

The costs of seven case-vignettes in the Danish health sector

- Appendectomy
- Normal delivery
- Hip replacement
- Cataract (operation)
- Stroke
- AMI
- Colonoscopy

Part II: Results from a survey based on figures from
2005

*Data Collection Report for Denmark, Work Package 9 of
the Health Basket project (SP21-CT-2004-501588)*

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List of abbreviations

ACS	Acute Coronary Syndrome
AMI	Acute Myocardial Infarction
ASA	American Society of Anaesthesiology (grouping of patients according to risk (1-5) in anaesthesia)
DAGS	Danish ambulatory groups
DD	Daily Doses
DkDRG	Danish version of Diagnosis Related Groups
DRG	Diagnosis Related Groups
ECG	Electro cardiography
GP	General Practitioner
KAG	Coronary Arterygraphy
LOS	Length of stay
NCD	National Cost Database
NCSP	Nordic Classification of Surgical Procedures
NIP	National Indicator Project
NOV	Number of visits
PCI	Percutane Coronary Intervention
SD	Standard deviation
IU	Injection Units

Preface

This report is preceded by another report, “Part I”¹, which outlines the results of a data collection process aiming at costing ten case-vignettes in the Danish health sector (denoted Part I). Part I is based on a description of patient pathways and ways of organising the services as they took place in 2004 in the Danish health sector and on top of that on the provision of corresponding cost figures from 2004. This report, “Part II”, provides an update of these figures to 2005 and compares them with results of a survey of resource use from a sample of Danish hospitals to assess the costs of seven of the hospital based vignettes from a “bottom-up” perspective.

The report has been elaborated in autumn 2006 by the DSI Danish Institute for Health Services Research as part of Work Package 9 of the EU funded research project, “HealthBAS-KET, Health Benefits and Services Costs in Europe ” (EU-contract No. SP 21-2004-501588 under the sixth Framework Programme).

Authors of the report are Anni Ankjær-Jensen (responsible for the project management) and Jesper Thyge Johansen (responsible for the questionnaire part of the project concerning vignette 1 (appendectomy), 2 (normal delivery), 3 (hip replacement), 4 (cataract), 5 (stroke), 6 (AMI) and 8 (colonoscopy) and for coordination of this report.

We thank the (many) participating health care sites for their efforts in providing data for the survey.

Omissions and errors are our own.

¹ Bilde L, Ankjær-Jensen A, Kilsmark K. Costing 10 case-vignettes in the Danish Health Sector, Part I, DSI Danish Institute for Health Services Research

1 Results and summary

The purpose of this report is to outline the results of a questionnaire based survey in which Danish hospital departments were asked to provide estimates of their resource use in relation to seven hospital-based case-vignettes. The questionnaires were constructed on the basis of the description of patient pathways provided in the first report, “part I”. Furthermore, the report provides a price and wage adjustment of the 2004 national figures from “part I” to 2005, and compares these figures with the results from the survey.

Table 1.1 below provides a summary of the results at local as well as national level concerning vignettes 1-6 and 8. The table indicates the number of hospitals and patient records included in the cost estimates. Further the table indicates mean length of stay, the mean total cost per vignette, and a comparison with the national (DRG) tariff.

Table 1.1 Results summary Denmark in € 2005, results and cost figures based on local sample, the national cost database and, national tariffs 2004, Vignette 1-6 and vignette 8.*

Results summary Denmark in €2005, results and cost figures based on sample and national cost database, national tariff 2005

Vignette	Local sample				National average				Tariff
	N Hospitals	n patient records	Mean LOS/NOV	Mean costs €	N Hospitals	n patient records	Mean LOS/NOV	Mean costs €	National Tariff €
1 Appendicitis	2	23	2	2.617	29	312	2	2.455	2.233
2. Normal Delivery	4	2.821	2	1.633	18	8905	2	1.786	1.944
3. Hip replacement	2	89	7	5.067	28	869	8	8.847	7.841
4. Cataract	4	420	1	597	9	723	2	974	1.440
5. Stroke	1	109	5	3.362	38	867	11	5.562	5.889
6 AMI with surgery	1	159	3	14.575	2	160	6	14.533	
6 AMI without surgery	2	69	5	2.403	34	528	3	3.226	
8 Colonoscopy	3	0	1	722	24	426	1	705	

*National cost and price figures 2004 from the first report “Part I”, adjusted to 2005 prices and wages.

The table represents two different approaches to cost calculation. One approach is the calculation of national averages based on the National Cost Database (NCD), undertaken as part of and described in “part I” report, price and wage adjusted to 2005. The other approach is a calculation based on information of direct resource use from a small sample of hospitals to elicit mean total costs for the hospitals included in the sample, supplemented by data from the NCD on the particular hospitals in the sample.

It appears from table 1.1 that there is only a small difference between the two cost estimates for some vignettes (1, 2, 8). For other vignettes (3, 4, 5 and 6) there are major differences in the cost estimates. The main reason for the differences between the two estimates is undoubtedly the small sample on which the local cost estimate is based. The sample does therefore not seem to be very representative for the hospitals in Denmark.

The discussion of costs vs. prices has been undertaken in the first report, “Part I”.

2 Introduction

2.1 Background and objective of report

This report is part of one out of many outputs from a European research collaboration aiming at developing methods to compare health care services and costs across countries, the Health Basket project². It provides a price and wage adjustment to 2005 of the results of part I, which estimated the costs of ten “case-vignettes” in the Danish setting for 2004. Furthermore, this report outlines the results of a survey carried out among a number of Danish hospital departments to estimate the resource use and costs of seven hospital based case-vignettes and compare these estimates with the adjusted national cost figures.

2.2 Methods and data sources

Introduction

The methods, data sources and processes relating to the translation of the data collection guidelines into the Danish setting, the inclusion of patients and extraction of national data etc. are described in the first report, “part I”.

All cost figures from the first report which were from 2004 have been price and wage adjusted to 2005.

Methods for calculating costs for the hospital-based vignettes (1-6, and 8)

Data from the local samples

The initial strategy of conducting interviews with key clinics/departments to supplement the national average cost of the NCD is described in the first report, Part I. In the present report, we opted for a method where samples of local figures would be supplemented with local data from the NCD and compared to the NCD national average figures. Hence the original data from the interviews are here supplemented with data from questionnaires, where we have sought to broaden the base of the sample.

We sent out 48 questionnaires to relevant clinics/departments geographically situated in the region of Sealand. Due to an unfortunate combination of a short deadline and holidays we only received 14 questionnaires to supplement the original 7 interviews. Two of the received questionnaires were unusable due to lack of data quality or because the questionnaire only dealt with parts of the hospitalization.

We asked the clinics/departments to estimate the resources used in terms of time (staff), number and type of diagnostic procedures, drug use etc. Since local costs of services supplied by departments within the hospital are often absent in Danish Hospital settings and due to a short deadline of the projects we used unit costs from a single supplier. The chosen reference hospital has several years of experience in calculating costs for different purposes in the Danish Health sector, and they do it within a single framework: the method of activity based costing.

² Health Basket: Health Benefits and Service Costs in Europe, EU contract No. SP21-CT-2004-501588.

Wages includes all wage elements including costs of pension. The effective hourly wage is calculated by dividing the annual wage with the sum of working hours (subtracting holidays and average figures for absence due to illness, maternity leave, etc.).

Costs of Radiology services (X-rays, CT-scans, etc.) are calculated using cost data from the reference hospital and relative service weights supplied by the National Board of Health.

Costs of laboratory tests are based on the unit costs calculated at the reference hospital.

Drug costs are based on the price list of the hospital pharmacy of the Copenhagen Hospital Corporation.

