The cost effectiveness of aging in place: A literature review

Nguyen Tan Loi¹*, Nguyen Tien Dung², Ho Nhut Quang³

¹Eastern International University, Vietnam
²University of Economics and Law, Vietnam
³International University, Vietnam National University Ho Chi Minh City, Vietnam

*Corresponding author: loi.nguyen@eiu.edu.vn

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ABSTRACT

The objective of this paper is to discover the evidence supporting or refuting the cost-effectiveness of Assisted Living Technology (ALT) in aging in place of older adults through a comprehensive presentation of cost studies and economic analyses. The search was conducted on two main databases for health economic valuation: The NHS economic valuation database (NHS EED) and the health economic valuation database (HEED). The study was evaluated using the protocol required by Campbell and Cochrane Economic Methods. As an aging society evolves, the need for long-term care services increases. The prevalence of chronic diseases increases in the older population; seniors may have to abandon their active social life and need long-term care in a nursing home. Aging is a global phenomenon. Asia is aging rapidly. By 2030, the number of Asians aged 65 and over will increase from the current 300 million to 565 million. By 2050, this number will increase to 900 million, about one-sixth of the number of people in Asia. Aging trends are regional, but demographic changes are diverse. Countries such as Japan, South Korea, Singapore, and China, whose populations are steadily aging, are in extreme situations. Research has shown that ALT can reduce costs in some cases, but with little precise data and low quality. Later developments, e.g., capacity methods, should be used for further research. Qualitative research is needed to assess the cost-effectiveness of ALT before making reliable conclusions about the application.

1. Introduction

From 1980 to 2017, the world’s population over 60 more than double, from 382 million to 692 million. By 2050, it is more than double again in developing countries. In a country with a population of about 2.1 billion people, the number grows faster than in developed countries. The population of this age group in Asia is expected to more than triple, and the population over 60 is projected to increase from 549 million in 2017 to 1.27 billion in 2050. This vital trend, as well as our advances in modern medicine, are having a significant impact on labor supply, family and family structure, retirement schemes, health and welfare needs, and housing and transportation services. Life extension is a double-edged process, especially in Asia, as governments around the world struggle to pay for institutional resources and facilities for medical and nursing care, as in the West. It turns out to be a sword. Private medical expenses are also skyrocketing. Therefore, it is necessary to create a lifestyle that allows older people to take care of them.
The World Health Organization defines older people as those older than 65 years or more aged (Cattan, White, Bond, & Learmouth, 2005), whereas the United Nations (UN) defines older people as those over the age of 60 (Kong, 2018). According to the estimate, in 2050, nearly 2 billion of the world’s population, constituting about 22%, will be over 60 years of age, with 402 million people above 80 years of age. Increased aging is related to a rise in vulnerability and frailty, resulting in a greater requirement for health and aged care services (The United Nations, 2012). Most elderly persons choose to remain in their homes instead of transfer into a nursing home or assisted living facility (Lehning, Smith, & Dunkle, 2015). Aging in place is a concept that refers to the practice of remaining at home in familiar intergenerational communities while retaining autonomy, occupations, and social life. Aging in place is a strategy that allows elders to remain securely and comfortably in their own homes or primary residences (Fausset, Kelly, Rogers, & Fisk, 2011). People maintain a higher sense of independence and control over their life when they reside in their place, surrounded by appropriate assistance such as their family members and friends. With the baby boomer generation’s advancing age, there is a growing need for aging-in-place services. Numerous variables must be addressed when determining how to best satisfy the requirements of individuals who prefer to stay at home, including residence, conveying, recreational possibilities, closeness to necessary services, social connection, and cultural participation (Wiles, Leibing, Guberman, Reeve, & Allen, 2012). In literature, the aging in place concentrates on accommodation and assistance or care (Judd, Olsberg, Quinn, Groenhart, & Demirbilek, 2010). Lawton (1982) highlights the importance of the interplay between personal competency and ecological gerontology and the physical home environment on older adults’ well-being, demonstrating how improvements to the house (such as reducing barriers or adding physical assistance may improve independence) (Lawton, 1982). There is rising worry regarding the safety and suitability of the existing residential estate for ageing in place, including insulation, heating/cooling, dwelling size, and design (Means, 2007).

While technology improvements persist, the healthcare business has historically been slow to respond (Halford, Lotherington, Obstfelder, & Dyb, 2010). Assisted Living Technology (ALTs) solutions must priorities both enhancing the aging in place experience and helping people and the taxpayer in cost containment. The purpose of this work is to conduct a systematic evaluation of cost and cost-effectiveness studies on ALTs for older adults and to identify areas where more research is required to support the case for ALTs. Financial assessment of health treatments are becoming more prevalent, combining data on efficacy and expenditure to determine the cost-effectiveness of their adoption. There is a growing body of data demonstrating the effectiveness and acceptability of ALTs (Martin, Kelly, Kernohan, McCreight, & Nugent, 2008) and more significantly, ALTs for older adults (Barlow, Singh, Bayer, & Curry, 2007). Moreover, there has been no assessment of the financial evaluations for the use of ALTs that may support aging in place in older adults, indicating a critical need in the research that this study will fill. A concrete illustration of this gap is provided by the results of a recent Scottish research on ‘smart technology’ (Bowes & McColgan, 2006). According to this article, the ALTs for older adults employed in their research were acceptable to users and staff. Although the ALTs were successful in lowering the use of certain health care services, the intervention cost was not evaluated, and hence no economic analysis could be conducted (Bowes & McColgan, 2006). Even though the usefulness of ALTs for older adults is widely recognized, it is critical to quantify the expenses and advantages of broad deployment enough so that the decision-makers in publicly and privately financed healthcare organizations may select choices based on pieces of evidence (Drummond, Sculpher, Claxton, Stoddart, & Torrance, 2015). The dearth of such research was noted in a recent review (Bahaadinbeigy, Yogesan, & Wootton, 2010), which
identified many significant gaps in the existing literature on economic analysis. As very few research on the topic, this paper contributes to finding evidence supporting or refuting the cost-effectiveness of ALT in aging in place of older adults through a comprehensive presentation of cost studies and economic analyses.

