Measuring Affordability and Factors Affecting Affordability of Elderly in Hong Kong

Wong, F.K.W.

Department of Building and Real Estate, The Hong Kong Polytechnic University
(email: bskwwong@polyu.edu.hk)

Hui, E.C.M.

Department of Building and Real Estate, The Hong Kong Polytechnic University
(email: bscmhui@polyu.edu.hk)

To, W.H.

Department of Building and Real Estate, The Hong Kong Polytechnic University
(email: bsto16@polyu.edu.hk)

Chung, K.W.

Department of Applied Social Sciences, The Hong Kong Polytechnic University
(email: sskwchun@polyu.edu.hk)

Abstract

In many countries, people are reaching an advanced age in greater numbers and in better health than ever before. Hence, aging population is a popular demographical feature in developed countries. Elderly should be placed in a secure place to live with dignity. Affordable housing is therefore a critical factor to promote the well-being of the elderly. The discussion and debate of affordability has been triggered since the 1980s in Britain. Since then, many efforts have been put to determine who is regarded as unaffordable to housing and therefore requires government subsidies or government provision of housing. It is believed that the better the understanding on the housing affordability of the elderly, the more the Government can suggest or implement within her housing policy planning as a means of social welfare. There are three popular approaches to measuring housing affordability. They are including Normative Approach, which means an upper limit or a ratio is laid down to judge whether a household is unaffordable to housing. The second measuring approach is Behavioural Approach; it directly reviews the housing consumption behaviour of a household. The final approach is Subjective Approach; it directly asks the respondent whether he is affordable to his house or not. The result will be checked against his financial position to ensure validity. Subject to the measurement, there are four major types of factors affecting affordability, i.e. Rent, Income, Housing Related Cost, and Non Housing Cost. While the importance of these factors varies in different context, e.g. age, the factors affecting the affordability of elderly might not be the same as non-elderly. A precise understanding of elderly affordability and factors affecting the housing affordability of elderly is a necessary step to formulate a holistic housing policy for elderly. However, research findings show that some non-monetary factors for instance, age, health status, education level, and household features, exert significant influence on the level of housing

affordability. It is believed that the findings exert significant influence on the level of housing affordability. This paper would firstly present the definition of affordability and its measurement. Secondly, comments would be given to the measurement of affordability. Thirdly, factors affecting the affordability of the elderly would be identified and hence to review how it affects their affordability. Finally, a policy implication and conclusion will be given to round up the paper.

Keywords: housing affordability; elderly; Hong Kong

1. Aims of the study

This study focuses on the investigation of non-monetary factors to see how these factors affect one's affordability. Based on the literature review and research gap, this research aims to base on the given definitions, investigate the non-monetary factors affecting the housing affordability and discover the interrelation between the factors. It is because, in fact, traditional perspective on housing affordability heavily focuses on monetary factors, for instance, income, asset, and rent; while for those non-monetary factors, such as household features, age, education level, are overlooked. Moreover, Hong Kong is confronting an aging population; the government could benefit from the findings of the elderly housing research to design relevant housing policy. Therefore, in this study, the elderly group is being selected as the research target population. Some recommendations will be given for policy formulation process to provide affordable/decent housing for the elderly. However, the factor of supply and modality in Hong Kong would not be covered throughout this paper in deep.

2. Introduction

Similar to other developed states and cities, Hong Kong is facing a rapid expansion of aging population. By the end of 2008, there were 1.2 millions of elderly (equivalent to 17.1% of total population) and it is the highest figure in the history of Hong Kong. It is estimated that the elderly population will reach 2.7 millions in 2036, which accounts for 32% of total population (Census and Statistics Department, 2009). The elderly dependency ratio will increase from 170 in 2008 to 456 in 2036[1].

The Hong Kong government is obligated to promote the well-being of elderly and so, such concern has been put on the policy agenda since its colonial era. 'Community care' and 'ageing in place' are two leading principles of elderly service in Hong Kong which means appropriate support should be provided for older people and their families to allow them to grow old with minimal disruption. Government residential care services or nursing home are the last resort to elderly. Therefore, providing affordable housing for elderly is a critical and essential step to uphold the principles of promoting the well-being of elderly in Hong Kong.

