

**Impact of health informatics for the
health reform process -DRGs**

**Principles and
Introduction in Hungary**

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Hungary

The issues of the presentation

- **About health informatics in Hungary**
- **About model of Hungarian Health Reimbursement system shortly**
- **What means „DRGs” and what means „DRGs” reimbursement system”**
- **Survey with DRGs/HBCs system**
- **Implementation of DRGs/HBCs system**
- **The key elements of successful process**
- **Experiences and learning**

Background

- Parliament and government supervision
- Independent health insurance controlled by Ministry of Health
- Contributions are collected by National Tax Office
- Dual reimbursement system in terms of payers: operational cost is covered by NHIF, investment cost is covered by state budget and owners (local governments, etc.)
- The health provision system is characterized by special health market regulation.
- Patients have a right to access the health services relatively with free way: patients are free to choose GP, ambulatory care units, hospitals, but not every case is free to access the specialized care without GP's or other provider's transferring.

Reimbursement for different provider's level from 1993

- **Primary care: per-capita + supplementary payment**
- **Specialised care**
 - Acute hospital care = DRGs like payment with some additional rules**
 - Chronice hospital care = bed-days**
- **Out-patient care = fee for service**

Budget for operational cost 2011

Task		Ft millió	EURO/ person
GPs	Háziorvosi, háziiorvosi ügyelet ellátása összesen	81 115.90	30.04
Dentist	Fogászati ellátás	23 470.40	8.69
	Gondozóintézeti gondozás		
	Nemibeteg gondozás	261.6	0.10
	Tudógondozás	1 065.20	0.39
	Pszichiátriai gondozás	548.4	0.20
	Onkológiai gondozás	256.7	0.10
	Alkohológia és drogellátás	168.6	0.06
Continoues care out-patient's	Gondozóintézeti gondozás összesen	2 300.50	0.85
Dialyses	Műveskezelés	23 171.10	8.58
Home-care	Otthoni szakápolás	4 404.80	1.63
Labor	Laboratóriumi ellátás	20 893.00	7.74
Total in-patient +out-patient's care for sor special care	Összevont szakellátás		
Out-patient	Járóbeteg-szakellátás + CT, MRI	118 548.30	43.91
In-patient acut	Fekvőbeteg-szakellátás	410 270.60	151.95
chorinc	aktív fekvőbeteg szakellátás	346 607.50	128.37
Availability fee	krónikus fekvőbeteg szakellátás	62 715.10	23.23
Extra (cost-outlyer	bázis finanszírozású szakellátás (BM BVOP)	948	0.35
Special (fee for services)	Extrafinanszírozás	20.6	0.01
Special total	Speciális finanszírozású fekvőbeteg	34 872.60	12.92
Total	Összevont szakellátás összesen	563 712.10	208.78
Total		770 120.00	285.23

Number of active beds

	Aktív ágyak száma	1993 = 100 %
1993	76367	100
2000	64836	85
2003	60 433	79
2009	44 411	58

Number of chronice beds in 2009: 27 329

The impact of health informatics in hospital sector

- Data technologies for complex assessment to define the product of hospitals
- To analyses the needs for hospital care
- To analyses the utilization of the sectors
- To analyses the result of the hospital care
- And several other using
without informatics there are no possible to manage appropriate reimbursement system

The result of health informatics in Hungary

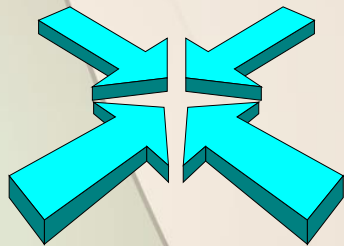
- **Development and implementation of coding schema for health (procedures, diagnosis, and others)**
- **Development grouping system for case-mix measurement**
- **Development of uniform data-set for every type of health providers at encounter level and collecting that and using for reimbursement and other analyses.**
- **The new indexes to measure activity**
- **Development information system for health management**
- **Using information system during the medical care**

Players in the Process of Development for Health Informatics

Parliament

Government

Ministry of Health



**Law on the data protection and personal data security
Using ID for patient's**

National Programs for statistics

**National Health Informatics Body
National Institution for Health Informatics
National Medical Institution
Public Health Officers Network**

Providers

Companies for software development

Short History of the Basic Implementation Process of Information Systems for reimbursement: in the very beginning

**1969 start to collect hospital discharge data in Tolna
County**

**1974 establish the institution, developing information
model and real system for county**

Short History of developing, implementing and using of new reimbursement for hospitals

- | | |
|-----------|-----------------------------------------------------------------------------------------------------------------------------------------------|
| 1986 | The first survey with DRGs in one county hospital |
| 1987-1991 | The national survey with 23 hospitals |
| 1992 | Introduction of basic information system (MBDS) for the reimbursement process in nation wide |
| 1993 | Implementation of the DRGs like payment system for hospitals with some protection rules, national cost – weight, own prices for each hospital |
| 1997 | Implementation of the general base-rate, refinement version of HBCs (Hungarian case-grouping system) |
| 1998 | Regulation by ministerial law of definition process of |
| 1999 | Reimbursement units and process, implementation some special reimbursement rules due to more precise and managable scheme |
| 2004 | HTA introduction
Volumencontrol |
| 2005 | DRGs based on reimbursement medical protocol for oncololgy
Severel modification |
| 2007 | The changes in the structure of hospital care |
| 2009 | The new general refinement |

What means DRGs/HBCs sytem

- **DRGs = Diagnosis Related Groups**
- **HBCs= Homogén Betegségcsoportok**

Grouping system of the hospital cases considering the medical problems and expected resources needed of treatments

List of hospital product based on main features

Grouping factors: main diagnosis for hospitalization, operation or other main procedures in hospital care, age, secondary diagnosis) of the care

There are several other classification methods for hospital cases with multiply grouping factort for other measurement issues (severity, prediction)

The leading department for DRGs-PPS

GYOGYINFOK

National Health Insurance Fund

Ministry of Health

Working Committee for Up-dating

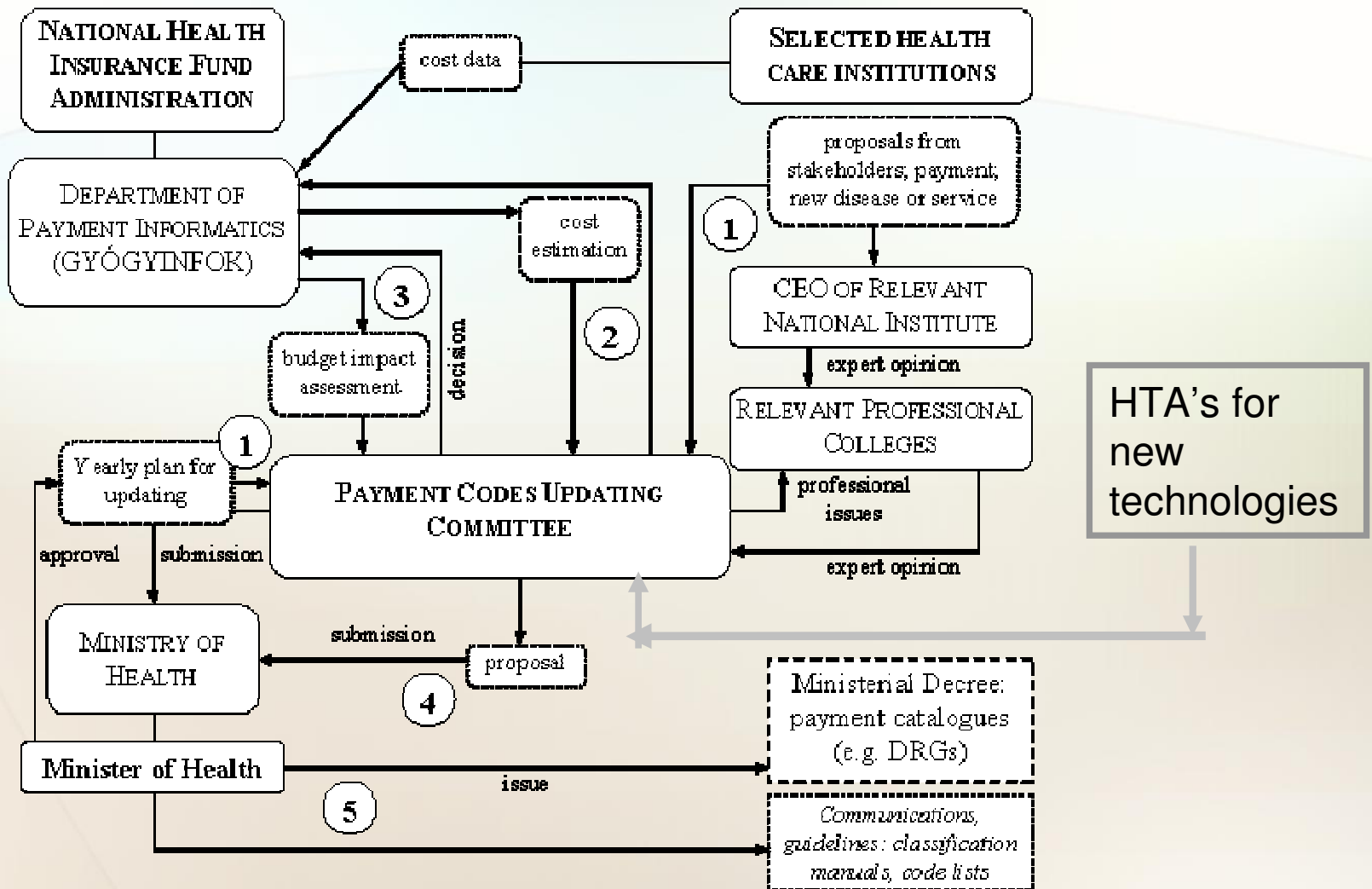
Committee for HTAs

National Medical Colleges

GYÓGYINFOK

- From starting to 2004: leader informatics institution under Ministry of Health for implementation and grouping, calculation of activity
- From 2004: part of the National Health Fund, with the same function