2. Why aging in place is important?

World life expectancy has increased in recent decades thanks to improved living conditions and advances in medicine and technology. Recently population estimates predicted that while the proportion of older persons will be constant of high, the growth ratio of the older population will be even higher. In Europe, for example, the population over 80 will double by 2080 compared to 2014 (Eurostat, 2015). To tackle population aging, strategy and services are increasingly focusing on community life instead of institutions as the significant compact of supply (Van Bilsen, Hamers, Groot, & Spreeuwenberg, 2008). Ilinca and colleagues noted that the procedure of deinstitutionalization of care the sustainability of the care system is increased and improve the standard of life of its users (Ilinca, Leichsenring, & Rodrigues, 2015). Additionally, studies have shown that older persons in Western Europe are as willing to resident in a familiar habitat as possible (Teti, Grittner, Kuhlmey, & Blüher, 2014). Cutchin described the political goal of being able to stay in the current environment at a certain age as “aging” (Cutchin, 2003).

Older people can take care of those in their home of option appear to affect their quality of life. Older people view families and communities as part of the “good” that improves their quality of life (Bowling et al., 2003). The relationship between “quality of life” and “local age” will be explained in more detail in the next section. Aging in the field due to changes in demographics and politics, the concept of aging in the field has recently received more and more attention. Aging used to mean that people grow old within their own four walls, but now the concept has expanded to include being in the current community and living in the home of their choice. Comparing Cutchin’s previous clarity, the World Health Organization (WHO) Centre for Health Development defines the term as Helps ensure a level of independence (World Health Organization, 2004). As pointed out by Cutchin (2003), independence, skill level, and environmental control are the foundation of aging in place and, therefore, should be encouraged. Andrews, Cutchin, McCracken, Phillips, and Wiles (2007) note in this context that the concept is currently being expanded to include ancillary living quarters, which are a form of supportive life for older people. In addition to the preferences of older people, care for the elderly is generally considered cheaper than inpatient care (Marek, Stetzer, Adams, Popejoy, & Rantz, 2012) and is regarded as an inexpensive solution for an aging population (Sixsmith & Sixsmith, 2008).

People’s quality of life appears to be improved from this aging in place, as autonomy (Mitzner, Chen, Kemp, & Rogers, 2014) and social relationships are preserved (Horner & Boldy, 2008). In fact, the “home” not only plays an important role in the quality of life of older people but is also the place where people spend most of their lives. Therefore, this place connects them with intimacy and relationships with friends and relatives (Perez, Fernandez, Rivera, & Abuin, 2001). Some authors highlight the benefits of aging on the fly, but there are potential negative consequences as well. First, delays in obtaining needed services and accommodations can be detrimental and overwhelmed by intermittent caregivers (Horner & Boldy, 2008). Secondly, tough household chores can turn your home into a prison. Managing the family and home environment can be a burden for older people with disabilities. Thirdly, the negative consequences of aging in the same place also led to a deterioration in the quality of life of older people. This is at risk of policies and practices that support only the basic needs of older people. External factors such as inadequate informal support, poor homes and communities, poor social
networks, inadequate health care and social assistance can threaten the quality of life. A person’s home should not be a place for experiences such as disappointment, strong negative emotions, or loneliness (Sixsmith & Sixsmith, 2008), but an area where people can occurrence quality life as they grow up. Standard of life “Quality of life” has become a significant part in medical, social, and psychological research. In addition, Gabriel and Bowling’s opinion (2004) should also be the endpoint key for assessing the public approach. However, “quality of life” is often used as an all-encompassing term, and in health care, it primarily refers to body composition and sometimes mental composition. Although this concept is widely used, it is usually not clearly defined or understood, and there is no single definition (Moons, Budts, & De Geest, 2006). Some scientists find it challenging to define because it is influenced by both objective and subjective aspects (Gabriel & Bowling, 2004). Nevertheless, there is a consensus on the following aspects: (a) Quality of life is multidimensional (Cummins, 2005); (b) Quality of life is dynamic and can vary from person to person (Carr, Gibson, & Robinson, 2001); (c) Quality of life consists of objective and subjective elements (Carr et al., 2001). The World Health Organization (WHO) Quality of Life Group takes an integrated, holistic approach, emphasizing subjectivity, values, and cultural characteristics and defining quality of life as follows: Life and its goals a value system associated with expectations, standards and concerns (Group, 1995). In recent years, research on “old age” and “quality of life” has advanced significantly. However, to date, little awareness has been given to assessing the quality of life of older individuals on the ground. Standard of life is very important in the concept of “ageing in place”. Quality of life of life and aging in situ are inextricably linked, as aging is an important factor affecting the “quality of life” of older people as detail about quality of life is described below in Table 1.

