



# State of the art in costing methods

22 January 2015

Siok Swan Tan

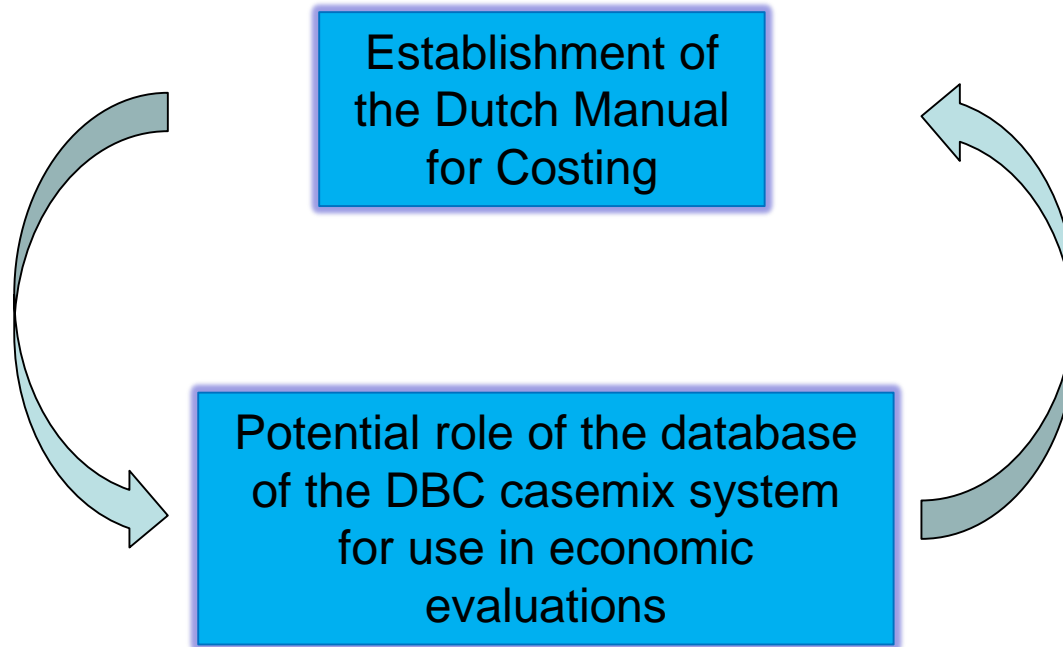
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# Agenda



# The Dutch Manual for Costing

2000

2004

2010

2015



# The Dutch Manual for Costing

→ instrument to researchers and healthcare decision makers which facilitates the implementation and assessment of costing studies in economic evaluations



2 sections:

- » Cost study Action Plan
- » Reference prices

# Cost study Action Plan

1. perspective

2. cost categories

3. identification services

4. measurement services

5. valuation services

6. uncertainty

7. cost reporting



# Cost study Action Plan: international comparison

Societal perspective *versus* healthcare payer's perspective



# Cost study Action Plan: international comparison

Societal perspective *versus* healthcare payer's perspective



Medical costs in life-years gained

Productivity costs

Discounting

# Reference prices

	Reference price
<b>Hospital:</b>	
Inpatient days	€457*
General hospital	€435
Academic hospital	€575
Intensive care department	€2183
Daycare treatments	€251
Outpatient visit	€72*
General hospital	€64
Academic hospital	€129
Emergency care	€151
<b>Blood products</b>	
Removal of erythrocytes, leukocytes, in SAGM	€201
Combining thrombocytes, 5 <sup>th</sup> , in plasma, leukocytes removed	€485
Apheresis plasma in citrate, fresh/frozen, leukocytes removed, secure from viruses	€173
<b>GP consultations</b>	
Standard consult	€28
Home visit	€43
Telephone contact/repeat prescription	€14
<b>Paramedical care</b>	
Physiotherapy	€36
Exercise therapy	€35
Speech therapy	€33
Occupational therapy	€22
Dietary advice	€27

	Reference price
Ambulance transport	€262
<b>Nursing home, residential home and home care</b>	
Inpatient day	€238
Day-care	€90
Home care (per hour)	€35
<b>Mental health care</b>	
First line:	
Contact first-line psychologist	€80
Contact social worker	€65
Contact GP	€57
Second line:	
Contact independent psychiatrist	€103
Contact independent psychotherapist	€77
Ambulant contact	€171
Third line:	
Ambulant contact	€173
Part-time treatment	€154
Inpatient day	€232
<b>Protected residential forms</b>	
Inpatient day	€151
<b>Rehabilitation:</b>	
Rehabilitation treatment hour	€110
Inpatient day	€340



