Visit to care center Angeles Cobo Lopez, Alcaudete, Andalucia, Spain
A secondment within the REMIND project

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1 Meeting

The visit to the care center was preceded by a meeting between Eric Järpe, Halmstad University and Mar Olmo, AgeingLab. Mar received Järpe at the café Columbia 50 near Jaén University and the discussion continued on the way to the care center.
The health tech company AgingLab are dealing three kinds of accommodations for elderly with different sorts of conditions: 1. Patients with all kinds of severity (none to severe) living together in homes for many residents and sharing all activities except for having private bedrooms, 2. Patients in initial state of mild cognitive impairment living and receiving treatment in their own homes, 3. Patients with mild symptoms live and receive treatment in day care centers. The Alcaudete care center Angeles Cobo Lopez is a home of the first kind.

2 Arrival

This visit occurred April 25, 2019. The secondee Eric Järpe from Halmstad University and Maria del Mar Olmo Vidal from AgeingLab arrived to the care center Angeles Cobo Lopez at 11.30 am and were received by the General Director and the Vice Director of the care center.

3 Presentation of the care center Angeles Cobo Lopez

Apart from the leading staff of general director and vice general director, a neuropsychologist is working regularly at the facility. At the care center 64 staff members work with attending to 84 care recipients (the maximum capacity is 88 patients) of which 8 have no cognition symptoms but have some degree of mobility issues, 8 are diagnosed with very mild cognitive impairment and 10 with regular mild cognitive impairment, 9 are diagnosed with moderate cognitive impairment, 18 with moderately severe cognitive impairment, 26 with severe cognitive impairment, and 5 with very severe cognitive impairment. Totally 58 are diagnosed with Dementia, unclear whether it is Alzheimer’s disease or other forms of dementia (e.g. dementia with Lewy bodies or fronto-temporal dementia).

Regarding the problems suggested in the report [1], falls are an urgent and thoroughly understood problem at the care center. Training in falling techniques are offered in order to mitigate consequences of falls among the patients. This training was in progress during this very visit and documented, see below. However, the problem of financial exploitation via internet or mobile telephone are not relevant since the patients have no contact with these communication media. Instead staff members accompany the patients individually in visits to their bank in order to attend to private economy matters.

3.1 Ground and first floor

At the ground and first floor are the patients with most severe diagnoses located. On each floor are 16 rooms. In Figure 2 the main corridor leading a room for cognition training and to offices is shown. The corridor leading to the living quarters of the patients is not pictured here. On the ground floor all rooms are
Figure 1: The Alcaudete care center Angeles Cobo Lopez has a capacity of housing 88 patients. Currently there are 84 patients with different kinds of immobility or cognition disorders living there.

Figure 2: A corridor on the ground floor. This particular corridor was not the one leading to the living quarters of the patients though.
Figure 3: *Living quarters with one bed. On the bedside table is an alarm button for calling attention from the staff. Next to the bed is the wall mounted device for reporting patient activities.*

with one single beds as pictured in Figure 3. In all room (one as well as two

Figure 4: *All rooms are equipped with a lavatory consisting of a toilet, a shower with a small stool and a water basin.*

beds) was also a lavatory with a toilet, a shower and a water basin as pictured in Figure 4.

The sleeping quarters on the first floor was a corridor leading to 8 one single bed rooms and 8 two single bed rooms as pictured in Figure 5. Living in the rooms of the ground and first floor are patients with severe stages of mental disorder, severe dementia, depression, schizophrenia and behaviour disorders etc. Next to the bed/beds in each room is a telephone, see Figure 6. Also, next to this, is a number keypad and a small display. Different codes typed into this keypad mean different events; for instance the digit 5 meant the activity "mak-
Figure 5: Living quarters with two single beds. On the bedside table is an alarm button for calling attention from the staff and on the wall is the device for reporting activities of the patient.

Figure 6: Next to the bed/beds in each of the rooms in the care center is a reporting device where activities of the patient can be registered.
The registrations of activity reports from the devices in the patient’s rooms are summarized on-line in a central monitor in the main office of the ground floor. There is also a monitor that shows video pictures of the 16 rooms on the ground floor.

