Population Ageing and the Malaysian Chinese: Issues and Challenges

CHAI Sen Tyng* and Tengku Aizan HAMID**

Abstract

The United Nations (UN) defines population ageing as a demographic process in which the proportion of older persons aged 60 years and above increases in a country or geographical area. Depending on the indicators of population ageing, Malaysia is expects to reach aged nation status within the next two decades. The Department of Statistics estimates that the number of older Malaysians is projected to reach 5.1 million in 2034, making up about 15 per cent of the total population. Out of the 2.2 million older Malaysians aged 60 years and above recorded in the 2010 census, the rate of ageing differs among the Malays, Chinese and Indians. Lower fertility, longer life expectancy and emigration have accelerated the rate of ageing among the Chinese, of whom one out of eight is an aged person. This proportion is significantly higher than those of the Malays and Indians. Past studies show that the Chinese elderly are less likely than other ethnic communities to live with their adult children. With advancing age, the demand for long-term health care facilities and services will grow, especially in urban areas. The issues and challenges facing the older Chinese population are inextricably linked to their current socio-demographic and economic status. Old age does not mean frailty and passive dependency. While there has to be some rethinking in the approach of our social protection programmes as society ages, we need to place more emphasis on the empowerment of older persons and their changing roles. In view of the more rapid ageing process of the Chinese, their unique socio-economic and cultural milieu will give rise to a distinctive ageing experience that will influence and drive the social changes of Malaysia in the coming decades.

Key words: Population ageing, Malaysian Chinese, socio-economic conditions, issues and challenges

^{*} CHAI Sen Tyng (蔡信廷) is a Research Officer at the Institute of Gerontology, Universiti Putra Malaysia, Malaysia. E-mail: chez1978@gmail.com

^{**} Dr. Tengku Aizan HAMID is Director and Professor, Institute of Gerontology, Universiti Putra Malaysia, Malaysia. E-mail: aizan@upm.edu.my

Introduction

The UN defines population ageing as a demographic process in which the proportion of persons aged 60 years and above in a country or geographical area increases. The latest world population ageing report indicates that declining fertility and mortality rates are turning population ageing into a phenomenon "in nearly all the countries of the world" (UN, 2013: xii). While the most aged societies are found in developed countries, it is the developing countries that account for the majority of older persons in the world. Between 2000 and 2030, the older population in developing countries are envisaged to more than double in number (Kinsella and Velkoff, 2001). While population ageing occurs at different paces in different parts of the world (Uhlenberg, 2009: 1), and it is taking place most rapidly in less developed regions such as Asia and Latin America (Kinsella and He, 2009; Fu and Hughes, 2009; Kinsella and Phillips, 2005). Malaysia is one of the countries that will experience significant and rapid ageing over the next few decades. It took developed countries such as France and Sweden 115 years and 85 years respectively to double their population aged 65 years and above from 7 per cent to 14 per cent, but it will take developing countries such as Thailand and Malaysia about 20 years to reach this level.

According to Chen and Jones (1989: 1), a population may be regarded as "aged" when the proportion of those aged 60 years and above reaches 15 per cent. The report on *National* Policy for Older Persons (Ministry of Women, Family and Community Development, 2011: 3) estimated that Malaysia will reach this milestone by 2030 based on the medium projections of the UN's World Population Prospects (2009). In this study, "older persons" and "60+" are used to refer to those aged 60 and above. It will examine the situation of population ageing in Malaysia from an ethnic perspective, using data from past national censuses, surveys and reports.

Demography of Population Ageing in Malaysia

In the 2010 population census, the total Malaysian population (excluding non-citizens) numbered 26 million, of which 67.4 per cent were Malays and Bumiputera, 24.6 per cent Chinese, 7.3 per cent Indians, and 0.7 per cent others. The ethnic distribution of older Malaysians, however, is a reflection of demographic patterns of the past (Table 1). Out of the 2.2 million persons aged 60 years and above in 2010, 56.9 per cent were Malays and Bumiputera, 35.6 per cent Chinese, 6.9 per cent Indians, and 0.5 per cent others. One out of eight Chinese is an "aged" person, a proportion significantly higher than the Malays and Indians (one out of thirteen). The higher rate of ageing among the Chinese is attributed to their lower fertility, longer life expectancy, and emigration (Tey, 2004).