Process of decision about definition and pricing of provision and main players



Budget for the institution responsible for payment

Authority: Ministry of Health

Annually budget for every function expect up-date, and special statistics: 130 millió HUF (the number of staff 60 people) = 503,500 Euro (1400000 Euro)

Annually budget of update: 150 millió HUF = 580,945 Euro (3703704 EURO)

Annually budget for sectorial statistics with publishing cost: 50 millió HUF = 193,648 Euro

TOTAL BUDGET: 330 millió HUF = 1,278,079 Euro

Budget for the Minimum Task

Hospital budget: 219268 millió HUF

At providers level :

300 IBM PC compatibility computer Intel Pentium 2 (at least 100 Mhz)

•10000 discharges / computer

•price: minimum 300.000 HUF/computer

total budget for providers: 90 millió HUF = 348,567 Euro

Operating cost for central process: 60 millió HUF/year =

total budget for central data-process = 232,378 Euro



Target of implementation of DRGs like system

- **More accountable system**
- **More accessible system**
- **More equitable system**
- **More manageable system**
- **More cost- effective system (reduce of length of stay, push the cases from active care to chronic care, normative system, output-oriented system, reduce the unnecessary treatment, etc.)**
- **Protect the equity**
- **Cost-containment**

The Key Element of the Introduction

-
- Create basic information system for MBDS as survey
 - Define grouping scheme
 - Organization the cost-survey to define cost-parameters
 - Define the first reimbursement rules

Survey
period

-
- Voluntary use of MBDS system (in the first step)
 - Free computers and software for minimum information system to use that system
 - The communication standard for the mandatory data-gathering
 - The free choosing to use software but form of data communication is standard
 - Training and education
 - Regular consultation
 - Regular controlling
 - Use the information for different issues replaced the traditional statistical report
 - Organise the process of definition of reimbursement parameters

After
decision to
use it



The main advantages and disadvantages at starting point

- + Use the MBDS system from 1974 for 10 % of discharges at national level (the first application was in 1969 in Tolna county)**
- + Use the ICD from that time**
- + Standard budget information**

- There are no list for all medical services except surgery and labor examination**
- There are no cost calculation for services**
- There are no complete information system**

Summary

- DRGs like system is the most appropriate way to express hospital responsibility in the treatment process and to use as reimbursement unit actually
- DRGs like system support the quality issues, health policy but of course just one very important element of the total regulation and not replace other necessary regulation.
- The information system required is technically carriable.
- The regulation frame influence very well the real effect the DRGs like reimbursement system.
- There are some positive effects and change in the health system related to using HBCs.
- Hungary has some real additional benefits also because the system initiate some other development process in health care (developing quality standards, capacity regulation, cost-effectiveness analyses to modify benefit's list, analyses of resource consumption, morbidity, quality indicators, accessibility, etc.)

MBDS of Hospital Discharges: Defining and Coding Cases

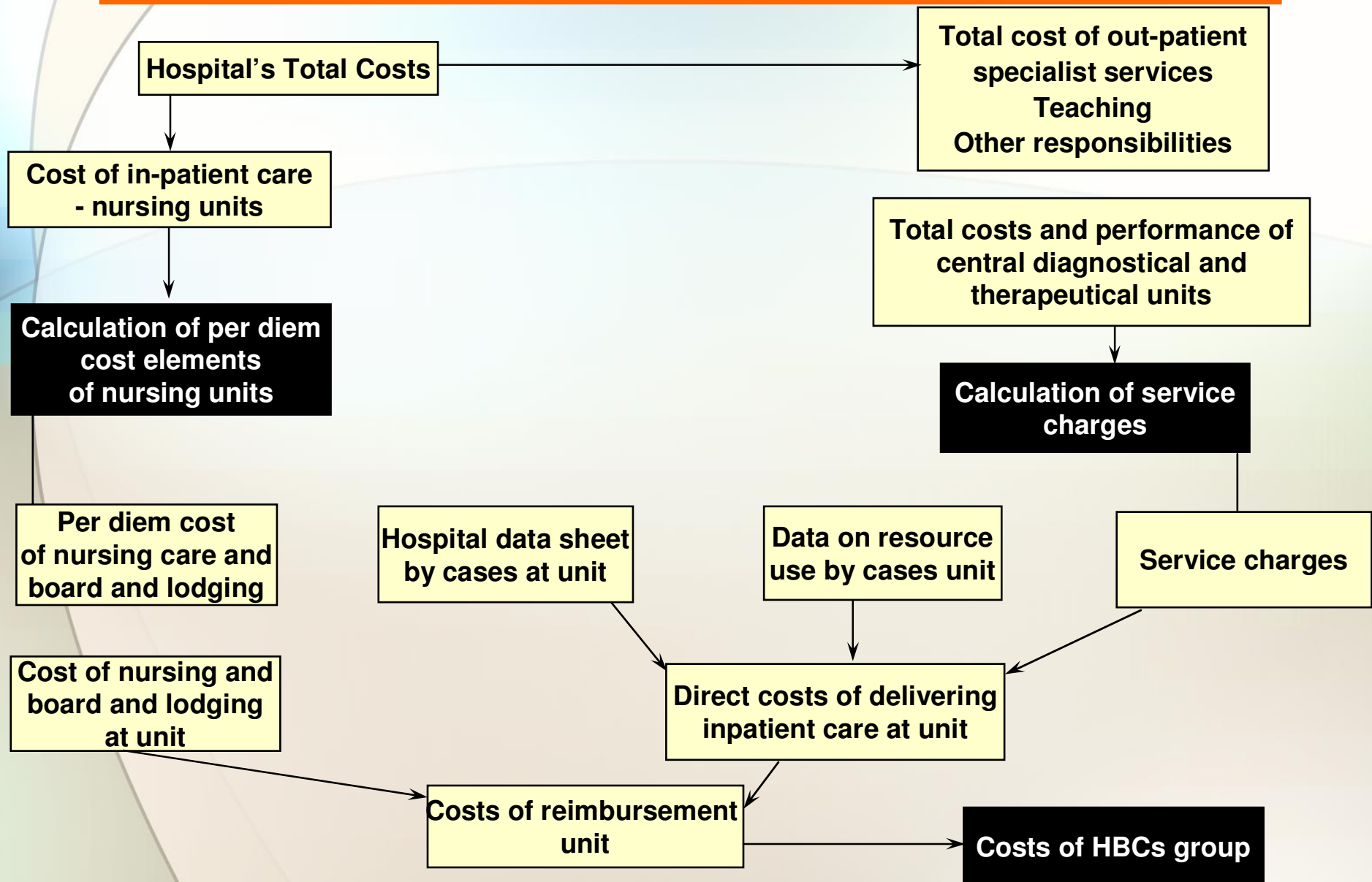
Determination of the mode of payment - who shall reimburse for the services, what should be taken as one payment case

- **Provider's identification data**
- **Patient identification data (health insurance number, other personal data, date of birth, sex)**
- **Identification of the hospital case (log number)**
- **Payment category (the Health Insurance Fund Administration will reimburse the costs in specific payment categories, in other cases another purchaser should reimburse for the services delivered)**

The Coding and Grouping Systems

- **Diagnosis Codes: ICD-10**
- **Procedures: Based on ICPM**
- **Oncological status: based on morphology coding scheme**
- **The coding scheme should be realizable.**
- **The coding system should be comparable with international data.**
- **The coding rules should provide precise definition of causes of hospitalization and relation to patient status**
- **The data provides benefits for reimbursement AND for medical analyses (epidemiological, quality analyses, etc.)**
- **The coding rules help the controlling process.**
- **The coding scheme helps to refine the grouping process in future.**

