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Long-term care service needs and planning for the future: a study of middle-aged and older adults in Hong Kong

ALEX JINGWEI HE* and KEE-LEE CHOU*

ABSTRACT
Long-term care (LTC) planning is important in helping the older people tackle their future needs better. The needs for LTC services represent generational characteristics as they may be different between the current and upcoming cohorts of older adults. However, very few studies have examined the cohort differences in terms of their expected utilisation of LTC services, while understanding the patterns is crucial in helping policy makers prepare for the development of LTC services. This study fills the research gap by examining the plans and expectations for LTC services of 1,613 middle-aged and older persons in Hong Kong with data collected from a telephone survey. By applying the Andersen Model to examine LTC expectations, this study analyses the LTC needs and plans of the middle-aged and older cohorts of Hong Kong adults, as well as their associated factors, with a multiple logistic regression method. Both gender and birth cohort were examined individually and in combination. Birth cohort and gender have been found to exert an impact on all aspects of LTC needs and planning to varying degrees. The findings are interpreted and contrasted with those of a key study based in the West, with reference to the contextual characteristics of Hong Kong. This study furthers the scholarly understanding on LTC needs and planning and their cohort effect, and draws evidence-based recommendations for LTC development in Hong Kong, a rapidly ageing East Asian society.

KEY WORDS– long-term care, planning, cohort, housing, Hong Kong, social policy.

Introduction

Defined as 'remaining living in the community, with some level of independence, rather than in residential care' (Davey *et al.* 2004: 133), the concept of 'ageing in place' has been gaining currency in recent years. It has vigorously redefined social policy for older people in many ageing

* Department of Asian and Policy Studies, The Education University of Hong Kong, Tai Po, Hong Kong.

societies, alongside the rise to prominence of similar notions such as 'community care' and 'care in the community' (Chui 2008; Sixsmith and Sixsmith 2008). The arguments supporting the approach of ageing in place are threefold. First, abundant studies have shown that most older people wish to stay in their homes as long as possible (Burholt and Windle 2001; Frank 2002; Gitlin 2003). Second, ageing in place enables older people to maintain their independence, autonomy and connections to social support, and it thereby considerably improves their emotional as well as physical wellbeing (Keeling 1999; Lawler 2001). Third, having people remain in their homes for as long as possible also helps reduce the escalating costs of residential and nursing care, and is therefore favoured by policy makers and many older people themselves (Tinker 1997; World Health Organization 2007).

A major challenge to ageing in place comes from the rising prevalence of chronic disability. As they age, older people are more likely to experience not only acute illnesses but also chronic disability conditions that require long-term care (LTC), defined as a set of services provided on a daily basis, formally or informally, at home or in institutions, to people who experience a loss of mobility and autonomy in their activities of daily living (ADLs) (Costa-Font and Courbage 2012). Traditionally, family played the key role in LTC provision, but it has become an increasingly unreliable source of support due to changes in family structure and social values (Chow 1999). With the remarkable decline of co-habitation, fewer and fewer older people live with their adult children, whereas more and more live on their own (Gierveld, Dykstra and Schenk 2012; Leung 2001; Ruggles 2007). These changes in living arrangements among older people have raised serious questions as to the reliable provision of LTC.

An equally daunting challenge comes from financing, in part because of the large costs associated with LTC services. The lack of public awareness of LTC costs tends to lead to poor financial preparedness among users, who often find the costs too large to absorb (San Antonio and Rubinstein 2004). In the absence of a crisis, it is relatively rare for older people to plan proactively for their LTC needs (Friedemann *et al.* 2004). Hence, LTC planning is of critical importance in helping older persons to tackle their future needs and expenses better. Moreover, the need for LTC services represents generational characteristics in the sense that these needs may be different between the current and upcoming cohorts of older people because individuals' needs and plans vary with their socio-demographic characteristics as well as with their financial and social resources. However, very few studies to date have examined the cohort differences in terms of their expected utilisation of LTC services (Robison *et al.* 2014). While many within the current cohort of older adults have been

struggling with their LTC needs, middle-aged adults will be facing the same challenges in due course, probably at an even greater magnitude due to longer life expectancy and decreased support from adult children (Chong *et al.* 2006). Therefore, understanding the patterns of LTC needs and the plans of different cohorts of people is of crucial importance in helping policy makers prepare for the development of LTC services in the coming decades.

While this line of investigation is scant in Western ageing societies (Robison *et al.* 2014), even less is known in Asia, where the population is ageing at an unprecedented rate. As a result of ethnic and cultural differences, older people in Asia may present rather distinct characteristics in regard to their LTC needs and plans, warranting closer examination. To fill this research gap, this study attempts to examine the plans and expectations for LTC services of both middle-aged and older persons in Hong Kong, a rapidly ageing Asian society. Although Hong Kong is by no means representative of the whole of Asia, given the continent's vast diversity, the purpose of this article is to take this rapidly ageing Asian society as a case to examine the LTC needs and plans of both cohorts, to explain the dynamics with reference to Hong Kong's contextual characteristics, and to provide insights into how policy and service development can meet the future needs of this ageing population.

Long-term care services in Hong Kong

Before describing the LTC system of Hong Kong, it is necessary to contextualise it into the entire social policy system, so as to help the readership understand the broader institutional setting better. First of all, positive non-interventionism has been the overarching philosophy of governance in Hong Kong. Although the government has historically abhorred the idea of the welfare state and taken a residualist stance on social policy, the state does intervene to a fairly deep extent, especially in public housing, health care and heavily subsidised education, as well as through providing various forms of financial aid and social services for the community (Ramesh 2004). Although the system relies heavily on non-profit organisations in the delivery of social services (particularly in family counselling, rehabilitation, elderly care and community services), the bulk of the funding comes from government finances.

There is no universal retirement protection scheme in Hong Kong. Government provides non-contributory Old Age Living Allowance (OALA, with means-test) and Old Age Allowance (OAA, without means-test) to senior citizens. No statutory retirement plan existed until the

launch of the Mandatory Provident Fund (MPF) in 2000, but many of the current cohort of older adults were either not covered by this programme or accumulated little savings (Chou *et al.* 2015). In stark contrast to the territory's high affluence, about one-quarter of Hong Kong's senior citizens live below the statutory poverty line (Lee and Chou 2016). A large number of them rely on the Comprehensive Social Security Assistance Scheme (CSSA, Hong Kong's social safety net) (Chan and Chou 2016). Among the few welfare benefits that senior citizens enjoy, highly subsidised health-care services are generously provided by public hospitals without means-testing, making it universally accessible (He 2016). The concept of medical insurance is under-developed in Hong Kong and LTC insurance is essentially non-existent (Leung 2001).

Traditionally, family care plays the key role in LTC, and it remains the first priority in Chinese societies including Hong Kong. Yet, changes in family structure and the deterioration of traditional values have made family an increasingly unreliable source of care (Chow 1999). A 2008 survey in Hong Kong estimated that approximately 280,500 community-dwelling older adults needed assistance in their daily living, but merely 47.6 per cent of them had care-givers. Of this group of older people with care-givers, 65.6 per cent had their family members playing this role, whereas 25.6 per cent were attended by domestic helpers[1] or nurses (Census and Statistics Department 2009). LTC in Hong Kong is predominantly provided at home, with residential care as a last resort (Chou, Chi and Chong 2006; Chou, Chow and Chi 2005). However, this pattern will gradually change in the coming years because the supply of informal care-givers is expected to drop as a result of increased labour force participation by women, fewer children in families, changes in living arrangement (*e.g.* more older couples living by themselves) and higher divorce rates (Chou, Chi and Chong 2006; Chou, Chow and Chi 2005).

