Social Isolation in Elderly (Prof Ron Baecker)

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Designing technology to keep seniors connected - a response to the public health crisis of social isolation

Outline

1. Public health crises
2. Keeping seniors connected
3. Design research
4. FamiliNet.app as solution
5. Planned developments, esp with respect to dementia
6. Designing a product, not an interface
7. Q&A

1. Public Health Crises

- Examples:
  - 2011: E.coli outbreak
  - 2012: Fraud on breast implants
  - 2015: Zika virus outbreak
- Importantly:
  - State of planet's environment
  - **Social isolation**

Good news	- We are living longer
	- The oldest old
	  • By 2050, people aged ≥60 will double
	  • By 2050, people aged ≥80 will quadruple
	- Enjoy family / friends, convey wisdom, reap rewards

Bad news	- Sensory, motor cognitive challenges (Alzheimer's disease, aphasia, Parkinson's, blindness, deafness, etc.) - Isolation, loneliness, vulnerability, depression *Hence, our focus: Tech to help prevent social isolation, loneliness, vulnerability and depression*

2. Keeping Seniors Connected

- Many individuals socially isolated:
  - Live alone, little family, small social networks
  - Sensory and motor impairments
  - Little control over feelings from moment to moment -> important of asynchronous messaging
- Data:

US	- 35% of adults aged ≥45 are lonely - 36% of adults aged 60-69 are lonely - 24% of adults aged ≥70 are lonely - 45% of women aged ≥75 live alone
Japan	- 6.5m of individuals aged ≥60 live alone (2010) - 9m individuals aged ≥60 will live alone (2030 est)

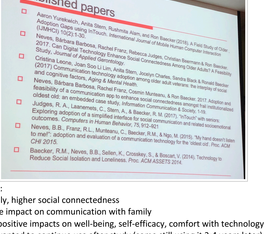
- Health consequences of isolation:
  - Depression, morbidity, stress, functional decline (Edelbrock et al., 2001; Perissinotto et al., 2012, Steptoe et al., 2013)
  - Health risks comparable to dangers of smoking, cigarettes and obesity (Cornwell & Waite, 2009)
  - Loneliness kills:
    - 50% increased likelihood of survival for participants with stronger social relationships (Holt-Lunstad et al., 2010)
    - 29%, 26% and 32% increased likelihood of mortality with increases in social isolation, loneliness and living alone (Holt-Lunstad et al., 2015)
- Social interaction and cognitive decline:
  - RCT of 235 lonely Finnish seniors (Pitkala et al., 2011)
    - Socialisation in group setting vs Control of 'usual' care at day centre
    - Significant improvement in cognition, mental function
  - TCT of 120 Chinese seniors (Mortimer et al., 2012)
    - Tai Chi, social interaction vs Walking, no interaction
    - Significant changes in brain volume, etc

3. Design Research

- User-centred design process (Gould, Boeis, Lewis, 1991):
  - Early focus on users
  - Integrated design
  - Early and continual user testing
  - Iterative design
- Interview studies with potential users to inform design of InTouch:
  - Technologies for Aging Gracefully lab (TAGlab)
  - Interview and diary studies with seniors
  - Deployment of proof-of-concept prototypes
- Learnings of integrated design:
  - Design appliances, not software or interfaces
  - Leverage pictures of family
  - Focus on asynchronous messaging
  - Support conversations of multimedia messages
  - Use as little text as possible
  - Provide secure closed family network
- Testing, studying and improving what we built by iterative design (2012-2016):
  - Mixed methods studies with seniors evaluating the concept and prototype software

Study 1	4 in long term care (Chinese speakers)
Study 2	12 in retirement home, normal cognition
Study 3	10 in home care, normal cognition
Study 4	12 in retirement home or home care, some experiencing cognitive decline
Study 5	10 veterans in long-term care, some experiencing cognitive decline