In order to provide affordable housing for elderly, it is, basically, necessary to have a deep understanding and identify what factors that will exert influence to the affordability of elderly.

3. Background of affordability

The concept of affordability was firstly arisen in Britain at the end of the 1980s. The concept of housing affordability is stimulated by the transformation of the housing market and housing subsidy system in Britain. Who is likely to be unaffordable to housing is now a crucial question to be considered by the

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[1] *The Elderly Dependency Ratio is calculated by the Person aged 65 or above / Person aged 15 - 64 X 1000*

housing providers, especially to the government. It is because the government has her unique responsibility to provide affordable housing for those needy targets. It is indeed controversial to regard someone to be unaffordable to housing. Definition with different interpretation offers different measurement of housing affordability. From time to time, people find themselves to be ranked differently in different measurements. The first objective of this paper is to critically review the literatures on the concept of housing affordability. It aims not to construct a new approach to replace or rectify various definitions but to identify, through a comprehensive literature review, the factors affecting housing affordability.

3.1 Definition of affordability

The research on housing affordability has become popular since the 1980s. Prior to the 1980s, there was only limited research on housing affordability. Since then the research on affordability is increasing and at different realm, such as academia, professionals, and government, have been devoted to explore on the topic of affordability. Extensive literatures concluded many different interpretation and understanding of affordability.

Howenstine may be the first one to give a definition in the notion of "affordability". He defined housing affordability as:

> *'The ability of the household to acquire decent accommodation by the payment of a reasonable amount of its income on shelter' (Howenstine, 1983, p.20).*

In response to Howenstine, Maclennan and William offered another more comprehensive definition to define affordability; they pinpointed the vagueness of the definition offered by Howenstine and attempted to clarify what is '*reasonable amount*'. They defined that:

> *'Affordability is concerned with securing some given standard of housing (or different standards) at a price or rent which does not impose, in the eye of some third party (usually government) as unreasonable burden on household incomes' (Maclennan and William, 1990; p.9).*

Despite the clarification of 'reasonable amount', the concept of 'given standard of housing' and 'unreasonable burden' is too vague and should be defined more precisely. Bramley gave a more specific and precise definition to affordability. He mentioned that:

> *'Household should be able to occupy housing that meets well-established (social sector) norms of adequacy (given household type and size) at a net rent which leaves them enough income to live on without falling below some poverty standard' (Bramley, 1990; p.16).*

Hancock attempted to incorporate the concept of opportunity cost to affordability. In his interpretation, affordability is strongly related to opportunity, which means something needs to be forgone in order to

obtain a house. He defined that:

> *'...concerned with the notion of opportunity cost of housing, and clearly this is the essence of the concept of affordability: what has to be forgone in order to obtain housing and whether that which is forgone is reasonable or excessive in some sense' (Hancock, 1993; p.129)*

Thalmann attempted to give a summarized definition and he simplified the affordability as the comparison between housing expenditure and non housing expenditure. He wrote that:

> *'Housing is not affordable for a household if it excessively crowds out other expenditure' (Thalmann, 2003).*

Local scholar also contributed to define the concept of affordability. Lau defined affordability as:

> *'After paying housing costs for staying in housing unit which meets the socially accepted norms of adequate housing standard, are unable to live on a living standard of those social security recipients' (Lau, 2001; p.1).*

Although there are many different definitions of 'affordability' offered by different scholars and consensus are still required to be further established, common elements and considerations could be found in different definitions. Yip (1995) argues that, firstly, affordability deals with the user cost of housing of an individual household. Secondly, the household should be able to consume housing at some given lowest standard. Thirdly, the opportunity cost of non-housing consumption is an important concern of affordability. Fourthly, affordability includes the concept of merit goods. Non-housing goods and services are regarded as merit goods as many definitions state the importance to keep sufficient amount of resource for non-housing consumption; while whether housing is regarded as merit goods is still undergoing debate. Whitehead argues that the housing in UK is not merit goods (Whitehead, 1989); but Hancock contends that '*any approach which does not taking housing to be a merit good is likely unreasonable*' (Hancock, 1993; p.129). Finally, there is a close relationship between poverty and affordability, for instance, Bramley's definition explicitly states that '*without falling into some poverty standard*'. Yet, it is argued that affordability is not the same as poverty and a clear distinction should be made between them (Yip, 1995; p.49).

