



ABC of DRGs – the European Experience

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**Funding Models to Support
Quality and Sustainability**
A Pan-Canadian Dialogue

» November 25 and 26, 2010





What do we expect when paying providers?

Provider payment mechanisms are key to the performance of any health system, and the demands placed on them are high:

- Allocate resources fairly among different providers of care
- Motivate actors within the system to be productive
- Account for patients' needs, the appropriateness of the services, and outcomes
- Be administratively easy and contribute to an overall efficient and financially sustainable health system.



Incentives linked to different forms of hospital payment



	Productivity and number of services	Patient needs (risk acceptance)	Appropriateness and adherence to evidence-based medicine (quality of processes)	Quality of outcomes	Administrative simplicity and ease of financial sustainability
Global budget	-	(-)	Cheap and bad → Undertreatment		0
Per diems	(+)	0	0	→ Inappropriate treatment	
FFS	+	(+)	Expensive and bad → Overtreatment		(-)



Incentives linked to different forms of hospital payment

	Productivity and number of services	Patient needs (risk acceptance)	Appropriateness and adherence to evidence-based medicine (quality of processes)	Quality of outcomes	Administrative simplicity and ease of financial sustainability
Global budget	—	(—)	(—)	0	+
Per diems	(+)	0	0	(—)	(+)/0
Simple DRGs (based on diagnosis)	+ [cases] — [services/case]	(—) [if insufficient consideration of severity]	(—) [if insufficient consideration of necessary services]	(—) / 0	(—) / 0
FFS	+	(+)	(—)	(—)	—



Incentives linked to different forms of hospital payment

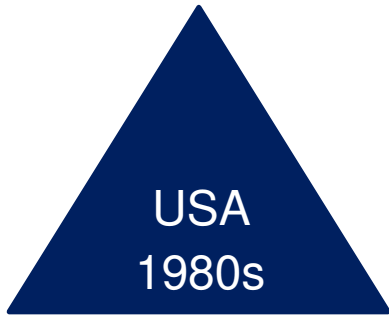
	Productivity and number of services	Patient needs (risk acceptance)	Appropriateness and adherence to evidence-based medicine (quality of processes)	Quality of outcomes	Administrative simplicity and ease of financial sustainability
Global budget	—	(—)	European countries 1990s/2000s		+
Per diems	(+)	0		(—)	(+) / 0
Simple DRGs (based on diagnosis)	+ [cases] — [services/case]	(—) [if insufficient consideration of severity]	(—) [if insufficient consideration of severity]	(—) / 0	(—) / 0
FFS	+	(+)	USA 1980s		—

→ “dumping” (avoidance), “creaming” (selection) and “skimping” (undertreatment)
→ up/wrong-coding, gaming





Empirical evidence (I): hospital activity and length-of-stay under DRGs



Country	Study	Activity	ALoS
US, 1983	US Congress - Office of Technology Assessment, 1985	▼	▼
	Guterman et al., 1988	▼	▼
	Davis and Rhodes, 1988	▼	▼
	Kahn et al., 1990		▼
	Manton et al., 1993	▼	▼
	Muller, 1993	▼	▼
	Rosenberg and Browne, 2001	▼	▼





European countries
1990s/
2000s

Country	Study	Activity	ALoS
Sweden, early 1990s	Anell, 2005	▲	▼
	Kastberg and Siverbo, 2007	▲	▼
Italy, 1995	Louis et al., 1999	▼	▼
	Ettelt et al., 2006	▲	
Spain, 1996	Ellis/ Vidal-Fernández, 2007	▲	
Norway, 1997	Biørn et al., 2003	▲	
	Kjerstad, 2003	▲	
	Hagen et al., 2006	▲	
	Magnussen et al., 2007	▲	
Austria, 1997	Theurl and Winner, 2007		▼
Denmark, 2002	Street et al., 2007	▲	
Germany, 2003	Böcking et al., 2005	▲	▼
	Schreyögg et al., 2005		▼
	Hensen et al., 2008	▲	▼
England, 2003/4	Farrar et al., 2007	▲	▼
	Audit Commission, 2008	▲	▼
	Farrar et al., 2009	▲	▼
France, 2004/5	Or, 2009	▲	





Empirical evidence (II): costs under DRGs



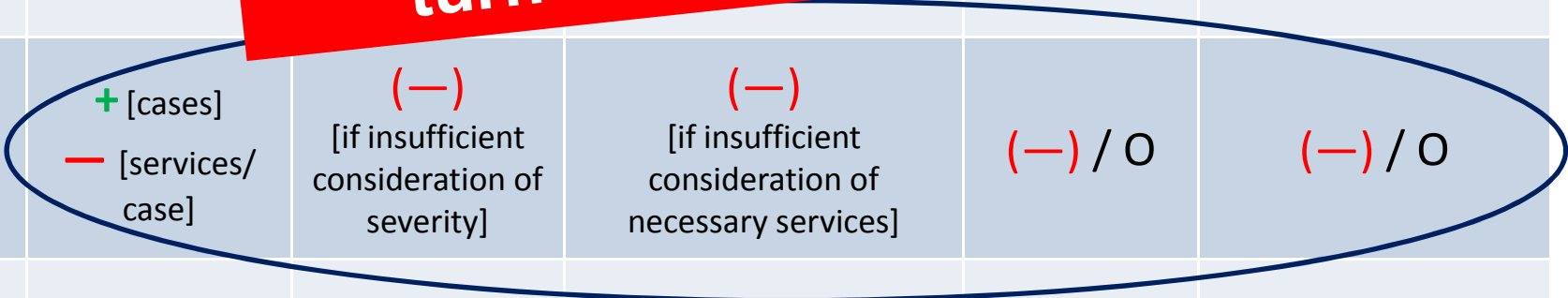
Country	Study	Costs	
		Unit	Total
US, 1983	Guterman et al., 1988		▲ slower rate
Sweden, early 1990s	Anell, 2005		▲
	Kastberg and Siverbo, 2007		▲
Spain, 1996	Ellis/ Vidal-Fernández, 2007	▲ slower rate	
England, 2003/4	Farrar et al., 2007	▼	
	Farrar et al., 2009	▼	



Incentives linked to different forms of hospital payment

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Simple DRGs (based on diagnosis)	+ [cases] - [services/case]	(-) [if insufficient consideration of severity]	(-) [if insufficient consideration of necessary services]	(-) / 0	(-) / 0

How do European countries turn the incentives?





So then, why DRGs?

