

# SP: HOUSING & DAILY LIVING

## Criteria and assessment of assistive technologies for ageing-in-place

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**ISSUE:** Ageing can be in good health. Unfortunately, due to biological processes, ageing will occur with a high risk of both cognitive and functional decline, while ageing people desire to live as they have been doing before. Although ambitions differ across individuals a general ambition is to age-in-place. Ageing-in-place (AiP) comprises more than the living and housing conditions but also concerns being able to continue to enjoy activities such as sports, hobbies, work, traveling, shopping, and other activities including the activities needed for daily living. Technology alone is though not sufficient to bring about the necessary support for aging. Supportive communities helping older people to age in place could be a relevant asset as well. The same accounts for ambient intelligence technologies to support ageing-in-place by monitoring clients in the home to provide an increased sense of safety and security (van Hoof et al., 2011). Older people within their communities will use assistive technologies (AT) for themselves or to support others. Understanding their view on AT is therefore of utmost importance as well as understanding their view on AiP. This will give researchers appropriate directions for the design of AT, the development of appropriate use, access, affordability, and procurement of AT (WHO GReAT report 2022).

**CONTENT** Our symposium is designed to present different views on ageing in place and the meaning of assistive technologies for older people. The symposium will share data to help us understand that AiP by use of AT depends on older people's views, regulations, and policy, while the assessment of AT for AiP should be person-centered as well. Furthermore, the view on AT should be more than compensating for decline.

**STRUCTURE** Kort and Marquine Raymundo will elaborate on the concept of ageing-in-place from the view of older people, the view of professionals and scientists in AT. Laan & van Tilborg will report on experts' views in the ISG community on assessment criteria for AT in AiP. After this Zegwaard & Nap will present the development of two examples of value assessment metrics for AT for older people. In the end, a different angle on assistive technology for AiP for older people will be given by emphasizing the additional use of AT by demonstrating the use of canes and walkers from the perspective of internal and external arts. Shae the representative from WHO will act as a discussant of the symposium

**CONCLUSION:** the view of older people and their caregivers on AiP depends on the economic status of a country region. Challenges associated with AiP, emphasize the need for user-centered design and comprehensive support systems of AT. The assessment tool to be developed focuses on the interplay between what the technology offers and the concrete needs and person-centered care. The final presentation shows that AT could be used beyond the purpose of functional decline.

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**Keywords:** frailty, dependence, self-confidence, AT, care professionals, martial arts.

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## Older adults and care professionals' view on ageing-in-place with assistive technologies

H. S. M Kort & T. Marquine Raymundo

**Purpose** The world population is ageing and ageing is accompanied by functional decline and in some cases also by mental decline. In the concept of gerontechnology, technologies can be designed beyond the functional difficulties. The project is executed as one of the first Memorandum of Understanding between the World Health Organization (WHO) and the International Society for Gerontechnology (Aspnes et al., 2022). The WHO report GREAT described Assistive Technologies (AT) as an umbrella term for assistive products and their related systems and services. AT is used to enable and promote social participation and compensate for the functional difficulties of persons with disabilities, ageing populations, and people living with chronic conditions. While AT comprises products, systems, and services, Gerontechnology, although often referred to as AT then for older people, beholds approaches in which technologies are designed and tested for full adoption in daily life. This brief report is part of a larger project on developing assessment criteria/evaluation metrics to assess the safety and effectiveness of technology to support active assisted living and ageing in place (AiP). The aim is to get a better understanding of AiP from the perspective of older people and care professionals. **Method** The studies are qualitatively designed study comprising interviews and questionnaires. One study focused on the view of older adults on AT for AiP. And the second focused on the view of care professionals (community care nurses) on AT for AiP. All studies started with a literature search relevant to the questions. After this, the topic list for the interviews was composed. Two studies were executed at the beginning of 2022 during COVID-19 (Q1-Q2) and two were executed at the end of 2022 when all COVID-19 restrictions measured were released (Q3-Q4). Data collection: Participants for the interviews with older people consisted of convenient samples. Older people were 65 plus and living at home. Care professionals were recruited at a home care organization and via a closed group on Facebook for nurses and nurse assistants. All interviews last for not more than 30 minutes. Interviews with older adults were taken via telephone, Microsoft Teams, or at home. Care professionals were recruited via Facebook for nurses and nurse assistants. Only nurses or nurse assistants with at least two years of working experience in home/community care with older people were eligible. The project was executed in the Netherlands. The findings of the project and the composed constructs for AiP were discussed in 2023 at an educational workshop on AT. **Results and Discussion** The data could be placed in two constructs of AiP namely My Home, My Castle, and Living Comfortable as possible. (Table 1 and Figure 1). Both older adults and professional caregivers mentioned to have a lack of knowledge regarding AT. Benefits that were mentioned are that AT supports independent living, aging in a familiar environment, relieves the family care burden, and provides a feeling of safety. The challenges mentioned are: that using AT can bring embarrassment, is difficult to use, and is too expensive. The use of AT was increased due to the COVID-19 situation and due to the shortage of staff. More information and education are needed about AT and how AT can be used for AiP. The reflection by the participants of the workshop on the constructs of AiP was that the constructs only reflect the situation of a European high-income country and do not consider the aspect of ageing without having a home and having no access to any AT whatsoever. Therefore, a future project should comprise the view of older people and their caregivers in low-and middle-income countries as well.