Table 1. Total Population and Population of Older Persons by Ethnicity, 2000 and 2010

	2000	2010			
Total	60+	% 60+	Total	60+	% 60+
14,248,179	804,166	5.64	17,523,508	1,242,865	7.09
11,680,421	673,983	5.77	14,191,720	1,037,383	7.31
2,567,758	130,183	5.07	3,331,788	205,482	6.17
5,691,908	501,007	8.80	6,392,636	777,622	12.16
1,680,132	93,861	5.59	1,907,827	150,339	7.88
269,697	12,467	4.62	189,385	11,978	6.32
21,889,916	1,411,501	6.45	26,013,356	2,182,804	8.39
1,384,774	40,164	2.90	2,320,779	68,412	2.95
23,274,690	1,451,665	6.24	28,334,135	2,251,216	7.95
	14,248,179 11,680,421 2,567,758 5,691,908 1,680,132 269,697 21,889,916 1,384,774	Total 60+ 14,248,179 804,166 11,680,421 673,983 2,567,758 130,183 5,691,908 501,007 1,680,132 93,861 269,697 12,467 21,889,916 1,411,501 1,384,774 40,164	Total 60+ % 60+ 14,248,179 804,166 5.64 11,680,421 673,983 5.77 2,567,758 130,183 5.07 5,691,908 501,007 8.80 1,680,132 93,861 5.59 269,697 12,467 4.62 21,889,916 1,411,501 6.45 1,384,774 40,164 2.90	Total 60+ % 60+ Total 14,248,179 804,166 5.64 17,523,508 11,680,421 673,983 5.77 14,191,720 2,567,758 130,183 5.07 3,331,788 5,691,908 501,007 8.80 6,392,636 1,680,132 93,861 5.59 1,907,827 269,697 12,467 4.62 189,385 21,889,916 1,411,501 6.45 26,013,356 1,384,774 40,164 2.90 2,320,779	Total 60+ % 60+ Total 60+ 14,248,179 804,166 5.64 17,523,508 1,242,865 11,680,421 673,983 5.77 14,191,720 1,037,383 2,567,758 130,183 5.07 3,331,788 205,482 5,691,908 501,007 8.80 6,392,636 777,622 1,680,132 93,861 5.59 1,907,827 150,339 269,697 12,467 4.62 189,385 11,978 21,889,916 1,411,501 6.45 26,013,356 2,182,804 1,384,774 40,164 2.90 2,320,779 68,412

Source: DSM, 2011; 2001

Between 2000 and 2010, the population aged 60 years and above increased by 5.5 per cent annually compared with 2.2 per cent for the total population. The largest difference in growth rates were recorded for those 75 years and above which grew by 6.5 per cent annually (DSM, 2001 and 2011). Since 1980, the number of older Malaysians (excluding non-citizens) has doubled to more than 2.18 million in 2010. In the next 30 years, this figure will reach 6 million, but in relative terms, this section of the population will increase from 8.4 per cent in 2010 to almost 17 per cent of the total population in 2040. From Table 2, it is evident that ethnic differences in the rate of population ageing will persist, although the national proportion of the older Chinese will shrink. The number of older Chinese is projected to grow from 0.78 million in 2010 to 1.85 million in 2040, whereas their proportion will double from 12.2 per cent to 26.1 per cent in the same period. This means that by 2040, one out of four Chinese will be an elderly person.

Table 2. Population and Percentage of Older Malaysians (60+) by Ethnicity, 1980-2040

Year -	Population ('000)						Percentage within respective Ethnic Group			
Tear -	Malay*	Chinese	Indian	Others	Total	Malay*	Chinese	Indian	Others	Total
1980	381.8	311.6	60.1	5.9	759.5	4.69	6.99	5.05	6.26	5.47
1990	568.4	359.3	77.0	10.8	1,015.6	4.92	7.20	5.47	7.33	5.61
2000	804.2	501.0	93.9	12.5	1,411.5	5.64	8.80	5.59	4.62	6.45
2010	1,242.9	777.6	150.3	12.0	2,182.8	7.09	12.16	7.88	6.32	8.39
2020	1,889.3	1,153.8	254.7	21.1	3,318.9	9.12	16.90	12.15	6.89	11.08
2030	2,709.1	1,540.3	373.5	33.9	4,656.8	11.42	21.87	16.82	8.70	13.95
2040	3,704.3	1,854.6	473.9	47.0	6,079.8	14.23	26.13	20.99	9.85	16.95

^{*} Including Other Bumiputera

Source: DSM, 2001; 2011; 2012

The increasing proportion of the older population can be attributed to the rapid decline in fertility and mortality rates. Malaysia's Total Fertility Rate (TFR) reached replacement levels in 2010, but that of the Chinese touched the 2.1 level in 2002 (DSM, 2006). Admittedly, the drop in fertility levels is consistent across all ethnic groups (Figure 1). This phenomenon is attributed to delayed first age of marriage, postponement of childbirth, higher levels of female education, increased use of contraceptives and early termination of childbearing (Tey, 2006). The mean age at first marriage for females, for example, was the highest among the Chinese at 27 years in 2010, as against 25.4 years and 26.1 years for the Bumiputera and Indians respectively (DSM, 2013b).