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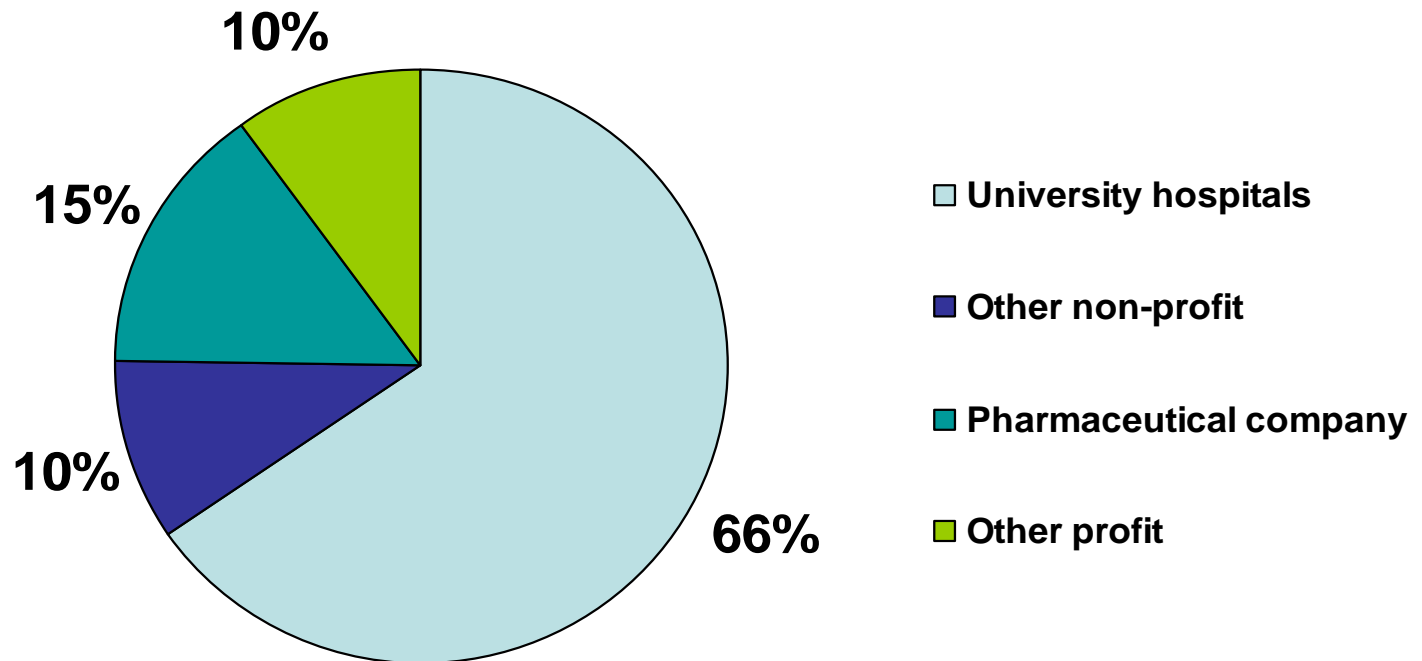
# Inpatient day ~ breakdown of costs