  - Published papers



- Study results:
  - Typically, higher social connectedness
  - Positive impact on communication with family
  - Some positive impacts on well-being, self-efficacy, comfort with technology
  - Most wanted to continue use after study (some still using it 3-4 years later)
  - Biggest obstacles:
    - Need for multiple platforms, better UX
    - Physical barriers (vision, hearing, hand tremors)
    - Need for support (typically used volunteers)
- 2010-2016 takeaways:
  - Social isolation kills seniors
  - InTouch system - communications that seniors can use
  - Validation through series of filed studies over 7 years and deployment over 4 years
  - And now...FamiliNet.app

4. FamiliNet.app as Solution

- Features:
  - People in FamiliNet are salient, "in your face"
  - Multiple media:
  - Text -> Speech
  - Speech -> text
  - Transcription
  - Translation
  - MyMedia (Scrapbook)
  - News
  - Games
  - Online video training and reminders
- Summary:
  - Secure private family network
  - Cross-platform
  - Powerful, but easy to learn and use features
    - Family made salient through large photos
    - Messages - text, voice, music, photos, videos, webpages
    - Accessible to seniors with challenges
    - Multi-lingual conversations, transcription and translation
    - Group memory-building and support
    - Online services - news, games
    - Built-in video training

5. Planned Developments

- Plans to support people with dementia:
  - Scrapbook enhanced to support reminiscence therapy
  - Libraries of personally meaningful music

6. Designing a Product, not an Interface

- Appropriate functionality - not minimal, but not bloatware
- Stakeholder requirements:
  - Seniors
  - Family
  - Caregivers
- Commercial considerations - market segments
  - Seniors who are tech averse
  - Veterans
  - Seniors on dementia path
  - Seniors linguistically mismatched with grandchildren
  - Seniors who are almost blind
- *We are not just researchers, but designers and creators and innovators and ideally entrepreneurs*
- Modified user-centred design process:
  - Early focus on users **and possible users**
  - Integrate design **for all stakeholders**
  - Early and continual user testing **and envisionment**
  - Iterative design **and product releases**

7. Q&A

- ***Regarding the functionality of the app, many other existing apps have similar features (e.g. WhatsApp, Facebook). What is lacking in existing apps that caused you to develop FamiliNet?***
  - Not about replacing functions already available in major commercial messaging systems, but choosing functionalities that are most important and making it available to seniors
  - Existing apps are not very suitable for specific groups of seniors (e.g. those with cognitive decline, those with linguistic mismatches with family)
  - Existing apps are not easy to learn and use (e.g. too many ads)
- ***How did you manage the changes in user interface?***
  - E.g. Change from 2x2 to 4x3 interface
  - More about changing mindsets towards technology, rather than getting them used to a particular interface
- ***Do you use existing technologies for functions like text->speech and speech->text?***
  - Integration of existing functions, rather than developing these functions from scratch
  - Team focuses on showing how clever integration can make a meaningful difference
- ***How do you define and quantify social loneliness?***
  - Isolation defined operationally - frequency and number of contacts
  - Loneliness based on scales - validated over time, different length (e.g. Beck's depression inventory)
  - Singapore data:
    - 44% of seniors in community are at risk of social isolation
    - Risk determined by validated tools:
      - E.g. Lubben social network scale -> evaluates social network
    - Significant associations with social isolation:
      1. Gait speed
      2. Cognition (MMSE)
      3. Quality of life
    - Living alone was not a key predictor for social isolation
- ***What are the offline capabilities for seniors without wifi?***
  - Consider going to places with wifi (e.g. veterans going to centralised place to use app with volunteers)
  - Yet, that would significantly affect quality of experience since the app would only be used at fixed times of the day
- ***Is there longitudinal follow-up for the use of technology in the long term?***
  - Studies have been more short-term so far
- ***What were some challenges you had from scaling up your product from a prototype to commercial level?***
  - Biggest challenge: Cross-platform (Android, iOS, Macbook, Windows laptops)
  - Second biggest problem: Not acting on every idea you have to make it better -> in order to build a viable, cross-platform app with limited resources