STUDIES IN HEALTH TECHNOLOGY AND INFORMATICS 319

Effects of Design on Health and Wellbeing

Proceedings of the 6th International Conference on Architecture, Research, Care and Health (ARCH24)
Espoo, Finland, 17-19 June 2024

Editors: Ira Verma
Laura Arpiainen

IOS Press

Effects of Design on Health and Wellbeing
I. Verma and L. Arpiainen (Eds.)

doi:10.3233/SHTI240963

Through the Eyes of Architects: Challenges in Designing Collective Housing Projects for Wellbeing and Innovation

Elke IELEGEMS[a,1], An-Sofie SMETCOREN[b], Sander LAMBRIX[a], and Ann PETERMANS[a]
[a] *Faculty of Architecture and Arts, ArcK-Designing for More, UHasselt*
[b] *Department Educational Sciences, Vrije Universiteit Brussel (VUB)*
ORCiD ID: Elke Ielegems https://orcid.org/0000-0001-9829-2694

Abstract. The housing sector plays a crucial role in fostering innovation in response to the changing needs and desires of a growingly diverse ageing population. In recent years, collective housing concepts have gained more attention as a promising alternative option to address these changing needs. Architects are at the forefront of creating suitable, collective housing projects that enhance the subjective wellbeing of both current and future older residents. However, the challenges and constraints faced by architects when realizing these projects have remained largely unexplored. This study seeks to bridge this knowledge gap by conducting in-depth interviews with ten Belgian architects who have completed a collective project for future or current older people. The findings provide an overview of the obstacles architects encounter related to (1) architects' values and vision, (2) collaboration and communication, and (3) practical and policy barriers, offering a better understanding in the process of designing innovative, collective housing projects. As a next step, these results may be utilized by policymakers, designers, and stakeholders, to develop more effective strategies for overcoming these challenges and constraints, and to unlock the potential for innovative, collective housing solutions that cater for the wellbeing of residents.

Keywords. future and current older adults, architect, collective housing, collaborative housing, subjective wellbeing

1. Introduction

1.1. Context

Our home plays a vital role throughout our lives. As we age, its role changes and becomes even more important, since we tend to spend more time within our immediate home environment as daily activities take place closer to home [1]. This results in a reduction of our action radius when we grow older [1, 2]. Additionally, shifting household compositions and reduced mobility redefine the meaning of the home environment [1]. These factors impact older people's wellbeing, health and quality of life in their home environment [1, 3].

[1] Corresponding Author: Elke Ielegems, elke.ielegems@uhasselt.be.

The majority of older European adults opt for independent living in their own, often long-established homes [4], aligning with the emphasis on the concept of 'ageing in place' [5, 6]. This is also the case in Flanders, where this study is conducted [7, 8]. However, this predominant housing choice may not adequately address the rapidly changing population where current and future generations of older adults become more diverse [9], due to, for example, increased longevity, social class, migration history, and evolving household compositions. Presently, our housing stock is mainly focused on people to 'age in place' in traditional single-family houses. However, a more diverse range of housing typologies is needed to cater to this increasingly diversified older population with different housing expectations, needs and wishes [7, 10]. Therefore, in this paper we focus on collective housing projects, as a possible and innovative alternative answering these changing needs. As 'collective housing' cannot be reduced to one specific housing type, we will refer to it here as an umbrella term that includes "various types of housing with shared facilities" and "with different degrees of collective support & self-organisation" among residents [11-13]. Other concepts used in the literature, coming from different regions and backgrounds, are for example shared housing, cooperative housing, collaborative housing, co-housing, communal housing. [13, 14].

1.2. The potential of innovative collective housing for subjective wellbeing and the role of the architect

Collective housing projects are characterised by sharing physical spaces as well as social sharing. Babos et al. [13] distinguishes three fields of social sharing, being shared creation (e.g. participatory design process), shared activities (e.g. social events within the community), and shared tenure (e.g. share rental, residential cooperative). A review of 2560 articles [15] confirms how cohousing models could enhance wellbeing and health of its inhabitants. Various benefits are highlighted in the literature that positively influence the wellbeing of (senior) cohousing residents, such as the creation of a sense of community [16-18] and the presence of strong mutual support that goes beyond helping each other in times of need [16-20]. Several studies indicate how this can lead to reducing the risk of loneliness, feelings of insecurity, unsafety and boredom in old age [17, 18, 20, 21].

The rising focus around these collective housing models within research circles is also accompanied by growing attention to this form of housing from older people, policymakers and other stakeholders [22]. For example, a Belgian study shows how, in 2022, 10% of individuals aged 60 and above considered shared housing such as cohousing as a possible alternative when independent living is no longer feasible, compared to 8% in 2020 [23]. For a secondary dwelling unit, the percentage has doubled, increasing from 6 in 2020 to 12% in 2022 [23]. Despite the benefits of these models and its increased attention, their growth in real-life practice remains rather limited and their establishment often takes several years [24-26]. Identifying and eliminating the barriers that different stakeholders encounter is important to further integrate these alternative housing projects into the current housing landscape.

Architects have a significant impact on the development of collective housing projects, often working closely with its residents [25, 27, 28]. Although their specific position can differ from project to project [29], architects play a key role as intermediaries between end-users, clients (if distinct), policymakers, and other stakeholders. "They can spatially facilitate the balance between autonomy and social exchange, which is a key aspect for the wellbeing of residents and which differs in each

case. Moreover, architects are able to create added value for residents and for the broader society" [25]. In the context of Belgium, the architectural profession is legally protected and every construction project must involve an architect. As such, their remit, skills and potential influence places them in a central position to influence the shaping of these projects as well as the experiences and wellbeing of its inhabitants.