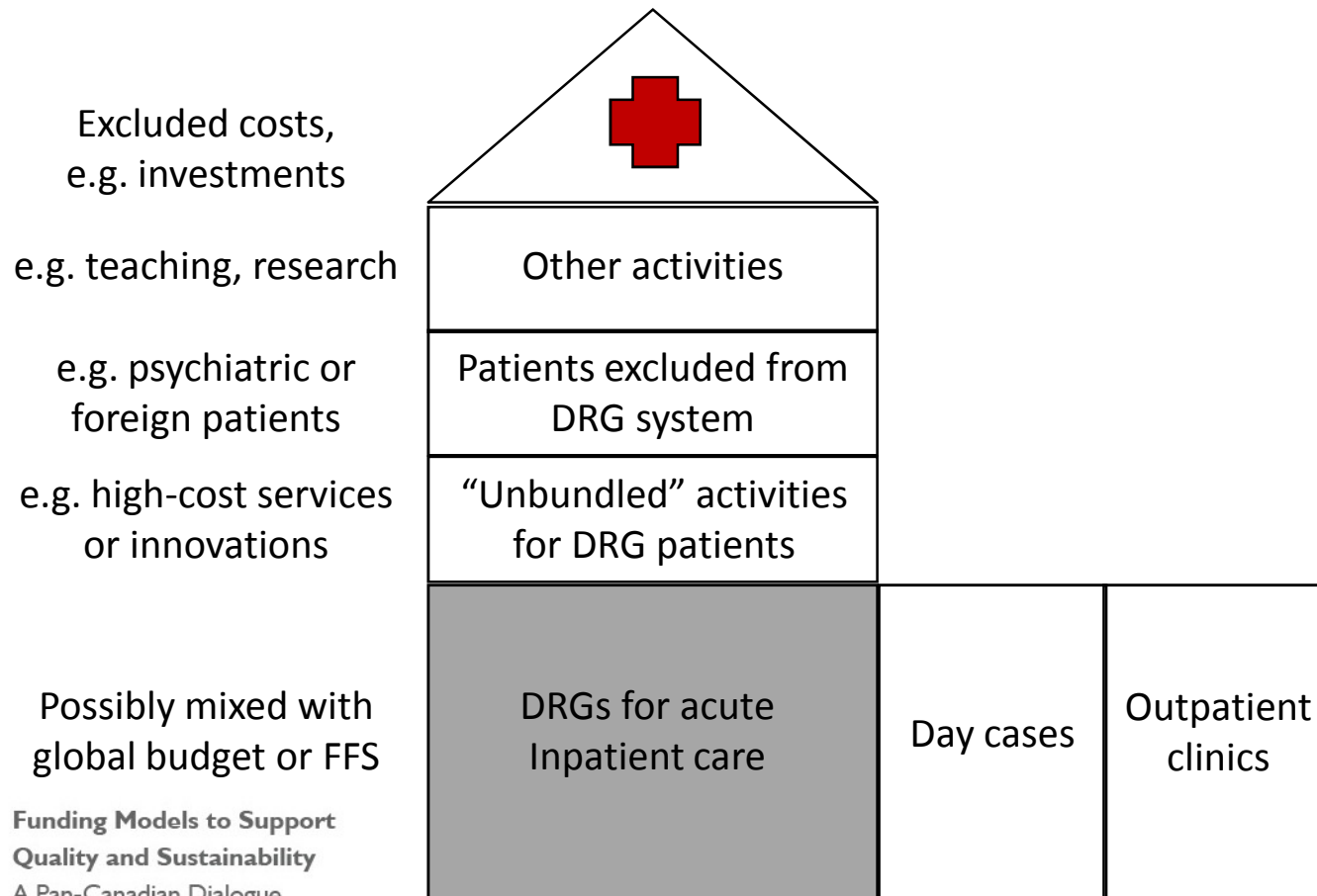
To get a common “currency” of hospital activity for

- transparency → performance measurement
→ efficiency benchmarking,
- budget allocation (or division among purchasers),
- planning of capacities,
- payment



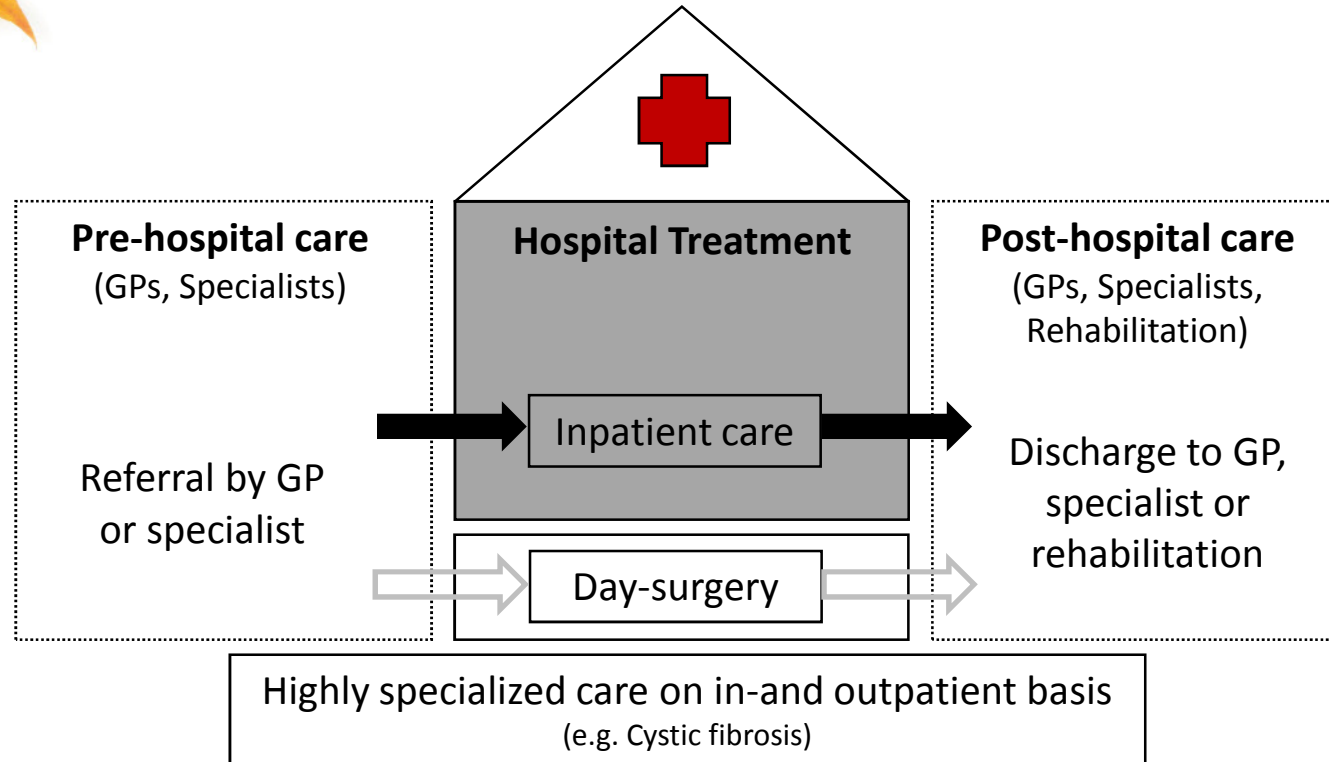


For what types of activities? Scope of DRGs – the “DRG house”