The LTC system in Hong Kong is constituted of a patchwork of fragmented services that handle the sporadic needs of older adults (Chung *et al.* 2009). Institutional care has been traditionally provided by non-governmental organisations (NGOs) that are directly subvented by the government as well as by homes operated by the private sector. The service quality of subvented homes is monitored by the Social Welfare Department, while the quality of services rendered by private institutions varies substantially due to minimal monitoring from the Department (Chi 2001). Recently, the government has also been encouraging non-profit providers to operate self-financing residential care homes in their subvented facilities for financially capable older people. In light of the rapid growth of LTC needs and the limited capacity of subvented homes operated by NGOs, the government also introduced the Bought Place Scheme (BPS),

under which quality private home operators are contracted to provide additional beds (Chui 2011).

In 2016, the total number of beds for residential care services was 74,056; of these, 37 per cent were subsidised places while the rest were either in private homes (41,655/56%) or non-subsidised places in self-financing and contract homes (5,287/7%) (Social Welfare Department 2017). The limited capacity in service provision stands in sharp contrast with the vast unmet demand for LTC in Hong Kong. By 31 August 2016, there were 34,749 applicants on the waiting list for various types of subsidised residential care service; the waiting time was 38 months for subvented homes and contract homes, and eight months for beds under the BPS in private homes.[2] Sadly, 4,000–4,500 older persons on the waiting list had passed away in the preceding decade while waiting for subvented facilities (Research Office, Legislative Council 2015), which are preferred by most older people because of their higher service quality (Chi 2001). The long waiting list has been a major cause of difficulty in accessing care, indicating the shortage of subsidised facilities. The quality of services rendered by private facilities has aroused public concern due to abuse cases and scandals occasionally reported in the media.[3]

Under the current arrangement, the allocation of subvented services and bought beds is grounded on needs assessment without means-test and thus operates on a first-come-first-served basis (Kwong and Kwan 2001). The absence of means-test mechanisms for subsidised residential care services has essentially granted all older persons, regardless of their financial status, eligibility to apply provided that they pass the care needs assessments. Moreover, heavy government subsidy has lowered costs considerably so that even ordinary families can absorb them. While the monthly fees paid to a government-subsidised LTC place are merely HK $2,000, the charges of private facilities vary from HK $4,500 to HK $21,000,[4] depending on the coverage and quality of services provided (Hong Kong Consumer Council 2015). Such sharp contrast in prices, compounded by the lack of universal retirement protection and high elderly poverty rate, makes subvented homes preferred by almost all older people, despite the long waits.

In contrast to the high institutionalisation rate for LTC services, community care services in Hong Kong are underdeveloped, despite great demand (Chi 2001; Leung 2001). In 2011, 24,746 subsidised residential care beds were distributed, but only 7,089 community care places were available.[5] The annual government budget for residential care services was five times more than that for community care services.[6] In line with the worldwide trend of 'ageing in place', the general preference among older people in Hong Kong is to continue living in their own homes instead of entering an institution (Lou *et al.* 2009). Largely operated by NGOs, community

care services in Hong Kong consist of enhanced homes and community care services, integrated home-care services and day-care centres. With the government's policy of promoting community care, subsidies are available for local non-profit providers to operate various community care services. All these services are tax-funded without any means-test and are operated on a first-come-first-served basis with a screening mechanism. Apart from formal home-care services, paid domestic helpers can also be hired as formal care-givers for frail older adults (Chong *et al.* 2014).

Planning for long-term care services

LTC services constitute a significant out-of-pocket financial risk to older people that unfortunately is often underestimated (MetLife Mature Market Institute 2009; NOP Roper Public Affairs and Media 2009). While ordinary medical insurance in many health systems does provide coverage for some LTC services, the level of protection tends to be limited, requiring more substantial financial protection. Despite calls for the establishment of dedicated private LTC insurance, the market remains rather small even in developed countries for a variety of demand-side as well as supply-side reasons (Brown and Finkelstein 2008). In the United States of America (USA), merely seven to nine million citizens had LTC insurance in 2010, accounting for approximately 20 per cent of its elderly population (LifePlans 2012). State-run social LTC insurance programmes have been emerging in East Asia, particularly in Japan and South Korea, while some local pilot schemes of similar initiatives have been observed in China (Campbell, Ikegami and Kwon 2009; Shirasawa 2015; Yang *et al.* 2016).

The under-estimation of LTC needs and costs is primarily owing to low public awareness (Iwasaki *et al.* 2010). Public education campaigns are thus needed to encourage prior planning before people age. Individuals' plans for LTC services and costs are ultimately determined by their own assessments of personal risks, such as age, health status, income and assets (Finkelstein and McGarry 2006; Iwasaki *et al.* 2010). A few studies have identified characteristics of individuals labelled as 'planners' for LTC in contrast to those of 'non-planners' (Black, Reynolds and Osman 2008; Lusardi and Mitchell 2007). An empirical study in Florida, USA found that women, older persons and the better educated were more likely to have advance LTC plans, but those with more chronic conditions were less likely to plan (Black, Reynolds and Osman 2008). Among the decisions that older people have to make about their living arrangements, those involving residential relocation are usually very difficult ones in light of the wide preference for ageing in place. A study conducted in the USA identified five

important dimensions that influence the decision to move to a retirement community, including functional status, features of current housing, social networks, features of retirement communities and financial considerations (Caro *et al.* 2012). Current living arrangement has also been found to determine older people's expectations for the future use of LTC services. A study in the USA revealed that older people living with minor children were the least likely to expect to need LTC services, while those living alone were the most likely to expect to need such services (Henning-Smith and Shippee 2015).

A few studies in recent years have started to pay closer attention to the generational characteristics of LTC planning against the backdrop of post-Second World War baby-boomers entering their older years (Quine and Carter 2006; Robison *et al.* 2014). LTC planning is inherently a personal decision that may be influenced by cohort characteristics, and understanding the needs and plans of middle-aged adults and of their preceding cohort of counterparts is therefore critically useful for policy makers in planning the LTC system. A major weakness in the literature is that most studies on LTC planning to date are largely descriptive in nature, and very few of them have examined the differences between the current and future cohorts of older people (Robison *et al.* 2014), while even less is known regarding their implications for social policies.

In the study conducted by Robison *et al.* (2014), two-thirds of the US adults in the sample expected to need LTC services, but few reported saving for such services. Compared with their older counterparts, middle-aged adults were significantly more likely to plan to move to residential facilities and to live with their adult children. The same study also found that women were more likely than men to report planning to use specific LTC services, but specific plans did not vary by birth cohort. To the best of the authors' knowledge, there is virtually no related study on the East Asian context in the English-language literature. As such, it is of theoretical value and policy relevance to examine the LTC needs and planning of both current and upcoming cohorts of adults in the East Asian context. What preparations have current older adults and soon-to-be-older persons made for their future LTC needs? What LTC services do they anticipate that they will use? Who will provide them? How will the services be paid for? This study aims to answer these research questions with empirical results from Hong Kong, a rapidly ageing economy in Asia where people enjoy the highest longevity in the world (United Nations Department of Economic and Social Affairs 2015).

