Residential care for older persons in Belgium: what are the future needs?

Projections of residential care users 2010 - 2025

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Policy background

• Successive protocol agreements between federal and regional authorities (1997, 2003, 2005)

• Aims (inter alia):
  Moratorium on the number of beds in residential care
  Substitution of higher care nursing beds (MRS/RVT) for lower care beds (ROB/MRPA)
  Allow older people to stay at home

• Moratorium was due to expire on 1 October 2011
  But has been extended
### Policy background

Recent trends in supply of residential care: overall stability, substitution of nursing home beds for beds in homes for the elderly

<table>
<thead>
<tr>
<th>Year</th>
<th>Nursing homes</th>
<th>Homes for the elderly</th>
<th>Total beds</th>
<th>Beds/1000 persons 65+ years</th>
<th>Beds/1000 persons 75+ years</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>33 103</td>
<td>87 940</td>
<td>121 043</td>
<td>71</td>
<td>164</td>
</tr>
<tr>
<td>2001</td>
<td>37 489</td>
<td>85 055</td>
<td>122 544</td>
<td>71</td>
<td>162</td>
</tr>
<tr>
<td>2002</td>
<td>39 403</td>
<td>85 350</td>
<td>124 753</td>
<td>71</td>
<td>160</td>
</tr>
<tr>
<td>2003</td>
<td>45 306</td>
<td>79 139</td>
<td>124 445</td>
<td>71</td>
<td>156</td>
</tr>
<tr>
<td>2004</td>
<td>46 905</td>
<td>78 068</td>
<td>124 973</td>
<td>70</td>
<td>154</td>
</tr>
<tr>
<td>2005</td>
<td>47 165</td>
<td>77 917</td>
<td>125 243</td>
<td>70</td>
<td>150</td>
</tr>
<tr>
<td>2006</td>
<td>48 712</td>
<td>76 406</td>
<td>125 279</td>
<td>69</td>
<td>146</td>
</tr>
<tr>
<td>2007</td>
<td>51 442</td>
<td>73 941</td>
<td>125 539</td>
<td>69</td>
<td>142</td>
</tr>
<tr>
<td>2008</td>
<td>54 796</td>
<td>71 963</td>
<td>126 916</td>
<td>70</td>
<td>140</td>
</tr>
<tr>
<td>2009</td>
<td>59 504</td>
<td>68 760</td>
<td>128 421</td>
<td>70</td>
<td>139</td>
</tr>
<tr>
<td>2010</td>
<td>63 064</td>
<td>66 179</td>
<td>129 400</td>
<td>70</td>
<td>138</td>
</tr>
<tr>
<td>2011</td>
<td>65 325</td>
<td>64 255</td>
<td>129 732</td>
<td>n.a.</td>
<td>n.a.</td>
</tr>
</tbody>
</table>
## Policy background

Recent trends in home care (Flanders only): expansion

<table>
<thead>
<tr>
<th>Year</th>
<th>Users of home nursing – 60+</th>
<th>Users/1000 persons 60+</th>
<th>Households receiving family care&lt;sup&gt;a&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>107,985</td>
<td>48.2</td>
<td>62,629</td>
</tr>
<tr>
<td>2001</td>
<td>112,029</td>
<td>49.8</td>
<td>63,225</td>
</tr>
<tr>
<td>2002</td>
<td>n.a.</td>
<td>0</td>
<td>65,870</td>
</tr>
<tr>
<td>2003</td>
<td>n.a.</td>
<td>0</td>
<td>67,005</td>
</tr>
<tr>
<td>2004</td>
<td>133,119</td>
<td>58.7</td>
<td>67,725</td>
</tr>
<tr>
<td>2005</td>
<td>126,037</td>
<td>55</td>
<td>70,112</td>
</tr>
<tr>
<td>2006</td>
<td>131,091</td>
<td>56.6</td>
<td>74,406</td>
</tr>
<tr>
<td>2007</td>
<td>136,832</td>
<td>57.9</td>
<td>79,181</td>
</tr>
<tr>
<td>2008</td>
<td>140,851</td>
<td>58.5</td>
<td>n.a.</td>
</tr>
<tr>
<td>2009</td>
<td>148,039</td>
<td>60.4</td>
<td>n.a.</td>
</tr>
<tr>
<td>2010</td>
<td>152,802</td>
<td>61.3</td>
<td>n.a.</td>
</tr>
<tr>
<td>2011</td>
<td>157,280</td>
<td>n.a.</td>
<td>n.a.</td>
</tr>
</tbody>
</table>
Policy background

