<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Neuro-psychiatric care</td>
</tr>
<tr>
<td>C</td>
<td>Surgery (diagnosis &amp; surgery)</td>
</tr>
<tr>
<td>D</td>
<td>Internal Medicine (diagnosis &amp; treatment)</td>
</tr>
<tr>
<td>E</td>
<td>Pediatric care</td>
</tr>
<tr>
<td>G</td>
<td>Geriatric care</td>
</tr>
<tr>
<td>I</td>
<td>Intensive care</td>
</tr>
<tr>
<td>M</td>
<td>Maternity</td>
</tr>
</tbody>
</table>
Two dimensions of Nursing care

- **SELF-CARE**
  - Patient is independent or nurses are instructing selfcare

- **COMPLETE CARE**
  - Patient is totally dependent
  - Nurses are taking over

- **CARE**
  - Care oriented

- **CURE**
  - Diagnoses & Therapy oriented
National map

CARE

SELFCARE

CURE

COMPLETE CARE
National map divided into zones

Dims 1 and 2

Selfcare <-> Complete care

Zones 2000

27  18  23  17  22
19  21  15  26  20
14  13  16  5  27
11  8  7  6  2
4  3  2  3  4
24  25  12  19  24
28
8  9  10  11  12
13  14  15  16  17
18  19  20  21  22
23  24  25  26  27

Care arrow in purple.
Grafical projection of patient Z
4. B-NMDS version 2

- Healthcare is evolving rapidly and continuously → implications nursing care
- 23 items of NMDS version 1 (1988) → poor information in the years 2000
- Revision of NMDS 2002 - 2004
Revision NMDS: Phase I (2002)

• Methods:
  – Literature review
  – Secondary data-analysis

• Choice for NIC-framework:
  – Nursing intervention Classification (NIC): 433 interventions in 26 classes
  – Comprehensive, research-based, standardised, international accepted, available in French and Dutch
Revision NMDS: Phase II 2002 – 2003

• Methods:
  – Panels of clinical experts (N= 75)
  – Six care programmes: cardiology, geriatrics, oncology, rehabilitation, paediatrics, intensive care
  – Pre-test in 15 different hospitals

• Results:
  – Alpha version: 105 nursing interventions
  – Definitions & scoring manual
4. B-NMDS version 2

Revision NMDS:
Phase III Pilot testing and tool validation 2003 – 2004

• Methods:
  – 30 days of data collection
  – 66 hospitals, 158 nursing wards, 95000 patient records
  – NMDS-I, NMDS-II, DRGs, Financial data (Finhosta), Pharmaceutical data

• Results:
  – Number of interventions/pat/day: Med=14 (1-43)
  – Time (N=3504: 42 hospitals, 81) wards: Med= 4’ (IQR=3’-7’)
  – Interrater reliability (9 cases, 66 raters): Above 70% for 80% of the interventions
Revision NMDS: Phase IV Validity testing

- **Criterion-related validity:**
  - comparing NMDS-II with NMDS-I
  - 21146 patient records
  - Correlations from 0.88 (tube feeding) to 0.16 (emotional support)

- **Construct validity:**
  - Principal component analysis (CATPCA)
  - Intra-class and interclass analysis
  - Latent variables: nursing intensity, care/cure

- **Face validity:**
  - Expert panels (2004/11) are validating final NMDS-II
4. B-NMDS version 2

Final version:
• 78 nursing interventions
• Based on NMDS version 1 and NIC
• 2 sets of nursing data:
  – Core data (comparing between care programs)
  – Supplementary data (care program specific)
    (comparing within care programs)
• Linked with CMDS (based on ICD-10-CM);
  registration started in 1990; linked since 2007
4. B-NMDS version 2

From data to applications:

• **Appropriateness Evaluation protocol (AEP)**
  – Nursing care explains 80% of stay in hospital
  – In B-NMDS: 8 nursing interventions support AEP

• **Nurse Staffing**
  – Validating patients’ nursing care profiles in relation to nurse staffing ratios
  – Selection of key-interventions for nurse staffing

• **Reimbursement / funding**
  – Nurse staffing & nursing care profile per DRG

• **Quality Management**
  – Nurse staffing sensitive patient outcomes (Needleman et.al. 2002)
  – Relation: Nurse intervention – patient problem
Linking NMDS and DRGs

N patients / days-of-stay

Nursing profile / day-of-stay

Data: DRG 166, Coronary Artery Bypass Graft (CABG) without cardiac catherisation
Y2000 Belgian data, 5575 admissions, 74925 inpatient days, 2670 linked NMDS-days.
Per Hospital; for DRG166
Comparing 2 hospitals A - B

Hospital A:
Median LOS=9 days

Hospital B:
Median LOS=12 days

Number of admission: 584/y
Number of inpatient days: 6377
N in NMDS: 399 (6.2%)

Number of admission: 379/y
Number of inpatient days: 5009
N in NMDS: 322 (6.4%)