

# DRG-based hospital payment



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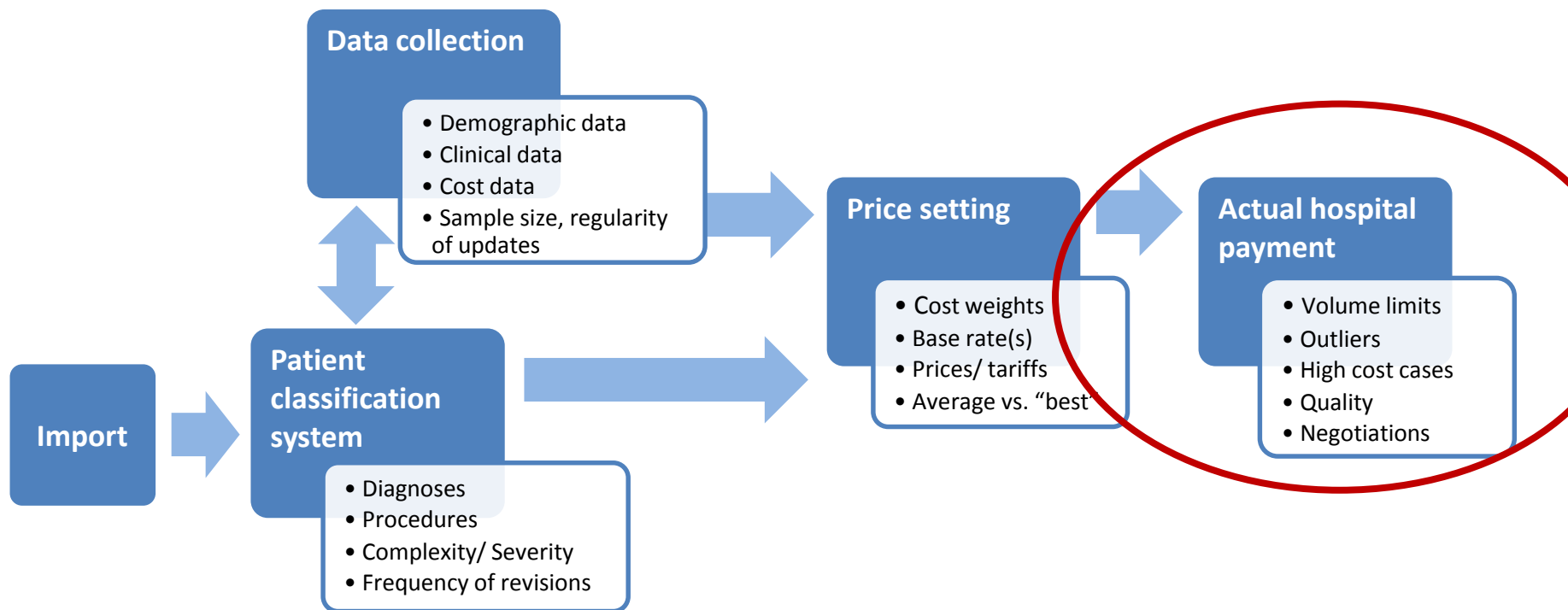
Technische Universität Berlin

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## DRG system building blocks



# Adequacy of payment depends on

## 1. Patient classification system:

- Are DRGs cost homogenous?
- How detailed is the classification system? How many groups?

## 2. System of price setting:

- Reliable cost data to determine/calculate DRG weights
- Data/negotiations to determine conversion factor
- Adjustments (region, hospital type, etc.)

## 3. Actual hospital payment

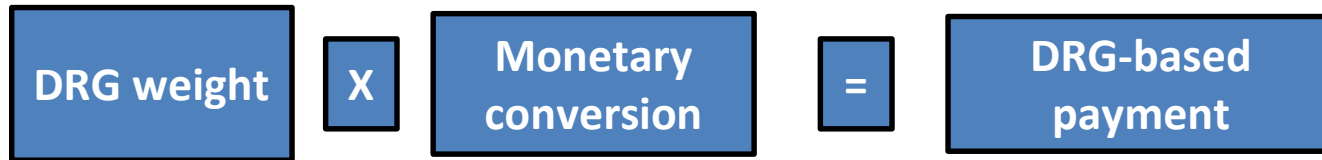
- Type of DRG-based payment system
- Adjustments
- Combination with other payment mechanisms

# What should be included in DRG-based payment?

- What costs?
  - All costs of the admission or certain costs of the admission (e.g. only recurrent costs).
- What services?
  - All services, including physician services and nursing care or excluding certain services (e.g. intensive care)
  - All services during the admission or only services provided by one hospital department?
- What time period?
  - The admission?
  - Until 30 days after discharge?
  - The entire year?

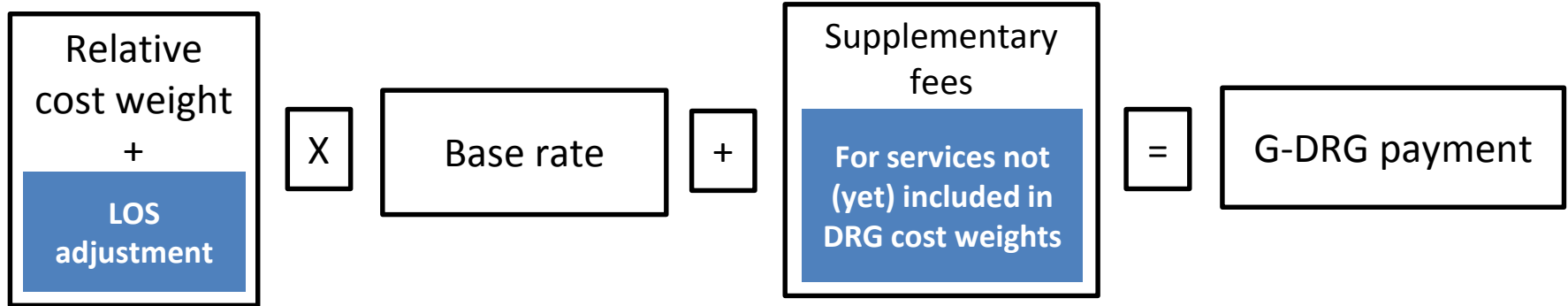
Decisions influence design of DRG system and price setting mechanism

- DRG-based case payment
  - Each case treated in a hospital is classified into a DRG
  - Payment is determined for each case based on the DRG weight and the monetary conversion rate



- DRG-based budget allocation
  - Each case treated in a hospital is classified into a DRG
  - DRG weights of all cases are summed up per hospital: → hospital case mix
  - Hospital case mix (or case mix index → case mix divided by # of patients) is used to determine hospital budget