Figure 1. Total Fertility Rate by Ethnicity, Malaysia, 1965-2012

* Peninsular Malaysia only

Source: DSM, 2001b; 2003; 2006; 2011b; 2013

Differences in life expectancy at birth and at age 60 by ethnicity are similarly evident. The Chinese, both males and females, enjoy the longest life expectancies at birth and at 60 among all ethnic groups. A Chinese woman at age 60 in 2013 can look forward to, on average, another 22.3 years of life.

Life	1991		2	2000		010	2013 (E	2013 (Estimated)	
Expectancy	Male	Female	Male	Female	Male	Female	Male	Female	
At birth									
Total	69.2	73.4	70.0	74.7	71.9	76.6	72.6	77.2	
Malay*	68.8	71.9	69.0	73.3	70.7	75.4	71.3	76.1	
Chinese	70.7	76.4	72.4	77.6	74.4	79.1	75.0	79.7	
Indian	64.2	71.4	65.7	73.5	67.6	75.7	67.9	76.2	
At 60 years									
Total	16.1	18.1	16.7	19.0	17.9	20.1	18.3	20.6	
Malay*	15.7	16.9	15.9	17.8	17.1	19.4	17.6	19.8	
Chinese	16.8	20.2	18.1	21.1	19.1	21.7	19.6	22.3	
Indian	14.2	17.6	15.2	19.1	16.9	19.8	17.4	20.3	

Table 3. Life Expectancy at Birth and at Age 60 by Ethnicity, Malaysia, 1991-2013

Source: DSM, 1997; 2002; 2013c

According to medium projections by the UN (2012 revision), Malaysia's older population will reach 9.7 million in 2050. In 2020, the nation's median age is estimated to be 30.3 years. As shown in Table 4, Malaysia's old age dependency ratio (65+/15-64*100), potential support ratio (15-64/65+), parent support ratio (85+/50-64*100) and ageing index (60+/<15*100) all point to a rapid population ageing trend (UN, 2002).

In summary, Malaysia's population is nearing the end of the third stage of demographic transition characterized by low birth and death rates as the fertility rate reaches replacement levels. The country is now entering a stage where the demographic window is closing for the first population dividend (Bloom et al., 2002). Echoing Pala's observation in 2005 on the growth of older persons between the 1991 and 2000 censuses, "the demographic and social trends of population ageing in Malaysia are moving at a quicker pace than observed 10 years ago" (Pala, 1998; 2005). Malaysia's population is greying rapidly and one of the notable features of the ageing phenomenon is the different rates of ageing among different ethnic groups.

^{*} Including Other Bumiputera

	Table 4. Selected	Indicators	of Population	Ageing, Mala	avsia. 1950-2050
--	-------------------	------------	---------------	--------------	------------------

Population Ageing Indicators	1950	1960	1970	1980	1990	2000	2010	2020	2030	2040	2050
60+ Population ('000)	448	434	587	776	1,028	1,449	2,193	3,520	5,218	7,006	9,747
65+ Population ('000)	309	280	357	495	658	900	1,369	2,253	3,590	5,001	6,959
85+ Population ('000)	n/a	n/a	n/a	n/a	23	37	62	103	177	350	626
% 60+ Population	7.3	5.3	5.4	5.6	5.6	6.2	7.8	10.7	14.2	17.6	23.1
% 65+ Population	5.1	3.4	3.3	3.6	3.6	3.8	4.8	6.9	9.7	12.6	16.5
% 85+ Population	n/a	n/a	n/a	n/a	0.1	0.2	0.2	0.3	0.5	0.9	1.5
Crude Birth Rate	42.7	39.5	31.4	29.5	27.5	20.1	17.7	16.2	13.4	11.9	11.4
Crude Death Rate	14.4	9.5	6.7	5.5	4.7	4.4	4.7	5.3	6.1	7.2	8.3
Total Fertility Rate	6.2	6.0	4.6	3.7	3.4	2.5	2.0	1.9	1.8	1.8	1.8
Median Age	19.8	17.6	17.4	19.6	21.6	23.8	26.1	30.3	34.0	37.4	39.8
Total Dependency Ratio	85.0	95.8	92.5	74.1	68.7	59.1	48.2	44.2	46.9	46.6	51.3
Old Age Dependency Ratio	9.4	6.7	6.3	6.2	6.1	6.1	7.2	9.9	14.3	18.4	25.0
Parent Support Ratio	n/a	n/a	n/a	n/a	0.2	0.3	0.3	0.5	0.7	1.3	2.3
Potential Support Ratio	10.7	14.9	15.9	16.1	16.4	16.4	13.9	10.1	7.0	5.4	4.0
Ageing Index	17.9	11.7	12.0	14.4	15.2	18.6	28.0	45.0	63.9	91.4	133.3