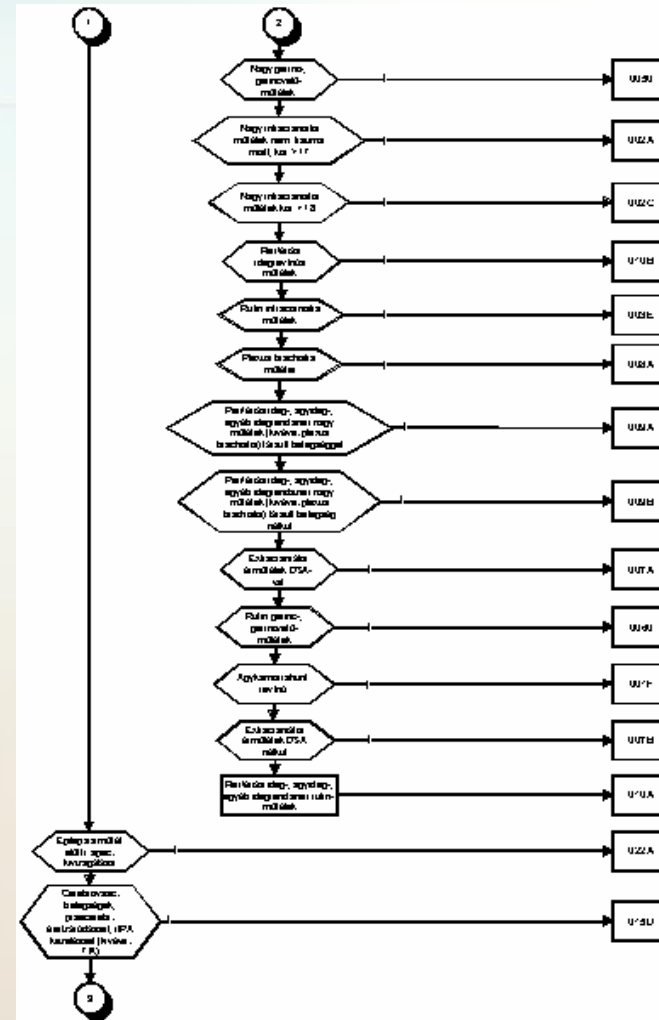
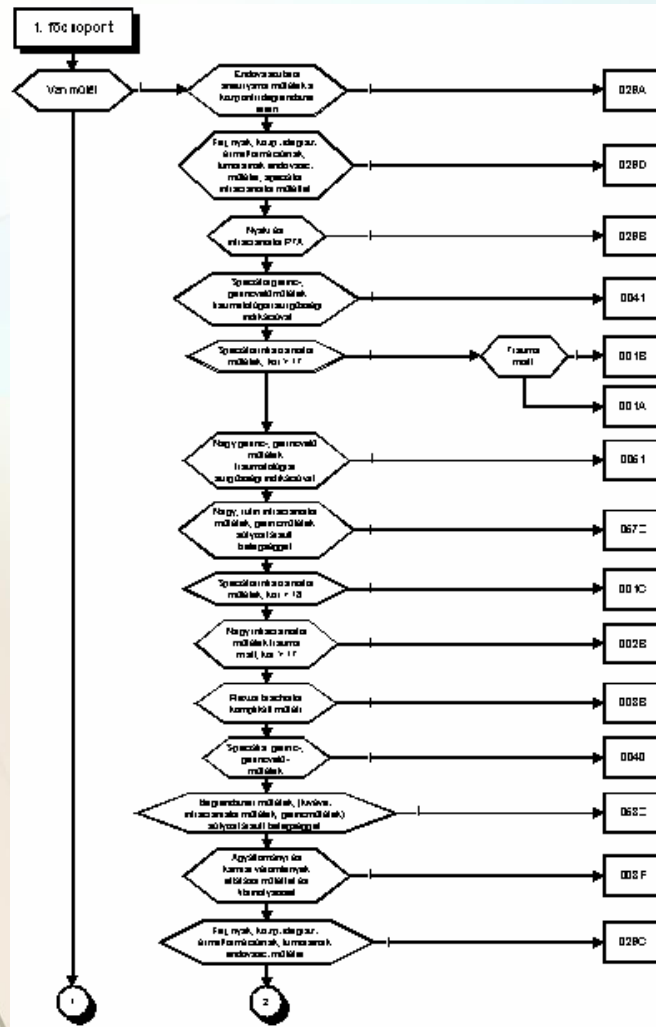
Calculation Process of Reimbursement Parameters



Create the first reimbursement parameters*

- **Hungary use own created parameters for reimbursement from beginnings (of course their done some comparison with other published parameters)**
- **The first study was in 1986.**
- **During 5 years period continusly analyses of the data: 28 hospitals involved in the study. Finally their had resource-consumption data about 500000 cases for definition the first parameters.**
- **Each departmental discharges were obseved independently.**
- **In the first step the resourses were measured in the natural unit, in the second step the cost data was calculated in values (Forints). (It is possible to calculate new cost value just with modification the unit cost.)**
- **The study was organized by Ministry of Healt and was manageg by GYOGYINFOK. The hospitals involved in the study got cost-reimbursement for their activity.**

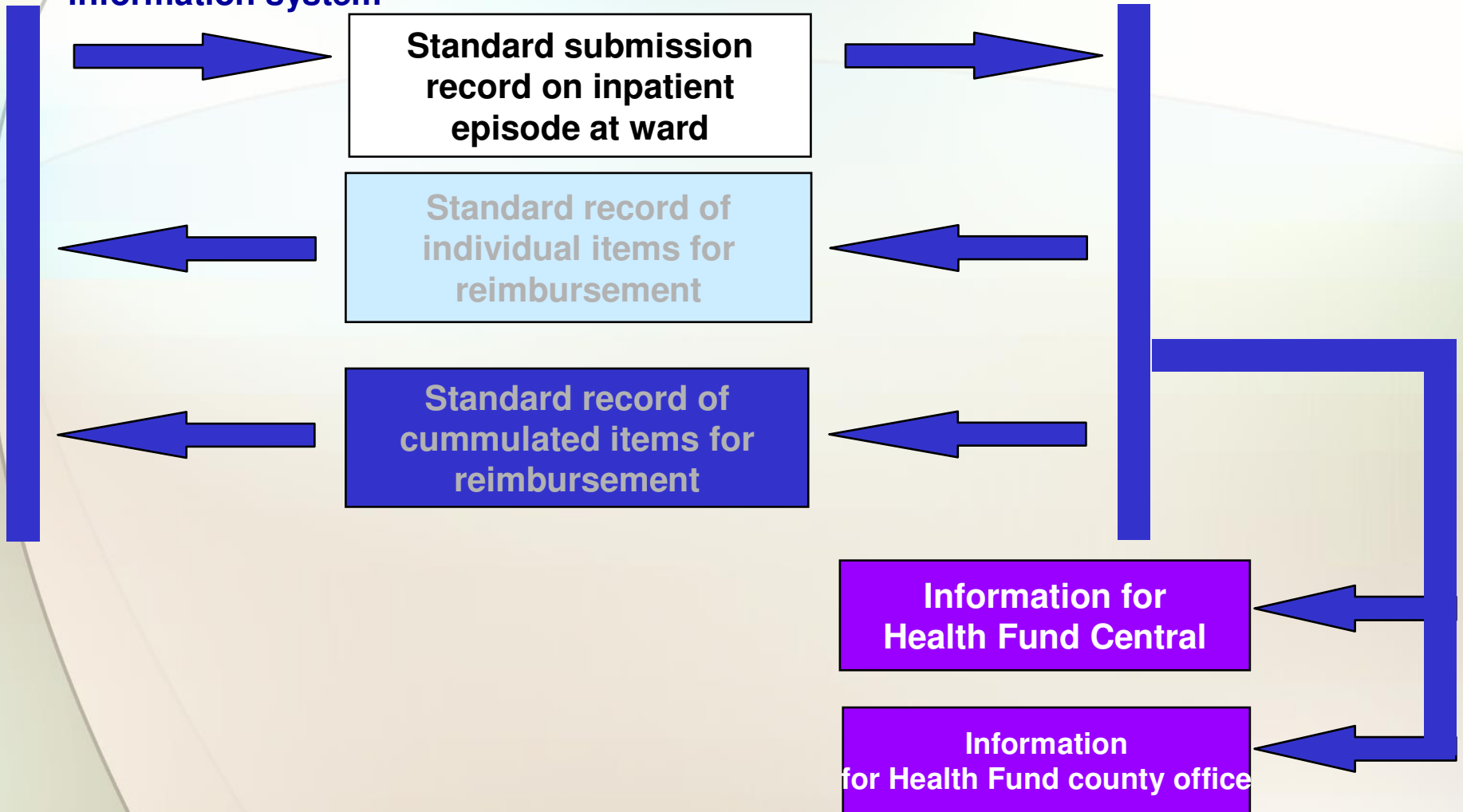
Sample for algorithmn: I. Main Groups Nervous System



Information Flow

The hospital's information system

Central reimbursement process



Price setting: methods of calculation Survey features

- a. Sample from every level of provision by hospital
- b. About 100.000 cases observed in one survey, more than 500.000 cases before introduction
- c. Time period: two month with 20 – 25 hospitals.
- d. Unit of survey: departmental cases
- e. Resources observed: direct medical and nursing services: drugs, imaging procedures, laboratory, CT, MR, surgery, etc

The direct costs are calculated according to the following formula:

DC = total cost of the service in one of the main resource consumption category
 q_j = quantity of the j^{th} resource used
 p_j = price of the j^{th} resource used

$$DC = \sum_{i=1}^k q_i * p_i$$

Indirect costs are calculated according to the following formula:

IC = total indirect costs of the service in one of the main cost categories
 CD = actual value of the cost driver
 TYIC = yearly total indirect costs in one of the main cost categories
 TYCD = yearly total value of the cost driver

$$IC = CD * \frac{TYIC}{TYCD}$$

Analyses of homogeneity based on reduction of variancy by grouping

RV = Reduction Of Variancy
 AGV = Average if ubterbak varyabcy by groups
 TV = Total variancy!

$$RV = \frac{AGV}{TV}$$

Price setting: methods of calculation

Which is the best price for the calculation of the cost of different resources required for certain DRGs: model of function-based calculation

1. Total costs of diagnosis and treatment

Diagnostical and therapeutic procedures

1.1. Drugs

1.2.1. Histopathological investigations

1.2.2. X-ray and ultrasound investigations

1.2.3. Endoscopy

1.2.4. Laboratory investigations

1.2.5. Operating room procedures (surgeries)

1.2.6. Anaesthesia

1.2.7. Implants

1.2.8. Physiotherapy

1.2.9. Radiation therapy

1.2.10. CT

1.2.11. EEG

1.2.12. ECG

1.2.13 Other investigations

1.2.14. Psychiatric interventions

1.2.15 Other treatments

1.2.16. Medical supplies, single-use devices

1.2 Diagnostical and therapeutic services, total

1.3 General medical diagnostical and treatment activities at the floor

2. Total nursing costs

2.1. Nurses' wages + expenditure on wages

2.2. Nursing materials and supplies

2.3 Low-cost physical assets in nursing

3. Total of cost of other materials

3.1 .Other pharmaceuticals-type supplies

3.2. Other personal benefits

3.3. Other costs

4. Total costs of medical and nursing care

5. Total costs of accommodation/other costs

5.1. Support staff

5.2. Non-medical materials and supplies

5.3.1. Maintenance services

5.3.2. Energy, gas, water, heating, sewage

5.3.3. Laundry, linen repairs

5.3.4. Central sterile supplies

5.3.5. Food services (catering)

5.3.6. Other ancillary services

5.3. Total ancillary services

6. Limited net costs of treatment and care

7. Costs of central management and administration

8. Total net costs of treatment and care

Price setting: methods of calculation

Which is the best price for the calculation of the cost of different resources required for certain DRGs - new solution

