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Integration of needs – inclusive, integrated design enabling health, care and well-being

An interdisciplinary research method for new models for elderly living environments in an aging society.

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Abstract: This study focuses on research about the spatial and social living environment of elderly with care demand. It developed from the urge for new ways of thinking about the design of care for elderly in neighborhoods and houses. In a collaboration between an architectural school of education and a social housing association housing the elderly, an interdisciplinary research method to come to new models for elderly living was developed. The study describes the method and main findings.

In the Netherlands the demographic transition to an aging society runs parallel with transitions in the policy and practice of elderly care. Due to a steep rise in the cost of care and a shortage of staff, care moves away from institutional buildings and organizations towards a more informal support network with professionals in the background. The research questions addressed in this study concern the everyday life of elderly needing care. Within a one-week stay in a nursing- or elderly care home, participating in the daily life, we aim to get answers through anthropological and participatory research to understand, document and visualize the needs and living conditions of elderly today. Finally, these data are translated into architectural design. We claim that the person whom we design for should be the first to meet and talk to. In that way we learn about their wishes, needs and capabilities. This argument was our starting point of collaboration. Our methodology leads to unexpected results. The study will show main findings and topics of discussion.

Keywords: elderly; new models for a home; user centered research;

1. Introduction

This article describes an ongoing study into innovative housing concepts for elderly people in need of care. The main aspect of the research is the development and implementation of a research method to understand the daily routines of the elderly,   their needs, more deeply. Then subsequently translate these into architectural models and innovative housing. The method is developed in close collaboration between teachers and students of the Faculty of Architecture at TU Delft and Habion, a Dutch social housing association, housing the elderly. Anthropological research, aimed at observing the daily practices of the residents, their habits and their social networks, is combined with architectural research, aimed at the spatial, material and organizational qualities of the living environment. The resident is central to the research. With this attitude as the starting point, innovative living concepts are gradually developed.

Currently there is a shortage of housing for the elderly and a lack of suitable houses. According to the Ministry of Health, Welfare and Sport, around 200.000 homes for the elderly must be added by 2030 (Eichholtz, 2021). This also includes the care that many of the elderly will eventually need. If there were 1.4 million people over 75 in the Netherlands in 2020, it will already be 2 million by 2030. And due to the effect of double aging over 1.5 million people will be over 80 by 2040. In contrast, the younger age group, between 50 and 74 years old, will decline over the next 10 years, making informal and professional support increasingly difficult. Conversations with the elderly themselves show that the elderly of today want to be able to choose (Witter, Harkes, 2018, p. 8). Many elderly express the wish to continue living at home for as long as possible. For them, this is linked to maintaining independence. A dilemma has arisen. On the one hand, continuing to live independently is a great need, on the other, many homes are not at all suitable for this.

In recent decades, living and care have been separated from each other due to budget cuts by the government. The old retirement home, a result of the welfare state after the Second World War, was abolished as such. The elderly had to live at home for longer, even move back to rental houses. Research done in 2013 showed that 800 retirement homes had to be demolished and new construction projects were cancelled (Algemeen Dagblad 21-02-2013). According to Habion, this can also be done differently. "Demolition is not sustainable, it is a destruction of capital and in view of the aging population we could really need those buildings," says Peter Boerenfijn, director of the housing corporation that has been exclusively involved in the housing of the elderly since its foundation in 1952.

Today, 92% of all over-75s still live at home (Ministerie van Volksgezondheid, Welzijn en Sport, 2020). Yet there is a growing number of elderly people who need care and cannot find alternatives due to the disappearance of the retirement home. Between staying at home and the nursing home the supply is scarce. This shortage manifests itself in neighbourhoods where the elderly live in isolation. In other words, staying at home is not always the best solution, but there are no attractive and suitable alternatives. There is a major challenge in both transformation of the retirement homes and in new construction. This challenge was the starting point for us to start a collaboration between education and practice.