Source: Tabulation from World Population Prospects: 2012 Revision (UN, 2013)

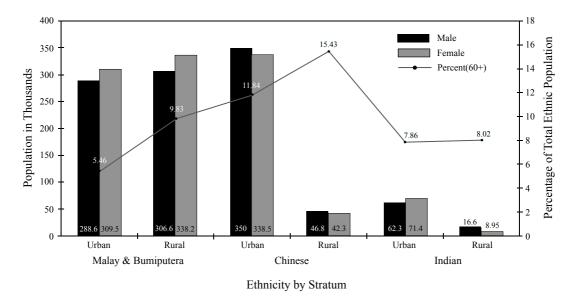


Figure 2. Distribution of Older Malaysians by Ethnicity, Sex and Stratum, 2010

Source: Hamid and Chai, 2013, tabulated from DSM, 2011

Characteristics of the Aged Chinese Population

Malaysian Chinese aged 60 and above currently stand at 877,200 in number, representing 13.4 per cent of the entire community, and 35.6 per cent of the total "aged" population in the country (DSM, 2012). The 2010 census showed that 688,505 or 88.5 per cent of the elderly Chinese resided in urban areas (Figure 2). Although only 89,000 older Chinese lived in rural areas, they showed the highest rate of ageing (Hamid and Chai, 2013). The fact that the "aged" Chinese males out-numbered the females may reflect the dominance of male immigration of the earlier period. The male-female ratio of the aged was consequently the highest among the Chinese (104.2), whereas the figures for the Malays and Bumiputera (91.9) and Indians (87.0) were much lower.

Corresponding to the distribution of the Chinese population in the different states and federal territories, the older Chinese persons were located mostly in Selangor (14.8%), Perak (12.4%) and Johor (12.4%) (Table 5). However, the highest rates of ageing were found in Perak (17.9%), Perlis (17.0%) and Melaka (14.8%) (DSM, 2011). Older Chinese were relatively more numerous than other ethnic groups in Penang (60.4%), Kuala Lumpur (54.3%) and Perak (44.3%).

Table 5. Distribution of the Older Population and Older Chinese Population by State, 2000 and 2010

		20	000				2010	
	Number	% 60+	Number	% 60+	Number	% 60+	Number	% 60+
Year	60+	within	60+	within	60+	within	60+	within
		State	Chinese	Chinese		State	Chinese	Chinese
Johor	172,390	6.29	70,393	7.68	278,028	8.30	112,001	10.82
Kedah	130,900	7.93	23,939	9.91	184,087	9.45	36,791	14.39
Kelantan	94,857	7.22	4,944	10.07	135,935	8.83	7,284	14.11
Melaka	51,115	8.04	19,314	10.83	79,422	9.67	30,610	14.76
N. Sembilan	63,378	7.37	22,387	10.56	91,920	9.00	32,881	14.73
Pahang	71,385	5.54	20,616	9.44	122,719	8.18	30,607	13.26
Perak	189,763	9.25	82,770	12.87	280,118	11.91	124,168	17.91
Perlis	18,767	9.18	2,447	11.77	25,499	11.01	3,052	16.97
Pulau Pinang	103,605	7.88	61,366	10.42	159,285	10.20	96,166	14.34
Sabah	100,168	3.85	21,675	8.27	138,386	4.32	28,098	9.50
Sarawak	133,541	6.45	41,256	7.68	211,181	8.55	62,734	10.86
Selangor	189,644	4.53	80,865	6.57	334,289	6.12	139,120	9.65
Terengganu	54,856	6.10	2,307	9.50	78,058	7.53	3,644	13.79
*Kuala Lumpur	74,962	5.43	46,028	8.22	127,825	7.63	69,446	10.60
*Labuan	2,334	3.06	700	7.38	3,483	4.01	1,000	9.99
*Putrajaya	n/a	n/a	n/a	n/a	981	1.35	20	4.18
Total	1,451,665	6.23	501,007	8.80	2,251,216	7.95	777,622	12.16