3.2 Measurement of affordability

To measure the extent of affordability, the concept of affordability must be operationalized. Based on the previous definition and concept, Yip (1995) suggested an excellent framework to present different measurement of affordability. The framework summarizes the measurement of affordability into three approaches. They are namely normative approach; behavioural approach and; subjective approach.

3.2.1 Normative approach

Normative approach refers to the limits or norms of housing affordability in terms of certain threshold values (Yip, 1995; p. 56). A list of benchmarks is set to distinguish whether a household is affordable to housing. There are two different types of norm set to identify the affordability. The first is ratio measurement, which means the housing cost of a household should not exceed a certain proportion of the household income.

3.2.2 Traditional ratio measurement

As ratio measurement has a long history of development, there is more than one measurement and new ratio measurement method is coined to tackle with the limitation of the old method. Traditional approach of ratio measurement is simply the same as the definition, i.e. a household is experiencing unaffordable housing if the ratio of housing cost to income, the affordability ratio, exceeds a certain threshold ratio.

3.2.3 Quality-based ratio measurement

Yet, it is criticized that the traditional approach is not comprehensive enough and the quality of housing is not being covered. Lerman and Reeder (1987) modified the traditional approach and made the approach to embrace the consideration of housing quality. Affordability is therefore defined as a household is unaffordable to housing if it must spend above a certain threshold proportion of its income on a minimally adequate house in the locality. It prevents the case that a household can only occupy a sub standard accommodation although he is spending less than the prescribed level of income. It is because more than the target ratio would need to be spent in order to raise the standard of housing to the minimally adequate level.

3.2.4 Core need measurement

Another different approach to revise the traditional ratio measurement is core need measurement, which is suggested by Sueke and colleague (1981). This approach also considers the quality aspect, but it differs with the quality based measurement. Core need assessment does not incorporate the quality aspect into the cost of acquisition at the minimally adequate quality; in contrast, the core need assessment treats housing quality as a separate dimension which includes physical quality of the dwelling as well as over-crowding. Thus, a household is regarded as unaffordable to housing, or in core housing need, if he is occupying inadequate or unsuitable housing regardless of the proportion of the household income spent on housing (Yip, 1995; p.60).

3.2.5 Residual income measurement

The second type of normative measurement refers to residual income measurement. It was firstly

developed in UK in the late 1980s. Residual income measurement means housing is affordable if, after paying housing cost, it leaves them enough income to live without falling below the poverty standard (Bramley, 1990). The residual income measurement is closely related to the concept of poverty, as assessment of affordability requires comparing the residual income against poverty line. The most common way to set the poverty line is appealing to 'income support' level or the social security level (Lau, 2001; p.1).

Hancock (1993) extends the Residual income measurement to include any indication of housing quality. It considers households with affordability problem to the extent that consumption of housing and non-housing goods are both below the socially defined minimum level. However, further information is required to indicate the preference and constraint of the household in order to determine the affordability position of the household.

As it is difficult to distinguish preference from constraint, an extended definition of residual income approach is coined to revise the residual income approach. It defines household with either housing or non-housing consumption under the socially accepted minimum as experiencing unaffordable housing (Yip, 1995; p.62).

In short, Thalmann (2003) gave a clear distinction between ratio measurement and residual measurement of affordability. For ratio measurement, housing is affordable if housing expenditure does not exceed a given share of income; while for residual income measurement, housing is affordable if income minuses housing expenditure is no less than standard non-housing expenditure.

3.2.6 Behavioural approach

It is believed that people's housing consumption behaviour can also be used to assess housing affordability. In order to assess housing affordability, Bramley states that to 'focus on normal housing decision, looking at what households with given incomes and characteristics, facing given prices, choose to spend' (Bramley, 1994; p.105). Another behavioural approach is to look at the problem of mortgage arrears and repossessions, so that to investigate the household's affordability based on their decision. Although different efforts have been found, the previous researches and studies gave only inconclusive result to the understanding of affordability. While some scholars still believe that this approach, theoretically, is more accurate in demonstrating the expenditure pattern of household to the extent that the affordability, addressed as a specific issue and empirical data, is rich enough to allow a thorough investigation (Yip, 1995).