In the Hong Kong context, several salient characteristics distinguish middle-aged adults from the older cohorts and may influence their respective LTC needs and planning. First, the middle-aged cohort of Hong Kong

citizens in general has higher educational attainment than does the current cohort of older adults, which may lead to greater risk awareness (Chou, Chow and Chi 2004). Second, raised in the more economically prosperous period of the territory's history, they tend to have higher expectations for their standard of living in old age. Third, compared to many older persons in their preceding cohorts, most of whom were refugees from Mainland China, this cohort predominantly grew up in Hong Kong; specifically, as revealed in the 2011 Population Census, only 29.6 per cent of older adults aged 60 and above were born in Hong Kong, while almost two-thirds of middle-aged adults between the ages of 40 and 49 were born in the city (Census and Statistics Department 2012). Predominantly born in Hong Kong and extensively exposed to both Eastern and Western cultures, the middle-aged cohort tends to put heavier emphasis on individualism that may lead to greater demands for more and better options in living arrangements. Fourth, as most of the current middle-aged people are covered by the MPF, this cohort has considerably stronger retirement income protection *vis-à-vis* their senior counterparts;[7] this may also affect their LTC needs and plans.

Last, but not least, Hong Kong has undergone remarkable social and demographic changes in the past three decades characterised by lower fertility rates, more nuclear families and fewer extended families, and lower rates of marriage but higher divorce rates (Chou, Chow and Chi 2005). These changes will inevitably reduce the chances of middle-aged people receiving informal care from their adult children or spouses. In sum, all of these generational differences may significantly impact the LTC needs and planning of the middle-aged and older cohorts of Hong Kong citizens, warranting empirical investigation.

Methodology

Sampling

This study draws on data collected from a telephone survey that was conducted by the Public Opinion Programme of the University of Hong Kong in January and February 2016. Ethical approval was obtained from the Human Research Ethics Committee of the authors' university. The sampling procedure involved two steps. First, a fixed set of telephone numbers was randomly drawn from the latest residential telephone directories as 'seed' numbers, and another set was then generated using the 'plus/minus one/two' method to capture new and unlisted numbers. Second, one person per household aged 40 or older who was a Cantonese-speaking Hong Kong resident was randomly selected using the 'next birthday' rule,

which selects the person with the soonest upcoming birthday. The survey was conducted anonymously; no remuneration was given. Eventually, the sample included 1,613 respondents aged 40 and above with a response rate of 63.3 per cent. Of these, 220 cases were excluded due to missing values, so the sample consequently consisted of 1,393 respondents (with 818 between the ages of 40 and 59 and 575 aged 60 and above).

Analytical framework

In order to account for the variety of factors that may influence LTC needs and planning of individuals, Andersen's Behavioral Model of Health Services Use was adopted as the analytical framework. According to this model, the utilisation of health-related services is determined by three sets of factors, namely predisposing factors, enabling factors and needs factors. Predisposing characteristics are those that exist prior to illness but may influence behaviours related to service utilisation, such as race, age and health beliefs. Enabling factors facilitate or inhibit service utilisation once illness occurs; examples could include family support, health insurance and the like. Needs factors represent both perceived and actual needs for health-related services that exert direct influence on utilisation (Andersen 1995). Widely applied in empirical studies analysing LTC needs and use (Bradley *et al.* 2002; Lou *et al.* 2011), the Andersen Model was adopted in this study to account for the factors shaping respondents' LTC needs and planning behaviours in Hong Kong.

Dependent variables

LTC planning was the central dependent variable, consisting of five dimensions of need and planning, namely (a) anticipated LTC needs, (b) anticipated future living arrangement, (c) anticipated utilisation of home- and community-based LTC services, (d) preferred ways of managing LTC services, and (e) plans to finance services. The question measuring anticipated LTC needs was phrased as: 'do you think you will need LTC services including care at home, assisted living and residential care services?' Anticipated future living arrangement was measured by a multiple-entry item with seven response options. The question read: 'as you become older, how likely are you to move to, or live in, the following living arrangements?' Respondents were asked to rate how likely it would be for them to live in different arrangements on a five-point scale ranging from a very high chance to a very low chance. These living arrangements consisted of the following options: (a) remain home without modifications (*e.g.* handrails, raised toilet seats, wheelchair access, *etc.*), (b) remain home with modifications,

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(c) remain home with home care, (d) remain home with foreign domestic helpers, (e) live in assisted living, (f) live with an adult child in his/her home, and (g) live in a nursing home.

Respondents were asked to describe their expectations about their use of home- and community-based LTC services by one item: 'as you grow older, which of the following services will you use?' The services included (a) home care, (b) transportation, (c) home-delivered meals, (d) home maintenance, and (e) personal care. Respondents were asked to answer the question using a five-point scale ranging from very likely to very unlikely. To gauge their preferred ways of managing LTC services, three distinct approaches, as suggested by Robinson *et al.* (2014), were described from which respondents could choose, including: (a) agency driven (depending on an organisation that takes care of all aspects of the services needed), (b) joint effort (working jointly with an organisation), and (c) consumer directed (managing by themselves without any assistance from an organisation). Lastly, plans to pay for LTC services were assessed by asking respondents: 'how do you plan to pay for LTC services if you need them?' Seven options were provided as answers, including: (a) family members, (b) savings or investments, (c) sell my apartment, (d) loan from mortgage, (e) LTC insurance, (f) health insurance, and (g) tax-funded welfare support from the government (*i.e.* cash transfer schemes operated by the Hong Kong SAR Government, including the CSSA, the OALA and OAA).

Independent variables

In this study, predisposing variables included age group (40–59 *versus* 60+), gender, marital status (married *versus* not married), education level (high school *versus* less than high school) and living arrangement (living alone, living with spouse only, living with spouse and children, living with children only and living among three generations). Enabling variables were composed of whether or not respondents (a) reported having money left over at the end of the month for discretionary use, (b) could afford any LTC services, (c) reported having instrumental support for daily activities such as meal preparation, shopping, phone calls or transportation, (d) reported being care-givers to their family members, and (e) described themselves as planners; other enabling variables included respondents' (f) household income, (g) personal assets, (h) number of children, (i) perceived social class, and (j) financial literacy. Financial assets were measured by asking respondents to estimate the value of their assets (including savings, stocks, bonds and property). Financial literacy was assessed by three items that were originally designed for the 2004 Health and Retirement Study and have been adopted in other national surveys in other countries (Bucher-

Koenen and Lusardi 2011; Fornero and Monticone 2011). These three items captured basic knowledge of finance: (a) knowledge about the compound nature of interest, (b) understanding of the effect of inflation, and (c) knowledge of risk diversification.

Needs factors included: (a) the presence of a disability, (b) self-reported health status, (c) number of chronic medical conditions, (d) distress, and (e) perceived life expectancy. The presence of a disability was determined by asking respondents if they needed ADL help due to physical, emotional or psychological health problems. Distress was measured by asking respondents if they had experienced emotional disturbances such as sadness, hopelessness or anxiety in the past 30 days. Perceived life expectancy was measured by asking respondents, on a scale ranging from 0 to 100, what they thought the chances were that they would live to be 80 (Inkmann, Lopes and Michaelides 2011).

Analysis

First, we divided the sample into four groups by age group and gender: (a) middle-aged men (between 40 and 59), (b) older men (60 and older), (c) middle-aged women (between 40 and 59), and (d) older women (60 and older). Descriptive statistics for LTC services needs and planning measures were presented for all respondents and each sub-group mentioned above, while a chi-squared test was performed to examine significant differences for all dependent variables among the sub-groups of respondents. A chi-square or analysis of variance (ANOVA) was also performed to test significant differences for all independent variables. We then performed logistic regression to examine the multivariate relationship between each LTC need and planning variable and predisposing, enabling and need characteristics. SPSS 21.0 was used in the data analysis. The odds ratio and 95 per cent confidence interval indicated the effect of each predictor and whether it met statistical significance.