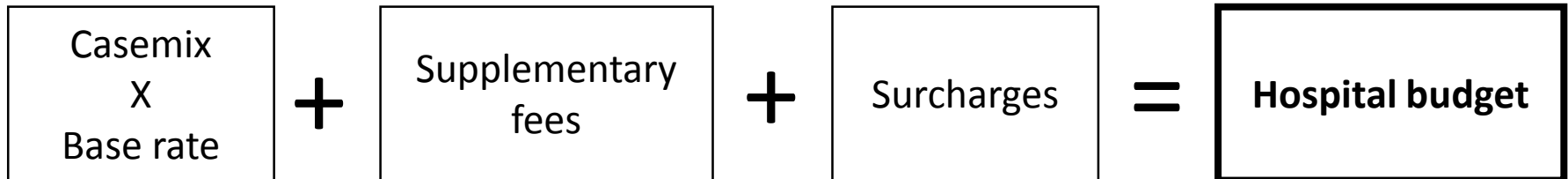
# DRG-based hospital payment in Germany



**Operated in combination with public investment funding and negotiated target budgets**

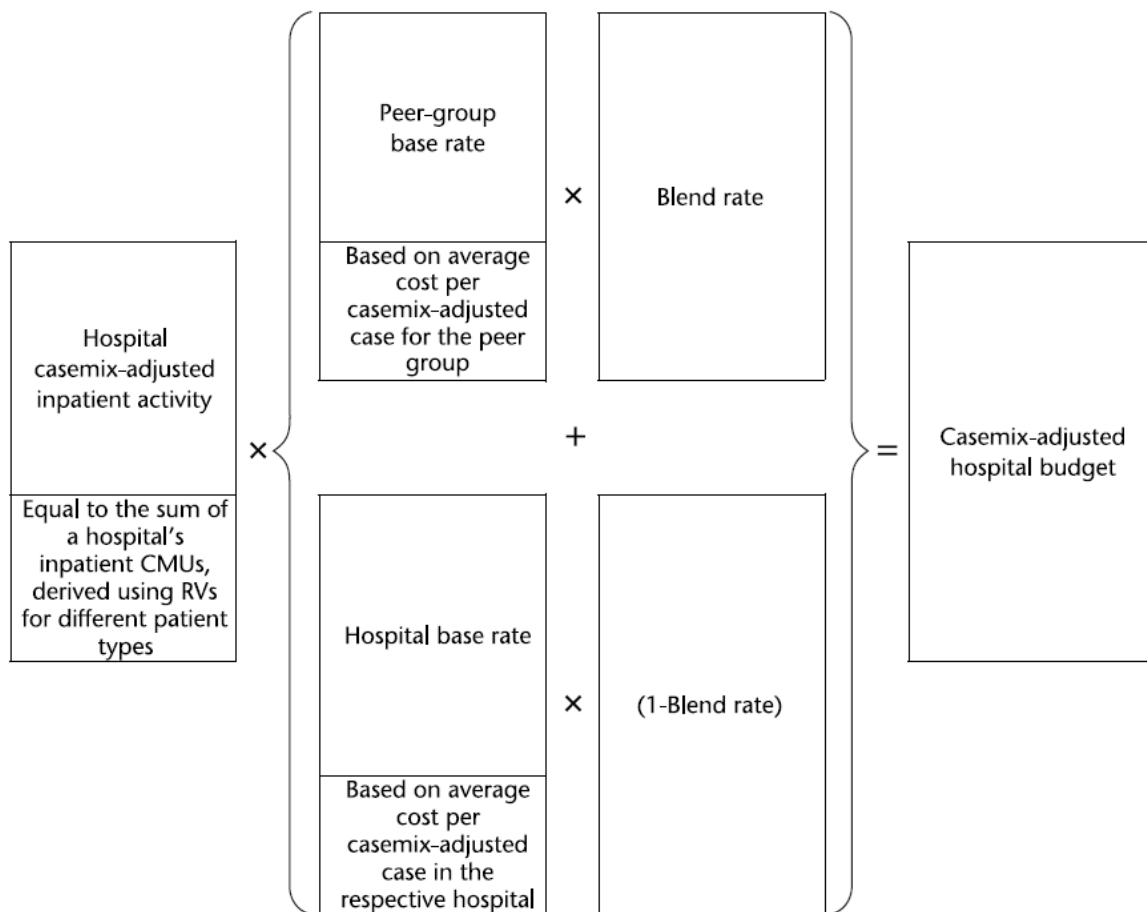
# DRG-based payment in Germany 2

- Investment costs are paid by the state governments (<4% of costs)
- Sickness funds negotiate activity based DRG budgets every year with every “planned” Hospital.



- Budget over-run adjustment (hospital pays back):
  - 65 % (standard DRGs), 25 % (drugs, medical, polytrauma and burns DRGs),  
Negotiations for certain DRGs (those that are difficult to predict)
- Budget under-run adjustment (hospital receives compensation) :
  - 20% (standard DRGs)

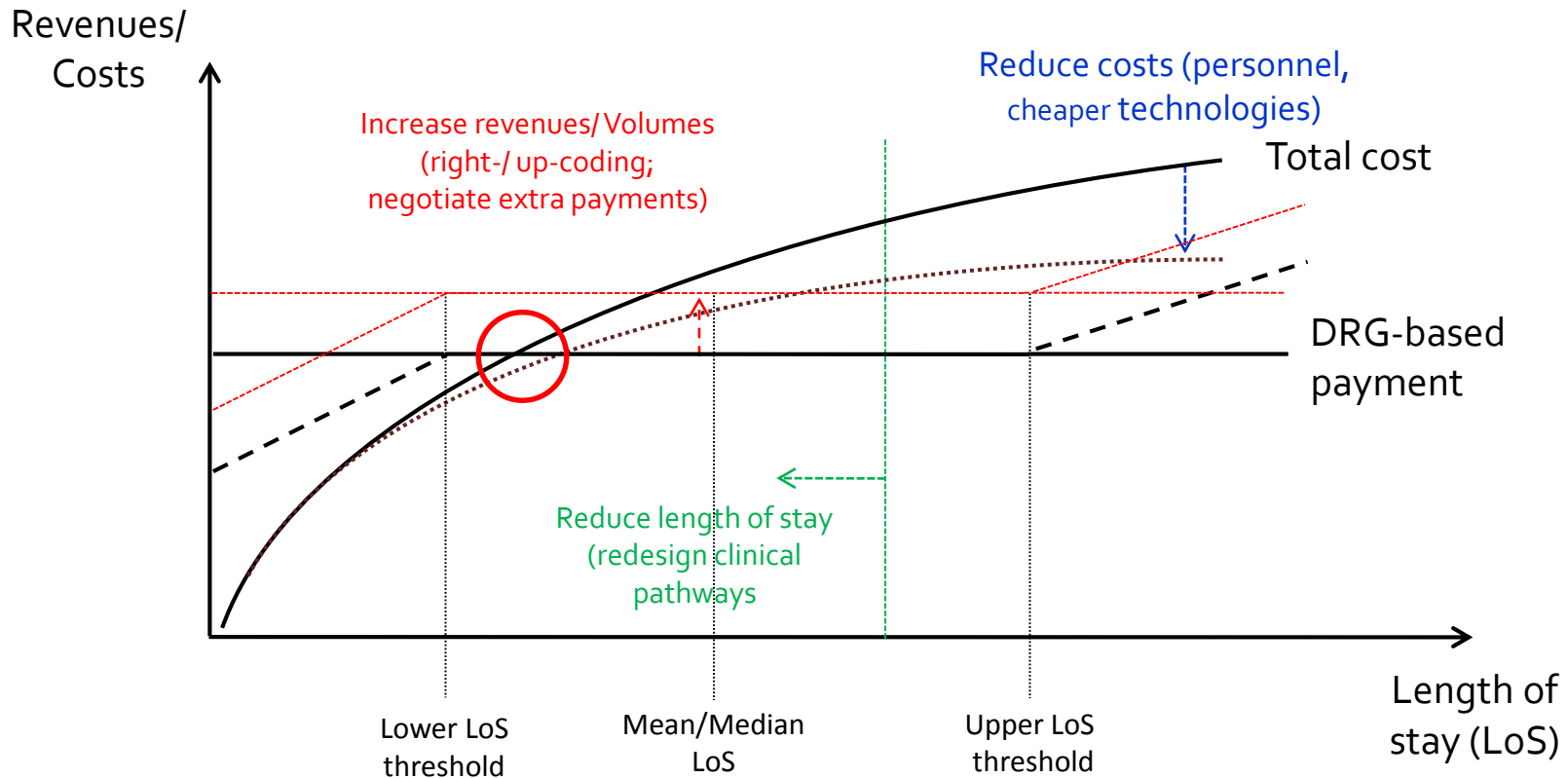
# DRG-based budget allocation in Ireland



**Figure 15.3** Calculation of the hospital inpatient casemix-adjusted budget



# DRG-based payment is for average costs: but some costs are much higher: the problem of outliers



Parametric:

Standard deviation (STD) of LoS is multiplied to (e.g., Germany, Estonia).