^{*} Federal Territories

Source: Author's tabulation from DSM, 2001; 2011

Issues, Challenges and the Road Ahead

The issues and challenges of the older Chinese population are inextricably linked to their current socio-demographic and economic status. The patterns of co-residence, utilization of healthcare facilities and wealth of the older Chinese population are examined using previous survey data from the Institute of Gerontology, Universiti Putra Malaysia and other sources.

Living Arrangement and Proximity of Adult Children

Past studies have consistently shown that patterns of co-residence are strongly linked to ethnicity and culture (Davanzo and Chan, 1994; Chan and Davanzo, 1996). From the 2010 census, the average size of private households was the smallest among the Chinese (3.7 persons), followed by the Indians (4.1 persons) and the Malays and Bumiputera (4.4 persons). Out of the 6.3 million private households in Malaysia in 2010, 62.3 per cent were nucleus family households and 32.6 per cent were extended family households. However, only 20.7 per cent of the 1.6 million Chinese households were of the extended type (DSM, 2013d). Pala (2005) showed that in the 1991 and 2000 censuses, households with older persons made up about 16 to 17 per cent of the total private households in Malaysia.

A 2008 survey of 1,885 households by Nurizan Yahaya and others in Peninsular Malaysia found that only 50 per cent of older Chinese lived with their adult children, compared with the sample average of 62.5 per cent (Yahaya et al., 2008). The same study showed that one-quarter of the older Chinese respondents had at least one child living overseas, compared with 6.6 per cent among the surveyed households (Figure 3). A 2014 survey of older persons in 2,322 households in the states of Johor, Perak, Kelantan and Selangor showed similar patterns of elderly co-residence with adult children (57%) among the older Chinese (49.4%), Malays (60.1%) and Indians (66.7%) (Hamid et al., 2014). It is evident that living arrangement and proximity of adult children were affected by a number of factors in relation to the characteristics of both the older parent(s) and their offspring.

With advancing age, the demand for long-term health care facilities and services will grow, especially among the urban Chinese. The increase in female labour force participation rate raises the question on the availability of family caregivers, and the longevity of older Malaysians increases the need for specialized care for the aged. It is no coincidence that the majority of residents in old folks' homes and nursing homes are Chinese. It would be easy to attribute the emergence of the private residential aged-care industry to the eroding social values of filial piety and responsibility, but the reality is that with fewer children (and children overseas), older Chinese have limited options. The challenge lies in ensuring a minimum standard of care in these long-term nursing homes and extending the access of such facilities and services to lower and middle-income families.

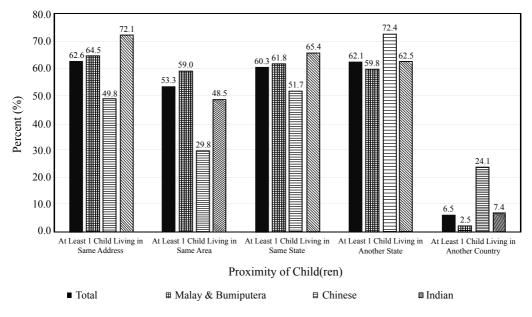


Figure 3. Location of Children of Respondents Aged 60 and Above (n = 1,809), 2008 Source: Yahaya *et al.*, 2008 and unpublished data

Utilization of Public and Private Healthcare

In a recent study, Krishnaswamy and her colleagues (2009: 449) pointed out that in Malaysia, "underutilization of health care services showed a complex ethno-cultural relationship" and that "respondents from certain areas, ethnic groups, and backgrounds" have poorer service utilization in general.

