

PAPER

## **RESIDENTIAL HEALTHCARE - Evaluation of apartment layouts for senior persons**

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### **Abstract**

Residential Healthcare is a new, but relevant research-area with a background in the demographic situation with aging societies in most developed countries around the world. New challenges and possibilities occur when care and healthcare moves into private homes. In Sweden there is an increasing of not only home-care but also home-healthcare which will impact the layout of housing with new demands.

This paper describes a recently started project with the aim to analyze, from a number of aspects, the empirical material of more than 60 different design-solutions of Housing for elderly, made by Master-students in design-project run for the last 7 years. The design-solutions are illustrating research-questions, which I, as the teacher, have stated in the course-program.

Small but attractive and accessible flats for 1 and 2 persons are complemented with space for flexible use of healthcare, treatments of feet, massage, hairdresser etc and also for common activities. The need for such housing was identified a result of a recent investigation from the government of Sweden (SOU 2008:113). We have been working in existing context with real construction clients, planning to build such facilities and real sites. The focus is not only on the elderly but also on the staff in home-care and home-healthcare. What are their possibilities to perform a good work in ordinary private homes? What needs to be specifically considered in the design of new housing?

The project will be using the actual design-solutions as empirical work-material, the architectural research technique Research by design. Complementing empirical materials will be the design of recently built facilities for Senior Housing in Sweden. Workshops, as a complementary method, with staff from homecare and home-healthcare will be implemented, catching the experiences from experts. Parameters for measuring the outcomes will be from the area of architectural qualities as well as from accessibility and usability in a broad perspective.

**Keywords:** Accessibility, Assessment, Housing for seniors, Layout-plans

## **PAPER**

### **RESIDENTIAL HEALTHCARE - Evaluation of apartment layouts for senior persons**

#### **Introduction**

The demographic situation around the world, with a growing proportion of elderly people, stresses the need for innovative thinking. The demographic development in Sweden will have a great impact on planning and economy in the municipal sector, which is responsible for the eldercare. In Sweden approx. 94% of persons over 65 years are living in ordinary housing, many with assistance from home-care. (SKL 2009) For the majority of persons over 65 years that is also how they prefer to live. But along with an increasing life-span pensioners are a very diverse group. The third age is the age over 65 when you still can live an active life, while the fourth age is the age where most people becomes in need of help in their daily life (Agahi, Thorslund, Lagergren & Wånell 2004).

Demographic trends places demands on health care in completely different ways than the traditional ones. Health care becomes more specialized and the intensity of technology is increasing. By this trend care in hospitals becomes more expensive, and as a result the number of days in hospital is decreasing. For the old patients there is often a gap in care chains, a situation that is now beginning to be addressed. The possibilities for home-healthcare are increasing and they are able to perform many kinds of treatments, some of them in combination with the rapid development of the digital support of health care, now called E-health (Gund 2011, Sandström 2009).

The need for health care after surgery or treatments will increasingly be delivered out of the hospitals; in patient hotel, rehabilitation clinics and the like but also in private homes. With the demographic development of today, more patients will be frail and in need for longer time of care for recovery.

The private home for the elderly is already and will increasingly become the work of staff in home care and home care. What happens to the older man's home when it becomes simultaneously working for others? Usually it is not only one, but several staff persons in nursing and home care. How will the situation be experienced the situation of the healthier spouse / husband / partner in the household?

The benefits of care within or adjacent to the homes of the people is of course obvious, including reduced medical travel, less anxiety in patients and reduce healthcare costs. However, for this combination of activities to work well, requires that both houses and neighborhoods are designed also to care work. Innovative design based on research will be necessary, promoting comfortable life in older age (Äldreboendedelegationen 2008).

Home healthcare is increasing in two ways: First by the possibilities of today to perform qualified treatments. Even simple procedures with laparoscopic surgery (ie surgical operations carried out by means of telescopic instrument introduced into the body) can now be performed in private homes. Secondly the amount of care activities are increasing. 87 % of the entire home care efforts are made to people over 85 years. This shows a great development, but the situation is not without its problems. Socialstyrelsen (National Board of Health) states in an evaluation in 2008 that home care is suffering a shortage of skilled personnel, it is divided into several principals and is also home care assignments very unclear (Socialstyrelsen 2008). Care of the elderly cost about 70% of all social services costs of 126 billion SEK, already in 2001. About two thirds of the cost was for residential care, the form which thus contains only about 6% of the population over 65 years. (Socialstyrelsen 2002) The costs are obvious, as it is about people with very high care needs. Internationally, one can roughly assume that 50% of the cost of medical care goes to people over 65 years (Taylor 2003) If you could see the cost of elderly care services in a larger perspective, it appears clear that society has much to gain from efforts for those who remain in their normal home, instead of more older people have to move to assisted living.