2. Theories and Methods

When writing about seniors, we must state that there is no clear age for a senior. Our research focusses on the elderly who need care and today they often live in a nursing home where the average age is 80+. There are different options for senior homes, depending on the gradient of care that is provided and not on age. In the Netherlands, initiatives have been launched to move care for the elderly from institutional settings, such as nursing homes, to more informally organized care in districts and neighborhoods. As a result, innovative living ideas for seniors are emerging. In the meantime, the Netherlands has a scale of housing forms for seniors, but it's still not enough. Between staying at home and staying in a nursing home, there are some intermediate forms. In general you can find four categories: 'Aging in Place', 'Independent Living for the Elderly', 'Residential Care Homes' and the 'Nursing Home'. The care component is the variable component which gets more important and prominent towards the nursing home. The in-between concepts are still developing and elderly are, like other age groups, a diverse group of people with different demands and wishes. Research into the housing preferences of the elderly shows that most elderly people try to continue living at home, with some adjustments (Koerten, 2020 p. 61-63). One out of six of the average 74 year olds plans to move in the next five years. Their housing requirements mainly focus on the single-storey house with a small garden in contact with like-minded people. However, there is still a lot of information missing. It seems that too little attention is paid to how seniors in need of care manage daily life and there

is little insight into the use of space by the elderly. How could this knowledge be incorporated into the design and (re)development of the built environment? Anthropological studies show that the domestic practices of the elderly are scarce (Makay, Reinder, 2016).

It is precisely these studies that could provide information about the daily lives of the elderly and provide valuable information about necessary adjustments to the home or the design of new buildings. Knowledge that is still missing and that is obvious. The authors of the seniors organization KBO-PCOB, which conducted the research into the housing needs of the elderly, advise to primarily engage in a dialogue with the target group themselves: "The discussion with seniors is of great added value for the way in which we should organize our housing stock in the Netherlands. As parties with a housing assignment, talk to each other and to the people for whom the building is to be built. Seniors know better than anyone what is needed."(Koerten, 2020).

The lack of information about daily practices was the main reason for us to do research in the living environment of elderly people with care need. We decided to embed this study in a graduation studio of architecture students. The students would make contact with the target group, observe them in their daily lives and enter into dialogue with them.

In recent years, anthropological or ethnographic research has increasingly been applied in architecture education. In doing so, we work from very concrete observations and conversations to architectural models. The students meet the people for whom they will design. This creates a much more direct relationship between user and designer.

The main questions the students start their research with are global: Who is the senior in need of care? What does a day in the life of him/her look like? What are the meeting moments and where do they take place? The structure of the research method has been refined in the last four years and has now become a purported method for us. We follow four phases:

Phase 1: Anthropological research

Learning how to observe requires a neutral view, without interpretation and judgement. In her teaching as an anthropologist Andre Gaspar describes how she manages to teach this by using small experimental exercises, and that is what we do as well (Gaspar, 2018). Students are instructed to spend an hour looking at what they see, without assessment or appreciation. This seems more difficult than expected because our mind immediately interprets and judges. The students then continue with this exercise, but now aimed at the elderly. The students take pictures and make sketches of their observations and bring them with them in the second week. They are also asked to nominate a photographer who portrays the daily lives of people with series and to explain how he works.

Phase 2: Fieldwork

The fieldwork is divided into experimental exercises and on-site explorations.
The first experimental exercise is to spent a day in a wheelchair which opens the eyes how wheelchair users experience the barriers in the building environment. The students experienced the need to get assistance. They found themselves in a constant need to adapt to the built environment. Besides this adventure, another exercise is to wear glasses which simulate different kind of eye diseases you might get when you are becoming older.

