PFLEGE BE(OB)ACHTEN

Einblicke anhand statistischer Daten
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Belgian Nursing Minimum Data Set
Be-NMDS

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Content

- **Belgian nursing minimum data**
- Use of the Be-NMDS in Belgian hospital financing

A Nursing Minimum Dataset

- "A minimum set of items of information with uniform definitions and categories, concerning the specific dimension of professional nursing, which meets the essential needs of multiple data users in the health care system (Werley et al., 1986)"

    - uniform definitions and categories
    - minimal
    - Multiple data users (nurses, medical doctors, administrators, policy makers, …)

- Datasets in the world: Australia, Belgium, Finland, Ireland, Portugal, Switzerland, USA ….

Be-Nursing Minimum Data Set -I (1988-2007)

- Compulsory from 1988
- All Belgian acute Hospitals
- Content:
  - Patient demographics
  - 23 nursing interventions
  - Nurse staffing data (FTE nurses / qualification level)
- Sample: 5 out of 15 days / 3 months
- 19 million nursing records since 1988
- One of the largest nursing datasets in the world
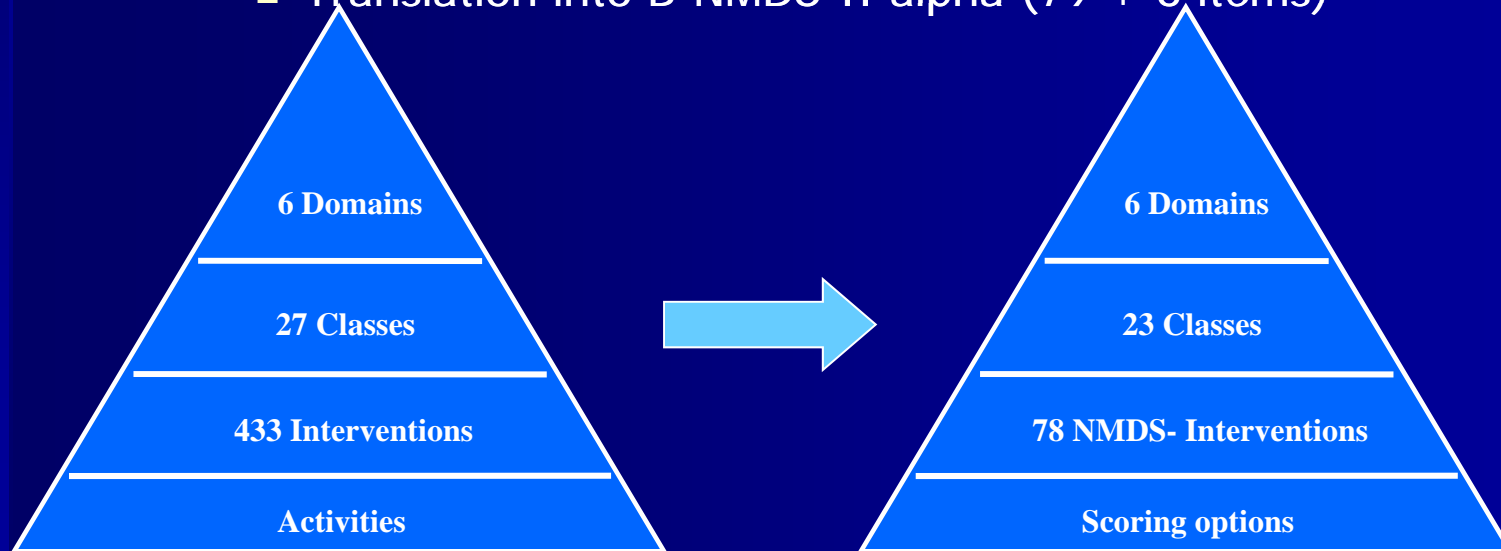- Need for revision

Be-Nursing Minimum Data Set -II (2008 -)