3.2.7 Subjective approach

If both normative approach and behavioural approach are regarded as an objective measurement by scientific research and objective data collection, Kearns and Colleagues (1993) offered a completely

different approach, i.e. subjective approach. Kearns and Colleagues adopted subjective approach to study the housing in Scotland. The study simply required the respondent to answer the question about affordability in subjective evaluation of their own situation. The respondent was requested to answer the question in a Likert scale from 'very difficult to afford' to 'very easy to afford'. The qualitative and subjective measurement is checked against their financial position and other quantitative factors. The data collected are used to determine the threshold level of their housing affordability with the belief that the individual is the best judge of their own situation (Yip, 1995; p. 68).

3.3 Factors affecting affordability

Under different measurement approaches, some factors affected affordability could be identified. The most obvious one is rent and income. All different approaches largely emphasize on these two factors. Rent is important in affecting affordability, as it determines how much is required to pay for housing. Income is also playing a fundamental role to affect affordability. It determines a household's ability to pay for housing. Few would doubt these two factors are strongly affecting one's affordability, but the discussion should not be stopped here. There are other factors affecting one's affordability in addition to income and rent.

In addition to rent and income, housing expenditure also will affect the level of affordability to pay for housing. No one could avoid housing expenditure if he or she consumes a unit. Housing expenditure refers to those expenses on housing, for instance, tax, rate, maintenance fee, management fee (Mostafa, 2008; p. 89). It is because the amount spent on housing expenditure would at the same time reduce one's income available for paying housing rent. Higher housing expenditure would reduce one's household affordability. While on the other hand, the 'maintenance fee' and 'management fee' items are two technical but complicated areas in terms of 'housing affordability' which should be further investigated in other research studies.

Apart from housing expenditure, residual income measurement puts a lots concern on non housing expenditure. Non housing expenditure can be operationalized into money spent on basic living, such as food, education, healthcare, childcare (Mostafa, 2008; p. 89). They are vital for household to maintain a basic living. The supporter of residual income measurement argues that housing is unaffordable if the household is unable to maintain their basic living after paying certain amount for housing rent. Thus, in this point of view, the non housing expenditure would also strongly determine the household's affordability, especially when it comes to apply on the elderly group.

Quality Based Measurement also emphasizes on the importance of housing quality. It argues that a household is unaffordable to housing if it consumes a housing unit which is below the socially acceptable standard, regardless to the rent paid is below certain ratio. Housing quality can be operationalized into different indicators, such as housing size and household size.

Table 1: Factors affecting affordability (Mostafa, 2008)

Different Affordability Measurement	Factors affecting affordability
Traditional Ratio Measurement	*Rent*
	Income
	Housing expenditure
Quality Based Measurement and Core Need Measurement	*Rent*
	Income
	Housing expenditure
	Minimum socially accepted standard housing unit
Residual Income Measurement	*Income*
	Housing expenditure
	Minimum socially accepted non housing expenditure

4. The practice in Hong Kong

In Hong Kong, normative approach is commonly adopted to investigate the affordability of the household. The most commonly used indicators are rent-to-income ratio and mortgage-to-income ratio. Rent-to-income ratio (RIR) is the expression of rent as a percentage of income; while mortgage-to-income (MIR) is the expression of mortgage payment as a percentage of income. In spite of rent-income-ratio and mortgage-income-ratio, house price-to-income ratio (HIR) is also another measurement, which is adopted recently. For a single housing unit, it calculates the ratio of current market value of the unit to the total annual income of the family that occupies it; for a market, house price-to-income ratio is the ratio of the median value of all recent housing sales during a given period to the median annual household income in the market under study (Lau, 2001; p. 3).