In order to get more information about the daily life and the use of spaces by the people whom the students finally would design for, the on-site explorations start after these first experimental exercises. The students stay (in couples) one week in one of the selected sheltered elderly homes, which is a very unique experience for them. They do anthropological research by observation and interviews. They all start with the same knowledge about the methodology, but by going to different nursing homes, each couple uses different ways to get into contact and to generate information. For example students make big posters to let the inhabitants "speak" by *post-its* asking two questions: 'what do you like here?' and 'What would you like to improve?' By doing this, they get first-hand information about the place and the wishes of the elderly. The students study the apartments and identify different elements on day-to-day basis, like the appropriation of space and identity. They observe the activities in different rooms to see if and how the room changes during the day according to the people who use and adapt it. Furniture moves according to wheelchair or walker usage and some places are not used at all. These observations help the students to understand the daily life of the elderly. The on-site explorations have shown that the students develop different strategies to get in touch with the residents: informal conversations, formal interviews, surveys, attending and organizing activities. The scale levels the environment, the building and the private room.

Phase 3: Analysis and in-depth research

Data from the fieldwork are organized and analyzed. Photo series often tell a lot about the usage of spaces, leading to new questions   about topics that were touched upon during the visit.   Thereby the research takes the form of an individual follow-up trajectory . The student chooses to shed light on one topic. This requires further observations, interviews, but also literature study. It often comes to a return day in the senior home. After 10 weeks, the work is presented as a draft research.

Phase 4: From data to evaluation and conclusion

From now on, the student tries to reach conclusions through the research that supports his design practice. The translation of information into material and spatial solutions comes into play. The main question now is: what does a conclusion drawn from the fieldwork mean for architecture? In the eight to ten weeks that follow, step-by-step, a translation is made into architectural answers and these are gradually introduced into a concrete design location. The design starts with the scale of the neighbourhood and ends up with a detailed design of the building(s).

3. Results

3.1. Results of the fieldwork

The five topics, as written down below, all students work through:

1. The organization of the building; 2. The residents and the neighbourhood; 3. Usage of spaces in the building; 4. The residents themselves; 5. Residents' wishes and preferences;

1. The organization of the building – This means understanding the accessibility and the organization of the building and its immediate living environment, the apartments and rooms. All buildings visited are owned by Habion. The accessibility is generally good, but in a few exceptions there is a second entrance not suitable for wheelchairs (Huis Assendorp in Zwolle) that could cause problems. In Huis Assendorp, several wings are linked together. Observation showed that there happens to be little social interaction between the residents of one wing and the other . After several conversations it became clear that the reason is a lack of clarity and therefore a psychological barrier to enter the other wing (Huis Assendorp). In the 'Liv-inn' in Hilversum, the socio-economic difference (rental versus privately owned apartments) seems to be the reason. The 'traffic flow' drawing makes clear where 'traffic jams' occur, for example at the entrance or at the elevator (fig.1).
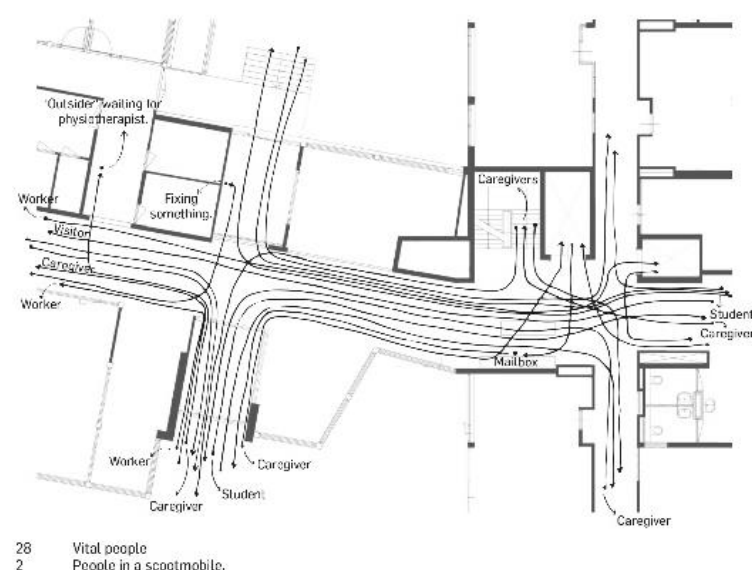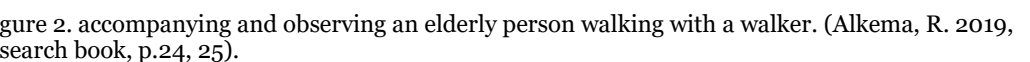

Figure 1. Traffic flows and traffic jam at Huis Assendorp in Zwolle. (Alkema, R., 2019, research book p.51).