TABEL 9.1: REFERENTIEPRIJZEN VERPLEEGDAGEN

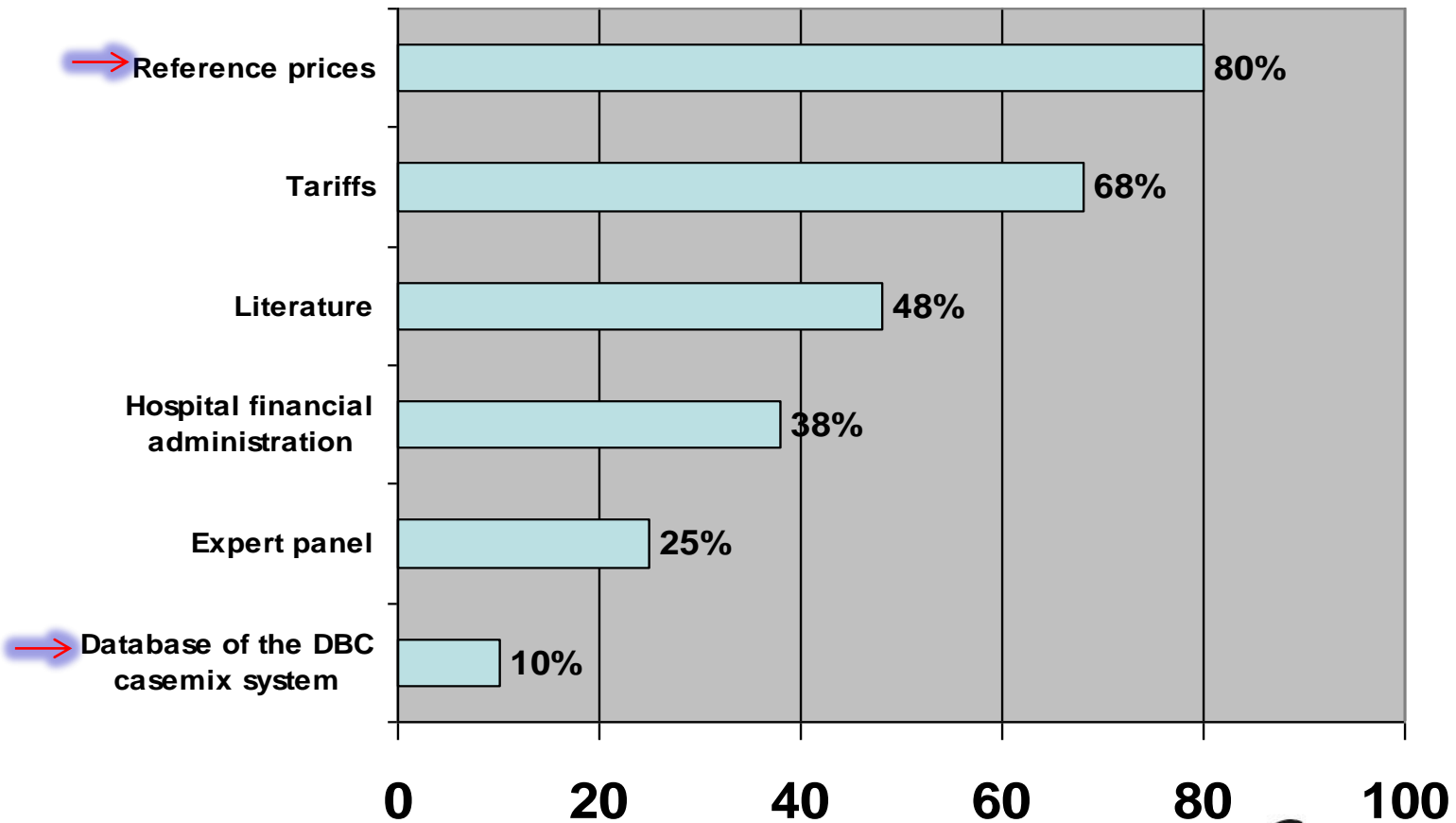
EURO 2009

	Algemeen ziekenhuis	Academisch ziekenhuis	Intensive Care Unit
Medisch specialist	27	21	63
Arts-assistent/ zaalarts	16	25	33
Verplegend/ direct personeel	150	203	907
Materiaal, voeding, hotelkosten	45	72	385
Geneesmiddelen	68	85	151
Huisvesting	20	26	98
Overhead en apparatuur	109	144	546
Referentieprijz 2009	435	575	2183