All unit costs are based on 2004-figures adjusted to 2005-prices and wages. The adjusted cost figures are presented in € using the 2005 yearly calculated average exchange rate of 100 € = 745.1927 DKK³

The local estimates of number of resource units used in the different vignettes are then multiplied (where applicable) with the unit costs from the reference hospital in order to get the total cost of the particular resource.

Data from the National Cost Database (NCD)

The national cost database is managed by the National Board of Health and includes detailed cost data from most Danish hospitals⁴. The hospitals calculate their patient specific costs using a step-down cost allocation method, where all costs are allocated to intermediate and final cost centres, and subsequently from intermediate to final cost centres using relevant allocation keys. The hospitals report these data to the National Board of Health, who then merge cost data with data from the patient activity database (LPR) to form what is called the “patient string”. The patient string consists of patient data with costs, i.e. a list of all services the patient has received during stay at the hospital. On the basis of the patient string the National Board of Health is able to supply detailed cost figures for local hospitals, where the costs are based on patients - not on clinics and departments - and thus to calculate national tariffs for the Danish DRG system DkDRG.

The Danish case-mix system consists of the DkDRG system for inpatients and the DAGS for patients treated as out-patients. The case-mix system and the costing procedure have previously been described in other publications relating to the Health Basket project.⁵

Indirect costs

Indirect costs at department as well as at hospital level are already included in the National Cost database figures. Two different approaches have been utilised in order to estimate the indirect- or overhead parts of the total cost.

At national level this was done by calculating the proportion of indirect costs of the total annual hospital costs from three of the participating hospitals. This calculation resulted in indirect costs of 29, 30, 31 per cent respectively of the total cost. Thus 30 per cent is assumed to

³ Data from the National Bank of Denmark, Danmarks Nationalbank, www.nationalbanken.dk

⁴ The 2006 version of the cost database is based on 86% of total number of patient contacts in public hospitals.

⁵ Bilde L, Jensen AA. Approaches for price setting and cost assessment in the Danish Health sector. DSI København 2005, published at www.dsi.dk and www.ehma.org and

Jensen AA, Rosling P, Bilde L. Cost weights in the Danish case-mix system. Variable prospective financing in the Danish hospital sector and the development of a Danish case-mix system. In press. Health Management Science 2006

be applicable to all calculated total costs. The cost components included in the indirect costs calculated were administration, cleaning, laundry, feeding of patients, maintenance of buildings and green areas.

At local level overhead costs are, in principle, the difference between average total cost of the patients included in the vignette, and the direct cost calculated on the basis of the information gathered through the questionnaire. In order to split overhead into overhead at department level and overhead at hospital level, we used data from the reference hospital reflecting clinic/department direct costs compared to the total costs allocated to the clinic/department.

The figures of the reference hospital have, when available, been used to calculate overhead for similar clinics/departments.

No reduction of indirect departments costs have been made in the presentation of results.

Capital costs and depreciations are not included in the Danish DRG prices and therefore not included in the estimates from the cost database.

Overview of the method used for calculations.

The method used in the hospital vignettes can be summarised in the following way:

- A. The interviews and questionnaires provide local estimates of units and number of units of resources used.
- B. The local estimates are multiplied with unit costs calculated at the reference hospital to calculate total direct cost.
- C. Local total cost figures for the relevant vignette are supplied from the NCD.
- D. The average local cost figure from the NCD are then multiplied with the overhead-percentage from a comparable clinical setting at the reference hospital to calculate the overhead cost at hospital level.
- E. The clinic/department overhead is then calculated by subtracting overhead (D) and local cost figures supplied from the bottom-up approach (A+B).

The method is thus a combination of a bottom-up and a top-down approach, which partly ensures relatively detailed information in the clinic/department setting, partly places local estimates in a balanced local framework, where total local cost figures have been balanced with the total account of the hospital.

Unless otherwise stated calculations of average costs, LOS, etc. are weighted averages - the number of cases constituting the weight factor.

3 Cost estimates based on local data

3.1 Appendectomy (vignette 1)

Patient inclusion criteria: “Healthy male, ca. 14-25 years old, presents to hospital (accident and emergency department if existing; otherwise directly to surgical department) with acute abdominal pain. Start of case vignette: hospital door. Abdominal palpation yields typical signs of appendicitis. End of vignette: discharge.”

Cost estimate based on local data

The data of the vignette consists of data from one interview and one questionnaire. Seven questionnaires were sent to a selection of Gastroenterological departments – two was returned. Data from the sample is presented below.

Hospital A

General information about the gastroenterology department Hospital A

Hospital level	Department level				
Number of beds	Number of beds	Number of cases	Average length of stay	Number of physicians	Number of nursing staff
725	93	6,304		55	167

In 2004, the number of appendectomies carried out at the department was around 300, of which 17 met the inclusion criteria for the vignette.

The elements of the treatment episode are described in the table 3.1 below.

Table 3.1 Cost data for patients admitted with appendicitis at the gastroenterology department at Hospital A

Phase	Type of resource used	Units	Percentage of patients	No. of units used/patient	Unit cost	Total cost
Preparation for operation	Staff	Physician: 90 min.	100%	1,50	45,57	68,36
		Nurse: 120 min.	100%	2,00	26,93	53,86
		Physician (anesthetist) : 22 min.	100%	0,37	45,57	16,71
Operation	Staff	Nurse (anesthetist) 90 min.	100%	1,50	26,93	40,39
		Physician (anesthetist) : 30 min.	100%	0,50	45,57	22,79
		Physician (surgeon): 2 X 60 min.	100%	2,00	45,57	91,14
		Nurse 2 X 90 min.	100%	3,00	26,93	80,79
	Drugs	Innohep 3.500 IU	100%	1,00	3,33	3,33
		Anaesthetics	100%	1,00	134,19	134,19
	Other resources	Consumables	100%	1,00	117,00	117,00
		Microbiological test for infection	10%	1,00	na.	
		Pathological test	na.	na.	na.	
Wake-up room	Staff	Porter 15 min.	100%	0,25	26,20	6,55
		Nurse 55 min.	100%	0,92	26,93	24,69
Post operative	Staff	Nurse 216 min.	100%	3,60	26,93	96,95
	Drugs	Paracetamol (1g. X 4)	100%	4,00	na.	
		Ibuprofen (600 mg. X 3)	100%	3,00	0,08	0,23
		Metronidazol	100%	1,00	0,15	0,15
		Gentamycin	100%	1,00	na.	
		Anhyphen (if. Infection)	na.	na.	na.	na.
Overhead department level						944,88
Overhead and services from other departments						811,69
Total cost						2.513,69

Patients treated meeting the inclusion criteria

17

Average LOS

1,4 days

Source: Interviews

Hospital B

General information about the surgical department Hospital B

Hospital level	Department level				
Number of beds	Number of beds	Number of cases	Average length of stay	Number of physicians	Number of nursing staff
1,207					

Table 3.2 Cost data for patients admitted with appendicitis at the surgical department at Hospital B