Therefore, it is valuable to examine architects' experiences with designing and building collective housing projects. Few studies have focused on the role of the architect in collective or cohousing projects [e.g. 25, 30], or the collaboration between users and other stakeholders (architects being one of them) throughout the architectural design process [e.g. 27, 28, 29, 31]. In addition, there is limited knowledge about the barriers and constraints architects face in daily practice when designing collective housing projects. In this article, we explore architects' experiences from three different collective housing typologies: cohousing, cohabitation and secondary dwelling units. The latter is a concept known in Belgium as 'kangoeroewonen', where (generally) two families of different generations live together, share facilities and take care of each other. This paper addresses the following research question: What challenges and constraints do architects encounter when designing and constructing collective housing projects promoting wellbeing of current and future older people?

2. Method

This research is part of the HOUSE-project (www.HOUSE-research.be). This multidisciplinary research project, which continues until December 2025, aims to analyse, conceptualise and design innovative housing projects that contribute to older adults' subjective wellbeing. For answering the research question of this paper, we have selected nine existing collective housing projects applying the following inclusion criteria: a collective housing typology (i.e. (senior) cohousing, co-living or secondary dwelling units), projects specifically designed for older adults or intergenerational models where older people can live alongside residents of various ages, and located in Belgium. Additionally, all projects were required to meet a standard of architectural quality. This was discussed and defined based on architectural publications (such as 'Architectural Yearbook Flanders', database of the 'Flemish Architectural institute) and on conversations within the research group consisting of social scientists and architects.

For all selected cases, we interviewed the architect involved in the design process. Semi-structured interviews were conducted between January and September 2023, lasting between 50 and 129 minutes. Gaining insight in architects' challenges and constraints was one aspect of a more comprehensive topic list. The interviews consisted out of three parts: (1) getting to know one specific reference project, (including encountered challenges) (2) focus on the architects' perspective on 'subjective wellbeing' when designing housing projects, and (3) focus on the design process (including encountered challenges). All semi-structured interviews were tape-recorded and transcribed. All participants signed an informed consent for participation in the study and use of data. Through a multi-phase coding process, distinct themes and subthemes were established to answer this research question. In one case, it was a duo interview with both architects involved. Interview A9 was an interview with the architect together with the two clients. **Table 1** presents an overview with more detailed information regarding the selected projects and respondents.

Table 1. Overview of respondents and projects.

Respondent			Project						
Code	**Gender**	**Office size**	**Typology**	**Year**	**Target group**	**# units**	**# floors**	**Shared spaces**	**Context**
A1	M	10 till 19	cohousing	2022	Inter generation	59	8	- garden - atelier - laundry - kitchen - play area - co-work space	urban
A2(1)	F+F	1 till 9	secondary dwelling unit	2019	Inter generation	2	2	- garden	rural
A3	M	10 till 19	senior cohousing	2023	older adults	9	3	- garden - (multifunc.) entrance area - laundry - kitchen - living room - guest room - extra bathroom	rural
A4	M	1 till 9	co-living	2018	Inter generation	12	4	- roof garden	urban
A5	M	50+	co-living	2006	Inter generation	10	5	- garden - multifunc. entrance area	urban
A6	M	50+	co-living	2017	Inter generation	70	3	- garden - multifunc. area	rural
A7	M	20+	cohousing	2022	Inter generation	23	3	- garden - atelier - laundry bar - multifunc. area - kitchen - library - music room - play area	urban
A8	M	1 till 9	secondary dwelling unit	2014	older adults	2	1	- whole house & garden, excl. private bedroom & bathroom	rural
A9(2)	M	1 till 9	co-living	1999	Inter generation	6	2	- garden - multifunct. area	rural

(1) duo interview with two architects

(2) interview with architect and the clients

3. Results

Three overarching themes were identified when analysing the interviews, namely challenges and constraints linked to (1) architects' values and vision, (2) collaboration and communication, and (3) practical and policy barriers.

3.1. Challenging architects' values and design vision

3.1.1. Dealing with conflicts regarding improving users' experiences and wellbeing

Respondents had various visions and applied different strategies on designing for wellbeing and improving users' experiences. Aligning visions between architects and clients and/or users was seen as crucial for a smoother design process: "*I think everything is aligned, the more you can involve a client in a narrative and in your vision, the smoother such a process goes*" (A5). However, when architects' views conflicted on topics, ranging from aesthetics, sustainability, designing for collectivity and social connectedness, to architectural quality and wellbeing, they were challenged to hold on to their values, beliefs or ideas. Throughout the design and building process, the strategies architects used to deal with these conflicts varied, spanning from concessions to compromises, as well as steadfastly defending their values and insights. Notably, many topics seemed to impact users' experiences and wellbeing in one way or another. We highlight four of them to clarify this connection.