# Wide use of Dutch Manual for Costing



# Wide use of Dutch Manual for Costing



## DBC casemix system; 2005



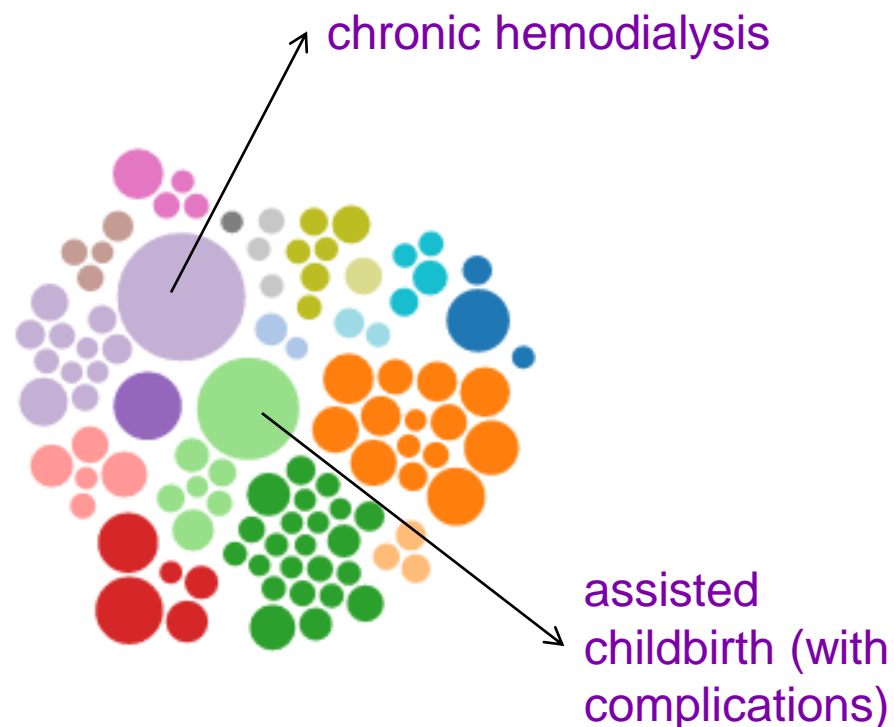
- Diagnose ~ Diagnosis
- Behandel ~ Treatment
- Combinatie ~ Combination

→ whole set of hospital services provided by the medical specialist and hospital from the first consultation and diagnosis of the medical specialist at the hospital to treatment completion

Number of DBCs: 4,391

# Top 100 most prevalent diagnoses per medical specialty (2014; *turnover*)

- Inwendige geneeskunde
- Obstetrie en gynaecologie
- Kindergeneeskunde
- Orthopedie
- Oogheelkunde
- Cardiologie
- Neurologie
- Longziekten
- Chirurgie
- Specialist ouderengeneeskunde
- Geriatrie
- Radiotherapie
- Dermatologie
- Urologie
- Keel-, neus- en oorheelkunde
- Cardio thoracale chirurgie
- Gastro-enterologie
- Revalidatie
- Anaesthesiologie
- Overig/alle specialismen



# Dutch Manual cautions against use of DBC tariffs

	Share of DBCs With fixed national prices	Share of DBCs with negotiated prices
2006	90%	10%
2009	67%	33%
2012	33%	67%
2015	10%	90%



# Database of the DBC casemix system

→ Primary objective: tariff setting

	Share of DBCs With fixed national prices	Share of DBCs with negotiated prices
2006	90%	10%
2009	67%	33%
2012	33%	67%
2015	10%	90%

# Resource categories

	Stroke
1. inpatient days	5
2. intensive care days	16
3. outpatient/ emergency room visits	9
4. daycare admissions	2
5. surgical procedures	58
6. medical devices	9
7. diagnostic procedures	182
8. medical imaging services	98
9. laboratory services	336
10. microbiology/ parasitology services	68
11. pathology services	6
12. blood products	7
13. paramedical services	32
14. rehabilitation services	6
	834

# Limitations of database

Not collected:

some hospital services

unit costs

clinical parameters



“Data don’t make any sense,  
we will have to resort to statistics.”

# Primary objective: tariff setting

The database of the DBC casemix system in support of economic evaluations

determine  
treatment  
costs and  
costs of  
illness

assess the  
compliance  
to practice  
guidelines

track  
treatment  
patterns  
over time

identify  
variables  
able to  
predict  
treatment  
costs

establish  
reference  
prices

# Patient populations

Patient population	Number of included patients
stroke	31,100
→ acute myocardial infarction	25,657
→ breast cancer	14,000
inguinal hernia repair	16,001
appendectomy	8,489
cholecystectomy	17,181

# Data sources

unit costs

Hospital services:

- database of the DBC casemix system

Unit costs:

- reference prices \*
- national prices
- existing literature

\* inpatient days, intensive care days, outpatient and emergency room visits and daycare admissions

# Acute myocardial infarction

unit costs

Hospital service	Unit costs (2008)
Catheterization	€ 366
PCI procedure	€ 361
Cardiovascular stent	€ 1,657