The corridors leading to living quarters were all decorated by wall paintings, as can be seen in Figure 8, made by the patients themselves. On the first floor the staff provided some basic lines for structure but all coloring was made by the patients. On each floor the motive was a season of the year. On the first floor the season was spring.

### 3.2 Second floor

The corridor on the second floor leads to the living quarters of 8 rooms, each capable of housing 2 patients. Here the patients are diagnosed with mild to moderate dementia or medium stage immobility. As pictured in Figure 9 the walls on this floor are in the theme of summer season.

### 3.3 Third floor

Here the corridor leads to 8 rooms, each which is capable of being the residence of 2 care recipients. Here the patients have no cognition impairment symptoms at all, just reduced mobility. The wall decoration theme (see Figure 10) here is season autumn.

### 3.4 Fourth floor

The top floor houses consists of a corridor leading to 8 rooms, each with single beds for 2 patients. As in the case with the third floor, all patients here are com-
Figure 8: The corridor leading to the rooms of the care recipients of the first floor. The walls are decorated with motives of the spring, made by the patients themselves.

Figure 9: The corridor of the second floor showing decorations with summer season motives.
Figure 10: The third floor corridor leading to rooms of the patients with no cognition impairment problems. The walls are showing motives of the autumn season.

Figure 11: Also the corridor of the fourth floor lead to the quarters of patients with no cognition impairment issues, merely slight immobility. Here the walls are showing winter season decorations.
pletely free from cognition impairment signs, merely slight immobility problems. The theme for the wall decorations here are winter as seen in Figure [11].

4 Treatment of patients

The patients of the care center are trained and assessed both mentally and physically in various ways.

4.1 Cognition training

In the cognition practice room, as shown in Figures [12] and [13], patients receive treatment of their cognition disorder by means of activities stimulating their participation and concentration to accomplish different tasks. One patient is standing by the interactive screen for special activities and the others are sitting by tables engaged in drawing and other more independent activities. Also the social contact is an important part of this activity.

By making different tasks and games by the interactive video screen the physician supervising the activity can assess the patients current state as well as improvement or deterioration based on historic data from the same or similar activities. At the same time the activities are one sort of training for maintaining or improving cognitive skills.

4.2 Physical treatment

In the gym hall, see Figure [14] many mainly mobility exercises may be conducted, but also other activities are performed here.

Examples of the former are walking practice, see Figure [15] uphill and down-
Figure 13: One patient is using the interactive video screen for different forms of tests and games in order to assess and practice cognition capabilities under the active guidance of the neuropsychological physician at the care center. In the top row the patient should indicate all discs of a specified color. In the middle row the patient is shown some pictures (of which one is a glass of wine) and then he should indicate from the list of items which of these were shown in the pictures just before. Finally, in the bottom row, the patient is playing the classical game of memory.
Figure 14: The gymnastics hall of the care center. Here many activities, mostly regarding mobility, are practiced and assessed.

Figure 15: A care recipient is practicing walking over pedestrian bridge with handrails and a nurse guiding the activity.
hill, possibly by aid of the handrails.

Another example of a mobility exercise is the learning of how to fall, see Figure 16, in a more controlled and less risky way in order to reduce injuries from falls. This is done by developing ability to use falling techniques from instruction given by a nurse.

An example of the latter, i.e. activities other than mobility exercises, is treatment of ache due to arthritis. This may be done by exposing the aching part of the body to heat, see Figure 17. The heat is generated by a reddish colored lamp illuminating the neck and back while sitting in a chair.

Other common mobility exercises may be performed independently by means of exercise tools such as the ones pictured in Figure 18. Apart from practice in order to result in improved mobility, the tools can also be used in studies about efficiency of different approaches or rate of improvement etc.

Of course, since there can be great individual differences, monitoring of the progress of different treatments and exercises is very important. With many alternative methods focusing on different muscular and joint parts and different conditions, the chances of tailoring a successful treatment for a certain individual increases.