Tengku Aizan Hamid and her colleagues conducted a nationwide survey in 2005 among 2,979 older persons to document their health-seeking behaviour in the three months prior to the study. It was found that fewer older Chinese (57%) needed to access health care facilities and services compared with the Malays (67%) and Indians (71%), and they also relied less on public hospitals and clinics (Hamid *et al.*, 2005). In another national survey carried out by a Universiti Putra Malaysia (UPM, 2009) research team on a sample of 1,309 older persons in 2008, similar patterns were found wherein 42 per cent of the Chinese respondents used only private health care facilities and services exclusively in the past six months prior to the study (Figure 4). In general, older Chinese have more health care options and are less reliant on government hospitals and clinics. This may be attributed to their wealth and urban living, but it also means that they will be more susceptible to the rising out-of-pocket spending on health care.

The growing prevalence of chronic illnesses such as hypertension, diabetes, hypercholesterolemia, osteoporosis, and heart disease, including the co-morbidities of common non-communicable diseases, varies across ethnic groups (Teh *et al.*, 2014). The national health care system is under considerable strain and increased public spending is needed to improve universal healthcare coverage to reduce the burden of care-giving among the target population (Barraclough, 1999; Chee and Barraclough, 2007).

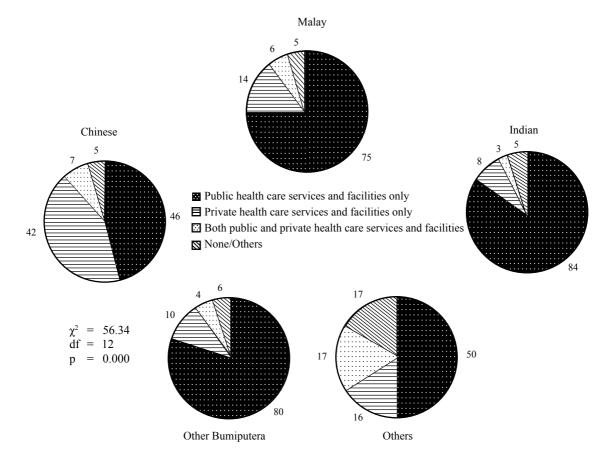


Figure 4. Utilization of Public and Private Healthcare Facilities by Older Malaysians (n = 1,309), 2008

Source: Hamid et al., 2008 and unpublished data

Wealth and Asset Ownership

The issue of income security in old age has been extensively discussed by many researchers in the literature (Hamid et al., 2004; Masud et al., 2012; Masud and Haron, 2014). Differences in income and financial situations among older Malaysians are evident across ethnic lines.

An analysis of the 2008 national survey data by Hamid and her colleagues found that older Chinese reported a higher mean monthly income (RM1,024) than that of the Malays (RM666), other Bumiputera (RM482) and Indians (RM358). Only 14.3 per cent of the older Chinese respondents reported zero income, compared with the higher figures for Bumiputera (16.6%), Malays (19.7%) and Indians (34.7%). Nevertheless, the same dataset showed that a majority of the Malays (83.8%) and Bumiputera (69.4%), Chinese (69.8%), and Indians (56.9%) own at least one residential property and with slightly lower figures for land ownership (Table 6). This pattern is consistent with the "asset rich but income poor" situation of the elderly in many other countries.

		Monthly	Asset Ownership			
Ethnicity	Number	No Income (%)	Mean (RM)	Standard Deviation	Property (%)	Land (%)
Malay	740	19.7	666.09	975.45	83.8	72.6
Other Bumiputera	301	16.6	482.01	742.47	69.4	55.1
Chinese	189	14.3	1,024.05	1,555.49	69.8	43.9
Indian	72	34.7	358.19	987.98	56.9	25.0
Others	7	14.3	871.47	806.17	14.3	71.4
Total	1.309	19.0	659.61	1 048 56	77.0	61.8

Table 6. Average Monthly Income and Asset Ownership by Ethnicity, 2008

Source: Hamid et al., 2008 and unpublished data

It is important to note that old age is not all about frailty, vulnerability and passive dependency. A Chinese saying states that "having an older person in the family is like possessing a precious treasure" (家有一老, 如有一宝). The idea behind the saying is that older persons are a source of wisdom and knowledge founded on their life experiences. Unfortunately, many older persons are not only marginalized in the national development but also constantly ignored in their own home. While there has to be some rethinking in the approach of our social protection programmes as the society ages, more focus is needed in the empowerment of older persons and their changing roles. Older persons should be viewed as a resource rather than a burden to the society. The older generations have contributed to the prosperity of the nation as a whole, and we have a responsibility to reciprocate their past contributions. In her book (1954: 337), Pearl S. Buck pointed out that "our society must make it right and possible for old people not to fear the young or be deserted by them, for the test of a civilization is the way that it cares for its helpless members."