Non-parametric :

A multiple of the inter-quartile range (IQR) between the first (Q25) and the third (Q75) quartile is added to the third quartile (e.g., Denmark, England, Italy)

**Table 3 – Outlier cases: definition and payments**

Country	Outliers based on	Outlier definition	Outlier payments
Denmark	LOS	No lower LOS threshold Upper LOS threshold: $Q3+(Q3-Q1)*1.5$	Per diem (regardless of the DRG)
England	LOS	No lower LOS threshold Upper LOS threshold: $Q3+(Q3-Q1)*1.5$	Per diem
Estonia	Costs	Lower cost threshold: average cost – 2*STD Upper cost threshold: average cost + 2*STD	Fee for service Fee for service
France	LOS	Lower LOS threshold: $(ALOS/2.5) + 1$ Upper LOS threshold: $ALOS*2.5$	Per diem or fixed price Per diem
Germany	LOS	Lower LOS threshold: $\text{round}[\max(2, ALOS/3)]$ Upper LOS threshold: $\text{round}[\min(2, ALOS+2*STD, ALOS + 17)]$	Per diem Per diem
USA (Medicare Part A)	Costs	No lower cost threshold Upper cost threshold: DRG price + fixed loss deductible amount	80% of its costs above the cost threshold

LOS=length of stay; ALOS=average LOS; DRG=diagnosis-related group; Q1=first quartile; Q3=third quartile; STD=standard deviation

Stephani et al 2018

# DRG-based payment and incentives for higher activity in hospitals

- May be an intended or unintended effect of DRG-based payment:
  - Intended, e.g. if waiting times are a problem
  - Unintended, e.g. if leading to overtreatment
- May increase total costs of service provision in hospitals
- Options to control costs and reduce incentive for overtreatment:
  - Strengthening gate-keeping
  - Monitoring activity and checking indication for admission
  - Combining DRG-based payment with (target) budget

# DRG-based payment: type and importance

Determines strength of the incentives

Country	DRG-based hospital payment model	% of hospital revenues related to DRGs	Other payment components
Austria	DRG-based budget allocation	≈ 96	Per diems
England	DRG-based case payments	≈ 60	GB, additional payments
Estonia	DRG-based case payments	39	FFS (33%), per diem (28%)
Finland	In 13 out of 21 districts: DRG-based case payments (within GB)	Varies	Varies
France	DRG-based case payments, MLPC	≈ 80	GB, additional payments
Germany	DRG-based case payments (within GB)	≈ 80	GB, additional payments
Ireland	DRG-based budget allocation	≈ 80	GB, additional payments
Netherlands	DRG-based case payments (within GB for 67% of DRGs)	≈ 84	GB, additional payments
Poland	DRG-based case payments, MLPC	≥ 60	GB, additional payments
Portugal	(1) DRG-based budget allocation (NHS) (2) DRG-based case payments (health insurance)	≈ 80	Additional payments
Spain (Catalonia)	DRG-based budget allocation (Catalonia)	≈ 20	GB (based on structural index), FFS, additional payments
Sweden	DRG-based case payments with volume ceilings or GBs (region-specific allocation)	Varies	Varies

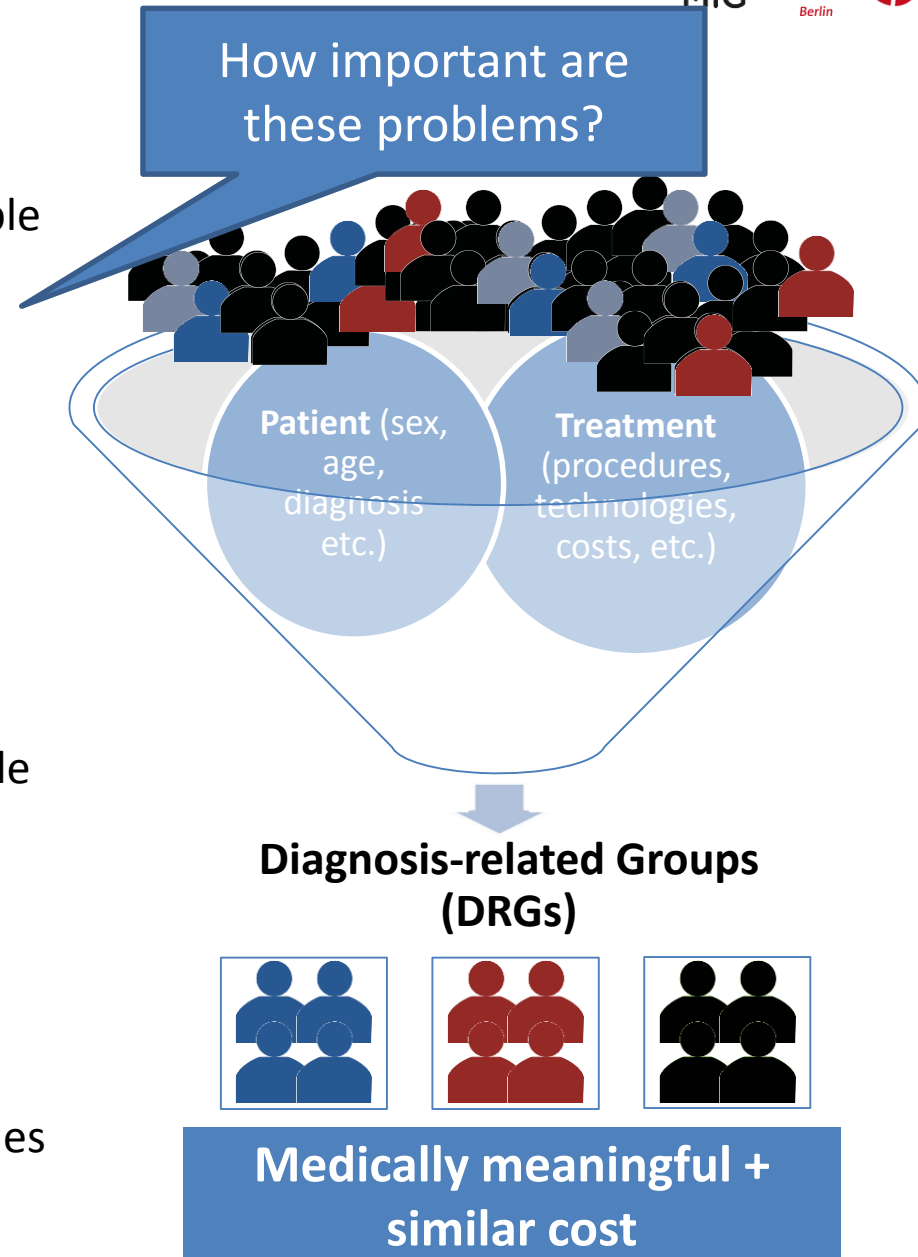
MLPC = Macro-level Price Control

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# Problems with DRG-based payment: variability of costs of certain patients

- Ideally, DRGs contain cases that have comparable costs in order to allow reliable calculation of average costs per DRG.
- **Problems:** For certain groups of patients and/or hospitals DRGs are problematic:
  - There are too few cases to calculate average costs per DRG
  - Highly complex patients with multiple comorbidities have unforeseeable costs
  - Statistical variation
  - Hospitals have other functions besides patient care



# Different approaches to address these problems

Relationship with the DRG-based payment system	Mechanism
<b>Within the DRG system</b>	split DRG
	assign cases to other DRGs
	create new DRGs
<b>At the margin of DRG-based payment system</b>	outlier payments (FFS or per diems)
	additional payments with fixed prices (FFS or per diems)
	DRGs with negotiated prices
<b>Outside DRG-based payment system</b>	additional payments with negotiated prices
	separate provider level budgets
	reimbursement of provider costs

# DRG-based payment can be adjusted for highly complex care

Within the DRG system

- All countries in Europe (and beyond) have revised their systems, increasing the number of DRGs to better account for complexity.
- Range of DRG-based payments in Germany (2019):
  - Lowest valued DRG: J68B: Dermatological disease, one day treatment, w/o complex diagnosis, age > 15 years ≈ €744.
  - Average DRG (weight = 1): L16A : Implantation/exchange of neurostimulator and/or –electrodes for diseases of urinary organs ≈ €3 545.
  - Highest valued DRG: A06A artificial ventilation > 1 799h with high intensity ICU care or with highly complex intervention ≈ €253 814.