A significant challenge mentioned by several respondents was 'fighting for space', especially when commercial partners, such as project developers, were involved as client. Respondents emphasised the struggle for more surface area that was not tied to private units (and thus saleable surface area). Architects emphasised the need for additional space to stimulate informal interaction among residents by focusing on the circulation areas (rather than communal living areas). The following quote from a respondent illustrates this difference in approach between social and commercial projects: "*That entrance moment, that should be somewhat festive enough. And that's also the place where encounters can happen, often the ideal spot for meeting people, that entrance. So, that is a kind of common thread in all these social housing projects. And there, often more can happen than in commercial housing projects where they tend to cut back on those common spaces. They're all a bit smaller because if you add a meter to each apartment on both sides, it ends up being such a narrow hallway where you can't even put a bench anymore*" (A5). Although some of the examined typologies in this study have more communal spaces than others, the issue of fighting for more circulation space was mentioned by respondents of all three collective housing typologies (see **Figure 1**).

Figure 1. Additional circulation space to stimulate informal interaction among residents

Another challenge faced by architects is associated with social sustainability. Architects weighed the comfort and usability of a project not just for the current generation but also for the next ones. Consequently, tensions frequently arised with clients and/or users concerning the consideration of future use and users, as illustrated by the following quote: "*And occasionally, you also have to be willing to push back and say, 'No, sorry, but having a laundry room without any windows in the basement, that just doesn't work in today's context.' It should be a very pleasant space, and as a designer, I believe you need to stand firm on that. So, I think a bit of resistance and a bit of persuasion are crucial for architects to continue doing that. We also see that it doesn't always happen, and that's heartbreaking because then you end up with buildings that will stand there for another 200 years, designed to meet the needs of that one specific client, but ultimately not reusable*" (A6).

Respondents also noted aesthetic conflicts. Some advocated prioritising users' wellbeing over designing solely for architectural magazines, while others navigated conflicts with clients whose interior preferences might compromise the wellbeing of future users. Striking a balance between (over)personalisation of interior design and incorporating universal, more standardised interior design aspects (e.g. no ceilings below the standardised heights) was deemed crucial for long-term viability. In this context as well, the consideration of social sustainability, focusing on future generations, becomes apparent.

In most instances cited by respondents, the client and/or user played a pivotal role in conflicting with architects' vision. However, in some cases, conflicts arose from internal struggles experienced by the respondents. The following example illustrates such an internal conflict between designing pleasant spaces with ample natural light to enhance users' wellbeing on the one hand, and complying with the most energy-efficient measures on the other: "*Today, we are asked, or almost compelled by the government, to create thermal boxes that save as much energy as possible. This essentially means minimising window openings, as that's where the most heat loss occurs. However, we are teetering on the edge because of the daylight comfort that we still want to maintain. People want to feel a connection between the indoor and outdoor environments. […] People want to feel it on their skin. These are aspects that, I believe, should be a significant consideration in today's wellbeing*" (A6). For some respondents, this delicate balance between energy efficiency and wellbeing opened up interesting considerations at the intersection of sustainability and human experience in their designs.

3.1.2. Additional roles and risks for the architect

Beyond the conventional tasks associated with being an architect, the interviews revealed that many respondents went above and beyond in their projects, considerably complicating their job. Whether viewed as a duty of a good architect or stemming from genuine conviction in a specific project, they voluntarily took on additional roles or risks that fell outside of the 'traditional' job description.

The initiation phase -i.e. the initial stage in the design process where a project is conceived, defined and set in motion- posed a significant barrier to the viability of a project. Some respondents, deeply convinced of the project, took on the additional role of 'initiator' to facilitate the actual start of a project. Various tasks were described for this role, ranging from negotiating with various stakeholders, securing financial support from investors, to assessing program feasibility before the actual launch of the design process.

Respondents acknowledged the inherent risk of investing time and money in a project that might not materialise. In a unique case, an architect also served as the financial investor due to a lack of external funding and a steadfast belief in the project.

Apart from the role of 'initiator' linked to project launch, various other tasks and roles were embraced by different respondents who believed that "*as an architect, you can do much more*" (A21). In one case, a secondary dwelling unit was designed for a client with a terminal illness. The person was palliative and desired to remain at home until his death, regardless of his care needs. The architect wanted to gather family and friends of the client to build the new dwelling together aiming to foster collaboration and "*shift[ing] the focus from illness [and] death to collaboration and future*" (A8). Therefore, he examined materials and structures that could be easily built by non-professionals: "*That was also a strategy to ensure that those people could actually be brought together, […], but they are friends and family of the same client, to work together and then actually, that challenge to build, that it's actually shared.[…] It somehow helps to intensify and transform the relationship with the client.[...] So, that means that the whole strategy is indeed designed by me. Otherwise, it wouldn't work*" (A8). In this case, as an additional role, the architect intentionally crafted a strategy to enhance the wellbeing of the client (and of those in his social network), not only in the final design but also throughout the building process.

3.2. Barriers to collaboration and communication

3.2.1. Expectations and close collaborations

The analysed cases vary widely in scale and amount of users involved (see table 1), due to their distinct housing typologies. Some projects have only one client, while others collaborate with a larger user group and, additionally, an external client. While most respondents emphasised the importance of communication and collaboration with clients and users, some related challenges or restraints were mentioned as well.