Conclusion

Population ageing in Malaysia accords with a general demographic trend that is seen in many countries in the world. The ethnic diversity of the population in Malaysia is indeed unique because of the differences in the rates and patterns of ageing according to ethnicity and the social and cultural factors that come into play. It is evident that the Chinese community is ageing faster than their Malay and Indian counterparts. It is this community that will bear the impact of the many problems and issues associated with ageing ahead of the Malays and Indians. The unique socio-economic and cultural milieux of the Chinese are likely to accelerate the process of ageing. As the Chinese ageing phenomenon is the precursor of future trends of demographic development of Malaysia, it is essential that effective and practical strategies be put in place to deal with the future needs of the nation as a whole.

References

- BARRACLOUGH, S. 1999. Constraints on the retreat from a welfare-oriented approach to public health care in Malaysia, Health Policy, 47(1): 53-67.
- BLOOM, D., CANNING, D. and SEVILLA, J. 2002. The Demographic Dividend: A New Perspective on the Economic Consequences of Population Change, Population Matters. California: RAND.
- BUCK, P.S. 1954. My Several Worlds: A Personal Record, New York: Pocket Books.
- CHAN, A. and DAVANZO, J. 1996. Ethnic differences in parents' coresidence with adult children in Peninsular Malaysia. *Journal of Cross-Cultural Gerontology*, 11(1): 29-59.
- CHEE, H.L. and BARRACLOUGH, S. 2007. Health Care in Malaysia: The Dynamics of Provision, Financing and Access, New York: Routledge.
- CHEN, A. J. and JONES, G. 1989. Ageing in ASEAN: Its Socio-Economic Consequences, Singapore: Institute of Southeast Asian Studies.
- DAVANZO, J. and CHAN, A. 1994. Living arrangements of older Malaysians: Who co-resides with their adult children? *Demography*, 3(1): 95-114.
- Department of Statistics, Malaysia (DSM) 1997. Abridged Life Tables, Malaysia, 1991 1996. Kuala Lumpur: DSM.
- ---- 2001. Population Distribution and Basic Demographic Characteristics. Population and Housing Census of Malaysia, 2000. Putrajaya: DSM.
- ---- 2001b. Vital Statistics Time Series, Malaysia, 1963-1998. Putrajaya: DSM.
- ---- 2002. Abridged Life Tables, Malaysia (Preliminary Release), 1999-2001. Putrajaya: DSM.
- ---- 2003. Vital Statistics, Malaysia, 2003. Putrajaya: DSM.
- ---- 2006. Vital Statistics, Malaysia, Special Edition, 2001-2006. Putrajaya: DSM.
- ---- 2011. Population Distribution and Basic Demographic Characteristics 2010. Population and Housing Census of Malaysia, 2010. Putrajaya: DSM.
- ---- 2011b. Vital Statistics, Malaysia 2010. Putrajaya: DSM.
- ---- 2012. Population Projections, Malaysia: 2010-2040. Putrajaya: DSM.
- ---- 2013. Vital Statistics, Malaysia 2012. Putrajaya: DSM.
- ---- 2013b. Education and Social Characteristics of the Population 2010. Population and Housing Census of Malaysia, 2010. Putrajaya: DSM.
- ---- 2013c. Abridged Life Tables, Malaysia, 2010-2013. Putrajaya: DSM.
- ---- 2013d. Characteristics of Household 2010. Population and Housing Census of Malaysia, 2010. Putrajaya: DSM.
- FU, T. and HUGHES, R. (eds) 2009. Ageing in East Asia: Challenges and Policies for the 21st Century. London: Routledge Press.
- HAMID, T.A. and CHAI, S.T. 2013. Meeting the needs of older Malaysians: Expansion, diversification and multi-sector collaboration. Malaysian Journal of Economic Studies, 50(2): 157-174.
- ----, MASUD, J. and CHAI, S.T. 2004. Socioeconomic status of older Malaysians: A gender comparison, Malaysian Journal of Family Studies, 1(1): 54-69.
- ----, MASUD, J., ABDUL RASHID, S.N.S., YASSIN, Z., AHMAD, Z., IBRAHIM, R., ISMAIL, N.A., ABDULLAH, S.F.Z., CHAI, S.T. 2008. Review of the national policy for the elderly and plan of action. Unpublished data.