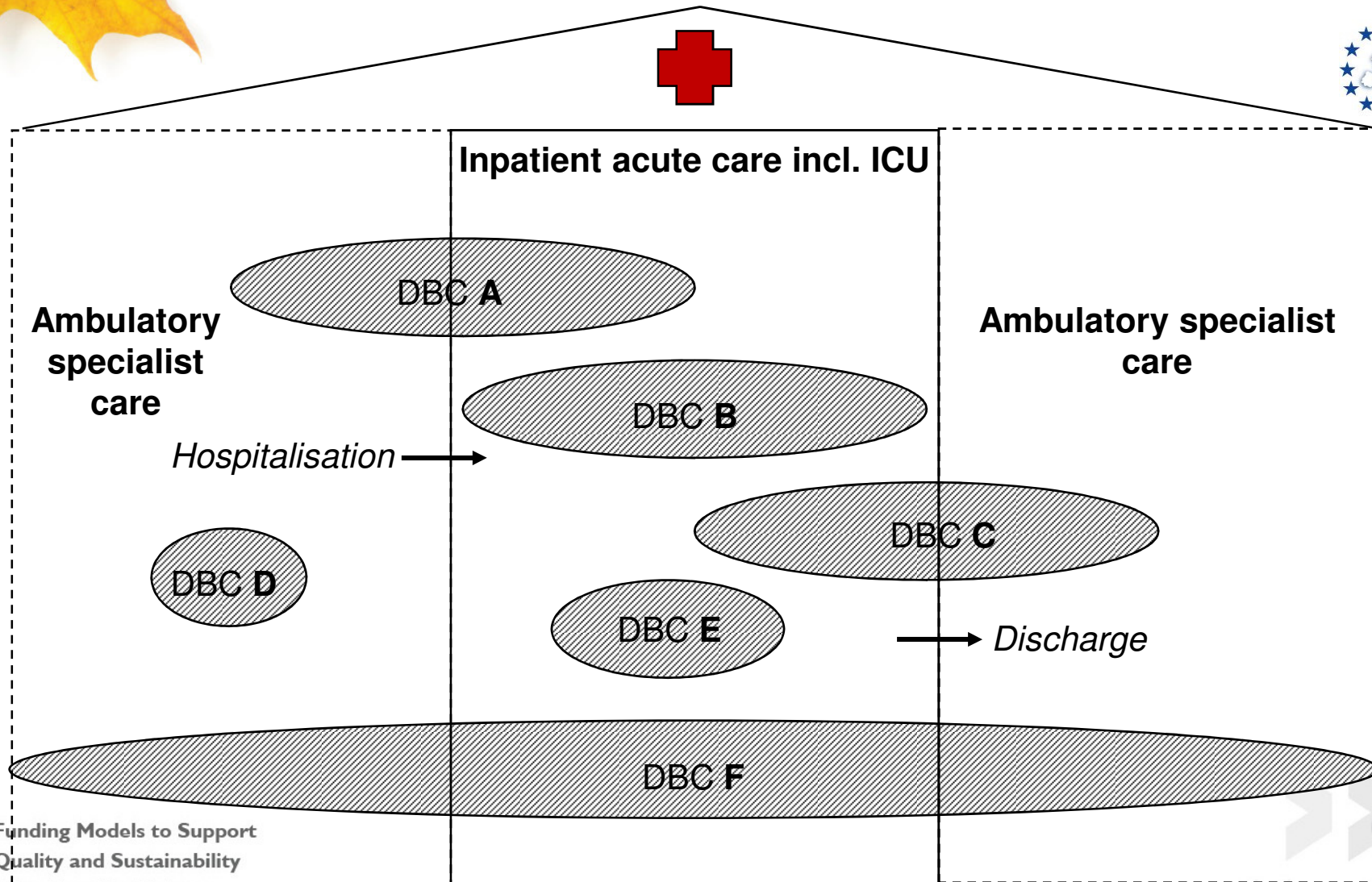




DRG scope: Limited to inpatients (and some day-cases=) in Germany



Scope in the Netherlands: DBCs (diagnosis-treatment combinations)





The growing scope of DRGs in Europe



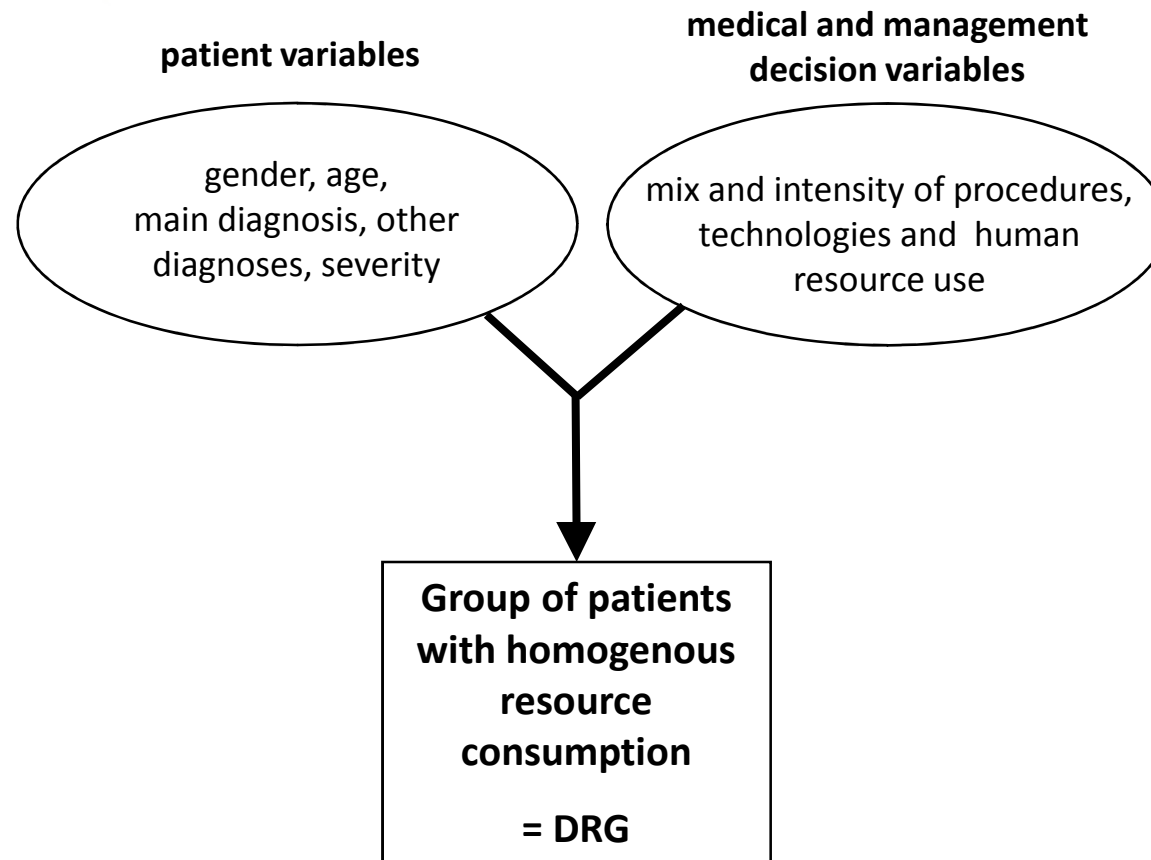
Country	Inpatient	Outpatients	Psychiatry	Rehabilitation
Austria	X	?	?	?
England	X	X	starting 2012	?
Estonia	X	starting 20xx	?	?
Finland	X	X	?	?
France	X	X	starting 20xx	starting 20xx
Germany	X	-	starting 2013	-
The Netherlands	X	X	?	?
Ireland	X	X	-	?
Poland	X	starting 20xx	starting 20xx	starting 20xx
Portugal	X	?	starting 20xx	?
Spain	X	starting 20xx	?	?
Sweden	X	X	?	?





The DRG logic

1st step = patient classification / grouping



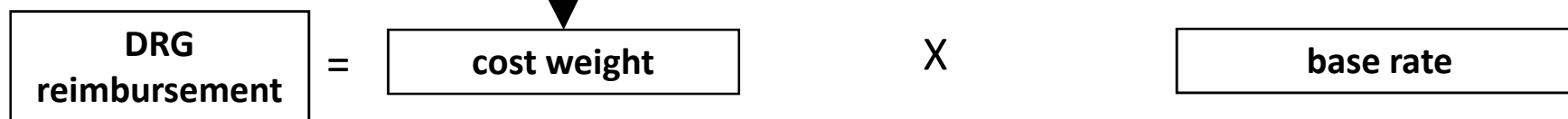
2nd step = Price setting (I)

patient variables

gender, age,
main diagnosis, other
diagnoses, severity

medical and management decision variables

mix and intensity of procedures,
technologies and human
resource use



2nd step = Price setting (II)