Phase	Type of resource used	Units	Percentage of patients	No. of units used/patient	Unit cost	Total cost
Preparation for operation	Staff	Physician: 30 min.	100%	0,50	45,57	22,79
		Nurse: 45 min.	100%	0,75	26,93	20,20
		Physician (anesthetist): 10 min.	100%	0,17	45,57	7,60
	Diagnostic resources	Blood tests	100%	1,00	na.	
		BAS test (blood test)	80%	1,00	21,50	17,20
		Ultra sound abdomen	20%	1,00	60,43	12,09
		X-ray Thorax	10%	1,00	54,54	5,45
		Magnetic Resonance abdomen	10%	1,00	na.	
	Drugs	Analgesics	30%	1,00	na.	
		Antibiotics	70%	1,00	na.	
Operation	Staff	Nurse (anesthetist) 110 min.	100%	1,83	26,93	49,37
		Physician (anesthetist) : 60 min.	100%	1,00	45,57	45,57
		Physician (surgeon): 2 X 65 min.	100%	2,17	45,57	98,74
		Nurse 2 X 100 min.	100%	3,33	26,93	89,76
	Drugs	Metronidazol, 1,5 g.	40%	1,00	1,04	0,41
		Gentamycin 240 mg.	25%	1,00	na.	
		Zinacef 1,5 g.	25%	1,00	10,52	2,63
Other resources	Microbiological test for infection	10%		na.		
Wake-up room	Staff	Porter 10 min.	100%	0,17	26,20	4,37
		Nurse 45 min.	100%	0,75	26,93	20,20
Post operative	Staff	Nurse 40 min./day	100%	1,33	26,93	35,91
		Physician 15 min./day	100%	0,50	45,57	22,79
		Porter 10 min./day	100%	0,33	26,20	8,73
	Drugs	Paracetamol (1g. X 4)	100%		na.	
		NSAID 8 mg. X 3	95%	na.	na.	
		Metronidazol (500 mg. X 3)	25%	3,00	0,69	0,52
		Morphine 10 mg. X 4	90%	4,00	0,11	0,39
		Gentamycin (240 mg. X 1)	25%	na.	na.	
		Zinacef 1,5 g. X 3	25%	3,00	9,82	7,37
Antibiotics	25%	1,00	na.			
Overhead department level						1356,05
Overhead and services from other departments						1.087,43
Total cost						2.908,18

Patients treated meeting the inclusion criteria

6

Average LOS after operation

2,0 days

Source: Questionnaire

Table 3.3 Average cost from sample. Appendectomy

Average costs vignette 1 appendectomy

Phase	Type of ressource used	Units	Unit cost	Total cost
Preparation for operation	Staff	Physician:	45,57	56,47
		Nurse:	26,93	45,08
		Physician (anaesthetist):	45,57	14,33
	Diagnostic ressources			9,06
	Drugs		na.	
Operation	Staff	Nurse (anaesthetist)	26,93	42,74
		Physician (anaesthetist)	45,57	28,73
		Physician (surgeon)	45,57	93,12
		Nurse	26,93	83,13
	Drugs			102,44
	Other ressources			86,48
Wake-up room	Staff	Porter	26,20	5,98
		Nurse	26,93	23,51
Post operative	Staff	Nurse	26,93	81,02
		Physician	45,57	5,94
		Porter	26,20	2,28
	Drugs			2,44
Overhead department level				945,05
Overhead and services from other departments				988,79
Total cost				2.616,60

Patients treated meeting the inclusion criteria

23

Average LOS after operation

1,6 days

3.2 Normal Delivery (vignette 2)

Patient inclusion criteria: “Healthy woman, 25-34 years old, presents to hospital after 39 weeks of an uncomplicated first pregnancy with labour pains. Start of case vignette: hospital door. Upon examination of the woman, the baby presentation is normal (i.e. cephalic/ vertex; one foetus) and a vaginal “normal” delivery is carried out without complications (no transfer to paediatric department or new born intensive care unit). End of vignette: discharge of mother and child (both are well).”

Cost estimate based on local data

The sample data of the vignette consists of data from one interview and three questionnaires. Seven questionnaires were sent to a selection of gynaecological-obstetric departments. Four questionnaires were returned but one was omitted due to poor data. Data from the sample of four departments are presented below.

Hospital A

General information about the gynaecological-obstetric department at Hospital A

Hospital level	Department level				
Number of beds	Number of beds	Number of cases	Average length of stay	Number of physicians	Number of nursing staff
725	89	6170	3,2	46	130

Table 4.1 Cost data for patients admitted for normal delivery at Hospital A

Phase	Type of resource used	Units	Percentage of patients	No. of units used/patient	Unit cost	Total cost
Pre-delivery (admission and planning)	Staff	Midwife 20 min.	100%	0,33	28,11	9,37
		Nurse: 10 min.	75%	0,17	26,93	3,37
	Diagnostic procedures	Cardiotocography 10 min.	90%	1,00	na.	
	Drugs	Klyx 250 ml.	95%	1,00	na.	
Delivery (including partum and post partum activity in delivery room)	Staff	Midwife 390 min.	100%	6,50	28,11	182,70
		Nurse (anesthetist) 40 min.	30%	0,67	26,93	5,39
		Physician (anesthetist) : 20 min.	30%	0,33	45,57	4,56
		Physician: 10 min.	50%	0,17	45,57	3,80
		Nurse 30 min.	100%	0,50	26,93	13,46
	Diagnostic procedures	Cardiotocography	na.	na.	na.	
		Blood tests	na.	na.	na.	
	Drugs	Morphine	5%	1,00	na.	
		Bupovacain + sufenta (Epidural)	26%	1,00	na.	
		Carbocain 10mg./ml. 10 ml.	25%	1,00	2,12	0,53
		Carbocain 10mg./ml. 20 ml. (Pudendus)	10%	1,00	4,24	0,42
		Syntocinon	100%	1,00	0,48	0,48
Konaktion 10mg./ml. (child)		100%	1,00	1,32	1,32	
Post-delivery	Staff	Midwife 75 min./day	100%	1,86	26,20	48,79
		Nurse 75 min./day	100%	1,86	26,93	50,14
		Physician 10 min./child/day	100%	0,25	45,57	11,31
		Physiotherapist 30 min./day	50%	0,74	29,74	11,07
		Porter 10 min.	50%	0,17	26,20	2,18
	Drugs	Pamol	75%	4,00	0,08	0,24
		Anti-D	30%	1,00	na.	
Overhead department level						752,24
Overhead and services from other departments						518,19
Total cost						1.619,57

Number of patients treated meeting the inclusion criteria

1145

Average LOS

2,0 days

Source: Questionnaire

Hospital B

General information about the gynaecological-obstetric department Hospital B

Hospital level	Department level				
Number of beds	Number of beds	Number of cases	Average length of stay	Number of physicians	Number of nursing staff
1,207	48	7,403	4.4	56.5	60.2

Table 4.2 Cost data for patients admitted for normal delivery at Hospital B

Phase	Type of resource used	Units	Percentage of patients	No. of units used/patient	Unit cost	Total cost	
Pre-delivery (admission and planning)	Staff	Midwife 100 min.	100%	1,00	28,11	28,11	
		Nurse: 10 min.	100%	0,17	26,93	4,49	
		Assistant 10 min.	100%	0,10	23,30	2,33	
Delivery (including partum and post partum activity in delivery room)	Staff	Diagnostic procedures	Cardiotocography 30 min.	70%	1,00	na.	
		Midwife 420 min.	100%	7,00	28,11	196,76	
		Nurse (anesthetist) 30 min.	30%	0,50	26,93	4,04	
		Physician (anesthetist) 30 min.	30%	0,50	45,57	6,84	
		Physician: 30 min.	70%	0,50	45,57	15,95	
	Nurse 60 min.	100%	1,00	26,93	26,93		
	Diagnostic procedures	Cardiotocography	70%	1,00	na.		
	Drugs	Epidural	20%	1,00	na.		
		Lidocain	na.	na.	na.		
		Bupivacain	na.	na.	na.		
Syntocinon		45%	1,00	0,48	0,22		
Post-delivery	Staff	Midwife 200 min.	na.	3,33	26,20	87,35	
		Nurse 120 min. X 2	95%	5,33	26,93	136,44	
	Drugs	Pamol	75%	4,00	0,08	0,24	
		Anti-D	30%	1,00	na.		
Overhead department level						585,30	
Overhead and services from other departments						533,50	
Total cost						1.628,48	

Number of patients treated meeting the inclusion criteria

643

Average LOS

2,2 days

Source: Questionnaire

Hospital C

General information about the gynaecological-obstetric department Hospital C

Hospital level	Department level				
Number of beds	Number of beds	Number of cases	Average length of stay	Number of physicians	Number of nursing staff
	36			33	64