Different expectations and project goals between the client and the design team were a challenge recounted by some respondents. In one case, a user group had previously worked with another architect on the project, resulting in a terminated collaboration. This incident had profound (negative) consequences on the relationship with the subsequent architect throughout the entire process: "*Actually, the atmosphere and relationship with an architect were already soured*" (A7). In another example, the respondent indicated that clients who were mainly focussed on hiring a cheap architect were no longer desired in their practice. In such cases, intense collaboration was often less valued by the client, even though the architect considered this close cooperation essential to ensure the quality of the design throughout the entire process. Next to setting the right expectations, respondents expressed appreciation when clients or users set high ambitions for a project. Some architects mentioned how they were encouraged by the client, given trust and freedom to create inventive solutions. This combination seemed a driving force here for better performance throughout the design process and a successful and innovative end result.

3.2.2. Challenges of group dynamics when co-designing

Two respondents, both involved in cohousing projects, engaged in an intensive co-design trajectory with a larger user group. This section primarily focuses on these two projects, one comprising 23 housing units and the other 59 units. The group dynamics in these

projects significantly influenced the architects' work both positively and negatively. The close collaboration with users enriched the design process. One respondent highly appreciated the one-to-one co-design meetings with substantive discussions focused on users' personal life experiences in relation to the home environment, like living with a disability, wanting to cocoon in the morning sun, or discussing lifelong living aspects.

Challenges that were mentioned are the time-consuming nature of individual and group discussions with all users, which will be further discussed in section 3.3.2. Another important aspect was how tensions in the group atmosphere and dynamics also impacted the architects' work indirectly. Respondents cited examples of potential risks that could strengthen or divide the user group, such as increase in project costs that can be better borne by some participants with more financial resources than by others, or changes in membership during the (often prolonged) design process. A critical challenge influencing the group dynamic, and subsequently also affecting respondents' work, was the collaboration with a coordinator or spokesperson. In both design processes, a volunteer was responsible for collecting information from users and conveying relevant details to the design team. This proved to be a demanding role: "*They got a burn out after two years because they have underestimated how much time it takes, how much responsibility it entails, how many complaints it brings into their private lives, with everyone turning to them. And throughout this project, there have been four or five changes of people in that role. So, there are people who have let go of it, saying "I can't do it anymore, I'm depleted." Yes, that's how it is.*" (A7). In this instance, the design team asked for an external coordinator, but this never happened, leading to a rather inefficient and ineffective information flow, significantly challenging the respondent.

3.2.3. Challenges in effective communication related to care and wellbeing

Three aspects related to challenges in effective communication were identified, with two of them more associated with challenges faced by others rather than serving as barriers experienced by the architect. We briefly mention these two before elaborating on the third challenge. Firstly, there was a need for clear and understandable communication, avoiding complex design-specific terminology and utilising inclusive design materials. This was emphasised not only by respondents engaged in co-design processes but also by a respondent valuing this for all design processes. A second challenge drew attention to the use of the term 'cohousing'. Some respondents drew attention to the misuse of the term 'cohousing,' considering it a commercial "*umbrella term*" (A5) for projects with limited space and quality for private use, coupled with a sparse program for collectivity.

However, a third challenge directly impacted architects' design processes. When discussing collective housing projects with users, respondents sought information on subjects that proved difficult to discuss with some clients. According to a respondent, a topic that users found challenging to address is the future when becoming of age, including potential bodily limitations and higher care needs. "*Also, that is difficult, it's often, well, dismissed a lot. Like, 'oh come on', and nobody wants […] to see themselves, that, after you've been to the toilet, a third person has to come to […] clean you. […] Nobody wants that*" (A8). He considered it the architect's responsibility to always take users' future (care) needs into account, even if clients were reluctant to discuss these issues. Discussing users' future care needs and their specific wishes appeared also challenging for respondents since they were not trained to do this. For example, in the case of a palliative client with a terminal disease (see section 3.1.2), discussing future

care was nearly impossible, notwithstanding it being the architect's specific purpose for building the project.

Despite some architects' specialisation in collective housing, discussions on the topic 'collectivity' were mentioned as a challenging one in some cases. Respondents explained that, in their experience, 'collectivity' meant something different for everyone: "*Once you are part of a cohousing project, it may insinuate that you have to be a 'guru of collectivity' by definition, even though the definition of collectivity varies for everyone, but people don't talk about it easily. […] That often comes out as surprises later [in the process]*" (A7). For instance, "*not every family is willing to walk with their laundry basket, underwear on top, across the garden […], or through the common areas to the laundry room. So, there are people who still prefer to have a washing machine at home. But they don't share that in the group; they tell us in a personal conversation because there's a kind of shame about not going to the communal laundry room. We want that to be private.*" These examples clearly show an internal struggle for architects to discuss sensitive topics related to users' wellbeing and future care needs.

3.3. Practical and policy barriers

3.3.1. Higher complexity in the building process

Three practical and concrete issues were highlighted that increased the complexity of the analysed projects. Firstly, in two out of three analysed cohousing projects, users had the freedom to design or co-design the interior. This resulted in highly customised interior plans, where no floor plan was similar. This posed huge challenges to the architects, engineers as well as contractors on site since design, planning, calculation, implementation and site supervision became considerably more complex. This issue also impacted neighbouring residents as an architect explained, "*Every beam is different. The technical engineer had to ensure that all pipes fit into shafts everywhere, and even then, it was sometimes very difficult to explain someone that a load-bearing column will end up in the living room and they didn't want it, but yes, these are the consequences of, um, yes, you have a uniquely designed apartment upstairs and downstairs everything is different so sometimes a column ends up in a place that you don't really want it*" (A1).