determinants of hospital costs

patient variables

gender, age,
main diagnosis, other
diagnoses, severity

medical and management
decision variables

mix and intensity of procedures,
technologies and human
resource use

structural variables on
hospital/ regional/
national level

e.g. size, teaching status;
urbanity; wage level

DRG
reimbursement

=

cost weight

X

base rate

+

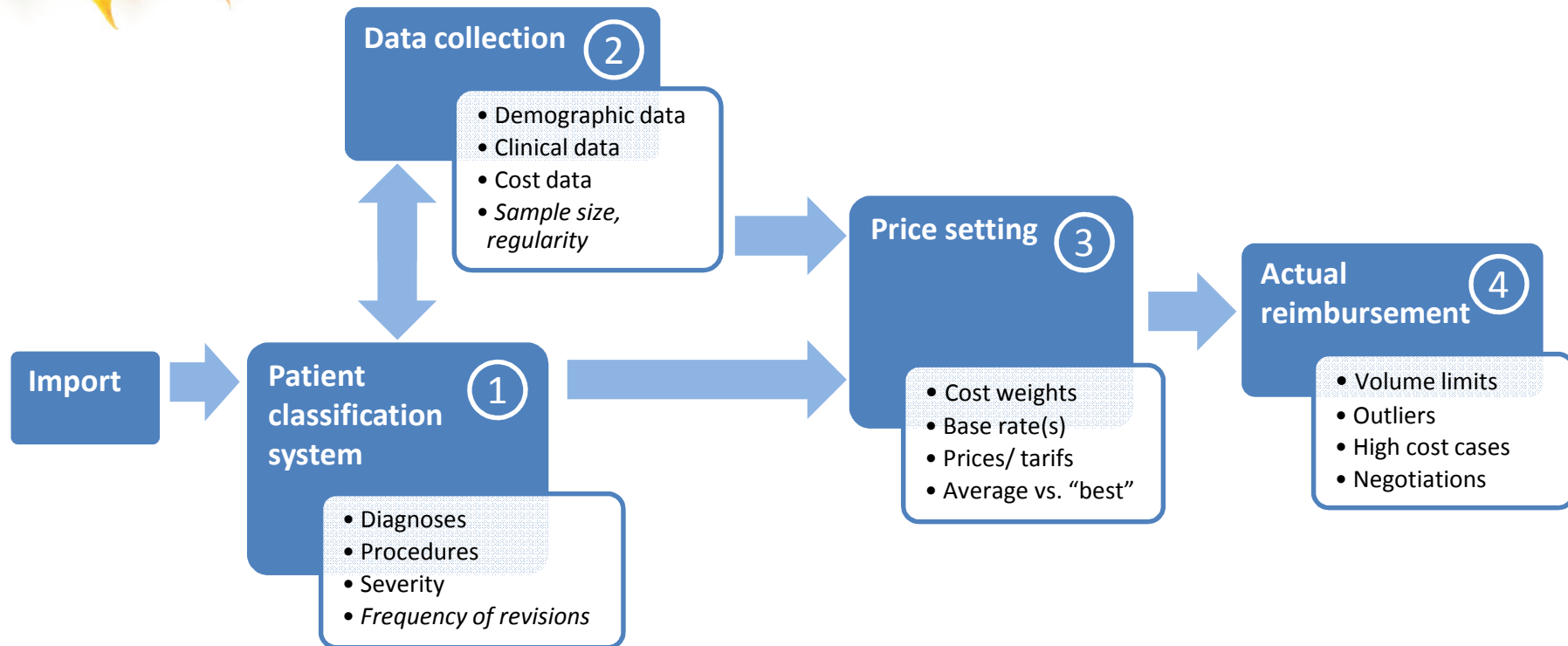
adjustment factors

CAVE confusing terminology across countries!





Essential building blocks of DRG systems





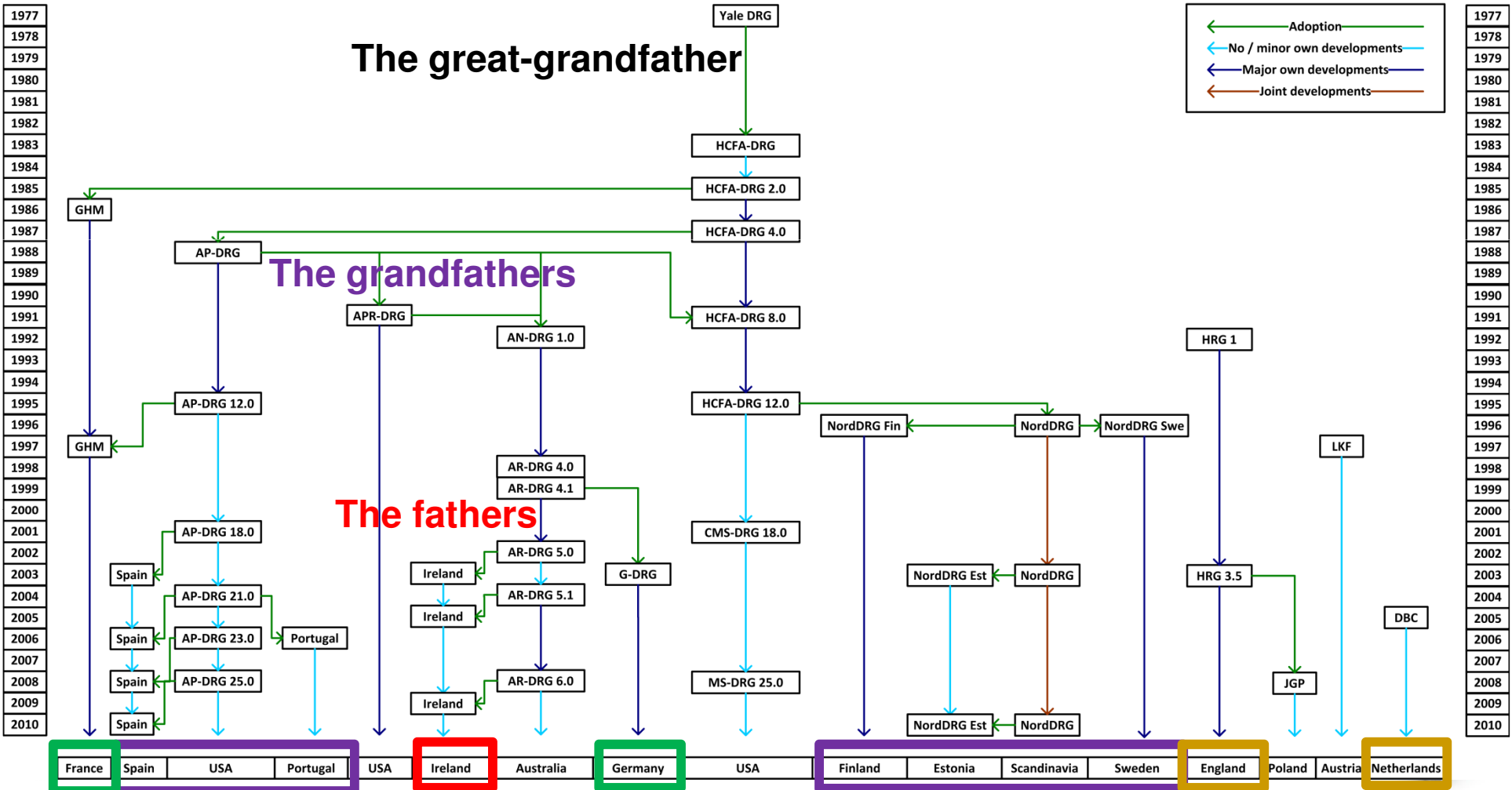
Choosing a PCS: copied, further developed or self-developed?

Patient classification system



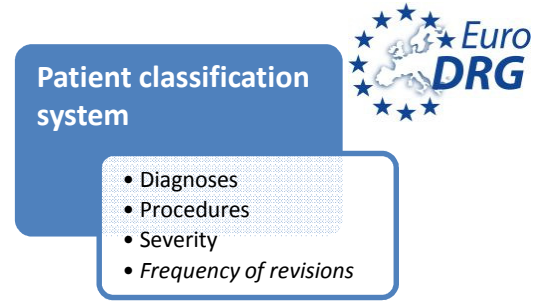
- Diagnoses
- Procedures
- Severity
- Frequency of revisions

France Spain USA Portugal USA Ireland Australia Germany USA Finland Estonia Scandinavia Sweden England Poland Austria Netherlands





Classification variables and severity levels in European DRG-like PCS



	AP-DRG	AR-DRG	G-DRG	GHM	NordDRG	HRG	JGP	LKF	DBC
Classification Variables									
<i>Patient characteristics</i>									
Age	X	X	X	X	X	X	X	X	-
Gender	-	-	-	-	X	-	-	-	-
Diagnoses	X	X	X	X	X	X	X	X	X
Neoplasms / Malignancy	X	X	X	-	-	-	-	-	-
Body Weight (Newborn)	X	X	X	X	-	-	-	-	-
Mental Health Legal Status	-	X	X	-	-	-	-	-	-
<i>Medical and management decision variables</i>									
Admission Type	-	-	-	-	-	X	X	-	-
Procedures	-	-	X	X	X	X	X	X	X
Mechanical Ventilation	-	-	X	X	-	-	-	-	-
Discharge Type	-	-	-	X	X	X	X	-	-
LOS / Same Day Status	-	X	X	X	X	X	X	-	-
<i>Structural characteristics</i>									
Setting (inpatient, outpatient, ICU etc.)	-	-	-	X	-	-	-	-	X
Stay at Specialist Departments	-	-	-	-	-	-	-	X	-
Medical Specialty	-	-	-	-	-	-	-	-	X
Demands for Care	-	-	-	-	-	-	-	-	X
Severity / Complexity Levels	3*	4	unlimited	5**	2	3	3	unlimited	-
Aggregate case complexity measure	-	PCCL	PCCL	X	-	-	-	-	-

More emphasis on procedures and length-of-stay than in US

PCCL = Patient Clinical Complexity level

* not explicitly mentioned (Major CCs at MDC level plus 2 levels of severity at DRG level)