Few samples of possibilities depending on the type or resources (health technologies, non-specific health technologies)

- a. **Drugs: considered to be covered with minimal price or average price or cost calculated by other standard methods of the agent (considering the price of generic)**
- b. **Medical devices (included implantations, catheters, etc.) covered**
- c. **Medical services (X-ray, CT, MRI, surgery services, implantation, etc.) considered to be covered : the same cost calculated for in-patient care as the fee paid for out-patient treatment by health insurance**
- d. **Surgery treatment: cost calculation by survey or by protocol**
- e. **Cost of staying: use the cost data of survey adjusted with normative expected utilization ratio compared with market price of similar goods**

Price setting based on protocols

Define DRGs for chemotherapy based on medical protocols reimbursed

- Relation to the coverage process: Hungary created new regulation as EU transparency directive ordered for all drugs to accept into medical services' basket reimbursed based on positive result of HTA.
- Relation to process of definition medical reimbursement protocol: Medical board-committee for oncology has responsibility to define the medical protocol for the chemotherapy and the total process before acceptance for reimbursement
- Relation to the type of provision: Patient's could get chemotherapy as the hospital care or out-patient's care, but independently type of provision it is reimbursed with the same fee, with the same way based on the same documentation required. The provision status of the patient's could be changed duration of cycles.

The fundamental questions under debate:

- **DRG system or reimbursement for every medical services treated the patient's (fee-for services reimbursement) ?**
- **Uniform financing nationwide, or consideration given to levels of progressiveness?**
- **All treatment to be financed based on DRG, or could there be exceptions?**
- **What proportion of the total reimbursement should be DRG-based, what proportion should remain as input or fixed reimbursement?**
- **The cost-weights of DRGs to be determined based on surveys, or in accordance with medical protocols?**
- **What adaptation strategy needs to be applied to ensure that the modification of the reimbursement system does not cause either problems in the provision or problems of the cost-containment issues?**

How use the grouping system for reimbursement

- There are very different cases in the hospital = „every cases differents from others”
- Choose appropriate factors for grouping which are able to express: type of treatmet’s path, cost of treatment, minimal requirements for providers to ensure to do that
- Define the critères for homogeneity and define the grouping rules
- Define parameters as requirements for that groups cosidering target of reimbursement (for example: normative lengh of stay, upper and lower trimmpoints, cost-weights)
- Define the additional reimbursement rules, process, information system, etc.

Sample for definition: without surgery

08 421C Fracture of upper arm

Diseases

- S4200 Kulcscsont-törés
- S4210 Lapocka-törés
- S4220 A humerus proximális végének törése
- S4230 A humerus középső részének törése
- S4240 A humerus distalis végének törése
- S4280 A váll és felkar egyéb részeinek törése
- S4290 A vállöv k.m.n. részének törése
- S4800 A vállizület traumás amputációja
- S4810 A felkar traumás amputációja
- S4890 A felkar k.m.n. szintjének traumás amputációja

Sample for definition: with surgery

Diseases

**** 07 3475 *Epe- és hasnyálmirigy-vezeték szűkülések és elzáródások endoszkopos műtéte öntáguló fémstenttel*

BETEGSÉGEK

C2200 Májsejt-rák
C2210 Intrahepaticus epeút-rák
C2220 Hepatoblastoma rosszindulatú daganata
C2230 Amáj angiosarcoma
C2240 Amáj egyéb sarcomái
C2270 Amáj egyéb meghatározott rákjai
C2290 Máj rosszindulatú daganata, k.m.n.
C23HD Az epehólyag rosszindulatú daganata
C2400 Extrahepaticus epeút rosszindulatú daganata
C2410 Papilla (ampulla) Vateri rosszindulatú daganata
C2480 Az epeutak átfedő elzáródása, rosszindulatú daganata
C2490 Epeút rosszindulatú daganata, k.m.n.
C2500 Hasnyálmirigyfejr rosszindulatú daganata
C2510 Hasnyálmirigytest rosszindulatú daganata
C2520 Hasnyálmirigyfarok rosszindulatú daganata
C2530 Hasnyálmirigyvezeték rosszindulatú daganata
C2540 Endocrin pancreas rosszindulatú daganata
C2570 A hasnyálmirigy egyéb részeinek rosszindulatú daganata
C2580 A hasnyálmirigy átfedő rosszindulatú daganata
C2590 Hasnyálmirigy rosszindulatú daganata, k.m.n.
C7720 Intraabdominalis nyirokcsomók rosszindulatú daganata
C7870 Amáj másodlagos rosszindulatú daganata
K8310 Epevezeték-elzáródás

Procedures

ÉS BEAVATKOZÁSOK

16361 Endoscopos sphincterotomia
16362 Endoscopos nasobiliaris drénezés
16367 Wirsungotomia endoscopica et dilatatio eadem
32630 PTC cholangiographia percutanea transhepatica
32631 Percutan transhepaticus drainage (PTD)
32660 Endoscopos retrograd cholangiopancreatographia (ERCP)
32661 ERP pancreatographia endoscopica

ÉS ESZKÖZÖK

01358 Öntáguló fémstent az epeutak, pancreas vezeték területén történő felhasználásban

Sample of HBCs with parameters for 5. Circulatory system

	Code	Name	Lower trimmpoint	Upper trimmpoint	Normative lenght of stay	Cost-weight
	05P 2000	Embolectomy	2	13	6	0,97895
	05P 2010	Amputation because of circulation disease except digits	2	53	22	2,71572
	05P 2020	Amputation because of circulation disease for digits	2	50	16	1,3712
	05P 2030	Varix surgery	1	25	4	0,51132
	05P 2040	Other surgery for circulatory system	2	25	7	1,3698
	05M 2050	AMI with thrombolysis	6	40	13	2,74354
	05M 2060	AMI with temporary implantation of pacemaker	6	40	14	2,56517
	05M 2070	AMI without special treatment	6	40	13	1,85417
*	05P 2081	AMI with PCI (one or more stent)	2	40	13	8,36299
*	05P 2082	AMI with PCI, without stent	2	40	13	6,22345
*	05M 2091	Thrombolysis AMI esetén with rtP with transfer	0	40	1	3,20511

What is the means of HBCs each parameters

- **Cost-weight = reflect the resource's need compared with „average” cases**
- **Upper and lower trimmpoint: hospital cases between that two time corridor**

The Main Grouping Principles

- The main grouping factor is a diagnosis code.
- The second factor could be a certain therapy or procedures.
- Other factors could be age, commorbidities, justifying procedures: subgroups based on that secondary factors
- The commorbidities are important factors mainly for diseases with have different stadium (not too serious, or not simply cases).
- The ages are important factors mainly for age-dependent diseases or stadium.
- Justifying procedures are very important when the treating processes needed for the same disease and stadium are very different.
- Homogeneity requirements: medical problem, resources consumption, requirements of minimal medical envirements, path of treatment process (guarantee, one-day cases)

The ways how you could use the DRGs system for reimbursement – it could be very variant with very different effects

- **Input methods**
- **Output method with different base - rate**
- **Output method with similar base - rate**
- **Mixed system (input + output)**
- **etc.**

Hungarian Solution: Basic regulation elements of reimbursement by DRGs

- **legislation for new reimbursement**
- **organization for case-mix development and data-process**
- **regulated process for up-dating with participation of the stake-holders**
- **connection with the other legislation areas**
- **reimbursement rules**

Hungarian Solution: Basic regulation elements of reimbursement by DRGs

- **base-rate**
- **reimbursement unit**
- **reimbursement calculation**
- **guarancie rules**
- **outliers**
- **general condition for reimbursement**
- **reimbursement process, correction**
- **penalty rules**

What criteria should be medical providers designed by insurance institution meet

- Permission to do health treatment in certain medical profession (minimal requirements are regulated)
- Covering decision by Minister of Health and Minister of Finance to could be working under the reimbursement of NHIF
- Contract with NHIF
- Data-provision on their activity as regulated (monthly, at discharge level)

Main objectives of modifying the hospital financing system:

- **Patients only to be admitted to hospital for necessary treatment.**
- **Of such treatments, only those services to be provided at the hospital that cannot be provided efficiently elsewhere.**
- **Patients to receive treatment at the appropriate location.**
- **Patients to receive the appropriate standard of treatment.**
- **Cases to be treated cost-effectively following admission (reduction in nursing time, adherence to specified nursing times, omission of unnecessary tests).**
- **No significant regional or other discrepancies in the availability of treatment.**
- **Financing limitations to be realistically applicable.**

Model of Health Care Market under National Social Health Insurance System

- Health Markets are regulated: products, price, quality, transactions
- The basket of Health Services modified by regulated procedures.
- There are the quality defined of services which are acceptable for reimbursement.
- The more output produce more income for providers

There are strong transaction between health sector and other sector for goods

Define the Product of Hospitals

Questions:

- What is considered to be one unit of payment (a case at the ward, an episode at the hospital, all hospital episodes within a specific period of time)
- What categories of the unit of payment should be differentiated by type of hospital case (categories and rules of grouping in the DRG classification system).