# Acute myocardial infarction

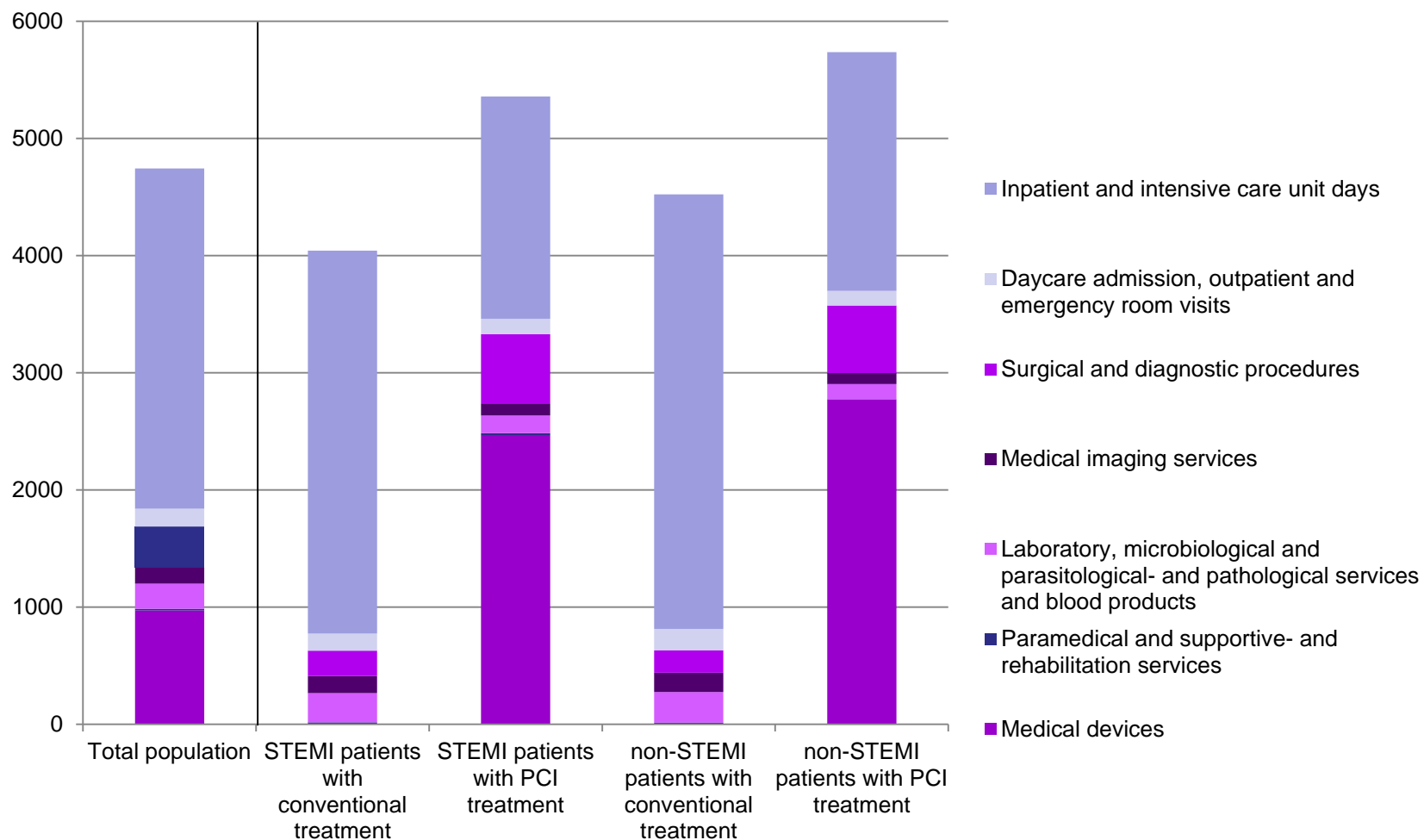
clinical parameters

## Patient sub-populations

- (1) STEMI patients with conventional treatment
- (2) STEMI patients with PCI treatment
- (3) non-STEMI patients with conventional treatment
- (4) non-STEMI patients with PCI treatment



# Acute myocardial infarction, n=25,657



# Breast cancer

clinical parameters

## Patient sub-populations

- (1) Benign breast cancer patients with conservative treatment
- (2) Benign breast cancer patients with surgical treatment
- (3) Malignant breast cancer patients with conservative treatment
- (4) Malignant breast cancer patients with surgical treatment
- (5) Malignant breast cancer patients with chemotherapy/hormonal treatment