Alternative forms of LTC are expanding but still marginal

<table>
<thead>
<tr>
<th>Year</th>
<th>Short stay centres</th>
<th>Day care centres</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Beds (absolute numbers)</td>
<td>Beds/1000 persons 75+ years</td>
</tr>
<tr>
<td>2000</td>
<td>241</td>
<td>0.3</td>
</tr>
<tr>
<td>2001</td>
<td>267</td>
<td>0.4</td>
</tr>
<tr>
<td>2002</td>
<td>333</td>
<td>0.4</td>
</tr>
<tr>
<td>2003</td>
<td>408</td>
<td>0.5</td>
</tr>
<tr>
<td>2004</td>
<td>558</td>
<td>0.7</td>
</tr>
<tr>
<td>2005</td>
<td>749</td>
<td>0.9</td>
</tr>
<tr>
<td>2006</td>
<td>916</td>
<td>1.1</td>
</tr>
<tr>
<td>2007</td>
<td>1 103</td>
<td>1.2</td>
</tr>
<tr>
<td>2008</td>
<td>1 262</td>
<td>1.4</td>
</tr>
<tr>
<td>2009</td>
<td>1 401</td>
<td>1.5</td>
</tr>
<tr>
<td>2010</td>
<td>1 626</td>
<td>1.7</td>
</tr>
<tr>
<td>2011</td>
<td>1 757</td>
<td>n.a.</td>
</tr>
</tbody>
</table>
Strong increase in number of 65+ from 2010 on
Increase in number of 80+ accelerates after 2025
Research aim

- Projection of the number of older persons (65+) using residential care up to 2025

Research steps

- Literature review
  - Determinants of care needs (ADL disability)
  - Determinants of entry into residential care
  - Projection models of residential care
- Selection of databases
  - Health Interview by Survey (HIS) 2004, 2008
  - Permanent Sample (EPS) 2004-2009
- Design of projection model
- Estimation of equations
- Projection
Projection model set-up: main variables

A. Demography: Age and Sex

C. Household situation: marital status, presence of children
   Availability of informal care

B. Chronic conditions
   Disability: ADL limitations (Need for care)

D. Use of formal care
   Formal home care
   Residential care

Supply of formal care
Regional variation
Projection model: main steps

1. Estimation of model of transitions between LTC situations
   Independent variables: age, sex, living situation, disability, province

2. Projecting number of persons in various LTC situations, using equations estimated in step 1.
Transition model database 1: EPS

Main database: Echantillon Permanent(e) Steekproef (EPS)

• Administrative panel, anonymised, 2002-2009
• Sample of population in Belgian public health insurance
  • 1/40 of persons < 65
  • 1/20 of persons 65+
• Data on use of public health care and related variables
  • Also on living situation
  • Not on health and disability itself!
• Data used in this project restricted to:
  • Population aged 65+
  • Years 2004-2009
Transition model database 1: EPS

- Five chronic conditions, which are predictors of disability, could be identified in the EPS using data on medication and medical treatments:

<table>
<thead>
<tr>
<th>Name</th>
<th>Impact</th>
<th>Prevalence</th>
</tr>
</thead>
<tbody>
<tr>
<td>COPD</td>
<td>moderate</td>
<td>high</td>
</tr>
<tr>
<td>Dementia</td>
<td>very high</td>
<td>moderate</td>
</tr>
<tr>
<td>Diabetes</td>
<td>moderate</td>
<td>high</td>
</tr>
<tr>
<td>Hip fracture</td>
<td>high</td>
<td>low</td>
</tr>
<tr>
<td>Parkinson’s disease</td>
<td>very high</td>
<td>low</td>
</tr>
</tbody>
</table>

- Disability (1 or more limitation in ADL) imputed, using equation estimated with HIS 2004 & 2008
Transition model database 2: HIS 2004 & 2008

Additional database: Health Interview Survey 2004 & 2008

- Large survey on health, health problems and health behavior
- Sample from population of Belgian residents
  - Including institutionalized population
- Oversampling of persons 65+ (2004); 75+ (2008)
- Sample sizes (65+) 3594 (2004); 2859 (2008)
- Logistic model of disability (1 or more limitations in ADL)
  - Using age, sex, province and five chronic conditions as predictors
Transition model database 2: HIS 2004 & 2008

Age is dominant predictor of disability: % with disability by age
Transition model of LTC use

Model of transitions between LTC situations.