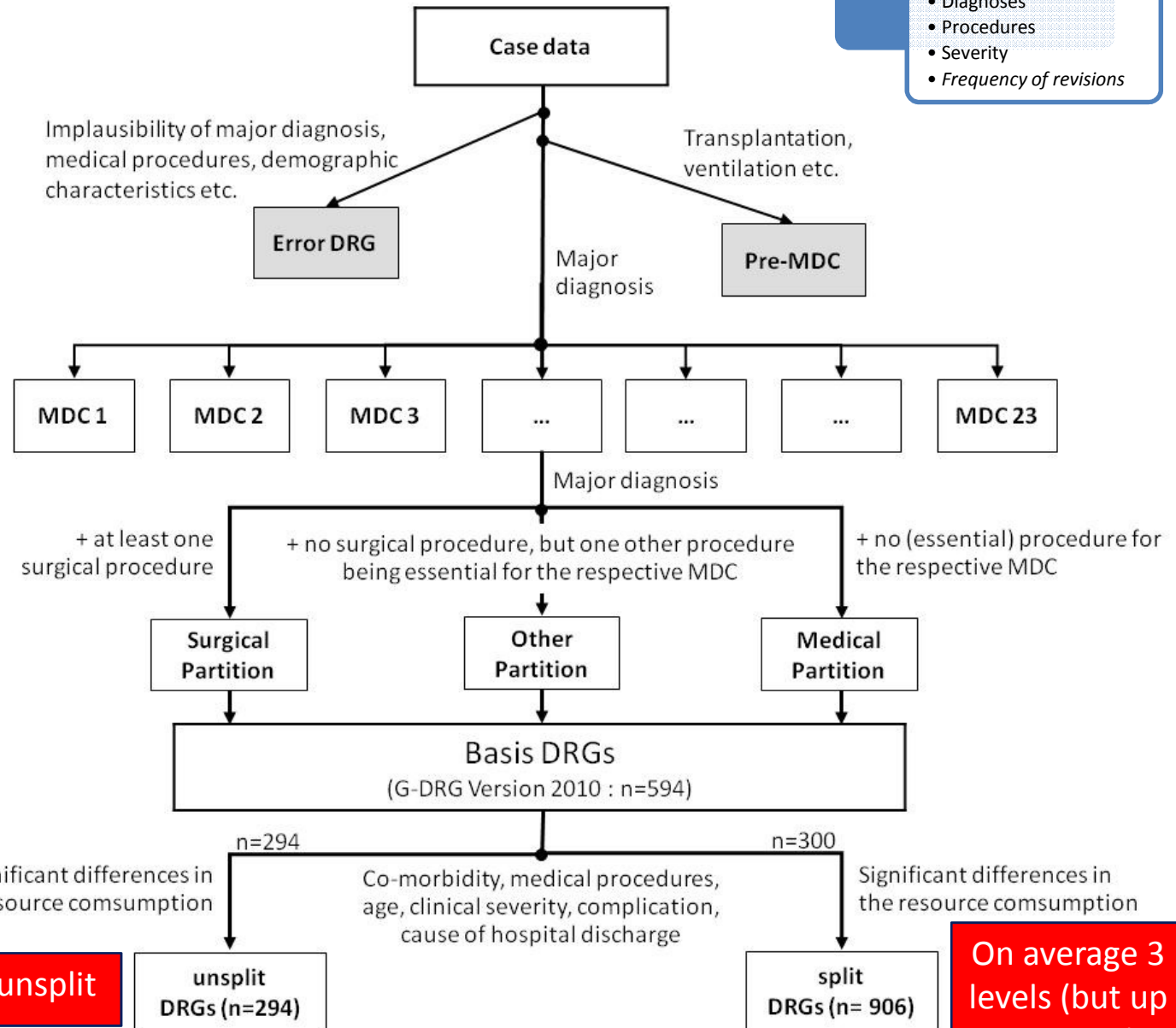
** 4 levels of severity plus one GHM for short stays or outpatient care



PCS: the German approach

Patient classification system

- Diagnoses
- Procedures
- Severity
- Frequency of revisions



**NB: Three partitions
→ one for not surgical procedures!**

50% unsplit

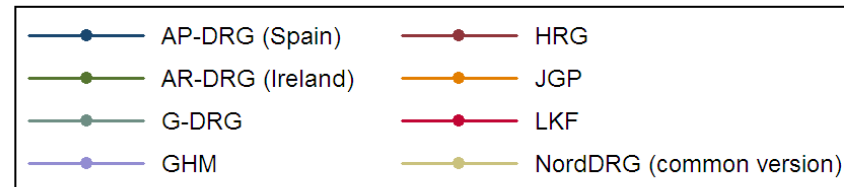
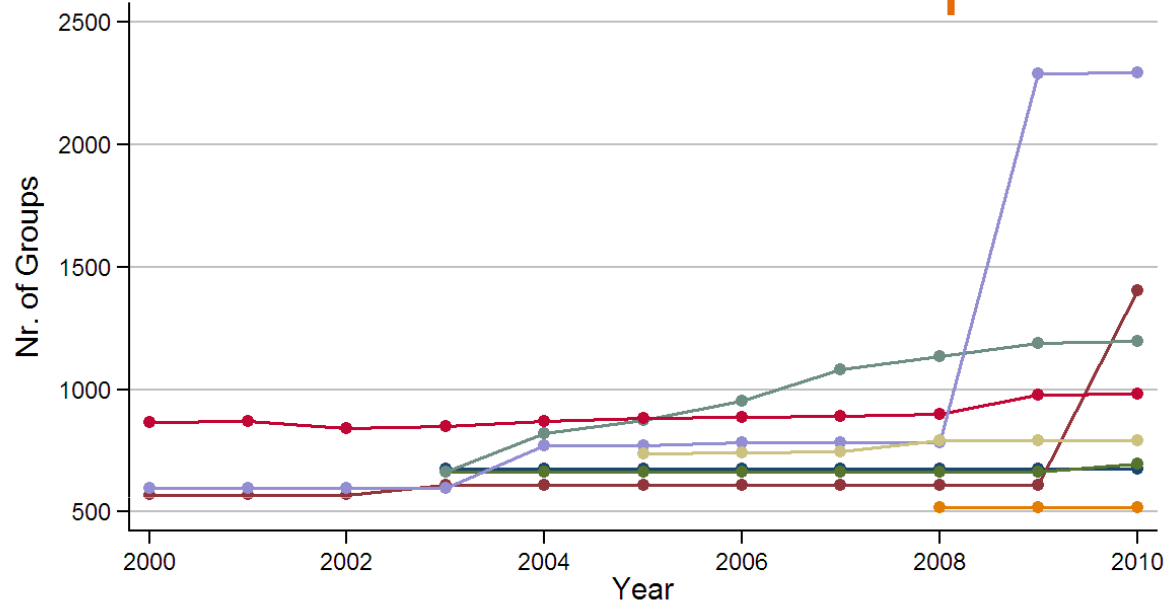
On average 3 levels (but up to ca. 10)



Basic characteristics of DRG-like PCS in Europe

Patient classification system

- Diagnoses
- Procedures
- Severity
- Frequency of revisions



	AP-DRG	AR-DRG	G-DRG	GHM	NordDRG	HRG	JGP	LKF	DBC
DRGs / DRG-like groups	679	665	1,200	2,297	794	1,389	518	979	≈30,000
MDCs / Chapters	25	24	26	28	28	23	16	-	-
Partitions	2	3	3	4	2	2*	2*	2*	-