Results

LTC service needs and planning

LTC services needs and planning variables were assessed by age cohort (middle-aged and older adults) and gender (*see* Table 1). Almost half (47.7%) of the respondents reported anticipated needs for LTC services in the future. As expected, the anticipated needs differed by both birth cohort and gender; the percentage was highest for older women, followed by older men and middle-aged women, and it was lowest for middle-aged

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TABLE 1. *Long-term care (LTC) service needs and plans by birth cohort and gender*

	Total	Men		Women	
		Aged 40–59	Aged 60+	Aged 40–59	Aged 60+
N	1,393	364	279	454	296
		Percentages			
Anticipated need for LTC services (yes)***	47.7	36.8	52.4	49.7	53.5
Anticipated living arrangements (very or somewhat likely):					
Remain home without modifications***	69.8	75.4	79.6	62.7	64.4
Remain home with modifications**	18.7	21.3	12.5	23.7	13.6
Remain home with home care**	41.7	33.1	39.9	47.5	45.3
Remain home with foreign domestic helpers**	27.8	29.9	21.1	33.1	23.3
Live in assisted living	5.1	5.8	4.3	5.9	3.7
Live with adult child in his/her home	23.2	18.8	22.4	25.1	26.7
Live in a nursing home*	21.7	16.0	20.5	23.5	27.0
Anticipated home-based services (very or somewhat likely):					
Home care***	27.3	20.0	24.7	31.7	32.3
Transportation	33.0	27.7	30.7	36.5	36.0
Home-delivered meals*	20.8	16.1	17.8	25.3	22.8
Home maintenance***	41.3	34.5	31.5	51.0	43.9
Personal care**	27.1	23.6	23.6	33.5	25.0
Model of service planning and delivery:***					
Agency-driven	11.7	8.2	6.0	15.0	16.3
Joint model	10.6	14.1	4.4	13.6	7.6
Consumer-directed	46.1	50.4	49.4	47.5	35.3
Don't know	31.6	27.3	40.1	23.9	40.8
Anticipated financial source for covering LTC services:					
Family***	17.3	8.0	15.6	19.4	27.0
Savings or investments***	37.7	49.7	30.9	46.3	16.0
Loan from mortgage	2.1	4.0	1.6	1.5	1.3
LTC or health insurance*	2.7	4.1	1.3	3.3	1.2
Welfare support	21.1	22.0	20.5	20.6	21.2

Note: Differences between groups are tested by a chi-square test.
Significance levels: * $p<0.05$, ** $p<0.01$, *** $p<0.001$.

men. Regarding their anticipated living arrangements, approximately 70 per cent of all the respondents expected to remain at home without modifications; 42 per cent of the sample expected to continue to live in their own homes with receipt of home care, while about 28 per cent would hire a domestic helper at home; about 23 per cent would live in their adult children's homes; approximately 22 per cent anticipated nursing homes as the most likely living arrangement; and around 19 per cent would continue to live in their own homes with some modifications. Only 5 per cent would opt for assisted living.

Cohort and gender differences were noted in all anticipated living arrangements except those of assisted living and living in the homes of adult children. Regardless of their age group, men were more likely than women to expect to remain in their homes without modifications, while women were more likely than men to expect to remain home with home care. Similarly, middle-aged adults were associated with a higher anticipation of staying in their homes with some modifications or of hiring a foreign domestic helper, regardless of gender. Reflecting a clear cohort mark, this result suggests that the middle-aged group of Hong Kong adults intends to have more independent living arrangements as it ages. In contrast to that of all other living arrangements, the anticipation of moving to a nursing home showed the most pronounced cohort and gender differences. Specifically, women and the older cohort of respondents were more likely than men and middle-aged adults to foresee living in a nursing home.

Approximately 41 per cent of respondents planned to use home maintenance, followed by transportation (33%) and home care (27%) or personal care (27%), while about one-fifth (21%) expected to use home-delivered meals should LTC needs arise. Expected use of all five home-based services differed significantly across age and gender groups, except in transportation services. Women appeared more likely to endorse home-care services. A similar pattern was found in planned use of home-delivered meals. Home maintenance appealed most to middle-aged women, followed by older women, and it appealed least to middle-aged and older men; the same pattern was observed in personal care.

Both the agency-driven and joint models of service planning and delivery were endorsed by only a small proportion of the respondents (12 and 11%, respectively), while a purely consumer-directed model appealed to nearly half of the respondents (46%). Table 1 shows that older women were the least likely to prefer managing their LTC services in a consumer-directed fashion, arguably owing to their financial dependence, followed by middle-aged women and middle-aged and older men. As expected, older adults were more likely to report their lack of knowledge of planning and of the delivery model of LTC services than were their middle-aged counterparts. Clearly, case management and the consumer-directed arrangement of LTC services are very much new concepts to both cohorts in Hong Kong.

In terms of LTC services financing, most respondents planned to use their own savings or investments (38%, including MPF payment and voluntary retirement savings) to finance future LTC services, followed by those who planned to rely on welfare from the government (21%) and on family members (17%). Very few respondents expressed an intention to purchase private insurance (3%). Gender and cohort differed significantly

on family support, personal savings or investment, and private insurance. Almost half of middle-aged adults expected to use savings or investments, while only 31 and 16 per cent of older men and women relied on this source, respectively, suggesting that the middle-aged cohort is in a relatively better-off situation that enables them to absorb LTC costs more from private sources. Economic situation also appears to constrain older women's choices, as they tended to expect family members to contribute to LTC expenses more than did middle-aged women, while this source was endorsed the least by middle-aged men. Remarkably, middle-aged adults were more likely to purchase insurance than were older ones, regardless of gender.

Predisposing, enabling and need characteristics

The predisposing, enabling and need characteristics of our sample sorted by age cohort and gender are shown in Table 2. Of the sample, slightly more than three-quarters were married (77%); half had attained an education level higher than that of high school (49%); one-tenth lived alone; one-fifth lived with their spouses only; 46% lived with their spouses and children; and 11 per cent lived with their children only. In terms of the enabling variables, slightly more than one-third (35%) of respondents reported having more than HK $1,000 left over at the end of each month for discretionary use; 60 per cent were unable to afford LTC services; one-quarter (24%) reported the availability of instrumental support; 23 per cent were currently care-givers; 57 per cent saw themselves as planners; 24 per cent had household incomes greater than HK $40,000; 46 per cent had personal assets worth more than HK $300,000; 83 per cent had children; and 45 per cent perceived themselves as being of a lower social class. The respondents' average financial literacy score was 1.4 out of 3. All predisposing and enabling factors differed significantly by age group and gender, except those of having instrumental support and being planners. Regarding needs factors, 9 per cent of respondents needed ADL assistance; 7 per cent reported poor or very poor subjective health status; 41 per cent had at least one chronic medical condition; 23 per cent reported distress; and 58 per cent expected to live to be 80 years old. Age and gender differences were found in self-rated health, chronic illness and perceived life expectancy.