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- Global report on assistive technology. Geneva: World Health Organization and the United Nations Children's Fund (UNICEF), 2022. Licence: CC BY-NC-SA 3.0 IGO.

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Table 1. AT use by older adults

Target group	AT for Daily Use	Health Monitoring	Health support
Older adults 65-82	Smartphone; Lap/desktop Smartwatch	Weight, sleep & heart-rate monitoring Pedometers (on the smartwatch)	e-receipts for medication contact with the Physician
Older adults 73- 92	Smartphone Smart TV Automatic light	Personal alarm, Glucose monitoring Automated blood pressure meter	No data



Figure 1 AiP constructs

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## Assessment criteria for assistive technology in aging-in-place

D. Laan, M. van Tilborg, H. Nap, H. S. M. Kort

**Purpose** As the global population ages, there is a rising prevalence of functional decline among older adults. Gerontechnology is an emerging field focused on developing technologies to address these challenges and support Aging-in-Place (AiP). As people age, many faces functional declines that impact their ability to live independently. Assistive technologies (ATs) can help maintain or increase an individual's functioning and independence, which is crucial for enabling AiP. This study is part of a collaborative project between the World Health Organization (WHO) and the International Society for Gerontechnology (ISG), focusing on the role of ATs in promoting active living and healthy aging (Aspnes et al., 2022). The project is structured around three main pillars, with one specifically dedicated to establishing criteria assessments for the safety and effectiveness of these technologies. Given the growing availability of ATs, it is essential to understand current expert perspectives on their use in AiP contexts. This study aims to contribute to this understanding by gathering insights from experts about criteria assessments for ATs in AiP. **Method** The study employs a qualitative design and includes a questionnaire comprising 35 questions, including both semi-structured and open-ended questions. The questionnaire was composed based on existing predefined themes (World Health Organization, 2022). These covered demographic information, essential criteria for assessing AT, and their prioritization of these criteria in AiP settings. The questionnaire is designed to capture experts' views regarding self-management, health, strategies for conceptualizing technology, general use of resources, improving the AT systems, and the principal types of problems addressed by these technologies. To ensure a broad range of expertise and representation from diverse socioeconomic backgrounds, the questionnaire was distributed to experts within the ISG community. Data was collected electronically and analyzed using both quantitative analyses of demographic data and qualitative content analyses to identify common outcomes in the existing predefined themes in the perspectives of the experts. **Results and Discussion** A total of 22 experts comprising researchers, professors, physicians, geriatricians, and a psychologist (n=14,4,2,2,1) filled in the questionnaire. Geographically, the participants were predominantly based in Europe, followed by North America, East Asia, and South America (n=12,7,2,1). The majority of respondents (86%) classified their country as high-income; the others (14%) considered their country middle-income, no low-income countries participated in this study. Most respondents prioritized criteria usability, ease of use, affordability, product quality, and the degree of instruction provided as most important (Figure 1). No huge differences are found between the middle- or high-income countries. The importance of tailored technological solutions can be stated by the identified challenges, including inadequate housing, mobility limitations, and social isolation. Findings highlight the critical role of ATs in addressing challenges associated with AiP, emphasizing the need for user-centered design and comprehensive support systems. Essential for successful AiP is to integrate gerontechnology with a focus on prevention, compensation, and quality of life.