2. The residents and the neighbourhood – the students researched the outside activities in daily life. A walk through the garden or to the supermarket often is the only daily round of an elderly person. "The overall conclusion is that the interruption of their path, the sidewalk, is the biggest problem for the elderly in the city. Most of the time, the sidewalks are interrupted by big, busy streets. These fast traffic flows are overwhelming and elderly people get anxious because of the pace difference between them and the cars. Another problem with the sidewalks around Huis Assendorp is that they are not even accessible for wheelchairs. They are too small or there are obstacles blocking the path. The traffic lights also form a problem. They turn from green to red too fast for less mobile people, so they end up in a dangerous situation." (Rosanne Alkema, 2019, research p.31).

A WALK THROUGH THE 'GARDEN'

Just a small break

She end up at the pond, confused why the path is going there instead of going to the entrance

"Sorry, this must be boring for you." (why?!)

Terrace under the plane trees.

→ "I'm not able to walk much further."

"My favorite place to sit during the summer."

"I'm glad that they are not going to demolish this to make space for the playground for the daycare."

"It's going to be a small walk because my leg is very painful the last couple of days."

→ "We've filed protests because of that."

Private gardens

Parking

→ Elements to sit on.

Different pavement

Different pavement (smoother). Walks better with a walker but it causes confusion because it's not leading towards the entrance but to the pond.

Pond

Mrs. Nieuwenhuisen Kalsbeek only looks at the ground.

"During the summer I used to sit here with friends, in the shadow underneath the plane trees."

Entrance

ANALYSIS

Fast traffic flows as a boundary.

Disconnection because of the pavement which not leads towards the entrance.

Pavement is a huge boundary.

Disoriented.

Benches.

Outside Inside

Frontdoor.

——	Path
⟵- - ⟶	Disconnection
▲	Landmark
- - - -	District
◯	Nodes
‖‖‖‖‖	Edge/ boundary

Figure 2. accompanying and observing an elderly person walking with a walker. (Alkema, R. 2019, research book, p.24, 25).

3. Usage of spaces in the building – students especially look at the patterns of use within the different spaces like   the collective garden, the collective rooms inside, the circulation spaces, entrance of the apartments and the apartments.

The entrance doors of the apartments seem to be important to personalize. This makes recognition much easier.

Figure 3. Personalization at the entrances (Borgdorff, S., 2021, research book, p.48-51)

Within the apartments, several students realized that the door from the living room to the   bedroom often is blocked by furniture. The inhabitants frequently told the students that they do not want to see the bed during the day. Next to this, the furniture of the bedroom blocked the window. This did not seem a satisfied design.
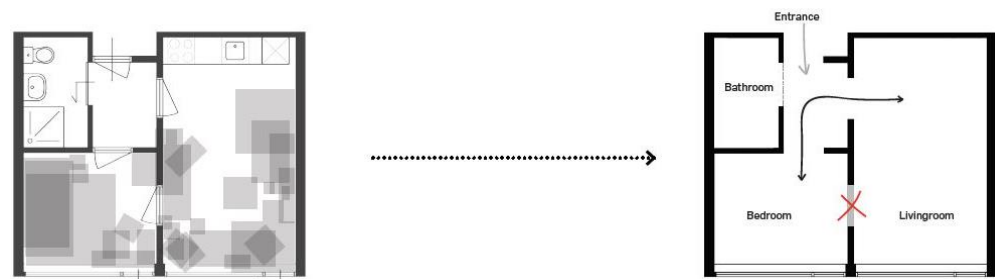

Figure 4. In grey the places of the furniture of several apartments in Huis Assendorp in Zwolle. The right floorplan shows the blocked door. (Alkema, R., 2019, research book p.89,99).

