Home environment design to enhance the quality of living among older people

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Ageing in NL: policies and demographics

2.9 million 65+ (17.3 % of population): 720.000 80+
1 out of 5: retired

Ageing-in-place as the ideal

• In the own home, with little care support. Modified dwellings with technology or additional care support when needed.
• “It is important that older people start thinking about how they wish to live in time.”
• Residential care homes phased-out. New nursing home admissions: higher thresholds.

Role of municipalities

• Provision of advice and information. Helps to find adequate care support: day care, domestic support, caregiver support, sometimes home modifications
The Dutch ambitions: ‘the 3 homes’

1. High-end rehabilitation: ‘return home sooner’
2. Intensive nursing home care: ‘like home’
3. Community care: ‘continue living at home’
The challenges

- NL: yearly need for 44,000 senior-proof dwellings until 2021
- Current building regulations: older people with a physical impairment (mobility problems, stair elevators).
- Limited home ownership <50%
- Little systematic research done to verify if/how independence and well-being are supported by modifications
- Current design guidelines frequently based on practical experience only.
- Insufficient training and educational possibilities for architects, occupational therapist, social workers etc.

- How to age-in-place in times that the state is withdrawing?
Parallels between Hong Kong and The Netherlands: the need for educational programmes and training
Technology @ Home programme
Training, education and design

- Woerden, NL
- 60 m²
- 26 April 2012
- Environmental modifications
- Focus group sessions
- Design guidelines: safety, familiarity, etc

(van Hoof et al., 2013, Journal of Housing for the Elderly)
Evidence-based building design
www.thuiswonenmetdementie.nl
Public website for home modifications

source: Kort & van Hoof (2014) Technology and Disability
Does technology contribute to ageing-in-place?

**Example: UAS-technology**

- Project Unattended Autonomous Surveillance: sensor-based technology
- Pilot with 18 older people: nursing home care at home

**Goal of system:**
- ageing-in-place, delay of institutional care

**By:**
- increasing sense of safety and security
- support of formal/informal carers

**Research questions:**
Does the system work?
What do clients need and expect?
Main outcomes

- Increase of quality of care through use of technology.
- The provision of care is more than the implementation of care technology.
- Technology alone offers no solution.
- Home modifications are much needed, such as stair elevators and communication technologies.
- Implications for management

- Question: So how can technology help?

van Hoof et al. (2011) International Journal of Medical Informatics
### Use and acceptance of technology in NL

<table>
<thead>
<tr>
<th>Use by people aged 60+ (in %)</th>
<th></th>
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<tbody>
<tr>
<td>Browing the Internet for health-related information</td>
<td>33</td>
</tr>
<tr>
<td>Wheeled walkers</td>
<td>10</td>
</tr>
<tr>
<td>Wrist- or neck-worn emergency response systems</td>
<td>6</td>
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<tr>
<td>Stair elevator</td>
<td>4</td>
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<tr>
<td>Vacuum robot</td>
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<tr>
<td>Support stockings (oedema) machine</td>
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<tr>
<td>Monitoring of activities/daily patterns</td>
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<tr>
<td>Keeping appointments with GP via the Internet</td>
<td>2</td>
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<tr>
<td>Video communication with GP</td>
<td>2</td>
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</tbody>
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*(NIVEL Consumentenpanel, 2014, n = 319-328)*
Current literature: acceptance

- 2014: Limited number of studies (16) on technology acceptance
- Most about technology to support safety/security or social interaction
- Mostly pre-implementation, too few post-implementation studies

Pre-implementation attitudes:
- Many concrete disadvantages (false alarms, burden on children, etc)
- Advantages are more abstract (independence, safety)
- General attitude: “very nice, but not suitable for me”
- Wanting to be independent ≠ acceptance

(Peek et al, 2014, International Journal of Medical Informatics)
Longitudinal field study
Independence and technology

1) Being able to care of yourself, not being dependent on others;
2) The freedom to do what you want to do;
3) Don’t feel burdened / obliged towards others;

Nr. 1: what older adults want and what is promised by suppliers
Nr. 2: related to control (over/by technology)
Nr. 3: related to relationships with others (asking for help, being a burden to others)

(Sixsmith, 1991)
(Peek et al., 2015, Gerontology)
Like home
„Heaven and haven“
Structured review of the sense of home

Psychological (4)

1. Sense of acknowledgement
2. Preservation of own identity
3. Autonomy & control
4. Coping

Social (7)

5. Interaction with staff
6. Interaction with residents
7. Interaction with family & friends
8. Interaction with others (general)
9. Interaction with pets / dolls
10. Reciprocity (in care relations)
11. Activities

The built environment (8)

12. Layout: private space
13. Layout: (quasi)-public space
14. Personal belongings
15. Automation & communication
16. Look and feel
17. Outdoors

Potential for architectural solutions
Examples of interior design inside Dutch nursing homes
Making moodboards with residents with dementia

Home improvement with people with dementia residing in nursing homes
Design research: We should involve older people
Seniors in class
Interaction older people and students: in our Nursing Home Living Labs
Cocreation and codesign
Low-tech solutions for accessibility
New ways to open doors
Interactive water pump
Design Research Living Lab: cocreation with industry, residents, staff & students