Residential Healthcare concerns the increasing tendency of more of healthcare activities to take place in private homes as studied in the project *Healthcare in Housing* (Malmqvist 2009). Since 2006 master-students at the School of Architecture at Chalmers University of Technology have been designing Housing for seniors as a part of that research-project. The student's Design-solutions are illustrating research-questions, which I, as the teacher, have stated in the course-program. The empirical material consists of more than 60 different design-solutions of Housing for elderly. The aim of the Design Studio was that the students should obtain ability to design space for care and housing for elderly and gain general knowledge in factors of aging and the aging society.

### **Aim**

This research project aims to improve knowledge and ideas on how to build the new health care situation in two ways: How neighborhoods should be designed to facilitate patient care in the home, and how and where new devices for simple housing-related care designed. Knowledge is a great need in both practice and research, as these issues are new and needs have recently started to become apparent. The aim of this study is to analyze, from a number of aspects, these different design solutions.

### **Application project – a master-student project**

The Studio-project as well as the research-project, deals with the new challenges when care and healthcare moves into private homes. The subject for the studio-work is to design new housing for senior persons. In addition the students shall design relevant complements. As the

design work in an existing context with real sites, it is also important to strive for good contact with the surrounding areas.

In the studio, each year a new application project has been carefully selected. We have worked in collaboration with one of the municipalities of Sweden, where planning for the old people is going on. That means that we are acting as a part of actual “real” planning process. We entered in a phase where everything still is very open and we could meet engagement and interests from the client and other stakeholders. The students had thus the opportunity to have a dialogue with persons that are experts on housing for senior persons and elderly and of different kinds of care. Their projects were sometimes used by the professionals as illustrations for ideas, and could in this way influence the client’s process. The students also presented their final proposals to a broad range of actors in the real creating of housing for seniors.

The pedagogical idea of the Studio-project has been that students are encouraged to work in teams and develop communication skills to later on be able to work interdisciplinary with people of varying backgrounds. Studio-Work has been supported by 3 workshops with specific subjects related to the different phases of the design-work. A full-scale lab offered basic knowledge of measures for wheelchairs and other walking aids in bedrooms and bathrooms. Lectures from experts in different disciplines also supported their design-work. Their material has been presented by the students and later on some of the receiving organizations have been using them as illustrations to their further programming and planning.

There is a need for small but attractive and fully accessible flats for 1 and 2 persons in buildings or blocks that also offer some space for common activities. Having a common meal or cup of coffee are important such activities, but in the construction brief for the students, also included space for healthcare, treatments of feet, massage, hairdresser etc was suggested, preferably in spaces that could be used in flexible ways. The need for such housing was a result of a recent investigation from the government of Sweden (Äldreboendedelegationen 2008). In the end of 2008 this delegation were suggesting that so called Trygghetsbostäder should be built. “Trygghetsbostäder” was translated by researcher Jonas E Andersson to Safe haven (Andersson 2011). This kind of housing had approximately the same construction brief as the students had been working with, but with the extension that to be able to get some governmental subsidies there also was a demand for a host or hostess helping the seniors some hours a week. Today many municipalities in Sweden are building such facilities for housing for seniors.

**Main areas needed from the Design programme:**

“Housing: Approx. 50 apartments for elderly persons.

More than half of them shall be for 2 persons, that is of 3 – 4 rooms + kitchen (approx. 55 – 80 m<sup>2</sup>). The rest shall be for 1 person; 2 rooms + kitchen (approx. 45 – 60 m<sup>2</sup>).

Common areas:

- Kitchen plus dining-area

- Space for common activities – make your own suggestions and reasons why. Dining-area can be included in space for common activities, but show different possibilities for use.

Complementary areas:

- Waste room
- Common laundry room
- Storage (for each flat)
- Room for cleaners etc

Working-areas:

For personnel of homecare and home-healthcare that are working in the area. Decide what kind of space you suggest, give the reasons why, and show possible use.”

To be offered help and healthcare in your own private home is fundamentally positive as it gives the sick or senior person more of a private life than being in a hospital. But the total experience may very well include more negative factors. Experiences from next-of-kin to persons that has had care and healthcare in their home, was that the home had been translated into a healthcare facility. It was hard to have a normal life of a family, both because of all technical equipment that was needed but also from the fact that the home felt to be invaded by staff-persons coming and going. (Borgstrand & Berg 2009) To be able to offer good housing settings in the future, we need more knowledge about how apartments can be designed to support the new needs in better ways.