- Quarterly
- Careful definition of care situations: Each individual in any quarter had to be assigned to a single care situation
- Determinants: age, sex, probability of disability, living situation, province
  - Living situation:
    - partner
    - daughter, son
    - other persons
    - distinction between present / present but available for informal care / not present
- Set of hierarchical transition probability models
Transition model: LTC situations

- no long-term care, no hospitalization
- home-care use ‘low’ intensity (categories A, T)
- home-care use ‘high intensity’ (categories B, C),
- residential care, cat. O: 0 ADL limitations
- residential care, cat. A: 1-2 ADL lim’s or ‘disoriented’
- residential care, cat. B*: 3-4 ADL lim’s or ‘disoriented’ and 1-2 ADL lim’s
- residential care, cat. C*: 5-6 ADL lim’s, not ‘disoriented’
- residential care, cat. Cd*: 5-6 ADL lim’s and ‘disoriented’
- hospitalization
- Deceased

* Distinction between ROB/MRPA and RVT/MRS collapsed
# Transitions in LTC situations after one year: descriptive

<table>
<thead>
<tr>
<th>4 quarters</th>
<th>No care</th>
<th>Home care low</th>
<th>Home care high</th>
<th>Resid. care level O</th>
<th>Resid. care level A</th>
<th>Resid. care level B*</th>
<th>Resid. care level C*</th>
<th>Resid. care level Cd*</th>
<th>Hospitalization</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>No care</td>
<td>93.4</td>
<td>7.4</td>
<td>4.4</td>
<td>1.6</td>
<td>0.6</td>
<td>0.5</td>
<td>0.2</td>
<td>0.2</td>
<td>31.8</td>
<td>81.2</td>
</tr>
<tr>
<td>Home care low</td>
<td>1.9</td>
<td>66.8</td>
<td>5.9</td>
<td>0.3</td>
<td>0.4</td>
<td>0.4</td>
<td>0.2</td>
<td>0.0</td>
<td>9.5</td>
<td>5.3</td>
</tr>
<tr>
<td>Home care high</td>
<td>0.4</td>
<td>5.6</td>
<td>57.6</td>
<td>0.1</td>
<td>0.1</td>
<td>0.1</td>
<td>0.3</td>
<td>0.2</td>
<td>4.8</td>
<td>1.5</td>
</tr>
<tr>
<td>Resid. care level O</td>
<td>0.2</td>
<td>0.8</td>
<td>0.2</td>
<td>65.7</td>
<td>7.0</td>
<td>2.3</td>
<td>0.7</td>
<td>0.1</td>
<td>2.7</td>
<td>1.2</td>
</tr>
<tr>
<td>Resid. care level A</td>
<td>0.2</td>
<td>1.7</td>
<td>0.7</td>
<td>10.6</td>
<td>49.9</td>
<td>5.8</td>
<td>2.2</td>
<td>0.5</td>
<td>3.2</td>
<td>1.1</td>
</tr>
<tr>
<td>Resid. care level B*</td>
<td>0.3</td>
<td>2.6</td>
<td>2.3</td>
<td>6.4</td>
<td>15.8</td>
<td>48.5</td>
<td>5.0</td>
<td>1.9</td>
<td>5.0</td>
<td>1.4</td>
</tr>
<tr>
<td>Resid. care level C*</td>
<td>0.1</td>
<td>1.0</td>
<td>2.2</td>
<td>2.0</td>
<td>4.4</td>
<td>6.0</td>
<td>48.7</td>
<td>1.4</td>
<td>3.0</td>
<td>0.7</td>
</tr>
<tr>
<td>Resid. care level Cd*</td>
<td>0.2</td>
<td>1.5</td>
<td>3.1</td>
<td>1.9</td>
<td>4.7</td>
<td>15.2</td>
<td>12.6</td>
<td>60.2</td>
<td>4.8</td>
<td>1.8</td>
</tr>
<tr>
<td>Hospitalization</td>
<td>0.7</td>
<td>2.5</td>
<td>2.1</td>
<td>1.0</td>
<td>1.0</td>
<td>0.9</td>
<td>0.8</td>
<td>0.5</td>
<td>12.9</td>
<td>0.9</td>
</tr>
<tr>
<td>Deceased</td>
<td>2.7</td>
<td>10.3</td>
<td>21.4</td>
<td>10.5</td>
<td>16.2</td>
<td>20.3</td>
<td>29.4</td>
<td>35.0</td>
<td>22.4</td>
<td>4.9</td>
</tr>
<tr>
<td>Total</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
</tr>
<tr>
<td>% in origin category</td>
<td>86.1%</td>
<td>5.1%</td>
<td>1.5%</td>
<td>1.3%</td>
<td>1.1%</td>
<td>1.4%</td>
<td>0.8%</td>
<td>1.8%</td>
<td>1.0%</td>
<td>100.0%</td>
</tr>
</tbody>
</table>
Transition model: hierarchical structure