- ----, HARON, S.A., IBRAHIM, R., ISMAIL, N.W., MOHAMED NOR, N., ALJUNID, S.M., ONG, F.S., KAMARUZZAMAN, S.B., SHAFIE, A.A., RAZALI, R., MOHAMED SHARIFF, A.R., SAID, R., MASUD, J., MUHAMMAD NUR, A., SALLEH, M., YUSOFF, S., AZMAN A., MADON Z., AHMED, Z., MASTURA, A., KAHAR, R., HARUN, S., KORIS, R., CHAI, S.T., BAGAT, M.F., ABDULLAH, S.S. and ISMAIL, N.A. 2014. Identifying psychosocial and economic risk factors and quantifying the costs of age-related cognitive impairment: Implications of population ageing in Malaysia. Unpublished data.
- ----, LOW W.Y., ISMAIL, R., YAHAYA, N., ABDUL RASHID, S.N.S., ABU SAMAH, A., EBENEZER, E.G., YUSOFF, S., YAU, W.K., DRAHMAN, I. and SHABAS, S. 2005. Mental health and quality of life of older Malaysians. Unpublished data.
- KINSELLA, K. and HE, W. 2009. An Aging World: 2008. International Population Reports, P95/09-1, Washington: U. S. Census Bureau.
- ---- and PHILLIPS, D.R. 2005. Global aging: The challenge of success. Population Bulletin, 60(1): 5-42.
- ---- and VELKOFF, V. A. 2001. An Aging World: 2001. International Population Reports, P95/01-1. Washington: U. S. Census Bureau.
- KRISHNASWAMY, S., SUBRAMANIAM, K., LOW, W.Y., AZIZ, J.A., INDRAN, T., RAMACHANDRAN, P., HAMID, A.R. and PATEL, V. 2009. Factors contributing to utilization of health care services in Malaysia: A population-based study, Asia Pacific Journal of Public Health, 21(4): 442-450.
- MASUD, J. and HARON, S.A. 2014. Income disparity among older Malaysians. Research in Applied Economics, 6(2): 116-131.
- ----, SABRI, M.F. and HARON, S.A. 2012. Ethnic differences in financial practices of Malaysian elderly. Malaysian Journal of Consumer and Family Economics, 15: 54-70.
- Ministry of Women, Family and Community Development (2011). Dasar dan Pelan Tindakan Warga Emas Negara. Putrajaya: KPWKM.
- PALA, J. 2005. Population Ageing Trends in Malaysia. Monograph Series, Population Census 2000. Putrajaya: Department of Statistics, Malaysia.
- ----- 1998. Senior Citizens and Population Ageing in Malaysia. Population Census Monograph Series. Kuala Lumpur: Department of Statistics, Malaysia.
- TEH, J.K.L., TEY, N.P. and NG, S.T. 2014. Ethnic and gender differentials in non-communicable diseases and self-rated health in Malaysia, PLoS ONE, 9(3): e91328. Doi: 10.1371/journal.pone.0091328.
- TEY, N.P. 2004. Causes and consequences of demographic change in the Chinese community in Malaysia. In The Chinese Population in Malaysia: Trends and Issues, edited by Voon Phin Keong, Kuala Lumpur: Centre for Malaysian Chinese Studies: 15-48.
- ---- 2006. Population and development trends. In Our People Our Future: Malaysian Population in Perspective, edited by Y.L. Wong and N.P. Tey, Kuala Lumpur: University of Malaya Press: 7-28.
- UHLENBERG, P. 2009. International Handbook of Population Ageing. New York: Springer.
- United Nations (UN) 2013. World Population Ageing 2013. Population Division, Department of Economic and Social Affairs, ST/ESA/SER.A/348, UN: New York.
- ---- 2013b. World Population Prospects: The 2012 Revision. Available from Population Division, Department of Economic and Social Affairs Website, http://esa.un.org/unpp/
- ----- 2002. World Population Ageing: 1950-2050. New York: Population Division, Department of Economic and Social Affairs.
- Universiti Putra Malaysia (UPM) 2009. Laporan Akhir Kajian Semula Dasar Warga Tua Negara dan Pelan Tindakan Dasar Warga Tua Negara. Serdang: UPM Consultancy and Services.
- YAHAYA, N., HAMID, T.A., ABU SAMAH, A., OTHMAN, M., ARIF, A.M.M., and SABRI, B. 2008. Patterns of social relationships and psychological well-being among older persons in Peninsular Malaysia. Unpublished data.