The price-setting for health services

Questions:

- What costs are covered by the reimbursement rates (only operating expenses or depreciation costs, too)
- Which is the type of price (relation to the cost, willingness, usefulness)
- What is the process to define the fee.
- What is the basic for calculation: medical protocol or practice

What is the assumptions of acceptable services and what are consequences

- **Consequences of incorrect data provision**
- **Regulation of hospital utilisation**
- **Quality requirements of allowable services, guaranty limitations in repeated services**
- **Limits by capacity and contract of allowable services**
- **General conditions of limitations to services**
- **Establishment of time relationships between output and reimbursement**

Hungarian Solution for reimbursement: PPS prospective payment system

- **Reimbursement system is totally output-oriented system and has very limited fixed elements.**
- **The regulation scheme has 4 level**
 - **- parliamentary law: general rules, health budget for hospitals**
 - **- governmental law: information, calculation, controlling and payment**
 - **- ministerial law: reimbursement units, parameters, other requirements**
 - **- manual book: coding and grouping rules**
- **Number of HBCs groups: 750-800 (because several modification)**

The establishment of Hospital Reimbursement System

- **The reimbursement fee is different for different HBCs and for different type of cases, for the same cases is the same at nationwide.**
- **The system involve the part-day care and total-day care.**
- **The HBCs system cover not only the normal hospital cases: one-day clinical and surgical cases, sort- urgent cases (6-24 hours treatments) and serial out-patient cases (chemotherapy, etc.) are also involved.**

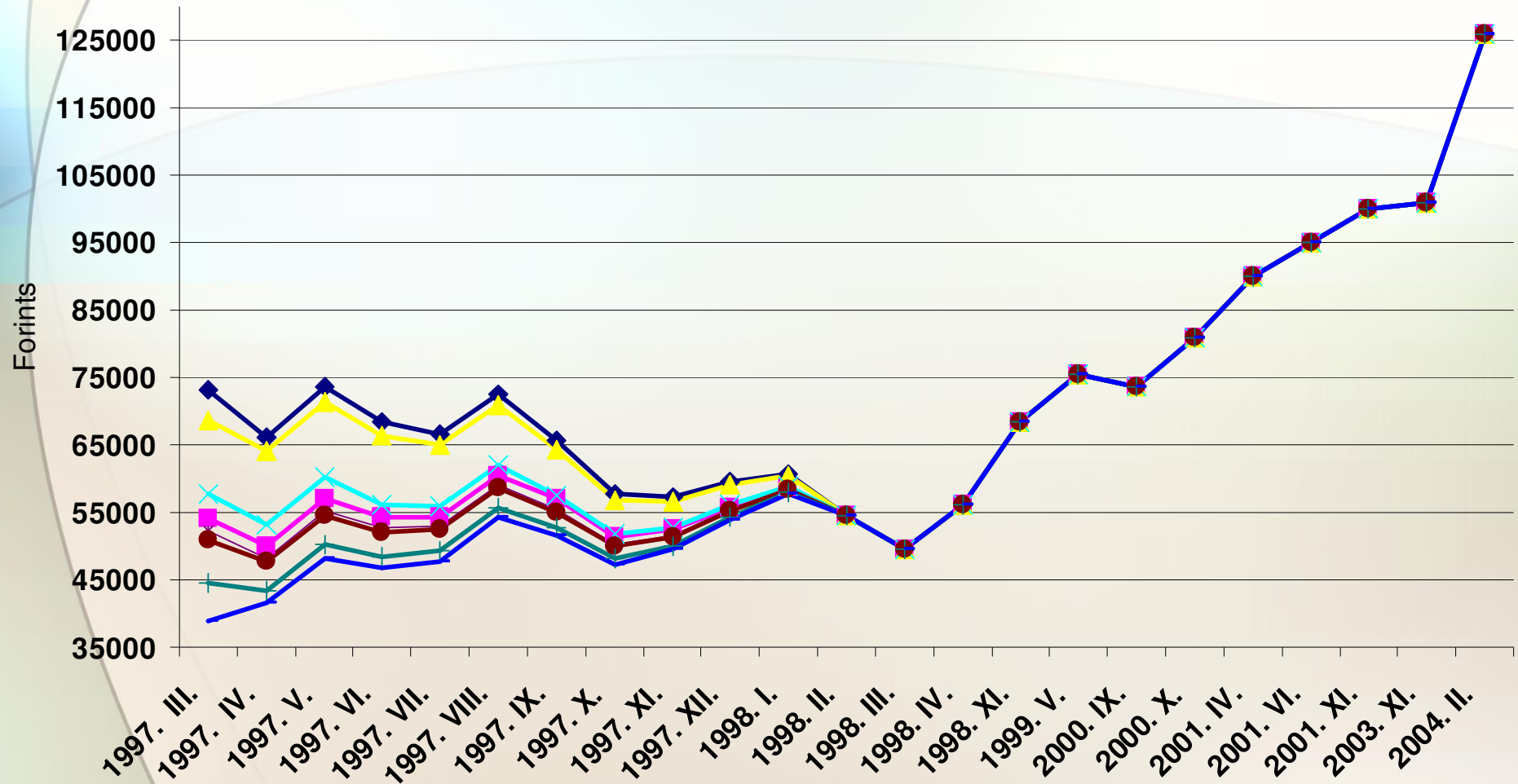
Base-rate policy

- **Actually the base rate is the same nation wide and predefined.**
- **The reimbursement fee is different for different HBCs and for different type of cases.**

The way to national base-rate

- ➔ **1993: own base-rate (cost/activity adjusted by case-mix at starting) and modification multiply factors because of fixed national monthly budget**
- ➔ **1995: multiply factors for medical brances, type of provider and modification multiply factors because of fixed national monthly budget**
- ➔ **1997: montly base-rate and adaptation to the national base-rate**
- ➔ **1998: predefined national base rate, additional fee at highest progressziv level**

Base-rate - Adaption period



Calculation of reimbursement fee





Reimbursement fee for certain DRGs = base-rate * cost-weight of that DRGs

for example 146.000 Ft*1,23276 cost-weight =
179.983,- Ft/cases

The change of definition of reimbursement unit

- **1993**: one hospital case could be more than one reimbursement unit if the patient was treated by more than one department
- **1995**: one hospital case could be only one reimbursement case
- **1997**: more than one hospital cases within the same provider could be only one reimbursement case if the patient was readmitted before upper trimmpoint except several urgent cases, etc. (garancy rule)
- **2005**: more than one hospital cases independently who was the previous provider could be only one reimbursement case if the patient was readmitted before upper trimmpoint except several urgent cases, etc. (garancy rule)
- **2007**: after hospitalization, before upper trimmpoint no additional payment for out-patient's care.

The accounting rules for different type of cases

- | | | |
|-----------------------------------------------------------------|--------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|
| • Short cases (length of stay is less lower trimmpoint of HBCs) |  | • (Cost-weight/lower trimm-point)*base-rate |
| • Normal cases |  | • Cost-weight*base rate |
| • Long cases |  | • Cost-weight * base rate+
number of long days * basic
chronic daily base rate * 0,7 |
| • Transferred cases (except surgery cases) |  | • (Cost-weight/normative
length of stay) * base-rate |

The current system..

- **Cost - outliers are paid based on details data of resource consumption.**
- **Day – outliers are paid based on daily rates (different for intensive and normal care).**
- **There are some important rules related to HBCs as conditions of reimbursement (not every hospitals have a licence for all HBCs)**
- **Very limited list of services in hospitals where reimbursement is fee for services like (graft, some special implantatum, transplantation, dialysis, etc.).**
- **In the introduction and transition period the system use special risk corridor but actally no risk corridor at hospital level, just at national level**
- **The budget for hospitals at national level is fix for year, the base-rate must be recalculated if the activity get certain level.**

Connection among chronic and acute hospital care

Current regulation

- **usually hospitals have acute and chronic department**
- **use the same MBDS information system for chronic cases**
- **daily fee depending on the type of chronic care: rehabilitation, nursing care, etc.**
- **some special merge rules among acute and chronic cases if the patients are transferred from acute to chronic: no daily fee why staying in hospital less than normative days of HBCs (in acute cases) + 7 days**

Future issues

- **use chronic case classification system like HBCs**
- **accreditation for different function**

General Reimbursement Timetable presently

Day 5 of the month following the month under review

Day 20 of the following the month under review

Day 29 of the month following the month under review

Day 1 of the second month following the month under review

Day 5 of the third month following the month under review

Deadline for submitting data of activities Performed during month under review

Process for data for reimbursement month under review or to correction of data by additional items

**Reimbursement and money transfer orders sent to the Treasury
Reimbursement information (list of errors) sent to providers**

Reimbursement credited to provider's account based on money transfer by Treasury

Last chance to correct items submitted for reimbursement for month under review, based on list of errors

Pozitív impact of HBCs system at national level

- More accountable, accessible, equitable, manageable system.
- HBCs is appropriate tool to create frame for cost-containment at national and hospital level, for optimal risk sharing between hospitals and insurance institution.
- The HBCs could support cost-effective issues at hospital level and alone (not considering the other elements of health system) at national level too with certain limitation.
- The HBCs could support the health priority and policy issues.
- No waiting list (before volumen control).
- No unmanageable problem at technical level to send the necessary information.
- Final result: during the last 15 years the real value for hospital care was decreasing but the activity of hospital sector was increasing.

Pozitív impact of HBCs system at national level II.