Secondly, a recurring complexity mentioned by several respondents revolved around the practical challenge of connecting utilities like electricity, water, or gas. Utility companies often proved to be inflexible or rigid resulting in some cases in illogical situations. A third practical issue was the importance of designing for older people's accessibility and wellbeing. One respondent pointed out that contractors sometimes lacked awareness of construction details crucial for accessibility. Minor thresholds, considered acceptable or overlooked by contractors, could have a significant impact, demonstrating the need for increased attention to accessibility considerations during construction. In this case, this resulted in the partial demolition and reinstallation of the terrace sealing.

3.3.2. Time and cost constraints

Respondents addressed concerns about time and cost. Two challenges were mentioned that influenced the overall duration of the design process and that challenged architects regarding their own time and labour cost. Notably, respondents from cohousing and co-living projects highlighted challenges in this regard.

A first challenge considers the initiation phase, which has already been mentioned in section 3.1.2. Architects revealed that the initiation phase demanded particularly more time in some cases. Delays were attributed to, for example, negotiations with diverse stakeholders (e.g. local urban planning officers, neighbourhood, investors) or extensive research related to, for example, the viability or feasibility of the project. The innovative nature of these projects made them less straightforward to execute, posing a higher financial risk for clients. Consequently, there was a heightened emphasis on evaluating program options, target groups, and alternative financial support during the initiation phase.

Second, next to a long initiation phase, a significant factor contributing to the architects' increased time and labour costs was the close involvement of users in co-designing. Collaborating intensively and engaging in extensive conversations with various users or their representatives were valued, but coupled with the challenge of incorporating all this input and aligning it with the overall concept and structure of the building. This proved to be time-consuming. One architect acknowledged the complexity, stating, "*It's a bit of a combination, sometimes you think you're actually designing 59 individual homes but that's of course, that's not for the fee of 59 individual homes, you also estimate a bit of repetition and economy of scale but that does sometimes get negated when there's so much variation*"(A1). However, some respondents recognised the opportunity in dedicating more time, yielding innovative designs or refining the design program. One respondent emphasised that innovation and quality inherently required time, stating, "*Philosophically, quality takes time. There is no such thing as doing things quickly and cheaply, but we did the right thing for the right price. It took time. But I don't think anyone regrets this strategy afterwards*" (A4).

3.3.3. Constraints of the existing context

Respondents in this study highlighted external constraints related to the existing context, being the existing building (in case of a renovation) and its location. These constraints impacted the final design outcomes both in positive and negative ways and were associated with available space (e.g. considerations of accessibility and program requirements), unforeseen circumstances (e.g. when renovations took place in an existing building), and constraints stemming from financial or urban planning restrictions. These external constraints seem to be inherent to any architectural design process [32] instead of being solely characteristic for collective housing projects.

3.3.4. Policy and regulation at different levels

Most important barriers were associated with policies and regulations at different levels. This issue may be influenced by the specific federal context for Belgium, where responsibilities are distributed across national (i.e. Belgium), regional (i.e. Flanders) and local levels (i.e. province, cities and municipalities). Concerns were raised about Flemish building regulations being outdated and unsuitable for contemporary urban landscapes and new housing typologies. When undertaking innovative, non-traditional projects that demanded creative solutions, respondents shared mixed experiences with the contribution of local urban planning officials to the projects. Some officials were accommodating, willing to find solutions and compromise, while others posed difficulties, resulting in intense discussions. One respondent emphasised the variability in officials' flexibility with regulations, stating, "*You have people who are flexible, but*

you also have people who hide behind regulations. You have to be lucky who is sitting in front of you" (A9).

In one case, involving a fully enclosed site where a senior cohousing project would be situated at the centre of a town, the respondent illustrated how creatively addressing a local regulatory limitation ultimately became a strength for the project. The municipality insisted on applying local parking rules, requiring parking to be organised on-site. This led to the design of an oversized entrance hall, allowing not only the passage of vehicles and bicycles but also providing a versatile interior space for informal meeting, parties, receptions or a game of ping pong (see **Figure 2**). While this example showcases an opportunity, respondents also highlighted significant limitations faced by some projects.

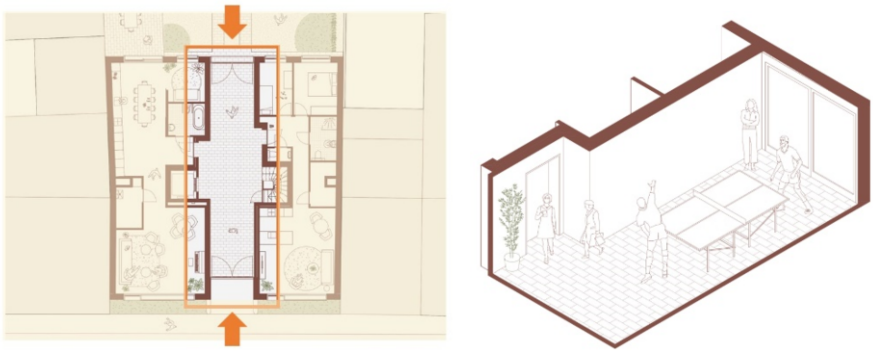

Figure 2. Oversized entrance hall ©Infunctievan

On a national and regional level, subsidies were obtained for the use of innovative techniques, securing financial support for collective housing options involving older individuals proved challenging. Some respondents noted a lack of commitment of the government to encourage the realisation of innovative projects targeting older people. One respondent tried to start negotiations on a higher level, asking for financial encouragement to realise the project "*like a VAT reduction or something with cadastral income or whatever, well, nothing is possible. Actually, it's quite sad. […] In our society, where so much is provided for so many people. But for that group [of older people], there's actually, there's nothing, nothing exists*"(A3). This challenge resulted in considerable delays for two projects.