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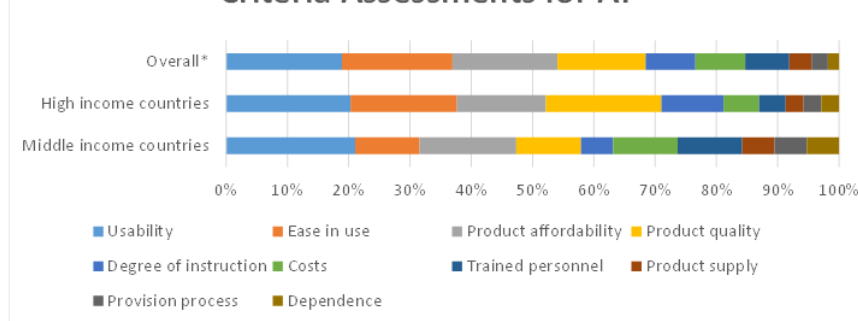
**Keywords:** aging in place, gerontechnology, assistive technology, criteria assessment

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## Criteria Assessments for AT



\* = Overall is ranked from most mentioned to least; ATs = Assistive Technology

Figure 1. Overview of criteria assessments in ATs. (The overall criteria from most mentioned to least mentioned by all ISG members who responded (N=22) to the survey are presented. Also, two columns were added to provide information on the distribution preferences of high and middle-income countries.)

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## Developing value assessment metrics for assistive technologies for older people

M. I. Zegwaard & H. H. Nap

**Purpose** Due to worldwide changes in the ageing of the global population, by 2050, 3,5 billion people might need one or more assistive products (WHO, 2022). These assistive technologies (ATs) are essential as they can be a necessary element for maintaining active living, health, and ageing in place for as long as possible in both welfare states and countries identified as low- or middle-income economies. The presented project is part of a WHO-ISG collaborative project focused on Assistive Technology for Healthy Ageing. We consider applications and the use of AT not only from a medical standpoint but also from a social perspective in the context of Gerontechnology. This social perspective fits with the view of the current paradigm shift towards person-centered healthcare in general and person-centered technology-supported care in particular. There is a need to weigh technology-supported interventions in terms of their user's person-centeredness and their indicators considering, for instance, quality of life, autonomy, independence, social inclusion, caregiver burden and economic costs. Hence, the purpose of this project is to gain insight into- and the development of value assessment metrics for ATs. The insights will support the study on user perspectives of impact, benefits, and effectiveness of ATs on quality of life and the successful implementation and use in daily life. **Method** A (scoping) literature review (by snowballing) and cooperation with the target groups and their supporters will lead to further insight into known- and unknown criteria for assessment. Essential in value-based assessment tools is the attention to the clients' and caregivers' conditions like the condition or illness, availability, accessibility, affordability, usability, previously acquired digital skills and a timely transfer of these skills in learning how to use AT. In the development of person-centered criteria/evaluation metrics, models like the NASSS framework (Greenhalgh et al., 2017), the Vilans Waardewaaier (Digizo.nu), and the Digizo.nu (Waardewaaier, 2024) were studied. These frameworks support assessing value of assistive technologies and insight into these metrics as they combine tailor-made criteria with accessibility, hard and soft costs for use from either a person-centered perspective or a broader (institutional and societal) perspective, and the interaction and mutual adaptation between all these domains over time. **Results and Discussion** The assessment tool to be developed focuses on the interplay between what the technology offers and the concrete needs and person-centered care of the intended users and their problems, as well as on clients/ citizens and caregivers as co-designers. This contributes to a deeper understanding of the role that technology may play and not play in the lives of older people and their circles of care and the derived positive consequences for the job satisfaction of the professionals. During a roundtable discussion, we will give an overall introduction on the subject based on (preliminary) results from the literature review. Then, we will present and discuss two examples of assessment tools for assistive technologies developed in the Netherlands called (1) The Waardewaaier (2024) and (2) the Digizo.nu value assessment methodology (Waardewaaier, 2024) together with a possible add-on considering the clients' and caregivers' perspective based on accepted evidence and input from the target groups and their supporters.