4.3 Rest

Some care recipients are not up for cognition training or physical treatment. Still it is considered good for them to be socializing to the extent they can muster. These patients are spending some time in the restroom, an area separated by a flexible wall from a very large hall, pictured in Figure 19.
Figure 17: *Arthritis can cause ache in different parts of the body. Here a care recipient receives heat treatment for his neck and back ache caused by arthritis.*

Figure 18: *Different kinds of practice tools for practice and assessment. To the left is an apparatus for practicing arm mobility, in the middle is a wheel for practicing arm strength, and to the right is a pair of pedals for practicing leg strength.*
5 Maintenance

Different kinds of maintenance processes (such as cooking, laundry, cleaning etc) have to be solved for the care center to work properly. Here also health care has to be part of that infrastructure.

5.1 Cooking

For a well-functioning community, the food is an essential part. In a well equipped kitchen (see Figure 20) all meals of the day are cooked and prepared,
Figure 21: At the day of the visit there were meatballs for dinner (left picture) and a kind of pannacotta like dessert (right picture) being prepared.

Figure 22: A part of the dining room for the care recipients of the care center.
5.2 Laundry

Another necessity is the establishment for taking care of all laundry. In the basement are the rooms and staff devoted to this, see Figure 23. All ownership of garments are carefully kept track of, just as at the dry cleaners. Clean and neatly folded they are then distributed in due course back to the patients they belong to.

Figure 23: In the laundry room all laundry is separated into different categories (left picture). Each jacket has a name tag attached to it so it will not get lost. The underwear is kept in different drawers with numbers on it, and attached to the trolley with the drawers is a list explaining, for each number, which name is connected to that number (middle picture). In the inner room are the laundry machine and the dryer machine.

5.3 Health care

In another part of the basement are the rooms for health care and medication, see Figure 24. As one enters the corridor there is a desk for a staff member directly to the right. In this corridor are also all medical equipment and medicine storage. Also the distribution of medication is controlled from here by preparation of plastic boxes (see the right picture of Figure 24) facilitating for the care recipients to take their medicine: the right kind, the right amount, at the right time.

5.4 Visiting

For the purpose of reception of visitors there is a visiting room simply furnished with some chairs in one end, and a table and a wall mounted TV set in the other end of the room.

6 Outlook

Angeles Cobo Lopez seems to be a well functioning housing of multiple patients, mainly with different levels of cognition impairment. A study of fall detection as indicated in [1] could be performed with data from these residents.
Figure 24: The medical treatment corridor (left picture). At direct right is a desk and opposite that desk are racks of plastic boxes containing medication. Each patient specific box (right picture) is prepared with one vertical compartment for each day of the week and each day divided into subcompartments for different medicines during that day. Also in the left picture at the far end of the corridor is the doctors reception room.

Figure 25: Also available is a simple visiting room with some chairs (visible) and a table and a TV set (to the left, not visible).
Figure 26: From the left: first General Director of the care center, second Vice Director, third Maria del Mar Olmo Vidal, Project technique and psychology from AgeingLab and fourth Eric Järpe, Statistics Ph.D. from Halmstad University.
Figure 27: AgeingLabs Twitter post about the visit to the care center Angeles Cobo Lopez the 25 April, 2019.
The first step would be to apply for consent from the patients and staff at the care center. Secondly it could be checked if there is historic data about falls, when they occurred, to who, about circumstances etc. Of particular interest would be if there is any information about the extent of the delay of alarm, i.e. the time it took after the fall until there was staff members present at the place of the fall to help.

It may not be ideal for this kind of study. The fall detection would presumably be most adequate for people living in their own homes or in smart homes (that is the other two kinds of accommodations in collaboration with AgeingLab). Also, the care recipients at Angeles Cobo Lopez have a (wired) alarm button next to their beds and if they fell in their room they would possibly try to reach for this. Further, if a care recipient fell in one of the rooms in the basement floor, this would most likely be recorded by the video surveillance and seen by staff members promptly on the monitor in the central office and trigger staff to rush to the fallen persons help. All of these circumstances would reduce the need for change-point detection methods for assisting in fall detection at a care center like Angeles Cobo Lopez.

So preferably one of the more independent kinds of care centers would be more relevant for such a study in order to develop methods improving detection of falls as soon and as accurately as they occur.

Regarding a study for development of methods shielding elderly in early stages of dementia from financial exploitation, the care center Angeles Cobo Lopez is right out. Again, if a study at some of the more independent kinds of care centers, that could prove most beneficial.

References