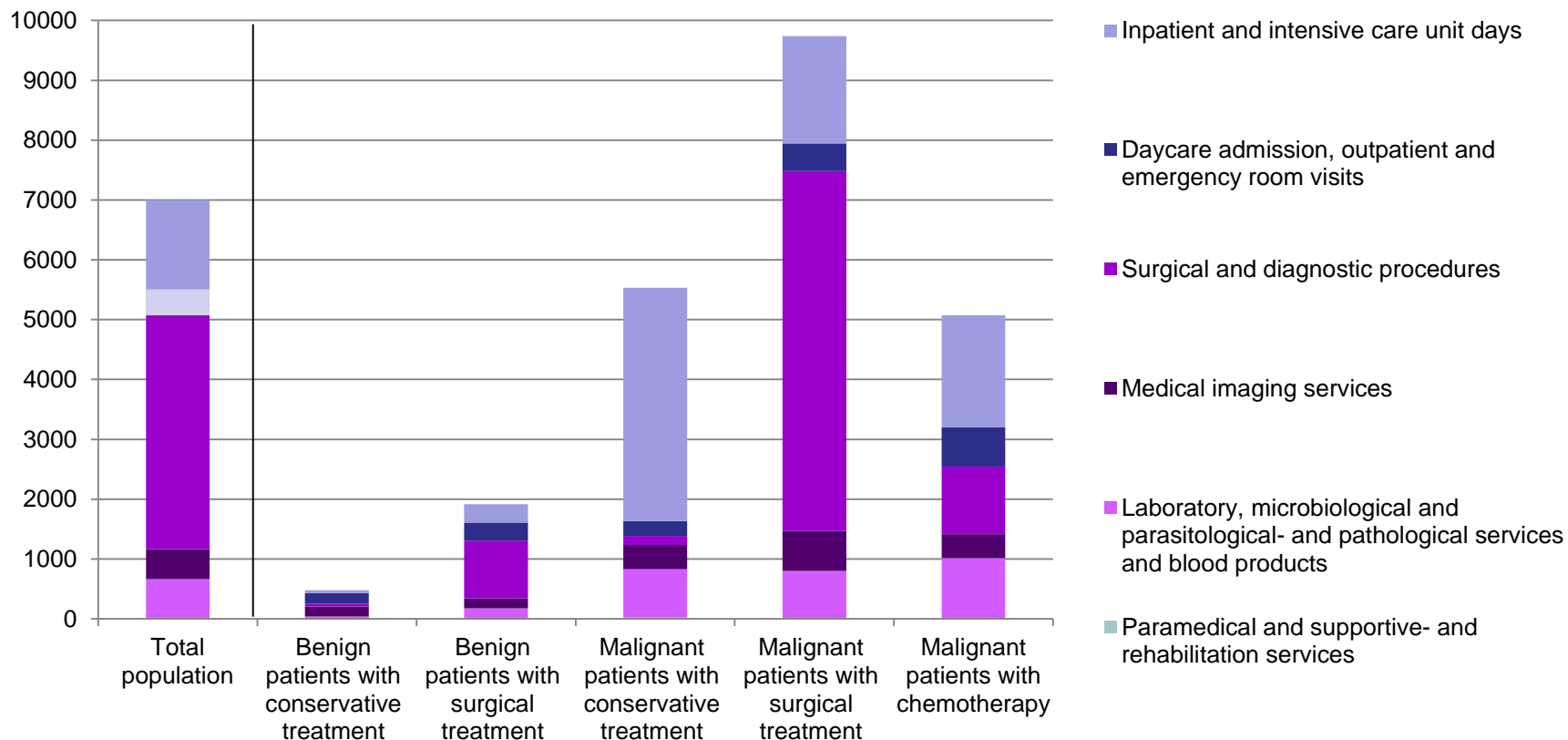
some hospital services

unit costs


# Breast cancer

Resource use	Unit costs (2008)
Mastectomy, unilateral	€ 6,763
Mastectomy, bilateral	€ 10,077
Chemotherapy	???
Hormonal therapy	???
Radiation therapy	???