**Table 1**

Explanation about quality of life by different authors

| Definition                                                                 | Quality of Life QOL | Respondents       | Sources                                      |
|---------------------------------------------------------------------------|---------------------|-------------------|----------------------------------------------|
| None                                                                      | Overall QOL         | Self-respondents  | Van Bilsen et al. (2008)                     |
| “The quality of life is specific areas that seem important; The opportunity to have fun and participate; Feel the promise in life Participation makes sense” | None                | None              | Perez et al. (2001)                          |
| None                                                                      | WHO-QOL             | Self-reports      | Deshmukh, Dongre, Rajendran, and Kumar (2015) |
| None                                                                      | Questions related to QOL and overall QOL | Self-response | McKee, Kostela, and Dahlberg (2015)         |
| “The quality of life of the elderly Concerning pain relief; Good overall perception; Financial stability, moderation; Get enough food; Resources, options Physical activity and function” | Overall, about QOL and Question related to QOL | Self-reports | Classen, Mann, Wu, and Tomita (2004)         |
| None                                                                      | Overview of QOL and questions related to QOL | Self-studies     | Prieto-Flores, Fernandez-                   |
3. Methodology

3.1. Search strategy

The search was conducted on two primary databases for health economic valuation: The NHS economic valuation database (NHS EED) and the health economic valuation database (HEED). The NHS EED contains a structured summary of a complete economic assessment of the quality of medical technology. The only criterion for which is that the study must be a complete economic assessment. Like the NHS EED, HEED includes complete economic assessments, cost analyses, medical cost studies, and applied research reviews that include economic data. Thus, the search is systematic and repeatable.

3.2. Selection criterion

ALTs are limited to the elderly (median study age 65 and over) and can live independently at home / in old age. However, some comparators are not excluded.

3.3. Exclusion criterion

- This survey is aimed at young people (average age less than 65 or unknown age);
- Research by non-human participants (theoretical work or simulation);
- It is based on personal interviews outside the home;
- Intervention by well-trained family professionals;
- Interventions that include family medicine, diagnosis, and treatment are excluded and “only encourage the exchange of data between patients and cares” (Steventon et al., 2012). Remote care interventions are excluded unless independence is specifically required;
- Does not include cost and/or benefit comparisons according to economic valuation studies.
3.4. Quality checking

The study was evaluated using the protocol required by Campbell and Cochrane Economic Methods Group (Shemilt et al., 2019). These consist of protocols described in the Cochrane Handbook and latest developments (Vale, 2010) and include an economic scenario into the GRADE confirmed framework (Brunetti et al., 2013). In addition, CCEMG’s current guidelines for assessing the quality of cost analysis indicate that appropriate components should be used in one of the following two Jefferson, Demicheli, and Entwistle (1995) and Drummond et al. (2015).

3.5. Data collection

Our purpose is to apply specialized quantitative protocols such as meta-analysis to the outcomes, but this is all-encompassing because the quality of the research and the various methodologies did not allow us to do this. Due to the diversity of studies conducted, the direct parallel protocol recommended in Cochrane Handbook is much suitable (Sterne, Hernán, McAleenan, Reeves, & Higgins, 2019). Thus, this paper aims to find out evidence supporting or refuting the cost-effectiveness of ALT in aging in situ of older adults through a comprehensive presentation of cost studies and economic analyses. The environment is not a global estimate and cannot be applied to any environment.

4. Results

Like the majority of public hospitals across Singapore, the occupancy rate of the beds at Khoo Teck Puat Hospital (KTPH), rose very quickly and exceeded 80% by early 2011. In late 2011, further analyses identified 425 patients who had been hospitalized three or more times within six months, accumulating nearly 9,000 bed days. Patients hospitalized repeatedly occupy valuable bed space, consume large quantities of medical resources, and likely have unmet needs in the community, resulting in high and avoidable healthcare costs (Figure 1). The Aging-In-Place (AIP) program, offered by KTPH, is a person-centered home-health intervention to reduce the frequency of readmission for patients who were hospitalized three or more times within a single six-month period (Figure 2) (Matchar et al., 2018).