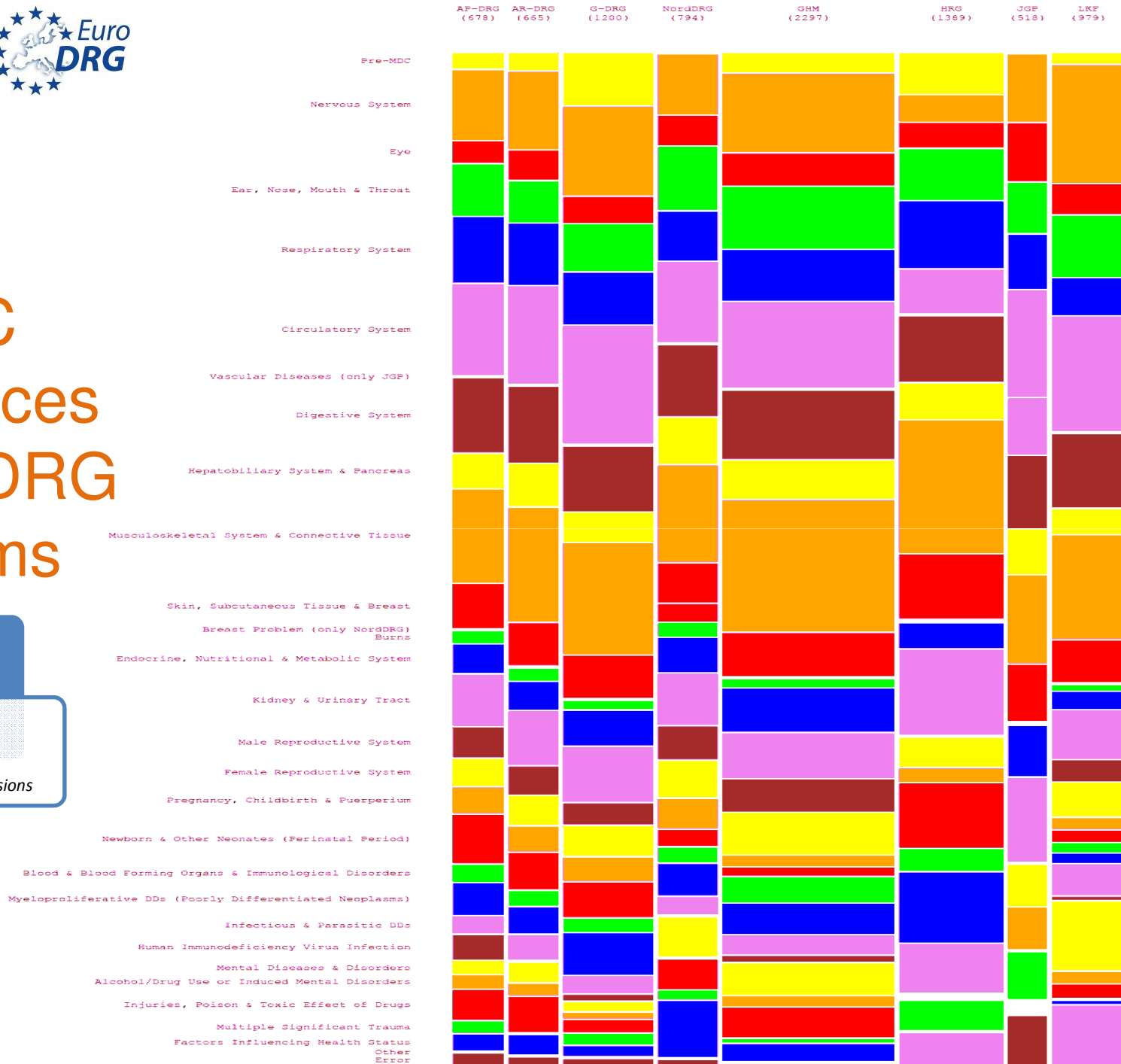


MDC differences across DRG systems

Patient classification system

- Diagnoses
- Procedures
- Severity
- Frequency of revisions

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Main questions relating to data collection

Data collection

- Demographic data
- Clinical data
- Cost data
- *Sample size, regularity*

Clinical data

- classification system for diagnoses *and*
- classification system for procedures

Cost data

- imported (not good but easy) *or*
- collected within country (better but needs standardised cost accounting)

Sample size

- entire patient population *or*
- a smaller sample

Many countries: *clinical data* = all patients;
cost data = hospital sample
with standardised cost accounting system





Diagnosis and procedure coding across Europe



Country	Diagnosis Coding	Procedure Coding
Austria	ICD-10-AT	Leistungskatalog
England	ICD-10	OPCS - Office of Population Censuses and Surveys
Estonia	ICD-10	NCSP - Nomesco Classification of Surgical Procedures
Finland	ICD-10	NCSP - Nomesco Classification of Surgical Procedures
France	ICD-10	CCAM - Classification Commune des Actes Médicaux
Germany	ICD-10-GM	OPS - Operationen- und Prozedurenschlüssel
Ireland	ICD-10-AM	ACHI - Australian Classification of Health Interventions
The Netherlands	ICD-10	Elektronische DBC Typeringslijst
Poland	ICD-10	ICD-9-CM
Portugal	ICD-9-CM	ICD-9-CM
Spain	ICD-9-CM	ICD-9-CM
Sweden	ICD-10	NCSP - Nomesco Classification of Surgical Procedures

**(almost)
standardised**

no uniform standard available



Cost accounting in hospitals: How Germany does it

		Cost-Element Groups									
		1: Labour costs of the other medical staff	2: Labour costs of the nursing staff	3: Labour costs of the administrative and technical staff	4a: Drug costs	4b: Drug costs (individual costs/ actual consumption)	5: costs of implants and grafts	6a: Material costs (without drugs, implants and grafts)	6b: Material costs (individual costs/ actual consumption, without drugs, implants/ grafts)	7: Medical infrastructure costs	8: Non- medical infrastructure costs
		Labour			Material					Infrastructure	
Cost- Centre Groups	1: Normal ward	1.1	1.2	1.3	1.4a	1.4b	-	1.6a	1.6b	1.7	1.8
	2: Intensive care unit	2.1	2.2	2.3	2.4a	2.4b	2.5	2.6a	2.6b	2.7	2.8
	3: Dialysis unit	3.1	2.3	3.3	3.4a	3.4b	-	3.6a	3.6b	3.7	3.8
	4: Operating room	4.1	-	4.3	4.4a	4.4b	4.5	4.6a	4.6b	4.7	4.8
	5: Anaesthesia	5.1	-	5.3	5.4a	5.4b	-	5.6a	5.6b	5.7	5.8
	6: Maternity room	6.1	-	6.3	6.4a	6.4b	-	6.6a	6.6b	6.7	6.8
	7: Cardiac diagnostics/ therapy	7.1	-	7.3	7.4a	7.4b	7.5	7.6a	7.6b	7.7	7.8
	8: Endoscopic diagnostics/ therapy	8.1	-	8.3	8.4a	8.4b	8.5	8.6a	8.6b	8.7	8.8
	9: Radiology	9.1	-	9.3	9.4a	9.4b	9.5	9.6a	9.6b	9.7	9.8
	10: Laboratories	10.1	-	10.3	10.4a	10.4b	10.5	10.6a	10.6b	10.7	10.8
	11: Other diagnostic and therapeutic areas	11.1	11.2	11.3	11.4a	11.4b	11.5	11.6a	11.6b	11.7	11.8



MDC: **MDC 14 Schwangerschaft, Geburt und Wochenbett**

DRG: **060D: Vaginale Entbindung ohne komplizierende Diagnose** Zurücksetzen

Daten: **14** **MDC 14 Schwangerschaft, Geburt und Wochenbett** Anz. DRGs: **26** N: **81.952**