Initial situation

- P(Deceased)
- P(Survived)

- P(Hospitalised)
- P(Not hospitalised)

- P(At home)
- P(Residential)

- P(No care)
- P(Home care)

- P(Low care)
- P(High care)

- P(O)
- P(A)
- P(B)
- P(C)
- P(Cd)
Transition model: results

Probability of transition into residential care, from a situation of no care, by risk of disability, for four types of persons, by quarter.
Model of transitions in LTC: results

- Disability is dominant predictor
- Other important predictors: age, presence partner or child in household
- Disability is itself largely determined by age
- Important differences between provinces (not always significant)
  - But difficult to interpret
Transition & projection model limitations

- Not all relevant data are available
  - Level of disability (*number* of ADL limitations)
  - Informal care from outside the household
  - Income, education, home ownership
  - Formal LTC not paid by INAMI / RIZIV (home care)
- No data on local variations in supply of care (waiting lists?)
- Data limited to 2004-09, not possible to identify time trends
- No projections for Belgium for disability or chronic conditions
Projection method

Cell-based macro-projection model

- Cells defined by
  - Year (2010 - 2025)
  - Age category (5 year intervals)
  - Sex
  - Province+
  - Living situation (4 variables)
  - Chronic conditions (5 variables)

- Variables in each cell
  - Number in population
  - Risk (%) of disability
  - % in each LTC situation

- Projection results by aggregation across cells, weighted by number in population

- Calibration to 2010 total according to RIZIV data (125.500)
  - Necessary because of residential care ‘immigrants’
Projection method: set-up of projection matrix

- Population projections by FPB - ADSEI
  - Year x Age x Sex x Province

- Projection of living situations by Michel Poulain
  - Year x Age x Sex x Living situation
  - Living situation in base year from EPS
  - Some interpolation and calibration necessary

- Chronic conditions from EPS
  - Chronic conditions x Age x Sex x Province
  - Assumed unchanged across projection period in base scenario
  - But adapted in other scenarios

- Risk of disability
  - Imputed using equation estimated on HIS

- Proportion in each care situation
  - Imputed using equations estimated on EPS

- Cf. block diagram in handout
Projection results: base scenario
## Projection results by province+: base scenario