- **Follow-up the redistribution of the resources: more cases in the higher level – more accessibility and more resources distributed to the eastern part of Hungary**
- **Average length of stay: reduction**
 - **Coding: more cases with commorbitites**
 - **Measurable health care: analyses of hospital care possible**
 - **Number of beds: reduction seen**
 - **Complicated cases: more cases for operations and not hospitalization**
 - **Activity: increasing**
 - **Final result: reduction in real values for hospital care seen and more activity**

Problems with output-oriented system not-only with DRGs

- **More and more activity: uncontrolled admission**
- **Up-coding, more additional diagnosis: lack of efforts on the real controlling on the HCFA side, more effort on the regulation side and analyses**
- **Some adverse effects because of the inappropriate regulation (bed-regulation, definition of the reimbursement unit, volumen control, etc.)**

Problems with output-oriented system DRGs impact

- **„Quicker and sicker” : it is not effect if there are implementation of quarancy rules**
- **Not appropriate cost-weight: it could be corrected with refinement**
- **Selection of patiens: it could be prevented with better definition of groups**

Changes Seen in the Hospitals I.

- **Behavior: Enterprise like: looking after more patients, do the economical analyses, overview the changing, etc.**
- **Adoptation to the system: Very fast adoptation to the new system and his changing**
- **Development of internal regulation: Focusing on creation of income and cost centers, internal accounting, internal interesting system**
- **Organizational changing : Development of controlling organization and information groups**

Changes Seen in the Hospitals (continued) II.

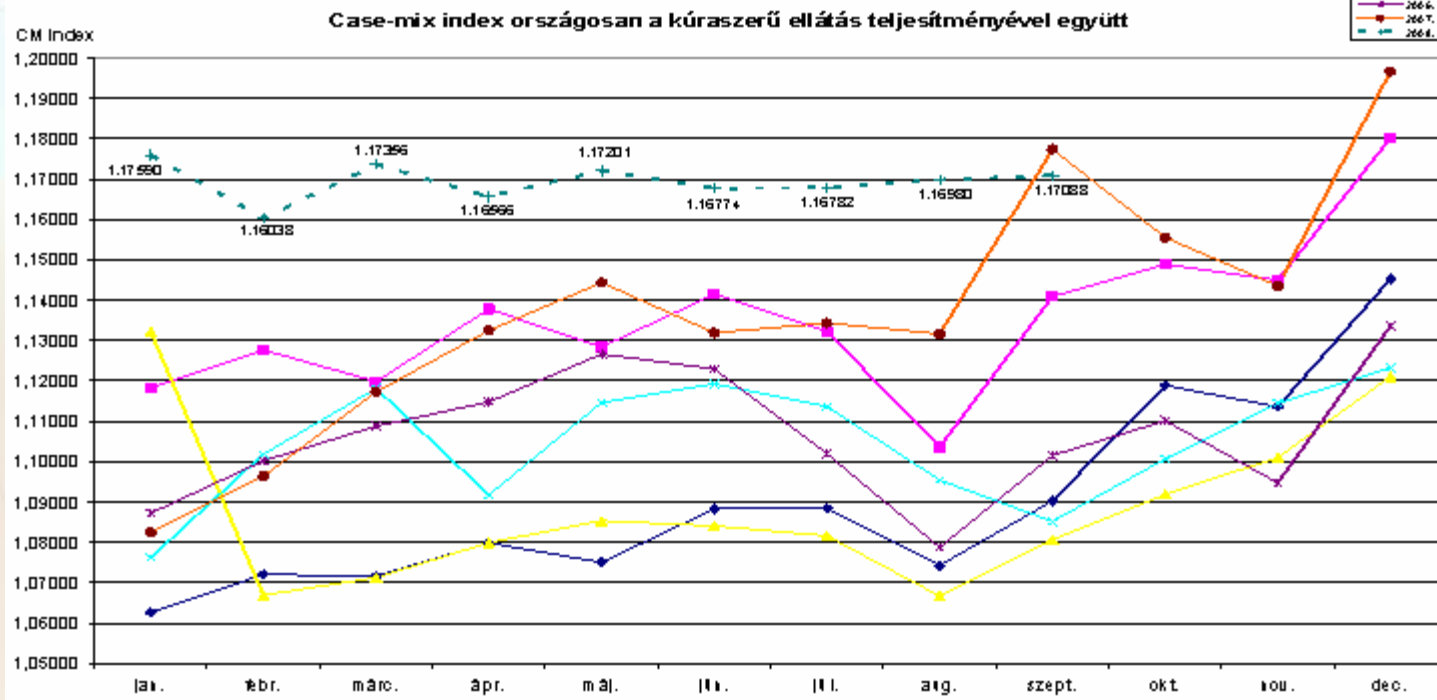
- **Management function: More data to planning, controlling the activity and resource consumption**
- **Knowledge on the system: By today majority of the physicians know the system well. The experts in informatics and controllers are very important members of the staff.**
- **Quality of the management: Several special education**

The Main Indexes and Methods for Analyses

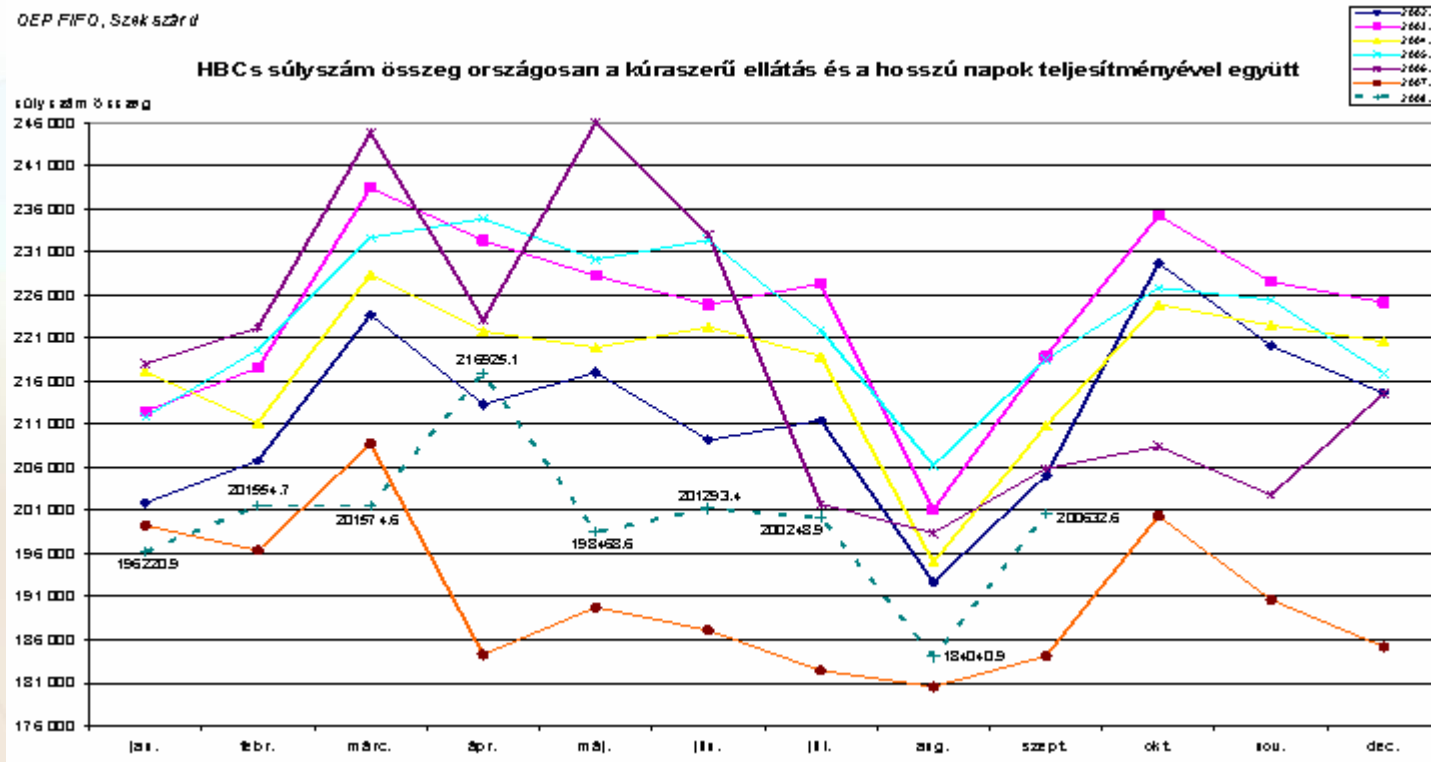
- **Case-mix index synchronized with reimbursement rules**
- **Average normative length of stay**
- **Normative utilization rate based on normative length of stay**
- **Factors to analyze activity changes**
- **Number of discharges adjusted by case-mix index**
- **Index of deviation**
- **Variance of the cases**
- **Index of concentration**