Fallzahl Normallieger 29.836 v. MDC: 36,41% v. gesamt: 1,49%	Verweildauer Kurzlieger 10,30% Normallieger 87,22% Langlieger 2,48% 1. Tag mit Abschlag 1 1. Tag zus. Entgelt 7 Mittl. arithm. VWD 3,5 Standardabw. VWD 1,0	PCCL 0 80,55% 1 0,00% 2 8,64% 3 10,71% 4 0,10% Profil drucken...	Geschlecht Männlich 0,00% Weiblich 100,00% Unbestimmt 0,00% Fallkosten Arith. MW 1.418,78 Std. Abw. 428,06	Alter <table border="1"> <tr><td>< 28 Tage</td><td>0,00%</td><td>30 - 39 Jahre</td><td>46,60%</td></tr> <tr><td>28 T. - < 1 Jahr</td><td>0,00%</td><td>40 - 49 Jahre</td><td>2,96%</td></tr> <tr><td>1 - 2 Jahre</td><td>0,00%</td><td>50 - 54 Jahre</td><td>0,00%</td></tr> <tr><td>3 - 5 Jahre</td><td>0,00%</td><td>55 - 59 Jahre</td><td>0,00%</td></tr> <tr><td>6 - 9 Jahre</td><td>0,00%</td><td>60 - 64 Jahre</td><td>0,00%</td></tr> <tr><td>10 - 15 Jahre</td><td>0,12%</td><td>65 - 74 Jahre</td><td>0,00%</td></tr> <tr><td>16 - 17 Jahre</td><td>0,81%</td><td>75 - 79 Jahre</td><td>0,00%</td></tr> <tr><td>18 - 29 Jahre</td><td>49,50%</td><td>80 Jahre u. älter</td><td>0,00%</td></tr> </table>	< 28 Tage	0,00%	30 - 39 Jahre	46,60%	28 T. - < 1 Jahr	0,00%	40 - 49 Jahre	2,96%	1 - 2 Jahre	0,00%	50 - 54 Jahre	0,00%	3 - 5 Jahre	0,00%	55 - 59 Jahre	0,00%	6 - 9 Jahre	0,00%	60 - 64 Jahre	0,00%	10 - 15 Jahre	0,12%	65 - 74 Jahre	0,00%	16 - 17 Jahre	0,81%	75 - 79 Jahre	0,00%	18 - 29 Jahre	49,50%	80 Jahre u. älter	0,00%
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Bewertungsrelation
0,541

Profile: **Hauptdiagnosen** | Nebendiagnosen | Prozeduren | **Kosten** | Recherche

Kostenbereich	Personalkosten:			Sachkosten:					Pers. - u. Sachkosten:		Summe
	Ärztlicher Dienst	Pflegedienst	med./techn. Dienst	Arzneimittel		Implantate / Transplant.	Übriger med. Bedarf		med. Infrastruktur	nicht med. Infrastruktur	
	1	2	3	4a	4b	5	6a	6b	7	8	
01. Normalstation	104,4	238,2	22,8	11,5	1,5	0,0	18,0	0,3	52,7	225,8	675,3
02. Intensivstation	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0	0,0	0,0	0,1
04. OP-Bereich	0,7	0,0	0,7	0,0	0,0	0,0	0,3	0,0	0,3	0,6	2,7
05. Anästhesie	10,3	0,0	5,4	1,2	0,1	0,0	2,9	0,0	1,3	4,3	25,4
06. Kreißsaal	113,7	0,0	328,8	17,3	0,2	0,0	34,7	0,0	25,1	143,8	663,7
08. Endoskopische Diagnostik / Ther	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,1
09. Radiologie	0,2	0,0	0,3	0,0	0,0	0,0	0,1	0,1	0,2	0,3	1,0
10. Laboratorien	2,2	0,0	8,4	0,3	0,2	0,0	6,4	1,9	0,7	3,7	23,7
11. Übrige diagnostische und therape	6,2	0,1	11,2	0,2	0,0	0,0	2,0	0,1	1,4	5,7	26,8
Summe:	237,7	238,4	377,6	30,5	1,9	0,0	64,5	2,5	81,7	384,1	1.418,8

InEK cost data browser: Average costs for normal birth without comorbidities or complications in German cost calculating hospitals



How to calculate costs and set prices fairly

Price setting

- Cost weights
- Base rate(s)
- Prices/ tariffs
- Average vs. “best”

- Based on good quality data (not possible if cost weights imported)
- Average costs vs. “best practice”
- “Cost weights x base rate” vs. “Tariff + adjustment”





How to calculate costs and set prices fairly

Price setting

- Cost weights
- Base rate(s)
- Prices/ tariffs
- Average vs. "best"

	"cost weight" (varies by DRG)		"base rate" or adjustment
England	£ 3000	X	1.0 – 1.32 (varies by hospital)
France	€ 3000	X	1.0 (+/-) (varies by region and hospital)
Germany	1.0	X	€ 3000 (+/-) (varies slightly by state)



Cost calculation and price setting – country experience

Price setting

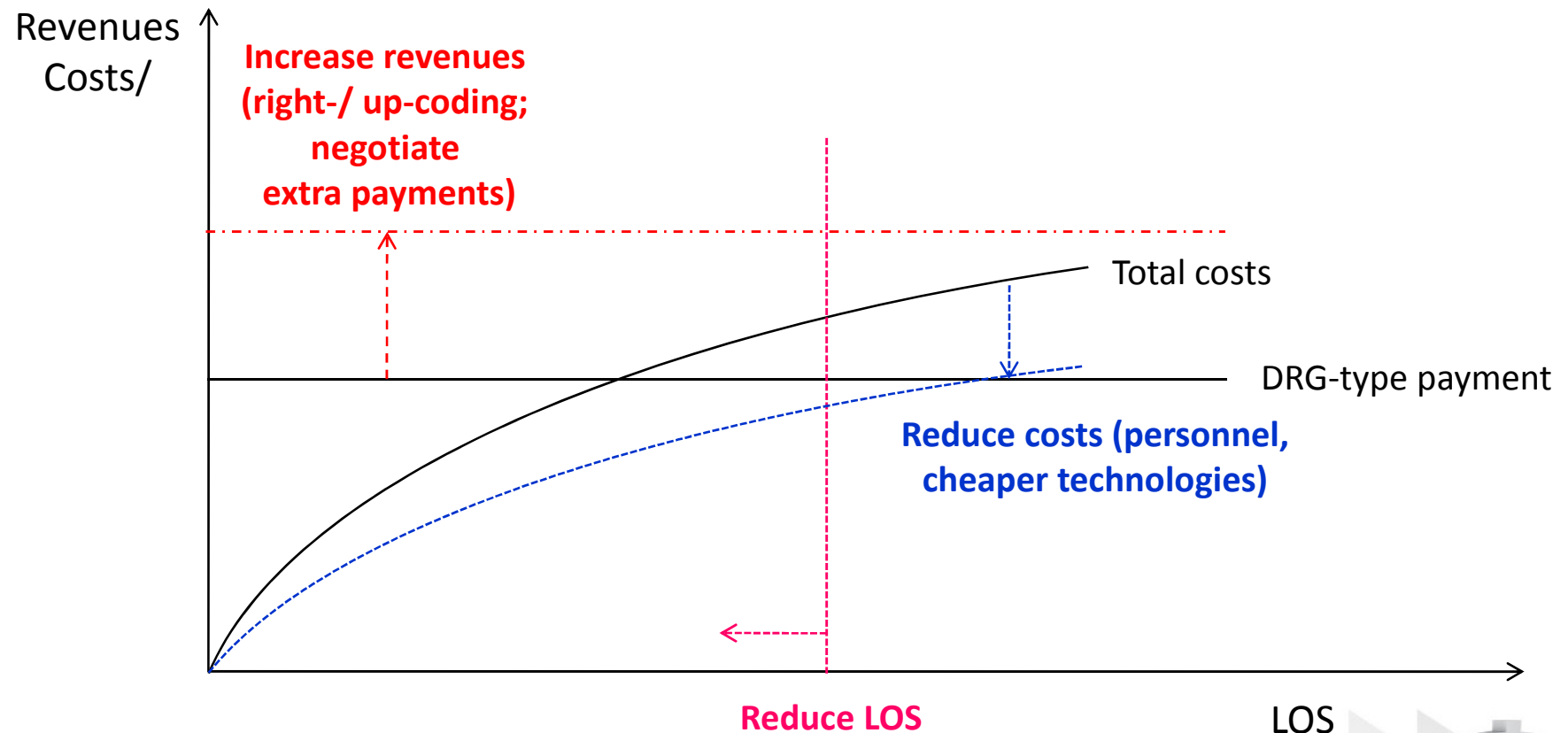
- Cost weights
- Base rate(s)
- Prices/ tariffs
- Average vs. “best”

	England	France	Germany	Netherlands
Cost data collection methodology to determine payment rate				
Sample size (% of all hospitals)	All NHS hospitals	99 hospitals (5%)	253 hospitals (13%)	Resource use: all hospitals; unit costs: 15-25 hospitals (24%)
Cost accounting methodology	Top down	Mix of top-down and bottom-up	Mainly bottom-up	Mainly bottom-up
Calculation of hospital payment				
Payment calculation	Direct (price)	Indirect (cost-weight)	Indirect (cost-weight)	Direct (price)
Applicability	Nationwide (but adjusted for market-forces- factor)	Nationwide (with adjustments and separate for public and private hospitals)	Cost-weights nationwide; monetary conversion state- wide	List A: nationwide List B: hospital specific
Volume/ expenditure limits	No (plans exist for volume cap)	Yes	Yes	List A: Yes List B: Yes/No