Table 4.3 Cost data for patients admitted for normal delivery at Hospital C

Phase	Type of resource used	Units	Percentage of patients	No. of units used/patient	Unit cost	Total cost
Pre-delivery (admission and planning)	Staff	Midwife 30 min.	100%	0,50	28,11	14,05
	Diagnostic procedures	Cardiotocography 20 min.	100%	1,00	na.	
Delivery (including partum and post partum activity in delivery room)	Staff	Midwife 480 min.	100%	8,00	28,11	224,86
		Physician (anesthetist) : 30 min.	19%	0,50	45,57	4,33
		Nurse 120 min.	100%	2,00	26,93	53,86
Post-delivery	Staff	Obstetrician	na.	0,50	45,57	22,79
		Physiotherapist	100%	1,08	29,74	32,22
Overhead department level						645,75
Overhead and services from other departments						446,16
Total cost						1.444,02

Number of patients treated meeting the inclusion criteria

595

Average LOS

1,9 days

Source: Interview

Hospital D

General information about the gynaecological-obstetric department Hospital D

Hospital level	Department level				
Number of beds	Number of beds	Number of cases	Average length of stay	Number of physicians	Number of nursing staff
768	36	5.890	2.8	22	75

Table 4.4 Cost data for patients admitted for normal delivery at Hospital D

Phase	Type of resource used	Units	Percentage of patients	No. of units used/patient	Unit cost	Total cost
Pre-delivery (admission and planning)	Staff	Midwife 45 min.	100%	0,75	28,11	21,08
	Diagnostic procedures	Cardiotocography 20 min.	100%	1,00	na.	
	Drugs	Pondocillin	2%	3,00	0,93	0,06
		Pamol	10%	2,00	0,19	0,04
Delivery (including partum and post partum activity in delivery room)	Staff	Midwife 540 min.	100%	9,00	28,11	252,97
		Physician (anesthetist) : 45 min.	30%	0,75	45,57	10,25
		Nurse 60 min.	100%	1,00	26,93	26,93
	Diagnostic procedures	Cardiotocography 60 min.	50%	na.	na.	
		Blood tests	na.	na.	na.	
	Drugs	Sufentanil 5 ug./ml.	30%	1,00	1,10	0,33
		Bubivacain 0,125% 4 ml.	30%	na.	na.	
		Lidocain nordadrenalin 10 mg./ml.	70%	1,00	na.	
		Syntocinon inteapartum 10 IU	43%	1,00	1,61	0,69
		Syntocinon post partum 10 IU	100%	1,00	1,61	1,61
		Konakion 0,2mg./ml. (child)	100%	4,00	1,32	5,27
	Post-delivery	Staff	Midwife 360 min.	100%	6,00	26,20
Nurse 120 min.			100%	2,00	26,93	53,86
Physician 10 min./child/day			5%	0,28	45,57	0,64
Drugs		Pamol 500 mg./ml.	70%	2,00	0,04	0,06
		Overhead department level				
Overhead and services from other departments					634,96	
Total cost					1.930,14	

Number of patients treated meeting the inclusion criteria

438

Average LOS

2,2 days

Source: Questionnaire

Table 4.5 Average cost from sample. Normal delivery

Average costs from sample vignette 2

Phase	Type of resource used	Units	Total cost
Pre-delivery (admission and planning)	Staff	Midwife	16,45
		Nurse:	2,39
		Assistant	0,53
	Drugs		0,01
Delivery (including partum and post partum activity in delivery room)	Staff	Midwife	205,71
		Nurse (anaesthetist)	3,11
		Physician (anaesthetist)	5,91
		Physician	5,18
		Nurse	27,14
	Drugs		2,39
Post-delivery	Staff	Midwife	64,12
		Nurse	59,81
		Physician	9,50
		Physiotherapis	11,29
		Porter	0,89
	Drugs		0,16
Overhead department level			693,58
Overhead and services from other departments			524,62
Total cost			1632,79

Number of patients treated meeting the inclusion criteria

2821,00

Average LOS

2,05 days

3.3 Hip Replacement (vignette 3)

Patient inclusion criteria: “Female, 65-75 years old, with hip osteoarthritis requiring hip replacement because of considerable impairment is finally (after waiting time if normal in the hospital) admitted for her first hip replacement (one side). The patient is without co-morbidity (i.e. expensive drugs due to treating co-morbidity should be excluded), the surgeon uses the most frequently used implant for female patients; the operation is without severe complications; end of case vignette: discharge (home or to separate rehabilitation institution)”.

Cost estimate based on local data

The sample data of the vignette consists of data from one interview and one questionnaire. Eight questionnaires were sent to a selection of orthopaedic departments. One questionnaire was returned. Data from the two departments are presented below.

Hospital A

General information about the orthopaedic department Hospital A

Hospital level	Department level				
Number of beds	Number of beds	Number of cases	Average length of stay	Number of physicians	Number of nursing staff
725	74	3.133	7,2	38	117

Table 5.1 Cost data for patients admitted for a hip replacement at Hospital A

Outpatient visit

Phase	Type of resource used	Units	Percentage of patients	No. of units used/patient	Unit cost	Total cost
Outpatient visit	Staff	Physician (anesthetist) : 10 min.	100%	0,17	45,57	7,60
		Physician (surgeon): 45 min.*	100%	0,75	45,57	34,18
		Nurse: 45 min.*	100%	0,75	26,93	20,20
		Physiotherapist 5 min. **	95%	0,08	29,74	2,35
		Nurse (anesthetist) 5 min.**	95%	0,08	26,93	2,13
		Physician (surgeon): 5 min.**	95%	0,08	45,57	3,61
		Nurse: 5 min.**	95%	0,08	26,93	2,13
	Diagnostic procedures	X-ray		100%	1,00	46,98
Blood tests			100%	1,00	24,26	24,26
Overhead department level						
Overhead and services from other departments						
Total cost						254,52

In-patient stay

Phase	Type of resource used	Units	Percentage of patients	No. of units used/patient	Unit cost	Total cost
Preparation for operation	Staff	Physician: 2 min.	100%	0,03	45,57	1,52
		Nurse: 20 min.	100%	0,33	26,93	8,93
Operation	Staff	Nurse (anesthetist) 90 min.	100%	1,50	26,93	40,39
		Physician (anesthetist) : 25 min.	100%	0,42	45,57	18,99
		Physician (surgeon): 60 min.	100%	1,00	45,57	45,57
		Nurse 2 X 120 min.	100%	4,00	26,93	107,72
	Drugs	Lidokain 20 ml.	100%	1,00	0,21	0,21
		Adrenalin	100%	1,00	2,14	2,14
		Marcain spinal plain 4 ml.	100%	1,00	6,93	6,93
		Propofol 10 mg./ml. 100 ml.	100%	1,00	41,63	41,63
		NaCl isotonic	100%	1,00	2,35	2,35
		Toradol 30mg./ml. 1 ml.	100%	1,00	2,54	2,54
		Spinal needle	100%	1,00	na.	na.
		Zinacef	100%	1,00	10,52	10,52
		Cyklokapron	98%	1,00	1,13	1,10
	Other resources	Instruments & utensils	100%	1,00	12,08	12,08
		Implants	100%	1,00		
Saw-blade, batteries, etc.		100%	1,00	103,53	103,53	
	Staff	Porter 10 min.	100%	0,17	26,20	4,37
		Nurse 180 min./day	100%	11,40	26,93	306,99
		Physician 5 min./day	100%	0,32	45,57	14,43
		Physiotherapist 60 min./day	100%	3,80	29,74	113,01
		Ergo therapist 5 min./day	100%	0,32	29,01	9,19
	Diagnostic procedures	X-ray	100%	1,00	46,98	46,98
		Blood tests	100%	1,00	na.	na.
Overhead department level						4400,57
Overhead and services from other departments						2.403,37
Total cost						7.705,12

Number of patients treated meeting the inclusion criteria

25

Average LOS

3,8 days

Implant used: bimetrix stem, ringloc cup, polyethylen liner

* Administrative work with the patient, pre-examination

** Seminar: joint information to groups of patients

Source: Questionnaire and telephone interviews

Hospital B

General information about the orthopaedic at Hospital B

Hospital level	Department level				
Number of beds	Number of beds	Number of cases	Average length of stay	Number of physicians	Number of nursing staff
			7.2	12	

The cost data from the department are presented below.