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**Keywords:** assistive technology, clients' and caregivers' conditions, person-centredness, assessment criteria

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## Vital oldies with adapted old martial arts

M. Dülp & J. E. M. H. van Bronswijk

**Purpose** We experience a double ageing crisis (rising percentage of aged persons who also attain a higher age). This stresses the importance of a good quality of life. Positive effects on physical and cognitive functions of QiGong and the internal martial art TaiChi is well documented (Park et al, 2023). In the Western World, this is usually taught without the self-preservation aspects that reduces harm from other persons. So-called external martial arts include self-defence but are taught to children and younger adults who focus on competition, not on self-preservation and community living as are concerns of older people (Bronswijk 2021). Comparing fitness with karate, an external martial art, showed increased reaction speed by karate only (Witte et al, 2016), providing an essential element of self-defence. **Method** We combined internal and external arts (Ries & Wogawa 2016) as adopted by the Nederlandse Federatie voor Krijgskunsten. It includes didactics, focusses on health and self-preservation, does not have competition, asks for daily training at home, and weekly sessions at the dojo, incorporates the cane and may lead to a black belt. Specific martial art content derives from the classical art practised by individual teachers. Okinawan martial arts from before the Japanese Meiji Restoration (1868-1890) supplied us with age-proof techniques. We developed full-day courses for martial arts teachers focussing on capabilities and aspirations of older people and methodical ways to address these. **Results and Discussion** Around 80 teachers (7♀, 72♂) completed a course. Gender diversity was larger with a female recruiter (Table 1). In June 2024 two German and four Dutch teachers, taught older adults. Low-tech punching pads, prepared breaking boards, etc. were supplied in the dojo. Most students used a privately owned smartwatch at dojo and at home. Some used a cane in daily life. Students entering classes had commonly practiced martial arts before, sometimes decades earlier. Each class contained around 4 to 8 students. A group that started in 2019 saw 6 students leaving (1♀ died, 1♀ and 1♂ moved, 1♀ and 2♂ losing interest), while 4 (3♀, 1♂) remained and reported clear assistance in daily live that stimulated ageing-in-place. One ♀ attained a blackbelt. To prevent association with violent martial art games and videos, the Dutch introduced a neutral term, VITOK. It derives from VITale Ouderen door Krijgskunst (Vital elderly through martial arts) and sounds well in Dutch. Recruiting students remained difficult. Only practicing older students were effective recruiters. To spread this assistive technology option, a slow but steady growth in participation is expected. In our workshop all ISG2024 participants are welcome to experience a class.

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**Keywords:** quality of life, older adults, martial arts, health, self-preservation

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Table 1. Classical styles of martial arts and gender of experienced practitioners who took an application course for teaching older adults (2019-2024)

Martial Art Origin*	Germany		Netherlands	
	♀♀ n=1	♂♂ n=47	♀♀ n=6	♂♂ n=25
Chinese	-	2	1	5
Indonesian / Philippine	-	1	2	1
Japanese	1	43	5	20
Okinawan	-	8	1	5
Korean	-	22	-	6
Other	-	8	-	2

\*Practitioners were commonly experts in several martial arts