## **Research question**

The general research questions of this project are to:

1. Identify preconditions for built environment to become socially sustainable in meeting requirements from persons of all ages,
2. Develop the specific profile of residential healthcare analyzed from an architectural standpoint,
3. Experience how good every-day space for elderly in normal housing at the same time can offer good working conditions for care-staff.

The expected outcome of this research is to enable programming and design for all ages, planning and implementation, requested by the Swedish municipal sector, construction-clients for housing facilities, architects etc. Some of the questions that will be discussed are:

What is a good life for elderly persons? How can Housing and healthcare be integrated into the urban life and its spatial configuration? What sort of healthcare will people ask for and where? How can we design building structures that is general and flexible enough to handle

activities in rapid change like healthcare? In what ways can architecture support and promote health?

Questions in a more detailed level, which can be discussed are for example: What are the possibilities for flexible use of a Facility or a room? How can we support by space for storage of the extras needed, such as disposable equipment? May a lift be hidden in the wall or is it possible in the ceiling? What is needed in the building's common parts?

Most research on accessibility and old persons are executed in existing physical environments and concerning the interaction between the individual and the environment. This study, though, will be an attempt to experience improved design of layout-plans of apartments or home settings, before they are built. This is an approach with a possibility for saving large money, as it offers a test of the function of layout-plans for old persons in need of help, before it is built.

## **Methods**

The kind of research described in this paper, is basically of a qualitative character, although the empirical material could be regarded as partly quantitative. The technique of Mixed methods, as described by Dawn Freshwater, will for this reason be executed by the combination of the following method (Freshwater 2007).

### Analysis of accessibility

Architecture is including several values that can be measured. Some of these are directly related to the layout of apartments. For an apartment to work well for old persons, also when they receive care and healthcare in their own homes, the most significant values are considered to be accessibility, which is also related to possibilities to furniture, to the concept of usability and to the regulating norms for housing in Sweden. To be able to catch values and functions that can be related to the layouts and can be measured, an analysis of accessibility will be done by using the assessment tool Housing Enabler in the reduced version (Carlsson et al. 2009).

The concept of accessibility comprises of two components of equal importance; the personal component and the environmental component (Iwarsson & Ståhl 2003). They argue that accessibility is an objective and measurable concept: "The personal component refers to dimensions objectively observed, and the demands of environment are defined according to societal norms and legislation (Slaug 2012).

### Analysis of architectural qualities

Good architecture is also including values that are not easy to measure. However Ola Nylander is identifying the immeasurable values of dwellings, as qualitative aesthetic and symbolic qualities (Nylander 2001). He argues that there are seven fields of characteristics; Materials and details, characteristics, axiality, envelopment, movement,

figures of room, light and organization of room. Five of these fields of characteristics may be analyzed properly from the layout-plan of apartments, namely axiality, envelopment, movements, figures of rooms and organization of rooms. As the empirical materials are consisting of smaller apartments, the aspects of axiality and of movements may be considered of less importance than the other ones.

## Selection

Out of the total number of suggested layouts for apartment, more than 60, a selection of a smaller amount is now implemented, for assessing only those that shows to be of a quality fitting the Swedish construction regulations for housing.

Complementing empirical materials will be the design of apartments in similar sizes from building-projects of recently built facilities for Senior Housing in Sweden.

The initial results of the two kinds of analyzes will then be discussed in Workshops with professional actors of different disciplines such as architects, staff from homecare and home-healthcare. The workshops will be implemented to catch the experiences from experts and followed up by interviews.

## Theoretical frame work

For this study I found that two focus are needed in the theoretical frame for the work, namely the Design Theory and the Theory of human persons acting in an environment. As an architectural researcher my work is based on the Design Theory as described by Donald Schön (Schön 1983). He has identified the process where you reflect in action as well as over your actions. The analysis of architectural aspects in this study is taking place in the dialogue with the artifact, in this case the drawings, visualizations of the artifacts, is fundamental.

The other focus of this study was started in the Lawtons & Nahemows so called Ecological model, where the relation between the individual the environment is fundamental (Scheidt & Norris-Baker 2004). The person can be defined with a set of competences and the environment as its demands. The environmental demands have a higher press on persons with lower competences (Lawton 1986).

## Discussion

As the study is recently started, no results are yet to be found. However, there are some indications that the area of bedroom and bathroom will be the most critical points if the layout of housing for this purpose. Bedroom and bathroom are the specific parts of an apartment where most of care and healthcare is actually delivered. As a result research concerning layouts of patient rooms in combination with bathrooms in hospitals, can be considered as corresponding sources of evidence. Several studies in Patient Safety indicate that patient falls typically occur in and around patient beds and bathrooms (Alcee, 2000).