The Case-Mix Index

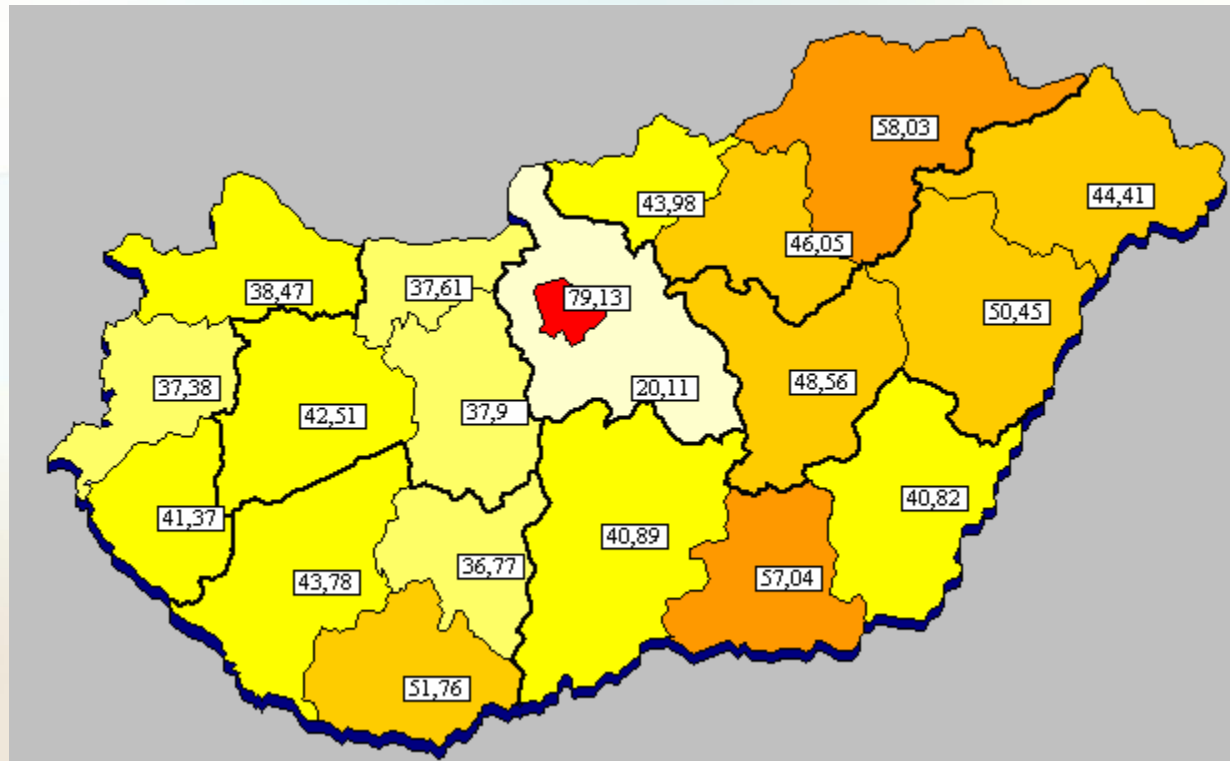
OEP FIFO, Szakszám



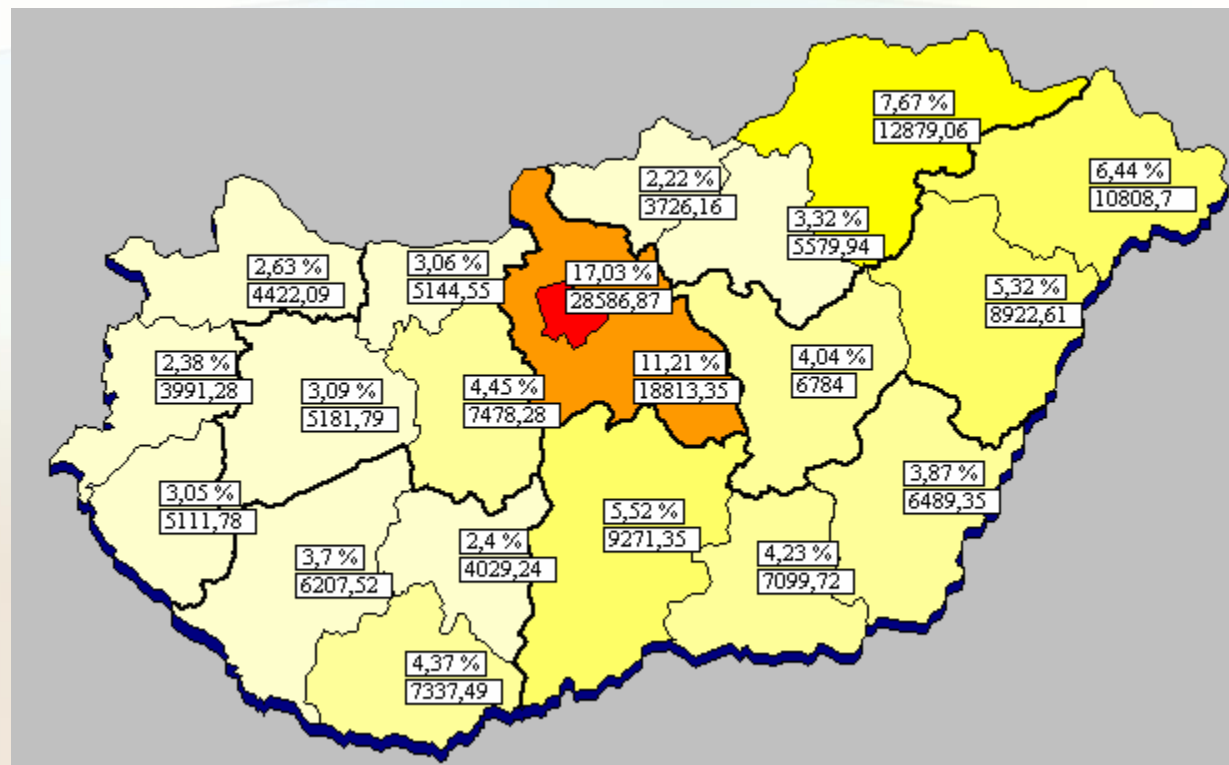
The number of discharges adjusted by case-mix



The number of beds per 10000 inhabitants



The number of discharges adjusted by case-mix per 10000 inhabitants based on patient's address



Sample Reports Published on the Internet

Activity data 1999 for hospitals in Hungary

	number of data Record	number of departmental cases	number of reimb. cases	number of average reimb. cases	cummulated cost.	days weight after higher trimm	CASE-MIX	CM INDEX- national average	Real number of days	Normative. number of days	Real / reimb. cases	NORM. reimb. cases
01 Belgyógyászat	382388	381917	332431.40	321909.86	351955.16	50004.43	1.09748	0.03841	3199489.0	3124793	9.62	9.40
02 Sebészet	240636	240265	209197.44	206159.83	237724.70	40728.06	1.15838	0.09931	1676154.0	1634228	8.01	7.81
03 Traumatológia	146515	145366	138424.51	136972.72	161230.80	41763.72	1.18524	0.12617	1043265.0	1094210	7.54	7.90
04 Szülészet-nőgyógyá	399024	398933	371460.30	360421.82	215458.73	33512.63	0.60027	-0.45880	1872770.5	1812341	5.04	4.88
05 Csecsemő-gyermekgy	218717	218668	206243.12	203137.38	159661.75	38134.23	0.79099	-0.26808	1298797.0	1357623	6.30	6.58
06 Fül-orr-gégegyógyá	110372	110361	104730.37	104054.74	62762.29	13643.33	0.60666	-0.45241	529365.0	541772	5.05	5.17
07 Szemészet	81177	81155	77789.20	77363.42	71753.05	1886.75	0.92813	-0.13094	443640.0	500007	5.70	6.43
08 Bőr- és nemibeteg-	26275	26266	24623.45	24569.82	24765.51	4226.80	1.01255	-0.04652	238570.0	221855	9.69	9.01
09 Ideggyógyászat	89737	89678	82344.40	81570.72	86235.06	15154.93	1.06214	0.00307	850311.0	848864	10.33	10.31
10 Ortopédia	34328	33313	32669.88	32365.24	54947.44	4402.99	1.70136	0.64229	299447.0	327845	9.17	10.04
11 Urológia	72449	72431	64889.63	64199.31	67870.61	17727.33	1.06456	0.00549	450677.0	454423	6.95	7.00
12 Onkológia, onkorad	49826	49797	44230.32	40798.61	51971.71	26105.26	1.29095	0.23188	348241.0	345942	7.87	7.82
13 Fogászat és szájse	8665	8664	8201.57	8154.71	8322.49	1454.83	1.02533	-0.03374	51720.0	55231	6.31	6.73
14 Reumatológia	45193	45191	43839.00	43858.10	43728.41	2448.79	0.99853	-0.06054	558038.0	502174	12.73	11.45
15 Intenzív betegellát	53019	52900	32030.49	28619.21	105704.27	10914.86	3.70365	2.64458	245836.0	365189	7.68	11.40
16 Fertőző betegellát	39973	39947	36222.97	35570.05	30475.29	7847.77	0.86266	-0.19641	305312.0	282270	8.43	7.79
17 Felvételi osztály	5618	5617	2021.40	1661.13	1518.77	20.45	0.91462	-0.14445	6913.0	14128	3.42	6.99
18 Pszichiátria	96031	95673	86634.02	86127.50	87793.95	37156.10	1.03087	-0.02820	1378381.0	1195308	15.91	13.80
19 Tüdőgyógyászat	83757	83536	76586.89	76512.97	89692.28	53554.39	1.19094	0.13187	975000.0	868550	12.73	11.34
21 Utókezelés	2	2	2.00	2.00	0.63	0.31500	-0.74407		31.5	31	15.75	15.50
22 Rehabilitáció	24	24	24.00	24.00	3.27	0.13625	-0.92282		163.5	157	6.81	6.54
24 Sugárterápia	12024	12023	11240.10	11081.82	15719.33	22413.19	1.47250	0.41343	117935.0	121356	10.49	10.80
27 Angiológia	7104	7001	5922.14	5829.40	6921.16	590.81	1.18999	0.13092	64545.0	56518	10.90	9.54
28 Haematológia	18724	18721	16129.43	15398.13	27701.90	13872.46	1.82310	0.76403	155548.0	154176	9.64	9.56
29 Immunológia, allerg	16636	16618	14471.55	14349.90	16786.26	4474.45	1.17811	0.11904	140733.0	142773	9.72	9.87
30 Anyagcsere és endo	11792	11774	10308.23	10243.31	9437.83	1608.92	0.92556	-0.13351	104210.0	94531	10.11	9.17
31 Gastroenterológia	42881	42853	36514.54	35692.92	37248.94	5487.48	1.04770	-0.01137	344900.0	332130	9.45	9.10
32 Tüdő- és mellkasse	8771	8758	4981.53	4916.36	9819.22	2553.41	2.01112	0.95205	64624.0	57258	12.97	11.49
33 Érsebészet	22192	22146	18372.29	18349.75	31125.05	4396.06	1.70261	0.64354	178900.0	189594	9.74	10.32
34 Idegsebészet	19142	19136	15514.19	15337.09	33073.64	3880.75	2.16320	1.10413	157813.0	167393	10.17	10.79
35 STROKE	20130	20111	17941.34	17642.70	21088.14	3021.70	1.19986	0.14079	175882.0	174930	9.80	9.75
36 PIC	5992	5892	5304.96	4893.57	26552.37	4079.15	5.44823	4.38916	91929.0	95351	17.33	17.97
37 Nephrológia	2566	2562	2195.01	2140.32	2582.25	488.05	1.21256	0.15349	23791.0	21617	10.84	9.85
39 Szívsebészet	10147	10142	7227.61	7076.47	33878.40	1630.48	4.79362	3.73455	65400.0	63175	9.05	8.74
40 Kardiológia	69934	69896	59997.71	58517.88	84361.81	7348.12	1.44499	0.38592	567263.0	558675	9.45	9.31
41 Ifjúsági pszichiát	918	918	896.29	884.49	1192.61	21.87	1.34902	0.28995	11366.0	14075	12.68	15.70
44 Drogbetegellátás	1	1	1.00	1.00	1.46	1.46270		0.40363	10.0	9	10.00	9.00
89 Összesen	2452680	2448256	2201614.46	2156408.42	2271066.69	476554.55	1.05907		18036970.5	17790502	8.19	8.08
91 Transzplantációs c	504	503	503.00	503.00					12845.0		25.54	25.52
92 0 súlyszámú HBES-k	9647	9631	9631.00	9631.00					90306.0		9.38	9.37
93 Ambuláns	8284	8284	8284.00	8284.00					.0			
94 Nem OEP finanszíro	11947	11930	11135.53	10523.67	9674.51	2354.99	0.92528		57422.0	66172	5.16	5.94