4. Discussion and conclusion

This study sheds light on the multifaceted challenges architects encounter in daily practice while designing and building innovative collective housing projects promoting wellbeing of current and future older people. The findings revealed practical and policy barriers, challenging architects' values and vision, and challenges in communication and collaboration. In the following sections, we relate the findings to the current literature, looking at overcoming obstacles to shape the future of collective housing and focusing on designing for subjective wellbeing. We conclude with limitations and possibilities for future research.

4.1.1. Redefining roles of architects in collective housing

Existing research shows how architects already take up a lot of different roles for collective housing, such as adviser, project manager, monument guardian, facilitator, etc [25, 27, 33]. This study indicates that the role of the architect varied significantly for each case, but that being 'more as an architect' seemed a driving force for many of them. In some cases, architects significantly contribute as 'initiator' to the start of the project. This may also be linked to the nature of the Belgian architectural profession, where they often tend to take the lead and exhibit a strong involvement in the design process. Although conceived as necessary and very valuable, these additional roles considerably complicate the design process and place more pressure on architects. For example, a co-design process and reaching consensus with all involved stakeholders can be time-consuming [18, 34] and challenge architects to ensure an efficient communication flow. Architects sometimes face constraints, such as limited time and financial resources to fulfil these roles effectively, as they may lack the necessary training or competencies, and are often constrained by budget and time constraints.

We agree with Czischke et al. that "*collaborative housing calls for new professional roles amongst architects and other built-environment professionals who assist groups in development and construction procedures. Architects who are often involved in these projects do not work for, but together with, the future residents. Their role is therefore constantly changing*" [35]. However, we do add to this that additional roles need to be made more explicit, in terms of setting expectations with all stakeholders, as well as in terms of the impact on the architect's personal time and labour cost. Higher design education has an important task here to prepare and train future generations of architects for these new roles. Additionally, moving forward by exploring innovative approaches, such as streamlining co-design methodologies or approaches [e.g. 36], could open up possibilities to overcome these challenges and enhance the efficiency of future design processes.

4.1.2. Navigating policy challenges in collective housing for the Belgian context

There is clearly an increasing interest in collective housing models among older people, policymakers and other stakeholders, also in the context of Belgium [22]. However, today we observe a limited realisation of projects in practice. There are several potential causes for this, one of which is the Belgian housing policy concerning alternative housing solutions. While architects from this study express concerns about Flemish building regulations, literature shows that the complexity of the Belgian policy situation -where responsibilities related to collective housing and older people are distributed- also affects other stakeholders who want to realise a project [37]. Regulations pose a dual challenge by often being too open for interpretation, due to absence of clear definitions and frameworks for housing typologies, such as co-living and cohousing [25, 37], and simultaneously being too rigid to support a more substantial role for collective housing projects [26]. And, since the Belgian government is not yet facilitating collective housing typologies in its regulation or as an initiator, the main initiatives come from private organisations or cities that open up to collective housing concepts [25]. A legal framework as well as shared terminology on different typologies within collective housing types would help to clear the current ambiguity.

4.1.3. Challenges linked to promoting wellbeing for future use

In line with a study of Schaff et al. [29], a constant balance between designing for the present and designing for the future was noticeable. Here, architects encounter numerous challenges intricately tied to ensuring the wellbeing of current users -today and in coming years as they age- as well as of future generations of users. This aspect adds complexity to the design process, posing design, collaboration and communication challenges when dealing with conflicting situations among various stakeholders. In this regard, architects faced challenges in obtaining information related to sensitive topics, such as future care needs or the concept of 'collectivity', which are crucial to address designing for users' wellbeing, not only today but also as they age. This clearly adds an additional layer of complexity to the design considerations. The term 'collective' can refer to various aspects of housing [25] and has a different meaning for people. However, this study unravelled how this is something architects need to be aware of throughout the design process.

Interviewed architects clearly considered the broader picture and incorporate elements that enhance both current and future use, such as sustainability (including social sustainability), accessibility, and collectivity. In the examined cases, this translated to architects grappling in the decision-making process, particularly when faced with conflicting visions and ideas, and users and/or clients who sometimes struggled to understand or appreciate the broader perspective of wellbeing for future use. Existing research confirms that collective decision-making is a complex characteristic of collective housing involving user groups [18, 29, 35]. Additionally, the results reveal that incorporating elements in the design to enhance the subjective wellbeing of current and/or future users may not always align with other important requirements or considerations, such as energy efficiency or affordability. This discrepancy seems to challenge architects as well in making decisions. Establishing clarity from the start of the project to ensure all stakeholders are aligned and share a cohesive vision regarding these topics is crucial to avoid misunderstandings and unnecessary struggles.

In the context of collective housing, the emphasis on social interaction becomes more pronounced [13]. While designers did not mention significant challenges related to communal spaces, they highlighted struggling with 'fighting for space' in the circulation areas to facilitate informal encounters and nurture a sense of community. Remarkably, this holds true for respondents from all three examined housing typologies, despite certain typologies featuring more communal spaces than others. Existing research in cohousing projects confirms the importance of design features to initiate casual social encounters that contribute to the sense of community and reduce the risk of loneliness [17, 38].