## Accessibility

According to a definition from the Swedish researchers Iwarsson and Ståhl (2003) is accessibility is a complex concept indicating the relation between a person's physical capacities and the design and demands of the physical environment/settings in terms of environmental obstacles. The Screening tool Housing Enabler in the reduced version of the original tool (Iwarsson & Slaug 2010) consisting of 61 items of assessment. In addition to the components of the person and the environment, it also includes the component of Activity, thereby entering the concept of Usability, defined in terms of Efficiency, Effectiveness and Satisfaction, where the latter is based on subjective opinions (ISO 1998).

## The meaning of your home

People's private home can be meaningful in many ways. It can mean a place for intimacy, security, anchor, self-determination and rooms for social communities. The researcher Gunnar Lantz describes the concept of home which is at once a practical and functional and somewhat emotionally-related identity (Lantz 2007). The practical may include a place for rest, meals and socializing. The emotional connected with the human sphere of life. The home can be seen as an extension of the person's identity. The home is a man's private territory and it gives people the opportunity to complete control of their lives in the home. This control helps people organize their lives, to bring order, predictability and stability in their lives. Sometimes there are two people in the household, and then, the one person able to live a normal life alongside his / her spouse or partner, care at home.

The researcher Maare Tamm put in an article on health care in the home as early as 1999 the existential question: "When does a home to be a home and becomes a workplace for working professionals?" (Tamm 1999)

## Layout-questions

The physical environment has a significant impact on health and safety. Concerning the layout of bedroom and bathroom, evidence-based results on research can be found in the related area of healthcare facilities. Donna Alcee studies 209 cases of injure by fall in hospitals, and found that 30% of these occurred when the patients were trying to use the toilet (Alcee 2000). In the article Safety by design, Safe design of healthcare facilities, J. Reiling presents a list of safety design features aimed at creating a safe, high quality, patient-centered environment in the patient-room (Reiling 2006). One of the features is: "Proximity between bed and bathroom, with railing support to reduce the potential risk for patient falls."

Some areas are particularly important for health care in the home. One must ask the question of where it is provided. Home nursing can act in all dwelling areas as needed. Rescheduling of wounds such as is often done in the patient's bed. Quite central to the housing to act as a hospital room, some functional dimensions are adequate. In particular it is important in

hygiene rooms and bedrooms where most of the care work is done. The hygiene room needs for example at least 60 cm space for care-staff on both sides of the toilet. Such a requirement, on the other hand, involve sanitary room is perceived excessive and therefore unsafe for elderly people who can do without caring staff, but need support to stay in the movement.

Also in the bedroom may require space for keeper at both sides of the bed. 120 cm provides both space for care-staff and to maneuver a wheelchair or other mobility devices. An alternative may be a mobile platform or a platform mounted in the ceiling. There is also another example of how the property functions must change rooms. Bedroom should be such that the bed may be placed in several ways. If your bedroom is too small, you may need to use your living-room, most often the biggest room in the apartment, as a bedroom. When the Swedish building regulations for new construction apply, are well prepared for both the disabled and caring staff in the home (Boverket 2011). Handbooks like Bygg ikapp (Svensson 2009) offer clear examples of good practice in building solutions for high accessibility.

With regard to personal hygiene may sometimes what is a benefit for a disabled person it difficult for staff to perform nursing. For example, the grab bar to sit in the way staff use. A balance between the demands of the individual elderly convenience and staff must take place.

#### Workplace of other persons

The housing apartments for the elderly are at the same time work-space for staff-persons in care and healthcare. This situation opens up a complex context, including possible conflicts. The study will have a focus not only on the elderly but also on the persons who are working in other person's homes, personnel in home-care and in healthcare. The needs of the staff-persons in various health care jobs need to be investigated.

- How can their legitimate requests for reasonable working environment met in residential areas?
- How can we as architects and planners to think again on new construction? What are the possibilities for improvement through simple measures of the large amount of existing housing?
- What are their possibilities to perform a good work in ordinary homes? What needs to be specifically considered in the design?
- What kind of localities and facilities are requested outside the individual homes?

#### A question of sustainability and usability

In most countries of at least the Northern Europe, the number of old persons is increasing, The large question of how we can deal with the aging population of many countries, is really a question of sustainability – to be able to give old persons a rich and good life is to build a society that is sustainable in both economic and social aspects. It is at the same time a question of flexibility and usability – our built environment will have to be used in several

new ways in the future. And you can contribute as architects, by showing the possibilities in space and buildings.

### Expected outcome

The expected outcome of this study is primarily knowledge about to what degree and in what parts different layout-plans in smaller apartment will be able to support the living of older persons receiving care and healthcare in their homes. Another expected outcome will be whether this kind of study may be a tool for identifying in a structured way obstacles and the degree of accessibility in the early stages of programming and designing of housing complex for the future.

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