![Figure 1. Incremental cost-effective ratio (ICER) using bootstrap scatterplot process (Matchar et al., 2018)](image-url)
Recent research has focused on the economic situation of older people (Oris, Gabriel, Ritschard, & Kliegel, 2017; Schöllgen, Huxhold, & Tesch-Römer, 2010). The updated version of the 2020 European Poverty and Exclusion Index states that 17.4% of the EU population aged 65 and over is at risk of poverty (Fret et al., 2018). In addition, the income gap for older people is widening. For example, in Belgium, the average income over the age of 65 (€18,021 per year in 2016) is lower than the average income under the age of 65 (€23,675 per year in 2016) (Džuka, Lačný, & Babinčák, 2019). In contrast, as people get older, they face increased costs and expenses associated with various health problems (Lehnert et al., 2011). Home age is a better choice for seniors, and politicians generally find it more cost-effective than inpatient care, but what are the cost-effective costs and benefits of home age. As long-term treatment costs rise, they become financially viable (Grabowski, 2006; Means, 2007). The study focuses on the individual cost of caring for older people with certain medical conditions (diabetes, depression, gout, etc.) (Katon, Lin, Russo, & Unützer, 2003; Wu et al., 2008). The purpose of this article is to examine the retirement costs of older people living in the community and determine if and when they will get older. The study concludes that Belgium has the highest poverty rate among older people in Europe (14.6% in the same age group in the 28 EU countries in 2016 compared to 15.4% among people aged 65 and over) (Haitz, 2015). Fret et al. (2018) find that the minimum monthly income Belgians need to avoid the risk of poverty was €1,115. Older people in Belgium with limited careers or inadequate financial resources can benefit from a social security system called “Income Guarantee for Older People” (IGO) (Fret et al., 2018). However, according to Fret’s study in 2017, the maximum monthly pay for seniors living alone is €1,083.28, below the above minimum income and still insufficient to meet the minimum standard of living in Belgium (Fret et al., 2017).
WHO prioritizes universal access to care and support, but social security systems in European countries differ greatly depending on the type of compensation (Marziale, 2016; Pacolet et al., 2018). Due to considerable differences in national health insurance systems, the percentage of core costs (non-reimbursable costs for in and outpatient care, prescription drugs, daycare, etc.) also varies greatly (Holly, Lamiraud, Chevrou-Severac, & Yalcin, 2005). In Belgium, personal spending on average accounts for 18% of total health care services, higher than in other West European nations, for example, Germany (14%) and France (7%). According to the study, the approach to the care of health in Belgium is usually good. Still, there are significant differences in unmet health requirements between income categories, mainly for economic reasons (Devaux, 2015). In latest years, European nationalities such as Belgium have been challenged with the “aid socialization” movement, which assumes that aid enters the community (Dury, 2018). This is complemented by a European move towards “deinstitutionalization” of care for the elderly, which inspires older individuals to remain at home as soon as possible (Anttonen & Karsio, 2016). There have been numerous studies on the costs of hospital care for the elderly and society (Kok, Berden, & Sadiraj, 2015). These studies show that nursing home care is expensive and difficult for older people to pay for such home care. For example, a recent study found that the average monthly rent for a nursing home in Flanders in 2017 was €1,665, much higher than the average Belgian pension (around €1,225 per month) (Pacolet et al., 2018). On the other hand, the study on the living expenses of older people in need of home care is yet very restricted. There are several studies on the cost of home care, but to our knowledge, none of the studies have included the total cost of older people needing home care (Costa-Font, Elvira, & Mascarilla-Miró, 2009; Davey, 2006). Mestheneos (2011) provides a clear indication of the economic challenges faced by older people that need to be seen from a broader perspective, not just long-term care costs. A study was conducted by Fret et al. (2018) to satisfy the affordable prices of home care that the province is researching to identify the various sources of income and spending for the elderly living in the area. Affordable prices for inpatient care have been investigated, but there is still no evidence for the cost of “community-based geriatric care.” Fret et al. (2018) collected 173 surveys from a non-random sample of seniors (age 60 and over) living in the community. Frequency and bivariate tests were run on the data (to see if there are specific high-risk, low-income, and high-cost groups). The results show that income sources are diverse and that financial balance is necessary to secure livelihoods, especially for older women and older residents. In addition, the study shows that “on-site elderly care” is not always available, especially for older people in need of care, and can become a problem in an aging society.

Social costs (housework, cleaning, family support, etc.) make up a relatively high proportion of care costs and support for older people. Social spending (11%) is the largest spending for older people after housing (36%) and living expenses (32%). The average income is 1,461.1 euros, from 130 euros. Seniors only benefit from Flemish long-term care insurance (which is an exception, the second-highest income is €530), the highest is €7,900, and the family has a high income. Housing appears to be an important cost factor for the average €450; living expenses is €397.1 on average; Social expenses (e.g., family care, housework, support (cooking, shopping, cleaning, ADL and IADL housework accompanied by the elderly) is average €141.7; and medical costs (€72.60 on average) exceed the medical costs (€69 on average). Most non-formal caregivers pay travel expenses (on average €40 per month), laundry for the elderly and bed linen (on average €40 per month), and professional family support (on average €40 per month). Therefore, you will have to pay an extra 144 euros per person. Some older people need to cut back on their professional hobbies, which leads to a loss of income (on average 225 euros per month). The average value of all family expenses per month is 1,382.0 euros (Table 2).
**Table 2**

Cost and expenditure analysis of older peoples

| Categories      | Income  | Expenses | Sources                                                                 |
|-----------------|---------|----------|-------------------------------------------------------------------------|
| Total           | €100    | €100     | Fret et al. (2017); Fret et al. (2018); Graybill, McMeekin, and Wildman (2014); Matchar et al. (2018) |
| Minimum         | €130    | €328     |                                                                         |
| Maximum         | €7,900  | €5,442.0 |                                                                         |
| 2nd Maximum     | €4,300  | €5,735.1 |                                                                         |
| Mean            | €1,671.9| €1,626.1 |                                                                         |
| Median          | €1,461.1| €1,382   |                                                                         |

Source: Authors’ synthesis

5. Discussion

Traditionally, older people in China prioritize living with their children, who can facilitate family reunification, affinity, and psychological help (Klassen, Higo, Dhirathiti, & Devasahayam, 2018). The family is an integral part of older people’s lives and symbolizes their human spirit (Gillsjö, Schwartz-Barcott, & von Post, 2011). Seniors who live with their children and families can enjoy a better living environment and greater happiness while avoiding loneliness. On the contrary, they live alone, become mentally healthy, and more prone to depression (Lim & Kua, 2011). A common feature of Asian children is filial piety and caring for their parents, but less than half of older people in Hong Kong live with their children and spouses (Lam & Fong, 2020). Therefore, the government needs to implement specific housing policies to help children live with their parents and to strengthen family support for the elderly. For example, a family with an older person must first move to a large social home.