Sample Reports Published on the Internet

Hospital activity 1999 cumulated cost-weight

County by hospitals	County by patient									
	BUDAPEST	BARANYA	BÁCS-K	BÉKÉS	B-A-Z	CSONGRÁD	FEJÉR	GYŐR-S-M	HAJDÚ-B	HEVES
01 Budapest	383513.84	1462.46	8052.01	2958.66	6113.58	1828.74	18770.50	6402.37	2030.48	13209.66
02 Baranya	565.95	94742.19	2182.72	189.02	316.32	281.22	859.33	308.55	64.25	130.47
03 Bacs-Kiskun	398.20	393.09	104143.07	382.82	115.65	654.52	249.80	17.57	113.28	63.63
04 Bekes	148.42	3.65	76.93	73704.79	36.37	629.60	17.50	15.88	135.21	11.74
05 Borsod-Abauj-Zemle	539.43	20.31	115.67	77.79	135854.53	32.58	82.92	25.42	361.76	1867.71
06 Csongrad	452.71	171.39	10405.07	9775.75	149.05	85020.67	127.40	60.62	131.45	97.06
07 Fejer	612.45	45.42	672.46	22.80	61.01	21.48	65326.37	26.38	19.03	40.95
08 Győr-Sopron-Moson	2276.02	71.67	69.93	25.35	83.20	37.50	287.90	71804.77	60.60	50.82
09 Hajdu-Bihar	697.47	39.21	873.95	1701.36	9036.22	393.31	249.47	66.42	128344.80	2117.89
10 Heves	378.71	24.70	55.02	31.71	1140.22	33.04	21.73	25.32	75.13	59649.67
11 Komárom-Esztergom	507.56	5.96	29.68	9.45	39.15	22.98	1211.77	335.62	37.02	30.74
12 Nograd	213.86	3.28	12.72	12.14	32.32	6.18	8.25	6.42	14.19	230.02
13 Pest	7919.37	41.28	439.53	111.97	266.38	54.82	520.61	299.92	124.04	442.42
14 Somogy	595.85	657.45	355.04	45.44	77.12	168.48	572.88	41.44	41.12	22.76
15 Szabolcs-Szatmar-Be	188.26	6.24	20.39	23.90	990.78	10.09	31.15	2.10	469.73	71.16
16 Jasz-Nagykun-Szolno	268.55	15.41	182.25	1545.49	79.06	78.18	36.42	16.06	380.21	248.77
17 Tolna	102.41	2530.78	242.86	5.09	33.38	38.85	289.71	3.72	6.14	5.73
18 Vas	152.37	60.59	10.90	15.80	9.68	9.20	21.46	849.10	5.54	8.78
19 Veszprem	699.40	58.39	89.19	35.44	75.30	28.85	518.47	288.00	61.16	41.40
20 Zala	594.87	251.75	116.97	47.28	32.50	96.69	204.77	365.18	28.55	26.75
21 Total	400825.81	100605.31	128146.46	90722.14	154541.90	89447.08	89408.53	80960.95	132503.80	78368.23

	KOMÁROM-E	NÓGRÁD	PEST	SOMOgy	SZABOLCS	SZOLNOK	TOLNA	VAS	VESZPRÉM	ZALA	EGYÉB	Total
01 Budapest	11823.57	10343.34	126148.76	4279.67	3697.49	9469.83	2629.80	2233.85	7664.62	2631.96	16873.37	642138.63
02 Baranya	100.71	41.43	272.57	9193.24	77.65	103.63	7162.11	438.91	690.47	3137.57	2514.98	123373.40
03 Bacs-Kiskun	25.99	76.16	2316.10	74.77	70.65	640.47	279.84	11.71	81.79	31.15	404.94	110545.29
04 Bekes	14.74	13.01	75.90	11.14	31.94	288.29	2.51	1.19	7.99	5.13	283.85	75515.88
05 Borsod-Abauj-Zemle	115.04	273.65	260.66	40.11	448.56	385.62	23.24	16.69	34.28	32.25	1038.47	141646.79
06 Csongrad	52.75	41.39	408.37	120.30	120.66	4399.13	194.79	35.12	95.57	55.98	1743.06	113658.39
07 Fejer	358.05	22.16	192.65	214.83	20.13	30.14	1716.11	70.06	527.53	89.99	317.28	70407.36
08 Győr-Sopron-Moson	3192.48	32.84	265.38	94.50	36.77	37.54	47.59	451.06	2583.51	130.42	366.24	82006.19
09 Hajdu-Bihar	87.32	204.59	359.30	37.16	14690.96	5763.94	24.57	30.68	74.94	48.07	2779.01	167620.75
10 Heves	19.37	858.79	3443.65	10.58	48.13	888.51	2.90	4.68	23.27	8.11	923.92	67667.24
11 Komárom-Esztergom	48325.61	45.38	409.17	23.37	26.77	38.03	20.35	31.51	55.18	17.23	1236.29	52458.90
12 Nograd	9.82	38132.37	121.71	1.19	6.49	79.61	4.59	0.51	6.18	4.46	157.34	39063.74
13 Pest	200.40	2485.20	78529.01	187.33	121.66	504.51	73.79	82.72	294.32	74.04	751.70	93525.14
14 Somogy	57.24	21.70	120.66	62277.20	18.69	70.53	1302.17	30.36	301.64	483.11	1256.25	68517.23
15 Szabolcs-Szatmar-Be	17.86	9.06	89.53	12.17	113432.22	66.19	6.62	3.40	29.15	7.82	1227.52	116715.45
16 Jasz-Nagykun-Szolno	17.14	49.85	2535.13	13.89	182.03	74511.51	9.55	2.10	36.05	9.20	199.02	80416.00
17 Tolna	13.93	1.64	24.71	204.77	11.63	14.55	38220.32	12.27	14.14	22.24	100.25	41899.20
18 Vas	29.64	3.80	44.41	109.66	10.35	7.24	14.21	39357.45	1836.94	1342.54	828.47	44728.24
19 Veszprem	111.68	21.81	156.02	202.29	56.45	46.35	72.45	190.79	64121.80	308.75	374.72	67558.83
20 Zala	82.61	14.20	161.03	1769.03	24.83	30.79	104.77	2248.61	2332.15	61433.00	1637.51	71603.94
21 Total	64656.03	52692.47	215934.80	78877.30	133134.16	97376.52	51912.38	45253.74	80811.62	69873.10	35014.27	2271066.69

Summary

Implementation of health policy objectives within the DRGs system

Cost -containment

Tools for limiting expenditures on the budget level are implemented

Efficiency

Technical efficiency improves (production of a specific service with the timely availability of appropriate resources and without wasting resources)

Problem:
expectation of efficiency in allocation takes effect only after hospital admission

Allocation efficiency improves (appropriate services in the care of a specific type of case)

In selected cases, best quality services will be given preferences

Equity in access

Free choice of hospital: more cases at higher levels of care

Obligation to provide in-area care: ensuring minimum access

Control of negative selection: an appropriate classification system **diminishes its scope**

Summary: Future development issues

- **Regulation against unnecessary increasing of activity**
- **Refinement HBCs, more merge rules**
- **Developing case classification for chronic care**
- **Developing the process of definition reimbursement parameters**
- **Developing other patient's classification system**
- **Developing other elements of regulated hospital and health market (capacity regulation, benefits regulation, quality regulation, etc.)**
- **Developing a price regulation based on health target**

Fund holders and partial case-managers*