4.1 Current housing situation of elderly in Hong Kong

According to the Census and Statistics Department in 2006, the top three housing situations of elderly are recorded as 'Living with children' (53.5%); 'Living with spouse only' (21.2%) and 'Living alone' (11.6%) respectively. This result implies that most of the elderly in Hong Kong, in fact, are rely on either their family members or otherwise nobody for any health care or daily lives' purposes. On the other hand, it is seen that there are a high demand on providing elderly care services too. While the top three types of housing occupied by the elderly in Hong Kong are: 'Private permanent housing' (41.3%); 'Public rental housing' (41.1%) and 'Subsidized sale flat' (16.6%).

4.2 Housing policy for elderly in Hong Kong

After the handover of Hong Kong in 1997, an Elderly Commission was established and mainly responsible for the overall elderly policy. So far, 'Single Elderly Persons Priority Scheme' and 'Elderly Persons Priority Scheme' are two major programs for the elderly housing (see Table 2 for details). As we can see, the efficiency of both programs should be enhanced since the supplied seats can no longer afford the growing trend of aging population in Hong Kong. Worse still, the shortage of elderly housing causes the longer waiting period of every applicant (the elderly) and finally, deteriorates the quality of daily living as a result.

Table 2: Public housing programs for elderly

Hong Kong Housing Authority's Program	Details	Time required for allocation	Successful cases in 2007/08	Number of cases on waiting list
Single Elderly Persons Priority Scheme	*Housing for Senior Citizen or One Person Flats are allocated to <u>single elderly</u> applicants*	*It depends on the availability of public rental houses*	*1,430*	*5,410*
Elderly Persons Priority Scheme	*For <u>two or more related or unrelated</u> elderly people who are willing to live together in a public rental flat*	*It depends. The allocation could be done by 2 years if they are willing to live in the New Territories.*	*630*	*1,820*

Sources: HKHS and HKU 2004, HKHA 2009, & Personal Communication with HKHA

5. Knowledge gap

Previous efforts are found to investigate the factors affecting housing affordability, there are, however, at least two major research gaps which deserve particular attention:

(i) Research on factors affecting affordability are mostly focusing on rent, income and housing related cost (Howenstine, 1983; Maclennan and William 1990; Bramley, 1990; Hancock, 1993). However, other factors are almost being ignored. For example, other non-monetary factors are also playing an important role to determine one's affordability. Without the critical investigation of these other factors, the complete picture of household affordability cannot be shown and to be further analysed. Worse still, in some cases, merely the half understanding of household affordability would mislead the housing providers and government to formulate inappropriate housing policy and hence hard to provide affordable housing for specific target population. Therefore, a study is necessary to look into the non-monetary factors and investigate the correlation between the non-monetary factors and affordability;

(ii) Nowadays many researches on housing affordability could be found and most of them are focusing on general population or some specific group, for instance, poverty group, single parent family, or working population. The in-depth investigation of housing affordability of elderly is relatively limited in academic realm. It is therefore unique if such a research is conducted to investigate the housing affordability of the elderly in Hong Kong.

This research is meaningful as Hong Kong is a minimalist welfare city. It is a place where no universal pension system is provided but its welfare system is highly residualized by only relying on MPF and personal saving as the major financial protection after retirement. Therefore, it is worthy that a research should be conducted to investigate the housing affordability of the elderly so as to enrich the understanding of their situation.

6. Research methodology & details

A structured questionnaire was used in this research to collect data from the better-off elderly in Hong Kong. It is because there were relatively few researches conducted to concern with the affordability of better-off elderly. In general, 'better-off' is a relative concept and is only a general term to identify households whose incomes are higher than the so-called Monthly Median Domestic Household Income (MMDHI); while many better-off people are, in fact, '*just*' affordable to housing or some even to afford housing at the expense of its living quality. Commonly, their relatively high household income makes them to be excluded from government subsidies and protection, for instance, they are ineligible for applying public rental housing under the current housing policy. Thus, it is worth to look into those better-off elderly and to explore the factors affecting their housing affordability.

In present, Hong Kong elderly is defined as who aged 60 or above, this definition is commonly adopted in the academic field. While on the other hand, better-off person usually is defined as a person who is living in a household, which the monthly household income is over the MMDHI of a country or city. Sometimes, other criteria would also be selected to distinguish and identify better-off elderly when there are difficulties to collect precise information on household income such as ignorance or unwilling to reveal of income.