Community infrastructure usually needs to be improved to support older people with disabilities. Governments need to strategically improve access to health facilities in the community as they are an essential factor in determining the health of older people (Loo, Lam, Mahendran, & Katagiri, 2017). Elderly with chronic conditions should regularly visit long-term care facilities to get the care they need. If a long-term care facility is too far away or inaccessible, it can adversely affect the health of older people. In addition, the original residential areas and transport networks need to be improved to ensure traffic safety for the elderly. On the other hand, in response to an aging population and given financial sustainability, the government needs to formulate a budgetary framework for housing for the elderly, accommodation for the elderly and surrounding areas, roads, transport, and improving the movement of other buildings. Making the community accessible to older people is one of the prerequisites for promoting an aging community. To be able to improve the quality.

The role of home care services such as Home Health Care (HHC) and Home/Long Term Care Support (HMPS) will become increasingly important to meet the ever-growing needs of older people. HHC contains nutritional information for nursing or health care services provided by healthcare professionals, while HMPS includes daily care such as food preparation, personal hygiene, and cleaning (Mery, Wodchis, & Laporte, 2016). The Department of Hospital Administration Nursing Services (CNS) aims to reduce the likelihood of readmission of discharged patients and provide care for patients with mental illness (Chan, Fung, & Chan, 2017). Governments need to develop home care plans, especially for older people, to provide the most appropriate home care and rehabilitation services. Home care services are different from
general long-term care services. Hence, the government must have a dedicated team to provide “home care services” to the elderly, social workers, doctors, nurses, nurses, physiotherapists, etc., bathing. Today, some private companies and NGOs offer targeted care services for the elderly, such as food delivery and laundry services. Thus, governments must coordinate the implementation of appropriate measures, ensure consistent quality of care, and play a leading role in meeting the need for care for the elderly.

6. Conclusion and policy implications

The results should be considered within the following constraints: The samples in this study do not represent conclusions related to the financial ability of whole older people. The review uses non-randomly samples, particularly attention to elderly people in need of care and health problems. The focus is to understand the costs and expenses and point out certain risks associated with availability. Further research on a larger sample is needed to better understand the economic situation of all older people. In addition, participants had to collect and register for a monthly fee. However, it is interesting to collect and record expenses over time to determine the income and costs of older people for the year. Some months require more effort or contingency than others because they don’t coincide with each month. Longitudinal research allows the study of large amounts of money.

Standard of life assessment is valuable for understanding the requirements of older individuals. It is also beneficial to estimate whether the objective is being achieved and provide information related to the disadvantages of intervention, effectiveness, and benefits of intervention. This literature search does not give the right tools for seniors on the fly, as it lacks features raised by the older population to show their way of life. Given the significance to homes, neighborhoods, and autonomy in the context of local aging, these aspects need to be integrated into assessment tools. In general, on-site dependent pensions are expensive and come with accessibility risks. Social spending seems to account for a relatively large share of the budget for older people. In this regard, the government is advised to consider the chances of “maximum demand” for private security. Previous researchers are already working on this issue, and this transfer is still ongoing. This is the driving force. The company agrees with the automatic right to receive all monetary compensation and donations. Automatic rights were partially introduced for “higher redemption status,” but not for qualified personnel in all categories.

The Flemish government has started a good deal and established Flanders Social Security to provide a “long-time care budget” for older people and those in need of long-time care. However, it is unclear whether a future people-centered retirement system will require older people’s care and financial position. Particular attention should be given. This is good for all responsible governments. In fact, the State’s responsibility for the elderly’s caring was transferred to local governments to older adults in the social rental market, who are particularly at threat of payment difficulties following the latest increase in rental guarantees that Flanders must pay within two to three months. Seniors are part of the life cycle. Older people can lose their physical fitness as they age. While advances in health care have improved health and increased life expectancy, older people’s basic needs, such as living conditions and the environment, cannot be ignored. The government wants older people to receive adequate care and live with their families in a familiar environment. However, existing projects on aging, such as community centers and healthcare facilities, are still in their infancy and will take some time to develop. Thus, the government should consider maintaining quality living conditions for older people through the region’s aging. Instead of living in a nursing home with care, older people can come into close contact with the community.
References

Andrews, G. J., Cutchin, M., McCracken, K., Phillips, D. R., & Wiles, J. (2007). Geographical gerontology: The constitution of a discipline. *Social Science & Medicine, 65*(1), 151-168.

Anttonen, A., & Karsio, O. (2016). Eldercare service redesign in Finland: Deinstitutionalization of long-term care. *Journal of Social Service Research, 42*(2), 151-166.

Bahaadinbeigy, K., Yogesan, K., & Wootton, R. (2010). Gaps in the systematic reviews of the telemedicine field. *Journal of Telemedicine and Telecare, 16*(7), 414-416.

Barlow, J., Singh, D., Bayer, S., & Curry, R. (2007). A systematic review of the benefits of home telecare for frail elderly people and those with long-term conditions. *Journal of Telemedicine and Telecare, 13*(4), 172-179.

Bowes, A., & McColgan, G. (2006). *Smart technology and community care for older people: innovation in West Lothian, Scotland.* West Lothian, Scotland: Age Concern Scotland.

Bowling, A., Gabriel, Z., Dykes, J., Dowding, L. M., Evans, O., Fleissig, A., ... Sutton, S. (2003). Let’s ask them: A national survey of definitions of quality of life and its enhancement among people aged 65 and over. *The International Journal of Aging and Human Development, 56*(4), 269-306.