- **Compulsory for all Belgian acute hospitals**
  - Be-NMDS-II:
  - Integrated and linked with hospital discharge dataset
  - 78 nursing interventions – based on Nursing Intervention Classification (NIC)
  - Specific sets: medical-surgical, day care, paediatric, geriatric, intensive care, maternity care, neonatal care, chronic care
- **Nurse staffing data**
  - Number / FTE nurses
  - Qualification level
  - Organisation (centralised , decentralised)
- **Sample: 15 days / 3 months**
- **Based on strong empirical evidence (2002-2006)**

Clinical validation of Be-NMDS II

- **International Nursing Language**
  - Based on Nursing Intervention Classification (NIC)
  - Expert Panels (N=89)
    - Selections van relevant interventions for Belgium (286)
    - Selections of relevant classes (23)
    - Translation into B-NMDS-II alpha (79 + 6 items)

Left pyramid:
6 Domains
27 Classes
433 Interventions
Activities

Right pyramid:
6 Domains
23 Classes
78 NMDS- Interventions
Scoring options

Selection of nursing interventions

Table 2. Selection of Relevant NIC Interventions for the Revised B-NMDS per Expert Panel

NIC domain	MAX	CAR[a]	ICU[a]	PED[a]	GER[a]	CHR[a]	ONC[a]
Physiological, basic (1)							
Classes[b]	6 (A–F)	6	5 (A)				
Interventions	89	21	24				
Physiological, complex (2)							
Classes	8 (G–N)	6 (I, M)	8				
Interventions	143	73	61				
Behavioral (3)							
Classes	6 (O–T)	3 (O, P, Q)	2 (O, P,				
Interventions	103	8	4				
Safety (4)							
Classes	2 (U, V)	2	2				
Interventions	46	10	7				
Family (5)							
Classes	2 (W, X)	0 (W, X)	0 (W,				
Interventions	63	0	0				
Health system (6)							
Classes	3 (Y–b)	1 (a, b)	1 (b,				
Interventions	38	1	3				
Overall							
Classes	27	18	18				
Interventions	433	113	99				

[a]Dropped classes between brackets.
[b]NIC classes: A, activity and exercise management; B, elimination management; C, immobility management; D, nutrition support; E, physical comfort promotion; F, self-care facilitation; G, electrolyte and acid base management; H, drug management; I, neurologic management; J, perioperative care; K, respiratory management; L, skin/wound management; M, thermoregulation; N, tissue perfusion management; O, behavior therapy; P, cognitive therapy; Q, communication enhancement; R, coping assistance; S, patient education; T, psychological comfort promotion; U, crisis management; V, risk management; W, childbearing care; X, life span care; Y, health system mediation; a, health system management; b, information management.
B-NMDS, Belgian nursing minimum data set; CAR, cardiology expert panel; CHR, chronic care expert panel; GER, geriatric expert panel; ICU, intensive care expert panel; MAX, maximum number of interventions or classes; NIC, Nursing Interventions Classification; ONC, oncology expert panel; PED, pediatric expert panel.

Box 1. Questions Posed to Guide the Expert Panel Meetings

Definitions
    What are the minimal requirements for this intervention?
    Is this intervention evidence based?
Response categories
    Does a score of 2 for a particular item imply more intensive care than a score of 1?
    Is it necessary to measure this kind of detail?
Controls
    What clinically relevant information should be documented in patient records for this intervention?
    Is it appropriate to ask nurses to document this kind of information in patient records?

Example of NMDS-items

Table 4. Items of the Revised B-NMDS (Alpha Version) for "Elimination Management" (Based on NIC Class B)