4. The residents themselves are as different as could be. What do they have in common? Meanwhile, a talk during the daily round gives them information about their daily activities. In analysis drawings, they compare the residents' activities and moments of encounter. Riet for example (Fig. 5) walks four times a day with her dog. The moments of encountering neighbours are frequent, inside and outside the building. Riet has blocked the doorway between living-room and bedroom, as well. Ad meets others at the moments for coffee, but asks for a taxi twice a week to meet friends outside. The different schematics of the elderly show their activity level, and the way they use their apartments. The layout of the apartments and the appropriation of the spaces often shows similarities in a way of furnishing that repeats itself.
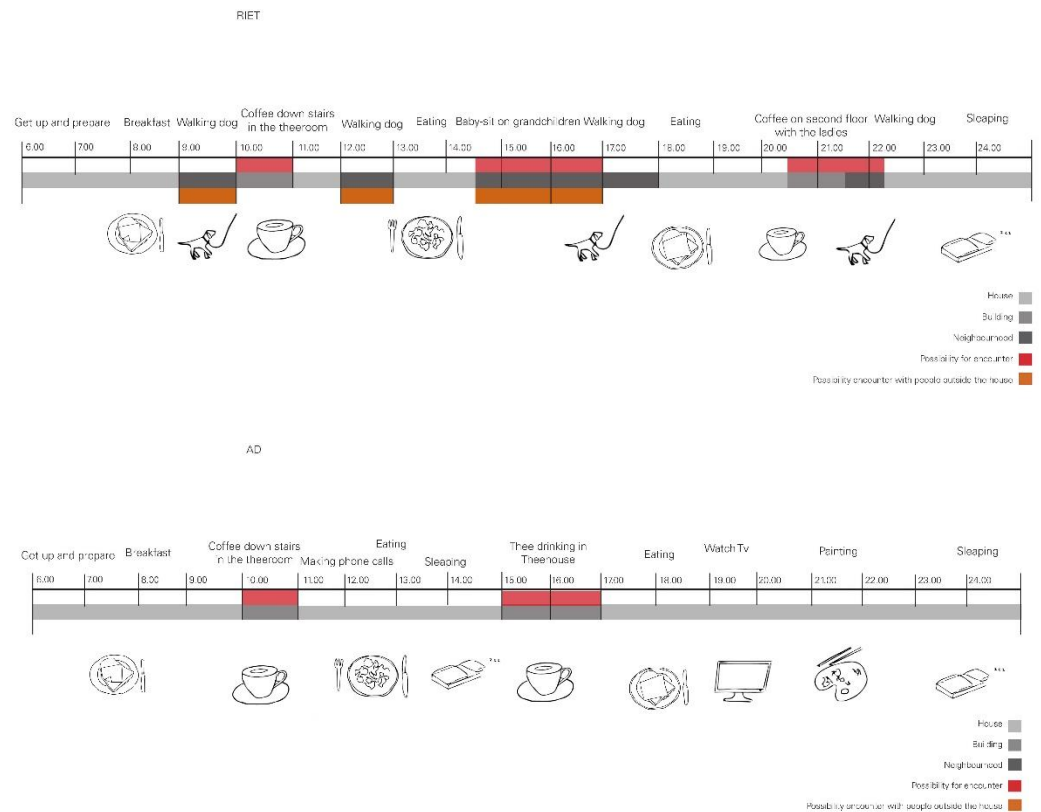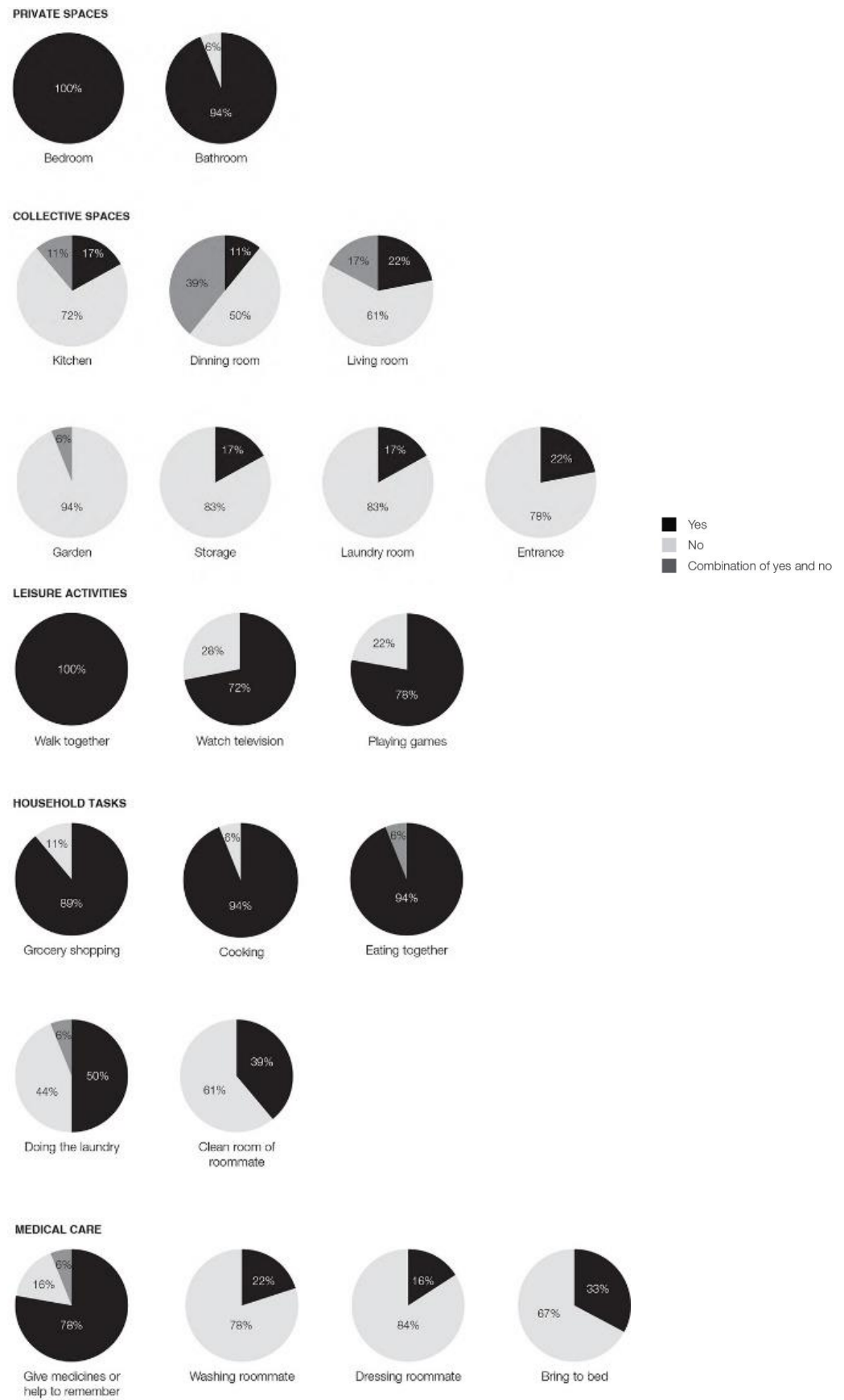
Fig. 5 – Riet and Ad and their pattern of daily life (Kieft, E., 2020, research book, p.20,21)