Brunetti, M., Shemilt, I., Pregno, S., Vale, L., Oxman, A. D., Lord, J., ... Guyatt, G. H. (2013). *GRADE guidelines: 10. Considering resource use and rating the quality of economic evidence.* *Journal of Clinical Epidemiology, 66*(2), 140-150.

Carr, A. J., Gibson, B., & Robinson, P. G. (2001). Is quality of life determined by expectations or experience? *BMJ: British Medical Journal, 322*(7296), 1240-1243.

Cattan, M., White, M., Bond, J., & Learmouth, A. (2005). Preventing social isolation and loneliness among older people: A systematic review of health promotion interventions. *Ageing & Society, 25*(1), 41-67.

Chan, W. Y., Fung, I. M., & Chan, E. (2017). Universal health coverage through community nursing services: China vs. Hong Kong. *Rev Lat Am Enfermagem, 25*, Article e2838. doi:10.1590/1518-8345.1664.2838

Classen, S., Mann, W., Wu, S. S., & Tomita, M. R. (2004). Relationship of number of medications to functional status, health, and quality of life for the frail home-based older adult. *OTJR: Occupation, Participation and Health, 24*(4), 151-160.

Costa-Font, J., Elvira, D., & Mascarilla-Miró, O. (2009). ‘Ageing in place’? Exploring elderly people’s housing preferences in spain. *Urban Studies, 46*(2), 295-316. doi:10.1177/0042098008099356

Cummins, R. A. (2005). Moving from the quality of life concept to a theory. *Journal of Intellectual Disability Research, 49*(10), 699-706.

Cutchin, M. P. (2003). The process of mediated aging-in-place: A theoretically and empirically based model. *Social Science & Medicine, 57*(6), 1077-1090.

Davey, J. (2006). “Ageing in place”: The views of older homeowners on maintenance, renovation and adaptation. *Social Policy Journal of New Zealand, 27*, 128.

Deshmukh, P. R., Dongre, A. R., Rajendran, K., & Kumar, S. (2015). Role of social, cultural and economic capitals in perceived quality of life among old age people in kerala, India. *Indian J Palliat Care, 21*(1), 39-44. doi:10.4103/0973-1075.150175
Devaux, M. (2015). Income-related inequalities and inequities in health care services utilisation in 18 selected OECD countries. *The European Journal of Health Economics, 16*(1), 21-33.

Doyle, J., Kealy, A., Loane, J., Walsh, L., O’Mullane, B., Flynn, C., ... Bond, R. (2014). An integrated home-based self-management system to support the wellbeing of older adults. *Journal of Ambient Intelligence and smart Environments, 6*(4), 359-383.

Drummond, M. F., Sculpher, M. J., Claxton, K., Stoddart, G. L., & Torrance, G. W. (2015). *Methods for the economic evaluation of health care programmes* (4th ed.). Oxford, UK: Oxford University Press.

Dury, S. (2018). Dynamics in motivations and reasons to quit in a Care Bank: A qualitative study in Belgium. *European Journal of Ageing, 15*(4), 407-416.

Džuka, J., Lačný, M., & Babinčák, P. (2019). Subjective well-being and income below the ‘at-risk-of-poverty threshold’: Analysis of slovak EU-SILC data. *Studia Psychologica, 61*(4), 213-229.

Eurostat, S. (2015). *Quality of life indicators-measuring quality of life*. Retrieved May 24, 2021, from http://ec.europa.eu/eurostat/statistics-explained/index.php

Fausset, C. B., Kelly, A. J., Rogers, W. A., & Fisk, A. D. (2011). Challenges to aging in place: Understanding home maintenance difficulties. *Journal of Housing for the Elderly, 25*(2), 125-141.

Fret, B., Lambotte, D., Van Regenmortel, S., Dury, S., De Witte, N., Dierckx, E., ... Verté, D. (2017). Socio-demographic, socio-economic and health need differences between types of care use in community-dwelling older adults. *International Journal of Care and Caring, 1*(3), 351-366.

Fret, B., Mondelaers, B., De Donder, L., Switsers, L., Smetcoren, A.-S., & Verté, D. (2018). Exploring the cost of ‘ageing in place’: Expenditures of community-dwelling older adults in Belgium. *Ageing International, 45*, 1-21.

Gabriel, Z., & Bowling, A. (2004). Quality of life from the perspectives of older people. *Ageing and Society, 24*(5), 675-691.

Gillsjö, C., Schwartz-Barcott, D., & von Post, I. (2011). Home: The place the older adult can not imagine living without. *BMC Geriatrics, 11*(1), Article 10. doi:10.1186/1471-2318-11-10

Grabowski, D. C. (2006). The cost-effectiveness of noninstitutional long-term care services: Review and synthesis of the most recent evidence. *Medical Care Research and Review, 63*(1), 3-28.

Graybill, E. M., McMeekin, P., & Wildman, J. (2014). Can aging in place be cost effective? A systematic review. *PloS One, 9*(7), Article e102705. doi:10.1371/journal.pone.0102705

Group, W. (1995). The World Health Organization Quality Of Life assessment (WHOQOL): Position paper from the World Health Organization. *Social Science & Medicine, 41*(10), 1403-1409.

Haitz, N. (2015). Old-age poverty in OECD countries and the issue of gender pension gaps. *CESifo DICE Report, 13*(2), 73-75.