Being aware of strategic behaviour of hospitals in times of DRGs

Options to avoid deficits under activity based payments





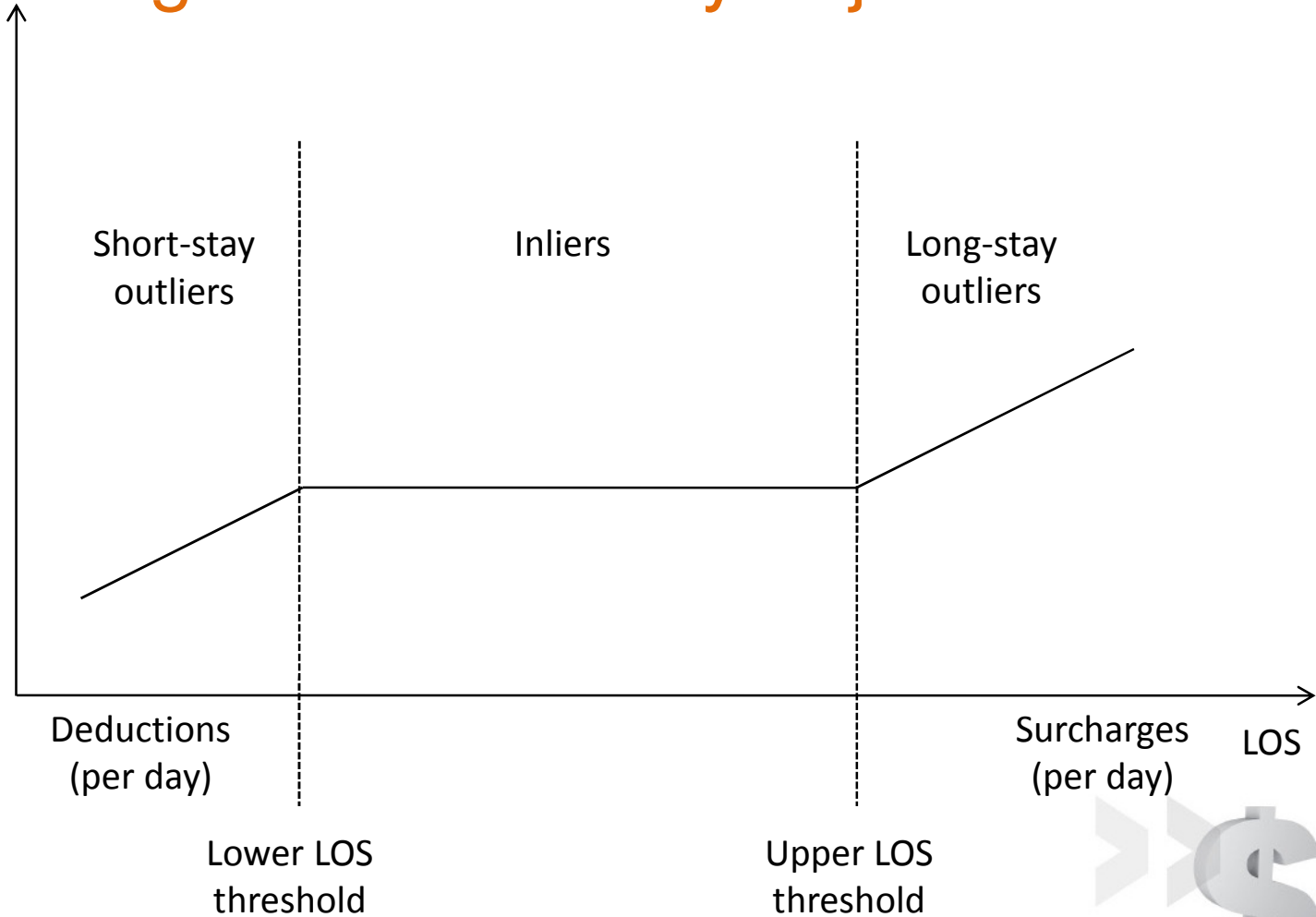
How DRG systems try to counter-act such behaviour:

1. long- and short-stay adjustments

Revenues

Actual reimbursement

- Volume limits
- Outliers
- High cost cases
- Negotiations





How DRG systems try to counter-act such behaviour:

2. FFS-type additional payments

Actual reimbursement

- Volume limits
- Outliers
- High cost cases
- Negotiations

	England	France	Germany	Netherlands
Payments per hospital stay	One	One	One	Several possible
Payments for specific high-cost services	Unbundled HRGs for e.g.: <ul style="list-style-type: none"> • Chemotherapy • Radiotherapy • Renal dialysis • Diagnostic imaging • High-cost drugs 	Séances GHM for e.g.: <ul style="list-style-type: none"> • Chemotherapy • Radiotherapy • Renal dialysis Additional payments: <ul style="list-style-type: none"> • ICU • Emergency care • High-cost drugs 	Supplementary payments for e.g.: <ul style="list-style-type: none"> • Chemotherapy • Radiotherapy • Renal dialysis • Diagnostic imaging • High-cost drugs 	No
Innovation-related add'l payments	Yes	Yes	Yes	Yes (for drugs)



How DRG systems try to counter-act such behaviour:

3. adjustments for quality

Actual reimbursement

- Volume limits
- Outliers
- High cost cases
- Negotiations

- England & Germany: no extra payment if patient readmitted within 30 days
- Germany: deduction for not submitting quality data
- England: up 1.5% reduction if quality standards are not met
- France: extra payments for quality improvement (e.g. regarding MRSA)





List B–DBC's as basis for price negotiations in the Netherlands

Actual reimbursement

- Volume limits
- Outliers
- High cost cases
- Negotiations

Table 1 Negotiated prices in 2007 and 2004 for seven list B DBCs at four health insurers

	2004 price (€)	Minimum 2007 price (€)	Maximum 2007 price (€)	Mean 2007 price (€)	Price increase (%)
Hip replacement	8571	7603	11370	9097	6.3
Knee replacement	10228	9097	13000	10746	5.1
Inguinal hernia repair	2163	1529	3088	2254	4.2
Diabetes	409	385	1027	483	18.1
Tonsillectomy	740	433	1498	800	8.1
Cataract	1317	1044	1599	1381	4.8
Spinal disc herniation	3046	2413	5778	3308	8.6





Implementation: Not from one day to the next - the long way of DRG introduction in Germany

2000-2002

2003 - 2004

2005 - 2009

2010 - 2014

	2) Budget-neutral phase	3) Phase of convergence to state-wide base rates	4) Discussion on Policy
1) Phase of preparation	<p>Historical Budget (2003)</p> <p>↓</p> <p>Transformation</p> <p>↓</p> <p>DRG-Budget (2004)</p>	<p>Hospital specific base rate</p> <p>↓ 15%</p> <p>↓ 20%</p> <p>↓ 20%</p> <p>↓ 20%</p> <p>↓ 25%</p> <p>Statewide base rate</p> <p>↑ 25%</p> <p>↑ 20%</p> <p>↑ 20%</p> <p>↑ 15%</p> <p>Hospital specific base rate</p>	<ul style="list-style-type: none"> • Nationwide base rate • Fixed or maximum prices • Selective or uniform negotiations • Quality Assurance (adjustments) • Budgeting (amount of services) • Dual Financing or Monistic





Conclusions

European countries have developed – and are continuously modifying – their own DRG systems, which

- classify patients into more groups,
 - give a higher weight to procedures and to setting,
 - base payment rates on actual average (or best-practice) costs,
 - pay separately for high-cost and innovative technologies,
 - are implemented in a step-wise manner, and
- thus reduce, or even avoid, the potential of risk selection and under-provision of services.





The EuroDRG project

- EuroDRG: project partner institutions from 13 countries
- Book on DRGs in Europe
- Mapping of grouping algorithms
- Analyses of determinants of hospital costs



<http://www.eurodrg.eu/>