NMDS item (and sub-items)	Response categories
B100: care linked to elimination in children (under 5)	(a) Day AND night supervision of elimination in potty-trained children by a care provider (b) Nighttime supervision of elimination in children who are potty-trained during the day by a care provider outside the context of specific enuresis programs (c) Care for children who are not potty trained during the day or night, e.g., supervision and regular changing
B200: urinary and/or fecal elimination education	(a) Presence of urinary education/training (b) Presence of fecal education/training (c) Presence of urinary and fecal education/training
B3**: care associated with urinary elimination	Only one of sub-items B310–B350 can be scored
B310: normal urinary elimination	(a) Presence of normal urinary elimination
B320: urinary elimination support for continent patients	(a) Supporting assistance
B330: care associated with urinary incontinence	(a) Presence of care associated with urinary incontinence
B340: care associated with the presence of a urinary ostomy	(a) Care associated with the presence of a urinary ostomy
B350: care associated with the presence of a permanent vesical catheter	(a) Care associated with the presence of a permanent catheter
B400: inserting a vesical catheter	Frequency of insertion
Item B5 **: fecal elimination	Only one of sub-items B510–B540 can be scored
B510: normal fecal elimination	(a) Presence of normal fecal elimination management
B520: fecal elimination support for continent patients	(a) Fecal elimination support for continent patients
B530: care associated with fecal incontinence	(a) Presence of care
B540: care associated with the presence of a fecal ostomy	(a) Care associated with the presence of a fecal ostomy
B600: administration of an enema or manual removal of fecaliths in order to treat or prevent constipation	(a) Insertion of a rectal cannula and/or administration and an enema and/or removal of fecaliths

B-NMDS, Belgian nursing minimum data set; NIC, Nursing Interventions Classification.

Statistical Validation

- **Construct validity:**
  - Validated in 66 hospitals (N=117.395)
  - Frequency > 1%
  - Dimensions of nursing care:
    - Nursing intensity, Care / cure, Patient education / support, Comfort management
  - Methods: Principal components for qualitative data
- **Content validity:**
  - Relationship to quality of care – expert panels
  - Content Validity Index (CVI) > 90%
- **Interrater reliability:**
  - (9 cases, 66 raters): Above 70% for 80% of the interventions
- **Feasibility:**
  - Number of interventions/pat/day: Med=14 (1- 43)
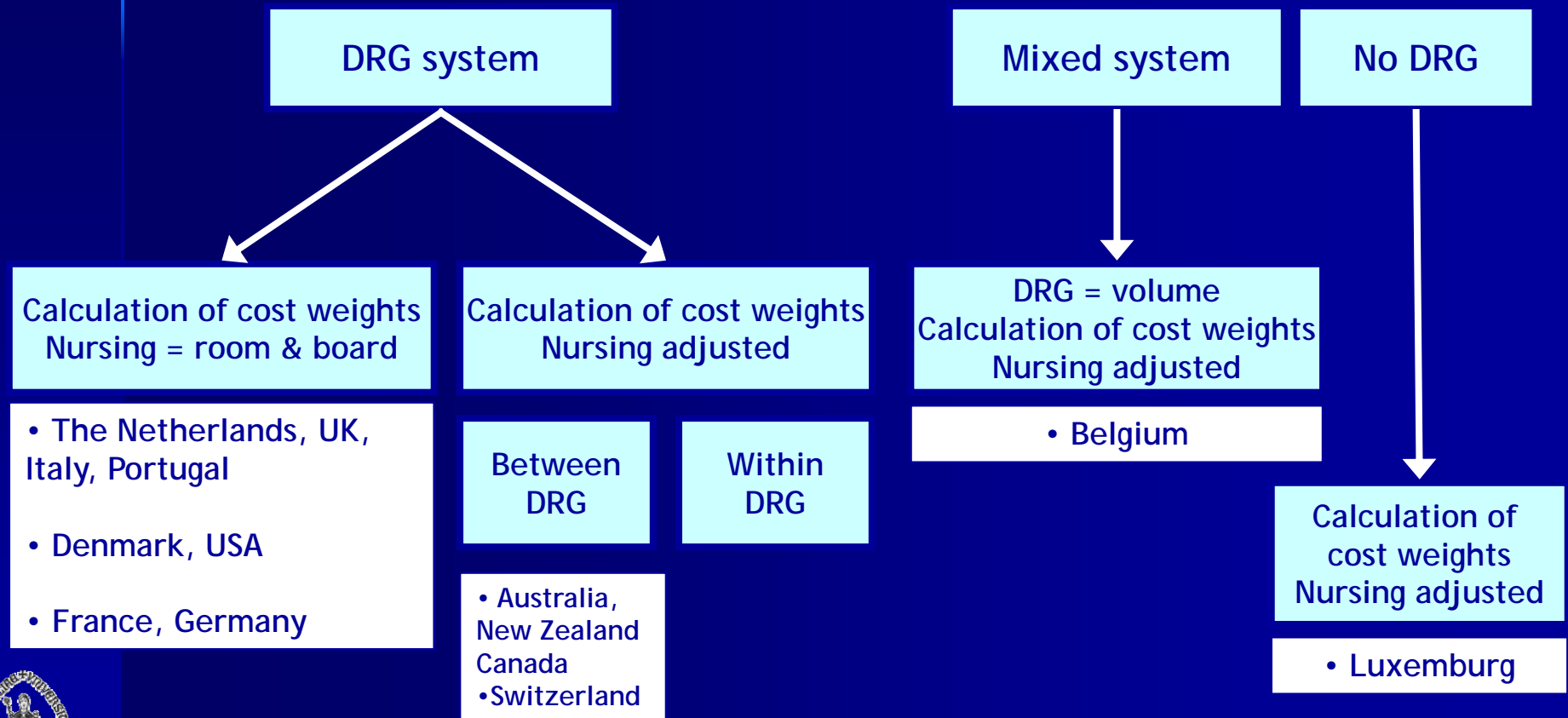 - Time-effort (N= 3504: 42 hospitals, 81 wards): Med= 4′ (IQR=3′- 7′)