Halford, S., Lothereington, A. T., Obstfelder, A., & Dyb, K. (2010). Getting the whole picture? New information and communication technologies in healthcare work and organization. *Information, Communication & Society, 13*(3), 442-465.
Holly, A., Lamiraud, K., Chevrou-Severac, H., & Yalcin, T. (2005). Out-of-pocket payments for health care expenditures. In Health, ageing and retirement in Europe: First results from the Survey of Health, Ageing and Retirement in Europe (pp. 126-132). Mannheim: MEA.

Horner, B., & Boldy, D. P. (2008). The benefit and burden of “ageing-in-place” in an aged care community. Australian Health Review, 32(2), 356-365.

Ilinca, S., Leichsenring, K., & Rodrigues, R. (2015). From care in homes to care at home: European experiences with (de) institutionalisation in long-term care (Policy Brief December 2015 No 12). European Centre for Social Welfare Policy and Research. Retrieved May 19, 2021, from https://www.euro.centre.org/publications/detail/420

Jefferson, T., Demicheli, V., & Entwistle, V. (1995). Assessing quality of economic submissions to the BMJ. BMJ: British Medical Journal, 311(7001), 393-394.

Judd, B., Olsberg, D., Quinn, J., Groenhart, L., & Demirbilek, O. (2010). Final report: Dwelling, land and neighbourhood use by older home owners (AHURI Final Report No. 144). Retrieved May 16, 2021, from https://www.ahuri.edu.au/research/final-reports/144

Katon, W. J., Lin, E., Russo, J., & Unützer, J. (2003). Increased medical costs of a population-based sample of depressed elderly patients. Archives of General Psychiatry, 60(9), 897-903.

Klassen, T. R., Higo, M., Dhirathiti, N. S., & Devasahayam, T. W. (2018). Ageing in Asia-Pacific: Interdisciplinary and Comparative Perspectives. London, UK: Routledge.

Kok, L., Berden, C., & Sadiraj, K. (2015). Costs and benefits of home care for the elderly versus residential care: A comparison using propensity scores. The European Journal of Health Economics, 16(2), 119-131.

Kong, F. (2018). Aging trend of the world. In T. Hoshi & S. Kodama (Eds.), The structure of healthy life determinants (pp. 7-21). Singapore: Springer.

Lam, C. Y., & Fong, B. Y. (2020). “Ageing in place” - Social and health implications in Hong Kong. Social and Health Implications in Hong Kong, 1(1), 1-7.

Lawton, M. P. (1982). Competence, environmental press, and the adaptation of older people. In M. P. Lawton, P. G. Windley & T. O. Byerts (Eds.), Aging and the environment (pp. 33-59). New York, NY: Springer New York.

Lehnert, T., Heider, D., Leicht, H., Heinrich, S., Corrieri, S., Luppma, M., ... König, H.-H. (2011). Health care utilization and costs of elderly persons with multiple chronic conditions. Medical Care Research and Review, 68(4), 387-420.

Lehning, A. J., Smith, R. J., & Dunkle, R. E. (2015). Do age-friendly characteristics influence the expectation to age in place? A comparison of low-income and higher income Detroit elders. Journal of Applied Gerontology, 34(2), 158-180.

Lim, L. L., & Kua, E.-H. (2011). Living alone, loneliness, and psychological well-being of older persons in Singapore. Current Gerontology and Geriatrics Research, 2011(1), Article 673181. doi:10.1155/2011/673181

Loo, B. P. Y., Lam, W. W. Y., Mahendran, R., & Katagiri, K. (2017). How is the neighborhood environment related to the health of seniors living in Hong Kong, Singapore, and Tokyo? Some insights for promoting aging in place. Annals of the American Association of Geographers, 107(4), 812-828. doi:10.1080/24694452.2016.1271306

Marek, K. D., Stetzer, F., Adams, S. J., Popejoy, L. L., & Rantz, M. (2012). Aging in place versus nursing home care: Comparison of costs to medicare and medicaid. Research in Gerontological Nursing, 5(2), 123-129.
Markle-Reid, M., Browne, G., & Gafni, A. (2013). Nurse-led health promotion interventions improve quality of life in frail older home care clients: Lessons learned from three randomized trials in Ontario, Canada. *Journal of Evaluation in Clinical Practice, 19*(1), 118-131.

Martin, S., Kelly, G., Kernohan, W. G., McCreight, B., & Nugent, C. (2008). Smart home technologies for health and social care support. *Cochrane Database of Systematic Reviews, 8*(4), Article CD006412. doi:10.1002/14651858.CD006412.pub2

Marziale, M. H. P. (2016). Universal access to health and universal health coverage: Nursing contributions. *Revista Latino-Americana De Enfermagem, 24*, e2667-e2667. doi:10.1590/1518-8345.0000.2667

Matchar, D. B., Liu, C., Ang, Y. H., Wong, S. F., Wong, C. H., & Xie, B. (2018). Cost-effectiveness analysis of the ageing-in-place (Aip) programme. *Value in Health, 21*, S58-S59. doi:10.1016/j.jval.2018.07.445

McKee, K. J., Kostela, J., & Dahlberg, L. (2015). Five years from now: Correlates of older people’s expectation of future quality of life. *Research on Aging, 37*(1), 18-40.

Means, R. (2007). Safe as houses? Ageing in place and vulnerable older people in the UK. *Social Policy & Administration, 41*(1), 65-85.

Mery, G., Wodchis, W. P., & Laporte, A. (2016). The determinants of the propensity to receive publicly funded home care services for the elderly in Canada: A panel two-stage residual inclusion approach. *Health Economics Review, 6*(1), Article 8. doi:10.1186/s13561-016-0086-6

Mestheneos, E. (2011). Ageing in place in the European Union. *Global Ageing, 7*(2), 17-24.