The targeted elderly group are selected from only better-off districts (better-off district means the MMDHI of *District* is above the MMDHI of Hong Kong), that is over HKD $18,000 (Census and Statistic Department, 2009). In order to find better-off elderly, the scope will be further narrowed down to find better-off *Constituency* in identified district (better-off Constituency refers to the MMDHI of Constituency is above the MMDHI of Hong Kong). The *District Elderly Community Centre* in the identified constituency will be invited by the research team to conduct questionnaire interview. The collected questionnaires will be further screened while recipients of Comprehensive Social Security Assistance (CSSA) or tenants of Public Rental House will be excluded from the collected questionnaires due to their unsuitable identity to this targeted population study. Selected elderly interviewees were then

chosen and approached through the centres, which are located in Tsuen Wan, Kowloon City, Shai Tin, Wan Chai, and Sai Kung. A simple random sampling was used to collect information from elderly. The whole questionnaire process is administered completely by the researchers due to the problem of illiteracy.

7. Data description and summary

There were in total 125 elderly answering this questionnaire but the effective questionnaires are only 103. Indeed, 22 out of 133 elderly are either CSSA recipients or tenant of Public Rental Housing who should be excluded from this analysis. Thus, only 103 effective questionnaires could be used for the following analysis as effective data which involved 70 female and 33 male respectively with the average age of 76.1.

7.1 Individual characteristics

All respondents are retired and almost all of them were participated in primary industries or secondary industries, such as *Manufacturing, Clothing, and Hawker*, before their retirement. 41.7% of the respondents received primary education only; while 35.9% respondents received no education. Concerning the marital status, 91% of respondents are married, but 45% of them are widow. 4% of respondents are single. On the other hand, the health conditions of elderly are generally good; most of the respondents perceived their health status is 'better' (29.1%) or 'much better' (23.3%) than the people in the same age group; however, melituria and hypertension were still two common diseases for elderly; some elderly even have serious chronic diseases, such as heart disease, cancer, or parkinson disease. 72.8% and 78.6% of respondents are able to perform all tasks in self-care (e.g. take medicine) and daily activities (e.g. dining) without any assistance. The remaining percentage represents the elderly require assistance to perform at least one task in either self-care or daily activities.

7.2 Household characteristics

There are about 39.8% of respondents are regarded as conventional family or ordinary family (elderly are living with spouse and children). For those from unconventional family or unordinary family, 36.9% respondents claim that they are living alone and 19.4% respondents are living with their spouse only. Yet it is not unexplainable that more small nuclear families are formed to replace traditional families in modern society. Moreover, as the target population in this study is better-off elderly in better-off household, their relatively high economic ability further encourages the children to depart from their parents and to live independently. While 89.3% respondents have already owned their housing unit and the remaining respondents were renting their housing unit instead. According to the subjective approach to measure affordability, the mean score is 3.78, this shows that respondents consider it easy to afford their housing based on their subjective assessment.

7.3 Factors affecting housing affordability

Based on the previous literature reviews, it is noticed that income is the most significant factor to consider one's affordability on housing. However, apart from that, there are in fact some non-monetary but potential factors that we should pay attention to decide one's income ability and hence his/her housing affordability. The following emphasizes on the non-monetary factors affecting affordability. Non-monetary factors can be divided into two categories: household factors and individual factors. Some hypotheses were set before the investigation of correlation between the variables and affordability. These are:

1.   Fewer the working adult in a household, lower the affordability

2.   Higher the age, lower the affordability

3.   More the health status deteriorated, lower the affordability

4.   Lower the education received, lower the affordability

7.4 Numbers of working adult in household

The study shows that the correlation between working adult in household and affordability is 0.426 which is positively correlated. This implies that the fewer working adult in a household, the lower the affordability (Table 3). However, it is believed that elderly group will suffer from this factor more seriously than other age cohorts, because they are usually unable to generate a high and stable income by themselves in the labour market. Besides, poor physical availability and voluntary retirement also makes elderly depart from the labour force which in turn implies that their major source of income is stopped. It is easy to understand that children tend to get rid of their responsibility to afford the housing cost of their parents as to support their own housing cost and living cost. Thus, elderly living in a household without any working adults are usually suffered from lower in affordability.