5. Residents' wishes and preferences – Student Marijn Bouwman made little room models and used them to discuss the willingness of sharing the room and helping others in their own living environment (family, neighbours, students, friends). Her results show that people do not want to share the bedroom, neither the bathroom. Only half of them would share the dining room and a bit more the living room. Functional rooms and gardens are no problem to share. Most people are willing to help with a household task, or walk together, but more private actions like dressing are problematic.

PRIVATE SPACES

100% — Bedroom	6% / 94% — Bathroom

COLLECTIVE SPACES

11% / 17% / 72% — Kitchen	11% / 50% / 39% — Dinning room	17% / 22% / 61% — Living room

6% / 94% — Garden	17% / 83% — Storage	17% / 83% — Laundry room	22% / 78% — Entrance

■ Yes
■ No
■ Combination of yes and no

LEISURE ACTIVITIES

100% — Walk together	28% / 72% — Watch television	22% / 78% — Playing games

HOUSEHOLD TASKS

11% / 89% — Grocery shopping	6% / 94% — Cooking	6% / 94% — Eating together

6% / 50% / 44% — Doing the laundry	39% / 61% — Clean room of roommate

MEDICAL CARE

6% / 16% / 78% — Give medicines or help to remember	22% / 78% — Washing roommate	16% / 84% — Dressing roommate	33% / 67% — Bring to bed

Tabel 1. The willingness to share a room and to help with certain activities (Bouwman, M., 2019, research book, p.54, 56)

It must be clear that this work is very much individual. The relation between a student and the elderly may foster very different dialogues. Nevertheless, certain aspects pop up regularly. They are therefore often themes for further research.
- From passive behaviour to self-reliance
- From dependence to independence
- Loneliness
- Social meetings
- Meaning of life
- Distance between residents and the neighborhood
- Feeling that you do not belong anymore
- Homesickness
- Dementia – able to stay where you are?
- Reciprocity between the elderly and other age groups
- Resilient housing enabling elderly people to stay at home as long as possible

3.2. First translations into architectural results

The daily walks inspired S. Alkema to design an ensemble of buildings that form one big courtyard, open towards the neighbourhood. Walking routes through and around the building give the residents several options for a safe daily walk. There is an extravert and an introvert walking route through the building ensemble with stimuli and places, inside and outside, to rest and to meet others. As almost all students heard from the seniors, it is not normal to live exclusively with 80+. To the south of this ensemble, a children day-care is placed, together with family houses. Due to the observations during her fieldwork, the student realized that the residents do not want to see the bed during the day, but once they get sick, it's nice to give the bed a good place. Therefore, she designed an apartment in which the bed can move to three different places, depending on the situation.
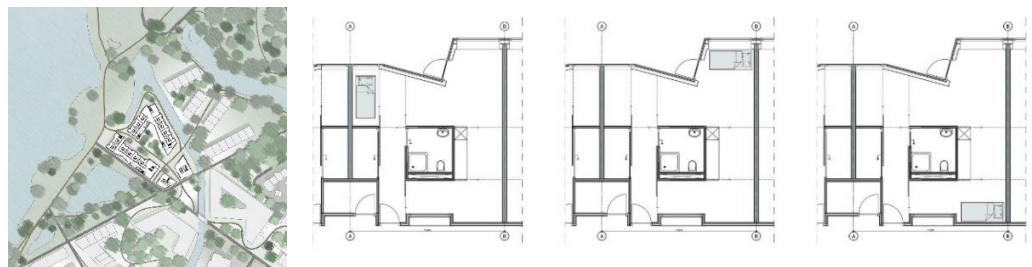

Figure 06. On the left you see the ensemble of four buildings and the walking paths outside, on the right, three positions for the bed with sliding doors to close the place or the room. (Alkema, R., 2019, book of drawings, p.1 and presentation slide 59).