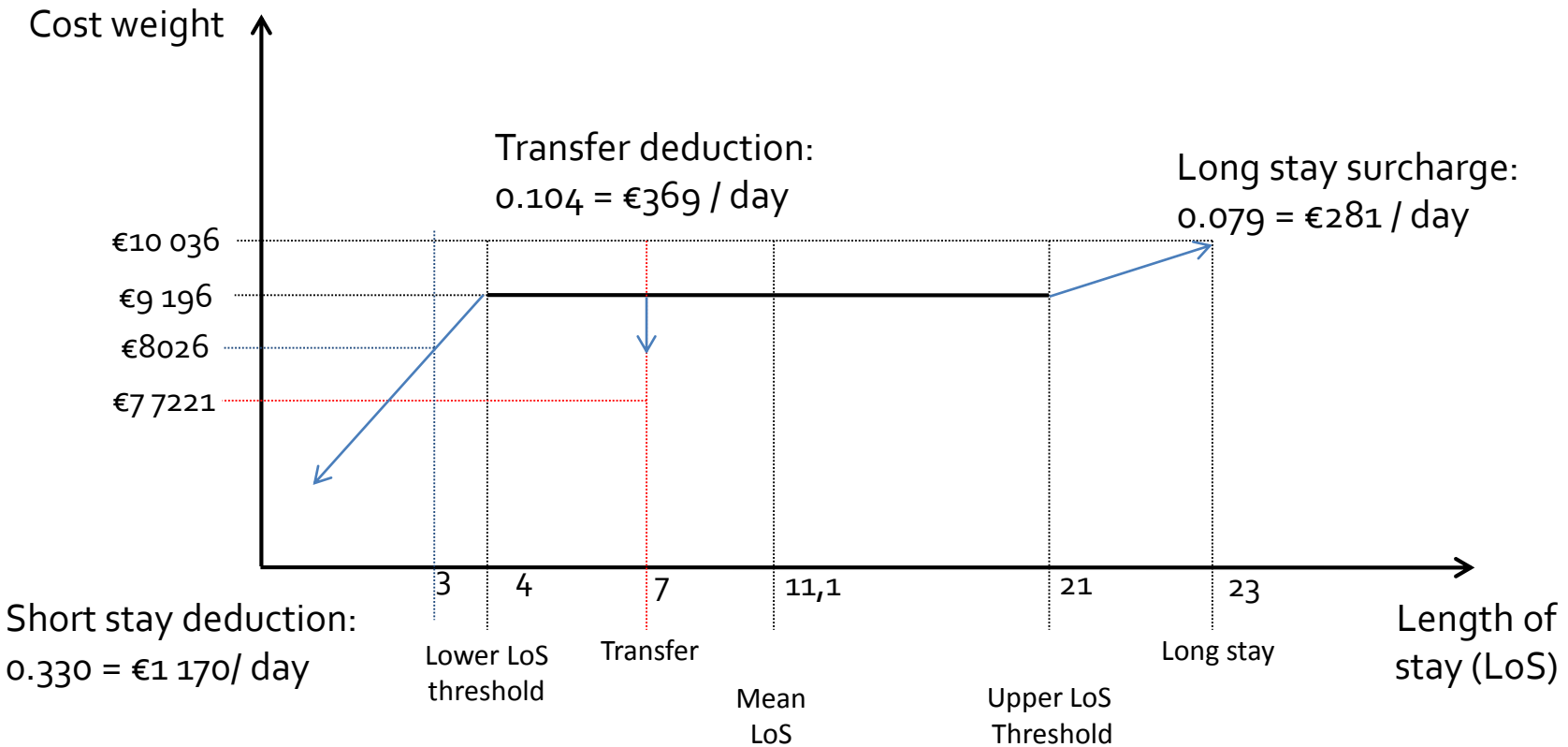


# Outlier and transfer adjustments

At the margin of DRG-based payment system

## German DRG catalogue 2019

DRG	Name	Cost weight	ALoS	Lower LoS threshold		Upper LoS threshold		Transfer Deduction per day (cost weight)
				First Day with deduction	Cost weight per day	First Day with surcharge	Cost weight per day	
I47A	Hip Replacement or Revision w/o CC	2.594	11.7	3	0.330	21	0,079	0,104



# Payment options beyond DRGs

At the margin of DRG-based payment system

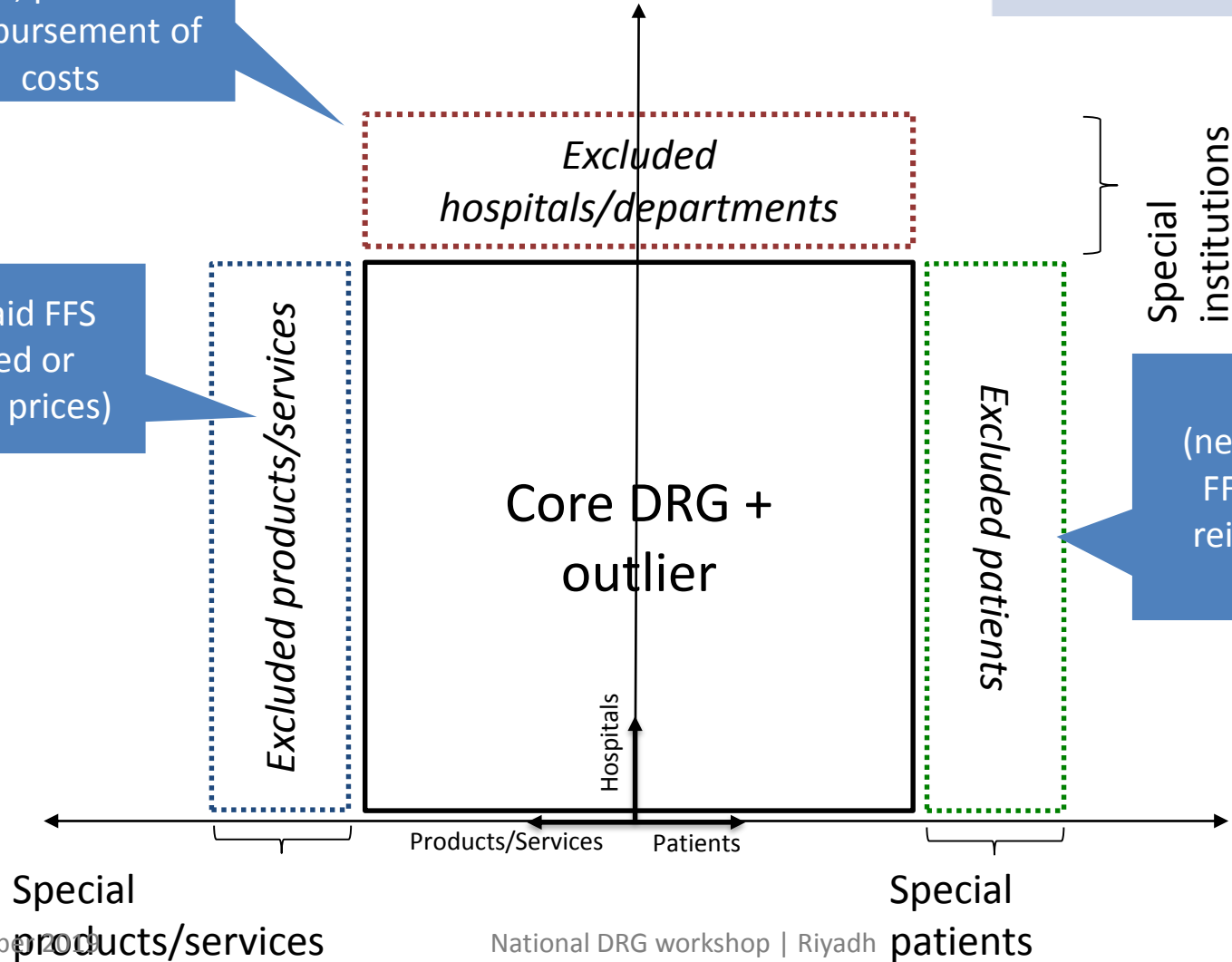
Outside DRG-based payment system

Not assessed: other payments for education, research, innovation, general public interest, investment costs