4.1.4. Future research and limitations

In conclusion, architects face various challenges are linked to ensuring design quality and promoting wellbeing for its inhabitants. Addressing these multifaceted challenges requires further exploration. Future research could delve into examining approaches to better support architects in taking up additional roles to foster effective collaboration among stakeholders and investigating the dynamics of collective decision-making. Moreover, alternative methods are needed to gather information on sensitive topics to design for the wellbeing and health of users, such as participatory action research and research by design. Additionally, providing clarity in confusing terminology to mitigate conflicting visions and ideas among stakeholders would provide

valuable insights to refine the design process. This study has some limitations, which can offer opportunities for future research. Initially, we selected nine cases of Belgian collective housing projects and interviewed architects to understand their experiences and challenges. Future research could examine how architects design for wellbeing in collective housing projects and comparing these results with of (older) residents' experiences.

The results of this paper are based on interviews with architects from nine selected collective housing projects. Since respondents are anonymous, a direct link between the data and respondent was not possible here. Thus, the data could not be enriched with more graphic documentation. As a next step, expanding the context with architectural plans, location data or data from other experts that shape a project could further intensify our understanding of the architectural and urban features and complexity of collective housing [39]. Applying graphic methods to analyse projects in a spatial manner could yield new insights.

Furthermore, the variety in selected projects, including different scales, housing models and user group sizes within three typologies, offers valuable insights but also presents limitations. Larger projects may introduce complexities in communication and decision-making not present in smaller-scale projects. Understanding these nuances accros different scales remains crucial. While this paper takes first steps, further research could benefit from a larger dataset encompassing more collective housing typologies and project sizes.

The insights from this paper could provide guidance for policymakers, designers, researchers or other stakeholders in the field to develop more effective strategies, unlocking the potential for innovative collective housing solutions that prioritise the wellbeing of its inhabitants. These guidelines can inform policymakers in crafting supportive regulations and incentives promoting age-friendly collective housing projects. For architects, more precise action points derived from encountered challenges can guide decision-making processes, optimizing designs to prioritize the wellbeing of older residents. Ultimately, these guidelines have the potential to foster collaborative efforts among stakeholders throughout the design process, leading to the creation of inclusive, age-friendly communities that enhance the quality of life for older people. As the housing landscape continues to evolve, addressing these limitations are essential steps towards fostering innovation and enhancing the effectiveness of architectural strategies in diverse collective living contexts.

References

[1] Oswald F, Wahl H-W. Dimensions of the meaning of home in later life. In: Rowls G, Chaudhury H, editors. Home and identity in late life: International perspectives. NY: Springer; 2005. p. 21-45.

[2] Khajehzadeh I, Vale B. How New Zealanders distribute their daily time between home indoors, home outdoors and out of home. Kōtuitui: New Zealand Journal of Social Sciences. 2017;12(1):17-31. [Accessed 08.08.2024] Availabe at: https://www.tandfonline.com/doi/full/10.1080/1177083X.2016.1187636#:~:text=CSVDisplay%20Table-,Discussion,in%20Korea%20(Yang%20et%20al.

[3] Petermans A, Cain R. Design for wellbeing: An applied approach. NY: Routledge; 2019. 248 p.

[4] Eurostat. Ageing Europe — Looking at the lives of older people in the EU — 2020 edition. In: Union E, editor. 2020, °doi: 10.2785/628105. [Accessed 08.08.2024] Availabe at: https://ec.europa.eu/eurostat/web/products-statistical-books/-/ks-02-20-655