The interviews Marijn Bouwman conducted with the elderly and their families about the willingness to share rooms and to help each other showed that there are certain private actions like washing somebody need to be done by professionals, whereas cooking for somebody and eating together, most people are willing to do so. This information resulted in dwelling clusters with collective living for the elderly and family living in-between. Because of the need of professional care, six co-living areas with in total 30 seniors would get one care-office as well. Her fieldwork showed that not everybody likes to sit in the collective kitchen with the others. Therefore each apartment has a little pantry as well and a good view towards the common room to see, who is sitting there.
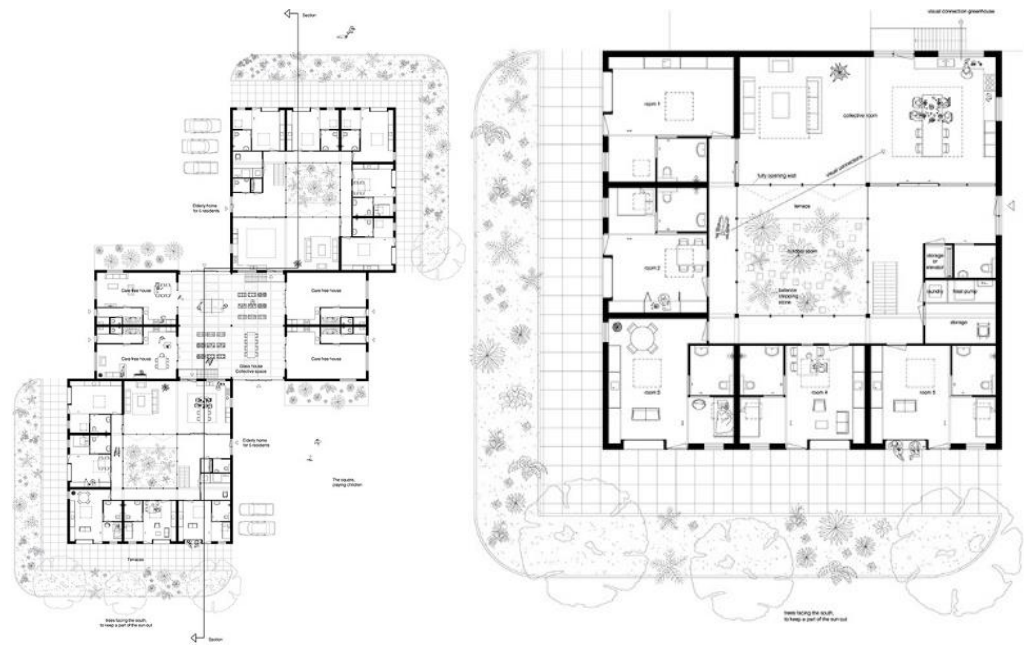
Figure 7. On the left you see one cluster of collective living apartments for the elderly and family living in-between; on the right, one collective living apartment group for five elderly on the ground floor and one group on the first floor. (Marijn Bouwman, 2019, design book, p.15,19)

Figure 8. One elderly's apartment and the cluster of co-living. During the day the bed will be hidden behind a sliding door. Each apartment has its own pantry and enough closets. There is a bench combined with the window to sit in front of the house. The cluster of co-living (one story high or two stories) and family houses are combined with a winter garden. (Marijn Bouman, 2019, design booklet, p.13,27)

4. Discussion

In the near future one out of four inhabitants will be over 65 years old. These elderly will be better educated, healthier and richer than the present. The existing housing stock is based on past experiences and mainly designed for families. Furthermore, there will be a shortage of professional staff and informal support. This makes it necessary that elderly support each other and stay as self-reliant as possible. To anticipate on this transition of society more research and in other scientific fields like anthropology, mobility and preventive health needs to be done by architects and urban planners to understand the needs of the elderly today and our near future because traditional designing will not provide the solutions.

5. Conclusions

We have never experienced an aging society before. New research methods, such as combining anthropological and architectural research, provide the necessary insight in the daily life of the elderly. Lots of elderly, but as well younger people like neighbours and

family provided us with information. After four years of work with the master students we can conclude that the method brought us new insides into the daily life of the elderly who need care as well as insides in the willingness and limits of others to help. We saw lots of translations to design proposals, not all of them could be shown in the limited context of this text.

By using this method, the students designed innovative living concepts in which the elderly could get old by their own standards, as independently and self-reliantly as possible. The cooperation between TU Delft and Habion not only gives the students the opportunity to observe the daily life of elderly people but also provides a living lab to test innovative ideas.

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