<table>
<thead>
<tr>
<th>Province</th>
<th>Persons in residential care</th>
<th>Increase in %</th>
<th>% aged 85+</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2010</td>
<td>2025</td>
<td>2025 / 2010</td>
</tr>
<tr>
<td>Antwerpen-Mechelen</td>
<td>15 294</td>
<td>19 563</td>
<td>28%</td>
</tr>
<tr>
<td>Turnhout</td>
<td>3 472</td>
<td>6 142</td>
<td>77%</td>
</tr>
<tr>
<td>Brussels</td>
<td>12 747</td>
<td>12 223</td>
<td>-4%</td>
</tr>
<tr>
<td>Halle-Vilvoorde</td>
<td>6 118</td>
<td>8 843</td>
<td>45%</td>
</tr>
<tr>
<td>Leuven</td>
<td>4 824</td>
<td>7 069</td>
<td>47%</td>
</tr>
<tr>
<td>Nivelles</td>
<td>4 111</td>
<td>6 082</td>
<td>48%</td>
</tr>
<tr>
<td>West-Vlaanderen-Kust</td>
<td>7 772</td>
<td>11 711</td>
<td>51%</td>
</tr>
<tr>
<td>West-Vlaanderen-Binnen</td>
<td>7 461</td>
<td>10 494</td>
<td>41%</td>
</tr>
<tr>
<td>Gent-Aalst</td>
<td>9 430</td>
<td>13 138</td>
<td>39%</td>
</tr>
<tr>
<td>Oost-Vlaanderen-rest</td>
<td>9 065</td>
<td>12 766</td>
<td>41%</td>
</tr>
<tr>
<td>Charleroi-Mons-Soignies</td>
<td>10 471</td>
<td>11 753</td>
<td>12%</td>
</tr>
<tr>
<td>Hainaut-autre</td>
<td>7 211</td>
<td>8 706</td>
<td>21%</td>
</tr>
<tr>
<td>Liège</td>
<td>14 195</td>
<td>17 186</td>
<td>21%</td>
</tr>
<tr>
<td>Limburg</td>
<td>5 571</td>
<td>10 390</td>
<td>87%</td>
</tr>
<tr>
<td>Luxembourg</td>
<td>2 745</td>
<td>3 401</td>
<td>24%</td>
</tr>
<tr>
<td>Namur-Namur</td>
<td>3 531</td>
<td>4 619</td>
<td>31%</td>
</tr>
<tr>
<td>Namur-autre</td>
<td>1 481</td>
<td>1 944</td>
<td>31%</td>
</tr>
<tr>
<td>Belgium-total</td>
<td>125 500</td>
<td>166 000</td>
<td>32%</td>
</tr>
</tbody>
</table>
Projection results: base scenario

• Results driven by ageing of the population
  • Due to importance of age, constant risk of disability, and constant transition probabilities between care situations

• Important differences between provinces in the projected number of users of residential care
  • Due to variation in demographic composition:
  • Some provinces with few 85+ now will experience strong ageing effect in near future
Projection results: six alternative scenarios

Three alternative scenarios on disability

1. “Better education”: the prevalence of chronic conditions declines in line with the increased educational level of each new cohort of older persons

2. “Morbidity compression”: the risk of disability by age and sex will decrease in future, in the sense that half of the projected increases in longevity are assumed to be spent free of disability

3. “Diabetes epidemic” the prevalence of diabetes will increase by 5% annually during the projection period
Projected results: six alternative scenarios

Projected trends in use of residential care according to four scenarios on disability

- "Unchanged disability"
- "Better education"
- "Diabetes epidemic"
- "Morbidity compression"
Projection results: six alternative scenarios

Two alternative scenarios on living situation

4. “Pure demographic”: living situation of older persons by age and sex group will not change during the projection period

5. “Fewer children”: the number of children living with their older parents will be halved during the projection period

One alternative scenario on home care

6. “Home care”: home care expands by 50% (beyond what is required by the ageing of the population).
Projection results: six alternative scenarios

Projected trends in use of residential care according to three scenarios on living situation

- "Pure demographic"
- "Fewer children"
- "Base"
Projection results: six alternative scenarios

- Base scen.
- "Home care scen."
Policy implications

- Base projection of 166,000 users (65+) of residential care in Belgium in 2025
  - Increase of 41,000 relative to 2010
- Alternative scenarios result in 150,000 to 170,000 users
- Without drastic changes in policies, 25,000 extra beds in 2025 seems an absolute minimum estimate (but only when home care is expanded drastically)
- At the same time, home care must be expanded by 31% to keep up with the ageing population
- The growth in the number of users of residential care will accelerate after 2025
Policy implications

Projection up to 2050, according to “pure demographic” scenario
Possible alternatives?

• Limit entry into residential care at level O
  • Currently 23 000 older persons in category MR/ROB O, who mostly are not really needing residential care (based on their ADL disability)
  • Beds could be used for older persons needing more intensive levels of care
  • This will require alternative care for persons now in residential care level O

• Due to ageing of the population, home care will have to expand anyway, roughly in the same proportion as residential care

• The expansion of both types of care will require additional qualified personnel, if quality is to be maintained