b>	271	455	877	+223.7	204	310	482	+135.6	67	145	396	+494.4
<b>Ages 80+, females</b>												
Living alone	75	92	235	+211.9	57	56	122	+113.7	18	36	113	+536.5
With spouse only	20	48	130	+557.0	15	30	71	+377.3	4.7	18	58	+1131.8
Sub total of not living with children	95	140	365	+283.8	72	86	193	+168.2	22	54	171	+661.8
Married, with children	26	91	136	+426.1	19	59	81	+314.3	6.4	31	55	+765.3
Not-married with children	366	502	699	+91.7	272	357	431	+58.6	94	145	268	+185.5
Sub total of living with children	392	592	835	+113.7	291	416	512	+75.7	100	176	323	+222.5
Institutionalized	3.5	5.1	11	+220.8	1.7	2.0	2.7	+59.1	1.8	3.0	9.1	+396.4
With others, not with spouse/child	7.0	7.5	10	+49.6	5.0	4.7	5.9	+17.1	1.9	2.8	5.1	+136.4
<b>Ages 80+, females total</b>	497	745	1221	+145.9	370	508	714	+92.8	126	236	508	+301.9
<b>Ages 80+, both sexes</b>												
Living alone	110	141	367	+233.2	85	87	198	+134.5	25	54	168	+568.3
With spouse only	66	142	389	+484.7	47	85	190	+301.6	19	57	199	+961.9
Sub total of not living with children	176	283	756	+327.7	132	172	389	+194.5	44	110	367	+736.5

Table 7 (continued)

	Rural and urban combined						Rural			Urban		
	1990	2000	2010	2010 vs. 1990 (%)	1990	2000	2010	2010 vs. 1990 (%)	1990	2000	2010	2010 vs. 1990 (%)
Married, with children	88	213	344	+290.0	66	145	194	+193.8	22	68	151	+575.4
Not-married with children	485	680	957	+98.2	364	487	595	+63.3	121	193	362	+200.1
Sub total of living with children	573	894	1301	+127.7	430	632	789	+83.3	143	261	513	+258.7
Institutionalized	6.7	9.1	23	+228.5	3.5	3.8	6.2	+77.8	3.2	5.3	16	+411.0
With others, not with spouse/child	12	13	20	+64.6	9.0	9.3	12	+32.4	2.9	4.1	7.7	+162.7
Ages 80+, both sexes total	768	1199	2099	+173.4	575	818	1195	+108.0	193	381	904	+368.3

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