Table 5.2 Cost data for patients admitted for hip replacement Hospital B

Outpatient visit

Phase	Type of resource used	Units	Percentage of patients	No. of units used/patient	Unit cost	Total cost
Outpatient visit	Staff	Physician (anesthetist)	na.	na.	na.	
		Physician (surgeon): 20 min.*	100%	0,33	45,57	15,19
	Diagnostic procedures	X-ray	100%	1,00	46,98	46,98
		Blood tests	100%	1,00	24,26	24,26
Overhead department level						-37,34
Overhead and services from other departments						22,06
Total cost						71,14

In-patient stay

Phase	Type of resource used	Units	Percentage of patients	No. of units used/patient	Unit cost	Total cost	
Preparation for operation	Staff	Physician	na.	na.	45,57		
		Nurse	na.	na.	26,93		
	Diagnostic procedures	BAS-test (blood-test)	100%	1,00	21,50	21,50	
	Drugs	Paracetamol	100%	1,00	na.		
		Triazolam 0,125 mg.	100%	1,00	0,13	0,13	
Operation	Staff	Nurse (anesthetist) 90 min.	na.	na.	26,93		
		Physician (anesthetist) : 168 min.	100%	2,80	45,57	127,60	
		Physician (surgeon): 202 min.	100%	3,37	45,57	153,42	
		Nurse	na.	na.	26,93		
	Drugs	Anticoagulative (eg. Fragmin)	100%	1,00	1,34	1,34	
		Antibiotics	na.	na.	na.		
		Marcaïn spinal plain 4 ml.	100%	1,00	6,93	6,93	
		Cyklokapron	100%	1,00	1,13	1,13	
		Other resources	Implants	100%	1,00		
Post-operative	Staff	Nurse 1.410 min.	100%	23,50	26,93	632,84	
		Physician	na.	na.	na.		
		Physiotherapist 180 min.	100%	3,00	29,74	89,22	
	Diagnostic procedures	X-ray	100%	3,00	46,98	140,93	
	Drugs	Oxynorm (morphine) 20 mg.	100%	1,00	0,13	0,13	
		Fragmin 5000 IU	100%	1,00	0,67	0,67	
		Paracetamol	100%	1,00	na.	na.	
Overhead department level						1841,68	
Overhead and services from other departments						847,97	
Total cost						3.865,50	

Number of patients treated meeting the inclusion criteria

64

Average LOS

8,0 days

Source: Interview

Table 5.3 Average cost of admission for hip replacement

Average sample costs vignette 3

Outpatient visit

Phase	Type of ressource used	Units	Total cost
Outpatient visit	Staff	Physician (anaesthetist)	2,13
		Physician (surgeon):	20,52
		Nurse:	5,67
		Physiotherapist	0,66
		Nurse (anaesthetist)	0,60
		Physician (surgeon)	1,01
		Nurse	0,60
		Ergotherapist	1,29
	Diagnostic procedures	X-ray	46,98
		Blood tests	24,26
Overhead department level			-26,85
Overhead and services from other departments			15,86
Total cost			122,65

In-patient stay

Phase	Type of ressource used	Units	Total cost
Preparation for operation	Staff	Physician	0,43
		Nurse	2,52
	Diagnostic procedures	BAS-test (blood-test)	15,46
	Drugs		0,10
Operation	Staff	Nurse (anaesthetist)	11,35
		Physician (anaesthetist)	97,09
		Physician (surgeon)	123,13
		Nurse	30,26
	Drugs		25,70
	Other ressources	Instruments & utensils	3,39
Implants		0,00	
Saw-blade, batteries, etc.		29,08	
	Staff	Porter	1,23
		Nurse	541,31
		Physician	4,05
		Physiotherapist	95,90
		Ergotherapist	2,58
	Diagnostic procedures	X-ray	114,54
	Drugs		0,57
Overhead department level			2560,47
Overhead and services from other departments			1284,88
Total cost			4944,04

Number of patients treated meeting the inclusion criteria

89

Average LOS

6,8 days

3.4 Cataract operation (vignette 4)

Patient inclusion criteria: “Male, 70-75 years old, has consulted a hospital clinic/ ophthalmologist's office because of blurred vision. After clinical assessment a diagnosis of *Cataracta Senilis* is made and the patient is put on the operating list. The case vignette concerns the actual operation in the hospital/ ophthalmologist's office (depending on country, please state) including any pre-operative assessment (possibly in separate visits). Please specify the type of implant/ ocular lens used (especially if costs differ)”.

Cost estimate based on local sample

The sample data of the vignette consists of data from one interview and three questionnaires. Four questionnaires were sent to a selection of eye departments. Three questionnaires were returned. Data from the sample of four departments are presented below.

Hospital A

General information about the eye department at Hospital A

Hospital level	Department level				
Number of beds	Number of beds	Number of out-patient visits	Average length of stay	Number of physicians	Number of nursing staff
402		5,525			

The cost data from the department are presented below.

Table 6.1 Cost data for patients admitted for cataract surgery at Hospital A

Outpatient visit						
Phase	Type of resource used	Units	Percentage of patients	No. of units used/patient	Unit cost	Total cost
Outpatient visit	Staff	Physician (surgeon): 20 min	100%	0,33	45,57	15,19
		Nurse: 45 min	100%	0,75	26,93	20,20
Overhead						69,88
Total cost						105,27
Operation						
Phase	Type of resource used	Units	Percentage of patients	No. of units used/patient	Unit cost	Total cost
Operation	Staff	Physician (surgeon): 15 min.	100%	0,25	45,57	11,39
		Nurse 40 min.	100%	0,67	26,93	17,95
	Drugs	Metaoxedrin 10%	100%	1,00	na.	na.
		Mydriacyl 1 %	100%	1,00	na.	na.
		Zinacef	100%	1,00	na.	na.
		Oxybuprocain	100%	1,00	na.	na.
	Other resources	Implant SA60 Alcon	100%	1,00	na.	na.
Overhead						75,40
Total cost						104,74

Patients treated meeting the inclusion criteria 78

Average LOS 1,0 days

Share of patients in general anesthesia 5,0%

Source: Questionnaire

Hospital B

General information about the eye clinic at Hospital B

Hospital level	Department level				
Number of beds	Number of beds	Number of out-patient visits	Average length of stay	Number of physicians	Number of nursing staff
415	4	5348	1,4	14	20

Table 6.2 Cost Data for patients admitted for cataract surgery at Hospital B

Outpatient visit

Phase	Type of resource used	Units	Percentage of patients	No. of units used/patient	Unit cost	Total cost
Outpatient visit	Staff	Physician (surgeon): 30 min	100%	0,50	45,57	22,79
		Nurse: 30 min	100%	0,50	26,93	13,46
	Drugs	Metaoxedrin 10%	100%	1,00	na.	na.
		Tropicamid 0,5%	100%	1,00	na.	na.
		Oxybuprocain	100%	1,00	na.	na.
Overhead						78,48
Total cost						114,73