Mitzner, T. L., Chen, T. L., Kemp, C. C., & Rogers, W. A. (2014). Identifying the potential for robotics to assist older adults in different living environments. *International Journal of Social Robotics, 6*(2), 213-227. doi:10.1007/s12369-013-0218-7

Molzahn, A. E., Gallagher, E., & McNulty, V. (2009). Quality of life associated with adult day centers. *Journal of Gerontological Nursing, 54*(2), 173-208.

Moons, P., Budts, W., & De Geest, S. (2006). Critique on the conceptualisation of quality of life: A review and evaluation of different conceptual approaches. *International Journal of Nursing Studies, 43*(7), 891-901.

Oris, M., Gabriel, R., Ritschard, G., & Kliegel, M. (2017). Long lives and old age poverty: Social stratification and life-course institutionalization in Switzerland. *Research in Human Development, 14*(1), 68-87.

Pacolet, J., Luyten, J., Op de Beeck, L., De Wispelaere, F., De Coninck, A., & Kuppens, S. (2018). *Noodzaak en modaliteiten van een duurzaam systeem van prijscontrole voor de residentiële ouderenvoorzieningen in Vlaanderen*. Vlaanderen, Belgium: KU Leuven.

Perez, F. R., Fernandez, G. F.-M., Rivera, E. P., & Abuin, J. M. R. (2001). Ageing in place: Predictors of the residential satisfaction of elderly. *Social Indicators Research, 54*(2), 173-208.

Prieto-Flores, M.-E., Fernandez-Mayoralas, G., Rosenberg, M. W., & Rojo-Perez, F. (2010). Identifying connections between the subjective experience of health and quality of life in old age. *Qualitative Health Research, 20*(11), 1491-1499.

Schöllgen, I., Huxhold, O., & Tesch-Römer, C. (2010). Socioeconomic status and health in the second half of life: findings from the German ageing survey. *European Journal of Ageing, 7*(1), 17-28.
Sheffield, C., Smith, C. A., & Becker, M. (2013). Evaluation of an agency-based occupational therapy intervention to facilitate aging in place. *The Gerontologist, 53*(6), 907-918.

Shemilt, I., Aluko, P., Graybill, E., Craig, D., Henderson, C., Drummond, M., ... Group, C. E. M. (2019). Economic evidence. In J. Higgins, J. Thomas, J. Chandler, M. Cumpston, T. Li, M. J. Page & V. A. Welch (Eds.), *Cochrane handbook for systematic reviews of interventions* (pp. 507-523). Chichester, UK: John Wiley & Sons.

Sixsmith, A., & Sixsmith, J. (2008). Ageing in place in the United Kingdom. *Ageing International, 32*(3), 219-235. doi:10.1007/s12126-008-9019-y

Sterne, J. A., Hernán, M. A., McAleenan, A., Reeves, B. C., & Higgins, J. P. (2019). Assessing risk of bias in a non-randomized study. In J. Higgins, J. Thomas, J. Chandler, M. Cumpston, T. Li, M. J. Page & V. A. Welch (Eds.), *Cochrane handbook for systematic reviews of interventions* (pp. 621-641). Chichester, UK: John Wiley & Sons.

Steventon, A., Bardsley, M., Billings, J., Dixon, J., Doll, H., Hirani, S., ... Newman, S. (2012). Effect of telehealth on use of secondary care and mortality: Findings from the Whole System Demonstrator cluster randomised trial. *BMJ: British Medical Journal, 344*(7865), 192. doi:10.1136/bmj.e3874

Szanton, S. L., Thorpe, R. J., Boyd, C., Tanner, E. K., Leff, B., Agree, E., ... Weiss, C. O. (2011). Community aging in place, advancing better living for elders: A bio-behavioral-environmental intervention to improve function and health-related quality of life in disabled older adults. *Journal of the American Geriatrics Society, 59*(12), 2314-2320.

Teti, A., Grittner, U., Kuhlmey, A., & Blüher, S. (2014). Residential mobility in old age. Age-appropriate housing as a primary preventive strategy. *Zeitschrift Fur Gerontologie Und Geriatrie, 47*(4), 320-328.

The United Nations. (2012). *Department of economic and social affairs, population division, population estimates and projections section*. Retrieved May 19, 2021, from https://population.un.org/wpp/Publications/Files/WPP2012_HIGHLIGHTS.pdf

Vale, L. (2010). *Evidence-based decisions and economics: Lessons for practice*. Oxford, UK: Wiley-Blackwell.

Van Bilsen, P. M., Hamers, J. P., Groot, W., & Spreeuwenberg, C. (2008). Sheltered housing compared to independent housing in the community. *Scandinavian Journal of Caring Sciences, 22*(2), 265-274.

Wiles, J. L., Leibing, A., Guberman, N., Reeve, J., & Allen, R. E. (2012). The meaning of “aging in place” to older people. *The Gerontologist, 52*(3), 357-366.

World Health Organization (WHO). (2004). *A glossary of terms for community health care and services for older persons* (Ageing and Health Technical Report No 5). WHO Centre for Health Development. Retrieved May 22, 2021, from https://apps.who.int/iris/handle/10665/68896

Wu, E. Q., Patel, P. A., Yu, A. P., Mody, R. R., Cahill, K. E., Tang, J., & Krishnan, E. (2008). Disease-related and all-cause health care costs of elderly patients with gout. *Journal of Managed Care Pharmacy, 14*(2), 164-175.

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