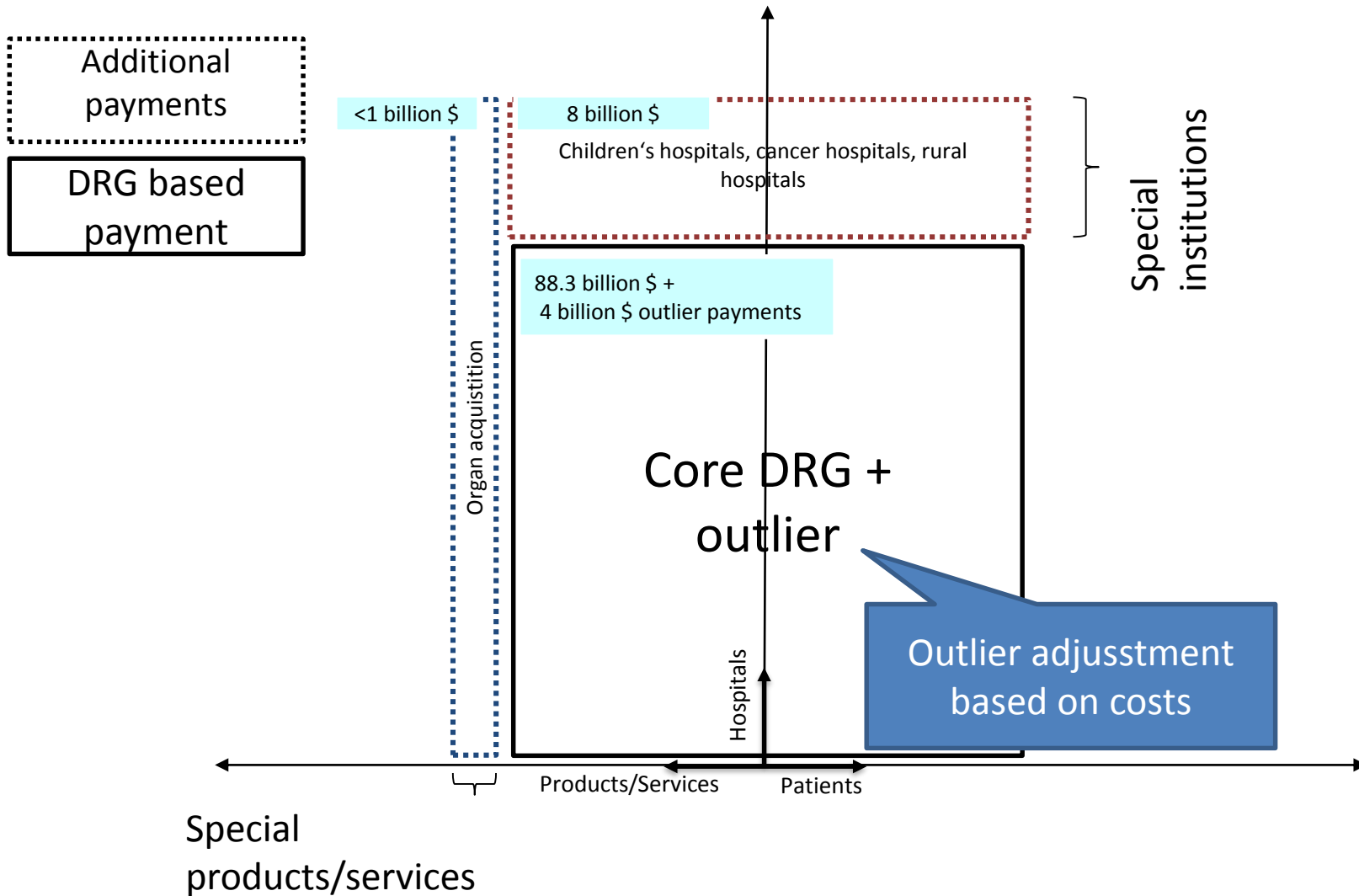
Usually paid with budget, per diem or reimbursement of costs

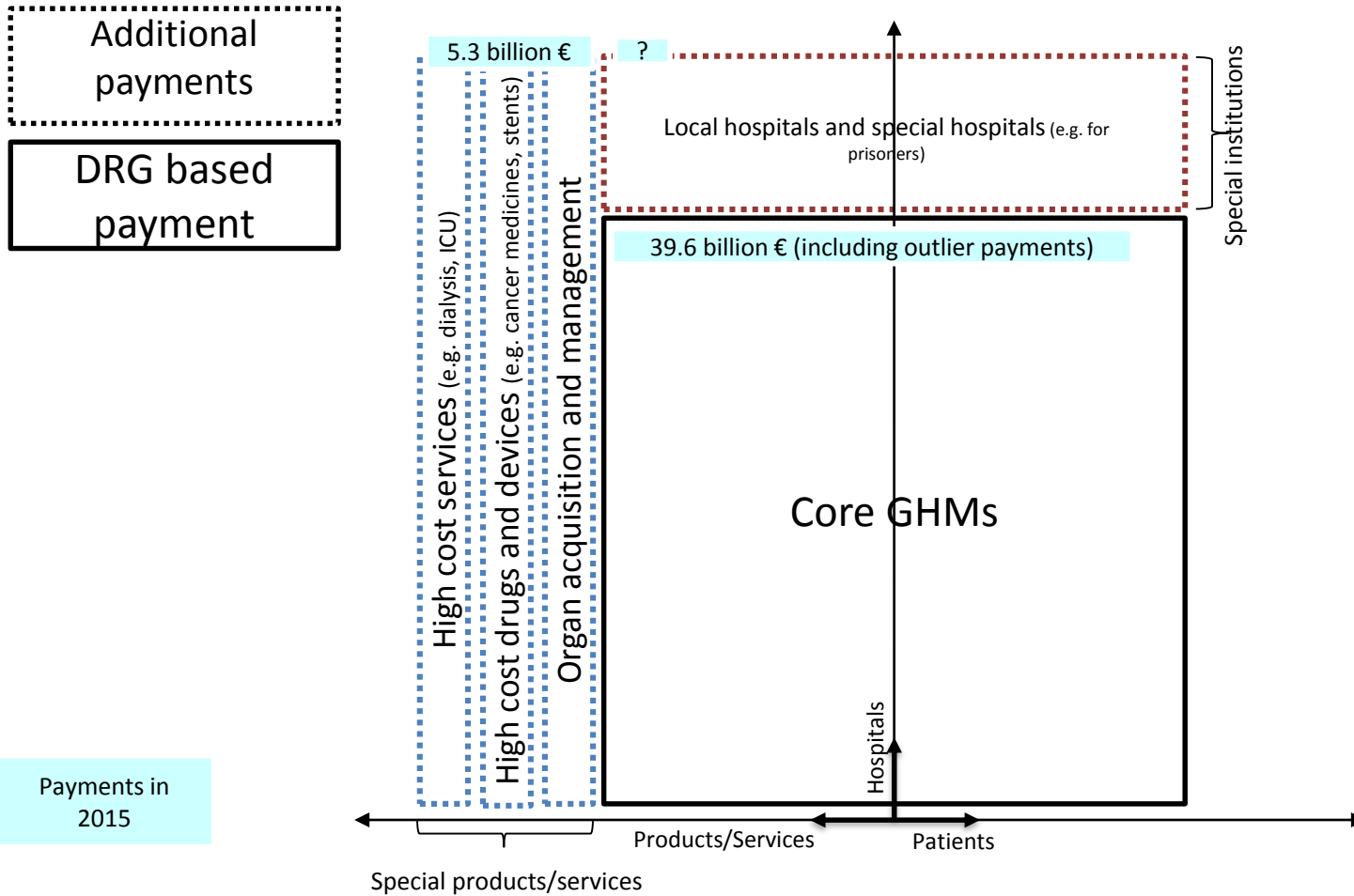
Usually paid FFS (with fixed or negotiated prices)

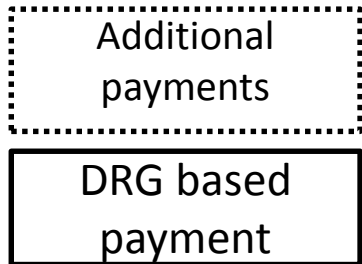
Paid by DRG (negotiated prices), FFS, per diem, or reimbursement of costs