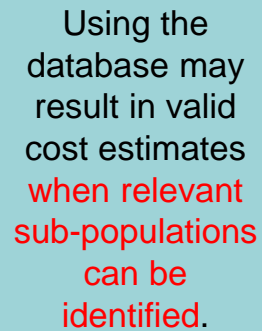
# Breast cancer, n=14,000



## The database of the DBC casemix system in support of economic evaluations

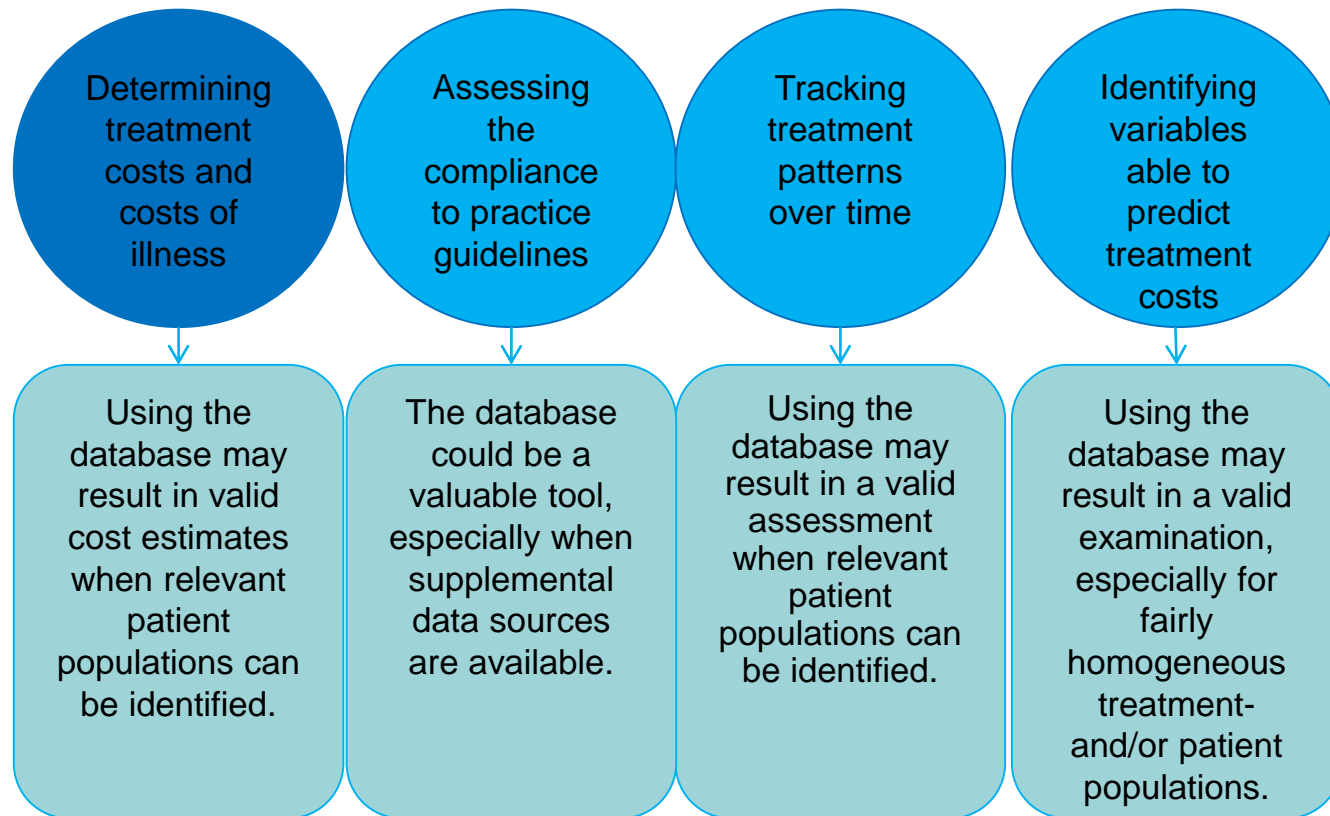


Determining  
treatment  
costs and  
costs of  
illness



Using the  
database may  
result in valid  
cost estimates  
when relevant  
sub-populations  
can be  
identified.

## The database of the DBC casemix system in support of economic evaluations



# Database in support of economic evaluations

Database may:

1. serve as an important data source for the conduct of economic evaluations
2. enable the collection of hospital services for individual patients from a single data source
3. encourage the comparability of economic evaluations

## The database of the DBC casemix system in support of economic evaluations

Determining  
treatment  
costs and  
costs of  
illness

Identifying  
variables  
able to  
predict  
treatment  
costs

Tracking  
treatment  
patterns  
over time

Assessing  
the  
compliance  
to practice  
guidelines

Establish  
reference  
prices

The database is  
**not sufficiently  
valid** to establish  
reference  
prices.