Content

- Belgian nursing minimum data
- Use of the Be-NMDS in Belgian hospital financing

Literature review of international acute hospital financing systems adjusting for nursing care

- DRG system
  - Calculation of cost weights Nursing = room & board
    - The Netherlands, UK, Italy, Portugal
    - Denmark, USA
    - France, Germany
  - Calculation of cost weights Nursing adjusted
    - Between DRG
    - Within DRG
      - Australia, New Zealand Canada
      - Switzerland
- Mixed system
  - DRG = volume Calculation of cost weights Nursing adjusted
    - Belgium
- No DRG
 - Calculation of cost weights Nursing adjusted
    - Luxemburg

(Laport et.al., 2008)

Use of Be-NMDS I

- Financing hospitals
- Fixed – variable
  - Fixed: based on minimum nurse-patients ratios applied to number of inpatient days (DRG-adjusted)
  - Variable: partly based on Be-NMDS (80%)
- Limited impact – average 6,5% of budget
- For three types of nursing wards
  - Medical-surgical wards
  - Paediatrics wards
  - ICU wards

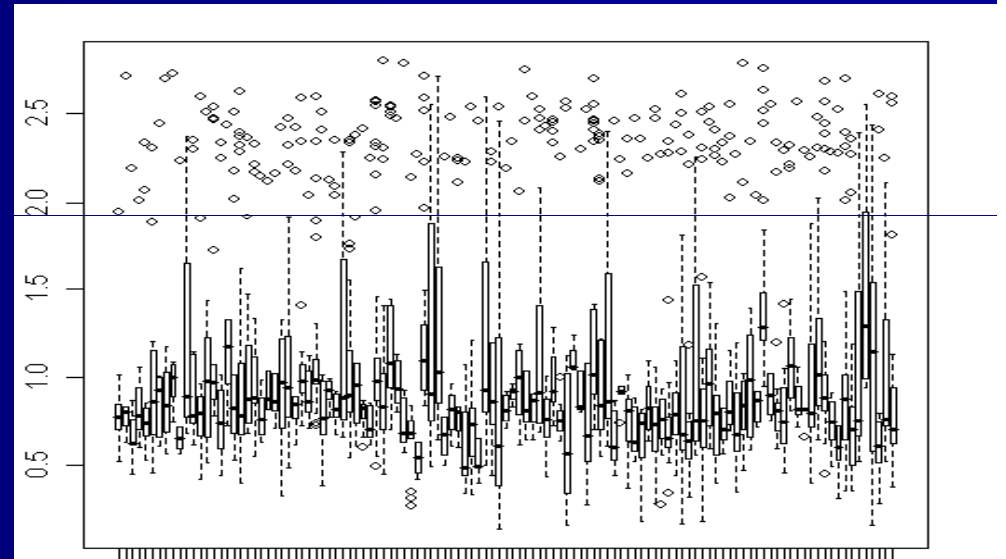# Fixed and variable nurse staffing (med.surg. Units)
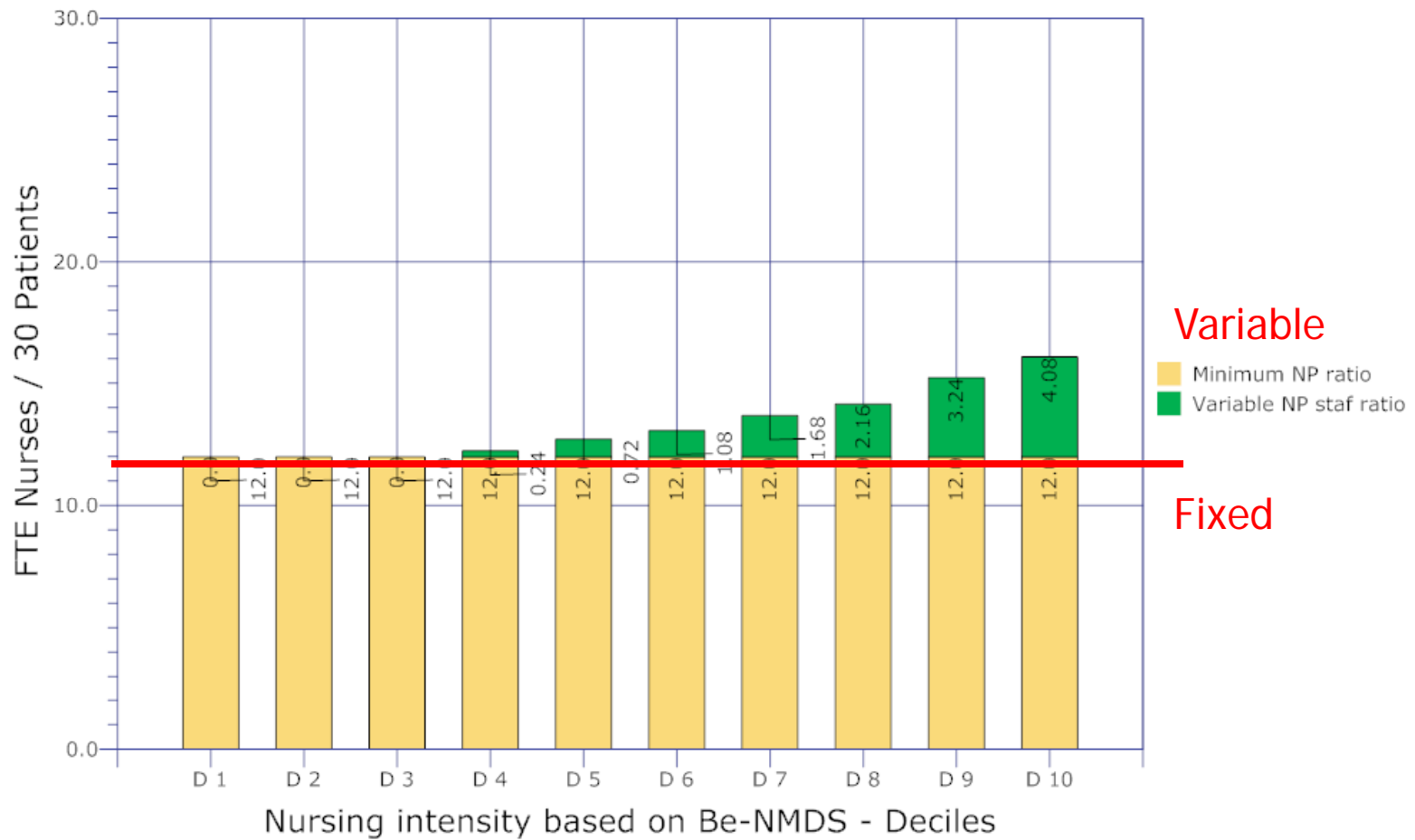
Share of variable nurse financing per hospital
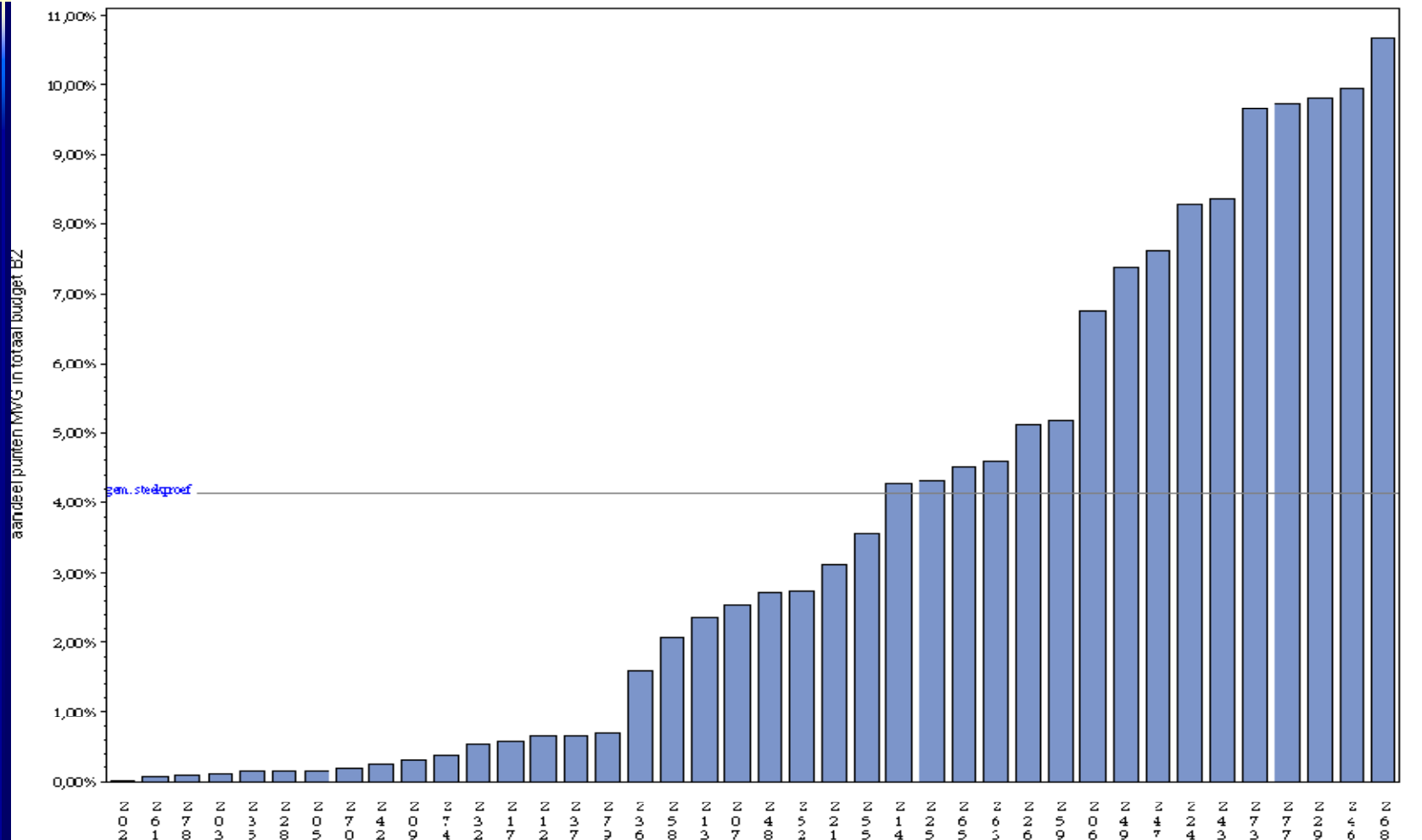
Effect