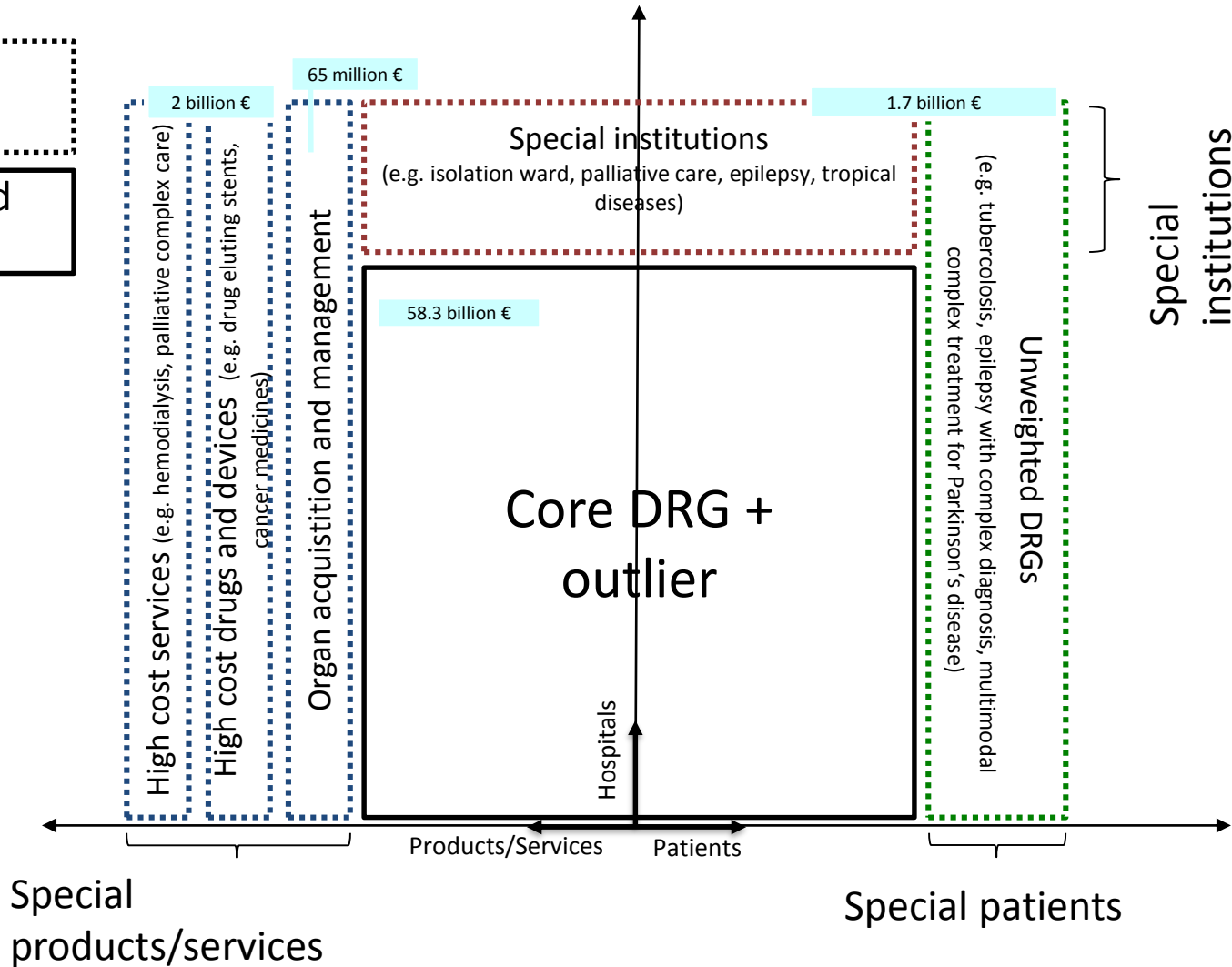
# USA – Medicare Part A

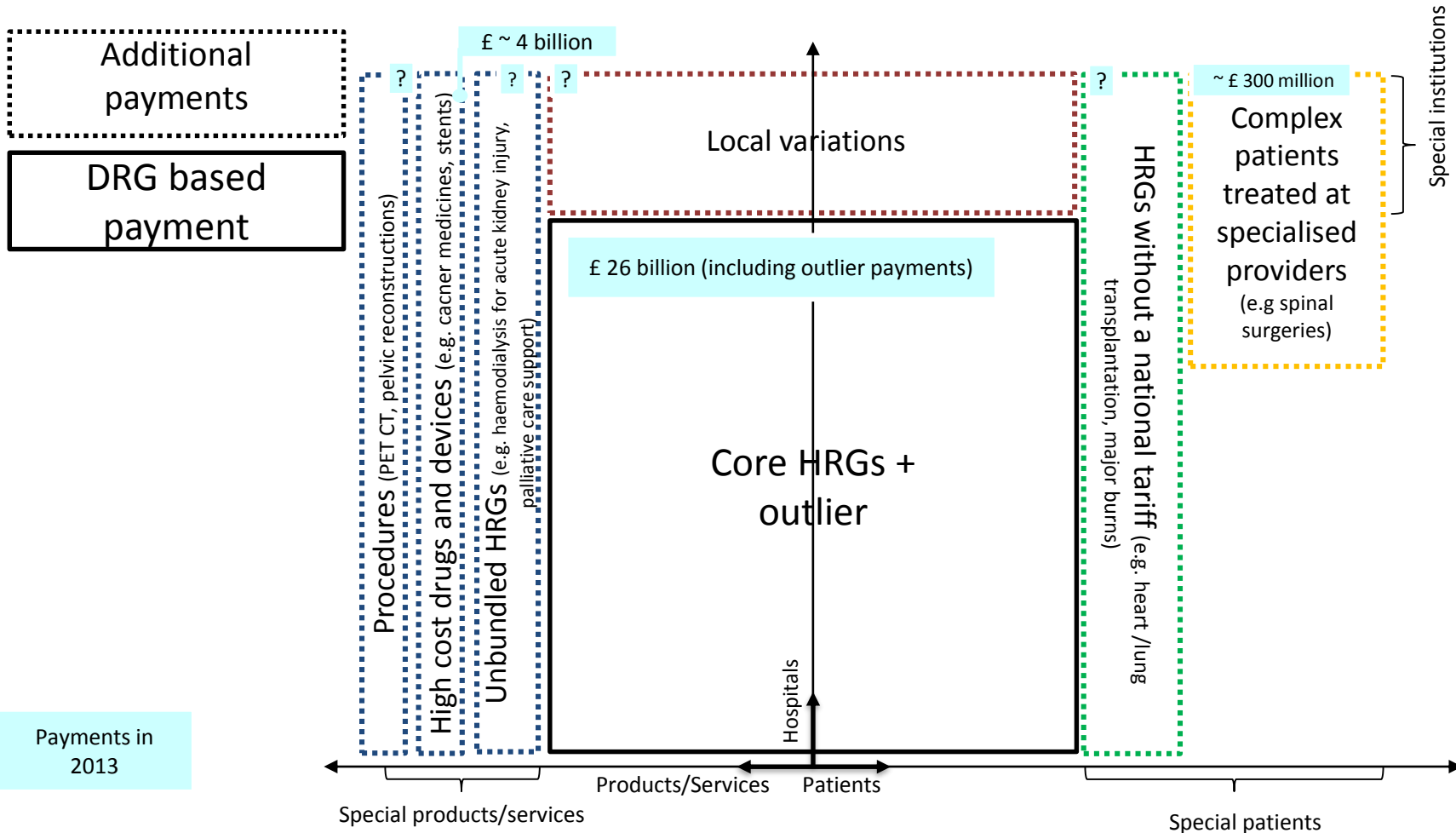


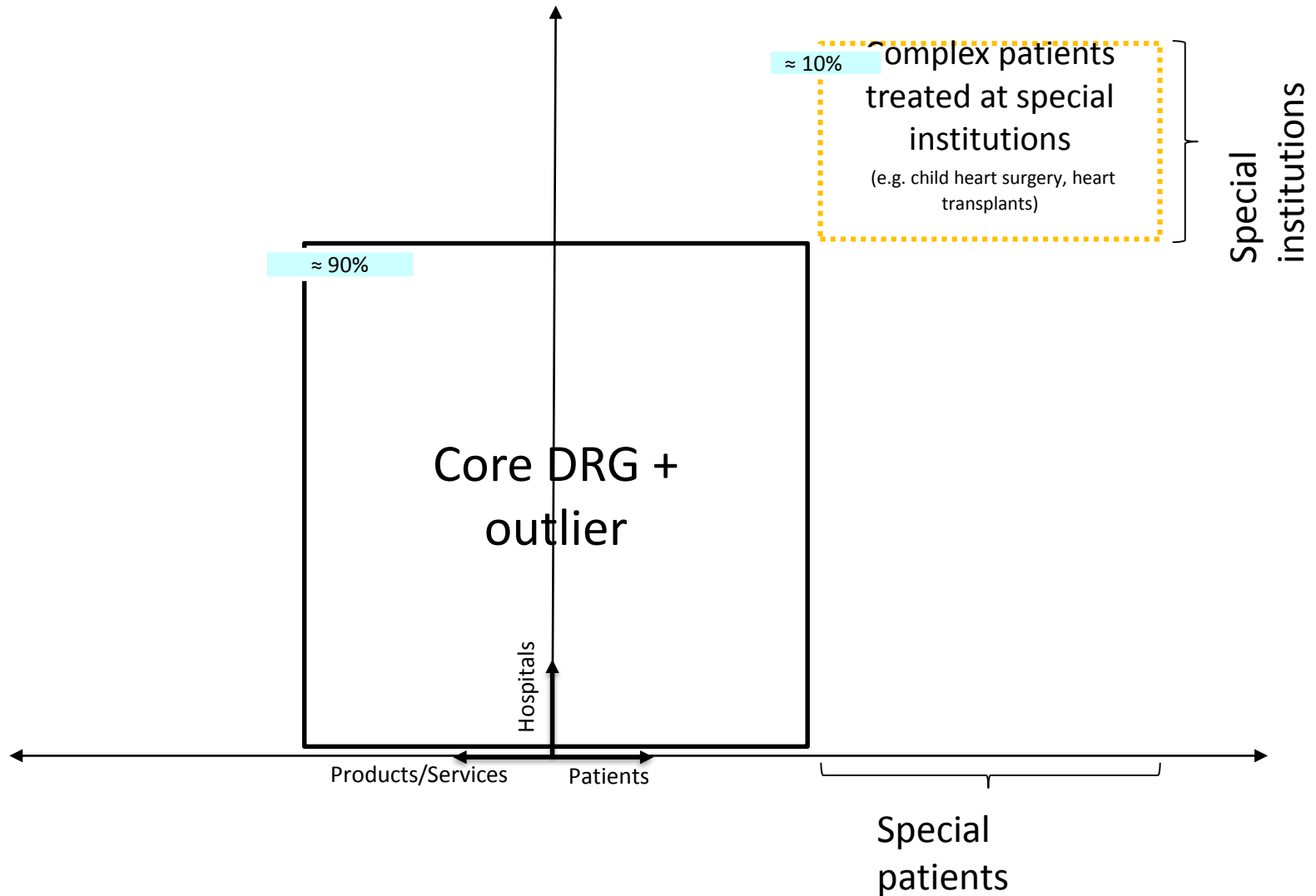




Payments in 2015





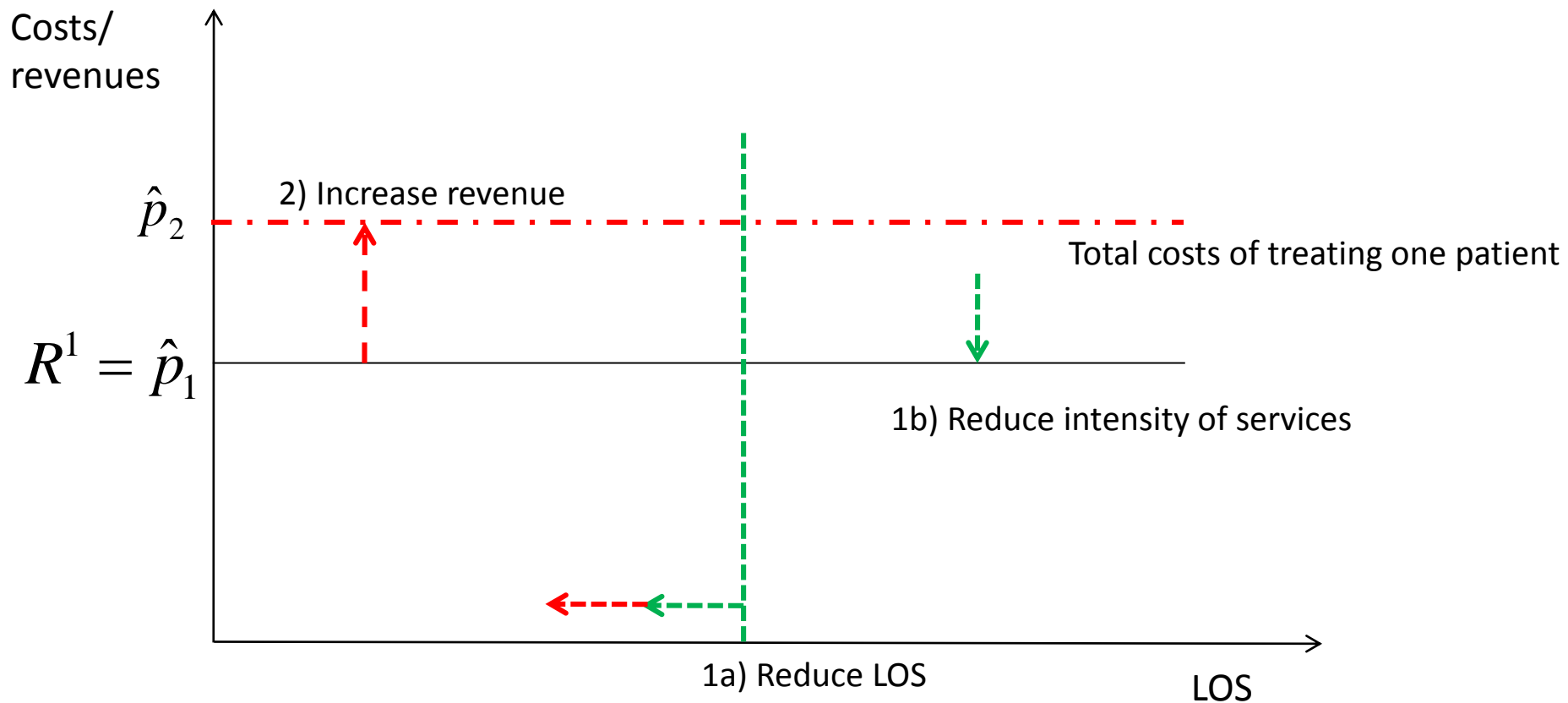


# Overview: examples of excluded medical areas

	Separate payment of			
	Patient Groups	Products/Services	Hospitals	Other
<b>Cancer treatment</b>	<b>England</b> (bone marrow transplantation) <b>Estonia</b> (chemotherapy) <b>Germany</b> (bone marrow transplantation)	<b>England, France, Germany</b> (cancer drugs)	<b>USA</b> (certain cancer hospitals)	<b>Denmark</b> (e.g. kidney cancer treatment)
<b>Specialized pediatrics</b>	<b>Germany</b> (certain neuropaediatrics)	<b>England</b> (e.g. neonatal intensive care) <b>France</b> (e.g. paediatric intensive care) <b>Germany</b> (neuropaediatric diagnostics)	<b>Germany</b> (e.g. child-rheumatology) <b>USA</b> (60 children hospitals)	<b>Denmark</b> (e.g. pediatric intensive care) <b>England</b> (top up payments for several specialized services)