Table 3: Cross tabulation between affordability and number of working adult in a household

Affordability level	Distribution of Number of Working Adult in Household of Elderly				
	0	1	2	3	More than 3
1 (very difficult to afford)	12.7%	0%	0%	0%	0%
2 (difficult to afford)	20.6%	0%	0%	0%	0%
3 (just affordable)	15.9%	9.5%	7.1%	0%	0%
4 (easy to afford)	34.9%	33.3%	42.9%	100%	0%
5 (very easy to afford)	15.9%	57.2%	50%	0%	100%

7.5 Age

The finding below records a negative correlation (- 0.49) between age and affordability, which is regarded as a strong negative correlation (Table 4). For age group 60-69, no respondent rated unaffordable to housing, but it comes to more respondents rated '*difficult to afford*' housing in older age groups. Such reverse correlation between age and affordability can be attributed to the specific context of elderly. It is known that almost all elderly have departed from the labour force due to voluntary retirement or physically incapable; the process of wealth accumulation will be stopped once they retired and the saving will be consumed continuously at the same time. Without means to increase their income and saving, the affordability of elderly is decreasing with higher age and hence, it is expected that elderly with older age do need more subsidies from the Government.

Table 4: Cross tabulation between affordability and age

Affordability level	Age Distribution of Elderly (by Age group)			
	60-69	*70-79*	*80-89*	*90-99*
1 (very difficult to afford)	0%	6.5%	15.2%	0%
2 (difficult to afford)	0%	6.5%	27.3%	25%
3 (just affordable)	0%	6.5%	21.2%	75%
4 (easy to afford)	40%	34.8%	36.3%	0%
5 (very easy to afford)	60%	45.7%	0%	0%

7.6 Deterioration of health condition

The correlation between health status and affordability is negatively correlated (- 0.541). That is, the more intense of deterioration of health the elderly faced with, the lower affordability they suffered. As we know, elderly usually have hypertension and melituria; yet these two diseases are, in fact, chronic but not serious in relative to other diseases, like cancer or heart disease. The medicine for these two diseases is under government subsidies and therefore exerts less economic pressure to the elderly. However, it is also common for elderly to have serious diseases such as heart disease, cancer, and parkinson disease; these diseases are far more serious than hypertension and melituria, but better or more effective medicine with less side-effect is excluded from government subsidies. The nature of healthcare is a paradox and the demand for medical treatment is inelastic, which means people usually pay for medical cost in regardless of the cost of treatment and they are willing to pay for it at the expense of other living cost, such as housing cost. Therefore, the cost on medical treatment would correspondently reduce one's level of housing affordability, especially for the elderly with serious disease.

Table 5: Cross tabulation between affordability and deterioration of health condition

Affordability level	Distribution of Health Status of Elderly (1: much better; 5 much worse)				
	1	2	3	4	5
1 (very difficult to afford)	0%	3.4%	0%	12%	50%
2 (difficult to afford)	0%	6.9%	29%	20%	12.5%
3 (just affordable)	8.3%	13.8%	11.8%	12%	25%
4 (easy to afford)	16.7%	44.8%	47.1%	44%	0%
5 (very easy to afford)	75%	31%	11.8%	12%	12.5%

7.7 Education level

It is found that the correlation between education and affordability is 0.44, which is a medium and positive correlation (Table 6). It proves that elderly with better education are more likely to be affordable to housing. Higher education also guarantees better affordability. In fact, Hong Kong is a place without comprehensive pension and retirement protection system, people saving for retirement is entirely based on their previous occupation and income earning ability. Hence, it could be concluded that better education enables people to find job with more stable and higher income. In other words, low income implies saving is limited and people are unable to buy investment products like shares or insurance to generate future income. As a consequence, saving sounds too limited to afford housing and therefore, for lower educated elderly, they are less likely to be affordable to housing.