Anticipated needs for LTC services: logistic regression analysis

We then used multiple logistic regression to analyse factors associated with anticipated needs for LTC services. The results are exhibited in Table 3. A significance model of chi-squared statistics indicated that the independent

TABLE 2. *Predisposing, enabling and need characteristics by birth cohort and gender*

	Total	Men		Women	
		Aged 40–59	Aged 60+	Aged 40–59	Aged 60+
N	1,393	364	279	454	296
	Percentages or means				
Predisposing variables:					
Age***:					
Mean	58.0	49.9[a]	69.8[b]	49.4[a]	69.9[b]
Range	40–91	40–59	60–90	40–59	60–91
Married***	76.8	77.1	82.6	83.0	61.4
Education level greater than high school***	49.4	69.5	37.3	59.7	20.0
Current living arrangement***:					
Living alone	10.5	5.7	13.4	3.9	23.6
Living with spouse only	19.9	10.1	36.5	12.3	28.1
Living with spouse and children	46.4	58.8	38.9	56.7	22.5
Living with children only	10.9	4.5	7.9	12.4	19.3
Other	12.3	20.9	3.3	14.7	6.5
Enabling variables:					
Money left over: $1,001+***	34.7	50.2	25.5	38.9	17.7
Cannot afford any LTC services**	60.8	40.9	63.0	61.4	82.3
Has instrumental support	24.2	28.6	20.6	23.6	23.3
Is a care-giver***	23.4	23.0	13.4	30.3	22.6
Is a planner	57.4	59.8	57.1	60.1	50.4
Household income: $40,001+***	23.9	39.3	14.1	27.5	8.7
Personal assets: $300,001+***	46.2	65.4	28.5	62.4	14.4
Number of children***	82.9	74.1	86.8	82.9	90.1
Lower social class***	44.9	36.3	50.0	43.1	53.6
Mean financial literacy***	1.4	1.7[a]	1.3[b]	1.5[a]	1.1[b]
Need variables:					
Needs help with ADLs	9.3	7.9	8.5	9.0	12.4
Self-rated health (very or somewhat poor)***	6.8	3.6	8.6	4.8	11.9
Has chronic illness***	41.3	27.7	62.3	23.9	65.0
Distress	22.5	22.3	18.1	23.2	26.0
Mean perceived life expectancy: 80***	58.1	49.7[a]	70.1[b]	52.1[a]	66.6[b]

Notes: Differences between groups are tested by an analysis of variance or chi-square test, as appropriate. Means sharing the same superscript letter are not significantly different from each other at the 0.05 level according to *post-hoc* Scheffé's tests. LTC: long-term care. ADLs: activities of daily living.

Significance levels: ** $p < 0.01$, *** $p < 0.001$.

variables examined reliably predict the expected LTC service needs, albeit the proportion of variance explained appears low (10.5%). Compared with older women, middle-aged men were less likely to express the need for LTC services, but no cohort effect was found. Among the enabling factors, only being a care-giver turned out to be a significant predictor, while among the needs factors, having ADL assistance needs and having a

TABLE 3. *Odds ratio of anticipated need for long-term care (LTC) services (logistic regression)*

	Anticipated need for LTC services
Predisposing variables:	
Group (Ref. Women aged 60+):	
Men aged 40–59	0.62* (0.51***)
Men aged 60+	1.14 (0.96)
Women aged 40–59	1.07 (0.86)
Married (Ref. Not married)	0.92
Education level greater than high school (Ref. Less than high school)	0.95
Current living arrangement (Ref. With spouse and children):	
Living alone	1.44
Living with spouse only	0.76
Living with children only	1.05
Other	0.74
Enabling variables:	
Money left over: $1,001+ (Ref. ⩽$1,000)	0.98
Cannot afford any LTC services (Ref. Can afford)	0.98
Has instrumental support (Ref. Does not have)	0.98
Is a care-giver (Ref. No)	1.72**
Is a planner (Ref. No)	0.99
Household income: $40,001+ (Ref. ⩽$40,000)	0.87
Personal assets: $1,000,001+ (Ref. ⩽$1,000,000)	1.24
Has children (Ref. No)	1.09
Lower social class (Ref. Middle/upper)	0.92
Financial literacy	1.14
Need variables:	
Needs help with ADLs (Ref. Does not need)	2.23**
Poor self-rated health (Ref. Fair/good)	1.38
Has chronic illness (Ref. No)	1.57**
Distress (Ref. None)	1.25
Perceived life expectancy: 80	1.00
Model summary:	
Nagelkerke R^2	0.1050
χ^2 with df = 24 (p-value)	114.60 (<0.0001)
−2 Log likelihood	1,813.72

Notes: N = 1,393. Values in parentheses are the odds ratios without controlling for other variables. Ref.: reference category. ADLs: activities of daily living. df: degrees of freedom.
Significance levels: ** $p < 0.01$, *** $p < 0.001$.

chronic medical condition were also understandably related to expected LTC service needs.

Expected future housing plans: logistic regression analysis

The results of the logistic regression analysis examining correlations of anticipated future housing plans are shown in Table 4. The significance

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TABLE 4. *Odds ratio of anticipated living arrangements (logistic regression)*

	Remain home without modifications	Remain home with modifications	Remain home with home care	Remain home with foreign domestic helpers	Live in assisted living	Live with adult child	Live in a nursing home
Predisposing variables							
Group (Ref. Women aged 60+):							
Men aged 40–59	1.65* (1.69**)	1.11 (1.72*)	0.57* (0.60**)	0.39*** (1.40)	1.32 (1.62)	0.66 (0.64*)	0.81 (0.52**)
Men aged 60+	2.07*** (2.16***)	0.80 (0.91)	0.88 (0.80)	0.52** (0.88)	1.12 (1.19)	0.77 (0.80)	0.75 (0.70)
Women aged 40–59	0.95 (0.93)	1.48 (1.97***)	1.11 (1.09)	0.66* (1.63**)	1.49 (1.64)	0.91 (0.92)	1.26 (0.83)
Married (Ref. Not married)	0.69	0.88	1.04	1.72	2.31*	1.00	1.19
Education level greater than high school (Ref. Less than high school)	0.88	1.55*	1.04	2.15***	1.09	0.99	0.87
Current living arrangement (Ref. With spouse and children):							
Living alone	0.88	1.03	1.24	0.65	3.96**	0.19***	1.44
Living with spouse only	1.02	1.59*	0.84	0.71	0.77	0.32***	1.32
Living with children only	0.73	1.25	1.21	0.79	1.67	1.68	1.37
Other	0.88	1.16	1.10	1.42	2.27	0.98	0.89
Enabling variables							
Money left over: $1,001+ (Ref. ⩽$1,000)	1.68**	1.04	0.94	0.89	0.99	0.97	1.06
Cannot afford any LTC services (Ref. Can afford)	1.04	0.68*	0.93	0.57***	1.31	1.02	1.05
Has instrumental support (Ref. does not have)	0.87	1.02	0.95	1.36	0.58	1.31	0.79
Is a care-giver (Ref. No)	0.87	1.35	1.74**	1.57**	1.10	0.59**	1.37
Is a planner (Ref. No)	1.21	0.9	1.26	0.98	0.99	1.12	1.22
Household income: $40,001+ (Ref. ⩽$40,000)	0.95	1.52*	0.96	1.73**	0.99	1.12	0.60**
Personal assets: $1,000,001+ (Ref. ⩽$1,000,000)	1.16	0.86	1.30	1.49*	1.21	0.60*	1.33
Has children (Ref. No)	1.11	0.70	0.93	0.97	0.51	1.68	0.73
Lower social class (Ref. Middle/upper)	1.10	0.91	0.95	0.68*	0.38**	1.10	0.89
Financial literacy	1.00	1.10	1.16	1.16	1.24	0.91	1.08

TABLE 4. (*Cont.*)

	Remain home without modifications	Remain home with modifications	Remain home with home care	Remain home with foreign domestic helpers	Live in assisted living	Live with adult child	Live in a nursing home
Need variables:							
Needs help with ADLs (Ref. Does not need)	0.45***	1.77*	2.23**	1.17	1.75	0.48	1.85*
Poor self-rated health (Ref. Fair/good)	1.37	1.53	1.54	1.63	0.84	1.05	1.27
Has chronic illness (Ref. No)	1.00	0.76	1.46**	0.98	0.92	1.45*	1.99***
Distress (Ref. None)	0.85	1.17	1.23	0.68*	0.97	1.00	1.09
Perceived life expectancy: 80	1.00	1.01	1.00	1.00	1.01	1.01*	1.00
Model summary:							
Nagelkerke R^2	0.0805	0.0983	0.1033	0.2179	0.0929	0.1512	0.0896
χ^2 with df = 24 (p-value)	81.86 (<0.0001)	87.56 (<0.0001)	111.65 (<0.0001)	228.98 (<0.0001)	43.57 (0.0086)	147.34 (<0.0001)	83.70 (<0.0001)
−2 Log likelihood	1,625.29	1,253.61	1,781.31	1,417.58	516.60	1,363.47	1,373.80

Notes: N = 1,393. Values in parentheses are the odds ratios without controlling for other variables. Ref.: reference category. LTC: long-term care. ADLs: activities of daily living. df: degrees of freedom.