<b>Severe burns</b>	<b>England, Germany</b> (major burns)		<b>Germany</b> (major burns)	<b>Denmark</b> (major burns)
<b>Neurological disease (e.g. multiple sclerosis, epilepsy)</b>	<b>Germany</b> (e.g. multimodal, complex treatment against Parkinson)	<b>Estonia</b> (biologic therapy for multiple sclerosis)	<b>Germany</b> (e.g. multiple sclerosis)	<b>Denmark</b> (e.g. atypical Parkinson) <b>England</b> (top-up payments for neuroscientific services)
<b>Intensive care</b>		<b>England</b> (e.g. neonatal intensive care) <b>France</b> (e.g. intensive care)		<b>Denmark</b> (e.g. intensive care for children)
<b>Transplantation</b>	<b>England</b> (transplantations)	<b>Estonia</b> (transplantations) <b>Germany, France</b> (only organ acquisition and management)	<b>USA</b> (transplantation centers for organ acquisition and management)	<b>Denmark</b> (transplantations)
<b>Radiotherapy</b>		<b>England</b> (e.g. radiotherapy) <b>Estonia</b> (brachytherapy) <b>France</b> (radiotherapy) <b>Germany</b> (certain radiotherapies)		<b>Denmark</b> (e.g. particle radiotherapy)