- Little variability on nurse staffing (adjusted for nursing intensity) among hospitals (4%)

- High variability within hospitals (96%)

- No difference in quality of care (sensitive to nurse staffing) between hospitals

Use of Be-NMDS II

- Under development
- Development of nursing cost-weights for NMDS
- Development of Nursing Related Groups (NRG) out of Be-NMDS (2010-2011)
- Linking with DRGs
  - Complementary
  - Evidence that nursing care / nursing costs cannot be predicted from DRGs (best models explain 20-25% of variability)
  - It is the combination of DRGs + NRGs that explain costs (major increase in explanatory power – Welton & Halloran, JONA, 2005)

Examples of nursing cost-weights

Appendix A

Relative nursing resource weights per NMDSII item

Domain I: Care for elementary physiological functions

Class A Support of activities and physical movement

item	Care description	Specific care modality	Nursing care weight
A100	Structured physical exercises		12

Class B Care for elimination

item	Care description	Specific care modality	Nursing care weight
B100_1	Elimination child care	Toilet trained child day and night time	10
B100_2		Toilet trained child night time	8
B100_3		Non-toilet trained child day and night time	6
B210	Urinary elimination follow-up		2
B220	Support of urinary continent patient		6
B230	Care for the urinary incontinent patient		10
B240	Care for urinary stoma		7
B250	Care for urinary catheter		5
B300	Bladder catheterization	× frequency	4
B410	Fecal elimination follow-up		2
B420	Support of fecal continent patient		5
B430	Care for the fecal incontinent patient		7
B440	Care for fecal stoma or pouch		5
B500	Constipation prevention or treatment		4
B600	Elimination care education		6

Linking DRG - NRG

apr_d rg	P/M	LABEL	Predicted Response Category						Total
			1	2	3	4	5	6	
001	P	LIVER TRANSPLANT						100,0	14
002	P	HEART &/OR LUNG TRANSPLANT				33,3	33,3	33,3	3
003	P	BONE MARROW TRANSPLANT				44,8	51,7	3,4	29
004	P	TRACHEOSTOMY EXCEPT FOR FACE,MOUTH & NECK DIAGNOSES				6,3	5,4	88,3	111
005	P	TRACHEOSTOMY FOR FACE,MOUTH & NECK DIAGNOSES			16,7	33,3		50,0	18
020	P	CRANIOTOMY FOR TRAUMA			5,9	11,8	5,9	76,5	17
021	P	CRANIOTOMY EXCEPT FOR TRAUMA			2,0	20,4	8,2	69,4	49
022	P	VENTRICULAR SHUNT PROCEDURES				45,5		54,5	11
023	P	SPINAL PROCEDURES					33,3	66,7	6
024	P	EXTRACRANIAL VASCULAR PROCEDURES			65,1	2,3	4,7	27,9	43
025	P	NERVOUS SYSTEM PROC FOR PERIPHERAL NERVE DISORDERS			50,0	50,0			4
026	P	NERVOUS SYST PROC FOR CRANIAL NERV & OTH NERV SYS DISORD			45,5	36,4		18,2	11
040	M	SPINAL DISORDERS & INJURIES				50,0		50,0	2
041	M	NERVOUS SYSTEM NEOPLASMS	1,8		27,3	58,2	7,3	5,5	55
042	M	DEGENERATIVE NERVOUS SYSTEM DISORDERS			15,3	70,4	14,3		98
043	M	MULTIPLE SCLEROSIS & CEREBELLAR ATAXIA			37,5	37,5	25,0		8
044	M	INTRACRANIAL HEMORRHAGE			7,4	48,1	14,8	29,6	27
045	M	CVA W INFARCT		1,2	12,8	51,2	26,7	8,1	86
046	M	NONSPECIFIC CVA & PRECEREBRAL OCCLUSION W/O INFARCT			35,4	47,9	10,4	6,3	48
047	M	TRANSIENT ISCHEMIA	2,4		26,2	61,9	7,1	2,4	42
048	M	CRANIAL & PERIPHERAL NERVE DISORDERS		8,7	26,1	47,8	8,7	8,7	23
049	M	BACTERIAL & TUBERCULOUS INFECTIONS OF NERVOUS SYSTEM				36,4		63,6	11
050	M	NON-BACTERIAL INFECTIONS OF NERVOUS SYSTEM EXC VIRAL MENINGITIS				25,0	25,0	50,0	4

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