### Preliminary Reference prices for some medical specialties (Euro 2011)

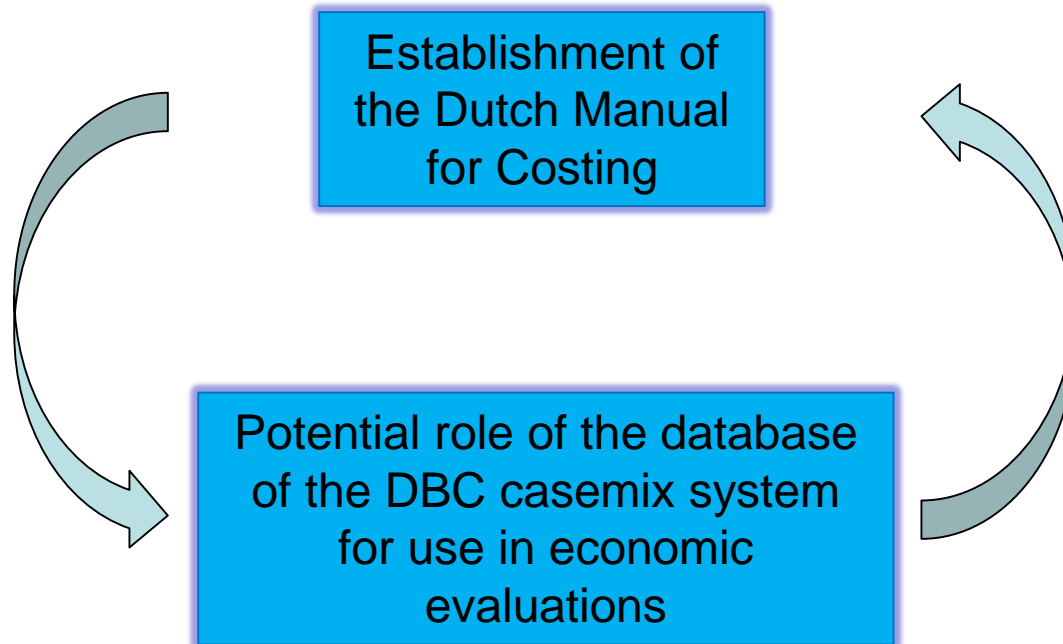
\*Weighted average based on a ratio of 1 (university) : 2 (general hospitals)

<sup>a</sup>Tan SS, van Gils CWM, Franken MG, Hakkaart L, Uyl CA. The unit costs of inpatient hospital days, outpatient visits and daycare treatments in the fields of oncology and hematology. Value in Health; 13(6): 712-19

<sup>b</sup>Hakkaart L, Tan SS, Bouwmans CAM. Dutch Manual for Costing. CVZ 2010

	Surgery	Neurology	Pediatrics	Hemato-oncology <sup>a</sup>	General reference prices <sup>b</sup>
<b>Inpatient days*</b>					
-university	414	-	657	522	474
-general	540	-	904	706	596
	350	353	528	430	451
<b>Outpatient visits*</b>					
-university	76	-	-	109	75
-general	98	-	-	141	134
	65	79	70	92	66

# Agenda





	Cost item	Unit costs	Average resource use per patient	Average costs per patient
LOS*	Inpatient days	€ 485	4.828	€ 2,343
	Intensive care days	€ 2,319	0.052	€ 120
Visits	Outpatient visits	€ 76	0.750	€ 57
	Emergency room visits	€ 160	0.077	€ 12
	Ambulatory treatment	€ 267	0.008	€ 2
Diagnostics/imaging tests	CT (brain)	€ 197	0.055	€ 11
	Duplex (carotid)	€ 85	1.161	€ 99
	ECG	€ 20	0.265	€ 5
	X-ray (thorax)	€ 51	0.166	€ 8
	MRI (brain)	€ 253	0.007	€ 2
	EEG	€ 73	0.457	€ 33
	Other imaging services	€ 129	0.951	€ 122
Surgery	Carotid endarterectomy	€ 3,486	1.000	€ 3,486
	Other surgery	€ 3,486	0.129	€ 450
Allied health services	Physical therapy	€ 38	0.292	€ 11
	Occupational therapy	€ 24	0.035	€ 1
	Speech therapy	€ 35	0.053	€ 2
	Psycho therapy	€ 82	0.000	€ 0
Laboratory investigations	Laboratory services	€ 13	3.369	€ 45
	Microbiological services	€ 15	0.542	€ 8
	Pathological services	€ 91	0.118	€ 11
	Blood (derived) products	€ 219	0.031	€ 7