Operation

Phase	Type of resource used	Units	Percentage of patients	No. of units used/patient	Unit cost	Total cost
Operation	Staff	Physician (surgeon): 30 min.	100%	0,50	45,57	22,79
		Nurse 2 X 30 min.	100%	1,00	26,93	26,93
	Drugs	Metaoxedrin 10%	100%	1,00	na.	na.
		ciloxan	100%	1,00	na.	na.
		PVD-iod	100%	1,00	na.	na.
		Oxybuprocain	100%	1,00	na.	na.
		Iopidine	100%	1,00	na.	na.
		Xylokain-gel 2%	100%	1,00	na.	na.
		Cefuroxim	100%	1,00	na.	na.
		Elektrolyt 250 ml.	100%	1,00	1,62	1,62
	Other resources	Implant SA60 Alcon	50%	1,00	na.	na.
		Implant MA60 Alcon	50%	1,00	na.	na.
		Costum pack from Alcon	100%	1,00	35,24	35,24
		Knives	100%	2,00	na.	na.
		Pair of gloves	100%	2,00	na.	na.
		Alcon Monarch II injector	100%	1,00	na.	na.
		0,85 ml. Healon	100%	1,00	na.	na.
		Eye bandage	100%	1,00	na.	na.
	Cassette/tubesystem	100%	1,00	na.	na.	
	Overhead					
Total cost						625,74

Patients treated meeting the inclusion criteria

138

Average LOS

1,0 days

Share of patients in general anesthesia

25,0%

Source: Questionnaire

Hospital C

General information about the eye clinic at Hospital C

Hospital level	Department level				
Number of beds	Number of beds	Number of out-patient visits	Average length of stay	Number of physicians	Number of nursing staff
	0			7	10

Table 6.3 Cost data for patients admitted for cataract operation at Hospital C

Outpatient visit

Phase	Type of resource used	Units	Percentage of patients	No. of units used/patient	Unit cost	Total cost
Outpatient visit	Staff	Physician (surgeon): 30 min	100%	0,50	45,57	22,79
		Nurse: 30 min	100%	0,50	26,93	13,46
	Drugs	Metaoxedrin 10%	100%	1,00	na.	na.
		Tropicamid 0,5%	100%	1,00	na.	na.
		Oxybuprocain	100%	1,00	na.	na.
Overhead						122,59
Total cost						158,84

Operation

Phase	Type of resource used	Units	Percentage of patients	No. of units used/patient	Unit cost	Total cost
Operation	Staff	Physician (surgeon): 37 min.	100%	0,62	45,57	28,10
		Nurse 3 X 37 min.	100%	1,85	26,93	49,82
	Drugs	Metaoxedrin 10%	100%	1,00	na.	na.
		cyclogyl 1%	100%	1,00	na.	na.
		Cocaine 4%	100%	1,00	na.	na.
		Oxybuprocain	100%	1,00	na.	na.
		Ipidine	100%	1,00	na.	na.
		Xylokain-gel 2%	100%	1,00	na.	na.
	Other resources	PVD Iodine	100%	1,00	na.	na.
		Implant 3 piece acrylic lens	100%	1,00	na.	na.
		"Butterfly" to hold the lens	100%	1,00	na.	na.
		Knife (non reusable)	100%	1,00	na.	na.
		"Viskoelastica"	100%	2,00	na.	na.
		Pair of gloves	100%	2,00	na.	na.
		Surgery kit	100%	1,00	na.	na.
Overhead						501,76
Total cost						579,68

Patients treated meeting the inclusion criteria

100

Average LOS

1,0 days

Share of patients in general anesthesia

0,0%

Source: Interview

Table 6.4 Average cost of patients admitted for cataract surgery.

Average costs from sample vignette 4

Outpatient visit

Phase	Type of ressource used	Units	Total cost
Outpatient visit	Staff	Physician	21,38
		Nurse	14,71
Overhead			128,25
Total cost			164,34

Operation

Phase	Type of ressource used	Units	Total cost
Operation	Staff	Physician	20,06
		Nurse	28,49
Overhead			383,99
Total cost			432,54

Patients treated meeting the inclusion criteria 420

Average LOS 1,0 days

Share of patients ind general anaesthetics 9,1%

3.5 Stroke (vignette 5)

Patient inclusion criteria: “So far healthy female (i.e. no co-morbidity), 60-70 years old, with sudden severe hemi paresis (right side) and dependency, with severe aphasia: Admission to hospital (accident & emergency, medical or neurological department depending on country/hospital) by ambulance car. Start of case vignette: hospital door. All the interventions including diagnostic and treatment are delivered in the same hospital. The patient is diagnosed and treated according to normal hospital standards (which may or may not include a stroke unit, early rehabilitation etc.); progress is average for age. Transient (TIA), short and reversible (RIND) and prolonged and reversible (PRIND) ischemic neurological deficits are excluded. End of vignette: discharge to rehabilitative institution or home.”

Cost estimate based on local data

The sample data of the vignette consists of data from one interview. Seven questionnaires were sent to a selection of Neurological departments. One questionnaire was returned but the questionnaire was not included in the sample due to lack of key data. Data from the department of Hospital A is presented below.

Hospital A

General information about the stroke clinic at Hospital A

Hospital level	Department level				
Number of beds	Number of beds	Number of out-patient visits	Average length of stay	Number of physicians	Number of nursing staff
	45			10	23

The cost data from the department are presented below.

Table 7.1 Cost for treating patients admitted for stroke at Hospital A

Phase	Type of resource used	Units	Percentage of patients	No. of units used/patient	Unit cost	Total cost
Stroke Unit	Staff	Physician 90 min.	100%	1,50	45,57	68,36
		Nurse 30 min.	100%	0,50	26,93	13,46
	Diagnostic procedures	CT-scan	100%	1,00	41,22	41,22
		MR-scan	10%	1,00	293,26	29,33
		Ultrasound	100%	1,00	72,51	72,51
		X-ray of Thorax	100%	1,00	54,54	54,54
		Blood tests	100%	2,00	199,01	398,01
Main Therapy	Drugs	ASA	100%	1,00	na.	
		ASA Dipyridamol.*	na.	na.	na.	
		Maravan (blood dilutive)**	na.	na.	na.	
		Cimvastin 40 mg.***	na.	na.	na.	
Hospital Care	Staff	Physician 60 min./day	100%	4,55	45,57	207,37
		Nurse 330 min./day	100%	25,03	26,93	673,98
		Physiotherapy 60 min./day	100%	4,55	29,74	135,33
		Occupational therapy 60 min./day	100%	4,55	29,01	132,03
		Speech therapist	100%	4,55	28,90	131,51
		Overhead department level				
Overhead and services from other departments						721,59
Total cost						3.361,79

Patients treated meeting the inclusion criteria

109

Average LOS

4,6 days

* if no cerebral hemorrhage

** if arterial fibrillation

*** if high cholesterol

Source: Interview and e-mails

3.6 AMI (vignette 6)

Patient inclusion criteria: “Up to the moment of presentation healthy male, 50-60 yr. old, who has developed a sudden acute chest pain. An ambulance is called and transports the patient within 2 hours of the onset of symptoms to hospital (accident & emergency department, cardiology or ICU depending on country/ hospital). Start of case vignette: hospital door. The patient shows typical ECG alterations and is admitted and treated for AMI. The patient is diagnosed and treated according to normal hospital standards (if a PTCA is performed, there are no complications, i.e. a referral to cardio-surgery is excluded); progress is average for age. End of vignette: discharge to rehabilitative institution or home.”

Cost estimate based on local data

The sample data of the vignette consists of data from one interview and two questionnaires. Eight questionnaires were sent to a selection of cardiologic departments. Two questionnaires were returned. Data from the sample are presented below.

Hospital A

General information about the stroke clinic at Hospital A

Hospital level	Department level					
	Number of beds	Number of beds	Number of out-patient visits	Average length of stay	Number of physicians	Number of nursing staff
402			7.368	5,0		

The cost data from the department are presented below.