[5] Pani-Harreman K, Bours G, Zander I, Kempen G, Duren Jv. Definitions, key themes and aspects of 'ageing in place'. Ageing & Society. 2020;41(9):2026-59, °doi: https://doi.org/10.1017/S0144686X20000094.
[6] Buffel T, Phillipson C. Ageing in Place in Urban Environments: Critical Perspectives. NY: Routledge; 2024. 218 p, °doi: https://doi.org/10.4342/9781003229322.
[7] Smetcoren A-S. I'm not leaving. Critical perspectives on ageing in place. Brussels: University press; 2016.
[8] Volckaert E. Oud vasthouden: Over vergrijzing, wonen en beleid. Antwerp: Gompel&Svacina; 2022. 312 p.
[9] Enßle F, Helbrecht I. Understanding diversity in later life through images of old age. Ageing & Society. 2021;41(10):2396-415.
[10] Golant SM. Residential normalcy and the enriched coping repertoires of successfully aging older adults. The Gerontologist. 2015;55(1):70-82.
[11] Fromm D. Collaborative communities: Cohousing, central living, and other new forms of housing with shared facilities: Van Nostrand Reinhold; 1991. 296 p.
[12] Czischke D, Carriou C, Lang R. Collaborative housing in Europe: Conceptualizing the field. Housing, Theory and Society. 2020;37(1):1-9, °doi: https://doi.org/10.1080/14036096.2020.1703611.
[13] Babos A, Szabó J, Orbán A, Benkő M. Sharing-based co-housing categorization. A structural overview of the terms and characteristics used in urban co-housing. Építés-Építészettudomány. 2020;48(3-4):331-55.
[14] Living together–Cohousing Ideas and Realities Around the World. Vestbro DU, editor. Stockholm: Division of Urban and Regional Studies, Royal Institute of Technology in Collaboration with Kollektivhus NU; 2010. 234 p.
[15] Carrere Balcells J, Reyes A, Oliveras L, Fernández A, Peralta Chiriboga AA, Novoa Pardo AM, et al. The effects of cohousing model on people's health and wellbeing: a scoping review. Public Health Rev 2020; 41-22.
[16] Izuhara M, West K, Hudson J, Arrigoitia MF, Scanlon K. Collaborative housing communities through the COVID-19 pandemic: rethinking governance and mutuality. Housing Studies. 2022;38(1):65-83.
[17] Glass AP. Sense of community, loneliness, and satisfaction in five elder cohousing neighborhoods. Journal of Women & Aging. 2020;32(1):3-27.
[18] Mandelman MD. Senior Cohousing: The Social Architecture of Cohousing, Community Design & Well Being. Wisconsin - Milwaukee: The University of Wisconsin-Milwaukee; 2021.
[19] Labit A. Self-managed co-housing in the context of an ageing population in Europe. In: Lidewij T, editor. The re-emergence of co-housing in Europe. NY: Routledge; 2016. p. 42-55.
[20] Weeks LE, Bigonnesse C, Rupasinghe V, Haché-Chiasson A, Dupuis-Blanchard S, Harman K, et al. The best place to be? Experiences of older adults living in Canadian cohousing communities during the COVID-19 pandemic. Journal of Aging and Environment. 2023;37(4):421-41.
[21] Pedersen M. Senior co-housing communities in Denmark. Journal of Housing for the Elderly. 2015;29(1-2):126-45.
[22] Van den Houte K, Ryckewaert M, Delbeke B, Oosterlynck S. Gemeenschappelijk Wonen. Leuven: Steunpunt Wonen; 2015. [Accessed 08.08.2024] Availabe at: https://archief.steunpuntwonen.be/Documenten_2012-2015/Onderzoek_Ad-hoc-opdrachten/Ad_hoc_13_Gemeenschappelijk_wonen.pdf
[23] Koning Boudewijnstichting. Levenskeuzes op latere leeftijd bij niet hulpbehoevende personen. Indiville 2022. [Accessed 08.08.2024] Availabe at: https://www.calameo.com/read/0017742952b00ec016442?authid=84uZMGtLZCpm
[24] Petermans A, Vanrie J, Smetcoren A-S, Harzé G, Broekx J. Design for wellbeing in architecture and interior architecture: Educating future designers on ageing well in place. Design for Wellbeing: Routledge; 2019. p. 46-59.
[25] De Vos E, Spoormans L. Collective housing in Belgium and the Netherlands: A comparative analysis. Urban Planning. 2022;7(1):336–48.
[26] Put B, Pasteels I. Motivational barriers to shared housing: The importance of meanings of "home" in the diffusion of housing innovations. Housing, Theory and Society. 2022;39(3):257-74.
[27] Czischke D. Collaborative housing and housing providers: towards an analytical framework of multi-stakeholder collaboration in housing co-production. International Journal of Housing Policy. 2018;18(1):55-81.
[28] Tummers L. Understanding co-housing from a planning perspective: why and how? The re-emergence of co-housing in Europe: Routledge; 2017. p. 74-88.
[29] Schaff G, Vanrie J, Courtejoie F, Elsen C, Petermans A. Architecture and ageing: lessons learned from a cohousing project. Journal of Housing and the Built Environment. 2023:1-27.

[30] Gerards S, De Ridder R, De Bleeckere S. Designing multigenerational dwelling: A workshop with four Flemish architecture firms. ArchNet-IJAR: International Journal of Architectural Research. 2015;9(2):20.
[31] Wang J, Pan Y, Hadjri K. Exploring collaborative design and sustainable living in British cohousing communities. Asian Journal of Behavioural Studies. 2018;3(14):30-53.
[32] Schön DA. The reflective practitioner: How professionals think in action. New York, USA: Basic books; 1983. 384 p.
[33] Andersen MA, Lyhne MB. Co-creating Danish cohousing. ARQ: Architectural Research Quarterly. 2022;26(2):197-208, °doi:
[34] The re-emergence of self-managed co-housing in Europe: A critical review of co-housing research. NY: Routledge; 2016. 2023-40.
[35] Czischke D, Peute M, Brysch S. Together:Towards Collaborative Living. Delft: TUDelft; 2024. 165 p.
[36] Meechao K. A study of stakeholders' experience of the architectural design process to stimulate an interactive form of communication: University for the Creative Arts/University of Brighton; 2018.
[37] Smetcoren A-S, Ielegems E, Petermans A. Oost, West, thuis best… of toch niet? Vroeger nadenken over later – inzichten vanuit woonverhalen van ouderen. In: Vranken J, Verté D, De Decker P, Crivit R, editors. Recht op Grijs: Bouwen aan ouderenbeleid. Antwerpen: Gompel & Svacina; 2024. p. 328.
[38] Marcus CC. Site planning, building design and a sense of community: An analysis of six cohousing schemes in Denmark, Sweden, and the Netherlands. Journal of Architectural and Planning Research. 2000;17(2):146-63.
[39] Lang R, Carriou C, Czischke D. Collaborative housing research (1990–2017): A systematic review and thematic analysis of the field. Housing, Theory and Society. 2020;37(1):10-39.