# Other problems with DRG-based hospital payment: unintended effects on quality?



- Measuring quality of care
- Mandatory reporting of quality of care
- Peer review
- Structural quality requirements (per DRG):
  - Staffing requirements (e.g. specialists or nurses)
  - Technical requirements (infrastructure, equipment)
  - Minimum volume thresholds
  - Quality management systems
- Linking payment to quality of care

# Possible options to adjust payments for quality of care

But highly complex because of difficulties to measure quality

	Single case	All cases with same diagnosis/ DRG	All cases within one hospital
Indication Quality	No payment if no indication	Deduction per DRG and share on case without indication; no payment if minimum quantity for specific treatments is not reached	
Structural Quality	Unverified procedure codes are neglected by grouping algorithm	Certain DRGs are not billable if specific structures are not in place (e.g. Stroke Unit DRG)	Budget deduction if structural deviation from hospital plan
Process Quality	Hospital acquired infections are neglected by grouping algorithm	„Best practice“ DRG-weights if costs for better quality are proven to be higher	
Outcome	Payment rules for unplanned readmissions	Surcharge for significant above average quality	Payment rules for unplanned readmissions
Reporting of Quality	No payment if quality data is not available	Deductions if quality data is not available for numerous cases	Base rate deduction if quality data is wrong or incomplete

# Other problems with DRG-based hospital payment: unintended effects on readmissions?

- Early discharge may lead to higher readmission because patients were still sick at discharge (“revolving door”)
- Incentives to increase number of patients
  - Splitting admissions (e.g. medical admission followed by surgical admission)
  - Readmitting patients for unnecessary care (inpatient follow-up)

# A framework for analysing readmission policies

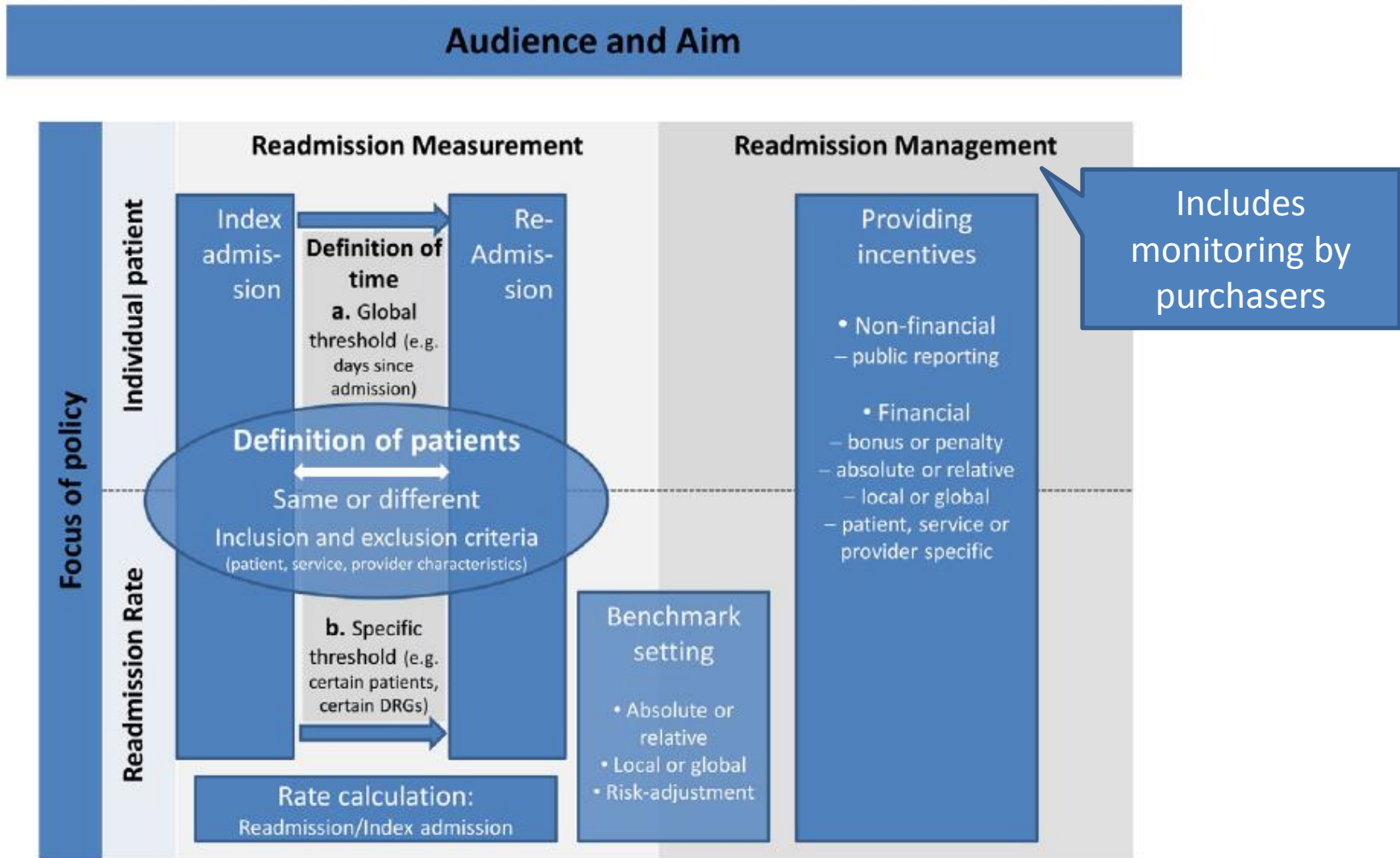


Fig. 1. A roadmap for health system policies for hospital readmissions.

Source: Kristensen et al. / Health Policy 119 (2015) 264–273

# Hospital budgets may/should consist of many components



Payments for non-patient care activities (e.g. teaching, research, advisory roles)

Payments for patients not classified into DRGs (e.g. psychiatry, rehab, outpatients)

Payments for special departments, treating special patients (e.g. burns units, pediatric intensive care)

Payments for special patients (e.g. epilepsy with complex diagnosis, transplantations)

Additional payments for special services/products (e.g. expensive drugs, innovations, teleconsultations)

Other types of payments for DRG-classified patients (e.g. global budgets, fee-for-service)

**DRG-based case payments,  
DRG-based budget allocation**  
(adjusted for outliers, quality etc.)

Adjustments for quality of care?

Negotiated budgets for designated centres of excellence

Payments only for centres designated in national plans

FFS, negotiated DRGs, per diems

Other funding mechanisms to reduce strength of DRG-based incentives

- Regular updates of DRG classification (based on input from providers)
- Refined classification to account for differences in complexity
- Adjusted to account for transfers between hospitals

- DRGs can be used for DRG-based case-payment or DRG-based budget allocation
- DRG-based payment is always combined with other payment components
- The proportion of costs paid based on DRGs determines the strength of the incentives
- Budgets are important to control incentives for volume increases
- Outlier payments and DRG carve-outs (for special services, patients, and/or hospitals) assure homogeneity of DRGs + adequate reimbursement for complex patients
- Quality assurance is important!
- Readmission policies need to be put in place.

Thank you very much for  
your time and attention!

Slides available on:  
**[www.mig.tu-berlin.de](http://www.mig.tu-berlin.de)**