Significance levels: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

of the chi-squared model suggests that the independent variables reliably predict future housing arrangement despite the relatively low proportion of variance explained. Compared with older women, middle-aged and older men were more likely to expect to stay at home without modifications, while men (middle-aged and older ones) and middle-aged women were less likely to see remaining at home with domestic helpers as a possible scenario. Having savings and a need for ADL help were significantly associated with planning to stay at home without modifications, while education level, living arrangement, affordability of LTC services, household income and ADL needs were related to the expectation of remaining home with modifications. Being a care-giver, having needs for ADL help and having a chronic illness were positively and significantly associated with 'staying at home with home care', while middle-aged men were less likely to expect to stay at home with home care when compared to older women. Higher education level, affordability of LTC services, being a care-giver, household income, personal assets, perceived social class and having distress were significant predictors of planning to stay at home with domestic helpers. Those married, living alone and of lower social classes tended to anticipate living in assisted living. Moreover, respondents who were care-givers and had more than HK $1,000,000 in assets were less likely to anticipate moving to the homes of their children, while those who had a chronic illness and longer life expectancy demonstrated a stronger preference for moving into their children's homes. Two needs factors, namely ADL assistance needs and having a chronic condition, were positively associated with planning to live in a nursing home, while high household income was negatively associated with planning to move to residential care facilities.

Expected home-based service needs: logistic regression analysis

The third dependent variable, anticipated home-based service needs, was also regressed by three sets of independent variables. As can be seen in Table 5, compared with older women, fewer middle-aged men planned to utilise home care and home maintenance services. Personal assets, ADL needs and perceived life expectancy predicted expected use of home care, while education level, being a care-giver and a planner, ADL needs, poor self-rated health, a reported chronic illness and perceived life expectancy were significantly associated with the planned use of transportation services. Those who were single, found LTC services unaffordable and reported having ADL needs tended to anticipate using home-delivered meals, while those who were rich in assets, scored high in financial literacy and reported ADL needs tended to express interest in using home maintenance. Lastly, the respondents who were not living with their spouses or

TABLE 5. *Odds ratio of anticipated home-based services (logistic regression)*

	Home care	Transportation	Home-delivered meals	Home maintenance	Personal care
Predisposing variables:					
Group (Ref. Women aged 60+):					
Men aged 40–59	0.41*** (0.52**)	0.63 (0.68*)	1.02 (0.65)	0.59* (0.67*)	0.93 (0.93)
Men aged 60+	0.72 (0.69*)	0.83 (0.79)	0.88 (0.73)	0.53*** (0.59**)	1.06 (0.93)
Women aged 40–59	0.89 (0.97)	0.98 (1.02)	1.68* (1.15)	1.30 (1.33)	1.57* (1.51*)
Married (Ref. Not married)	0.86	1.04	0.49*	0.99	0.86
Education level greater than high school (Ref. Less than high school)	1.29	1.46*	1.28	1.17	1.03
Current living arrangement (Ref. With spouse and children):					
Living alone	1.47	1.09	0.97	1.17	1.21
Living with spouse only	1.04	1.00	1.66*	1.33	1.30
Living with children only	1.27	1.18	0.85	1.01	1.20
Other	1.15	0.94	0.59	1.15	1.71*
Enabling variables:					
Money left over: $1,001+ (Ref. ⩽$1,000)	0.94	1.04	0.80	1.13	0.70*
Cannot afford any LTC services (Ref. Can afford)	1.04	0.99	1.49*	0.87	0.91
Has instrumental support (Ref. Does not have)	1.22	1.13	0.90	0.77	1.25
Is a care-giver (Ref. No)	1.31	1.67***	1.38	1.27	1.71**
Is a planner (Ref. No)	1.09	1.35*	1.17	1.11	1.39*
Household income: $40,001+ (Ref. ⩽$40,000)	1.08	1.09	0.72	0.83	0.78
Personal assets: $1,000,001+ (Ref. ⩽$1,000,000)	1.83**	1.13	1.26	1.41*	1.84**
Has children (Ref. No)	0.85	0.97	0.82	0.74	1.19

Lower social class (Ref. Middle/upper)	0.94	1.11	1.13	1.27	0.96
Financial literacy	1.09	0.94	0.96	1.24**	1.07
Need variables:					
Needs help with ADLs (Ref. Does not need)	2.24***	1.94**	1.84*	1.96**	1.80*
Poor self-rated health (Ref. Fair/good)	1.58	1.91*	1.67	1.11	2.03**
Has chronic illness (Ref. No)	1.18	1.53**	1.22	1.15	0.96
Distress (Ref. None)	1.01	1.11	1.17	1.19	1.20
Perceived life expectancy: 80	0.99*	0.99*	0.99	1.00	1.00
Model summary:					
Nagelkerke R^2	0.1052	0.1009	0.1105	0.0937	0.1068
χ^2 with df = 24 (p-value)	105.49 (<0.0001)	105.22 (<0.0001)	102.67 (<0.0001)	100.83 (<0.0001)	106.98 (<0.0001)
−2 Log likelihood	1,529.26	1,661.14	1,323.56	1,787.83	1,522.14

Notes: N = 1,393. Values in parentheses are the odds ratios without controlling for other variables. The table presents the final results when all sets of variables were entered at once, for the sake of presentational simplification. In the actual analysis, three sets of variables were entered into regression models in a phase-to-phase fashion, and the statistical patterns were robust; the results are available upon request. Ref.: reference category. LTC: long-term care. ADLs: activities of daily living. df: degrees of freedom.

Significance levels: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

children, had no money left at the end of the month, acted as care-givers, planned for the future, were asset-rich, had ADL needs and had poor self-rated health were correlated with expected use of personal care services.

Anticipated financial sources for LTC services: logistic regression analysis

Multiple logistic regression was later used to analyse factors associated with expected financing sources for LTC services, including family support, savings or investments, and welfare. The results are presented in Table 6. The percentage of variances explained by the predisposing, enabling and needs factors varied substantially for different financial sources, ranging from 7 per cent for welfare support to 33 per cent for private savings or investments. No age or gender differences were found among respondents planning to rely on welfare to finance their LTC services expenditures. Compared with older women, men of both cohorts and middle-aged women were less likely to expect to receive family support. Older men and middle-aged women tended to plan to use their savings or investments. Having children and ADL needs were positively associated with the expectation of receiving family support. Having a higher education level, having savings at the end of each month, having the ability to afford LTC services, being asset-rich, having no children, having a higher perceived social class and having greater financial literacy increased the expectation of using private savings. Understandably, respondents who were living alone, had no savings and perceived themselves as being of a lower social class had a greater likelihood of anticipating that welfare would pay for their LTC costs.