Table 6: Cross tabulation between affordability and education level

Affordability level	Distribution of Education Level of Elderly		
	No education	Primary education	Secondary or above
1 (very difficult to afford)	21.6%	0%	0%
2 (difficult to afford)	13.5%	18.6%	0%
3 (just affordable)	18.9%	13.9%	0%
4 (easy to afford)	24.3%	39.5%	43.5%
5 (very easy to afford)	21.6%	27.9%	56.5%

8. Policy Implication & recommendations

To conclude that elderly group is most likely affected by the above individual factors (age, education level and health status) and household factors (number of working adult in household). Say, unconventional family such as singleton elderly or elderly living with spouse only will be affected adversely due to no

more financial support and primary care from their children. Also, elderly with poor education level will be adversely affected due to limited earning capacities and so their low level of saving and assets. Furthermore, elderly with poor health status will reduce their economic availability for affording their housing. Furthermore, the older elderly will be lower in their affordability since their life-long saving is almost all they could consume without any compensation.

Subject to the findings, some recommendations are provided for the government to redevelop and improve the current elderly housing policy. The details are as the following:

8.1 Lessening the existing criteria

Affordable housing should be provided for unconventional family by lessening the existing criteria, i.e. mean-test, to ensure that they are able to afford housing with no expense of their basic living. Meanwhile such criteria could also be reviewed regularly from time to time in order to keep pace with the changing family structures in Hong Kong.

8.2 Tax allowance

Higher tax allowance should also be provided to encourage children to live with their parents. So that those parents would less likely suffer from lacking in care services and facing higher daily living cost; or otherwise, who have to live alone with merely low self-care ability instead.

8.3 Comprehensive retirement protection

Investigate a comprehensive retirement protection system to increase housing affordability of the elderly and the soon-to-be old. Moreover, the scheme could maintain people's quality of living to a certain extend and to prevent from poverty as a result.

8.4 Specific housing subsidy

A specific housing subsidy should be provided for those birth cohorts who received none compulsory education. The subsidy should be mean-tested. The criteria of such test should be reviewed regularly accordingly and it should always depend on the changes of social demography in Hong Kong.

8.5 Elderly subsidy for health care

Extra subsidies should be provided for the elderly who are with serious diseases, for instance, considering their health status when they are applying for public housing or increase more subsidies for better medical treatment. This could help the elderly prevent from over-worrying about their expenses on medical/health care, so that they would have more (economical) alternatives or become more affordable to the housing

cost or expenditure.

8.6 Investigation on housing preferences of the elderly

Affordable housing subject to the preference of elderly should also be regarded as an important section within the elderly housing policy in order to satisfy not only their physical or material needs, but also their psychological needs and living with dignity too. Therefore, further investigation on preference is absolutely necessary.

9. Conclusion

Previous efforts on factors affecting affordability are simply focusing on economic factors, while other factors, such as housing and non-housing expenditure, personal and social factors are not well covered. It deserves more attention and effort to investigate the factors affecting both affordability and even preference so as to gain a comprehensive picture of factors affecting elderly on housing affordability.

The critical review of the literature contributes to the basic understanding of the concept of housing affordability. The review also provides the framework for factors affecting affordability. It should be addressed that the literature review and the research is not intended to construct an alternative approach to measure affordability. Instead, it aims to identify the factors affecting affordability through the given definition and understanding of the concept. As a result, the factors affecting housing affordability, in addition to monetary factors, should also include: i) Number of working adult in a household; ii) Age; iii) Deterioration of health status and; iv) Education level.

From Table 7, which is about a correlation comparison between those factors and one's affordability to housing, it is concluded that the 'number of working adult in a household' and 'education level' are positively proportional while the 'age' and 'deterioration of health status' are negatively proportional to the housing affordability.

Table 7: Summary of correlation between the variables and affordability

Non-monetary factors	*Correlation Index*
Number of working adult in a household	*0.426*
Age	*- 0.49*
Deterioration of health status	*- 0.541*
Education level	*0.44*

Indeed, different non-monetary factors presented above show that the housing affordability will be reduced accordingly. These factors are not only confined into better-off elderly but also expected that they

will exert adversely towards those worse-off elderly too. Thus, further study is expected to investigate on how such non-monetary factors affect the affordability or even preferences of worse-off elderly.

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