Table 8.1 cost data for patients admitted for AMI at Hospital A

Estimated share of patients being transferred to Heart Center 20%

Patients treated meeting the inclusion criteria 16

Average LOS 8,6 days

Patient needs to be transferred to Heart Center

Phase	Type of resource used	Units	Percentage of patients	No. of units used/patient	Unit cost	Total cost
Emergency	Staff	Physician: 25 min.	100%	0,42	45,57	18,99
		Nurse: 35 min.	100%	0,58	26,93	15,71
	Drugs	Electrocardiography	100%	1	na.	na.
		aspisol 300 mg.	100%	1	na.	na.
		Heperin 10000 IE	100%	1	3,91	3,91
		Clopidogred 75 mg.	100%	8	na.	na.
		Seleken 5 mg.	100%	1	3,20	3,20
		Morphine 5 mg.	100%	1	1,33187	1,33
PCI-need is recognized	Staff	Nitroglycerin 0,5 mg.	100%	2	0,09	0,18
		Physician: 35 min.	100%	0,58	45,57	26,58
		Nurse: 5 min.	100%	0,08	26,93	2,24
Overhead department level						1.351,29
Overhead and services from other departments						849,36
Total cost						2.272,79

Patients treated meeting the inclusion criteria (calculated) 3

Patients do not need to be transferred to Heart Center for treatment

Phase	Type of resource used	Units	Percentage of patients	No. of units used/patient	Unit cost	Total cost
Emergency	Staff	Physician 60 min.	100%	1,00	45,57	45,57
		Nurse 65 min.	100%	1,08	26,93	29,17
	Diagnostic procedures	X-ray thorax	100%	1,00	54,54	54,54
		Blood tests	100%	1,00	318,63	318,63
	Drugs	Klexane 1mg./kg X 2	100%	1,00	26,0389	26,04
		Idotyl 250 mg.	100%	1,00	0,07	0,07
		Clopidogred 75 mg.	100%	4,00	na.	na.
		Selozok 50 mg.	100%	1,00	na.	na.
		Morphine 2,5 mg.	100%	1,00	0,665935	0,67
		Nitroglycerin 0,5 mg.	100%	2,00	0,09	0,18
Treatment	Staff	Physician 150 min.	100%	2,50	45,57	113,93
		Nurse: 420 min.	100%	7,00	26,93	188,51
		Physiotherapist 90 min.	100%	1,50	29,74	44,61
	Diagnostic procedures	X-ray thorax	95%	1,00	54,54	51,81
		Drugs	Klexane 1mg./kg X 2	100%	1,00	26,0389
	Selozok 50 mg.		100%	2,00	na.	na.
	Simvastatin 40 mg.		100%	1,00	0,19	0,19
	Magnyl 75mg.		100%	1,00	0,11	0,11
	Ramipril 5 mg.		50%	1,00	0,02	0,01
			Nitroglycerin 0,5 mg.	100%	2,00	0,09
Overhead department level						674,14
Overhead and services from other departments						698,41
Total cost						2.272,79

Patients treated meeting the inclusion criteria (calculated) 13

Source: Questionnaire

Hospital B

General information about the heart- and lung department at Hospital B

Hospital level	Department level				
Number of beds	Number of beds	Number of cases	Average length of stay	Number of physicians	Number of nursing staff
725	57	3.370	4,3	27	92

The cost data from the department are presented below.

Table 8. 2 Cost data for patients admitted for AMI at Hospital B

Estimated share of patients being transferred to Heart Center 95%

Patients treated meeting the inclusion criteria 23

Average LOS 6,0 days

Patient needs to be transferred to Heart Center

Phase	Type of resource used	Units	Percentage of patients	No. of units used/patient	Unit cost	Total cost
Emergency	Staff	Physician: 60 min. 10% of patients	10%	1,00	45,57	4,56
	Diagnostic Procedures	BAS-test	100%	1,00	60,23	60,23
	Other	Electrocardiography	100%	1	na.	na.
	Drugs	Magnyl 300 mg.	100%	1	0,21	0,21
		Heparin 10000 IE	100%	1	3,91	3,91
	Selozok 2,5 mg.	100%	8	na.	na.	
PCI-need is recognized	Staff	Physician: 60 min.	100%	1,00	45,57	45,57
Overhead department level						1.598,23
Overhead and services from other departments						1.021,97
Total cost						2.734,68

Patients treated meeting the inclusion criteria (calculated) 22

Patients do not need to be transferred to Heart Center for treatment

Phase	Type of resource used	Units	Percentage of patients	No. of units used/patient	Unit cost	Total cost
Emergency	Staff	Physician	na.	na.	na.	na.
		Nurse	na.	na.	na.	na.
	Diagnostic procedures	X-ray thorax	100%	1,00	54,54	54,54
		Blood tests	100%	1,00	60,23	60,23
	Drugs	Klexane 1mg./kg X 2	100%	1,00	26,04	26,04
		Simvastatin 40 mg.	100%	1,00	0,27	0,27
		Selozok 100 mg.	100%	1,00	0,41	0,41
		Plavix 75 mg.	100%	1,00	2,58	2,58
		Magnyl 75mg.	100%	1,00	0,11	0,11
	Treatment	Staff	Physician 15 min./day	100%	0,00	45,57
Nurse: 60 min./day			100%	0,00	26,93	0,00
Physiotherapist 15 min./day			100%	0,00	29,74	0,00
Diagnostic procedures		X-ray thorax	100%	1,00	54,54	54,54
		Blood tests	100%	1,00	21,50	21,50
Drugs		Klexane 1mg./kg X 2	100%	1,00	26,04	26,04
		Simvastatin 40 mg.	100%	1,00	0,27	0,27
		Selozok 100 mg.	100%	1,00	0,41	0,41
		Plavix 75 mg.	100%	1,00	2,58	2,58
		Magnyl 75mg.	100%	1,00	0,11	0,11
Overhead department level						1.572,17
Overhead and services from other departments						912,90
Total cost						2.734,68

Patients treated meeting the inclusion criteria (calculated) 1

Source: Questionnaire and correspondence

Hospital C

General information about the cardiology department at Hospital C

Hospital level	Department level				
Number of beds	Number of beds	Number of cases	Average length of stay	Number of physicians	Number of nursing staff
	64			37	128

On the basis of the ECG test results, the patients are divided into non-STEMI and STEMI, and the treatment parts for each patient category is described below.

All patients are offered rehabilitation after discharge from department. The rehabilitation consists of:

1 outpatient visit at the physician 4-6 weeks after discharge

4 visits (on average) in a nurse staffed ambulatory covering the following themes:

- Advice on life style (smoking, diet)
- Discussion of the patients mental reaction after the AMI
- Measurement of the patients blood pressure and cholesterol
- Furthermore, the patient is offered physiotherapy

Table 8.3 cost data for patients admitted for AMI at Hospital C

non-STEMI

Phase	Type of resource used	Units	Percentage of patients	No. of units used/patient	Unit cost	Total cost
Emergency	Staff	Physician	na.	na.	45,57	
		Nurse	na.	na.	26,93	
	Other	Lab.tests	na.	na.	na.	
	Drugs	Clopidogred 75 mg.	100%	8	na.	na.
Main Therapy	Staff	Physician: 30 min.	100%	0,50	45,57	22,79
		Nurse: 2 X 30 min.	100%	1,00	26,93	26,93
	Diagnostic procedures	X-ray thorax	100%	1,00	54,54	54,54
		Blood tests	100%	na.	na.	
	Drugs	LMH (first 3 days of stay)	100%	na.	na.	
		Nitroglycerine (in case of pain)	na.	1,00	1,34	1,34
		Copidogrel (Plavix) 75 mg.	100%	1,00	2,58	2,58
		Beta-blocker 25 mg.	100%	2,00	na.	
		Simvastin 40 mg.	100%	1,00	na.	
	ASA 75 mg.	100%	1,00	na.		
Overhead department level						1.465,86
Overhead and services from other departments						852,15
Total cost						2.426,18