Discussion

By applying the Andersen Model to examine LTC expectations, this study has analysed the LTC needs and plans of the middle-aged and older cohorts of Hong Kong adults as well as their associated factors. Both gender and birth cohort were examined individually and in combination against five aspects, including anticipated LTC needs, living arrangement, home-based services, models of service planning and delivery, and financial sources. Birth cohort and gender have been found to exert an impact on all aspects of LTC needs and planning to varying degrees.

First and foremost, the results revealed the overwhelming preference for ageing in place among Hong Kong adults, echoing the results of another study indicating that almost three-quarters of the Hong Kong older people surveyed agreed or strongly agreed that 'receiving care at home is better than that at residential facilities' (Lou *et al.* 2009). Second, we

TABLE 6. *Odds ratio of anticipated financial source for covering long-term care (LTC) services (logistic regression)*

	Family members	Savings or investments	Welfare support
Predisposing variables:			
Group (Ref. Women aged 60+):			
Men aged 40–59	0.23*** (0.23***)	1.51 (5.19***)	1.58 (1.05)
Men aged 60+	0.54** (0.50***)	1.55* (2.35***)	1.16 (0.96)
Women aged 40–59	0.61* (0.65*)	1.97** (4.53***)	1.31 (0.97)
Married (Ref. Not married)	0.79	1.54	1.14
Education level greater than high school (Ref. Less than high school)	0.93	2.46***	1.09
Current living arrangement (Ref. With spouse and children):			
Living alone	0.58	0.86	2.72**
Living with spouse only	0.86	0.94	1.21
Living with children only	1.06	1.15	1.06
Other	2.13*	1.19	0.84
Enabling variables:			
Money left over: $1,001+ (Ref. ⩽$1,000)	1.19	1.83***	0.67*
Cannot afford any LTC services (Ref. Can afford)	1.15	0.67*	1.14
Has instrumental support (Ref. Does not have)	1.18	1.12	1.15
Is a care-giver (Ref. No)	0.93	1.04	1.34
Is a planner (Ref. No)	1.08	1.35	1.20
Household income: $40,001+ (Ref. ⩽$40,000)	1.01	1.29	1.02
Personal assets: $1,000,001+ (Ref. ⩽$1,000,000)	0.84	1.50*	0.89
Has children (Ref. No)	4.31***	0.60*	0.97
Lower social class (Ref. Middle/upper)	0.81	0.65**	1.40*
Financial literacy	1.05	1.32**	0.99
Need variables:			
Needs help with ADL (Ref. Does not need)	2.34**	0.72	1.31
Poor self-rated health (Ref. Fair/good)	1.45	1.15	0.68
Has chronic illness (Ref. No)	0.96	1.00	1.30
Distress (Ref. None)	0.59*	0.74	1.14
Perceived life expectancy: 80	1.00	1.00	0.99*
Model summary:			
Nagelkerke R^2	0.1215	0.3297	0.0701
χ^2 with df = 24 (p-value)	106.07 (<0.0001)	387.48 (<0.0001)	64.43 (<0.0001)
−2 Log likelihood	1,176.19	1,458.44	1,370.13

Notes: N = 1,393. Values in parentheses are the odds ratios without controlling for other variables. Ref.: reference category. ADLs: activities of daily living. df: degrees of freedom.

Significance levels: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

found a relatively low level of awareness in terms of LTC needs among Hong Kong's older adults; although 48 per cent of the respondents reported anticipated LTC needs, the expressed need is still lower than what was found in a recent study by Robison *et al.* (2014), which suggested that two-thirds of the US respondents in their sample did expect to need LTC services. Further scrutiny indicates that every category of Hong Kong adults had significantly lower levels of expected LTC needs than did their US counterparts. Middle-aged women reported the highest likelihood of needing LTC services (71.6%) in the US sample, whereas 50 per cent of their Hong Kong peers did so. Although middle-aged men appeared the least likely to anticipate LTC needs in both our sample and that of Robison *et al.* (2014), there exists a gap in terms of these percentages (62.9% *versus* 36.8%). This significant gap may be due to the lower awareness of LTC risks among Hong Kong adults, but it could also be explained by their relatively good health status *vis-à-vis* their US peers. A piece of telling evidence comes from the CADENZA study, which showed that Hong Kong older people appeared to have fewer limitations in ADL than did their Western counterparts, suggesting their comparatively good physical conditions (Chau and Woo 2008).

Similar to the finding reported by Robison *et al.* (2014), remaining home appears to be the most popular living arrangement for the vast majority of Hong Kong older people in our sample. However, while no significant variation was found by cohort or gender in their study, this study found that remaining home without modifications was the most preferred living arrangement for both the middle-aged cohort and men in Hong Kong. Although it is increasingly possible for older adults with chronic disabilities to age in the community instead of in institutional settings, supportive living arrangements must be provided in advance. In Hong Kong, the prevalence of ADL impairment had increased from 4.9 per cent in 1996 to 6.9 per cent in 2004 among older adults aged 60 and above, while the prevalence among those aged 80 and above was 20.4 per cent higher in 2004 than it was in 1996 (Chou and Leung 2008). Most of our respondents may not be aware of the fact that disabilities occur in old age and of the likelihood of their developing dementia. Home modification is therefore needed for safety at home or for wheelchair movement.

While remaining home with home care stood out as the most preferred living arrangement for the US older adults studied in Robison *et al.* (2014), it was the second most popular arrangement among Hong Kong's older adults in our sample. The significant association between the anticipation of living at home with home care and acting as a caregiver implies that parents' LTC experiences may influence respondents' own expectations, as revealed by other studies in the West (Gottlieb,

Stoeckel and Caro 2009; Stum 2008). Remaining home with foreign domestic helpers appealed to the middle-aged cohort to a greater extent; this is in part attributable to the diminished sources of care-giving that they have experienced, and it is also reflected in the fact that a low percentage of this cohort anticipated living with their adult children.

Nursing homes are typically seen as the last resort for LTC services for most older people in Hong Kong. In this study, the older cohort and women tended to describe nursing homes as the most likely residential arrangement *vis-à-vis* their middle-aged and male counterparts, arguably due to their lower economic status and lack of family as well as of financial support. Moreover, peer influence may also play a role (Gottlieb, Stoeckel and Caro 2009), as this group of older people can see the poor living arrangements of other older women, resulting in their tending to have a more realistic outlook on their own LTC needs. The same pattern is observed in anticipated financing sources, as the older cohort and women also demonstrated a greater likelihood of planning to rely on family for financial assistance, whereas men and the middle-aged cohort reported a stronger financial capacity to absorb potential LTC expenses with savings or investments or by purchasing private insurance. Moreover, compared with older women, older men were more likely to rely on personal savings because they usually have greater access to the assets that they accumulated during their working years, whereas most members of the current cohort of older women in Hong Kong did not work in the past or had an intermittent working history in their adulthood due to family obligations. Furthermore, the younger cohort in Hong Kong was more likely to rely on retirement savings than was the older cohort due to its wide participation in the MPF and stronger ability to build personal savings (Chou *et al.* 2015).

The preferred model of LTC management and delivery constitutes an important aspect of planning behaviour. Although close to one-third of Hong Kong respondents in our sample were not able to identify the approach that best described their preferences, more than 46 per cent, particularly men and those in the middle-aged cohort, still demonstrated a clear consumer-directed orientation. Historically, the concept of consumer rights has been very popular in Hong Kong, especially since the establishment of the Consumer Council in 1977. The launch of the Elderly Care Voucher Scheme has also greatly empowered those on the demand side of LTC services. Hence, it is unsurprising to observe the high popularity of the consumer-directed model among Hong Kong adults. On the other hand, the joint model – representing a collaborative approach to handling LTC services that is very popular in Western societies – has found little endorsement in the Hong Kong context, as has the agency-driven model.

A variety of home-based services were endorsed by the respondents, with home maintenance being the most needed one, especially by the middle-aged cohort and women. Women in all categories reported higher needs than men, while the cohort effect was mixed across all types of services.

Further scrutiny of the descriptive results of the predisposing variables, enabling variables and need variables by gender and cohort provides clearer clues to understanding the findings revealed above. First, compared with older adults, the middle-aged cohort in Hong Kong was associated with higher education levels and better financial literacy; more savings, income and assets; and higher social class. All of these factors may raise their expectations for future LTC services while financially enabling them to handle various aspects of these services. Second, despite the higher number of children they have, the older cohort of respondents generally have a weak family support system, given their high incidence of living alone and living with their spouses only. Older women appeared to be the most vulnerable group. Women in both cohorts tended to report poorer health status, a higher incidence of chronic illness, stronger distress and greater needs in ADL.

Multivariate analyses offered deeper insights into the determinants of each anticipated living, service and financing arrangement. Among the most preferred living arrangements, the cohort effect and gender effect blurred. Men expressed more interest in remaining at home without modifications than did women, which may be explained by their better status in terms of needs factors; whereas older women were associated with the highest likelihood of remaining at home with foreign domestic helpers, partly because of their high incidence of living alone and their lack of family support. Interestingly, other socio-economic factors were also related to older women's preference for hiring domestic helpers to provide care, as those with higher education levels, with higher incomes and of a higher social class were more likely to do so. An important finding is the absence of any statistical significance between the anticipation of living in a nursing home and either cohort or gender, while the former was strongly correlated with the presence of chronic diseases, needs in ADL and lower income.

In the study by Robison *et al.* (2014), gender rather than cohort was found to explain older adults' needs for specific services. In our study, however, the effects of gender and cohort on the specific services needed were less clear-cut, except in the finding that women demonstrated a higher need for home maintenance services. This difference is due to the fact that respondents who were users of specific services were excluded from the study by Robison *et al.* (2014), whereas our study did not exclude this group. Among the need variables, needing help in ADL understandably

explained a great deal of the need for all anticipated home-based services, while other variables moderately explained the need for specific services. Echoing the finding of Robison *et al.* (2014), our study found that having a disability also increased the expectation of using multiple services as well as of living in a nursing home.

Among the enabling variables, higher personal assets led to higher expectation of service utilisation. Consistent with findings from the USA (Black, Reynolds and Osman 2008), higher education levels of older people led to greater needs in using transportation services. Needing help in ADL was significant in explaining the needs for all specific services. In line with the finding of Robison *et al.* (2014), acting as a family care-giver in Hong Kong was also associated with significantly higher expectations of using transportation and personal care services. In contradiction to what was found in the USA, however, general financial adequacy (measured by income, assets and money left over each month), predicted – to a substantive extent – the variance in terms of anticipated living arrangement, need for specific services and financing sources. This is related to the financing arrangements of LTC services in Hong Kong, most of which are either directly or indirectly subsidised by the government, therefore allowing older people to always be able to rely on welfare as a last resort so long as they can wait for subsidised residential care. While the study by Robison *et al.* (2014) found the availability of instrumental support to be a strong predictor of all specific services and most living arrangements in the US sample, our study in Hong Kong revealed no significant statistical contribution of this variable.

Concluding remarks

Several policy implications can be drawn from this study to inform the development of LTC services in Hong Kong. First and foremost, the government should prepare for a large population from the current and upcoming generations of older adults to age in place, given the vast number of respondents in this survey that expected to do so. The findings that emerged, however, indicate a clear disconnect between older persons' expectations and projected needs, which will become a significant barrier to helping them become better prepared for their LTC needs. This study underscores the need for public education programmes that encourage the Hong Kong people to plan for LTC services before needs arise and that inform them of the risks that needing such assistance may pose to their financial security in the future.

Second, in relation to the implications drawn above, reforms are needed to diversify the financing sources of LTC in Hong Kong in order to minimise catastrophic financial risks for individuals while improving the sustainability as well as the allocative efficiency of governmental resources. Although most of the soon-to-be-older generation of Hong Kong adults are MPF subscribers and are in a better-off economic situation *vis-à-vis* their preceding cohort, future LTC needs still represent a significant financial risk for them and their families. Government financing options, especially subsidies and vouchers, are associated with their own limitations. As such, new financing initiatives such as LTC insurance could be introduced on a pilot basis first.

Third, policies supporting ageing in place need to address a wide range of issues regarding living arrangement, service provision and financing. The results provided by this study can be useful in developing LTC service programmes that best target the specific segments of the elderly population with different needs. For example, in light of the high number of respondents who anticipated remaining home without modifications and remaining home with foreign domestic helpers, a government-subsidised voluntary home modification programme could be introduced, while professional short-term training programmes could also be provided to domestic helpers in order to enhance their ability to serve older people with disabilities. An interesting finding is that despite the low recognition of assisted living among Hong Kong's older adults, multivariate analysis actually revealed its popularity among those who are better educated, who are of higher social classes and who live alone. This suggests that more pilot LTC schemes could be introduced by catering to the needs of older people with different characteristics.

This study is certainly not without limitations. First, this study is based on cross-sectional data; we recognise that longitudinal data are needed to understand further the causal and temporal relations between the factors examined and LTC needs and planning. Second, the multivariate models explain a low proportion of the variance, suggesting that other factors aside from those included in our analysis influence the various aspects of LTC needs and planning. Future research is needed to explore other determinants further. Third, a key contribution that this study attempts to make is the examination of cohort differences in terms of LTC needs and planning in the Hong Kong context. Yet given the emerging nature of this research focus and the very limited number of previous studies available, the study of Robison *et al.* (2014) has been used as the key reference. However, their study was based on a sample of adults selected from a particular state, which was hardly representative of the whole country. Therefore, the comparison between our results and theirs should by no means be over-generalised. Due to the limitations recognised above, our findings

should be interpreted with caution. Nevertheless, the results derived from this study still shed light on the ongoing scholarly investigations on LTC needs and planning among different cohorts of adults, with new evidence from Hong Kong, a rapidly ageing East Asian society.

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NOTES

1 As a result of the high labour participation rate for women, foreign domestic helpers (mainly from South-East Asian countries) play a very crucial role in Hong Kong families, not only in providing ordinary domestic services but also in serving as long-term care-givers. Thus, they are considered as an important source of care in this study.
2 *See* Social Welfare Department (2016).
3 *See South China Morning Post* (2015).
4 The median monthly household income in Hong Kong in 2014 was HK $23,500.
5 Legislative Council Panel on Welfare Services Consultancy Study on Community Care Services for the Elderly Initiated by the Elderly Commission, 11 July 2011 (available online at http://www.legco.gov.hk/yr10-11/english/panels/ws/papers/ws0711cb2-2279-1-e.pdf).
6 The 2014–2015 Budget, Hong Kong SAR Government (available online at http://www.budget.gov.hk/2014/eng/pdf/2014_15_budget_media_sheet_all_e.pdf).
7 Siu (2002) reported that only about 3 per cent of the 3.4 million workers in Hong Kong participated in retirement protection programmes provided by individual employers before the implementation of MPF. Moreover, employees who join such a scheme will not normally have sufficient benefits to cover the needs of old age until they have contributed for at least 30 years, and consequently, many of the current and future retirees will not be able to support themselves through this scheme when they retire at age 65.

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Address for correspondence:
Alex Jingwei He,
Department of Asian and Policy Studies,
The Education University of Hong Kong,
10 Lo Ping Road, Tai Po, New Territories, Hong Kong

E-mail: jwhe@eduhk.hk