Number of patients meeting the inclusion criteria

55

STEMI

Phase	Type of resource used	Units	Percentage of patients	No. of units used/patient	Unit cost	Total cost
Main therapy (PCI)	Staff	Physician 90 min.	100%	1,50	45,57	68,36
		Nurse 3 X 90 min.	100%	4,50	26,93	121,18
	Other	Implants (average cost)	100%	1,00	1345,00	1.345,00
Bed department	Staff	Physician	na.	na.	45,57	
		Nurse	na.	na.	26,93	
	Diagnostic procedures	X-ray thorax	95%	1,00	54,54	51,81
		Lab. Tests	100%	1,00	na.	
	Drugs	Copidogrel (Plavix) 75 mg.	100%	1,00	2,58	2,58
		Beta-blocker 25 mg.	100%	2,00	na.	
Simvastin 40 mg.		100%	1,00	na.		
	ASA 75 mg.	100%	1,00	na.		
Overhead department level						7.591,20
Overhead and services from other departments						5.395,07
Total cost						14.575,20

Patients treated meeting the inclusion criteria

159

Average LOS

3,2 days

Source: Interview

Table 8.4 Average cost for patients admitted for AMI at the local sample

Non-STEMI

Average weighted costs AMI patient

Phase	Type of resource used	Units	Total cost
Emergency/operation	Staff	Physician	8,46
		Nurse	5,42
	Diagnostic procedures	X-ray thorax	11,03
		Blood tests	60,16
	Other costs	Implants	0,00
	Drugs		5,49
Bed department	Staff	Physician	40,47
		Nurse	59,17
		Physiotherapist	9,03
	Diagnostic procedures	X-ray thorax	54,03
		Blood tests	0,36
	Drugs		8,55
Overhead department level			1.316,07
Overhead and services from other departments			824,62
Total cost			2.402,85

Patients treated meeting the inclusion criteria

69

STEMI

Average weighted costs AMI patient

Phase	Type of resource used	Units	Total cost
Emergency/operation	Staff	Physician	68,36
		Nurse	121,18
	Diagnostic procedures	X-ray thorax	0,00
		Blood tests	0,00
	Other costs	Implants	1.345,00
	Drugs		0,00
Bed department	Staff	Physician	0,00
		Nurse	0,00
		Physiotherapist	0,00
	Diagnostic procedures	X-ray thorax	51,81
		Blood tests	0,00
	Drugs		2,58
Overhead department level			7.591,20
Overhead and services from other departments			5.395,07
Total cost			14.575,20

Patients treated meeting the inclusion criteria

159

3.7 Colonoscopy (vignette 8)

Patient inclusion criteria: „Male 55-70 year old with positive Faecal Occult Blood test is referred to an internist’s/ gastroenterologist’s office/ hospital out-patient department for diagnostic colonoscopy. Start of vignette: patient presents for the first time in office/ out-patient department. Please include all visits including the one where the colonoscopy is performed (i.e. most likely two), specify explicitly if and which sedatives, e.g. Benzodiazepines (flumazenil), fluids etc. are used/ prescribed. Cases with polypectomy during colonoscopy, pathological examinations and follow-up visits are excluded.”

Cost estimate based on local data

The sample data of the vignette consists of data from one interview and two questionnaires. Seven questionnaires were sent to a selection of gastroenterological departments. Two questionnaires were returned. Data from the sample are presented below.

Hospital A

General information about the Endoscopy clinic at Hospital A

Hospital level	Department level				
Number of beds	Number of beds	Number of cases	Average length of stay	Number of physicians	Number of nursing staff
754	70	6.231	3,4	39,7	118,6

Table 10.1 Cost estimate for colonoscopy for patients admitted to Hospital A

Phase	Type of resource used	Units	Percentage of patients	No. of units used/patient	Unit cost	Total cost
Preparation for examination	Staff	Physician 3 min.	100%	0,05	45,57	2,28
		Nurse 10 min.	100%	0,17	26,93	4,49
	Drugs	Venflon	100%	1,00	na.	
Examination	Staff	Nurse 30 min.	100%	0,50	26,93	13,46
		Physician 30 min.	100%	0,50	45,57	22,79
	Drugs	Midazolam iv.	100%	1,00	0,06	0,06
After examination	Staff	Physician 3 min.	100%	0,05	26,93	1,35
		Nurse 10 min.	100%	0,17	45,57	7,60
Overhead department level						261,19
Overhead and services from other departments						149,75
Total cost						462,95

Patients treated meeting the inclusion criteria

20

Source: Questionnaire

Hospital B

General information about the Endoscopy clinic at Hospital B

Hospital level	Department level				
Number of beds	Number of beds	Number of cases	Average length of stay	Number of physicians	Number of nursing staff
402					

Table 10.2 Cost data for patients admitted for colonoscopy at Hospital B

Phase	Type of resource used	Units	Percentage of patients	No. of units used/patient	Unit cost	Total cost
Preparation for examination	Staff	Nurse 3 min.	100%	0,05	26,93	1,35
	Drugs	Benzodiazepin (Dormicum)	100%	1,00	0,06	0,06
		Fentanyl (haldid)	100%	1,00	0,14	0,14
Examination	Staff	Nurse 2 X 45 min.	100%	1,50	26,93	40,39
		Physician 45 min.	100%	0,75	45,57	34,18
	Drugs	see below				
	Other resources	Consumables, drugs	100%	1,00	101,00	101,00
After examination	Staff	Nurse 15 min.	100%	0,25	45,57	11,39
Overhead department level						300,16
Overhead and services from other departments						233,63
Total cost						722,30

Patients treated meeting the inclusion criteria

27

Source: Interview

Hospital C

General information about the Endoscopy clinic at Hospital C

Hospital level	Department level				
Number of beds	Number of beds	Number of cases	Average length of stay	Number of physicians	Number of nursing staff
1,207					

Table 10.3 Cost data for patients admitted for colonoscopy at Hospital C

Phase	Type of resource used	Units	Percentage of patients	No. of units used/patient	Unit cost	Total cost
Preparation for examination	Staff	Physician 5 min.	100%	0,08	45,57	3,80
		Nurse 15 min.	100%	0,25	26,93	6,73
Examination	Staff	Nurse 2 X 37 min.	100%	1,23	26,93	33,21
		Physician 30 min.	100%	0,50	45,57	22,79
		Porter 10 min.	100%	0,17	26,20	4,37
		Drugs	Dormicum 3 mg.	95%	1,00	0,77
		Haldid 100 micrograms	95%	1,00	0,82	0,78
	Other resources					
After examination	Staff	Physician 10 min.	10%	0,17	45,57	0,76
		Nurse 15 min.	100%	0,25	26,93	6,73
		CT-Colonoscopy Physician 10 min.	12%	0,17	45,57	0,91
		CT-Colonoscopy Nurse 10 min.	12%	0,17	26,93	0,54
		Physician 10 min.*	10%	0,17	45,57	0,76
Overhead department level						318,71
Overhead and services from other departments						190,58
Total cost						589,20

Patients treated meeting the inclusion criteria

19

Source: Questionnaire

* Supplementary examination

Table 10.4 Average cost for patients admitted for colonoscopy based on local sample

Average Cost vignette 8

Phase	Type of ressource used	Units	Total cost
Preparation for examination	Staff	Physician	1,78
		Nurse	3,85
	Drugs		0,08
Examination	Staff	Nurse	30,22
		Physician	57,61
		Porters	1,26
	Other ressources incl. Drugs		41,77
After examination	Staff	Physician	1,11
		Nurse	9,06
Overhead department level			201,94
Overhead and services from other departments			140,96
Total cost			605,39

Patients treated meeting the inclusion criteria

66